



# WORKING PAPERS

RESEARCH DEPARTMENT

**WORKING PAPER NO. 14-8  
FORECLOSURE DELAY AND CONSUMER CREDIT  
PERFORMANCE**

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## Abstract

The deep housing market recession from 2008 through 2010 was characterized by a steep increase in the number of foreclosures. Foreclosure timelines — the length of time between initial mortgage delinquency and completion of foreclosure — also expanded significantly, averaging up to three years in some states. Most individuals undergoing foreclosure are experiencing serious financial stress. However, extended foreclosure timelines enable mortgage defaulters to live in their homes without making housing payments until the completion of the foreclosure process, thus providing a liquidity benefit. This paper tests whether the resulting liquidity was used to help cure nonmortgage credit delinquency. The authors find a significant relationship between longer foreclosure timelines and household performance on nonmortgage consumer credit during and after the foreclosure process. Their results indicate that a longer period of nonpayment of housing-related expenses results in higher cure rates on delinquent nonmortgage debts and improved household balance sheets. Foreclosure delay may have mitigated the impact of the economic downturn on credit card default. However, credit card performance may deteriorate in the future as the current foreclosure backlog is cleared and the affected households once again incur housing expenses.

Keywords: Mortgage Default, Foreclosure, Foreclosure Delay, Credit Card Default,  
JEL Classification Codes: G28, G21, G02

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## I. Background and Research Objectives

The deep housing market recession from 2008 through 2010 was characterized by a steep increase in the number of foreclosures. Foreclosure timelines — the length of time between initial mortgage delinquency and completion of foreclosure — also expanded significantly, averaging up to three years in some states. This paper investigates whether these lengthened foreclosure timelines provided liquidity to enable households to improve their payment performance on nonmortgage consumer debt.

About 2.7 million and 2.3 million foreclosure filings were reported for U.S. properties in 2011 and 2012, respectively. Total foreclosure filings peaked around 2009; however, recent trends vary across states.<sup>1</sup> Figure 1 presents the number of homes in foreclosure from 2000 to 2012. In addition to the high number of foreclosures in recent years, the typical length of time between when a borrower becomes delinquent and when a foreclosure is completed has significantly increased. While mortgage delinquency rates have been declining since 2010, the number of homes in the foreclosure pipeline has remained high through 2012 due to a substantial foreclosure backlog.<sup>2</sup> In some states, borrowers remained in their homes for nearly three years after defaulting on their mortgages.<sup>3</sup>

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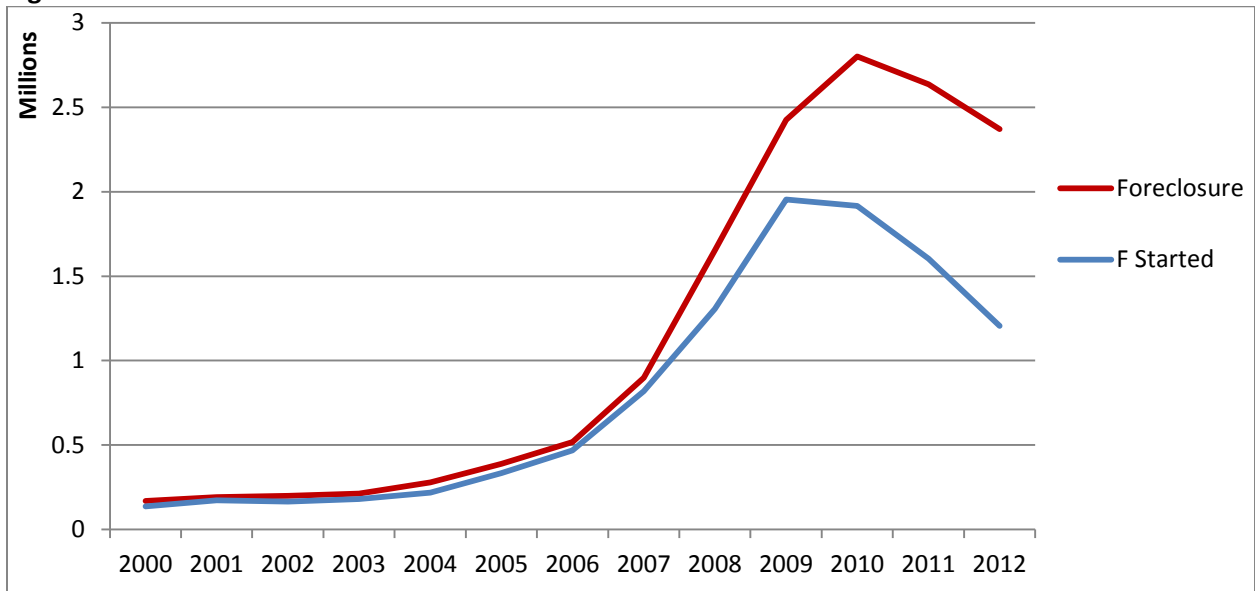
<sup>1</sup> From 2011 to 2012, the number of foreclosure filings declined in 25 states (including Nevada, Oregon, Arizona, and California) but increased in others, particularly those with longer judicial foreclosure processes. Foreclosure filing rates rose about 50 percent from 2011 to 2012 in New Jersey, Florida, Connecticut, and Indiana, and by about one-third in Illinois and New York. Piskorski, Seru, and Vig (2010) find a significantly lower foreclosure rate associated with bank-held loans when compared with similar securitized loans. The foreclosure rate of delinquent bank-held loans is 3 percent to 7 percent lower in absolute terms. There is a substantial heterogeneity in these effects, with large effects among borrowers with better credit quality and small effects among lower quality borrowers.

<sup>2</sup> Ghent and Kudlyak (2011) find that mortgage borrowers are less likely to default in recourse states (compared to nonrecourse states) given the amount of negative equity. This is because mortgage lenders have the right to go after mortgage defaulters in recourse states if the collateral is not sufficient to cover the mortgage amount. In addition, once defaulted, mortgage lenders usually used a more friendly process, rather than a foreclosure, in the recourse states.

<sup>3</sup> The extended foreclosure timelines are concentrated among states that follow judicial foreclosure processes as well as in some nonjudicial states (such as Nevada) that recently enacted “judicial-like” foreclosure laws.

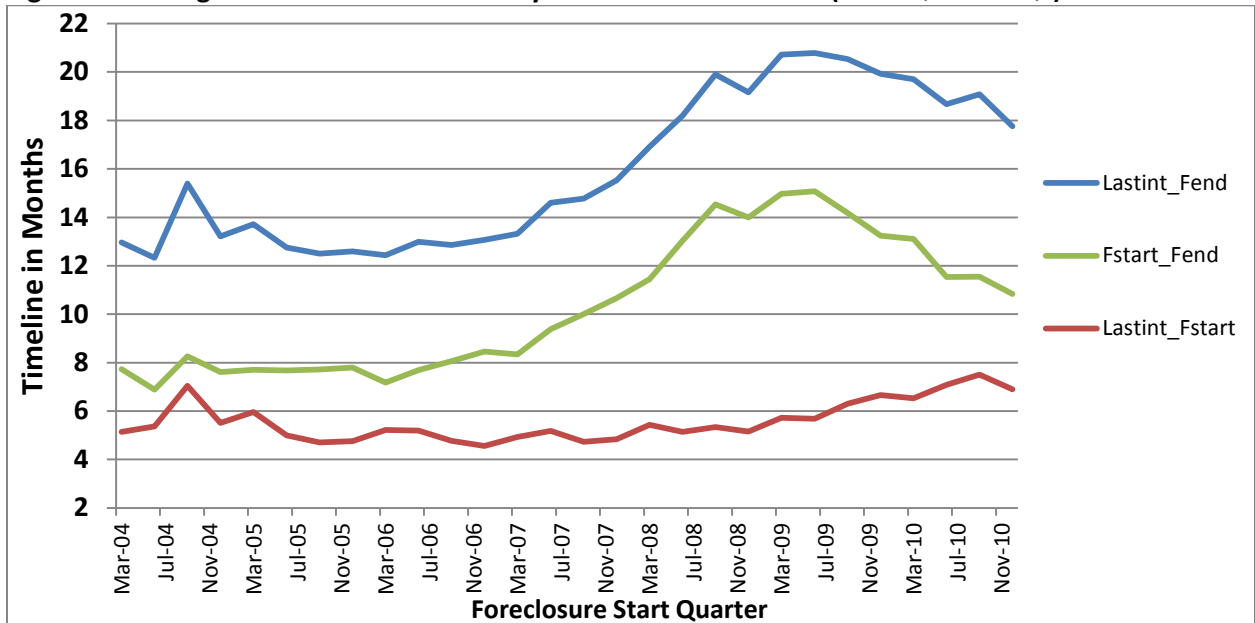
Figure 1 shows the number of foreclosure starts and the number of homes that remained in foreclosure annually from 2000 to 2012. While the number of foreclosure starts has been declining since mid-2009, the total number of homes in the foreclosure process continued to rise until mid-2010 due to the expanded foreclosure timelines.

**Figure 1: Number of Loans in Foreclosure Versus Foreclosure Started**



Source: Realty Trac’s Year-End 2011 and Year-End 2012 U.S. Foreclosure Market Reports. Note: These numbers are consistent with our own analysis based on a loan processing services (LPS) database that includes the 10 largest mortgage servicers.

**Figure 2: Average Foreclosure Timeline – by Foreclosure Start Date (2004:Q1-2010:Q4)**



Source: LPS database (excluding foreclosures that remained open as of year-end 2012)

Figure 2 presents the average foreclosure timelines (in months) for the various foreclosure start dates from 2004 to 2010. The blue line represents the national average foreclosure timeline from the time a mortgage became delinquent to the end of the foreclosure process. The timelines peaked at about 21 months and started to shorten for foreclosures that started near the end of 2009 or later.<sup>4</sup> The longer average foreclosure timeline seems to be driven overall by the foreclosure backlog (the time between the foreclosure start to the foreclosure end date, as represented by the green line), although the delay between the time the loan became delinquent and the foreclosure started (the red line) also contributes significantly to foreclosures that started in 2009 or later.

Previous studies have investigated the sources of lengthening foreclosure timelines or examined the relationship between the extended foreclosure timelines and the propensity to default on a mortgage. However, we are unaware of prior research that investigates the impact of a foreclosure delay on nonmortgage consumer credit performance, which is the objective of this paper. Household credit performance on consumer debt also evolved during the mortgage crisis period. As highlighted in several previous studies, such as Jagtiani and Lang (2011), the mortgage crisis period was characterized by changing priorities in consumer debt payments, with households more likely to be delinquent on their mortgage debt compared with their nonmortgage debt. The expanded foreclosure timelines may have contributed to this changing prioritization.

There are many potential costs associated with foreclosure delay. Cordell, Geng, Goodman, and Yang (2013) discuss the added losses to lenders given foreclosure delays. Moreover, there may also be costs to neighborhoods when houses are in the foreclosure process, and there is little incentive for those occupying the homes to invest in maintenance. However, foreclosure delays provide a financial

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<sup>4</sup> It should be noted that the decline in foreclosures in the 2009–2010 period could be affected by the censoring, since some of the foreclosures that started in 2009–2010 may not have been completed as of year-end 2012; thus, they are not included in this plot.

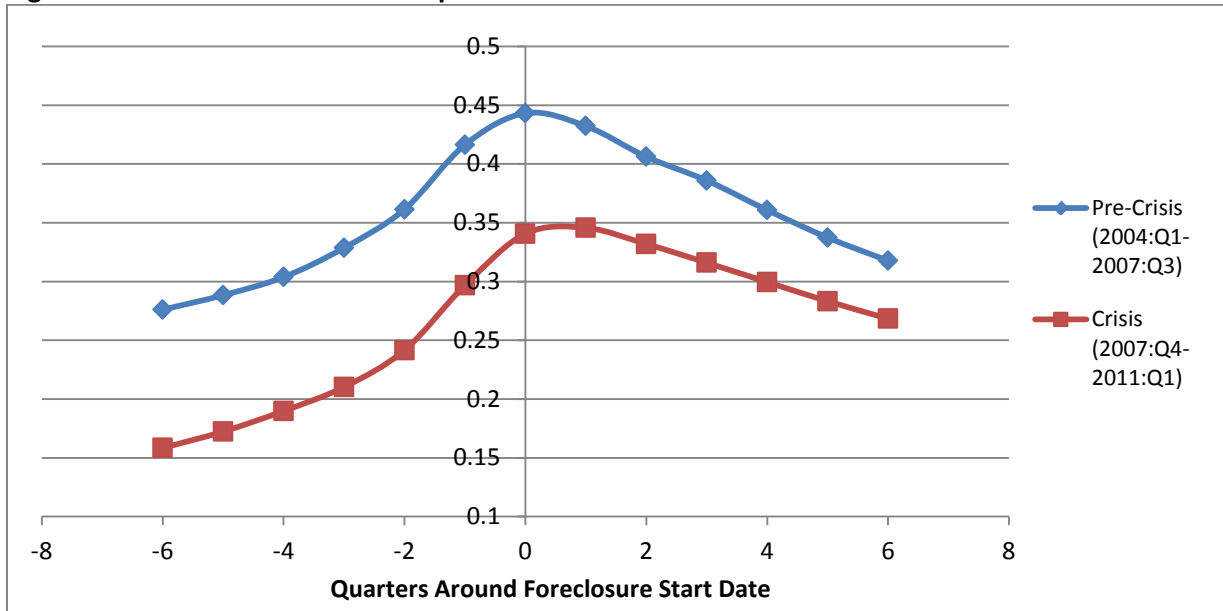
benefit to defaulted mortgage borrowers (at a cost to mortgage lenders). While households are in the foreclosure pipeline, they typically are not paying their mortgages and have a temporary relief from paying normal housing expenses. This paper examines whether foreclosed borrowers with longer foreclosure timelines take advantage of this benefit by strengthening their balance sheets and improving performance on nonmortgage-related debt.

To analyze this question, we focus on the credit card performance and behavior of households that are undergoing foreclosure. We demonstrate empirically that households experiencing longer foreclosure time periods are more likely to pay off their credit card debt and become cured (i.e., returning to a current status on their credit cards again). In other words, these households are more likely to improve their overall balance sheet when compared with households for which foreclosure timelines are shorter.

The simple plot in Figure 3 below shows the proportion of consumers in foreclosure who were delinquent — at least 60 days past due (DPD) — on at least one of their credit cards prior to and following their foreclosure start date. Figure 3 indicates that consumers who were defaulting on mortgages were generally in overall financial distress, as delinquencies on credit cards also rose prior to the foreclosure start date. The delinquency ratio on cards seems to decline afterward, probably due to mortgage payment relief during the foreclosure.

Note also that the percentage of individuals with a mortgage in foreclosure who also fell behind on credit card debt was higher during the pre-crisis period (2004:Q1 to 2007:Q3) than during the financial crisis (2007:Q4 to 2011:Q1). This is consistent with shifting debt payment priorities. During the crisis period, households were more likely to make credit card payments while defaulting on their mortgages. As documented in Jagtiani and Lang (2011), households were more likely to default on their first mortgages during the crisis period when their mortgages were underwater, while keeping up other payments.

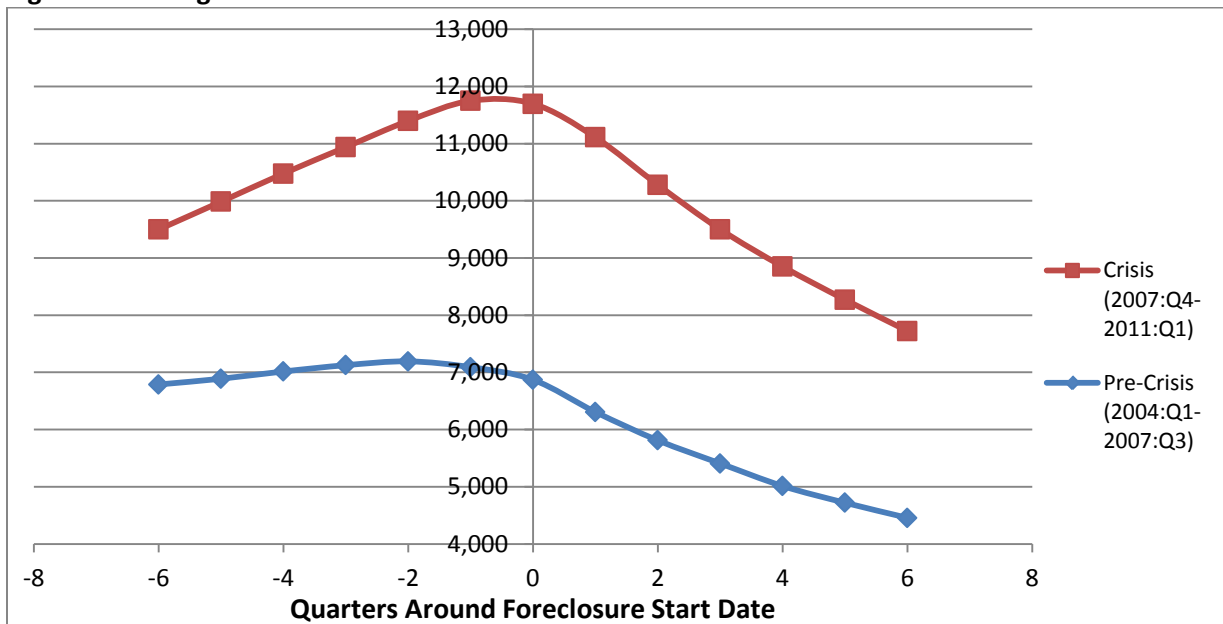
**Figure 3: Percent of Foreclosure Population with Credit Cards 60+ DPD Around Foreclosure Start Date**



Source: Merged LPS and Equifax databases

In Figure 3, the credit card delinquency rate among households experiencing foreclosure declined after the foreclosure start date and as the time following the foreclosure lengthens. In addition, as shown in Figure 4, average credit card balances also declined up to six quarters after the foreclosure started, before and after the financial crisis periods.

**Figure 4: Average Card Balance Around Foreclosure Start Date**



In this paper, we investigate the hypothesis that temporary relief from paying housing expenses may provide a boost to consumer balance sheets, thereby improving performance on nonmortgage debt and reducing outstanding balances on nonmortgage debt. The longer the foreclosure timeline, the larger the savings accrued to those who default on a mortgage. Our empirical analysis looks at the relationship between foreclosure timelines and improved performance on credit card debt for borrowers in the foreclosure process. We consider households that have undergone a foreclosure and under general financial distress as indicated by being seriously delinquent on payments for one or more credit cards. The analysis finds that in cases where foreclosure timelines are longer, a higher percentage of financially distressed mortgage borrowers cure their seriously delinquent credit card loans. Similarly, with longer foreclosure timelines, a higher percentage of mortgage defaulters are able to reduce their loan balance on credit cards. In addition, we find that the proportion of consumers who are delinquent on at least one of their cards rises after the foreclosure end date as mortgage defaulters start incurring housing expenses again. Our findings indicate that households do not consume all the benefits from temporary relief from housing expenses; instead, they use that temporary relief to cure their bad nonmortgage debts and improve their balance sheets.<sup>5</sup>

## II. Previous Research on Foreclosure Timelines

Studies examining the cause of timeline delays in the foreclosure process in recent years have identified several factors, including the effects of varying regulations across states and documentation issues with distressed mortgage loans. Regulations such as the *right-to-cure law* would block lenders from starting foreclosure proceedings for a set period after a borrower defaults on his or her loan, thus extending the foreclosure timeline. In addition, the *judicial-review right* allows for a judicial review of a foreclosure, which is available in 20 states (called judicial states). This delays the foreclosure process,

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<sup>5</sup> Our findings are consistent with Ambrose, Buttimer, Jr., and Capone (1997), who find that credit scores of those consumers who foreclosed in the 1990s tend to recover after the foreclosure.



since the review tends to bring the foreclosure filings to a halt and to impose a waiting period of at least 90 more days in filing subsequent foreclosures. The rest are *power-of-sale* states, where lenders are allowed to foreclose without judicial supervision.

Gerardi, Lambie-Hanson, and Willen (2011) examine the same states before and after the imposition of these laws, controlling for state effects and time trends. They find that in the short run, both the right-to-cure law and judicial foreclosure have a significant impact on extending the foreclosure timelines. While the judicial intervention temporarily reduces the number of foreclosures in the short run, it increases the number of persistent delinquencies, where borrowers are not likely to cure their mortgage debt and the loans are eventually foreclosed in the longer run. They find that the foreclosure gap between judicial states and power-of-sale states diminishes over time.

Pence (2006) finds that defaulter-friendly foreclosure laws are correlated with a 4 percent to 6 percent decrease in mortgage loan size. This suggests that while state laws could delay the start of the foreclosure to allow more time to cure, defaulter-friendly foreclosure laws may actually reduce the supply of mortgage credit to borrowers at the time of loan origination. Similarly, lenders may respond to higher risks associated to foreclosure laws by charging higher interest rates and/or a larger down payment, as also documented in Jones (1993).

The continued foreclosure delay that has been observed in recent years was also driven by problems of improper documentation associated with the huge volume of mortgages originated and securitized during the housing market boom and the unprecedented volume of foreclosures. Problems with mortgage documentation and mortgage processes resulted in many of the largest mortgage servicers instituting foreclosure moratoria in the fall of 2010 that lasted for several months, delaying mortgage foreclosures and increasing the backlog.

Allen, Peristiani, and Tang (2012) find that about 22 percent (about \$25 billion) of subprime loans that were originated in Florida from 2004 to 2008 were in limbo as of December 2010.<sup>6</sup> They attribute the cause of the “limbo loan” phenomenon (both the likelihood of being in limbo and the length of time spent in limbo) to the impairment of property rights, due to the presence of the Mortgage Electronic Registration System, rather than foreclosure capacity bottlenecks or bank capital constraints.

Regardless of the causes of the recent widespread delays in foreclosures, these delays have increased the temporary liquidity benefit from defaulting on a mortgage. Jagtiani and Lang (2011) provide evidence from the period of the financial crisis that borrowers who defaulted on their first mortgages still had access to liquidity and were able to keep current on other financial products, including auto loans and home equity lines of credit (HELOCs). Lee, Mayer, and Tracy (2012) find that due to increasing defaults on first mortgages during the financial crisis, defaults on more and more HELOCs are expected in the near future as households reach the end of the foreclosure process. Mayer, Morrison, Piskorski, and Gupta (2011) and Jagtiani and Lang (2011) find that access to loan modification programs impact the costs and benefits associated with mortgage delinquency and thereby influence default behavior.

Zhu and Pace (2011) attempt to estimate the relationship between foreclosure delay and borrowers’ default behavior using loan-level data on securitized mortgages that originated between 2005 and 2007.<sup>7</sup> The data track repayment performance of the loans until December 2009. Zhu and Pace find that foreclosure delays have a substantial impact on borrowers’ decision to default, particularly for mortgages with high loan-to-value (LTVs) figures at origination. Given that the borrowers have negative equity in their homes, their default decisions are sensitive to the expected

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<sup>6</sup> Limbo loans are defined as mortgage loans that have been delinquent for extended periods of time but have not progressed to any form of resolution, such as property sale, refinancing, modification, or foreclosure.

<sup>7</sup> They used loan-level data from Blackbox Logic’s BBx database, which covers 90 percent of nonagency residential securitized deals, including prime, Alt-A, and subprime.

foreclosure duration. The longer the foreclosure timelines, the more these mortgage defaulters save, and thus the more likely they are to default. In addition, the impact effect is found to be consistent across various loan types and across borrowers with different credit scores. The results imply that increased foreclosure timelines lead to more future mortgage defaults. The paper suggests that the savings a household may accrue from the time spent in foreclosure affects the household's financial decisions.

We further explore this notion by examining the impact of time spent in foreclosure (both before and during the financial crisis) on consumers' credit performance. We expect to observe that mortgage defaulters improved their credit performance (and reduced their financial distress) with other financial products during the rent-free (and mortgage payment-free) period and for some time thereafter.

### **III. The Data**

Our period of analysis spans 2002–2012, including all foreclosures started in 2004:Q1 to 2010:Q4. This covers the precrisis period along with the crisis period and the recent modest recovery until the end of 2012. In exploring the relationship between foreclosure timelines and credit card performance, we use merged loan-level mortgage data and consumer credit panel data, along with county-level and zip code-level economic data. Details on each of these data sets are presented below.

*Loan-Level Mortgage Data:* We rely on monthly mortgage performance data collected from the 10 largest servicers by Loan Processing Services (LPS). While the data account for approximately 75 percent of all mortgages in the U.S. (as of year-end 2010), there is less coverage for subprime mortgages in the LPS database compared with prime and Alt-A mortgages. From this LPS monthly data, we include only first-lien mortgages originated in 2000 or later that have a foreclosure start date during the period 2004:Q1 to 2010:Q4. We limit our attention to loans with foreclosure start dates before 2011 to allow us to look at the credit performance period for at least six quarters following the foreclosure start date.

*Equifax Consumer Credit Panel (Consumer-Level and Tradeline-Level Data):* We also rely on a panel data set consisting of a 5 percent random sample from the Equifax consumer credit reporting database. For our analysis, we collect tradeline-level mortgage information for each primary customer ID (CID) from the Federal Reserve Bank of New York (FRBNY) quarterly Equifax consumer credit panel.<sup>8</sup> As with the LPS data, we include only first-lien mortgages with a foreclosure start date between 2004:Q1 and 2010:Q4. We exclude any CID with more than one first mortgage as of the recorded foreclosure start date. In addition, we utilize the FRB Philadelphia semiannual Equifax consumer credit panel to collect payment performance information at the tradeline level for credit card accounts. This allows us to identify which credit cards were delinquent around the foreclosure date and which delinquent cards have been cured. From this source, we also collect information on credit card utilization as well as the number and type of consumer credit accounts at the individual credit-record level aggregated across accounts of the same individual.

*The Merging Process:* We merge the LPS and FRBNY Equifax databases based on the origination loan amount (exact dollar amount), zip code location, and the origination month of the mortgage. We restrict the merge to first-lien mortgages in each data set. Note that LPS lists the zip code of the property address for the corresponding mortgage, whereas Equifax provides only the mailing address for each CID on a quarterly basis. Consumers with multiple first-lien mortgages in the Equifax data are not included in the merging process to ensure that the mailing address from Equifax and the property address from LPS are the same.<sup>9</sup>

Our data merging process starts with all of the loans from LPS in the initial merge, rather than including only those that have gone through a foreclosure at a point during the life of the loan. We are

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<sup>8</sup> We focus on the primary CID only (which is 5 percent of the U.S. population); this allows us to follow the same customers through time and observe moving in and out of the home, if needed.

<sup>9</sup> We use the zip code from Equifax for the corresponding CID starting with the quarter in which the mortgage first appears in the Equifax database. The first available quarter is generally within one or two quarters following the open date.

interested only in those loans that enter into foreclosure, but we need to use the full sample to distinguish unique matches. We obtain a total of about 6.7 million loans in the initial merged data set. From this merged data set, we keep only the one-to-one unique matches between the two databases. For example, if one mortgage in LPS is matched to two mortgage tradeline IDs in Equifax, or vice versa, those observations would be deleted. Nonunique matches would potentially occur when two similar homes in the same zip code were sold in the same month, and since we cannot be certain which one is the correct match, all nonunique match loans are excluded from our sample. We end up with about 3.4 million loans in the merged data set after deleting nonunique matches (i.e., when more than one loan from LPS merged into the same Equifax loan or the same loan from LPS merged into more than one loan with different CIDs in Equifax; this could be due to joint ownership. Of these, 156,743 are associated with a mortgage that went into foreclosure between January 2004 and December 2010, based on the LPS-reported foreclosure start date.

For the purpose of examining card cured and reduced card balances, we confine our sample observations to those households undergoing foreclosure that are in overall financial distress as indicated by serious default (at least 60 DPD) on one or more credit card accounts. Since we are interested in borrowers who cured their credit card delinquency, we consider only households that had not filed for bankruptcy as of the foreclosure start date.<sup>10</sup> We have 35,185 observations for those with at least one delinquent card when the mortgage becomes delinquent. Of these 35,185 loans, 28 percent were foreclosed before the financial crisis (2004:Q1 to 2007:Q2), 59 percent were foreclosed during the financial crisis (2007:Q3 to 2009:Q4), and 13 percent were foreclosed in the postcrisis period (2010). The average foreclosure timeline for the sample is 18.9 months from the last mortgage payment to the foreclosure end date. This can be divided into the 5.8-month sample average between the last

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<sup>10</sup> We do not include delinquent cards that are in bankruptcy in our analysis because the cure of those cards is likely to be a result of bankruptcy discharge, rather than a result of mortgage default and foreclosure delay.

payment and the foreclosure start date and the average 13.1 months from foreclosure start to foreclosure end date.

There are advantages and disadvantages to using the merged data set. A large number of observations are lost due to the inability to identify a unique mortgage within the LPS data to associate with a mortgage tradeline in the Equifax data. Moreover, although LPS may cover as much as 75 percent of the entire mortgage market, there is a possibility of making a false match, such as when two similar homes in the same zip code were sold in the same month to two different buyers. One advantage of using the merged data set is that we can observe the relationship between credit performance and the foreclosure timeline at the loan level, rather than at a pool or segment level. In addition, the merged data set allows our analysis to include loan-level characteristics from LPS along with loan and borrower characteristics available only in Equifax. In this paper, we only report results using the merged data. However, we have also conducted our analysis on the nonmerged data, and our results were qualitatively similar.

The final merged data set for our cured and reduced card balance regressions includes only those foreclosed loans associated with borrowers who had at least one credit card that was delinquent (at least 60 DPD and outside of bankruptcy) as of the last mortgage payment date (which is the beginning of the mortgage-free period). The number of observations was reduced from 35,185 foreclosed loans to 27,529 that are associated with borrowers with at least one credit card being delinquent at the time of the last mortgage payment. We then use our unique Philadelphia consumer credit panel Equifax database, which allows us to follow consumer credit performance at the account level for credit card accounts. We observe whether at least one of the delinquent cards became current within six quarters after the last mortgage payment date. We also observe whether consumers are more likely to become delinquent on their cards again during the quarters following the foreclosure end date.

#### **IV. Do Households Cure Their Delinquent Cards During Foreclosure?**

The first part of our investigation examines the relationship between the time in foreclosure and likelihood of curing a delinquent credit card. The sample for this analysis consists of the 27,529 mortgage loans that are associated with at least one delinquent card outside of bankruptcy as of the last mortgage interest payment date.

The dependent variables in the logistic regressions are *CardCured* and *BalanceDecreased*. *CardCured* is the probability that at least one of the delinquent credit cards (as of the last mortgage payment date) is cured (becomes current) during the period of six quarters following the last mortgage payment date. The binary variable *CardCured* takes the value of one if at least one of the delinquent cards is cured, and zero otherwise. *BalanceDecreased* is also a binary variable, and it takes a value of one if the overall credit card loan balance is reduced between the last mortgage payment date and the following six quarters, and zero otherwise.

Our independent variables include different measures of foreclosure delay, loan characteristics, borrower characteristics, and the neighborhood market environment. The market environment variables are aggregate zip code- or county-level measures developed from the loan-level LPS database or the entire 5 percent random Equifax consumer credit panel. Panel A of Table 1 presents summary statistics of the sample observations used in our analysis.

##### ***Foreclosure Timeline***

We measure foreclosure timelines from the last mortgage interest payment date to the foreclosure end date, both at the loan level and the average segment level. Loan segments are loans with similar characteristics according to property location (same zip code), loan amount, and period (same quarter) of foreclosure start date. Due to concerns about the potential endogeneity of a household's own foreclosure timeline, our regression analysis focuses primarily on the average

foreclosure timeline for groups of similar mortgages associated with the same zip code.<sup>11</sup> The average timelines are calculated by zip code, loan size category, and loans entering foreclosure in the same quarter. The segment average foreclosure timeline between the last interest payment date and the foreclosure end date is calculated from the full, nonmerged LPS database.

Note that in addition to mitigating endogeneity concerns, the average foreclosure timeline specific to the zip code, loan size, and foreclosure start date also captures the impact of various state regulations on the foreclosure start date or foreclosure timelines. In some specifications, we include both the average timeline and the loan-level foreclosure timelines, with the endogeneity concerns duly noted.

### **Control Factors**

We control for local economic conditions that are likely to affect the probability of delinquent cards being cured within the observed time frame. Local economic conditions leading to foreclosure are captured by the change in the county unemployment rate from 12 months prior to the foreclosure start to the foreclosure start date (*Unemploy\_Change\_12m\_Prior\_FStart*). Credit problems tied to local unemployment shocks may exhibit distinct delinquency and cure dynamics from those triggered by other types of adversity. Evolving economic conditions during the observed time frame are captured by the ratio of consumers in the same county who are at least 60 DPD on at least one of their credit cards during the period between the foreclosure start date (approximately 120 DPD on a mortgage) and 15 months later (*County\_Percent Card 60+ DPD*). A delinquent credit card as of the foreclosure start date would be less likely to be cured in those counties where a larger percent of residents were delinquent on their credit cards.

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<sup>11</sup> Endogeneity arises, for instance, if the individual's choice between paying down the mortgage delinquency and curing the card may affect the relationship with the mortgage servicer and thus influence the foreclosure timeline. For example, borrowers choosing to make partial payments on the mortgage while allowing their cards to remain delinquent might receive more favorable treatment from servicers, as reflected in delaying the foreclosure process.



Whether the state where the property is located is a recourse or nonrecourse state also has some important implications on both the amount of savings for mortgage defaulters and the foreclosure timelines. In recourse states, such as Massachusetts, mortgage lenders have the right to attempt to recover additional money owed from borrowers after the bank has taken the collateral (e.g., to garnish their wages or levy their bank accounts). In contrast, mortgage lenders are not allowed to pursue anything other than collateral in nonrecourse states. Thus, a longer foreclosure timeline provides more effective financial relief to borrowers in nonrecourse states and therefore makes it more likely that borrowers in those states will cure delinquent credit card accounts. Our zip code-level average measures of mortgage defaults, credit card defaults, and foreclosure timelines are expected to capture this impact and control for the recourse versus nonrecourse states.

We also control for a variety of borrower or loan characteristics. These include prior consumer delinquency within the 12 months before the foreclosure start date (*Previous Delinquency\_12m*), credit card utilization for all credit cards combined (*Card Utilization*) as of the last mortgage payment date, and the Equifax risk score as of the last mortgage payment date (*Refreshed Risk Score*). In addition, we include a dummy indicator for a jumbo mortgage (*D\_Jumbo\_Mortgage*), a dummy indicator for a subprime mortgage (*D\_Subprime\_Mortgage*), a dummy indicator for a government-insured mortgage (*D\_Gov\_Insured\_Mortgage*), and a dummy indicator of whether the mortgage has been modified (*D\_Modification*).

Several other risk characteristics were considered but not included in the final regression models because they either are not significant or they are highly correlated with other variables already in the model. These factors are origination FICO scores the debt-to-income ratio at origination, ARM or option-ARM mortgages, interest-only mortgages, number of nonmortgage credit accounts that the borrowers have, number of delinquent (60+ DPD) credit cards 12 months prior to the foreclosure start

date, the ratio of mortgage payment to credit card balance as of the last mortgage payment date, various measures of house price index, LTV, and other unemployment rate measures.

### ***The Empirical Results***

The objective of the regression analysis is to investigate the impact of extended foreclosure timelines on borrowers' ability to cure their nonmortgage debt and/or to reduce their outstanding balance on credit card loans. Given that the borrowers have at least one credit card that is 60+DPD (and outside of bankruptcy) as of the last mortgage payment quarter, we explore the relationship of the time in foreclosure to whether the credit card cures within six quarters following the foreclosure start date and 2) whether the combined outstanding balance on the credit card loans decreases within the 12 months following the last mortgage payment date when the saving period begins. The results are presented in Table 2 and Table 3 for the probability of cured cards and the probability of decreased loan balance, respectively.

### ***The Impact of Longer Foreclosure Timelines on Ability to Cure a Delinquent Card***

In Table 2, the results indicate that the average foreclosure timeline — measured as the number of months between the last mortgage interest payment date and the foreclosure end date averaged across similar loans in the same zip code with a similar loan amount and foreclosure start date — plays a significant role in determining whether delinquent cards would be cured. The longer the foreclosure timeline is, the higher the probability of defaulted credit cards being cured.<sup>12</sup> Based on the expanded specifications in Columns 2 and 4, this relationship is robust to the loan-level timeline (between the last mortgage interest payment date and foreclosure end date). Unlike the average timelines, the

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<sup>12</sup> We also performed the same analysis using observations with at least one delinquent card (outside of bankruptcy) as of foreclosure start date (rather than as of last mortgage interest payment date), and the results are robust. The coefficient of average foreclosure timeline is positive and significant at the 1 percent level. The coefficient of individual loan timeline between the last interest payment and the foreclosure start date is significantly negative, as expected, because the timeline between the default date and the foreclosure start date does not matter for these borrowers who remain delinquent as of foreclosure start date. In fact, these defaulters are less likely to cure due to a burnt-out effect of missing opportunities to cure their cards soon after they stop making mortgage payments.

coefficients of the loan-level foreclosure timelines are significantly negative, consistent with the endogeneity problem discussed earlier.

Local economic factors are statistically significant, and the estimated relationships are intuitively plausible. As expected, the probability of cure is smaller in counties where economic conditions are weak around the last mortgage interest payment date, as reflected in rising unemployment during the prior year or a relatively high aggregate county delinquency rate for credit cards. The coefficients of other control variables also are generally significant with intuitively plausible signs.<sup>13</sup> For instance, the estimated coefficient on the card utilization rate indicates that individuals with a lower rate of utilization of card credit are more likely to cure their card delinquency. There is likely less incentive for borrowers to cure their delinquency when the utilization ratio is high, as there is less of an unused line to draw upon. Those with a larger percentage of delinquent accounts *ex ante* are less likely to cure (as indicated by the statistically significant, negative sign on *Number\_60+DPD\_Cards\_12mPrior* and statistically significant, positive sign on *Number of Nonmortgage Accounts*), consistent with such households facing more severe financial difficulties. Jumbo mortgages are positively related to likelihood of cure, consistent with these variables being associated with higher-income households that in the longer term are more financially stable. Conversely, subprime borrowers, who tend to have lower incomes and tend to be less financially stable in the long term, are less likely to cure. Similarly, government-insured mortgages, which are generally smaller mortgages and associated with less wealthy consumers, are also less likely to cure.

We find that age (25 years or younger) has no significant impact on consumers' ability to cure their delinquent cards during the foreclosure period. A higher refreshed credit score (Equifax risk score) being associated with a lower likelihood of cure at first seems counterintuitive. However, one plausible scenario is that in order to have a relatively high risk score despite being behind on a mortgage, the

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<sup>13</sup> The dummy variables indicating the period of foreclosure filing are not included in the final model because they are correlated with the foreclosure timelines.

individual may have made an ex-ante choice to remain current on some active credit accounts and fall behind on others. Such ex-ante decisions may be reflected in relatively low cure rates on the accounts selected for delinquency.

We have also explored the impact of loan modification by including either the ratio of loan modification in the segment (same zip code and similar loan amount and foreclosure date) or a dummy indicator of whether the loan was modified with either principal forgiveness or interest reduction or both. The results presented in Table 2 use the loan level modification indicator (in Columns 1 and 2). The coefficients are insignificantly different from zero, implying that, unlike the extended foreclosure timelines, the savings from the loan modification were not used by households toward credit card payments to improve their balance sheets. One possible interpretation is that servicers were more likely to extend modifications to households perceived as more inclined to cure their mortgage debt prior to curing other delinquent consumer debt.

#### ***The Impact of Longer Foreclosure Timelines on the Ability to Reduced Card Balance***

In Table 3, the dependent variable is whether the borrower's credit card balance (all cards combined) was reduced during the period following the last mortgage payment date. The variable takes the value of one if the borrower's combined card balances (across all cards) was reduced at any time between the last mortgage payment date and the six quarters following the last mortgage payment date, and it is zero otherwise. The results are consistent with those reported in Table 2 for the probability of curing delinquent credit cards. In particular, the average foreclosure timeline in the zip code is positively correlated with the probability of reducing credit card balances. The loan-level time from the last date current to the foreclosure start date is not significant when it is included together with the average timelines, but it is significantly positive as a standalone (Table 3, Column 3).

Note that only people who were delinquent (60+ DPD) on at least one credit card are included in the analysis. We explore the probability of a declining balance as a way to capture the notion that

households may be using a period of reduced housing expenses to strengthen their balance sheets. The coefficients of average zip code foreclosure timelines (the number of months between the foreclosure start date and the foreclosure end date) are positive and significant at the 1 percent level in all models. The loan-level timeline, measured as the time between the last mortgage payment date (last current) and the foreclosure end date, is also significantly positive when it is included alone in the regression (without the average timeline variable). All the control factors are significant with the expected signs. Again, the results overall suggest that longer foreclosure timelines are associated with a greater probability of having an improved balance sheet, where delinquent cards become cured or outstanding loan balances become smaller.<sup>14</sup>

#### **V. What Happens After the Foreclosure Ends? Do More People Become Delinquent?**

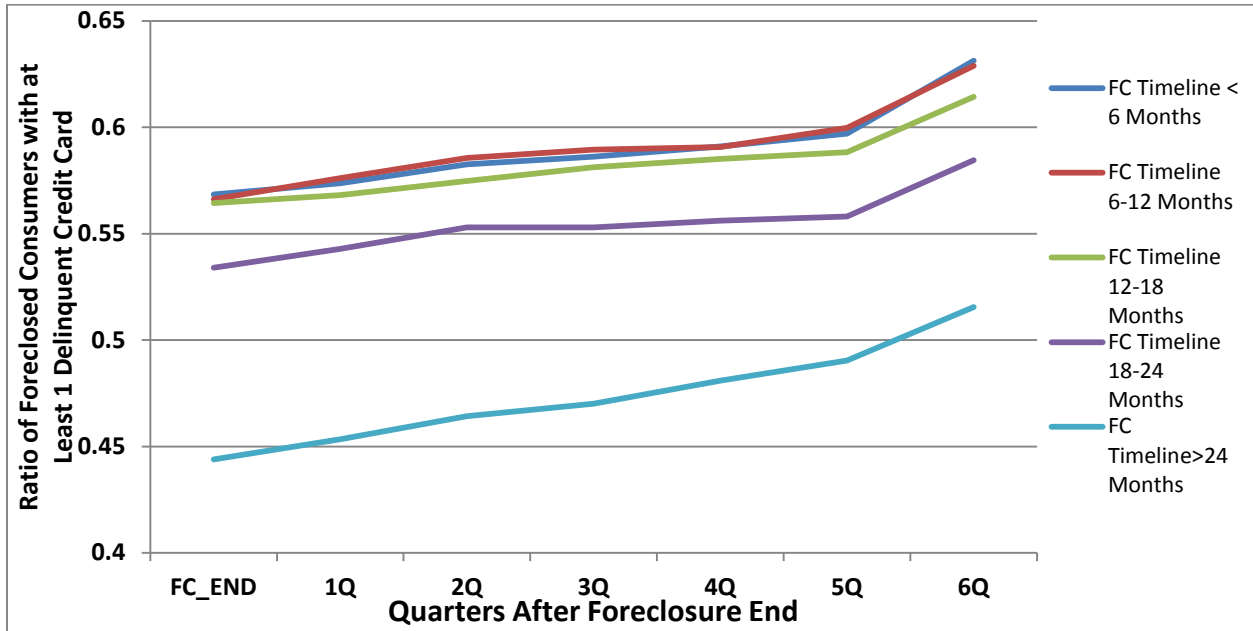
It is evident from the previous section that households in foreclosure use the temporary mortgage payment relief to improve their balance sheets and credit card performance, reflected in an association between longer foreclosure timelines and a higher likelihood of curing credit card debt. An implication of this finding is that, other things equal, credit card delinquencies are likely to rise as the backlog of foreclosures are cleared and people have to start making housing payments again. In other words, completion of foreclosures could become an important risk factor for credit card (and other consumer loans) lenders.<sup>15</sup> We examine credit card delinquencies up to six quarters following the foreclosure end date.

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<sup>14</sup> Gerardi , Rosenblatt, Willen, and Yao (2012) find that the delay in the foreclosure start date (i.e., the longer timeline between the last interest payment date and the foreclosure start date) has exacerbated the negative impact of mortgage distress and has caused home prices in the area to fall further.

<sup>15</sup> This negative effect on credit card payments could be offset by general economic growth if, for example, more foreclosures end when a defaulted borrower moves to take on a new job.

**Figure 5: Ratio of Foreclosed Borrowers with Delinquent Cards (60+DPD) Up to Six Quarters After the Foreclosure End Date**



Source: Merged LPS and Equifax Consumer Credit Panel

Figure 5 presents the ratio of foreclosed consumers with at least one delinquent credit card (at least 60 DPD) during the six quarters following the end of the foreclosure. The plot indicates the likelihood of being delinquent on a credit card within six quarters after the foreclosure. In addition, the likelihood of being delinquent on a card after the end of the foreclosure seems to be dependent on the foreclosure timelines. Individuals who had a longer foreclosure timeline tended to be better able to remain current on their nonmortgage credit for longer – this is consistent with obtaining financial relief during the foreclosure process.

### ***The Empirical Approach***

We perform a logistic regression analysis where the observations include all 214,866 foreclosed consumers whose foreclosure start date is in 2004:Q1 or later, and the foreclosure end date is in 2011:Q2 or earlier (to allow at least six quarters of performance after the foreclosure end date). The summary statistics of the sample is presented in Table 1 Panel B. The dependent variable (*Card\_Delinquent*) is a binary variable that takes a value of one for the foreclosed consumers who are

delinquent on at least one of their credit cards during the observation period, and zero otherwise. We focus our analysis on the impact of the foreclosure timelines and the number of quarters after the foreclosure end date. As in the previous analysis, we include both measures of the foreclosure timelines — the average foreclosure timelines by zip code, origination amount, and foreclosure start quarter (*Avg\_Lastint\_Fend\_Months*) and the loan level foreclosure timeline from the last interest payment date to the foreclosure end date (*Lastint\_Fend\_Months*). The time period after the end of the foreclosure end is divided into three groups — Quarters 1 and 2, Quarters 3 and 4, and Quarters 5 and 6 — following the foreclosure end date. We use dummy indicators *D\_Quarters\_3and4* and *D\_Quarters\_5and6* to indicate that the consumer credit performance being observed occurred during the third and fourth quarters and the fifth and sixth quarters after the foreclosure end date, respectively. The base case is for observations in the first and second quarters following the foreclosure end date.

We also control for the various economic factors and the market environment. *County\_Percent Card 60+DPD* is the ratio of consumers in the same county who are at least 60 DPD on at least one of their credit cards during the period between the foreclosure start date (approximated to be 120 DPD on mortgage) and 15 months later. *Previous Delinquency\_12m* indicates prior consumer delinquency within the 12 months prior to the foreclosure start date. The variable *Unemploy\_Change\_12m\_Prior\_FStart* is the county-level unemployment rate from 12 months prior to the foreclosure start to the foreclosure start date. *D\_Jumbo\_Mortgage*, *D\_Subprime\_Mortgage*, *D\_Gov\_Insured\_Mortgage*, and *D\_Modification* are dummy indicators for jumbo mortgage, subprime mortgage, government-insured mortgage, and whether the mortgage has been modified.

### ***The Empirical Results***

The logistic regression results after the end of the foreclosure are presented in Table 4. The negative coefficients of both the average and the loan-level foreclosure timelines in Columns 1, 3, 4, and 6 indicate that the longer timelines, which are associated with a larger amount of financial relief, are

associated with greater ability to remain current on all credit cards for at least six quarters after the foreclosure end. When both the average and the loan-level foreclosure timelines are included in the regressions (Columns 2 and 5), the coefficients remain significantly negative for the loan-level timelines but become positive (but much smaller in magnitude) for the average timelines.

The coefficients of the later quarters (Quarters 3 and 4 and Quarters 5 and 6) are both consistently significantly positive, and the coefficients for Quarters 5 and 6 are much larger than those of Quarters 3 and 4. The results indicate that the foreclosed consumers are less able to stay current on all their credit cards as they have to start making mortgage payments again after the foreclosure ends.

The sign of coefficients of all the control factors indicate that are as expected overall. People who live in an area where more people have at least one delinquent card are likely to be delinquent on at least one card as well. Similarly, people who live in an area where the unemployment rate is high are more likely to have a delinquent card within the six quarters following the end of the foreclosure. As expected, people who were delinquent on at least one card before the foreclosure are also likely to be delinquent on at least one card within six quarters following the foreclosure. Foreclosed consumers with subprime mortgages or government-insured mortgages are more likely to have at least one delinquent card after the foreclosure than those customers rated more creditworthy (more wealthy). Foreclosed consumers with jumbo mortgages (more wealthy) are more likely to have a delinquent card after the foreclosure than those foreclosed consumers with regular conforming mortgages, holding everything else the same. These more wealthy consumers may have experienced other shocks which are not captured in the regressions. It is interesting to note that the modification flag is significantly positive here, again consistent with the notion that servicers targeted for modification those households that place mortgage debt higher, and nonmortgage debt lower, in the repayment hierarchy.

Overall, our results suggest that it is likely that credit card delinquency will rise for individuals after they leave their homes as a result of foreclosure. It is interesting to observe that while the recent



recession provides an ideal representative of a severe stress for consumer credit performance on mortgage loans, it may be less ideally representative for credit card performance. Credit card default has not been as severe as mortgage defaults during the financial crisis, partly because of the savings to consumers from housing expense relief that has allowed them to improve their credit card debt performance. As we are approaching the recovery period, where the housing market recovers and foreclosure rate returns to normal, we could observe a reversal of this trend with credit card defaults rising while mortgage defaults decline.

## **VI. Conclusions and Policy Implications**

Borrowers in default on their mortgages could receive a temporary benefit from reduced housing expenses as they continue to live in their homes without making any mortgage or rental payments. With the foreclosure timeline lengthening, the value of this temporary benefit has been rising. Do households use this temporary benefit to maintain consumption levels, or do they use the benefit to improve their balance sheets and improve their credit performance on nonmortgage debt? Our analysis focuses on the impact of longer foreclosure timelines on consumers' performance on credit cards to determine the answer to this question.

Our findings support the hypothesis that people take advantage of lower housing expenses as foreclosure timelines expand. Longer foreclosure timelines are associated with a greater rate of cures on credit card debt.<sup>16</sup> Households are able to take advantage of a longer period of nonpayment of housing-related expenses to pay off their nonmortgage debts and improve their balance sheets. In addition, we find that foreclosed people are likely to become delinquent on their credit card again within six quarters following the foreclosure is completed.

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<sup>16</sup> In a separate analysis, as reported in the appendix, the mortgage payment relief associated with longer foreclosure timelines also results in a larger decline in credit card outstanding balances.

Our results suggest that there may be added risk for nonmortgage lenders when foreclosures are completed and households must incur the transaction costs of moving and incur significant housing expenses once again. Credit card defaults could rise significantly in the future as the current foreclosure backlog is cleared and people have to move out of their homes. We could potentially observe a rise in credit card defaults even though the economy is recovering and mortgage defaults are declining. This adds an additional dimension of risk to credit card lenders that has not been observed previously.

Interestingly, we find that the housing relief (savings) from longer foreclosure timelines is associated with improved balance sheet. We did not find any significant impact on consumers' balance sheets from savings from mortgage modifications.

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**Table 1: Summary Statistics of the Data — Merged LPS and Equifax Data**

Sample Period: 2000–2012. Sample includes first mortgages and consumers who were foreclosed on during the period 2004:Q1-2010:Q4. Consumer credit performance and other characteristics are observed up to two years before and after the foreclosure. *CardCured* takes the value of one if at least one of the delinquent cards is cured, and zero otherwise. *Lastint\_Fend\_Months* is the loan-level foreclosure timeline from the last interest payment to the foreclosure end date. *Avg\_Lastint\_Fend\_Months* is the average timelines calculated by zip code, loan size category, and loans entering foreclosure in the same quarter. *Unemploy\_Change\_12m\_Prior\_FStart* is the county-level unemployment rate from 12 months prior to the foreclosure start to the foreclosure start date. *Unemploy\_Change\_3mPrior\_15mAfterFStart* is county-level unemployment rate from three months prior to the foreclosure start date to 15 months after the foreclosure start date. *County\_Percent Card 60+DPD* is the ratio of consumers in the same county who are at least 60 DPD on at least one of their credit cards during the period between the foreclosure start date (approximated to be 120 DPD on mortgage) and 15 months later. *Previous Delinquency\_12m* indicates prior consumer delinquency within the 12 months prior to the foreclosure start date. *Card Utilization* is credit card utilization for all credit cards combined as of the last mortgage payment date. *Refreshed Risk Score* is the Equifax risk score as of the last mortgage payment date. *D\_Jumbo\_Mortgage*, *D\_Subprime\_Mortgage*, *D\_Gov\_Insured\_Mortgage*, and *D\_Modification* are dummy indicators for jumbo mortgage, subprime mortgage, government-insured mortgage, and whether the mortgage has been modified, respectively.

**Panel A: Sample Use for Logistic Regression — Probability of Delinquent Card Being Cured After Last Mortgage Interest Payment**

Variable	N	Mean	Std Dev	Minimum	Maximum	Sum
CardCured	27529	0.478	0.499	0	1	13170
Avg_Lastint_Fend_Months	26219	16.006	6.949	4	95	419666.8
Lastint_Fend_Months	27449	18.959	12.885	4	118	520417
County_% Card 60+DPD	27529	0.656	0.037	0.46	1	18080.4
Unemp_15change_Saving	27482	1.659	2.319	-3.5	7.1	45607.3
Refreshed Risk Score	27528	471.345	71.781	287	753	12975200
Number of Credit Accounts	27527	4.426	2.831	1	29	121848
Card Utilization	27219	1.068	0.364	0	2.49	29088.71
Previous Delinquency_12m	27496	1.104	1.513	0	25	30377
D_Under 25 Years Old	27529	0.017	0.131	0	1	488
D_Jumbo Mortgage	27529	0.058	0.234	0	1	1602
D_Subprime	27529	0.207	0.405	0	1	5719
D_Gov_Insured Mortgage	27529	0.2	0.4	0	1	5518
D_Modification	27529	0.096	0.295	0	1	2663

**Table 1: Summary Statistics — Merged LPS and Equifax Data (Continued)**

Sample Period: 2000–2012. Sample includes all foreclosed consumers with foreclosure starts in 2004:Q1 or later, and foreclosure end dates in 2011:Q2 or earlier (to allow six quarters of performance period after foreclosure ends). *Card\_Delinquent* is a binary variable that takes a value of one for the foreclosed consumers who are delinquent on at least one of their credit cards during the observation period, and zero otherwise. *Lastint\_Fend\_Months* is the loan-level foreclosure timeline from the last interest payment to the foreclosure end date. *Avg\_Lastint\_Fend\_Months* is the average timeline calculated by zip code, loan size category, and loans entering foreclosure in the same quarter. *D\_Quarters\_3 and 4* and *D\_Quarters\_5 and 6* are dummy variables to indicate that the consumer credit performance being observed during the third and fourth quarters and the fifth and sixth quarters after the foreclosure end date, respectively. The base case is for observations in the first and second quarters following the foreclosure end date. *Unemploy\_Change\_12m\_Prior\_FStart* is the county-level unemployment rate from 12 months prior to foreclosure start to the foreclosure start date. *County\_Percent Card 60+DPD* is the ratio of consumers in the same county who are at least 60 DPD on at least one of their credit cards during the period between foreclosure start date (approximated to be 120 DPD on mortgage) and 15 months later. *Previous\_Delinquency\_12m* indicates prior consumer delinquency within the 12 months prior to the foreclosure start date. *D\_Jumbo\_Mortgage*, *D\_Subprime\_Mortgage*, *D\_Gov\_Insured\_Mortgage*, and *D\_Modification* are dummy indicators for jumbo mortgage, subprime mortgage, government-insured mortgage, and whether the mortgage has been modified.

**Panel B: Sample Use for OLS Regression — Ratio of Foreclosed Consumers with Delinquent Card (60+DPD) After Foreclosure End**

Variable	N	Mean	Std Dev	Minimum	Maximum	Sum
Card_Delinquent	214866	0.586	0.492	0	1	125978
Avg_Lastint_Fend_Months	206706	14.788	5.925	4	121	3056951
Lastint_Fend_Months	214224	13.463	7.898	4	102	2884128
D_Quarters_3 and 4	214866	0.333	0.471	0	1	71622
D_Quarters_5 and 6	214866	0.333	0.471	0	1	71622
County_% Card 60+-DPD	214866	0.649	0.037	0	1	139626.7
Unemp_15change_Fend	214425	0.42	2.393	-3.8	7.1	90085.8
Previous Delinquency_12m	213738	0.287	0.882	0	14	61395
D_Jumbo Mortgage	214866	0.085	0.279	0	1	18399
D_Subprime	214866	0.172	0.378	0	1	37146
D_Gov_Insured Mortgage	214866	0.153	0.36	0	1	32979
D_Modification	214866	0.102	0.303	0	1	22029

**Table 2: Probability of Delinquent (60+DPD Outside Bankruptcy as of Last Mortgage Payment Date) Cards Becoming Cured Within Six Quarters Following Last Mortgage Payment Date**

The dependent variable is the probability of cured credit cards (i.e., delinquency status changed from 60+DPD as of last mortgage payment date to current status within six quarters later). Foreclosure start dates are from 2004:Q1 to 2010:Q4, allowing a 15-month performance period following the foreclosure start date. Sample includes only those people who were delinquent (60+DPD) on at least one credit card account as of last mortgage payment date. Independent variables are observed as of last mortgage payment quarter unless stated otherwise. Standard errors are reported in parentheses below the coefficients. The \*\*\*, \*\*, and \* represent statistical significance at the 1%, 5%, and 10% levels, respectively.

CardCured	(1)	(2)	(3)	(4)
Intercept	8.33218*** (<.0001)	8.35746*** (<.0001)	8.33355*** (<.0001)	8.35800*** (<.0001)
Avg_Lastint_Fend_Months	0.00443** (0.03930)	0.00783*** (0.00108)	0.00444** (0.03887)	0.00785*** (0.00102)
Lastint_Fend_Months		-0.00397*** (0.00181)		-0.00400*** (0.00156)
County_% Card 60+DPD	-1.95225*** (<.0001)	-1.93422*** (<.0001)	-1.95089*** (<.0001)	-1.93370*** (<.0001)
Unemp_12change_savin	-0.01663* (0.06149)	-0.01534* (0.08547)	-0.01609* (0.06877)	-0.01518* (0.08678)
Refreshed Risk Score	-0.01401*** (<.0001)	-0.01408*** (<.0001)	-0.01401*** (<.0001)	-0.01408*** (<.0001)
Num_Nonmortgage Accounts	0.08032*** (<.0001)	0.08028*** (<.0001)	0.08022*** (<.0001)	0.08026*** (<.0001)
Card_Utilization	-0.57348*** (<.0001)	-0.56612*** (<.0001)	-0.57345*** (<.0001)	-0.56610*** (<.0001)
Previous Delinquency_12m	-0.20670*** (<.0001)	-0.20394*** (<.0001)	-0.20654*** (<.0001)	-0.20389*** (<.0001)
D_Under 25 Years Old	-0.04348 (0.68611)	-0.04672 (0.66454)	-0.0445 (0.67915)	-0.04703 (0.66237)
D_Jumbo Mortgage	0.36821*** (<.0001)	0.37217*** (<.0001)	0.36875*** (<.0001)	0.37237*** (<.0001)
D_Subprime	-0.35078*** (<.0001)	-0.34361*** (<.0001)	-0.35083*** (<.0001)	-0.34357*** (<.0001)
D_Gov_Insured Mortgage	-0.30143*** (<.0001)	-0.30211*** (<.0001)	-0.30088*** (<.0001)	-0.30196*** (<.0001)
D_Modification	0.02623 (0.57451)	0.00759 (0.87228)		
N	25791	25723	25791	25723
Percent Concordant	77.2	77.2	77.2	77.2
Percent Discordant	22.6	22.6	22.6	22.6

**Table 3: Probability of Reduced Credit Card Loan Balance Within 12 Months Following the Last Mortgage Payment Date**

The dependent variable is the probability of decreased combined credit card balance within 12 months following the last mortgage payment date. Foreclosure start dates are from 2004:Q1 to 2010:Q4, allowing a 15-month performance period following the foreclosure start date. Sample includes only those people who were delinquent (60+DPD) on at least one credit card account as of last mortgage payment date. Independent variables are observed as of the last mortgage payment quarter unless stated otherwise. Standard errors are reported in parentheses below the coefficients. The \*\*\*, \*\*, and \* represent statistical significance at the 1%, 5%, and 10% levels, respectively.

Card Balance Decreased	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	1.06262*** (<.0001)	1.06658*** (<.0001)	1.08758*** (<.0001)	1.13416*** (<.0001)	1.13797*** (<.0001)	1.16908*** (<.0001)
Avg_Lastint_Fend_Months	0.00808*** (<.0001)	0.00847*** (<.0001)		0.00858*** (<.0001)	0.00962*** (<.0001)	
Lastint_Fend_Months		-0.00047 (0.55069)	0.00202*** (0.00236)		-0.00123 (0.11525)	0.00156** (0.01823)
County_% Card 60+DPD	-1.35316*** (<.0001)	-1.35819*** (<.0001)	-1.26353*** (<.0001)	-1.40927*** (<.0001)	-1.40960*** (<.0001)	-1.31064*** (<.0001)
Unemp_15change_savin	-0.04264*** (<.0001)	-0.04254*** (<.0001)	-0.04200*** (<.0001)	-0.04454*** (<.0001)	-0.04381*** (<.0001)	-0.04326*** (<.0001)
Refreshed Risk Score	-0.00165*** (<.0001)	-0.00165*** (<.0001)	-0.00164*** (<.0001)	-0.00168*** (<.0001)	-0.00168*** (<.0001)	-0.00167*** (<.0001)
Num_Nonmortgage A/C	0.10720*** (<.0001)	0.10727*** (<.0001)	0.10941*** (<.0001)	0.10651*** (<.0001)	0.10663*** (<.0001)	0.10879*** (<.0001)
Card Utilization	0.60745*** (<.0001)	0.60874*** (<.0001)	0.60554*** (<.0001)	0.60862*** (<.0001)	0.60967*** (<.0001)	0.60679*** (<.0001)
PreviousDelinquency_12m	0.03362*** (0.00023)	0.03380*** (0.00022)	0.03198*** (0.00034)	0.03400*** (0.00019)	0.03451*** (0.00016)	0.03272*** (0.00025)
D_Under 25 Years Old	-0.31704*** (<.0001)	-0.31797*** (<.0001)	-0.31625*** (<.0001)	-0.32874*** (<.0001)	-0.32992*** (<.0001)	-0.33070*** (<.0001)
D_Jumbo Mortgage	-0.03563 (0.20323)	-0.03638 (0.19438)	-0.02819 (0.30880)	-0.03393 (0.22532)	-0.03393 (0.22593)	-0.02528 (0.36115)
D_Subprime	-0.29243*** (<.0001)	-0.29002*** (<.0001)	-0.30005*** (<.0001)	-0.29476*** (<.0001)	-0.29101*** (<.0001)	-0.30301*** (<.0001)
D_Gov_Insured Mortgage	-0.18367*** (<.0001)	-0.18350*** (<.0001)	-0.18226*** (<.0001)	-0.18099*** (<.0001)	-0.18076*** (<.0001)	-0.17909*** (<.0001)
D_Modification	0.22772*** (<.0001)	0.22376*** (<.0001)	0.24219*** (<.0001)			
N	68308	68161	70505	68308	68161	70505
Percent Concordant	64.4	64.4	64.4	64.3	64.3	64.2
Percent Discordant	35.2	35.2	35.2	35.3	35.3	35.4

**Table 4: The Ratio of Foreclosed Consumers with at Least One Delinquent Card After Foreclosure End Date**

The dependent variable is the probability that foreclosed consumers would be delinquent on at least one of their credit cards during the observation period (within six quarters following the foreclosure end date), and zero otherwise. Foreclosures that remained open after 2011:Q2 are not included in this analysis, allowing at least six quarters following the foreclosure end date. Unlike in previous tables, the sample is not restricted to only foreclosed people who were delinquent on at least one credit card account as of the last mortgage interest payment date. Independent variables are observed as of the last mortgage payment quarter unless stated otherwise. Standard errors are reported in parentheses below the coefficients. The \*\*\*, \*\*, and \* represent statistical significance at the 1%, 5%, and 10% levels, respectively.

FCEND	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	-0.41016*** ( $<.0001$ )	-0.23420*** (0.00418)	-0.17440** (0.02867)	-0.40456*** ( $<.0001$ )	-0.22562*** (0.00577)	-0.16351** (0.04014)
Avg_Lastint_Fend_Month	-0.00476*** ( $<.0001$ )	0.00365*** (0.00001)		-0.00395*** ( $<.0001$ )	0.00447*** ( $<.0001$ )	
Lastint_Fend_Months		-0.01678*** ( $<.0001$ )	-0.01517*** ( $<.0001$ )		-0.01716*** ( $<.0001$ )	-0.01528*** ( $<.0001$ )
D_Quarters_3 and 4	0.03084*** (0.00496)	0.03066*** (0.00535)	0.03069*** (0.00446)	0.03082*** (0.00497)	0.03065*** (0.00536)	0.03069*** (0.00446)
D_Quarters_5 and 6	0.16247*** ( $<.0001$ )	0.16284*** ( $<.0001$ )	0.16029*** ( $<.0001$ )	0.16239*** ( $<.0001$ )	0.16280*** ( $<.0001$ )	0.16027*** ( $<.0001$ )
County_% Card 60+DPD	0.97642*** ( $<.0001$ )	0.87829*** ( $<.0001$ )	0.83073*** ( $<.0001$ )	0.97325*** ( $<.0001$ )	0.87331*** ( $<.0001$ )	0.83012*** ( $<.0001$ )
Unemp_12change_Fend	0.07063*** ( $<.0001$ )	0.05768*** ( $<.0001$ )	0.06104*** ( $<.0001$ )	0.06931*** ( $<.0001$ )	0.05634*** ( $<.0001$ )	0.06013*** ( $<.0001$ )
PreviousDelinquency_12m	0.13763*** ( $<.0001$ )	0.13907*** ( $<.0001$ )	0.13443*** ( $<.0001$ )	0.13870*** ( $<.0001$ )	0.13992*** ( $<.0001$ )	0.13513*** ( $<.0001$ )
D_Jumbo Mortgage	0.10519*** ( $<.0001$ )	0.12863*** ( $<.0001$ )	0.12267*** ( $<.0001$ )	0.10590*** ( $<.0001$ )	0.12966*** ( $<.0001$ )	0.12346*** ( $<.0001$ )
D_Subprime	0.03483*** (0.00417)	0.05426*** (0.00001)	0.04866*** (0.00005)	0.03369*** (0.00557)	0.05379*** (0.00001)	0.04722*** (0.00008)
D_Gov_Insured	0.08022*** ( $<.0001$ )	0.07169*** ( $<.0001$ )	0.08539*** ( $<.0001$ )	0.08596*** ( $<.0001$ )	0.07596*** ( $<.0001$ )	0.08808*** ( $<.0001$ )
D_Modification	0.15010*** ( $<.0001$ )	0.11807*** ( $<.0001$ )	0.08448*** ( $<.0001$ )			
N	205614	205068	213084	205614	205068	213084
Percent Concordant	54.7	55.6	54.5	54.5	55.5	55.4
Percent Discordant	44.0	43.2	44.1	44.1	43.3	43.4