Timing is Money: Does Lump-Sum Payment of Tax Credits Induce High-Cost Borrowing?

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Abstract

One important feature of the Earned Income Tax Credit (EITC) is that many families receive a large lump-sum payment when they file their taxes each year. In this paper, we use the Survey of Income and Program Participation (SIPP) wealth topical modules from 1990 to 2008 to analyze the impact of the expansions of the EITC at the federal and state level over the last twenty years on household savings and unsecured debt. Results suggest that increases in tax credit generosity are associated with increases in both household savings and debt. Using the Consumer Finance Monthly survey (CFM), we then show a seasonal pattern of debt accumulation for low-income households that reflects the once-a-year timing of benefits structure: low-income households are much more likely to pay down their debt in the months surrounding tax filing compared to their higher-income counterparts, while there is little or no difference in their debt accumulation and payoff compared to higher-income families throughout the rest of the year. We estimate that the use of high-cost credit to finance consumption during non-EITC months results in approximately 8 percent of all EITC funds being paid in consumer interest payments.

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Since the passage of welfare reform in 1996, spending on tax credits targeted towards low-income families has far surpassed spending on traditional welfare (Temporary Assistance for Needy Families, or TANF). As of 2011, spending on TANF was around 30 billion dollars nationally, while the largest tax credit for low-income families, the Earned Income Tax Credit (EITC), was worth nearly 60 billion dollars (Tax Policy Center 2012) and lifted more than 6 million people out of poverty (Center on Budget and Policy Priorities 2013). The shift away from delivery of transfer income through the welfare system to delivery through the tax code means that instead of receiving a consistent, monthly welfare check, many low-income families receive a lump-sum payment when they file their taxes each year. Qualitative studies have shown that many households use the credit to purchase large items, pay down debt, or catch up on overdue bills (Halpern-Meekin, Edin, Tach, and Sykes 2014; Tach and Halpern-Meekin 2014). Families also appear to purchase items that promote work (such as used vehicles) and to spend on items specifically helpful for child development (like children's clothes and fresh fruit and vegetables) in the months when EITC benefits are distributed (Barrow and McGranahan 2000; Goodman-Bacon and McGranahan 2008; McGranahan & Schanzenbach 2013). While lump-sum delivery of benefits can be a helpful savings mechanism to allow families to purchase large items that would be otherwise unaffordable, it may also have costly implications for household finances.

There are several reasons to expect that the EITC may affect household savings and debt. First, the EITC provides a direct transfer to low-income families, increasing their budget set and potentially increasing their savings and consumption and reducing debt. Second, through its work incentives, the EITC could impact debt by increasing credit-worthiness and allowing previously constrained households to access more credit. Whether this leads to increases or decreases in debt is an empirical question--while increased labor supply should improve a household's financial situation and result in a decline in debt, increased access to credit could also lead to increased debt holdings. Finally, the distribution of the EITC as a lump-sum payment may have important implications for household finances. Theory suggests that for perfectly rational, unconstrained consumers, the timing of income should not impact consumption patterns: families should not adjust expenditure patterns in response to the large influx of money at tax time. However, research has shown that the timing of the lump-sum payment does

significantly impact the timing of expenditures for this population – for both large, durable items and smaller day-to-day items like food (Goodman-Bacon and McGranahan 2008; McGranahan & Schanzenbach 2013). This suggests that families may be constrained, or suffering from biases in deciding how much of their lump-sum check to spend immediately. If families are constrained, myopic, or miscalculate the cost of using credit to smooth consumption, then increasing the generosity of the lump-sum EITC payments could lead to increased debt holdings.

In this paper, we expand the research on the EITC to investigate how the largest tax credit for low-income working families impacts household savings and unsecured debt. We make the following contributions to the literature: First, this is the first paper to our knowledge to analyze how the expansion of yearly tax credits for low-income households affects total savings, credit card debt and unsecured debt holdings.[1] Most previous studies examining the effects of tax benefit income on household spending decisions have investigated intra-year changes in debt behavior, tracking how behavior responds to the once-a-year disbursement schedule. We add to those findings here, but also take advantage of the policy-induced expansions of the EITC over the last several decades to test how an increase in the generosity of the EITC affects household savings and debt, thus making a methodological contribution to the literature as well. Further, while previous work has looked at how household consumption and debt is affected by tax refund receipt more broadly, many studies have relied on relatively small, one-time changes in the tax code such as the 2001 stimulus rebate, which was worth between $300-$600 (see Shapiro and Slemrod 1995; Shapiro and Slemrod 2003; Agarwal, Liu, and Souleles 2007; Bertrand and Morse 2009). The EITC, in contrast, is a 60 billion dollar federal program worth up to $6,000 per household. Examining how household savings and debt change in response to increases in generosity of the largest anti-poverty program in the United States is policy-relevant in its own right. Furthermore, if the timing of benefit payments induces families to take on high-cost credit, at least some government expenditures will be transferred to lenders through interest payments, and program efficiency will be compromised. We are able to address this concern.

In our main approach, we use the Survey of Income and Program Participation (SIPP)

[1] Previous work has looked at whether households pay down unsecured debt when the EITC is expanded (Shaefer, Song and Shanks 2011) and whether the investment income cap in the EITC rules affects the distribution of savings among low-income households (Weber 2014). There has been no work, to our knowledge, on both household savings and unsecured debt as a function of EITC generosity.

wealth topical modules from 1990 to 2008, and estimate the impact of plausibly exogenous shocks to tax credit generosity on household savings, credit card debt, and unsecured debt more broadly. We exploit variation in state EITC policies and federal changes to the EITC over time by family size in order to estimate the elasticity of savings and debt relative to tax benefit income. We employ a simulated instruments method, whereby we create a treatment variable that captures policy variation in benefit generosity, net of income and demographic effects (Currie and Gruber 1996; Milligan and Stabile 2011; Cohodes, Grossman, Kleiner, Lovenheim 2014; Bulman and Hoxby 2015; Jones, Milligan and Stabile 2015; Hoynes and Patel 2015). This approach has very similar properties as a difference-in-differences approach but allows us to capture several policy changes over an extended period of time. The results of this analysis address the question of how the expansion of the EITC over time has impacted average savings and debt holdings among single mothers, the target beneficiaries of the EITC. This method also allows us to estimate how much of the change in household savings and debt is due to the direct income effect of the credit and how much is due to the labor supply mechanism.

To investigate the seasonality of savings and debt holdings as a function of the EITC, we use self-reported, nationally-representative monthly data on savings and credit use from the Consumer Finance Monthly (CFM) survey. The monthly data allow us to identify seasonal patterns in savings, debt accumulation and payoff for EITC-eligible households relative to ineligible households, who typically receive much lower tax refunds or even negative tax refunds. This allows us to disentangle the seasonal patterns in household finance decisions of EITC-eligible households from those of the population as a whole. If the once-a-year disbursement of benefit payments leads families to use high-cost borrowing to smooth consumption over the course of the year, we should identify patterns of borrowing behavior among families eligible for the EITC that reflect the timing of benefit receipt—decreased borrowing in tax-filing season and accumulation of debt throughout the rest of the year.

Results from the SIPP suggest that increases in tax credit generosity are associated with increases in credit card debt and other unsecured debt among single mothers. We find that a policy-induced $1,000 increase in average household tax credits leads to a 4-percentage point increase in the likelihood of holding credit card debt, or an 11% increase in the likelihood of holding credit card debt. We also show that the EITC increases savings among low-income

single mothers. We find that a policy-induced $1,000 increase in the generosity of the EITC leads to a 6-percentage point increase in the likelihood of holding a savings account among single mothers—an 11% increase in the likelihood of holding any savings. Expansions of the EITC have also led to an increase in the amount of both credit card debt and savings held by single mothers. We estimate that a $1,000 increase in the EITC leads to a $570 increase in credit card debt and a $1,000 increase in savings. This suggests that single mothers use both savings and credit cards as a means of smoothing their consumption throughout the year. Disentangling the income effect from the labor supply effect, we estimate that up to half of these effects can be attributed to increased labor supply, which suggests that at least a portion of our results may be due to increased access to credit among low-income households.

We investigate the likelihood that the unexplained effect is due to the distribution schedule of the EITC. Results from the CFM data suggest that credit card debt levels follow the predicted seasonal pattern if families borrow against their expected tax credits, with increasing debt holdings leading up to the payment months and decreases in the peak months of tax filing. We also find evidence that families are significantly less likely to use unsecured debt to pay bills during tax season. Finally, we show the same u-shaped pattern of behavior when we investigate the number of credit cards that families own. Our results suggest that high-cost debt may be an important means of consumption smoothing over the course of the year for families who are eligible for the EITC.

We begin by providing background on the Earned Income Tax Credit and discussion of previous relevant research. We then discuss the SIPP data and related empirical strategy and results before detailing our analytical approach and results from the CFM data.

Background

The Earned Income Tax Credit

The EITC began as a small, temporary credit in 1975, worth up to $400 ($1,770 in 2013 dollars) or 10% of household earnings for low-income families. Since then, the credit has been expanded several times at both the federal and state level, with the federal credit worth up to $6,000 in 2013, or up to 45% of household earnings. Families with earnings below 200 percent of the federal poverty threshold are typically eligible for the EITC; households with earnings between

$13,000 and $22,000 in the 2014 tax year were eligible for the maximum credit. The EITC is also fully refundable, so households with no tax liability receive the EITC as part of their tax refund. In addition to the federal benefit, 26 states and the District of Columbia have their own EITCs, which increase the total benefit by 3-45 percent of the federal benefit. States implemented their own EITCs beginning in the late 1980s, but the majority implemented credits following welfare reform in the late 1990s and early 2000s. A list of states that have ever implemented EITCs, as well as the year of implementation, can be found in Appendix Table 1.

While there is quite a bit of variation in the timing of implementation of state EITCs, several states also changed benefit generosity over time. For instance, New York implemented an EITC in 1994 worth just 7.5 percent of the federal EITC. As of the 2011 tax year, New York had increased the value of its EITC to 30 percent of the federal EITC. Other states have reduced or eliminated their EITCs entirely. Colorado, for instance, had an EITC worth 8.5 percent of the federal benefit in 1999 but suspended it in 2003 due to lack of funding.[2]

With the formulation and expansion of the EITC since the 1990s, the United States has largely shifted from a welfare system that provided monthly benefits for non-working households with children to a social safety net largely operated through the tax code, providing annual benefits to working households with children. This shift has had several implications for low-income households. Individuals now have a strong incentive to work, as EITC benefits require at least some earnings and increase with every dollar earned up to a threshold. Second, benefits are now distributed through the tax system, simplifying the process of applying for benefits and reducing the stigma of applying for, and claiming, government benefits. EITC-eligible households file their taxes like all other households, and benefits are distributed via a tax refund, similar to higher-earning households. Finally, the shift towards provision of benefits through the tax code also means that benefits are distributed annually rather than monthly.

The EITC and household savings and spending: What do we expect and what do we know?

There are three mechanisms by which the EITC could impact consumption, savings and debt usage. First, the increased income that the EITC provides could impact household allocation of funds between savings, consumption and debt holdings. While the income effect may cause families to spend more, it is also likely to have positive effects on savings and debt

[2] Although Colorado has since re-instated its EITC effective for the 2014 tax year.

usage rates. By expanding the budget set, the additional income that the EITC provides should ease family finances, thereby making it easier to save or pay down debt. We expect savings to increase and debt to decrease with the additional income from the EITC. Second, the EITC could affect household finances indirectly through its impact on labor supply. Researchers have shown that the work incentives in the EITC program structure have been effective in increasing labor supply, especially among single mothers (Eissa and Hoynes 2006, Ellwood 2000, Meyer and Rosenbaum 2001). By increasing labor supply, the EITC should have a positive effect on finances, leading to increased saving and decreased debt. However, families may also gain access to more credit as they become more credit-worthy in the eyes of lenders. In this case, more generous EITC payments may generate higher debt holdings if families are induced to take on more debt as credit worthiness increases.

Finally, the EITC may have important impacts on household finance decisions due to the timing of payments. The EITC is paid out in one lump-sum payment and often represents a large (up to 45 percent of annual income) income shock (Holt 2009).[3] The Life Cycle/Permanent Income Hypothesis (LCPIH) suggests that for rational, unconstrained individuals who have access to savings or credit, the timing of consumption should not be affected by the timing of income. In the case of the EITC in particular, it should not matter whether the EITC is paid out in one lump-sum or periodically: perfectly rational consumers should choose their optimal consumption level and finance consumption either by spending a portion of their periodic check or, in the case of lump-sum payment of benefit income, by saving their tax refund and spending it slowly. For the majority of EITC recipients – for whom real interest rates on short-term borrowing are likely to far exceed the rate they can earn on highly liquid savings accounts – saving a portion of their return to finance future consumption will be preferable to borrowing. In this case, we expect savings to increase at tax time and be slowly depleted over the course of the year. Debt levels, on average, should not be impacted by the expansion of the EITC.

Two important exceptions to this rule may arise. First, if EITC recipients are financially constrained, they may be forced to rely on credit or informal borrowing throughout the year to finance necessary consumption. In this case, we might observe a large outlay in cash following

[3] Up until 2010, households could elect to receive up to half of their EITC benefits through their paychecks throughout the year. Less than 3% of EITC-eligible households participated in this program, and it was discontinued in 2010.

receipt of the benefit check, with decreased spending or increased borrowing over the course of the year to finance everyday consumption. Second, if consumers are impatient, miscalculate the costs of borrowing, or overestimate their eventual EITC payment, the benefit could lead to increasing debt over time. Families may be tempted to overspend when they receive such a large sum of money, or they may miscalculate the true costs of carrying debt or how much they will receive at tax time, and be unable to pay back owed money in full at the end of the year. In this case, we may see a temporal pattern to borrowing, along with an overall increase in debt holding as the EITC becomes more generous.

The empirical literature on expenditures among EITC recipients appears to confirm many of these expectations. Much of the initial work relied on surveys and in-depth interviews of small, non-nationally representative groups, finding that households use their refunds primarily to pay down debt or past-due bills (Romich and Weisner 2000; Smeeding et al. 2000). Several families also saved at least a portion of their refund, or made payments towards a car, school tuition, or other social mobility investments (Smeeding et al. 2000; Halpern-Meekin et al. 2014).[4] All of these studies also find that EITC-eligible households have trouble paying for basic expenses each month and that tax refunds are used to catch up on past bills, or even pay rent and utilities several months in advance (Romich and Weisner 2000; Smeeding et al. 2000; Halpern-Meekin 2014).

Other work has used the Consumer Expenditure Survey to examine trends in consumption patterns of EITC-eligible households over the course of the year. These studies have focused on identifying the timing effects of the EITC on expenditures. Barrow and McGranahan (2000) find an increase in total consumption around tax time (February for the EITC-eligible) relative to the ineligible population, with the increase concentrated in durable good expenditures. Other work by McGranahan and co-authors showed that households are more likely to purchase used cars in post-refund months (Goodman-Bacon and McGranahan 2008).

[4] In fact, there is evidence that families may prefer lump-sum receipt of their EITC: in an experiment, Jones (2010) was unable to induce families to enroll in the now discontinued Advance EITC program – which allowed families to spread some of their EITC payments over the course of the year – even when he made enrollment easier and highly incentivized . The Advance EITC program, however, suffered from the peculiarity that at the end of the year, families could potentially have to repay their advance ETIC payments had they miscalculated their expected EITC, or if their family situation had changed. Thus, it is impossible to identify whether distaste for the Advance program stemmed from the gradual payment schedule, or from the risk associated with advance payment.

Overall, they estimate that families spend about one-fifth of their benefit in the month they receive it, and suggest that their estimate is likely to be a lower-bound (Barrow and McGranahan 2000). The evidence suggests that families do smooth consumption to some degree, but may be required to use a significant chunk of their EITC payment immediately to pay down debt or invest in large items.

However, the evidence has also revealed that some of the increased spending families engage in after receipt of EITC benefit income happens in non-durable spending categories. Children's clothing expenditures, as well as consumption of fresh fruits and vegetables increase in the months following tax refund receipt (Goodman-Bacon and McGranahan 2008; McGranahan and Schanzenbach 2013). The research suggests that families may not be perfectly smoothing their consumption over the course of the year and that they may be liquidity constrained. Indeed, the spending patterns of EITC eligible families appear to be erratic, with lower spending in June and July, and higher spending around tax time and the holiday season (Barrow and McGranahan 2000).

How will such spending patterns impact saving and debt use? The fact that families may be financially constrained, may be carrying debt, and have trouble covering everyday expenses suggests that the EITC is likely to impact saving and debt use through all three mechanisms we described. A recent paper by Shaefer, Song, and Shanks (2013) used the SIPP to show that the federal expansions of the EITC for two-child households in the early 1990s led to a decrease in the value of unsecured debt among single mothers with at least two children, suggesting that households use the EITC to pay down debt. The authors' identification strategy reveals how debt patterns changed among different subsets of EITC-eligible families after the expansion, an approach that differs from the one used herein. In addition, they utilize data in which households were surveyed about their assets and debts during tax season, which may not provide a complete picture of household finances throughout the year. A more recent paper investigates whether the EITC tax schedule provides a disincentive for low-income individuals to save in income-bearing accounts. Weber (2014) uses a regression discontinuity design to show that for families with earnings in the phase-out region of the EITC tax schedule, the lower marginal net-of-tax rate of return on investment income appears to discourage saving in select accounts.

This analysis builds on prior work, using two distinct approaches to investigate the question of whether increased tax benefit generosity has led consumers to increase their debt levels. We begin by estimating the overall effect on savings and high-cost debt of an additional dollar of EITC credit. Using plausibly-exogenous variation in tax benefits within states over time and family size, we make causal inference about the overall impact of the EITC on household savings and debt accumulation. We proceed to provide evidence on the three potential mechanisms by which the EITC affects savings and debt – through the direct income effect, the indirect labor supply effect, and the timing of distribution effect.

We hypothesize that as the EITC has become more generous, average savings will have increased as families save EITC payments to spend slowly over the year. We additionally hypothesize that households use the EITC to pay down debt, but that there is a seasonal component to the pattern of debt accumulation and payoff. Because the EITC is typically received in February or March, we expect to find declines in household debt in those months, but increases in household debt throughout the rest of the year in anticipation of tax refunds.

Finally, if families are rational, we expect to see no overall increase in high-cost debt levels associated with increased EITC expansion. Even if families use credit to smooth consumption, the optimal expenditure pattern should have them pay-off debts in full with receipt of their EITC check. Any overall increase in debt levels associated with EITC expansion will indicate that either the labor supply effect or the timing effect is at play: either families have been induced to take on debt as they gain access to credit, or they have miscalculated their ability to pay off debt in full. We attempt to disentangle these two effects by first examining the debt response to increased labor supply, and second by examining the monthly pattern in debt accumulation and payoff for EITC-eligible households compared to non-eligible households. However, a timing effect will have important welfare implications even if families are able to pay off debt in full with EITC funds at tax time. EITC-eligible families generally face high interest rates which make carrying credit card debt for even a few months a costly and potentially welfare reducing endeavor. In the CFM, EITC-eligible households face an average credit card interest rate of approximately 14%, compared to 13% among higher-earning households.

Data and Method

Estimating the overall effect of the EITC on savings and debt

Our main data source is the Survey of Income and Program Participation (SIPP). The SIPP is a large, nationally-representative panel dataset surveying families for up to 60 months per panel. We utilize panels from 1990 to 2008, which span the years from 1990 through 2013. In addition to the main survey, which is conducted every four months, the SIPP also conducts a number of topical modules on specific areas such as fertility, education, and wealth. We utilize the wealth and assets topical modules, which are conducted once every twelve months and contain information on net worth, the value of secured and unsecured debt and credit card debt specifically. The SIPP employs a rotation group structure to its interviews. Households are assigned to one of four rotation groups and are interviewed over the course of four months. For the wealth topical modules, a household will always answer questions about wealth and debts in the same calendar month each year. Appendix Table 2 lists the months when households are surveyed about their wealth and debts for each panel. In the 2008 SIPP, for example, the wealth topical modules are conducted in September through December. We include calendar month fixed effects in all analyses to control for the seasonality of debt throughout the year. For example, credit card debt tends to peak around the end of the summer with back to school shopping, as well as the holiday season in November and December. These topical modules provide information on households up to four times per panel, although prior to the 1996 panel, household wealth and assets information was only collected once per panel. Because the EITC mostly benefits households with children, we restrict our analysis to households that have at least one child under the age of 19 at the start of the survey. In this analysis, we focus on single mothers, who are the primary recipients of the EITC, which yields a sample of 27,809 person-years.

Our primary outcomes of interest include whether the household had any savings, credit card debt or unsecured debt, and the value of each at the time of the survey. Households are asked about the value of mortgages, savings and checking accounts, car loans, store credit cards, bank loans, and other miscellaneous debt. These debts are then aggregated into secured and unsecured debt. Unsecured debt includes any debt not including mortgages, home equity loans, or car loans. We are able to separately analyze the presence of and value of credit card debt, but 'other' debt is assessed in the SIPP as the combined value of: medical bills not paid by insurance, education loans, money owed to private individuals, and "any other debt not covered, and

excluding mortgages, home equity loans, and car loans." We therefore analyze unsecured debt as a whole, as well as credit card debt specifically.

Table 1 shows descriptive statistics from the SIPP for single women with children under the age of 19. About half of these women have at least some unsecured debt and 40% have credit card debt. A little over half (55%) have any money in a savings or checking account. Unsecured debt makes up a large share of household income for single mothers, at nearly 30% of total household income. The average single mother in the sample earns $26,000 (2011$), and holds about $7,000 in unsecured debt--$2,400 of which is credit card debt. Women in our sample also hold a significant amount of money in savings and checking accounts ($3,500). Approximately 60% of single mothers are eligible for the EITC, with an average benefit (unconditional on eligibility) of about $1,600.

SIPP Empirical Strategy

Our goal is to identify what happens to debt and savings when EITC payments become more generous. To estimate this effect, however, we cannot simply relate our outcome variables to a family's own EITC. Because EITC payments are determined by income and family size, debt and savings are likely to be endogenous. That is, family-level characteristics that determine an EITC payment will also impact debt and savings through a non-causal mechanism. It is not clear which direction this will bias our results. Low-income households may have less access to credit, and therefore may be less likely to have debt. In the CFM, for instance, only about half of low-income households have credit cards, compared to nearly 90% of higher-income households. But low-income households may also have trouble making ends meet, and may rely more on credit card debt to finance consumption. In the CFM, low-income households are less likely to pay their credit card balances in full and are more likely to have at least one maxed-out credit card compared to higher-income households. Both of these factors will confound our ability to make causal inference on household debt using own EITC benefits.

To overcome the endogeneity problem, we use a simulated instruments approach to model the overall impact of an increase in tax credit generosity on household savings and debt accumulation. The general idea behind the simulated instrument approach is to fix a sample of representative households, and then calculate what their EITC would have been in each state-

year combination. We collapse the simulated EITC benefits to state-year-family size averages; the resulting instrument captures the differences in policy across states, years and family sizes, but is independent of family-level characteristics (since it has been calculated for the same sample of families with identical characteristics). This approach has several advantages over other identification strategies. It produces a treatment variable that only captures policy-induced changes in the value of benefits, and is independent of family-level characteristics. Further, it allows us to exploit the full richness of the EITC policy landscape over the past 15 years rather than focusing on any individual policy expansion. Finally, it produces easily interpretable intent-to-treat estimates of what happens to debt when a family's potential EITC payment becomes more generous.

To construct the instrument, we take the sample of single women in the 1997[5] SIPP and using the National Bureau of Economic Research's (NBER) TAXSIM model, we calculate their tax liability, including expected EITC payment. We then replicate this sample for each year between 1990 to 2012, adjusting income by the Consumer Price Index in each year. We run the sample through TAXSIM again and record the calculated EITC benefit amount for each family, in each year based on the number of children residing in the household.[6] Finally, we repeat the process by replicating the sample for each of the 50 states. After completing this, we are left with a dataset that contains, for each family in the original SIPP sample, a measure of what their EITC benefit would have been had they lived in each state-year potential world. We average these values at the state-year-family size level to produce the simulated instrument. Variation in this term reflects only policy changes across states in a given year and within states over time and across family size, eliminating variation due to endogenous decisions about geographic location or household income in relation to the outcomes of interest. We then match this information to our sample of single mothers by year, state, and number of children residing in the household.

Figure 1 shows how the average household EITC benefit changed over time, for families with different numbers of children residing in the household. The average EITC is calculated

[5] Results are not sensitive to this selection.

[6] We choose to use family-specific number of children in the household because larger families may have different income distributions than smaller families and there is no evidence of endogeneous fertility choices in response to EITC expansions (Baughman and Dickert-Conlin 2009). Results are not sensitive to this choice—we find very similar results if we simulate the number of children residing in the household.

using the simulated instruments method described above. In 2011 dollars, the average value of the combined federal and state EITC for a household with one child grew from approximately $700 in 1991, to $1,200 in 2011. In the early 1990s, the EITC was expanded for households with two or more children, which is evident in this graph as well. Over the last two decades, the average EITC for a household with two children grew from $700 to $2,000 by 2011. In 2009, the EITC was further expanded for households with three or more children—these households saw average EITC benefits grow to almost $2,500 by 2011.

Due to the variation in when states began implementing EITCs, there was also significant variation in the average household EITC benefit amount across states over this time period. Figure 2 illustrates this variation, with each dot representing a different state-year combination for a household with two children. Once again, the variation illustrated here is due solely to differences in tax laws across states, eliminating the variation due to the endogeneity of geographic location or household income. Figure 2 illustrates that, in any given year, the variation in average household tax credits between the most generous state EITC and the least generous was about $700.

Using this measure of benefit generosity that varies across states, years and family size, we model the impact of increased credit generosity on savings and debt using the following model:

$$Y_i = \beta_0 + \beta_1 C_{stf} + \beta_2 X_i + \beta_3 \alpha_{st} + \delta_s + \gamma_t + \lambda_f + \varepsilon_i \,, \qquad (1)$$

where *i* indexes individuals, *s* indexes states, and *t* indexes years. Y_i is the outcome of interest: an indicator for whether a household has any savings, credit card debt, or other unsecured debt, or total savings, credit card debt, or unsecured debt in thousands of dollars. Our primary coefficient of interest, β_1, is the coefficient on the simulated instrument – the average household EITC (in thousands of dollars) in a given state, year and family size, represented by C_{stf}.[7] We also include a vector of demographic characteristics at the individual level such as age

[7] We use the tax credit generosity in the given tax year, which implies that households would not receive that tax credit until the following year during tax time. It is not clear whether we expect households to respond more to the tax credit they expect to receive given their current earnings, or the tax credit they already received from last year's earnings. Appendix Table 3 shows results of our analysis using lagged tax credit generosity; results are substantively

and race. The state-year characteristics included in α_{st} act as controls for other factors that may be correlated with state EITC generosity and household debt such as the unemployment rate, the top tax rate, state GDP, the state minimum wage, and state welfare generosity. Finally, we include state (δ_s), year (γ_t), and family size (λ_f) fixed effects. State fixed effects control for time-invariant differences across states, such as political ideology, that may affect debt levels in a given state. Year fixed effects control for national trends such as recessions or changes to credit card laws at the federal level. Family size fixed effects control for different propensities to hold debt based on the number of children living in the household. With all of these controls in the model, variation is driven by policy-driven changes to EITC generosity within state-family size over time, which is illustrated in both figures 1 and 2.

SIPP Results

We begin by presenting OLS regression results from the SIPP using own EITC generosity, rather than our simulated instrument to illustrate the naïve relationship between EITC generosity and household finances. Table 2 presents the results of this exercise, which largely indicate a negative relationship between own tax credit generosity and household savings and debt. We find that a $1,000 increase in own tax credit generosity decreases the likelihood of holding unsecured debt or credit card debt by 1 percentage point, and also decreases the likelihood of holding any savings by 0.6 percentage points. We also estimate a negative relationship between own tax credit generosity and the amount of unsecured debt and savings held. This could indicate that tax credit generosity allows households to pay down debt, but could also indicate that households with larger EITCs are less likely to have access to credit cards.[8]

We next present estimates of our simulated instrument in table 3, where the coefficient indicates the change in the outcome variable of interest when the average household tax credit in a state and year increases by $1,000. Again, variation in this treatment variable is generated solely from policy differences across states and within states over time and by family size, and

very consistent, which we might expect given that single mothers typically receive the EITC for consecutive years and know how much they expect to receive for the coming year.

[8] In the Consumer Finance Monthly, we find that only about half of EITC-eligible families report having any credit cards, compared to 87% of families that were not eligible for the EITC.

not due to demographic or economic differences in populations across states.[9] Because there might be concerns of policy endogeneity of state EITCs, we also present results using only the national variation in the EITC over time, which is driven by changes to EITC generosity by family size over time. Results from this exercise are shown in Appendix Table 4 and are quite similar to those presented here. Using our simulated instrument, we find a positive relationship between EITC generosity and household debt among single mothers. We find that a $1,000 policy-induced increase in the EITC leads to a 4 percentage point increase in the likelihood of holding credit card debt among single mothers, representing an 11% increase in the likelihood of holding credit card debt. Along with this increase in the likelihood of holding credit card debt, we also find a positive association between EITC generosity and savings, confirming results found in qualitative studies. A $1,000 increase in the EITC leads to a 6 percentage point increase in the likelihood of holding any savings. Among single mothers, only about half have any savings, so this effect represents an 11% increase in the likelihood of holding savings.

Consistent with results suggesting that single mothers are more likely to hold debt and savings as a function of the EITC, we also find increases in the amount of credit card debt and savings that single mothers hold. We find that a $1,000 increase in the average household EITC leads to a $570 increase in credit card debt. We also find relatively large responses in savings with respect to EITC generosity: a $1,000 increase in EITC generosity leads to a $1,000 increase in the amount of savings held, implying that households do save their EITC to be spent throughout the year. This large increase in savings could also come from the labor supply incentives for single mothers as a function of the EITC. Hoynes and Patel (2015) note that much of the poverty-reducing effects of the EITC stem from its impact on before-tax earnings. Similarly, we might find a large increase in savings as a function of EITC generosity because single mothers have higher before-tax earnings and are able to save some of their income. We test for this explicitly below.

Mechanisms: Income vs. labor supply

It is well-known in the EITC literature that the EITC encourages work among single mothers (Ellwood 2000; Meyer and Rosenbaum 2001; Hoynes and Patel 2015). Increasing the

[9] We also estimate models using the lagged tax credit generosity; results are shown in Appendix Table 3 and are substantively quite similar.

labor force participation of single mothers may also lead to better access to credit among low-income households, and thus access to credit cards and other forms of unsecured debt that may have been previously unavailable. An increase in credit card debt may be a signal of an improved financial situation among these households, which has very different policy implications than if households take on more credit card debt because they have trouble making ends meet each month.[10]

We can decompose the total debt response to the EITC expansions as:

$$\frac{dDebt}{dEITC} \geq \frac{\delta Debt}{\delta Working} x \frac{\delta Working}{\delta EITC} \quad (3)$$

We are able to estimate the first term in the equation, $\frac{\delta Debt}{\delta Working}$, by regressing total household debt on an indicator for whether the single mother was working in the month of interview. The second term, $\frac{\delta Working}{\delta EITC}$, can be obtained from a regression of the indicator for household labor supply on our simulated measure of tax credit generosity. We can then divide the quotient of these two coefficients by our estimate of the total EITC effect on debt obtained from the estimation of model (1) to produce a back-of-the-envelope estimate of the portion of the total EITC effect that is due to labor supply changes.

Table 4 presents these results. In the first row, we present results from regressions of household debt and savings on an indicator for whether the single mother was working in the month of interview. The estimates in row (1) express the descriptive relationship between work and household debt. Results from this exercise suggest that working single mothers are approximately 21 percentage points more likely to hold any credit card or unsecured debt compared to non-working single mothers. However, they are also more likely to have savings.

The second row of Table 4 shows results from a linear probability model estimating the impact of increasing tax credit generosity on the likelihood of work. We find that a $1,000 increase in tax credit generosity increases labor force participation among single mothers by 9.5 percentage points, which is consistent with other recent estimates (Hoynes and Patel 2015).

[10] Our measures in the SIPP capture debt holdings rather than credit card balances before payments. While increased credit card debt may be a signal of improved financial stability and access to credit markets, it also comes with a high cost.

Given this relationship, we can compute what portion of our original coefficient estimate from Table 3 (reproduced in row 3 of Table 4) is due to labor supply. We estimate that between 15 and 50 percent of the total effects of EITC debt and savings are due to labor force changes. That is, we expect that up to half of our results are generated through the impact of tax credit generosity on labor supply; the remaining we attribute to cash transfer of the benefit itself, and the impact of the annual distribution of the tax credits. We find no statistically significant relationship between EITC generosity and unsecured debt, and labor supply incentives could account for nearly the entire effect that we do find. We next examine whether the timing of the distribution of the EITC also has an impact on household debt behavior.

Testing Seasonality: The Consumer Finance Monthly

To identify the timing effect, we use data from the Consumer Finance Monthly (CFM) survey, a nationally representative cross-sectional survey administered to a monthly sample of 300-500 households. The data are advantageous in that they are collected monthly and contain much more detailed information about financial characteristics than the SIPP. For the current study, we focus on the rich data available on credit card use and repayment, bill payment behavior and overall debt and asset holdings. In our main analysis, we use data collected between June 2006 and June 2013 on households with children, producing a sample of 6,980 families.[11]

The CFM asks a broad array of questions about financial behavior. We focus on questions that provide information on credit card borrowing and debt, and on unsecured debt behavior more broadly. To measure credit card behavior, we use questions that ask about the family's debt position at the time of the last statement. Specifically, we construct three variables: an indicator that equals 1 for families that report having any outstanding credit card debt after payments; the natural log of the total outstanding credit card debt; and a count of the total number of credit cards the family owns. For families who report owning no credit cards, we set values of all variables to zero.

[11] Sample size limitations stop us from focusing on single mothers as the main population of interest. However, we do show results for unmarried households with children in an appendix.

In addition, we construct measures of unsecured debt use. We construct a measure of the natural log of total unsecured debt by summing the total outstanding credit card debt, payday loan, installment loan, bank loan and other loan variables; we choose to omit student loan debt from this total, since its value is unlikely to be sensitive to seasonality. We also create an indicator that equals one for families who have any unsecured debt. Finally, using questions from the survey module that asks about bill payment methods, we construct a measure of whether a family uses unsecured debt to pay bills. For a series of spending categories, respondents are asked whether they "use *payment method* to pay bills" in the given category; we construct an indicator that equals one if the respondent indicated that they pay any bills using either credit cards, store credit cards, gas cards, or payday loans. The means of these variables, along with sample demographics, are displayed in Table 5.

Approximately 36% of sample households are eligible for the EITC according to reported family income and family structures. EITC-eligible households are less likely to have any credit cards (58% compared to 87% among non-eligible households), have higher interest rates on their credit cards (13.7% compared to 12.6%) and lower total credit limits ($9,385 compared to $26,638). This provides some evidence that EITC-eligible households have less access to credit than non-eligible households.

Thirty-six percent of all households (and 29% of EITC-eligible households) have credit card debt, while over 50% report having some outstanding unsecured debt. Among the full population with children, the average outstanding credit card debt equals just over $3,200, while EITC-eligible families owe about $2,100. EITC-ineligible families own just over 2.5 credit cards, and 45% use unsecured debt to pay bills. Among the EITC-eligible, families own 1.4 credit cards; 27% of families pay bills with unsecured debt. Compared to the general population with children, the EITC-eligible are more likely to be black and female, they are less likely to be married, and have lower household income, net worth, debt, and savings.

Empirical Strategy for Testing for Seasonality

In our tests for seasonality, we are no longer directly interested in how changes in the generosity of EITC affect debt patterns, but rather in how debt usage patterns over the year differ for those who receive the EITC versus those who do not. Following Barrow and McGranahan

(2000), we use the CFM to test for a seasonal pattern to household debt accumulation and pay off for EITC-eligible households. We examine credit card and unsecured debt behavior using residual plots of the CFM data that compare trends in monthly debt behavior of EITC-eligible households to those of ineligible households. We implement models of the following form:

$$Y_i = \alpha + \delta ELG_i + Month'\alpha + (ELG_i * Month)'\lambda + X_i'\beta + \gamma_y + \varepsilon_i \,, \qquad (2)$$

where Y_i represents the outcome of interest. The vector γ_y is a set of year fixed effects and X_i contains covariates including the number of minors in the household, age, and indicators of gender, race, marital status, and educational attainment. ELG_i is an indicator for whether the household income of individual i falls within the EITC-eligible range, which we calculate for each household using the state-, year- and family size-specific eligibility rules. $Month$ is a set of calendar month indicators that denote the month in which respondent *i* was surveyed, and $(ELG_i * Month)$ is the interaction of the EITC-eligibility indicator with each calendar month indicator. In all cases, we use March as the base month, and we estimate linear models with robust standard errors clustered at the state level. We are primarily interested in this vector of coefficients, λ, which indicate the relative change in the outcome variable of interest for EITC-eligible households compared to March levels. If our hypothesis is true, we expect to find low debt levels among EITC-eligible households in February and March, with increases later in the year.

We explore the results of estimated equation (2) both graphically and using statistical tests. We begin by plotting the monthly residuals for the EITC-eligible versus ineligible populations. These pictures allow us to compare the monthly trends in debt behavior between those who are likely to receive the EITC and those who are not, after controlling for observables. Second, we conduct t-tests for seasonality by testing whether the coefficients in vectors α and λ are jointly equal to zero. Specifically, we conduct three formal t-tests:

Test 1: seasonality among the EITC-ineligible

$$\alpha_j = \alpha_f = \alpha_a = \cdots = \alpha_d = 0$$

Test 2: seasonality among the EITC-eligible

$$\alpha_j + \lambda_j = \alpha_f + \lambda_f = \lambda_a = \cdots = \alpha_d + \lambda_d = 0$$

Test 3: difference in trends between EITC-eligible and –ineligible populations

$$\lambda_j = \lambda_f = \lambda_a = \cdots = \lambda_d = 0$$

In all cases, we test the null hypotheses that there is no seasonality (or that seasonality between the two groups is equal, in the case of test 3). Low p-values will allow us to reject the null hypotheses and conclude that, after controlling for observables, there is seasonality in debt behavior.

The results of this analysis are presented in figures 3 and 4. In all graphs, we plot debt behavior trends for the eligible and ineligible populations. The line marked *EITC eligible* (colored navy) shows plots the sum of the *Month* and *Month * EITC* indicators, and show the behavior trends among the eligible population, relative to March levels. The line marked *EITC ineligible* indicates the coefficient estimates from the *Month* indicators and shows the behavior trends (relative to March values) among the ineligible population. This line is intended as a comparison to show how debt behavior among the general population changes throughout the year. On a secondary axis, we additionally plot the average proportion of total EITC outlays paid out in each month by the Treasury Department. Because we do not know for certain when families in our sample receive their EITC check, we use this as a measure of when, on average, families are likely to receive their EITC payment.

Figure 3 shows results for the three credit card debt behavior variables we investigate. The top two graphs show how the likelihood of having any credit card debt and the natural log of total credit card debt evolve over the course of the year. Among the EITC-eligible population, debt holdings appear low in February, March and April, and increase over the course of the year, with highs in September. The low levels in tax season correspond with the timing of the lump-sum payment of benefits. The trend is more striking when compared to the rest of the population: among the EITC-ineligible population, there is little evidence of seasonal patterns in credit card use behavior. There is also a striking decrease in November in the amount and likelihood of owing money among the EITC population. Families may be paying off debt in anticipation of increased spending over the holiday season.

The third picture shows trends in the number of credit cards owned by a family. The behavior pattern among the EITC-eligible population is especially pronounced here: families own the fewest credit cards in March, and increase their ownership over the course of the year. This may reflect the tendency for families to pay off credit card debt with their benefit income, and subsequently close accounts. Again, the pattern among the EITC-eligible population is distinct from that among the general population. Figure 4 shows graphs that describe seasonality in unsecured debt behavior. The top two graphs show the likelihood of owing, and the natural log of total amount owed, on unsecured loans, excluding student loans. Again, there is a pattern of low debt level in February and March, with gradual increases over the course of the year. Families exhibit high debt levels in December. The trend among the ETIC ineligible population is again flat, or even decreasing from highs around tax time. This may reflect the tendency for families to keep cash on hand in anticipation of taxes owed in April (Dunn et al. 2011).

The third graph shows the likelihood of paying bills with unsecured debt, and illustrates a pronounced pattern in debt behavior. [12] Among the EITC-eligible population, families are unlikely to use unsecured debt to pay bills in March and April; the likelihood increases dramatically in the months following tax season. Again, the pattern is not evident among the general population, which appears to have fairly stable debt usage over the course of the year. Overall, the figures indicate a pattern of seasonality among the EITC-eligible population that confirms the hypothesis that families respond to the timing of tax benefit payment.

The results in Table 6 suggest the same conclusions with the use of t-tests. We show the estimated monthly residuals for the EITC-eligible and ineligible populations.[13] The first thing to note is the lack of statistical significance among the monthly coefficient for the EITC-ineligible. This reflects what our graphs show: that there is little seasonality in the debt behavior of the EITC-ineligible. The results of *test 1* confirm this: for three of the four outcomes we consider, we are not able to reject the null hypothesis of there being no seasonality in debt behavior among the EITC-ineligible. *Test 2* shows the opposite: in all cases, we can reject the null that there is no

[12] Recall that the third measure of unsecured debt behavior includes a different set of debt products than the first two. The bill payment measure includes use of credit cards, payday loans, gas cards and store credit cards.
[13] In the interest of space, we exclude results for the propensity of having any credit card or unsecured debt, since these variables are constructed from the total debt variables and demonstrate similar results. Results available upon request.

seasonality among the EITC-eligible. Further, *test 3* shows that there are statistically distinct patterns in behavior among the eligible and ineligible populations. In sum, our analysis reveals statistically significant seasonality in debt behavior among the EITC-eligible that reflects the timing of the lump-sum payment of tax benefits. This confirms that at least some of the increase in credit card debt as a function of EITC generosity is due to the distribution of the EITC in a single, lump-sum payment.

How robust is our finding of seasonality?

One feature of our approach with the CFM is that our initial sample selection determines the characteristics associated with EITC eligibility status. For example, in our main analysis above where we focus on families with children, the main determining factor of EITC eligibility will be household income; if we instead focused on families with lower incomes, then family structure would become the main determinant of eligibility. If the trends we uncover in our analysis are particular to families with lower incomes, then we may erroneously attribute the debt usage patterns to EITC status rather than to income. To check that this is not the case, we repeat the analysis above using a variety of initial samples: the full sample (N=18,738), where EITC eligibility is jointly determined by family structure and income; a low-education sample where the primary respondent has less than a college degree (N=10,257); and a sample of unmarried parents (N=1,074).

This exercise does not suggest that our results are determined by the initial sample we select. In the appendix, we show the results for the natural log of credit card debt and the natural log of unsecured debt using each of these three initial samples. In general, we see low levels of debt in February, March and April for the EITC eligible population, with increases throughout the year; the ineligible populations in all cases exhibit relatively flat debt usage patterns.

How much of the EITC goes to credit card companies?

Results from our analysis indicate that low-income households use a combination of savings and credit card debt to smooth consumption between EITC benefit payments. In fact, we find quite large savings responses to EITC generosity. Despite these increases in savings, we do find substantial increases in credit card debt as well. This implies that households are not perfectly smoothing consumption, or use credit cards to smooth their consumption, suggesting

that either households are financially constrained and have trouble making ends meet throughout the year, or that households are myopic. These results are consistent with the theory that households use a combination of savings and credit card debt to smooth consumption. While they serve as a convenient mechanism to smooth consumption, credit card usage is not without its costs. Assuming an interest rate of 14%, as we found in the CFM among low-income households, our results suggest that single mothers would pay approximately $80 in credit card interest as a result of this $1,000 policy-induced increase in the EITC, or that about 8% of spending on the EITC is diverted to credit card companies.

Conclusion

In this paper we investigate how lump-sum delivery of tax benefits impacts savings and debt among low-income families. Significant research has been undertaken on the seasonal patterns in consumption and savings among the EITC-eligible population. We extend this work by investigating whether high-cost debt positions also follow the expected pattern if families are borrowing against their expected tax refunds. We find significant evidence to confirm our hypothesis: families do appear to pay down debt during tax season and increase debt over the course of the year.

The fact that families use credit cards and other unsecured debt to finance consumption over the course of the year is not necessarily welfare reducing. While it is certainly costly to carry credit card debt for months while waiting for tax benefit income, the income shock afforded by lump-sum delivery of benefits may be valuable enough to warrant the use of credit cards to finance consumption throughout the course of the year. This argument becomes less persuasive if over time, families are increasing credit card debt without ever fully paying it off. We investigate this question using a simulated instruments approach that relates debt holding to exogenous changes in benefit generosity.

Results from this analysis indicate that households are significantly more likely to take on credit card debt but are also more likely to save as a function of tax credit generosity. A $1,000 increase in the average household EITC in a given state, year, and family size leads to an 11% increase in the likelihood of holding credit card debt and in the likelihood of having any savings. In testing whether these effects are due to the timing of the benefit payments themselves or the

labor supply incentives generated by the EITC, we calculate that up to half of our results could be due to the increased labor supply of single mothers following expansions of the EITC. While this implies an improved financial situation among this population, we also find increases in credit card debt as a function of EITC generosity. While this form of credit may allow households to smooth consumption, these same households are likely paying steep interest rates in order to do so. Data from the CFM suggests that the average EITC-eligible household has an annual interest rate of 14% on their credit cards. Given our results that credit card debt goes up by approximately $570 when EITC generosity increases by $1,000, we estimate that approximately 8% of spending on the EITC could be going directly to credit card companies in the form of interest payments from low-income households. As of the 2014 tax year, federal spending on the EITC was 66 billion dollars, implying that up to 5 billion dollars could be transferred to credit card companies.

With the expansion of the EITC beginning in the 1990s, the United States has shifted from a welfare system that primarily targeted non-working single mothers, to a system where many benefits are contingent upon work and distributed through the tax code. This shift has had several implications for the low-income population in the United States. Distributing benefits through the tax code simplifies the process of determining eligibility and claiming benefits, leading to lower stigma and higher claiming rates—typically near 90% of the eligible population, compared to averages of less than 50% for welfare benefits. Distributing benefits through the tax code also means that eligibility and benefits are determined annually rather than monthly. Determining eligibility annually may be beneficial in reducing the time spent proving eligibility, but it also means that households only receive benefits once a year.

While qualitative research suggests that families strongly prefer to receive these benefits in lump sums to allow for the purchase of large items, there is also evidence that these same households have trouble making ends meet throughout the rest of the year (Halpern-Meekin et al. 2014). Further, there has been evidence indicating spending on non-durable goods increases in the months following tax refund receipt as well (Barrow and McGranahan 2000, McGranahan and Schanzenbach 2013, Jones et al. 2015). Our findings are consistent with the seasonal patterns shown in these studies, implying that low-income families rely on both savings and credit card debt to partially smooth their consumption. Given the high cost of carrying credit card

debt over the course of the year, our results indicate that households may benefit from receiving at least a portion of their credit at a more regular interval.

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Table 1. Descriptive Statistics from the SIPP for single mothers with children under the age of 19

Indicator for presence of assets and debts	
Has unsecured debt	0.51
Has credit card debt	0.39
Has any money in savings or checking account	0.55
Value of assets and debts	
Total unsecured debt	6,996
Total credit card debt	2,384
Total value of savings and checking	3,498
Total family income in first year of SIPP	26,035
Average household credits by state-year	1,622
Total household credits in first year of SIPP	1,616
Total household credits as a percent of income	6.2%
Eligible for the EITC in first year of SIPP	58.7%
Demographic characteristics	
Black	0.31
Female	1.00
Age	37.12
Married	0.00
Number of kids in the household	1.80
Number of Observations	27,809

Source: Survey of Income and Program Participation 1990-2008. Single women with at least one child under the age of 19 living in the household at the start of the survey. All numbers are weighted by monthly person weights. All dollars in 2011$.

Table 2. OLS regressions of debt on own household EITC ($1,000s)

Outcome	Has unsecured debt	Has own credit card debt	Has savings	Unsecured debt	Credit card debt	Savings
Household EITC ($1,000s)	-0.01 **	-0.01 ***	-0.006 **	-0.454 ***	-0.181 ***	-0.518 ***
	(.003)	(.003)	(.003)	(.085)	(.028)	(.055)
Mean dependent variable	0.50	0.38	0.55	4.13	2.88	3.59
Demographic controls	Y	Y	Y	Y	Y	Y
State FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y
Number of Observations	27,809	27,809	27,809	27,809	27,809	27,809

Source: Survey of Income and Program Participation 1990-2008. Single women with at least one child under the age of 19 living in the household at the start of the survey. All regressions include state, year and month fixed effects, as well as demographi controls (age, race, number of children living in the household) and state-year characteristics (unemployment rate, minimum wage, GDP, top tax bracket, and welfare generosity). All dollars in 2011$. *p<.10 ** p<.05 *** p<.001

Table 3. Reduced form regressions of debt on simulated EITC ($1,000s)

Outcome	Has unsecured debt	Has own credit card debt	Has savings	Unsecured debt	Credit card debt	Savings
Simulated EITC	0.026 *	0.042 ***	0.061 ***	0.472	0.567 ***	1.090 *
	(.014)	(.011)	(.019)	(.78)	(.187)	(.599)
Mean dependent variable	0.50	0.38	0.55	7.10	2.33	3.50
Demographic controls	Y	Y	Y	Y	Y	Y
State FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y
Number of Observations	27,809	27,809	27,809	27,809	27,809	27,809

Source: Survey of Income and Program Participation 1990-2008. Single women with at least one child under the age of 19 living in the household at the start of the survey. All regressions include state, year and month fixed effects, as well as demographi controls (age, race, number of children living in the household) and state-year characteristics (unemployment rate, minimum wage, GDP, top tax bracket, and welfare generosity). All dollars in 2011$. *p<.10 ** p<.05 *** p<.001

Table 4. Estimated percent of impact of EITC on debt due to labor supply

	Has own credit card debt	Has savings	Credit card debt	Savings
Working (1=yes)	0.204 ***	0.297 ***	1.301 ***	1.542 ***
	(.009)	(.009)	(.105)	(.341)
Impact of simulated EITC on labor supply	0.094	0.094	0.094	0.094
Simulated EITC ($1,000s)	0.042	0.061	0.567	1.090
Percent due to labor supply	45.7%	45.8%	21.6%	13.3%
Mean dependent variable	0.38	0.55	2.88	3.59
Demographic controls	Y	Y	Y	Y
State FE	Y	Y	Y	Y
Year FE	Y	Y	Y	Y
Number of Observations	27,809	27,809	27,809	27,809

Source: Survey of Income and Program Participation 1990-2008. Single women with at least one child under the age of 19 living in the household at the start of the survey. All regressions include state, year and month fixed effects, as well as demographic controls (age, race, number of children living in the household) and state-year characteristics (unemployment rate, minimum wage, GDP, top tax bracket, and welfare generosity). All dollars in 2011$. *p<.10 ** p<.05 *** p<.001

Table 5. Descriptive Statistics from the CFM for households with children under the age of 19, by EITC-eligibility

	All households with children	EITC-eligible households
EITC eligible	0.36	1
Patterns in credit card usage		
Has a credit card	0.87	0.58
Interest rate on credit card with highest balance	12.6	13.7
Total credit card limit (of all cards)	26,638	9,385
Debt behavior outcomes		
Has credit card debt	0.36	0.29
Total credit card debt	3,229	2,123
Number of credit cards	2.66	1.43
Has unsecured debt	0.59	0.52
Total unsecured debt	10,430	6,039
Uses unsecured debt to pay bills	0.44	0.27
Value of assets and debts		
Total savings	36,672	20,209
Total debt	104,337	41,817
Total family income	81,824	23,276
Demographic characteristics		
Black	0.09	0.20
Female	0.62	0.72
Age	40.62	39.72
Married	0.81	0.65
Number of kids in the household	1.86	1.88
Number of Observations	6,980	1,958

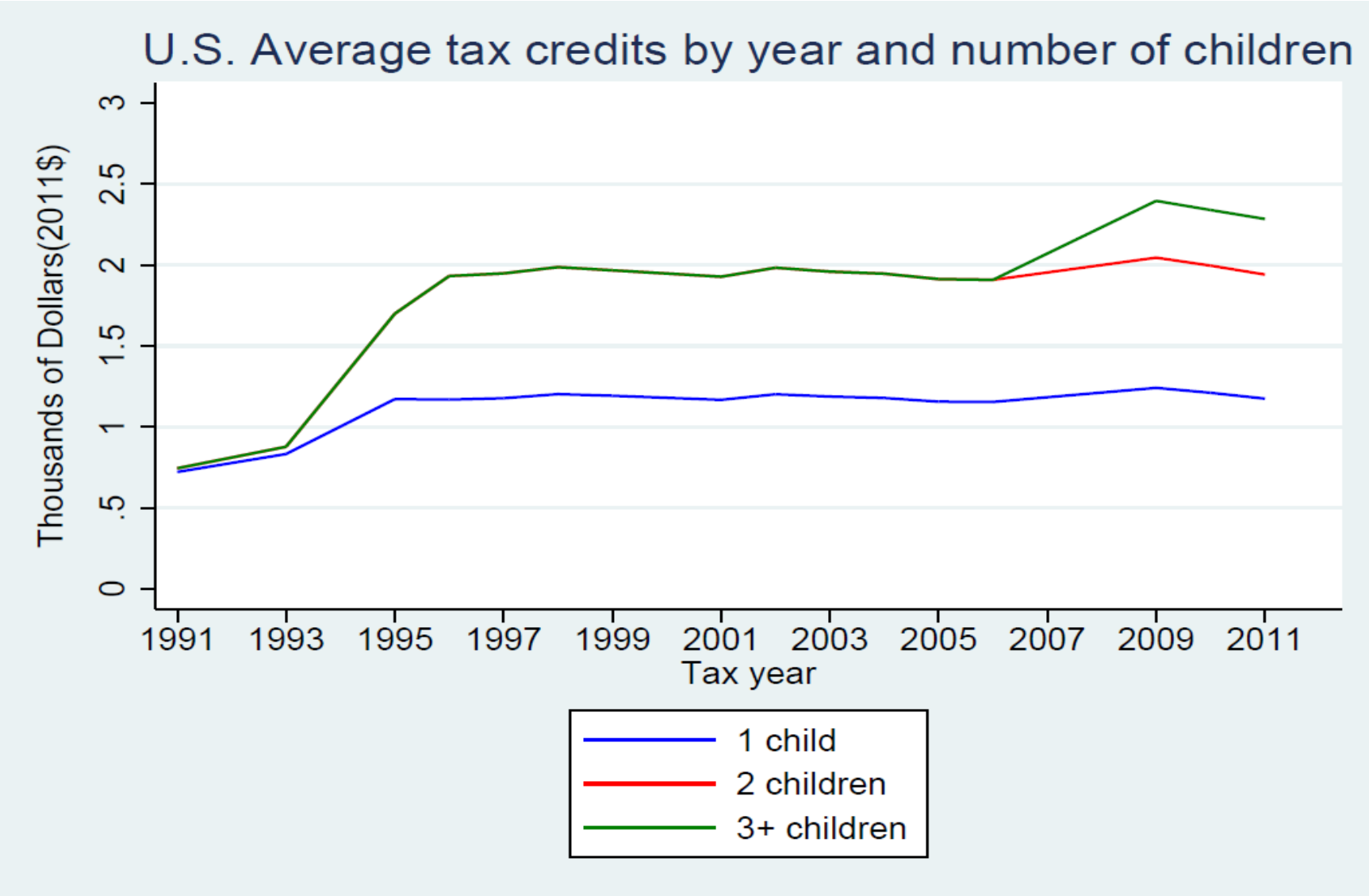
Source: Consumer Finance Montly survey, 2006-2013. Respondents of households with at least one child under the age of 19 living in the household. All dollars in 2013$.

Table 6. Regression results comparing monthly trends in debt behavior among EITC-eligible versus ineligible, families with children

Outcome	**ln(Total CC Debt)**		**Number of CCs**		**ln(Ttl Unsec Debt)**		**Used Unsec Debt**	
Monthly coefficient estimates	Inelig.	Eligible	Inelig.	Eligible	Inelig.	Eligible	Inelig.	Eligible
January	0.365	-0.879	-0.071	-1.357***	0.133	-1.888***	-0.056	-0.069
	(0.472)	(0.660)	(0.346)	(0.252)	(0.429)	(0.651)	(0.046)	(0.068)
February	0.126	-1.402***	0.101	-1.770***	-0.036	-2.305***	0.099**	-0.199**
	(0.440)	(0.494)	(0.419)	(0.320)	(0.433)	(0.652)	(0.043)	(0.084)
March		-1.212***		-1.870***		-1.857***		-0.267***
		(0.314)		(0.335)		(0.650)		(0.057)
April	0.150	-1.442**	-0.388	-1.368***	0.443	-1.019	0.002	-0.200***
	(0.436)	(0.548)	(0.320)	(0.295)	(0.360)	(0.673)	(0.046)	(0.073)
May	0.470	-1.187**	-0.050	-1.508**	0.211	-1.320**	0.064	-0.233***
	(0.455)	(0.561)	(0.541)	(0.569)	(0.384)	(0.539)	(0.049)	(0.059)
June	0.106	-0.081	-0.524	-0.852***	-0.324	-0.829	-0.015	-0.129**
	(0.368)	(0.583)	(0.332)	(0.261)	(0.453)	(0.578)	(0.042)	(0.052)
July	-0.003	-0.818*	-0.497	-0.914***	-0.088	-1.332**	-0.020	-0.110***
	(0.370)	(0.454)	(0.350)	(0.297)	(0.418)	(0.544)	(0.044)	(0.041)
August	0.200	-0.411	-0.291	-0.717**	0.130	-1.624***	0.011	0.014
	(0.526)	(0.555)	(0.334)	(0.316)	(0.465)	(0.524)	(0.041)	(0.051)
September	-0.089	0.480	-0.276	-0.745*	-0.334	-0.558	0.014	-0.058
	(0.388)	(0.570)	(0.305)	(0.392)	(0.390)	(0.680)	(0.049)	(0.049)
October	-0.039	-0.239	-0.386	-1.218***	-0.162	-0.785	0.034	-0.130***
	(0.332)	(0.407)	(0.315)	(0.205)	(0.441)	(0.603)	(0.038)	(0.049)
November	0.000	-1.137***	-0.364	-1.268***	-0.485	-0.625	-0.016	-0.133*
	(0.361)	(0.391)	(0.291)	(0.214)	(0.511)	(0.637)	(0.051)	(0.066)
December	0.398	-0.705	-0.069	-0.994**	-0.271	-0.071	0.016	-0.154**
	(0.347)	(0.607)	(0.369)	(0.391)	(0.428)	(0.765)	(0.042)	(0.058)
N	6132		6567		6600		6600	
F	51.85		184.29		88.53		369.79	
T-tests for seasonality								
Test 1: No seasonality ineligible	p=0.886		p=0.338		p=0.097		p=0.002	
Test 2: No seasonality eligible	p=0.001		p=0.008		p=0.000		p=0.000	
Test 3: Eligible= ineligible	p=0.000		p=0.000		p=0.000		p=0.000	

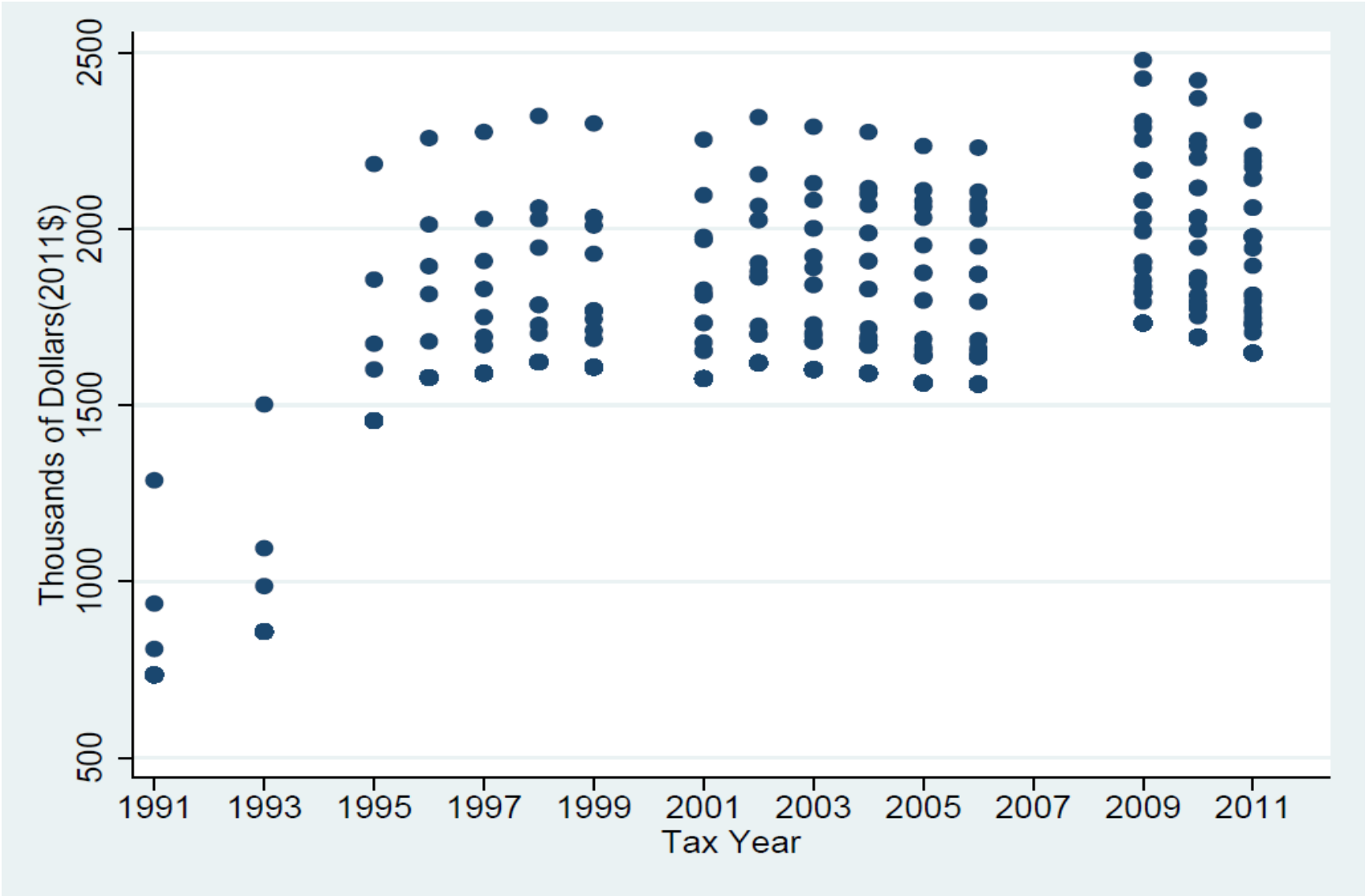
* p<0.10; ** p<0.05; *** p<0.001; Notes: Consumer Finance Monthly data 2006-2013 for families with kids. OLS regressions explaining debt behaviors. Additional controls include age, race, marital status, female head of household, education, number of children, and year fixed effects. Robust standard errors clusterd at the state level in parentheses.

Figure 1. Average household EITC benefits simulating by year and number of children living in the household



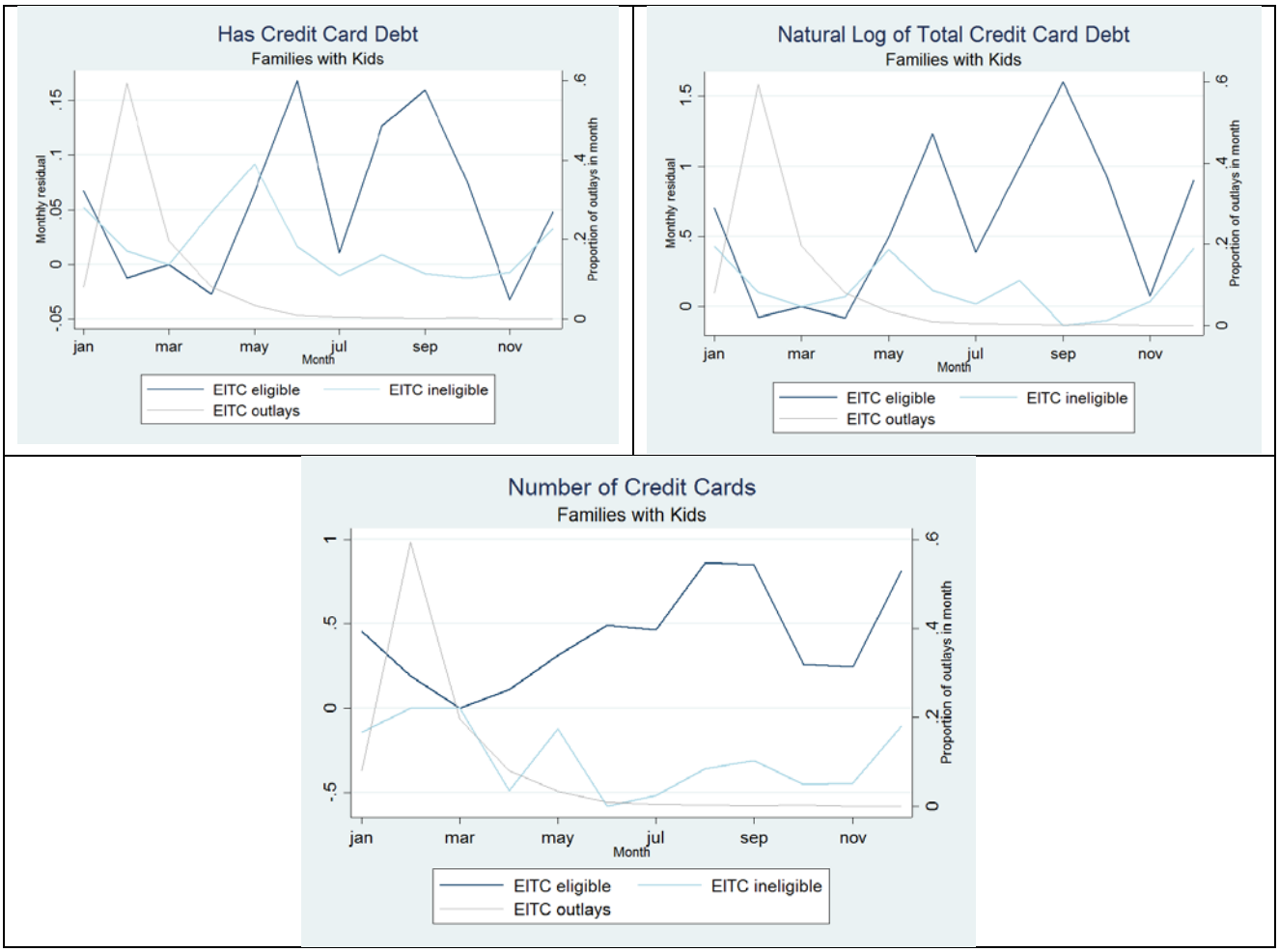
Source: Survey of Income and Program Participation 1990-2008. All numbers are weighted by monthly person weights. All dollars in 2011$.

Figure 2. Average simulated household EITC by state and year



Source: Survey of Income and Program Participation 1990-2008. All numbers are weighted by monthly person weights. All dollars in 2011$.

Figure 3. Tests for seasonality in credit card behavior in the CFM



Notes: source: Consumer Finance Monthly Survey 2006-2013. Families with children. Residual plots of monthly deviations from group-specific March levels among EITC-eligible vs ineligible families.

Figure 4. Tests for seasonality in unsecured debt behavior in the CFM

Notes: source: Consumer Finance Monthly Survey 2006-2013. Families with children. Residual plots of monthly deviations from group-specific March levels among EITC-eligible vs ineligible families.

Appendix Table 1. States with Earned Income Tax Credits, year of implementation

	Year of Implementation
Rhode Island	1986
Vermont	1988
Wisconsin[1]	1989
Iowa	1990
Minnesota[2]	1991
New York	1994
Massachusetts	1997
Oregon	1997
Kansas	1998
Maryland	1998
Colorado	1999
DC	2000
Illinois	2000
Maine	2000
New Jersey	2000
Oklahoma	2002
Indiana	2003
Nebraska	2003
Delaware	2006
Virginia	2006
New Mexico	2007
North Carolina	2008
Michigan	2008
Louisiana	2008
Connecticut	2011
Washington	2008 (announced)
Ohio	2013

Source: Tax Policy Center http://www.taxpolicycenter.org/taxfacts/displayafact.cfm?Docid=293

1: Wisconsin has a system based on the number of children in the household. Rate shown here is for households with 3 or more children.

2: Minnesota has a system based on whether there are any children living in the household, and after 1997, household earnings. Rate shown here is for households with children and the maximum possible rate given income.

Appendix Table 2. SIPP panel years and months of wealth topical modules

SIPP Panel	Months of wealth topical module	Years covered	Number of times sampled
1991	Febuary-May	1991	1
1992	Febuary-May	1992	1
1993	Febuary-May	1993	1
1996	December-March	1996-2000	4
2001	October-January	2001-2004	3
2004	October-January	2004-2007	2
2008	September-December	2008-2012	3

Appendix Table 3. Reduced form regressions of debt on simulated EITC using previous year's EITC rules

	Has unsecured debt	Has own credit card debt	Has savings	Unsecured debt (ln)	Credit card debt (ln)	Savings (ln)
Simulated EITC ($1,000s)	0.032 **	0.048 ***	0.065 ***	0.351	0.584 ***	0.774
	(.015)	(.012)	(.022)	(.86)	(.178)	(.616)
Mean dependent variable	0.50	0.38	0.55	7.10	2.33	3.50
Demographic controls	Y	Y	Y	Y	Y	Y
State FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y
Number of Observations	27,809	27,809	27,809	27,809	27,809	27,809

Source: Survey of Income and Program Participation 1990-2008. Single women with at least one child under the age of 19 living in the household at the start of the survey. All regressions include state, year and month fixed effects, as well as demographi controls (age, race, number of children living in the household). All dollars in 2011$. *p<.10 ** p<.05 *** p<.001

Appendix Table 4. Reduced form regressions of debt on simulated federal EITC changes (no state)

Outcome	Has unsecured debt	Has own credit card debt	Has savings	Unsecured debt	Credit card debt	Savings
Simulated EITC, Reduced form	0.028	0.043 ***	0.072 ***	0.377	0.556 **	1.046
	(.018)	(.014)	(.021)	(.858)	(.24)	(.627)
Mean dependent variable	0.50	0.38	0.55	7.10	2.33	3.50
Demographic controls	Y	Y	Y	Y	Y	Y
State FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y
Number of Observations	27,809	27,809	27,809	27,809	27,809	27,809

Source: Survey of Income and Program Participation 1990-2008. Single women with at least one child under the age of 19 living in the household at the start of the survey. All regressions include state, year and month fixed effects, as well as demographi controls (age, race, number of children living in the household) and state-year characteristics (unemployment rate, minimum wage, GDP, top tax bracket, and welfare generosity). All dollars in 2011$. *p<.10 ** p<.05 *** p<.001

Appendix Figure 1. Seasonality graphs from the CFM using different base samples