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# Food on the Fringe: Food Insecurity and the Use of Payday Loans

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**ABSTRACT** We examine how payday loan access and use relates to food-related material hardship with a sample of nonelderly households in both the December 2008 and January 2009 Current Population Surveys (CPS). We find that state legislation limiting access to payday loans increases the prevalence of our marginal food security measure by 1.4 percentage points and the probability of reporting that more money is needed for food (food inadequacy) by 2.3 percentage points. Further analyses using state payday loan limits as an instrumental variable suggest that using payday loans helps protect some households from food insecurity, especially those at the cusp of food insecurity. Our findings suggest that many households that are at risk for food insecurity face an unmet need for short-term credit and that improved credit access could reduce food insecurity and improve well-being.

## INTRODUCTION

Payday lending is a booming industry. Nationwide, nearly 20,000 stores offer more than \$40 billion in payday loans, or high-cost, short-term loans secured with a borrower's next paycheck, annually in more than 180 million transactions (Bair 2005; Flannery and Samolyk 2005). A payday loan allows a borrower to postdate a check or authorize an electronic funds transfer for the loan amount plus associated fees. The lender, in turn, agrees not to cash the check until a later date, often the date of the borrower's next paycheck. On the due date, the borrower either pays to redeem the check or allows the check to be cashed. In some states, the borrower may also roll over the loan by paying a fee to extend the loan.

Payday lenders normally require that a borrower have a bank account and employment (as the loan is borrowed against the next paycheck) or

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other documented income source, but they do not require that borrowers have the same level of credit worthiness that a credit card company or a bank would require for a loan. The typical payday loan is a 2-week loan for \$300 that incurs fees ranging from \$45 to \$90, resulting in an annualized percentage rate (APR) of 400–1,000 percent (Elliehausen and Lawrence 2001; Stegman and Faris 2003; Bair 2005; Skiba and Tobacman 2007; Stegman 2007). Many customers are chronic borrowers, using the rollover option if it is available and, on average, obtaining at least seven loans annually (Stegman and Faris 2003; Bair 2005; Flannery and Samolyk 2005).

Because of these high interest rates and fees, payday loans attract considerable attention and debate. Critics view payday lenders as usurious businesses that prey on the vulnerable poor, increasing financial distress by trapping households in a cycle of debt. Others argue that these businesses provide an essential service to those who have been abandoned by traditional banks and that, in some cases, a payday loan may be the least costly way to purchase necessities, such as food or rent, during an income shortage (Bertrand, Mullainathan, and Shafir 2006).

This debate is likely to continue. Federal regulation of the industry by the new Consumer Financial Protection Bureau (CFPB) could be on the horizon, and other states may follow Georgia's and Ohio's lead by introducing high-profile ballot initiatives capping payday loan interest rates. As the CFPB and state policy makers consider if and how to regulate this controversial industry, it is crucial to determine how payday loans relate to the material well-being of the 4.2 million households that use them (FDIC 2010).

We investigate whether access to and use of payday loans relates to material well-being, using food insecurity and food inadequacy as measures of consumption inadequacy. Food-insecure households are those that were, at times, unable to acquire adequate food for one or more household members because they had insufficient money and other resources for food. From 2008 through 2012, approximately 15 percent of all US households were food insecure (Coleman-Jensen, Nord, and Singh 2013).

Specifically, we explore the relationship between access to and use of payday loans and marginal food security. In this study, *marginal food security* includes households that experienced food insecurity and also households that had anxiety about accessing adequate food but did not substantially reduce the quality or quantity of their food intake. We use the term

*food inadequacy* to refer to households that reported needing more money for food. Households that experience marginal food security or food inadequacy are likely to be experiencing financial resource constraints because they face difficulties obtaining as basic a necessity as food. When an individual's current income is too low to afford enough food, payday loans, in conjunction with food assistance programs and other coping strategies, may ensure food security. The short-term liquidity provided by payday loans, however, increases these individuals' debt, potentially increasing the likelihood of food insecurity and food inadequacy as debt accumulates over a longer time period. With these offsetting relationships, the net relationship between payday loans and food security becomes an empirical question.

We employ Probit regressions to estimate the relationship between state limits on access to payday loans and marginal food security, using data on households in both the December 2008 and January 2009 Current Population Surveys (CPS). In addition to marginal food security of adults in the household, we examine food inadequacy, measured by a household reporting that they need to spend more in order to meet their food needs. We also seek to understand the relationship between payday borrowing and food security measures. Because those who borrow from payday lenders may be different from those who do not borrow from payday lenders in both observable and unobservable ways, we use state regulation of payday lenders to isolate exogenous variation in the availability of payday loans with an instrumental variable approach.

## BACKGROUND

Low- and moderate-income (under \$50,000) households are the predominant users of payday loans, although income levels vary somewhat by survey (Elliehausen and Lawrence 2001; Stegman and Faris 2003; Chessin 2005; Lawrence and Elliehausen 2008). Low income levels, income volatility, and liquidity constraints may create demand for short-term, small-dollar-amount loans that few mainstream financial providers offer.

Payday loan customers are highly credit-constrained and use payday loans when they have no alternative credit sources (Johnson and Johnson 1998; Elliehausen and Lawrence 2001; Bhutta, Skiba, and Tobacman, forthcoming). For example, using data from a large payday lender matched to the credit records of payday loan applicants, Neil Bhutta, Paige Marta Skiba,

and Jeremy Tobacman (forthcoming) establish that payday loan applicants typically face major financial difficulties and have already unsuccessfully sought credit from mainstream providers such as credit card companies before seeking payday loans. Although more than half (59 percent) of the applicants had at least one credit card, nearly all (92 percent) had less available credit than the typical \$300 payday loan. Moreover, many applicants were at least 30 days delinquent in their credit payments.

#### REGULATION OF PAYDAY LOANS

The payday lending industry faces both federal and state regulation, although state regulation tends to be more stringent. States tend to regulate at least some aspects of payday lending, such as limiting loan terms, fees, and the number of rollovers, but the most important regulation relates to the interest rates that payday lenders may charge. Most states specifically exempt payday lenders from state usury limits (Flannery and Samolyk 2005; National Council of State Legislatures 2013). A handful of states, however, prevent payday lenders from operating under state law either by indicating that these loans are illegal or by limiting the interest rate that payday lenders may charge to 36 percent, a level that payday lenders generally consider too low for profitability (National Council of State Legislatures 2013). There has been variation in payday lending limits over time, particularly over the past decade, when more states adopted limits on payday lending after allowing payday loans in the 1990s. While some reports suggest that enforcement of state payday lending laws and regulation is weak, research finds that state limits on payday loans do significantly reduce the probability of a consumer using a payday loan and that the Internet is not a significant source of payday loans (Avery and Samolyk 2011; Bhutta 2014).

At the federal level, the three bank regulators, the Federal Deposit Insurance Corporation (FDIC), the Federal Reserve, and the Office of the Comptroller of the Currency (OCC), regulate payday lenders. The most dramatic regulatory action taken by these entities occurred when they prevented payday lenders from partnering with out-of-state or national banks to evade state interest rate caps on payday lending. The Federal Reserve and the OCC ended this so-called “rent-a-charter” activity in 2002, while the FDIC ended the practice for the banks they regulate in 2005 (Mann and Hawkins 2007).

The only federal legislation limiting the availability of payday lending is the 2007 Talent-Nelson Amendment to the Department of Defense budget, which placed a 36 percent interest rate cap on any unsecured loan to military members and their dependents, effectively prohibiting payday lenders from making loans to active-duty service members.<sup>1</sup>

#### RELEVANT LITERATURE

In response to the concern that payday loans create a debt trap for borrowers, researchers have begun focusing on the relationship between payday loans and consumer well-being, but they are confronted with several problems. First, there are few publicly available data sets on payday borrowing, so researchers instead examine how access to payday loans relates to well-being. Variation in access typically arises from state-level payday loan regulations, but some researchers take into account the federal ban on payday lending to members of the military or the distance to the nearest state without limits on payday loans. However, access to payday loans is not equivalent to use of payday loans, and states may differ in more ways than their payday loan laws and regulations. Or, if data on payday borrowing are available, they frequently rely on proprietary data, for example, from one payday lending firm, which limits externality validity.

The second problem is that, even with data on payday borrowing, households that choose to apply for and receive a payday loan are likely different from otherwise similar households in important ways that may not be readily observable. The best work attempts to overcome this self-selection problem by considering variation in access to payday loans. Evidence of how payday loans may relate to changes in consumer well-being is mixed, with some studies suggesting that payday loans improve well-being and some demonstrating that these loans increase financial distress. As a result, the relationship between payday loans and consumer well-being continues to be a matter of debate.

1. The Talent-Nelson amendment to the John Warner National Defense Authorization Act for Fiscal Year 2007, Pub. L. No. 109-364, § 670(a), 120 Stat. 2083, 2266 (codified at 10 V.S.c.A. § 987(b)), states: "A creditor . . . may not impose an annual percentage rate of interest greater than 36 percent with respect to the consumer credit extended to a covered service member or a dependent of a covered service member." Before the ban, the military were more likely to use a payday loan, and their high use may have been one reason for the ban (Knize 2009).

Recent research on the consequences of payday loan access or use examines a range of outcomes related to financial distress, including debt, credit, late bill payment, and overall financial health. A few articles examine how access to or use of payday loans correlates with one of the most extreme debt outcomes possible: bankruptcy. For example, Skiba and Tobacman (2011) match data from 2000 through 2006 from one payday lender in Texas to public records on Chapter 7 and Chapter 13 bankruptcy filings up to 2 years later.<sup>2</sup> Comparing payday loan applicants based on whether their credit score exceeded or fell just below the lender's approval criteria in a regression discontinuity design, they find a doubling of Chapter 13 bankruptcy filings for those receiving payday loans. Although Skiba and Tobacman's research design can be criticized for lacking external validity for households far from the discontinuity, Donald Morgan, Michael Strain, and Ihab Seblani (2012) provide some evidence corroborating Skiba and Tobacman's work. In a state-level panel from 1998 through 2008, Morgan and colleagues find a 31 percent reduction in Chapter 13 bankruptcy filings when states limit access to payday lenders but no increase in Chapter 7 bankruptcy filings. While their findings are sensitive to the inclusion of state-specific time trends, overall these findings suggest that the interest and fees associated with payday borrowing may push a household into bankruptcy.

Other research using sub-state-level variation in payday loan access finds no evidence that payday loans increase bankruptcy filings. Richard Hynes (2012) uses county-level data from 1998 through 2009 to examine limits on payday loan access arising from state prohibitions, distance to neighboring states without limits on payday loans, and the 2007 limit on lending to military members. Hynes finds no change in bankruptcy filings after states legalize payday lending and some declines in bankruptcy filings in counties with large military communities that lost payday loan access after the 2007 limit on lending to the military. Using even more geographically refined data, Lars Lefgren and Frank McIntyre (2009) use zip code-level data on bankruptcy filings between 1999 and 2001 and find

2. Chapter 7 bankruptcy relieves a debtor of all dischargeable debts, after a trustee sells all nonexempt assets. Chapter 7 is only available to those who, in the 6 months prior to the bankruptcy filing, have income below the state median household income for a household of their size. Chapter 13 bankruptcy creates a 3-year repayment plan and, after the 3-year period, all remaining debts are discharged.

no evidence that state-level payday loan regulations correlate with bankruptcy filings across states. These articles do not suggest that payday loans will push a household into bankruptcy, but neither work has information on actual payday loan use.

Morgan (2007) examines nonmortgage debt more generally, using Survey of Consumer Finance (SCF) data from 1995 and 2001 in a difference-in-differences framework. Because he did not have information on payday loan use, Morgan proxied for payday loan use by comparing households with low levels of education or volatile income across states that differ in their payday loan limits. He finds that state payday loan limits are not related to higher levels of consumer debt or more missed debt payments but that they are related to an increased prevalence of being turned down for credit. Although his article is one of the earliest empirical works on how payday loans relate to well-being, Morgan's approach could lead to bias if there are any differential state-level trends correlated with state payday loan limits.

Others have investigated checking account overdrafts and late bill payments as indicators of financial distress. In addition to the bankruptcy work discussed above, Morgan and colleagues (2012) also created state-level panels with data on returned checks, income earned by banks from overdraft fees, and complaints against lenders and debt collectors from 1999 through 2008 to examine how state payday loan laws and regulations relate to these outcomes. They find that when access to payday loans is restricted, there is a 17 percent increase in returned checks, a 12 percent increase in overdraft fee income, and a 17 percent increase in complaints against debt collectors and other lenders. Based on this state-level variation in payday loan limits, and assuming there are no omitted variables correlated with the variation in payday access, they conclude that payday loans allow households to avoid costlier overdraft credit and that access to payday loans helps consumers to not miss bill payments.

Dennis Campbell, Asis Martinez-Jerez, and Peter Tufano (2012) examine outcomes related to those that Morgan and colleagues (2012) analyze, but they reach the opposite conclusion. In this research, the authors study the relationship between the supply of payday lenders and involuntary consumer bank closures from customers incurring too many overdrafts and find that access to payday loans increases financial distress, using two different approaches. First, using national data from 2006, they find a positive relationship between counties with more payday lenders and



account closures. Because the national data is only a cross section, they also use county-level data from 2002 through 2006 for Georgia and neighboring states (Alabama, Florida, North Carolina, South Carolina, and Tennessee). They find that after Georgia's 2004 limit on payday lending, involuntary bank account closures declined in Georgia by 9.4 percent. They find larger declines, up to 30.2 percent, among households more than 60 miles from the Georgia border. While the county-level analysis does corroborate their national data, these six southern states may not be representative of all US households.

Adair Morse (2011) provides further evidence that payday loans may help households avoid financial distress, using zip code-level data to examine how the supply of payday lenders in local communities changed foreclosure rates and nonviolent, small property crime rates following natural disasters in California. She finds a lower growth in both foreclosure rates and small property crime rates in communities with more payday lenders, suggesting that payday loans may provide necessary resources during an emergency. However, her work focuses on only one state and on the relatively rare occurrence of a natural disaster.

Examining Washington and Oregon residents who used a payday loan in the past 3 months, using a difference-in-differences approach, Jonathan Zinman (2010) concludes that after Oregon passed a statewide limit on payday loans in 2007, residents turned to higher-cost substitutes for needed liquidity, including bank overdrafts and late bill payment. In addition to increases in telephone disconnection and subjective rates of worse financial well-being, he finds declines in employment that he attributes to the inability of lower-income households to borrow for a financial emergency, such as an auto repair or a medical expense. He reports that 19 percent and 14 percent of all borrowers in Oregon and Washington, respectively, purchase food or groceries with a payday loan. While this research informs our work, Zinman uses a small, non-nationally-representative data set.

Unlike studies that only examine access to payday loans, Bhutta (2014) and Bhutta, Skiba, and Tobacman (forthcoming) measure payday loan use. Bhutta (2014) examines individual credit score data from 2006 to 2012 to understand how the supply of payday lenders in a household's immediate neighborhood affects financial health, considering variation in access resulting from state limits and distance from payday lenders. He finds little relationship between payday loans and changes in credit scores, new

payment delinquencies, or credit overdrafts.<sup>3</sup> Using similar data, Bhutta and colleagues (forthcoming) use a regression discontinuity design to compare payday loan applicants between June 2000 and August 2004, based on a payday lender's loan approval criteria. They find no difference in credit scores up to 3 years later, and they conclude that payday loans have little effect on an individual's creditworthiness. Their regression discontinuity approach, however, may lack external validity for those individuals with a credit score far from the approval criteria.

While some work suggests that payday loans protect consumers from, or at least do not worsen, financial distress, when used repeatedly or for impulse purchases, payday loans could reduce well-being in other ways. Using military job performance data for members of the US Air Force, Scott Carrell and Jonathan Zinman (2014) conclude that greater access to payday loans increases financial distress to the point that it reduces job performance and job readiness. Mary Zaki (2014) examines expenditure data from commissaries and exchanges on military bases before and after the ban on lending to military members and finds a 7 percent increase in spending on electronics and alcohol, which she attributes to impulse spending that harms households' long-term economic well-being. While these two studies suggest that payday loans may be related to job performance and purchasing patterns, the military population is likely different from the civilian population in important ways, and neither study can measure the actual use of payday loans.

Few studies examine how payday loan access or payday loan use relates to material hardship and, specifically, food-related hardship. Brian Melzer (2011) examines how payday loan access correlates with material hardship, using data from the National Survey of American Families (NSAF), a survey covering 13 states conducted in 1997, 1999, and 2002. Considering variation among the three states that limited payday loans during his sample period (Massachusetts, New Jersey, and New York), as well as distance to the border of a state that allows payday loans, Melzer finds a positive but insignificant relationship between payday loan access and the probability that adults in the family reduced the size of meals for financial reasons, perhaps because these households made greater use of public

3. Because payday lenders do not report payday borrowers to credit reporting bureaus, payday loans would only have an effect on credit scores by their ability to help the borrower meet other financial obligations.

food assistance programs and prioritized food over other expenditures. He also finds that access to payday loans increases the likelihood that households face difficulty in paying mortgage, rent, or utility bills by 25 percent and that it increases the probability that the households delay needed medical care due to financial circumstances by 25 percent. Melzer concludes that greater access to payday loans increases family economic hardship.

While Melzer (2011) does not find a significant relationship between payday loan access and food-related hardship, Michael Barr (2009) finds that households in the Detroit metropolitan area that did not own a bank account (a typical requirement for a payday loan) faced much higher rates of food hardship than banked households. Barr explains this result by pointing to the lack of payday loans and other sources of credit for the unbanked. Similarly, James Sullivan, Lesley Turner, and Sheldon Danziger (2008) find that lack of access to formal or informal credit significantly increases material hardship, including food insufficiency, and Zaki (2014) demonstrates that access to payday loans allows military service members to overcome liquidity constraints and smooth their food consumption between paychecks. These studies suggest that payday loans may reduce the likelihood of food insecurity by providing necessary liquidity to households at critical times.

Our analysis considers how access to or use of payday loans correlates with food insecurity. In addition to the research findings described above, prior work on the causes and correlates of food insecurity also informs our hypotheses about the ways in which payday loans may be related to food security. Food insecurity often results from resource constraints associated with low income (Rose, Gundersen, and Oliveira 1998; Gundersen and Gruber 2001; Ribar and Hamrick 2003; Leete and Bania 2010). Unexpected reductions in income or expenditure shocks (e.g., an unforeseen medical expense) may increase the likelihood that a household will experience food insecurity. For example, higher-than-average heating or cooling costs may result in decreased food expenditures, reduced caloric intake, and higher rates of food insecurity (Gundersen and Gruber 2001; Bhattacharya et al. 2003; Ribar and Hamrick 2003; Nord and Kantor 2006; Leete and Bania 2010; Guo 2011).

Households that have access to credit or adequate savings can smooth consumption during income or expenditure shocks and are more likely to remain food secure (Gundersen and Gruber 2001; Ribar and Hamrick 2003;

Leete and Bania 2010; Guo 2011). Because many lower-income households cannot borrow in mainstream credit markets, they may need to rely on alternative sources of credit, such as payday loans, when their current income is inadequate for current consumption. Thus, payday loans could potentially assist households in purchasing food, allowing them to maintain food security. For example, Zaki (2014) demonstrates that access to payday loans can assist with smoothing food consumption over a very short-term period.

Reconciling the findings of the literature on payday loans and the literature on food security allows us to hypothesize that credit-constrained households may be able to improve their food security with the liquidity provided to them by payday loans. However, if households repeatedly borrow, the interest and fees incurred from payday loans over time may produce debt that stresses household budgets, crowds out food spending, and increases the risk of food insecurity and food inadequacy. Thus, we hypothesize that payday loans have a potentially ambiguous relationship with food hardship, and our empirical analysis seeks to determine if payday borrowing is positively or negatively associated with food security.

This article fills in several gaps in the literature on the relationship between payday loans and consumer well-being. First, it uses nationally representative data, and thus results are broadly applicable to all US households. It also examines a basic consumption measure that could plausibly be related to payday loan use. We are also, to the best of our knowledge, the first to use the standardized US Department of Agriculture (USDA) measure of food security, which has been validated and rigorously studied, in our analysis rather than a food hardship measure that is defined differently across surveys. Finally, we are the first to examine how payday loan use, rather than access to payday loans, relates to these outcomes. With our identification strategy, we are able to shed light on two topics of considerable policy interest: the consequences of payday lending and the determinants of marginal food security and food inadequacy.

## DATA

We use data from the December 2008 and January 2009 Supplements to the Current Population Survey (CPS). In addition to collecting demographic and income data, each December the CPS includes the Food Security Supplement, with information on household food security as well as participation in food assistance programs and food expenditures. In January 2009,

the FDIC sponsored a special supplement to the CPS to collect nationally representative data on the use of alternative financial services (AFS), including payday lending. To create a data set with both payday lending use and food security outcomes, we link households in both surveys, following the recommendations of Brigitte Madrian and Lars Lefgren (1999).<sup>4</sup> The December 2008 CPS Food Security Supplement sample includes 44,019 households, and the January 2009 CPS supplement sample includes 46,547 households. The matched sample includes 29,466 households that were interviewed in both supplements.

We limited the sample to households in which the primary earner is younger than 60, resulting in an estimation sample of 20,518 households. We excluded households headed by people over age 60 because households headed by working-age adults are the population of primary policy interest for both fringe banking and food insecurity. Payday loans tend to be used by working-age adults, and households of the elderly are less likely to be food insecure than households headed by working-age adults. For example, in 2011, 8.4 percent of households with elderly members were food insecure, compared with 14.9 percent for all households and 20.6 percent of households with children (Coleman-Jensen et al. 2012).

Food security is the USDA's official classification of food adequacy. We are primarily interested in the food security status of adult household members over the past 12 months, determined from the number of affirmative responses to 10 questions about conditions or behaviors that indicate difficulty in meeting food needs.<sup>5</sup> Marginally food-secure households affirm one or more items, food-insecure households affirm three or more items, and very low food-secure households affirm six or more items. These classifications reflect increasing difficulties in obtaining enough food. Adults in marginally food-secure households report at least some anxiety about their food supply and may experience reductions in dietary quality and in-

4. Households in the Food Security Supplement and FDIC supplement were first merged at the person level by state, household identification numbers, and person's line number, and then characteristics of persons were compared across the two files to ensure that the persons matched were indeed the same in both supplements. There are 29,466 households with data from both the Food Security Supplement and a FDIC-sponsored supplement.

5. We use the adult food security measure rather than the household measure to allow for similar food insecurity calculations for households with and without children. For households with children, the household measure is composed of eight additional questions about children's food security.

take or disruptions in normal eating patterns. In addition to anxiety about their food supply, adults in food-insecure households have difficulty acquiring adequate food, report reductions in the quality or variety of their diet, and may reduce food intake. Very low food security is the most severe classification of food insecurity and is characterized by disrupted eating patterns and reductions in food intake, in addition to reduced dietary quality and anxiety about the food supply.

The main outcome in our study, marginal food security, includes households at all three levels of severity (marginally food secure, low food secure, very low food secure; for more information, see Coleman-Jensen and Gregory 2014), because households may turn to alternative financial providers such as payday lenders when they face worry or uncertainty about having enough food. In other words, we use the term *marginal food security* to refer to households with adults affirming one or more food-insecure conditions. In addition to the 12-month measure of marginal food security, we also examine marginal food security over the previous 30 days (from mid-November to mid-December 2008) because it is more likely that any payday loan use in the previous year (measured from January 2008 to January 2009) preceded the experience of food insecurity over the previous 30 days. As a result, it provides suggestive evidence for the relative timing of these behaviors.

The final outcome of interest is the respondent's report that the household needs to spend more to meet their food needs. We interpret this as an indicator of what we term *food inadequacy* because it captures actual food expenditures compared to the respondent's perception of an adequate level of expenditures. Needing to spend more to meet food needs is correlated with the USDA food insecurity measure (Gundersen and Ribar 2011).

The primary covariates of interest are measures of payday loan access and payday loan use. We capture access to payday lenders by taking into account state laws and regulations that inhibit access to payday loans, gathered from Brian Melzer and Donald Morgan (2009), Hynes (2012), the National Conference of State Legislatures (2013), Signe-Mary McKernan, Caroline Ratcliffe, and Daniel Kuehn (2013), and Bhutta (2014).<sup>6</sup> In 2008,

6. Households in states that limit payday loans can still access a loan if they travel across state lines or use an Internet provider or access payday loans on the Internet. Recent work finds that state laws limiting access to payday loans tend to be binding (Avery and Samolyk 2011; Bhutta 2014).

11 states and the District of Columbia had limits on payday loans in place: Connecticut, Georgia, Maryland, Massachusetts, New Jersey, New York, North Carolina, Oregon, Pennsylvania, Vermont, Washington, DC, and West Virginia.<sup>7</sup> For estimates examining how payday loan use relates to marginal food security and food inadequacy, our key covariate of interest is the household's payday loan use over the previous 12 months. Our measures of food security and payday loan use were collected over essentially the same period (the 12-month measure of food security was collected in December 2008, and the 12-month measure of payday loan use was collected in January 2009).

## METHOD

We are interested in two related issues: the relationship between access to payday lenders and both food insecurity and food inadequacy and the relationship between the use of a payday loan and these outcomes. To understand how access to payday lenders relates to marginal food security and food inadequacy, we estimate the relationship between the outcomes of interest and state-level differences in access to payday loans with the following Probit specification:

$$\Pr(\text{Food\_Insecurity}) = \beta_0 + \beta_1 \text{Payday\_Limit} + \beta_2 \text{Hhold\_Char} + \beta_4 \text{State\_Char} + \beta_5 \text{CBSA\_Char} + \varepsilon, \quad (1)$$

where the food insecurity outcomes of interest include marginal food security of adults in the household over the previous 12 months, food inadequacy, and marginal food security of adults in the household over the previous 30 days. The primary coefficient of interest is  $\beta_1$ , which equals one if state law or regulation limits payday loan availability. We report robust standard errors, clustered at the state level. All estimates are weighted by the food security supplement weight.

We include extensive controls to address households' demographic and economic differences (Hhold\_Char), and characteristics of the state (State\_Char) and Core-Based Statistical Area (CBSA) in which they reside

7. Localities may also restrict payday lenders through zoning or through city ordinances. For example, both Oakland and San Francisco limit the number and location of payday lenders (Morgan and Strain 2008).

(CBSA\_Char) that may be correlated with payday loan use and marginal food security or food inadequacy. The matrix of household characteristics captures demographic and economic characteristics of the household that have been shown to be associated with payday loan use or food insecurity.<sup>8</sup> We include indicators reflecting the household composition (single parent, single adults, and two or more adults without children; with married couples with children serving as the omitted group). Single-parent households are more likely to be food insecure and to use a payday loan than married-couple households. We also include controls for the age range of the primary earner in the household (30–39, 40–49, and 50–59; with age < 30 serving as the omitted group); controls for the age of the oldest child in the household; and dummies for race/ethnicity and citizenship status (non-Hispanic black, Hispanic, and native-born US citizen). Households with adolescents and those headed by racial/ethnic minorities have a higher likelihood of food insecurity. Racial/ethnic minorities are also more likely to use payday loans.

We include controls reflecting labor market and income characteristics, including indicators for educational attainment of the most educated adult in the household (less than high school, high school graduate; with at least some college serving as the omitted group) and a series of dichotomous variables for the household's income-to-poverty ratio (130 percent to < 185 percent, 185 percent to < 300 percent, 300 percent and above, and a dummy for missing income; with < 130 percent serving as the omitted group). A household employment dummy variable captures the employment status of the most employed adult in the household (full-time worker, part-time worker, unemployed but looking for work, retired or out of the labor force for reasons other than disability, and not in the labor force due to disability; full-time employment serves as the omitted group). Income is measured as annual household income, while labor force status is measured at the time of the food security survey and reflects current employment. Prior studies have found that, even after accounting for income, both education and labor force status are significantly related to food insecurity. Lower education levels and lower income levels are associated with a higher likelihood of food insecurity and payday loan use. Households without full-time workers, particularly those with part-time workers, unemployed adults,

8. For a recent analysis of macroeconomic factors and household-level characteristics associated with food insecurity, see Nord, Coleman-Jensen, and Gregory (2014).



or adults with disabilities who are out of the labor force, are more likely to be food insecure net of income and other household characteristics. Moreover, employment is typically required for a payday loan. Finally, we include an indicator for residing in a metropolitan area, as those residing in central cities and nonmetropolitan areas are more likely to face food insecurity than those in suburban areas.

State-level characteristics capture economic and policy characteristics of the state in 2008, including the unemployment rate, the maximum state EITC for a household with two children in thousands of dollars, and the minimum wage. Unemployment rates capture, in general, the labor market conditions in the state, while state EITC and minimum wage levels capture the generosity of the state's safety net that support households at or near poverty. We control for income of the CBSA with a series of indicators for the percentage of the population at different income levels calculated from the American Community Survey ( $< \$10,000$ ,  $\$10,000$  to  $< \$20,000$ , and  $\$20,000$  to  $< \$35,000$ ; with the percentage with income  $\$35,000$  or more as the omitted group). Areas with more low- and moderate-income households are more likely to have a greater supply of payday lenders.

After examining how access to payday lenders relates to food-related hardship, we estimate the relationship between payday loan use and food-related hardship. One concern with estimating this relationship is that payday loan borrowers are more likely to experience food hardship than those who choose not to borrow from payday lenders due to unobserved selection effects rather than payday loan use. As a result, the coefficient will be biased upward. Therefore, we follow the literature and use state payday loan limits to generate exogenous variation in payday loan use with an instrumental variables (IV) approach.

The second concern with our approach is a limitation imposed by our data. Because we do not know precisely when the household borrowed from a payday lender over the past year relative to when they experienced marginal food security, we can only approximate a causal relationship. Keeping this limitation in mind, we treat the IV estimates as exploratory and attempt to provide support for a causal interpretation by comparing the 12-month and 30-day measures of marginal food security.

We implement the IV approach with a two-stage least squares (2SLS) specification. The first equation in this specification estimates how payday loan use relates to payday loan access. The second equation uses the exogenous variation in payday loan use to identify the relationship between

payday loans and food-related outcomes. Using variation arising from state limits, we identify the local average treatment effect (LATE), or the relationship between payday loan use and our food-related outcomes for households that, absent a state limit on payday loans, would have used a payday loan. While the LATE does not provide insight into the average effect of payday borrowing in the overall population, it is the most useful parameter for policy because policy makers respond to concerns about payday borrowing and well-being by imposing (or eliminating) limits on payday lending. The LATE is relevant to assessing how consumers respond to changes in payday loan access created by legal and regulatory changes designed to alter the availability of payday loans. As a result, the LATE can serve to predict the consequences of changes in payday loan access.

Our approach is summarized by the following set of equations:

$$\begin{aligned} \text{Pr(Payday)} = & \gamma_0 + \gamma_1 \text{State\_Limit} + \gamma_2 \text{Hhold\_Char} \\ & + \gamma_4 \text{State\_Char} + \gamma_5 \text{CBSA\_Char} + \varepsilon, \end{aligned} \quad (2)$$

$$\begin{aligned} \text{Pr(Food\_Insecurity)} = & \delta_0 + \delta_1 \text{Payday} + \delta_2 \text{Hhold\_Char} \\ & + \delta_3 \text{State\_Char} + \delta_4 \text{CBSA\_Char} + \mu, \end{aligned} \quad (3)$$

where Payday reflects the household's report of payday loan use over the past 12 months, State\_Limit indicates if the state imposes limits on payday loans, and Food\_Insecurity reflects the marginal food security and food inadequacy outcomes we consider. The coefficient of interest,  $\delta_1$ , measures how payday borrowing relates to food insecurity and related outcomes. We report robust standard errors, clustered at the state level. All estimates are weighted by the food security supplement weight.

As with any IV approach, the validity of state payday loan limits as an instrument is critical for our approach. A valid instrument requires that these laws and regulations change the propensity to borrow from a payday lender but are unrelated to unobservable household preferences for credit. We will present evidence that state limits change the probability of using a payday loan, as well as examine if these state limits are exogenous to the household.

## DESCRIPTIVE STATISTICS

Table 1 shows descriptive statistics for our sample of nonelderly households. Column 1 shows that approximately 4 percent (3.9 percent) of the full

**TABLE 1.** Summary Statistics for Payday Loan Use, Marginal Food Security, and Food Inadequacy Outcomes, Weighted

	Full Sample (1)	State Limits Payday Loans (2)	State Allows Payday Loans (3)	t-Test of Sample Means	Has Not Used Payday Loan in Last Year (4)	Used Payday Loan in Last Year (5)	t-Test of Sample Means
Used payday loan in last year	.039 (.194)	.013 (.113)	.049 (.215)	+			
Marginally food secure over last 12 months	.254 (.435)	.258 (.438)	.244 (.430)	**	.240 (.427)	.623 (.485)	+
Household indicates need to spend more to meet food needs	.151 (.358)	.146 (.353)	.165 (.371)	**	.145 (.352)	.299 (.458)	+
Marginally food secure over last 30 days	.157 (.364)	.152 (.359)	.159 (.366)		.146 (.353)	.429 (.495)	+
Number of observations	20,511	15,529	4,982		19,783	728	

Source.—Authors' calculations using households in both December 2008 Current Population Survey and January 2009 Current Population Survey.

Note.—Marginal food security refers to households that affirmed one or more questions on the US Adult Food Security Survey Module. Sample includes households in which the primary earner is younger than age 60. See the text for further details on variables. Standard errors are in parentheses.

+  $p < .10$ .

\*\*  $p < .01$ .

sample borrowed from a payday lender sometime during the past year and that more than one-quarter (25.4 percent) of adults experienced marginal food security. The prevalence of food insecurity is 15.0 percent, a figure that nearly replicates the US population as a whole (14.6 percent in 2008), but it is consistent with research showing a higher prevalence of food insecurity among households headed by working-age adults. Overall, 15.1 percent of households reported that they needed to spend more to meet their food needs (food inadequacy). The remaining columns of table 1 compare households in states that limited payday lending to those in states that did not (cols. 2 and 3) and compare households that used a payday loan in the past year to those that did not (cols. 4 and 5).

Two interesting patterns emerge that provide preliminary evidence for our empirical analysis. First, there is little difference between the food

insecurity rates of households in states that limited payday loans and those that did not. States that limited payday loans had a slightly higher rate of marginal food security (25.8 percent vs. 24.4 percent) that is statistically significant at the 10 percent level, but the difference is not large in magnitude. Rates of food inadequacy are nearly five points higher in states that allowed payday loans. This provides preliminary evidence that, in the aggregate, state treatment of the payday loan industry is unrelated or only weakly related to food insecurity outcomes.

Second, there are large and important differences in the food security rates between households that report using a payday loan and those that do not. Households that reported using a payday loan in the past year were much worse off on every measure of food insecurity. They were 38.3 percentage points more likely to experience marginal food security (62.3 percent compared to 24.0 percent), 15.4 points more likely to report food inadequacy (29.9 percent compared to 14.5 percent), and 28.3 points more likely to experience marginal food security over the previous 30 days (42.9 percent compared to 14.6 percent). The 30-day prevalence of marginal food security is less than the 12-month prevalence due to the shorter time period for measurement and periodic nature of food insecurity.

In table 2, we provide the observable characteristics for our sample of households. Columns 2 and 3 compare households in states that limited payday loans to those in states that did not and show that households had significantly lower incomes in states that did not limit payday loans. Households in states that limited payday loans were more likely to be headed by an African American (16.5 percent vs. 11.3 percent) and less likely to be headed by a Hispanic (9.2 percent vs. 14.3 percent). Additionally, states that limited payday loans had slightly lower unemployment rates (5.6 percent vs. 5.8 percent) and a more generous Earned Income Tax Credit (EITC) than states that did not limit these loans.

Comparing households that did not use a payday loan to those that did (cols. 4 and 5), we find that payday loan users are significantly more likely to be single parents (29.0 percent vs. 13.5 percent) and significantly less likely to have two or more adults in the household. Payday loan users are concentrated among those with less educational attainment, less full-time employment (75.4 percent vs. 83.3 percent), and lower income relative to poverty levels, suggesting that payday loan use is related to economic hardship. Finally, payday loan users are more likely to be African American (24.0

**TABLE 2.** Demographic and Economic Characteristics of Sample, Weighted

	Full Sample (1)	State Limits Payday Loans (2)	State Allows Payday Loans (3)	t-Test of Sample Means	Has Not Used Payday Loan in Last Year (4)	Used Payday Loan in Last Year (5)	t-Test of Sample Means (6)
Household characteristics:							
Household type:							
Married couple with children	.308 (.462)	.308 (.462)	.308 (.462)		.309 (.462)	.273 (.446)	*
Two or more adults, no children	.341 (.474)	.334 (.472)	.343 (.475)		.345 (.475)	.242 (.429)	+
Single parent	.141 (.348)	.138 (.345)	.148 (.355)		.135 (.341)	.290 (.454)	+
Single adults	.211 (.408)	.210 (.407)	.211 (.408)		.211 (.408)	.195 (.397)	
Educational attainment:							
Less than high school	.056 (.230)	.050 (.218)	.058 (.234)		.055 (.228)	.083 (.276)	*
High school graduate	.222 (.416)	.223 (.416)	.222 (.416)		.220 (.414)	.293 (.456)	+
At least some college	.721 (.448)	.719 (.449)	.727 (.446)		.795 (.446)	.624 (.484)	+
Employment:							
Employed full-time	.830 (.376)	.836 (.370)	.828 (.378)		.833 (.373)	.754 (.431)	+
Employed part-time	.061 (.239)	.056 (.231)	.062 (.242)		.060 (.237)	.085 (.279)	+
Unemployed	.040 (.196)	.034 (.182)	.040 (.196)		.037 (.188)	.086 (.281)	+
Retired or not in labor force	.038 (.192)	.040 (.197)	.038 (.190)		.039 (.193)	.032 (.176)	
Disabled	.032 (.177)	.033 (.179)	.032 (.177)		.032 (.176)	.043 (.203)	*
Household income-to-poverty ratio	3.361 (2.823)	3.505 (2.981)	3.309 (2.763)	+	3.406 (2.846)	2.264 (1.905)	+
Demographic characteristics:							
Age	41.289 (10.836)	41.633 (10.538)	41.163 (10.938)		41.415 (10.830)	38.163 (10.494)	+

African-American, non-Hispanic	.127 (.333)	.165 (.371)	.113 (.316)	+	.122 (.327)	.240 (.428)	+
Hispanic	.129 (.335)	.092 (.288)	.143 (.350)	+	.129 (.335)	.143 (.351)	+
Native-born	.862 (.345)	.855 (.352)	.864 (.343)	+	.859 (.348)	.923 (.267)	+
No. of children	.855 (1.162)	.844 (1.127)	.859 (1.174)	**	.844 (1.155)	1.122 (1.281)	+
No. of children ages 6–14, for those with children	.497 (.500)	.492 (.500)	.499 (.500)		.493 (.500)	.564 (.497)	+
No. of children ages 15–17, for those with children	.274 (.446)	.280 (.449)	.272 (.445)		.277 (.448)	.280 (.449)	*
State characteristics in 2008: Unemployment rate	5.765 (1.101)	5.572 (.542)	5.837 (1.239)	*	5.766 (1.102)	5.751 (1.080)	
State maximum EITC for household with two children	297.219 (478.053)	649.342 (613.921)	166.439 (332.149)	+	305.1372 (484.499)	143.642 (289.150)	+
Minimum wage	7.057 (.549)	7.120 (.463)	7.033 (.576)	+	7.060 (.549)	6.993 (.545)	*
CBSA characteristics: Metropolitan area	.842 (.365)	.884 (.320)	.826 (.379)	+	.843 (.364)	.816 (.388)	
Percentage < \$10,000	7.025 (1.843)	7.039 (1.450)	7.020 (1.969)		7.0163 (1.839)	7.196 (1.896)	**
Percentage \$10,000 to < \$20,000	9.931 (3.014)	8.696 (3.752)	10.390 (2.541)	+	9.89625 (3.047)	10.606 (2.189)	+
Percentage \$20,000 to < \$35,000	14.946 (4.019)	12.864 (5.392)	15.719 (3.024)	+	14.880 (4.074)	16.234 (2.404)	+
Number of observations	20,511	4,982	15,529		19,783	728	

Source.—Authors' calculations using households in both December 2008 Current Population Survey and January 2009 Current Population Survey.

Note.—Sample includes households where the primary earner is younger than age 60. See the text for further details on variables. Standard errors are in parentheses.

+  $p < .10$ .

\*  $p < .05$ .

\*\*  $p < .01$ .

percent vs. 12.2 percent), and native-born citizens (92.3 percent vs. 85.9 percent), and they are more likely to have children in the home (1.1 vs. 0.84 children).

We begin to explore the relationship between payday loan access and use and food insecurity and inadequacy by examining adults' self-reported reasons for using a payday lender. The January 2009 CPS does not ask specifically about the motivations for using a payday loan, but it does ask why households used any AFS product, defined as a payday loan, a rent-to-own credit agreement, pawn loan, or a tax refund anticipation loan. In panel A of table 3, we examine the self-reported main motivation for obtaining payday AFS products. Most households that used any AFS product

**TABLE 3.** Reported Use of Alternative Financial Services, including Payday Loans, over the Last 12 Months, Weighted

A. Main Reason Needed Alternative Financial Services (AFS)	Overall (%)	Used Payday Loan (%)	Did Not Use Payday Loan (%)	Statistical Difference
Basic living expenses	35.43	45.43	31.51	+
Make up for lost income	14.80	19.46	12.97	+
Car repairs	3.28	7.61	1.58	+
Special gifts or luxuries	6.21	4.07	7.05	+
House repairs or buy appliance	7.44	3.58	8.96	+
Medical expenses	1.85	3.26	1.29	+
School or childcare expenses	1.55	1.26	1.66	
Other	29.45	15.31	34.99	+
Total	100.00	100.00	100.00	
<b>B. Main Reason Used a Payday Lender Rather than a Bank</b>				<b>%</b>
It is easier to get a payday loan than to qualify for a bank loan				43.57
The payday loan service is more convenient				26.27
Don't qualify for a bank loan				16.90
A payday loan service feels more comfortable than using a bank				2.54
Other				10.71
<b>C. Number of Times in the last 12 Months Used a Payday Loan, for Payday Loan Users</b>				<b>%</b>
1				43.75
2				17.75
3				8.94
4				6.45
5 or more				23.10
Mean for payday loan users				3.643
				(4.403)
Median for payday loan users				2

Note.—Authors' weighted calculations from all households in the January 2009 CPS. Alternative financial services are defined as payday loan, pawn shop, rent-to-own outlet, or tax refund anticipation loan.  
<sup>+</sup>  $p < .10$ .

in the past 12 months did so for necessities, including basic living expenses (35.4 percent), making up for lost income (14.8 percent), house repairs or appliance purchases (7.4 percent), car repairs (3.3 percent), medical expenses (1.9 percent), or school or childcare expenses (1.6 percent). Few reported using any AFS product for special gifts or luxuries (6.2 percent). These responses suggest that AFS products are generally used for expenditures related to necessities rather than luxuries.

We further compare households that specifically reported taking a payday loan in the past 12 months to those that used another AFS product not including a payday loan in the past 12 months. Households that specifically reported using a payday lender were even more likely than those who used other AFS products to report relying on AFS products when making up for lost income or basic living expenses (see panel A of table 3). This provides additional evidence that payday loans are not typically used for frivolous expenditures. Instead households seek payday loans to pay for day-to-day living expenses such as food. This corroborates Zinman's (2010) finding that payday borrowers in Oregon and Washington reported using payday loans for basic living expenses, including groceries, rather than luxuries.

In panel B of table 3, we examine payday borrowers' self-reported reasons for choosing payday lenders rather than banks. Payday loan users reported that it was easier to qualify for payday loans than bank loans (43.6 percent), that it was more convenient to get payday loans (26.3 percent), and that they did not qualify for bank loans (16.9 percent). In short, payday borrowers are motivated by lack of money or access to credit and by convenience. If these households were to face binding financial constraints and payday loans were not available, we would expect declines in their material well-being as they coped without needed expenditures or sought more expensive credit options.

Panel C of table 3 shows the frequency of payday loan use in our sample. The majority of borrowers used payday loans infrequently, reporting that they used a loan only once (43.8 percent) or twice (17.8 percent) over the past 12 months. However, some borrowers reported using payday loans quite frequently, at least five times in the previous year. This suggests that more than half of households only use payday loans infrequently and thus may only occasionally be unable to afford their basic expenses. However, a sizable portion of households may continually be struggling to pay for basic expenses and could be accumulating debt from the high interest rates charged on payday loans, as well as from loan fees.



**REGRESSION RESULTS**

**THE RELATIONSHIP BETWEEN PAYDAY LOAN ACCESS AND MARGINAL FOOD SECURITY AND FOOD INADEQUACY**

We begin with estimates of the relationship between payday loan access and the marginal food security and food inadequacy outcomes. Mean marginal effects from Probit regressions are reported in table 4. State limits on payday loans are estimated to increase the probability of marginal food security by 1.4 percentage points. Given that the average marginal food security rate is 25.4 percent, an increase in the probability of marginal food security of 1.4 percentage points amounts to a 5.5 ( $1.4 \div 25.4$ ) percent increase in this measure of food hardship.

In column 2 of table 4, we estimate the same specification for our food inadequacy measure. State limits on payday loans are estimated to increase

**TABLE 4.** The Relationship between State Payday Loan Limits, Marginal Food Security, and Food Inadequacy: Mean Marginal Effects from a Probit Regression

	Marginally Food Secure over Last 12 Months (1)	Indicates Need to Spend More to Meet Food Needs (2)	Marginally Food Secure over Last 30 Days (3)
State limits payday loans	.014** (.008)	.023 <sup>+</sup> (.007)	.014 (.009)
Two or more adults, no children	.057 <sup>+</sup> (.011)	.001 (.008)	.038 <sup>+</sup> (.008)
Single parents	.029 <sup>+</sup> (.011)	-.002 (.010)	.036 <sup>+</sup> (.012)
Single adults	.011 <sup>+</sup> (.011)	-.022* (.011)	.026* (.012)
Household income-to-poverty 130% to < 185%	-.047 (.014)	-.027* (.010)	-.028 <sup>+</sup> (.008)
Household income-to-poverty 185% to < 300%	-.132 <sup>+</sup> (.010)	-.092 <sup>+</sup> (.009)	-.075 <sup>+</sup> (.010)
Household income-to-poverty 300% and above	-.296 <sup>+</sup> (.010)	-.168 <sup>+</sup> (.010)	-.206 <sup>+</sup> (.009)
Missing income	-.245 <sup>+</sup> (.018)	-.128 <sup>+</sup> (.012)	-.159 <sup>+</sup> (.014)
Oldest child age 6–14	.040 <sup>+</sup> (.013)	.017** (.010)	.033 <sup>+</sup> (.008)
Oldest child age 15–17	.041* (.013)	.022 (.011)	.036 <sup>+</sup> (.010)
African American, non-Hispanic	.066 <sup>+</sup> (.011)	.098 <sup>+</sup> (.009)	.023* (.008)
Hispanic	.044 <sup>+</sup> (.008)	.040* (.011)	.033 <sup>+</sup> (.007)

TABLE 4 (continued)

	Marginally Food Secure over Last 12 Months (1)	Indicates Need to Spend More to Meet Food Needs (2)	Marginally Food Secure over Last 30 Days (3)
Native-born citizen	.002 (.008)	-.011 (.010)	-.002 (.008)
Primary earner, less than high school education	.067 <sup>+</sup> (.017)	.028* (.014)	.023 (.016)
Primary earner, high school graduate	.058 <sup>+</sup> (.008)	.034 <sup>+</sup> (.010)	.036 <sup>+</sup> (.006)
State unemployment rate in 2008	-.004 (.004)	-.002 (.003)	-.001 (.003)
Primary earner age 30–39	-.004 (.008)	.006 (.007)	.008 (.009)
Primary earner age 40–49	-.026* (.009)	.003 (.008)	-.014 (.010)
Primary earner age 50–59	-.048 <sup>+</sup> (.010)	.009 (.008)	-.022* (.009)
Not in the labor force	-.036** (.019)	-.009 (.014)	-.017 (.016)
Part-time employment	.059 <sup>+</sup> (.014)	.018 (.011)	.042 <sup>+</sup> (.015)
Unemployed	.136 <sup>+</sup> (.018)	.065 <sup>+</sup> (.012)	.120 <sup>+</sup> (.015)
Disabled	.167 <sup>+</sup> (.023)	.114 <sup>+</sup> (.015)	.131 <sup>+</sup> (.015)
Maximum state EITC rate for two children, in thousands	-.014 (.008)	-.002 (.006)	-.009 (.007)
Minimum wage in 2008	.019 (.011)	.004 (.005)	.003 (.008)
Metropolitan area	.021** (.010)	.015* (.007)	.034 <sup>+</sup> (.009)
Percent of CBSA population < \$10,000	-.003 (.004)	-.003 (.004)	-.003 (.002)
Percent of CBSA population \$10,000 to < \$20,000	.001 (.005)	.008** (.005)	.002 (.004)
Percent of CBSA population \$20,000 to < \$35,000	.003 (.004)	-.004 (.003)	.001 (.003)

Source.—Authors' calculations using matched households between December 2008 Current Population Survey (CPS) and January 2009 CPS.

Note.—Number of observations = 20,518. Marginal food security refers to households that affirmed one or more questions on the US Adult Food Security Survey Module. EITC = Earned Income Tax Credit; CBSA = Core-Based Statistical Area. Sample includes households where primary earner is younger than age 60. Estimates use robust standard errors, clustered by state. See the text for further details on covariates and estimation approach. Standard errors are in parentheses.

<sup>+</sup>  $p < .10$ .

\*  $p < .05$ .

\*\*  $p < .01$ .

the probability of reporting that more money is needed for food by 2.3 percentage points. With 15.1 percent of the sample reporting food inadequacy, this 2.3 percentage point increase translates into a 15.2 percent ( $2.3 \div 15.1$ ) increase in the probability of food inadequacy.

In column 3 of table 4, we examine the marginal food security outcome that captures the household's situation over the previous 30 days (from mid-November to mid-December 2008). We examine the 30-day food security measure because it is more likely that any payday loan use (measured from January 2008 to January 2009) preceded food insecurity if food insecurity is measured just over the last 30 days. The point estimate for the relationship between payday loan access and the 30-day measure of marginal food security (col. 3) is nearly identical to the point estimate using the 12-month measure as the dependent variable (col. 2). However, it is not statistically significant ( $p = .126$ ).

Taken together, columns 1 and 2 of table 4 suggest that limits on access to payday loans are related to an increased prevalence of marginal food security and food inadequacy. These results can be compared with Melzer's (2011) estimation of a positive but statistically insignificant relationship between payday loan access and food hardship, defined in his study as cutting the size of meals due to financial reasons. Our larger sample size, greater variation in the number of states with payday loan limits, and different measures of food hardship may explain our significant findings.

#### DOES THE UNIQUE ECONOMIC CLIMATE OF 2008 EXPLAIN OUR RESULTS?

Our identification strategy relies on cross-sectional data from 2008, which was the height of the Great Recession. We investigate any potential bias from the Great Recession and take advantage of the substantial temporal variation in state payday loan limits by creating a state-level panel for the period from 2001 through 2012. We adopt a state-level specification similar to that in equation (1) by controlling for state-level demographic and economic characteristics in addition to state fixed effects.<sup>9</sup> As the dependent variable,

9. The state-level controls are state-level versions of the control variables in eq. (1), including the percentage of households at various income-to-poverty ratios; percentage of households of various compositions; age composition of the state, racial, and ethnic composition of the state; and state unemployment rate.

however, we use state-level household food insecurity rates, a more severe measure of consumption inadequacy than our marginal food security measure. Our main covariate of interest is the interaction of state payday lending limits with the 2005 “rent-a-charter” ban. This is because, until the FDIC implemented the 2005 “rent-a-charter” ban that prevented payday lenders from partnering with out-of-state banks to evade state payday loan limits, state payday loan limits were nonbinding. In other words, until 2005 when the FDIC acted to stop “rent-a-charter” activity from banks they regulated, payday lenders could continue to operate in states with payday loan limits if they partnered with a bank chartered in a state without a payday lending limit.

Results from the state-level panel are shown in table 5. In column 1, we include the full interaction of state payday lending limits and the FDIC “rent-a-charter” bans. When state payday limits became truly binding (the state limited payday lending and all bank regulators banned firms from partnering with out-of-state or national banks), food insecurity rates significantly increased by nearly one percentage point ( $\beta = .009$ ). This corroborates the reduced-form estimates in table 5 and suggests that policies limiting access to payday loans reduce material well-being by increasing food hardship.

In column 2 of table 5, we replicate the analysis without including the full interaction. State limits on payday loans are again associated with a 0.9 percentage point increase ( $\beta = .009$ ) in state food insecurity rates, which is identical to the full interaction. With the average state food insecurity rate over this period at 12.2 percent, an increase in the food security rate of 0.9 percentage points translates to a 7.4 percent ( $0.9 \div 12.2$ ) increase in food insecurity. Thus, our state panel supports the estimates from our cross-sectional approach in table 4, and again suggests that state limits on access to payday loans have an important relationship with food-related material hardship.

#### THE RELATIONSHIP BETWEEN STATE PAYDAY LOAN LIMITS AND PAYDAY LOAN USE

Before examining the relationship between use of payday loans and food-related material hardship, we demonstrate the validity of state-level limits as an instrument. We estimate our first-stage equation (eq. [2]) that demonstrates the relationship between state limits and payday loan use. A positive

**TABLE 5.** Relationship between State Payday Loan Limits and State-Level Household Food Insecurity, State Panel, 2001–12

	(1)	(2)
State limits payday loans	-.004 (.003)	-.003 (.003)
FDIC import charter ban	-.003 (.003)	
State limits payday loans × FDIC ban	.009* (.004)	.009* (.004)
Percentage of households headed by single parents	.092 (.121)	.094 (.119)
Percentage of households headed by childless couples	-.175 (.117)	-.166 (.116)
Percentage of households headed by single adults	.007 (.120)	.006 (.118)
Percentage of households 130% to < 185% FPL	.088 (.154)	.108 (.155)
Percentage of households 185% to < 300% FPL	-.180 (.122)	-.157 (.117)
Percentage of households 300% and above FPL	.045 (.074)	.052 (.073)
Percentage of population < age 20	-.352 (.243)	-.277 (.223)
Percentage of population age 20–39	-.237 (.193)	-.193 (.188)
Percentage of population age 60 and above	.190 (.230)	.215 (.226)
Percentage of population Hispanic	.140 (.133)	.140 (.133)
Percentage of population African American	.060 (.164)	.060 (.164)
Percentage of population Asian	-.277 <sup>+</sup> (.090)	-.277 <sup>+</sup> (.090)
Unemployment rate	.005 <sup>+</sup> (.001)	.005 <sup>+</sup> (.001)
Constant	.261** (.143)	.208 (.131)
State fixed effects	Yes	Yes

Source.—Authors’ calculations using state-level food insecurity and very low food security from the Economic Research Service (ERS), state-level unemployment rates from the University of Kentucky’s Center for Poverty Research, and state-level characteristics from the Census Bureau.

Note.—Number of observations = 612. FPL = Federal Poverty Line. Mean state food insecurity rate, 2000–2012 = .122 (.03). Estimates use robust standard errors, clustered by state. Standard errors are in parentheses.

<sup>+</sup>  $p < .10$ .

<sup>\*</sup>  $p < .05$ .

<sup>\*\*</sup>  $p < .01$ .

and significant result is critical for our 2SLS approach. We report the mean marginal effects from Probit regressions in table 6.

Households living in states that limit payday loans are 3.6 percentage points less likely to use payday lenders than similar households in states that

do not limit payday loans (col. 1). This estimate is highly significant with a first-stage *F*-statistic of 67.63, indicating that our 2SLS approach will not suffer from weak instruments. Our estimate also nearly replicates work by McKernan and colleagues (2013). Using data from the National Financial Capability State-by-State Survey, they find that state limits reduced payday lending use over the previous 5 years by 3.4 percentage points.

One concern, however, with measuring the relationship between payday loan use and state limits is the substantial heterogeneity in consumer behavior. As shown in table 3, more than half of payday borrowers reported using a payday loan only once or twice in the previous 12 months, while others reported borrowing up to 20 times over this same period. We examine the intensity of payday loan use with specification checks in two ways. First, we treat those who reported using a payday loan only once during the previous 12 months like those who did not borrow from a payday lender during the previous 12 months. We find that state limits are related to a statistically significant 2.6 percent ( $p < .001$ ) reduction in payday borrowing. We also use a continuous measure of payday loans in an ordinary least squares (OLS) specification and find that payday limits are related to a statistically significantly fewer total number of payday loans of 0.12 (col. 2 of table 6). With the unconditional mean number of payday loans of 0.149, this suggests that state payday loan limits nearly eliminate payday loan use.<sup>10</sup>

Another potential concern for our 2SLS approach is policy endogeneity. For example, if states passed limits in response to high rates of food insecurity or material hardship, it would invalidate our methodological approach. We find little evidence for this. Simple cross-tabulations of state food insecurity rates and state payday lending limits show little relationship between low levels of material well-being and state payday lending limits. We also find little support for the notion that states adopt these limits in response to popular concern about the material well-being of the population. Many borrowers view these services favorably, even if they support some limits on the interest lenders can charge.<sup>11</sup> Borrowers also make up a

10. There are 66 households in our data that reported using a payday loan despite living in a state that limited payday loans. Each of these households resided in states that neighbored a state that did not limit payday lending.

11. These services are often open during longer hours and weekends, exhibit cultural sensitivity, provide staff in many languages, and provide attractive products (Stegman and Faris 2003). Still, payday loan customers perceive the cost of payday loans as higher than many of the alternatives, such as returned checks or late fees, and nearly three in four agreed that the government should limit interest rates charged by these providers (Elliehausen and Lawrence 2001).

**TABLE 6.** Relationship between State Payday Loan Limits and Use of Payday Loans

	Payday Loan, Last 12 Months (1)	Number of Payday Loans, Last 12 Months (2)
State limits payday loans	-.036 <sup>+</sup> (.005)	-.115 <sup>+</sup> (.023)
Two or more adults, no children	.017 <sup>+</sup> (.004)	.073** (.037)
Single parents	-.0004 (.007)	.014 (.036)
Single adults	.001 (.008)	-.006 (.043)
Part-time employment	.001 (.004)	-.044 (.032)
Unemployed	.017** (.007)	.054 (.060)
Not employed, disabled	-.003 (.008)	-.094 (.053)
Retired or not in the labor force	-.019* (.009)	-.158 <sup>+</sup> (.040)
Household income-to-poverty 130% to < 185%	.003 (.005)	.051 (.064)
Household income-to-poverty 185% to < 300%	.0003** (.005)	.030** (.047)
Household income-to-poverty 300% and above	-.029 (.006)	.150 <sup>+</sup> (.041)
Missing income	-.038 (.006)	-.166 (.046)
Primary earner age 30–39	-.004 (.005)	-.051 (.036)
Primary earner age 40–49	-.011 <sup>+</sup> (.004)	-.096 <sup>+</sup> (.033)
Primary earner age 50–59	-.016 <sup>+</sup> (.004)	-.089 <sup>+</sup> (.024)
African American, non-Hispanic	.027 <sup>+</sup> (.005)	.153 <sup>+</sup> (.049)
Hispanic	.003 (.007)	-.039** (.022)
Native-born citizen	.028 <sup>+</sup> (.006)	.062 <sup>+</sup> (.021)
Oldest child age 6–14	.009 (.006)	.071 (.046)
Oldest child age 15–17	-.002 (.007)	.037 (.031)
Unemployment	-.002 (.002)	.006 (.012)
Maximum state EITC, in thousands	-.015* (.007)	-.045* (.017)
Minimum wage in 2008	.010* (.004)	.033 (.030)
Metropolitan area	.005 (.004)	.014 (.023)
Percent of CBSA population < \$10,000	.002 (.001)	-.002 (.006)
Percent of CBSA population \$10,000 to < \$20,000	-.007 <sup>+</sup> (.002)	-.019 (.012)

TABLE 6 (continued)

	Payday Loan, Last 12 Months (1)	Number of Payday Loans, Last 12 Months (2)
Percent of CBSA population \$20,000 to < \$35,000	.006* (.002)	.015 (.008)
Number of observations	20,518	20,288
First-stage test for weak instruments	67.63 [ $p < .001$ ]	

Source.—Authors' calculations using matched households between December 2008 Current Population Survey and January 2009 Current Population Survey.

Note.—Sample includes households where the primary earner is younger than age 60 and provides nonmissing information on the payday loan question and the food security measure. EITC = Earned Income Tax Credit; CBSA = Core-Based Statistical Area. Column 1 reports the mean marginal effects from a Probit regression. Column 2 reports the coefficient from ordinary least squares regression. Estimates use robust standard errors, clustered by state. All estimates are weighted by the Food Security Supplement weight. See text for further details on covariates and estimation approach. Standard errors are in parentheses.

<sup>+</sup>  $p < .10$ .

\*  $p < .05$ .

\*\*  $p < .01$ .

relatively small fraction of the electorate and businesses offering payday lending services tend to be a powerful political force, both of which tends to make it difficult for consumer protection groups to successfully advocate for these limits (Rivlin 2010).

Another potential concern is the regional clustering of state payday lending limits, particularly in the Northeast. Our cross-sectional data prevent the inclusion of state fixed effects. Instead, we tested for geographic concentration in two ways. First, we estimated equation (2) by dropping all observations from one state at a time. With this approach, there is little change in our estimates, suggesting that no one state biases our results. We also estimated equation (2) within census divisions where there are both states with and without a payday lending limit: the New England Division, the South Atlantic Division, and the Pacific Division. Appendix A presents these results. All estimates are statistically significant, but the magnitude varies significantly: in the New England Division, limits are associated with an 11.8 percentage point reduction; in the South Atlantic Division, limits are associated with a 3.5 percentage point reduction; and in the Pacific Division, limits are associated with a 0.7 percentage point reduction. Differences in the magnitude across census divisions are related to the amount of variation and the ability for households to evade any payday loan limit. For example, in the South Atlantic Division, all households in Washington, DC, and many in Maryland could relatively easily travel to Virginia for a payday loan. In the Pacific Division, only Oregon had a limit, and it was in



place for only a short time before the reference period for the January 2009 CPS.<sup>12</sup>

In sum, our first-stage estimate suggests a strong relationship between state payday lending limits and payday loan use that is not biased by potential confounders. With these relationships established, we move to the 2SLS results examining the relationship between payday loan use and both marginal food security and food inadequacy.

#### THE RELATIONSHIP BETWEEN PAYDAY LOAN USE, MARGINAL FOOD SECURITY, AND FOOD INADEQUACY

Finally, we explore the relationship between self-reported payday loan use and our outcomes of interest with a 2SLS approach. Recall that the 2SLS approach estimates the LATE, which captures the relationship between payday loan use and the outcomes of interest for households that used a payday loan because the state allowed payday loans to operate (and otherwise would not have used a payday loan). To compare these estimates to those that do not attempt to correct for the potential endogeneity of payday loan use, we also present estimates from simple Probit regressions in table 7.

Beginning with the 12-month measure of marginal food security, the mean marginal effect from a simple probit regression shows that payday loan use is associated with a statistically significant 19.7 percentage point increase in marginal food security (col. 1). The 2SLS approach (col. 2), however, suggests a sizable reduction in marginal food security. Our estimates suggest that households that used a payday loan because their state did not place a limit on payday lending but would not have used a loan if the state limited payday lending experience a 53.6 percentage point reduction in the probability of marginal food security.

In columns 3 and 4, we estimate the relationship between payday loans and food inadequacy. The simple Probit regression (col. 3) suggests that payday loan use is associated with a 6.8 percentage point increase in self-reported food inadequacy. The 2SLS estimate suggests, however, that households using a payday loan because their state did not have a payday loan limit experienced an 87.0 percentage point reduction in food inadequacy. While

12. Because state payday lending limits would be perfectly colinear with state-level characteristics, in this estimate we dropped state characteristics from this regression.

this is a large effect, recall that this is the LATE estimate and reflects the change in food inadequacy for those who borrow from a payday lender if the state does not limit payday loans but do not borrow if the state imposes a limit. Coupled with the 12-month measure of marginal food security, we interpret this as evidence that payday loan borrowing is associated with a reduction in the anxiety a household may face about meeting their food needs.

The final two columns of table 7 examine the 30-day measure of marginal food security. We expect that using the 30-day measure of marginal food security makes it more likely that the household accessed the payday loan prior to their experience of marginal food security. The 30-day food security measure is based on marginal food security experienced between mid-November and mid-December 2008, while use of payday loans is based on use at any time in 2008. In column 5, the simple Probit regression suggests that loan use is associated with a 13.3 percentage point increase in marginal food security over the previous 30 days. The 2SLS point estimate (col. 6), however, is close in magnitude to the 12-month measure but is not statistically significant ( $p = .131$ ).

Thus, the 2SLS estimates suggest that use of payday loans is associated with reductions in marginal food security and food inadequacy. Because we do not know the precise timing of when payday borrowing occurred relative to the experience of marginal food security and food inadequacy, we cannot interpret these results as casual effects. However, the similarity of the point estimate for the 30-day measure of marginal food security to the 12-month measure provides some evidence that lack of precise information on timing does not substantially bias our results.

## DISCUSSION

Our estimates suggest that payday loans are associated with improvements in material well-being. We find that state limits on access to payday loans increase the prevalence of marginal food security over the previous 12 months by 1.4 percentage points and increase food inadequacy by 2.3 percentage points. In our 2SLS approach, for those households who would otherwise not borrow from a payday lender if the state limited access, payday loan use is associated with a 53.6 percentage point reduction in an adult's likelihood to experience marginal food security over the previous 12 months and a 87.0 percentage point reduction in a household's likelihood of experiencing food inadequacy.

**TABLE 7.** The Relationship between State Payday Loan Limits, Marginal Food Security, and Food Inadequacy, Marginal Effects from a Probit Regression and 2SLS Estimates

	Marginally Food Secure over Last 12 Months		Indicates Need to Spend More to Meet Food Needs		Marginally Food Secure over Last 30 Days	
	Probit (1)	2SLS (2)	Probit (3)	2SLS (4)	Probit (5)	2SLS (6)
Payday loan use, last 12 months	.197 <sup>+</sup> (.017)	-.536** (.325)	.068 <sup>+</sup> (.011)	-.870 <sup>+</sup> (.273)	.133 <sup>+</sup> (.012)	-.521 (.345)
Two or more adults, no children	.051 <sup>+</sup> (.011)	.086 <sup>+</sup> (.018)	-.001 (.008)	.029 <sup>+</sup> (.011)	.035 <sup>+</sup> (.009)	.063 <sup>+</sup> (.014)
Single parents	.029 <sup>+</sup> (.011)	.029 <sup>+</sup> (.011)	-.002 (.010)	.001 (.012)	.037 <sup>+</sup> (.012)	.035 <sup>+</sup> (.012)
Single adults	.012 <sup>+</sup> (.011)	.006 <sup>+</sup> (.012)	-.022 <sup>+</sup> (.011)	-.024** (.013)	.027* (.012)	.020 (.012)
Household income-to-poverty 130% to < 185%	-.047 <sup>+</sup> (.013)	-.076 <sup>+</sup> (.022)	-.027 <sup>+</sup> (.010)	-.050 <sup>+</sup> (.019)	-.028 <sup>+</sup> (.008)	-.057 <sup>+</sup> (.016)
Household income-to-poverty 185% to < 300%	-.131 <sup>+</sup> (.009)	-.208 <sup>+</sup> (.017)	-.091 <sup>+</sup> (.009)	-.143 <sup>+</sup> (.012)	-.075 <sup>+</sup> (.009)	-.135 <sup>+</sup> (.017)
Household income-to-poverty 300% and above	-.288 <sup>+</sup> (.010)	-.387 <sup>+</sup> (.018)	-.165 <sup>+</sup> (.010)	-.231 <sup>+</sup> (.016)	-.200 <sup>+</sup> (.008)	-.265 <sup>+</sup> (.017)
Missing income	-.236 <sup>+</sup> (.018)	-.353 <sup>+</sup> (.027)	-.124 <sup>+</sup> (.012)	-.211 <sup>+</sup> (.019)	-.152 <sup>+</sup> (.014)	-.242 <sup>+</sup> (.023)
Oldest child age 6–14	.037 <sup>+</sup> (.011)	.047 <sup>+</sup> (.012)	.015 (.009)	.028* (.011)	.031 <sup>+</sup> (.008)	.039 <sup>+</sup> (.011)
Oldest child age 15–17	.041 <sup>+</sup> (.013)	.041 <sup>+</sup> (.014)	.022* (.011)	.022 (.015)	.036 <sup>+</sup> (.009)	.036 <sup>+</sup> (.011)
African American, non-Hispanic	.060 <sup>+</sup> (.011)	.090 <sup>+</sup> (.016)	.098 <sup>+</sup> (.010)	.151 <sup>+</sup> (.017)	.020* (.008)	.043 <sup>+</sup> (.016)
Hispanic	.043 <sup>+</sup> (.008)	.051 <sup>+</sup> (.010)	.039 <sup>+</sup> (.011)	.045 <sup>+</sup> (.017)	.033 <sup>+</sup> (.008)	.040 <sup>+</sup> (.008)
Native-born citizen	-.004 (.007)	.016 (.011)	-.013 (.010)	.010 (.013)	-.007 (.008)	.010 (.011)
Primary earner, less than high school education	.066 <sup>+</sup> (.017)	.088 <sup>+</sup> (.024)	.028* (.014)	.041** (.021)	.023 (.036)	.031 (.026)
Primary earner, high school graduate	.058 <sup>+</sup> (.007)	.067 <sup>+</sup> (.010)	.035 <sup>+</sup> (.010)	.041 <sup>+</sup> (.013)	.036 <sup>+</sup> (.006)	.040 <sup>+</sup> (.008)
State Unemployment rate in 2008	-.004 (.004)	-.006 (.005)	-.002 (.010)	-.004 (.005)	-.001 (.003)	-.002 (.003)
Primary earner age 30–39	-.003 (.008)	-.008 (.011)	.007 (.007)	.004 (.009)	.010 (.008)	.008 (.011)
Primary earner age 40–49	-.022 <sup>+</sup> (.009)	-.035 <sup>+</sup> (.012)	.005 (.008)	-.006 (.001)	-.011 (.010)	-.020 (.013)
Primary earner age 50–59	-.044 <sup>+</sup> (.010)	-.055 <sup>+</sup> (.013)	.010 (.008)	-.002 (.009)	-.018* (.009)	-.026* (.011)
Not in the labor force	-.031 (.019)	-.056 <sup>+</sup> (.023)	-.007 (.014)	-.031 (.019)	-.013 (.015)	-.035** (.020)
Part-time employment	.058 <sup>+</sup> (.014)	.072 <sup>+</sup> (.018)	.019** (.011)	.017 (.014)	.043 <sup>+</sup> (.010)	.054 <sup>+</sup> (.016)
Unemployed	.130 <sup>+</sup> (.017)	.190 <sup>+</sup> (.026)	.063 <sup>+</sup> (.013)	.114 <sup>+</sup> (.023)	.115 <sup>+</sup> (.015)	.200 <sup>+</sup> (.029)
Disabled	.167 <sup>+</sup> (.022)	.215 <sup>+</sup> (.031)	.115 <sup>+</sup> (.015)	.176 <sup>+</sup> (.026)	.132 <sup>+</sup> (.015)	.210 <sup>+</sup> (.028)

TABLE 7 (continued)

	Marginally Food Secure over Last 12 Months		Indicates Need to Spend More to Meet Food Needs		Marginally Food Secure over Last 30 Days	
	Probit (1)	2SLS (2)	Probit (3)	2SLS (4)	Probit (5)	2SLS (6)
Maximum state EITC rate for two children, in thousands	-.004 (.006)	-.019* (.009)	.008 (.010)	-.009 (.007)	-.001 (.005)	-.014 (.009)
Minimum wage in 2008	.017 (.011)	.025** (.013)	.004 (.006)	.015* (.007)	.001 (.009)	.009 (.010)
Metropolitan area	.020** (.010)	.029+ (.011)	.014* (.007)	.024+ (.008)	.033+ (.009)	.043+ (.008)
Percent of CBSA population < \$10,000	-.003 (.003)	-.001 (.004)	-.002 (.004)	-.001 (.004)	-.003 (.003)	-.002 (.003)
Percent of CBSA population \$10,000 to < \$20,000	.003 (.005)	-.003 (.006)	.009 (.006)	.003+ (.006)	.004 (.005)	-.002 (.006)
Percent of CBSA population \$20,000 to < \$35,000	.001 (.004)	.005 (.005)	-.005 (.004)	.001+ (.004)	-.001 (.003)	.004 (.004)
Durbin-Wu-Hausman test for exogeneity	$p = .006$		$p < .001$		$p = .004$	

Source.—Authors' calculations using matched households between December 2008 Current Population Survey (CPS) and January 2009 CPS.

Note.—Number of observations = 20,518. EITC = Earned Income Tax Credit; CBSA = Core-Based Statistical Area. Marginal food security refers to households that affirmed one or more questions on the US Adult Food Security Survey Module. Sample includes households where primary earner is younger than 60. Estimates use robust standard errors, clustered by state. See the text for further details on covariates and estimation approach. Standard errors are in parentheses.

+  $p < .10$ .

\*  $p < .05$ .

\*\*  $p < .01$ .

Our findings come with important qualifiers. Without detailed information on the timing of when an individual borrowed from a payday lender relative to the spell of marginal food security or food inadequacy, we cannot rule out that the payday borrowing occurred after experiencing food hardship. Although our 30-day measure of marginal food security suggests that this is not a large source of bias, it does not provide definitive evidence that payday borrowing occurred prior to experiences of marginal food security or food inadequacy.

Additionally, this research largely relies on cross-sectional variation and our results could be sensitive to the unique economic circumstances occurring in 2008. While the corroboration of our main estimates for payday loan access with the state-level panel alleviates this concern somewhat, we do not have other time periods to study because the data file we created by

merging the December 2008 and January 2009 CPS is the first to have information on payday loan use with food security measures. However, we can create a back-of-the-envelope calculation using estimates from the state-level panel and estimates from the literature to examine the validity of our findings. With our estimated 0.9 percentage point increase in food insecurity after a state begins limiting payday loan access (table 5) and McKernan and colleagues' (2013) estimate of a 3.4 percentage point decrease in payday loan use over the 5 years after states limit payday loan access, the constructed Wald estimator for state-level food insecurity rates becomes  $\hat{\beta}^{IV} = (.009 / -.034) = -.265$ . This Wald estimator, the simplest of all instrumental variable estimators, is broadly similar to our 2SLS estimates for our marginal food security outcome, a less severe measure of food hardship than food insecurity.

Improvements in well-being suggested by the results of this study should also be interpreted cautiously. They do not necessarily mean that an expansion in access to payday lending or greater use of payday loans is the only or even the preferred method of reducing the prevalence of food insecurity, especially given the recent study done by the CFPB that followed payday borrowers for a 12-month period after their loan and concluded that payday loans trap some borrowers in a cycle of debt (CFPB 2014). A study covering a longer period of time than ours may find a less beneficial relationship between payday lending and food-related material hardship. That said, our findings speak to the importance of access to credit and of an unmet need for short-term credit for many households. This is consistent with other findings that low-asset households do not have enough access to credit to smooth consumption while unemployed, which was particularly relevant during the Great Recession period we study (Sullivan 2008).

Our conclusions also echo Zinman (2010), Morse (2011), and Morgan and colleagues (2012) in suggesting that access to payday loans may at least temporarily improve a household's ability to avoid economic hardship and forgo even costlier short-term credit substitutes that could be more detrimental to their well-being. While payday loans are an expensive form of borrowing, many households that are at risk for food insecurity have few good options when facing a gap between income and expenditure needs, as Bhutta et al. (forthcoming) demonstrate. A payday loan may actually be the least costly option available to many of these households. For example, overdraft and insufficient funds fees charged by mainstream banks are high, late

fees and finance charges on credit cards are costly, and other consequences of late payment such as phone disconnections or evictions could be far greater than high-interest borrowing (Mann and Hawkins 2007; Mullainathan and Shafir 2009).

Payday loan alternatives suggested by Sheila Bair (2005), including revolving and fixed-loan options offered by banks and credit unions, may serve the needs of households that are at risk for food insecurity at a lower cost than payday loans while protecting them from the risk of accumulating unsustainable debt. These products may also offer basic protections from the myopic decisions that all individuals make but that are particularly detrimental to lower-income individuals (Mullainathan and Shafir 2013). Appropriately designed consumer financial laws and regulations for mainstream sources of credit, including credit cards, could also reduce borrowing costs and debt for low- and moderate-income consumers, as Sumit Agarwal and colleagues (2013) show. If households could access short-term credit through less costly financial products, we would expect them to benefit from reduced risk of material hardship.

## APPENDIX A

**TABLE A1.** First-Stage Results: Effect of State Payday Lending Limits on Use of Payday Loans in the Last 12 Months, within Geographic Subareas

	Northeast Census Region, New England Division (1)	South Census Region, South Atlantic Division (2)	West Census Region, Pacific Division (3)
State limits payday loans	-.118 <sup>+</sup> (.053)	-.035 <sup>+</sup> (.004)	-.007 <sup>**</sup> (.003)
Number of observations	2,283	3,666	2,761
Percent of observations subject to state limit (%)	45.07	51.7	11.1
States with limits	CT, MA, VT	DC, GA, MD, NC, WV	OR
States without limits	ME, NH, RI	DE, FL, SC, VA	AK, CA, HI, WA

Source.—Author's calculations using the January 2009 Current Population Survey.

Note.—Regressions follow a similar specification as the main estimates, including controls for household income relative to poverty, age of the adult, age of the oldest child in the household, household type, race/ethnicity, education levels, military households, living in a metropolitan area, and employment status. We also control for the local unemployment, state EITC policies, state minimum wages, and local income levels. Results for col. 3 do not include state-level controls. All estimates use robust standard errors, clustered by state.

<sup>+</sup>  $p < .10$ .

<sup>\*\*</sup>  $p < .01$ .

**NOTE**

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