

When the Cat's Away: Payment Behavior During a Foreclosure Moratorium

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During the 2008 housing crisis, policymakers called for a freeze on foreclosures. Any remedy that relieves borrowers of the sanction of losing their home runs the risk of distorting behavior. Using an eight-month moratorium for six lenders in New Jersey, this paper shows that this moratorium did not increase overall delinquencies, but borrowers in default were more likely to cure delinquencies. The moratorium reinforced borrower trust in the court's foreclosure process, increasing the benefit of making payments on loans at risk of foreclosure. This finding highlights the importance of consumer protections to facilitate borrower compliance with loan and other contracts.

I. The Role of Courts in Mortgage Default

Contracts between two parties rely on the good faith that if either party fails to uphold his obligation, sanctions will follow. In many situations, courts are the third party administrator of contracts in the case of a breach. If one party perceives the due process provided by the court as being weakened, he may attempt to use this situation to his advantage. Starting with seminal work by Grossman and Katz (?) on the effects of plea bargains on social welfare, economists have been interested in the role of the courts in producing economically efficient out-

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comes. ? and, later, ? reiterate the importance of courts for economic behavior, as courts redistribute resources in ways that can distort the costs and benefits of future behavior. This paper contributes to this strand of literature by examining how a change in court enforcement of mortgage contracts can serve as a mechanism for adherence to contract terms by borrowers.

Mortgages are contracts between lenders and borrowers, and in 27 states courts are obligated to administer sanctions in the case of a default on that contract. During the housing bust of the late 2000s, this was not always the case, however. From March 2012 through June 2013, the National Mortgage Settlement distributed relief to over 300,000 borrowers who lost their homes but were not provided due process (?).¹ Improperly repossessing property is a form of theft, and legal regimes have set out to balance the rights of the borrower while protecting the lender's right to enforce the mortgage contract. High levels of repossessions where legal rules were not followed could result in borrowers losing trust in the process and withholding payments, fearing lenders will have an unfair advantage and unfairly repossess their properties.

Courts became overwhelmed by the volume of cases in which lenders were not following legal due process for foreclosure cases.² One proposed policy response was a moratorium on foreclosure filings. By October 2010, 61 percent of respondents to a Washington Post online poll viewed a national foreclosure moratorium as a 'good idea,' although there was no change in policy at the federal level (?). New Jersey, however, implemented a substantive moratorium within that state in the first half of 2011 when the courts implemented what turned into an eight-month moratorium on foreclosures targeted to just six mortgage servicers.

The lending industry responded to foreclosure moratorium proposals with predictions based on moral hazard, concluding that a moratorium would increase the number of delinquencies as borrowers who would "otherwise stretch to continue

¹Specific number calculated from the National Mortgage Servicer Consumer Relief Data <https://www.jasmithmonitoring.com/omso/reports/final-progress-report/>.

²See National Council of State Legislatures (?) report for more details on court responses to high volumes of cases.

to make payments will decide to stop at least for the duration of the moratorium” (?). Assuming borrowers make rational inferences on the costs and benefits of missing payments, the prediction of added defaults seems reasonable if the costs of default are lower than the alternative consumption benefits of the amount of mortgage payments. The industry further predicted that borrowers would fail to catch up and would be unable to become current again, worsening an already bleak situation for borrowers in financial trouble (?).

However, using a difference-in-differences-in-differences strategy that exploits variation in the moratorium by mortgage servicer, across states, and over time, we document that the New Jersey moratorium actually did not result in increased defaults, but rather increased the rate of borrowers in default *making payments*. We observe no changes in mortgage servicer behavior related to offering borrowers more modifications, more generous modification terms, or other loss mitigation activities due to the moratorium. Borrowers in New Jersey subject to the moratorium who were delinquent before the start of the moratorium were more likely to become current during the moratorium period compared to loans with the same mortgage servicers in nearby states, as well as compared to other servicers not subject to the moratorium within the state.

This presents a potentially curious finding. The moral hazard incentive of the moratorium is not strong enough to encourage defaults among borrowers who are current, likely since the long run costs of default are high. The fact that borrowers who are already behind, and face low marginal costs of missing another payment during the moratorium, actually repay at higher rates suggests that the moratorium shifted how borrowers considered the net present value of their mortgage payments. This is in part a mechanical process in that the moratorium simply added more time to the process and borrowers in default had a longer window around which to access liquidity for future payments, potentially to gather information and form expectations about housing markets. However, if indeed ‘more time’ systematically induced borrowers in default to start making payments, we

would expect to observe lenders regularly granting borrowers extensions in order to facilitate repayments. Indeed, if the borrower fears that he may still lose the property in the end through an unfair foreclosure and repossession process, then more time would not create incentives to begin making payments. The imposition of the moratorium may have signaled to borrowers that their legal rights would be respected during foreclosure—making capricious takings by mistrusted lenders less likely. The New Jersey moratorium provided not just an extended time for repayments, but a systematic reinforcement of the role of courts in the foreclosure process. While ‘the cat’ being away might be a signal borrowers are relieved of the contract enforcement of lenders, in fact ‘the cat’ in this context is the court. The moratorium re-instated the court’s oversight role for selected (misbehaving) lenders and increased borrower expectations of protection in the foreclosure process.

The remainder of the paper begins with background on the legal process surrounding foreclosures and explains the foreclosure moratorium in New Jersey (Section ??). Section ?? explains the theoretical predictions associated with a mortgage moratorium. The following section (Section ??) reviews the methods used and explains the empirical framework and the natural experiment used for this analysis. Section ?? discusses the data used to complete the analysis, providing summary statistics. Finally, in Section ?? we discuss the results of the models and in Section ?? we provide further discussion of this work and its implications for research and policy.

II. New Jersey Mortgage Moratorium

As the housing boom turned bust in 2008, millions of homeowners fell behind on their mortgages, triggering lenders to file for foreclosures at record levels. Media coverage of foreclosure filings focused on metaphors such as “the floodgates have opened” (?). Policymakers struggled to respond as the volume of people losing their homes to repossessions by lenders mounted.

Federal policy responses included the Home Affordable Modification Program (HAMP), counseling hotlines, and other attempts to facilitate alternatives to foreclosure. In judicial foreclosure procedure states, where the courts adjudicate foreclosures filings through a legal hearing, courts experienced substantial increases in cases filed. Reports began to surface that lenders failed to follow proper legal procedures, made clerical errors and even falsified missing documents. Concerns about due process coalesced into calls for a moratorium on foreclosure cases in courts (See, for example “California Activists Call for Foreclosure Moratorium” in DSNEWS.com (?) and ? for more on specific proposals.) There was even a call for a national level moratorium (?).³ In the past, policymakers have initiated moratoria in cases of natural disasters, such as in the aftermath of Hurricanes Katrina, Rita, and Wilma (?). Over 30 years ago, ? studied mortgage moratorium legislation within the specific context of farm foreclosures during the 1980s farm crisis. More recently, ? summarized approaches used during the Great Depression. The context of each approach is unique; indeed, New Jersey’s limited moratorium was designed primarily to shore up procedures and due process related to a subset of problematic lenders.

A. New Jersey Foreclosure Moratorium: Order to Show Just Cause

New Jersey, like 24 other states, requires lenders⁴ to go to court to present a legal case to prove the borrower is in breach of the mortgage contract. This is an adversarial process, and the borrower is permitted to represent her best interests in the case. In New Jersey the court requires lenders to follow a series of steps to engage the borrower in the due process, including requiring at a minimum five legal notices:

- 1) Notice of Intent to Foreclose—information about what is required to cure the default, provided after payments are missed but before filing is started;

³For a review the legal process of imposing a moratoria see ?

⁴For convenience we use the terms lender and servicer interchangeably in this paper. Payment processing and foreclosure filings are usually conducted by mortgage servicers, usually are not the lender.

- 2) Service of Complaint Filing—the legal filing defining the violation(s) of the terms of mortgage contract;
- 3) Default Notice—informs borrower that the mortgage contract is in breach and is required to appear to contest the dispute in court;
- 4) Notice of Right to Cure—informs the borrower that payments can reinstate the mortgage and avoid foreclosure, but failure to act could result in repossession;
- 5) Service of the Motion for Final Judgment—informs borrower of the intent to repossess the property (via an auction) as of a certain date; and,
- 6) Service of the Final Judgment—the borrower receives a notice of the impending loss of possession of the property and scheduled date for the auction or the property. If no bids at the auction exceed the existing balance, the lender retains ownership and the property becomes real estate owned (REO) by the bank.

Each of these notices must be delivered at specified time intervals using certified mail. Courts required lenders to make efforts to locate borrowers and show evidence borrowers received each document. Lenders are also required to organize signed loan documents for the court hearing showing the lender is in fact the rightful owner of the loan with legal standing to file the foreclosure. Borrowers can object to any documents or processes that were not accurate or complete as part of the foreclosure hearing. These steps are part of the protections intended to reassure borrowers any taking of property will be based on a fair due process.

In the summer of 2010 the national media covered stories of mortgage loan servicers using questionable methods in serving foreclosure documents like these notices, including hiring firms to sign court documents with no official review (so called “robo-signing”). By late September, a number of large national lenders faced increasing scrutiny for procedural failures. On September 20, 2010, GMAC (also known as Ally Financial) announced a halt to property repossessions in order to review its legal processes. On September 29, JP Morgan Chase announced a moratorium on new foreclosure filings to conduct a review of procedures. On October 1, Bank of America announced a moratorium on new foreclosure filings and repossessions. Media and political attention focused on problems with foreclosure

filing procedures from mid-summer through fall of 2010, although by November, lenders had generally removed any self-imposed moratorium and resumed foreclosures and repossessions.

In New Jersey, however, six national lenders continued to be closely watched: Bank of America, JP Morgan Chase, Citi Residential, GMAC (Ally Financial), OneWest (Indy Mac Federal), and Wells Fargo. These lenders were responsible for more than 29,000 of the 65,000 foreclosure filings in 2010 in the state. On November 4, 2010, Legal Services of New Jersey provided the Chief Justice for the State Supreme Court a report on the foreclosure document preparation and filing practices by these lenders. On December 20, 2010 the Court issued Administrative Order 01-2010, which created a moratorium on new foreclosure filings by these lenders. Chief Justice Rabner stated:

Today's actions are intended to provide greater confidence that the tens of thousands of residential foreclosure proceedings underway in New Jersey are based on reliable information. Nearly 95 percent of those cases are uncontested, despite evidence of flaws in the foreclosure process.

The Court's Administrative Order was known as an Order to Show Cause (OTSC), which required certain lenders to suspend all foreclosure filings and foreclosure sales. Before these lenders could proceed they were required to show "why the Court should not suspend the ministerial duties of the Office of Foreclosure Plaintiffs." The OTSC took effect on December 20, 2010 and applied only to the six listed above lenders.

Under a recommended stipulation proposed by the Court on March 18, 2011, the six targeted lenders were required to file OTSC documentation by April 1, 2011 demonstrating that their general foreclosure practices were in compliance with the Court. By May 26, 2011 the targeted lenders replied to the Court, with the Court then promising a future court order unique to each lender that would allow that lender to proceed with foreclosure filings and repossessions through

the normal judicial process. Five of the six lenders received a court order relieving them of the OTSC on August 17, 2011, with GMAC remaining under the OTSC until September 12, 2011 (see Figure ?? for a timeline).

The Court intended for the OTSC to reinforce proper legal processes for foreclosure cases (?).⁵ The Court did not place a firm timeline on when foreclosures might resume for each lender.

The fact that only a subset of lenders were impacted, and that the same lenders were active in similar housing markets in neighboring states provides a unique opportunity to test borrower loan repayment behavior. Figure ?? shows the metropolitan statistical areas (MSAs) we use in the state of New Jersey, each of which include another state: AllentownBethlehemEaston (PA-NJ), New York-Newark-Jersey City (NY-NJ-PA) and PhiladelphiaCamdenWilmington (PA-NJ-DE). By using MSAs in New Jersey that overlap into bordering states, we can study the effects of the OTSC on loans in New Jersey. Comparing lenders that were and were not subject to the OTSC over time provides a natural setting for a difference-in-differences-in-differences (DDD) analysis.

III. Theoretical Predictions

We focus on three predictions related to how borrower behavior will shift in response to a moratorium, where the OTSC moratorium will:

- 1) Introduce a disincentive for payment, especially among borrowers already in default who have low marginal costs of one more missed payment;
- 2) Increase the time frame over which borrowers form expectations about future house prices and future liquidity, facilitating payments by borrowers in default (if borrowers have positive expectations); and,
- 3) Increase borrower trust in the legal process of foreclosure takings related to the impacted lenders, facilitating payments by borrowers in default.

⁵? discusses the backlash from lenders, where lenders took legal action accusing the New Jersey Supreme Court of over-reaching on the rights of lenders in mortgage contracts.

A. Moral Hazard Among Already Delinquent Borrowers

Releasing borrowers from the immediate consequence of foreclosure lowers the costs of default. The OTSC could drive borrowers to reassess the costs and benefits of making a mortgage payment versus all other consumption. At a minimum, the moratorium extends the number of months the borrower can stay in the home rent-free until repossession and eviction. Lenders may work to offer borrowers alternatives to foreclosures, such as modifications of loan terms for lower monthly payments, since the costs of default to the lender are also increased. The borrower has to assess how long he can remain in his home if he does and does not make payments. Borrowers with good credit would be unlikely to default as the costs of default extend to other forms of credit and will persist for three or more years (?). Borrowers in default already have bad credit, and therefore face only the costs of one more late fee and accumulated arrears.

Several studies show that borrowers do engage in strategic default in response to certain incentives. For example, ? found that states with longer foreclosure processes also have increased probabilities of borrower default. The authors showed that borrowers behave as if they are seeking to maximize the time from the first missed payment to repossession, or the period of “free rent.” ? used a difference-in-differences framework across bordering states and find that a “right-to-cure” law in Massachusetts increased time to foreclosure but did not ultimately prevent foreclosures. ? found that judicial foreclosure requirements across states create incentives for borrowers and lenders to engage in mortgage modifications, but have no direct effects on foreclosures. Each of these studies examined time invariant, state-by-state differences in foreclosure processes rather than a change over time, which limits these conclusions to some extent. These studies also do not examine policies that reinforce the role of courts in the disposition of foreclosure filings—a key feature which may result in changed borrower perceptions of the costs and benefits of making payments on their loan.

B. Longer Time Horizon to Form Expectations About Repayment Prospects

New Jersey is what is known as a recourse state—that is the difference between the outstanding loan balance and the fair market value of the property can be recaptured by the lender within three months of the foreclosure sale through the pursuit of a deficiency judgment against the borrower.⁶ Given already long foreclosure timelines and soft resale markets, lenders may pursue the recourse option (or at least threaten to do so) with borrowers.⁷ The threat of recourse adds an incentive for a borrower who owes more than the home is worth to delay foreclosure if he expects house prices to rise (or accelerate foreclosure if house prices are on the decline). A longer time horizon also increases the period over which borrowers can form expectations about their ability to access formal and informal liquidity, including adding to income or income sources, or liquidating other assets. This longer time horizon may upwardly bias expectations such that paying in the current period is more likely (?). Other papers have shown mixed effects on longer foreclosure processes on borrower and lender behavior (???), making the effects of the delay related to the OTSC on the behavior of delinquent borrowers challenging to predict.

Payments made by delinquent borrowers during the OTSC would represent positive expectations about the prospects of maintaining the mortgage and property prices in the future. Deferring payments would reflect more negative prospects for the future. From 2008 onward, house price trends in the state were generally flat or declining. By late 2010, house prices were still not showing signs of recovery, although labor markets began to show some slight gains. Potentially, borrowers looking into 2011 had reasons for more optimism about future liquidity and their abilities to service mortgage payments. It would have been unclear

⁶If the lender seeks a judgment, the borrower's redemption period is extended from ten days to six months. The borrower can present a cash payment to return title to the property. However unlikely, this ties up the property from resale and may discourage lenders from exercising the recourse option.

⁷See New Jersey permanent statutes Title 2A(50) for details. Note that all of the states in this study use judicial foreclosure processes, and all have recourse provisions that allow lenders to levy a deficiency judgment on a borrower in the case where the proceeds from a foreclosure sale fall short of the amount owed.

to borrowers, *ex ante*, how long the moratorium would last, although the initial OTSC included a three month review. While a six-month extension could have reasonably been predicted by borrowers, the full eight months (or nine for GMAC borrowers) would likely have been longer than expected. It seems unlikely the OTSC would trigger a strong reassessment of the value of repayment based on expectations of macroeconomic trends.

C. Increased Trust in Foreclosure Process to Protect Borrower Rights

There is a robust literature on the role of trust in markets (see ? for example), but not an extensive study of the role of trust in mortgage foreclosure processes. The borrower's decision to make a payment on a mortgage is dependent upon her belief that the payment will be properly credited to the loan balance due, that the stipulations of the mortgage terms will be upheld, and that her rights as an owner will be safeguarded during the foreclosure and repossession process. Binding contracts (such as a mortgage when the repossession of collateral becomes imminent) rely on trust by each party. If one party lacks trust that the contract process will not be upheld as prescribed, breach may be the optimal option (?). In the absence of that trust, the borrower may not be willing to make payments. By introducing strong oversight by the Court, borrower confidence or trust may be increased under the OTSC.

? shows in several studies how people evaluate the courts in terms of the fairness of the treatment they expect to receive. While focused on criminal proceedings rather than contract enforcement procedures, these studies suggest that the perception of fair treatment is a factor in how people will engage with the system. Judicial procedures for foreclosures should provide higher quality oversight and fewer errors in foreclosure rulings, aiding borrower confidence in the system. ? argue that judicial systems may in fact benefit lenders overall, despite longer times through the foreclosure process. ? demonstrate that third party oversight, such as that provided by a court, makes the enforcement of aspects

of a contract feasible. Borrowers with lenders who are known to not follow due process procedures may incur added costs related to contract enforcement.

The role of borrower confidence in the foreclosure process is not addressed in current studies on mortgage repayment. Many studies recognize differences in state foreclosure laws, but mainly focus on the costs (and to a lesser extent, benefits) of borrower rights in the foreclosure process. For example, ? discuss the costs of delayed foreclosures, but not the role of legal rights in reassuring borrowers about the process. ? suggest that states with stronger legal rights for borrowers may support borrower confidence mortgage contract terms, but the authors make no assertions about how legal rights may influence the behavior of borrowers in default.

The analysis of ? complements this paper in several ways. First, that paper also uses differences in state policies, although this analysis permits a triple differences analysis (time, state, lender) compared to the double difference (state, time) in that paper. Second, this paper examines the effect of ‘more time’ on default, although this paper is specifically related to an externally imposed action affecting a subset of lenders in which the courts were explicitly trying to increase borrower trust in the foreclosure process. Third, both papers use similar types of data—monthly loan repayments—and use hazard models, although this paper focuses on subprime loans and makes more extensive use of the Cox hazard compared to the multinomial models used in that paper. Finally, this paper focuses more on borrowers already in default, although we do also examine general delinquency rates. We argue that our findings are generally consistent with ?, though we are able to focus more specifically on the trust mechanisms in the foreclosure process as facilitated by courts.

A recent paper by ? uses a difference-in-differences approach to show that the marginal current borrower will default in response to a loan modification program only available to delinquent borrowers of one lender (but will not default on credit card loans). Our analysis shows a triple difference to show that the marginal al-

ready delinquent borrower will respond to the court's reinforcement of their rights in the foreclosure process. Borrowers clearly respond to repayment incentives in both situations, but in the case of the OTSC, borrowers are not responding to direct monetary incentives but rather the expected value of re-starting payments under stronger court protections. The ? study, like this paper, underscores that the structure of contract enforcement procedures have economically meaningful implications for borrower behavior.

This paper is unique in that it examines a policy change in one state that applies to a subset of lenders—a policy change that plausibly could be related to how borrowers view the likelihood of receiving fair treatment in the foreclosure process. Delinquent borrowers, especially those who are working with a lender/servicer who has a poor reputation, may not be as likely to make payments to cure a delinquent loan if they do not believe they can recover the home by resolving the foreclosure filing. The OTSC is a unique natural experiment to test this mechanism.

IV. Empirical Methods

We estimate the effect of the OTSC moratorium on borrower behavior using comparisons across geography, time, and lender. We compare loans across geography using loans in New Jersey relative to loans in neighboring states within the New York City-Newark-Edison MSA, and the Allenton-Bethlehem-Easton MSA, Philadelphia-Camden-Wilmington MSA (See Figure ?? for the specific locations of each of these MSAs.) Figures ?? and ?? plot the total foreclosure filings by ZIP code using data from RealtyTrac on all foreclosure filings. Clearly, the overall rate of foreclosure filings dropped in the state of New Jersey during the study period. This method estimates the effects of the OTSC using MSAs located in New Jersey that also overlap with surrounding states. This is helpful for creating more homogeneous regions to test for the effects of the OTSC, especially since prior studies show a high degree of heterogeneity in mortgage default by geographic

location (??).

We can compare loans over time relative to the pre- and post-OTSC periods. Figure ?? shows the time line of the OTSC by the state Court. The key time period is December 2010 to August 2011, when the Court refused to proceed on any foreclosure filing from the six targeted lenders. These lenders received wide media attention in this time for abuses in New Jersey and nationally.⁸ Because the Court announced the OTSC in early December, January 2011 is the first month that borrowers might reasonably respond with the next mortgage payment due.

There are a variety of specifications used in the mortgage performance literature, including linear probability models (LPM), hazards, multinomial logits, among others. We find similar results of LPM and hazard models, but generally show hazard results in the following tables. While LPMs perform reasonably well (?), they can generate unrealistic fitted values when dependent variables are binary (?). The hazard model has the added advantage of dealing with censoring of failed loans from prior periods.⁹ Generally, our strategy is to examine monthly repayment trends in default rates for a sample of loans delinquent as of December 2009. Specifically, we estimate the model in Equation ??.

$$(1) \quad Y_{i,t} = \beta_0 + \beta_1 TT_t + \beta_2 NJ_i + \beta_3 TS_i + \gamma_1 (TT \times TS)_{i,t} + \gamma_2 (TT \times NJ)_{i,t} \\ \gamma_3 (NJ \times TS)_i + \delta (TT \times NJ \times TS)_{i,t} + \lambda \mathbf{X}_{i,t} + \kappa_{MSA} + \epsilon_{i,t}$$

This specification is a difference-in-difference-in-differences (DDD) where TT is a dichotomous indicator equal to one if the OTSC moratorium was in effect in the given month-year combination (and zero if it was not), regardless of location. NJ is an indicator for whether or not the loan is in the state, and was hence, the OTSC would be binding, and TS is a dummy for the OTSC lenders, meaning those

⁸See Appendix Table ?? for more details.

⁹We use Stata Corporation software version 12 for this analysis using the `stcox` procedure, where we use robust standard errors that are clustered at the loan level (i) across months (j).

subject to the moratorium in the state. The coefficient of interest, δ , will be the DDD estimator in this model, estimating the effect of the OTSC. We also include *PTT* which is an indicator for the time period after the moratorium concludes, and interactions with the OTSC lender and state to identify any persistent effects. Each loan-month is coded as being bound by the moratorium or not based on the state in which it was located and the lender being subject to OTSC. A small number of loans change servicer during the analysis period.

Contained in \mathbf{X} , are loan and borrower characteristics, including $\log(\text{Home Value})$, $\log(\text{original loan value})$, a dummy for an adjustable rate mortgage, the interest rates, $\log(\text{income})$, FICO score, and a minority race indicator. The borrower level characteristics are all at the time of loan origination. However, the home value and interest rate can change over time. We also include MSA fixed effects, κ_{MSA} , similar to the structure provided in the DDD model used in ?.

When using a DDD specification, we make the following assumptions:

- 1) The trends in OTSC and control lenders would be similar pre and post the OTSC moratorium in the absence of the court order;
- 2) The trends in loans would be similar pre and post the moratorium in the absence of the OTSC across MSAs;
- 3) People do not select their lender based on knowledge of the OTSC; and,
- 4) The OTSC is binding for lenders, and borrowers are cognizant of the policy.

We can confirm (1) and (2) are likely to be valid from the data (pre-post and cross-MSA trends are similar; see Appendix Table ??) and Figure ??. There are no major confounding policies occurring in conjunction with the OTSC moratorium. The OTSC was unanticipated by both borrowers and lenders until the month it was announced. Typically borrowers have little direct control over which lender owns and services their loan, which makes (3) unlikely. We believe that the moratorium was well publicized in New Jersey, as all local newspapers thoroughly covered the policy, in addition to local news stations. In general these assumptions are plausible; the DDD should provide a reasonable causal estimate of the OTSC moratorium.

Our main dependent variable is becoming current (or “cure”) conditional on being delinquent, although we also estimate the rate of loans becoming worse (for all loans), and the probability and terms of any modification of the original terms of the mortgage conditional on previous delinquency.¹⁰ The hazard addresses the censoring problem due to attrition by estimating relative hazard rates (ratios) among delinquent loans on which borrowers have the chance to start paying each month.

V. Data

This study draws data from Corporate Trust Services (CTS), a nationwide database comprised of individual monthly loan payments for mortgages initiated by more than 50 different lenders.¹¹ These lenders sold each mortgage contract to investors as part of mortgage backed securities, and the CTS serves as a report to investors on payments of principal and interest on each loan. The CTS only captures privately securitized loans—loans that were not backed by government sponsored agencies such as Freddie Mac and Fannie Mae (or Ginnie Mae). Most of the loans in the CTS have characteristics similar to industry standards for subprime mortgages, such as lower credit scores and a larger percentage of adjustable rate loans (versus fixed rate). These data consist of monthly remittance reports from over 80 unique loan servicers, including the loan number, payment history, ZIP code, original and current loan balance, and information on whether the loan contract has been permanently modified.^{12,13} One caveat to using the CTS data is that we do not observe all loans each borrower or property may have. Thus, borrowers may have other loans outside the CTS dataset on which they have become delinquent or foreclosed upon. We are further careful to follow loans

¹⁰Modifications are recorded only after any trial periods are completed and the terms are finalized.

¹¹?? use these data to study mortgage mediation, mortgage counseling, and regulatory oversight, respectively

¹²One advantage over other datasets is that servicers flag loans as “modified” if a formal permanent contract change, rather than a temporary modification or some other trial agreement. In other datasets, modifications are only speculated through changes in payments, term or interest rate.

¹³See ? and Quercia et al. (?) for more on the quality of the CTS data.

that changed to or from OTSC servicers due to acquisitions to ensure that each loan was accurately placed into the proper policy environment.

The CTS data used in this study covers the period from December 2009 until July 2012 (with one cross section of December 2013 to examine long run outcomes). The data are organized as a monthly panel. As loans are paid off, repossessed or sold off, the sample decreases in size. Table ?? summarizes the number of loans in the data as of November 2010, just before the start of the OTSC moratorium. The data is dominated by loans in the New York MSA, but still contains a large number of loans in New Jersey, including loans by OTSC lenders.

We are concerned that house price changes are endogenous with both lender decisions to foreclose and borrower decisions to cure a delinquency.¹⁴ In order to estimate for the value of the home used as collateral for each loan in each given month, we include ZIP code level house price data provided by Zillow. Zillow uses data on market transactions to estimate prevailing average market values in a small area. These non-seasonally adjusted estimates offer a reasonable mechanism to calculate parcel level changes in home values from the loan origination date to each period. We estimate the value of a home at time t as follows: $\text{Value}_t = \frac{\text{Balance}_{t_0}}{\text{LTV}_{t_0}} \times \Delta P_{t-t_0}$, where ΔP_{t-t_0} is the difference in average ZIP code level prices between the month of the loan's origin and the current month. These loan-level values are more useful than simply assuming that each MSA has identical housing market characteristics.

Table ?? shows the median estimated decline in home values during the period ending December 2010 for each loan in the data aggregated by state. The typical borrower holds a loan on a home that has declined in value since purchase, which could leave them in an "underwater" equity position with a loan to value (LTV) ratio that exceeds 1. This increases the incentive for borrowers to withhold payments and walk away from the property, and therefore decreases the probability

¹⁴See ? for a review of the correlations between foreclosures and home values.

borrower will cure a delinquency. We note that New York has the highest median origination price, while New Jersey experienced the greatest decline in this period, roughly 19 percent.

Only owner-occupied, single-family homes where the mortgage is the primary or first position lien are included.¹⁵ We only include loans that are active and in default by the first period of observation (one year prior to the OTSC).¹⁶ In order to account for demographic characteristics of borrowers, we have matched the CTS data to the data on loan applications from the Home Mortgage Disclosure Act (HMDA). This provides borrower characteristics recorded when the loan was first underwritten. We match approximately 80 percent of CTS records to HMDA, and thus we use these data only as a robustness check.

Table ?? presents summary statistics as of December of 2009, the first observed period, conditional on loans being at least 60 days delinquent (or ‘in default’). Other than home values, the samples are similar. FICO scores are just above 680, the cutoff for subprime loans of this vintage. Both samples include high shares of racial minorities. It is clear that lenders subject to OTSC have statistically different portfolios. The difference-in-differences framework will be an important method to address this potential problem, as will the addition of loan level controls. We will be able to look at changes among OTSC and non-OTSC lenders within MSAs across state lines, as well as compare the same loans to themselves across time periods. We also note that the number of loans in Table ?? is slightly smaller than that of Table ?? due to the mismatch between CTS and HMDA.

Table ?? shows loans in New Jersey and border areas at the conclusion of the OTSC that were delinquent as of the start of the OTSC. This shows that 15 percent of OTSC loans in New Jersey cure by the end of the moratorium, which is identical to the cure rate of loans by OTSC lenders outside the state, but lower than cure rates by non-OTSC lenders in the state (17 percent) and outside the

¹⁵See ? for a discussion of the role of securitization on lender behavior.

¹⁶A borrower is in default if she has missed two or more payments as of the current month.

state (24 percent). Borrowers appear less likely to receive modifications from OTSC lenders, within and across states. The self-cure rates (cures without modifications) are lower in New Jersey than border states. Borrowers with loans held by OTSC servicers are less likely to transition into a deeper level of default than those with non-OTSC servicers. Consistent with Table ??, loans subject to the OTSC moratorium tend to have lower risk factors such as delinquency and credit score. Thus, the simple means shown likely fail to capture important factors that could explain delinquency behavior. This also provides further support for using a DDD framework to identify changes in the trend for loans affected by the OTSC.

VI. Results

Tables ?? through ?? show DDD estimates for hazard rates for the δ estimate in Equation ?. Each table includes estimates during the OTSC moratorium, compared to before and after the moratorium. All tables include columns of estimates replicated with loan-level controls for home value, FICO score, minority race status, loan amount (logged), interest rate, and an ARM indicator, in addition to month and MSA fixed effects. Each table contains three panels, where Panel A estimates the DDD, Panel B estimates a DD across states (within OTSC lenders), and Panel C estimates a DD across OTSC lenders (within New Jersey).

Table ?? begins with a hazard model to estimate the rate of loans moving to worsened default status. For example, a loan not in default moves to 30 days behind the next month, while a loan 60 days behind (two payments late) moves to 90 days behind (3 payments late). Once a loan moves to 90 days delinquent, loan status cannot become worse. These estimates are also called aggregate ‘roll-rates’ for current loans missing payments or loans 30 or 60 days behind falling further behind. Table ??, unlike all other estimates presented, includes *all loans*, not just initially delinquent loans.

Importantly, these estimates confirm that there was no increase in default rates among OTSC loans during the OTSC period. Counter to industry predictions,

current and delinquent borrowers are not stopping payments as might be predicted when (short-term) sanctions for default are relaxed during a moratorium. These results are consistent when comparing loans across states (all OTSC lender loans) using a difference-in-differences (DD) approach, as well as an across-lender approach comparing lenders subject and not subject to OTSC (all in New Jersey). These results show no evidence that delinquency increases due to the OTSC moratorium.

Table ?? shows a hazard specification for rate of delinquent borrowers starting to make payments again. These ‘cures’ are set up as a terminal state, such that a borrower who goes from delinquent to becoming current is then dropped from the sample. The DDD hazard ratio suggests cure rates are relatively faster for loans with OTSC lenders in New Jersey during the moratorium, relative to non-OTSC lenders before or after the OTSC. These estimates show relatively large effects of the moratorium on delinquent borrowers catching up, with approximately 36 to 49 percent faster rates of cure. It is reassuring that trends hold across the DD estimates, both among OTSC lenders in New Jersey compared to non-New Jersey, as well as loans only in New Jersey across OTSC and non-OTSC lenders. Cure rates are faster for OTSC loans across all of these comparisons.

One explanation for borrowers catching up could be that lenders are basically resetting loans to current as part of a loan modification. Facing longer delays, lenders might believe that modifying a loan could be less costly than pursuing foreclosures during the moratorium, making modifications more likely. In fact, Columns (3) and (4) show lenders in New Jersey subject to the OTSC during the moratorium are making modifications of loan terms at higher rates. However, these estimates are not statistically different from one another and do not hold up within the DD comparisons. Lender loan modifications are not mechanically driving cure rates.

Borrowers making payments to OTSC lenders at higher rates is consistent with borrowers perceiving this court ruling as assurance that their payments would

'count' and their rights would be protected in the judicial foreclosure process. The six lenders targeted by the OTSC were subject to a great deal of negative press and scrutiny, perhaps weakening borrowers' perceived trust in these lenders relative to other lenders. The external oversight of the OTSC may have shifted borrower perceptions and reduced disincentives for withholding payments.

Table ?? shows the same types of estimates as those in Table ??, but conditional on borrower loan-to-value (LTV) ratio. Borrowers with high LTV ratios have more at risk in the case of a foreclosure, in part due to New Jersey allowing lenders to seek deficiency judgments for shortfalls. Specifically this table shows that delinquent borrowers with underwater loans, where the home is worth less than the mortgage ($LTV \geq 1$), are more likely to make payments on their loans. About 31 percent of mortgage loans in the data were 'underwater' or had estimated values of the home less than the mortgage amount as of December 2010. The effects of the OTSC moratorium are concentrated among these borrowers, who show faster cure rates across DDD and DD estimates. This finding is important as it underscores the effects are among those borrowers who will be most likely to need to negotiate a settlement through the foreclosure hearing to limit future liabilities. The OTSC may provide these borrowers with differential confidence in that process and increase the expected value of their homes given expectations about the foreclosure process.

Like Table ??, Table ?? shows heterogeneous effects of the OTSC. Here the data is divided by FICO Score at the 690 cutoff or above (below prime credit but still borderline quality for credit markets) as measured in December 2010. About 48 percent of borrowers in these data have scores at or above 690. Here it appears the effects of the OTSC on cures are concentrated among the highest FICO borrowers. FICO scores are designed to predict payment behaviors, so these cures are at least partially explained by the underlying traits of FICO measures. Higher FICO borrowers also have more to lose from longer delinquencies; unlike a deeply subprime credit quality borrower, these borrowers still have some capacity

to borrow at lower rates. A foreclosure will cause more harm to the credit record of these borrowers, and these borrowers might work harder to cure a delinquency for this reason. The hazard rates for lower score borrowers are all positive, but much smaller and not statistically different from one. Borrowers focused on preserving their credit may both be more attentive to the OTSC and more sensitive to how well they expect to be treated in the judicial process.

Following up on the potential problem of lenders offering modifications resulting in loan repayments among OTSC covered loans, Table ?? shows the terms of loan modifications by type of lender using similar DDD and DD strategies as the prior tables. However, here we transform our data to a cross section of loans that were modified. We still exploit the timing of the modification, the geography of the loan, and the servicer in analyzing the differences in the types of modifications across borrowers subject to and not subject to the OTSC. There is no evidence in these estimates that OTSC lenders, or lenders in New Jersey generally, were offering deeper concessions on loan terms. Modifications alone cannot explain the improved cure rate shown in prior tables.

Table ?? shows the rate of self-cures for loans—that is loans where delinquent borrowers resume payments with no loss mitigation or modifications provided by the lender. The rate of cures here is even larger than in Table ?. These cures are driven by actions of borrowers and include no modifications of loan terms, interest rates or principal forgiveness. The main effect of the OTSC seems to be derived from borrowers reconsidering the net present value of making payments given the oversight on the foreclosure process provided by the courts. Table ?? further underscores that lenders are not offering other forms of loss mitigation besides loan modifications. There do not appear to be any patterns of lender behavior under the OTSC that might serve as an alternative explanation of borrower behavior.

A key remaining question is: “Does the OTSC shift the trend in long run loan outcomes, especially related to foreclosure repossessions?” Table ?? shows loans as a cross section based on the last period available, including up to December

2013. This is three years after the OTSC was first announced, allowing more time for foreclosures to matriculate through the legal process. Here we require all loans to be alive as of December 2010, the start of the moratorium. The dependent variables of interest are a loan going to repossession, or REO, as well as whether a foreclosure action was ever filed with the Court. In a post-period cross section we can only estimate DD models (since all are exposed to the same time periods). It appears OTSC-covered loans in New Jersey, compared to all OTSC loans or all loans in New Jersey, are no more or less likely to experience a repossession. Columns (3)-(4) show that there is little evidence of differential foreclosure rates among OTSC-covered loans in New Jersey. OTSC lenders are less likely to file for foreclosure overall, but loans in New Jersey are generally more likely to have a filing. All of these findings are robust even when including borrower-level controls.

Overall these estimates suggest that delinquent borrowers are repaying their loans at higher rates during the OTSC moratorium. These effects do not appear to be driven by mortgage modifications or repayment terms. The Court's actions under the OTSC may have functioned to reassure borrowers that payments on the loan would not be captured by capricious lenders through sloppy legal processes.

A. Potential Threats to Internal Validity

Several caveats are worth noting. First, the New Jersey moratorium focused on six large lenders, all with relatively low default rates and negative public attention on questionable filing procedures. It is hard to rule out that these lenders were not engaged in increased borrower outreach or public relations during or after the OTSC. It seems unlikely that these lenders could have predicted with precision when the moratorium would begin—or even if it would begin—or when it would end. The attention brought on by the OTSC could have influenced lender practices in ways that encouraged delinquent borrowers to make payments. Since we see no changes in modifications, this would have had to be in unobserved

ways such as telephone calls, counseling or informal payment plans. Figure ?? further shows some evidence that there was not a spike in online discussions of foreclosure counseling by people in New Jersey relative to people online in New York. It seems unlikely any outreach strategy could be limited to New Jersey and also achieved at scale only among OTSC lenders.

Table ?? offers one test of the hypothesis that it is primarily borrower trust in the court process rather than lender behavior that drives the repayment results. Here we identify the voting behavior of the county where the borrower resides. Chief Justice Rabner, the judge who produced the OTSC, was appointed by Democratic Governor Jon Corzine.¹⁷ During the 2010 gubernatorial election, 13 counties in New Jersey supported Chris Christie, while eight supported Corzine. We use this partisan divide to split our sample within New Jersey, where we expect that those borrowers living in Democratic counties will be more likely to find the OTSC a reassuring action, affirming confidence in court procedures. In Table ??, we estimate a cross-lender (within-New Jersey) difference-in-differences model to see if the increase in cure rates is higher in Democratic counties than Republican counties due to partisan alignment. Indeed, we find that Columns (1)-(2) of Panel A report that borrowers living in Democratic counties are systematically responding to the moratorium, compared with their Republican county counterparts (Columns (3)-(4)). This finding is consistent with borrower trust in the institution. Panel B shows that lender behavior (shown through modifications) do not change, regardless of how we cut the data.

There is the possibility that both house prices and cure rates could be simultaneously affected by the moratorium. Though we argue that a change in the stock of foreclosures in New Jersey and not the surrounding states does not change the prices (see, for example, ?), we also verify that ZIP code-level house prices do not change as a result of the moratorium in Table ?. Treating each ZIP code in each period as the unit of observation, we compare ZIP codes in New Jersey to

¹⁷Governor Corzine served until January 2010

those across the border both before and after the moratorium was imposed. This difference-in-differences regression results in no change in house prices due to the moratorium.

Critics believed the moratorium would delay the process of clearing out the foreclosure inventory from the market, depressing market values for longer than would be the case in the absence of the OTSC. We cannot cleanly estimate this outcome, however. The OTSC could result in lenders increasing the fees and interest rates for borrowers in the state of New Jersey in the future, based on the expectation that foreclosures will be slower and more costly than in other states. This will be an important issue to monitor in the future. However, lenders may find that the net costs of foreclosures could be lowered if borrowers are more likely to cure with strong court oversight.

Lender inattention to legal processing was a primary justification for the OTSC. We only observe the legal actions taken by lenders, and the payment behavior of delinquent borrowers. Ideally we might observe the quality of filings (paperwork later challenged or overturned), as well as which borrowers attend the foreclosure hearing and plead a defense to the foreclosure case. Unfortunately, we cannot observe any of these processes. We can only observe the pattern of borrowers in default repaying loans at elevated rates; we propose that trust in the court supervised process is the main mechanism for this shift in behavior.

VII. Conclusions

Broadly speaking, this paper explores how *ex post* changes in the rules regarding due process in contract disputes impacts behavior. The OTSC could have encouraged borrowers, especially those in default and with poor credit, to retain their mortgage payments for other consumption and live rent free for a few months. Alternatively, the OTSC could provide assurance to a borrower that he will receive due process under the terms of the mortgage contract and increase the rate of repayments.

We find that relative to border areas and non-covered lenders, the New Jersey OTSC moratorium resulted in rising repayment rates among borrowers in default. This behavior is consistent with borrowers evaluating the long run expected value of the foreclosure process and judging that court oversight strengthens the value of payments in the current period.

We find that borrowers do not, as predicted by the lending community, strategically stop making payments due to the OTSC. We show no evidence of an increased probability of delinquencies or worsened loan status among borrowers in default. The OTSC moratorium on foreclosures may even be associated with keeping people in their homes, at least up to three years after the OTSC was released. Lower rates of home repossessions were not the goal of the Court in implementing the moratorium, but may be instructive to policymakers concerned about foreclosures.

To the extent that borrowers are making payments based on an enhanced trust of the legal process, these results underscore the importance of the enforcement of contract provisions for mortgage loans. As much as lenders dislike the pace and cost of judicial foreclosures, this process may result in better quality legal filings and more consideration of the borrower's rights. A borrower who lacks trust in due process may be less willing to cooperate with his lender, which may undermine the lender's goal of capturing repayments when a portfolio of loans is in default. Courts and policymakers under pressure to weaken the level of review of repossession cases might want to carefully consider how borrowers in default will perceive such changes. Protections under judicial foreclosure processes may support the curing of delinquent loan payments.

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VIII. Figures

Figure 1. : Timeline: New Jersey Foreclosure Moratorium

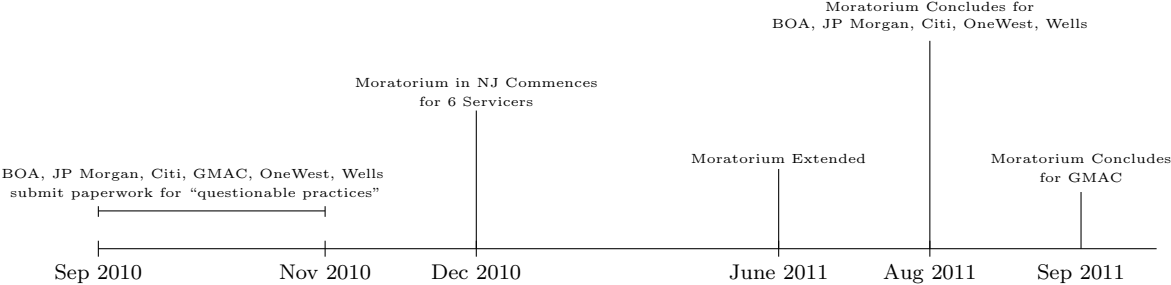
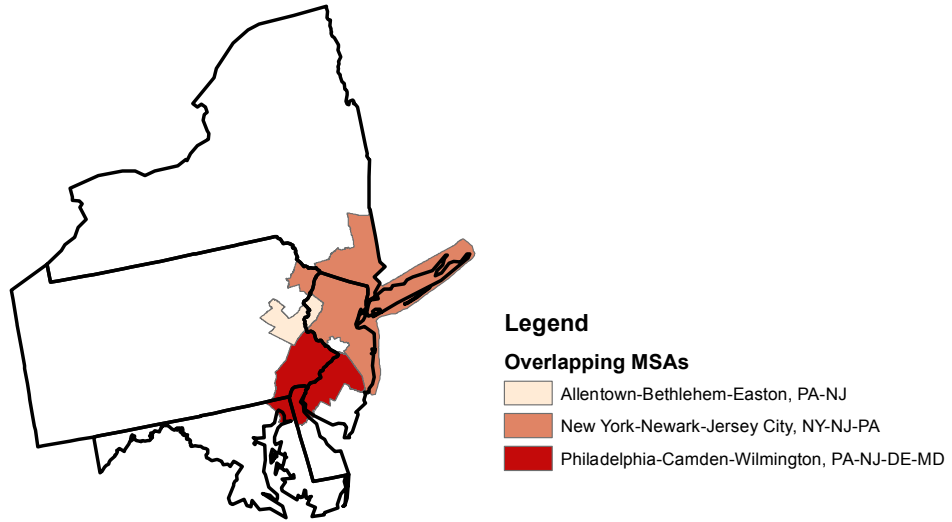
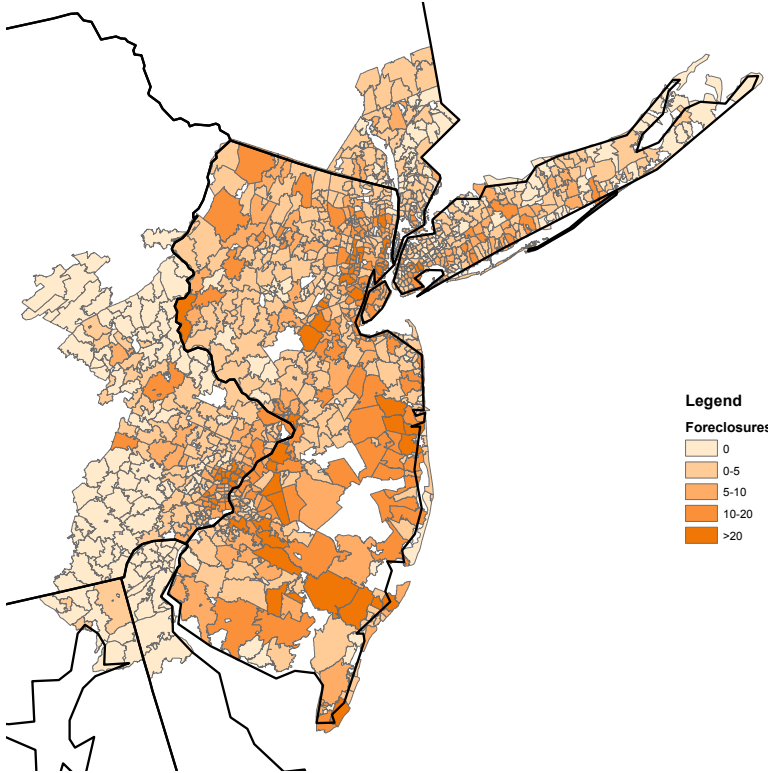


Figure 2. : Metropolitan Statistical Areas Crossing New Jersey State Lines



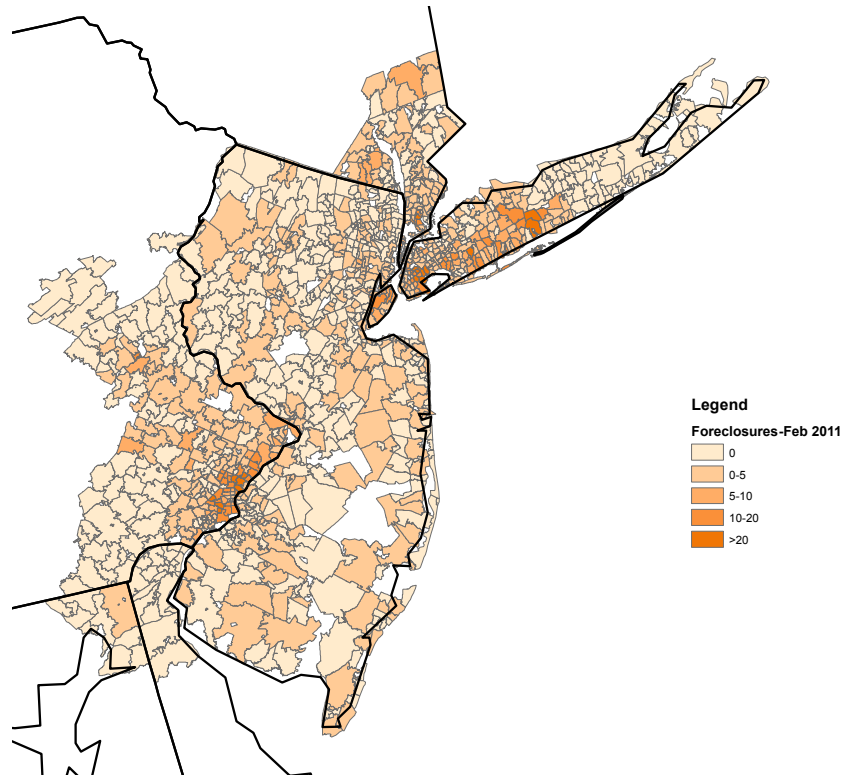
Source: Authors' calculations.

Figure 3. : New Jersey ZIP Code Level Foreclosures: November 2010



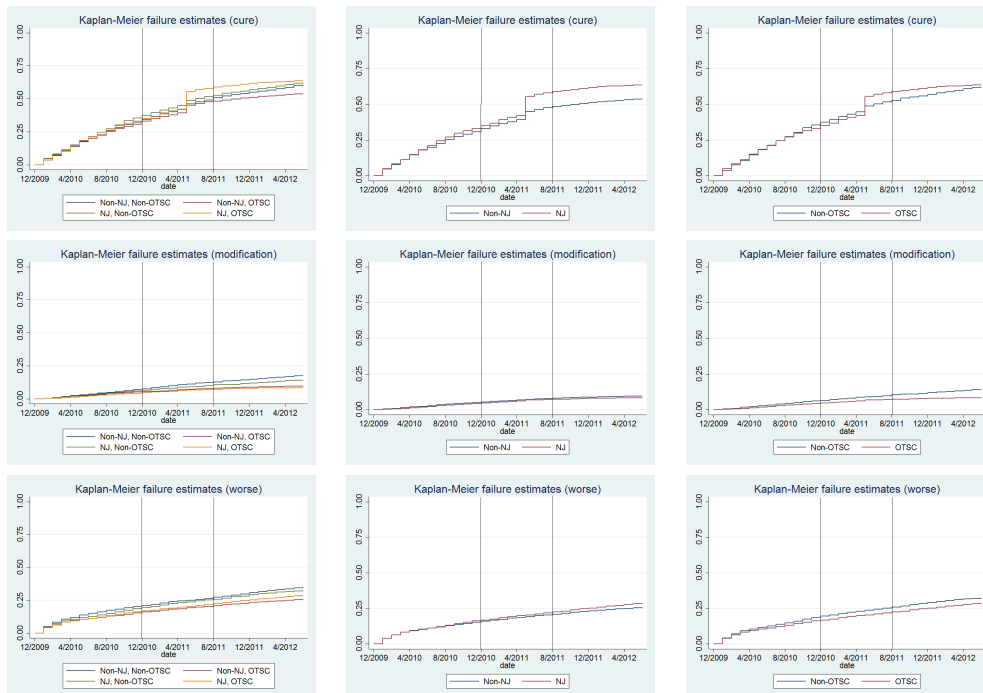
Source: Authors' calculations.

Figure 4. : New Jersey ZIP Code Level Foreclosures: February 2011



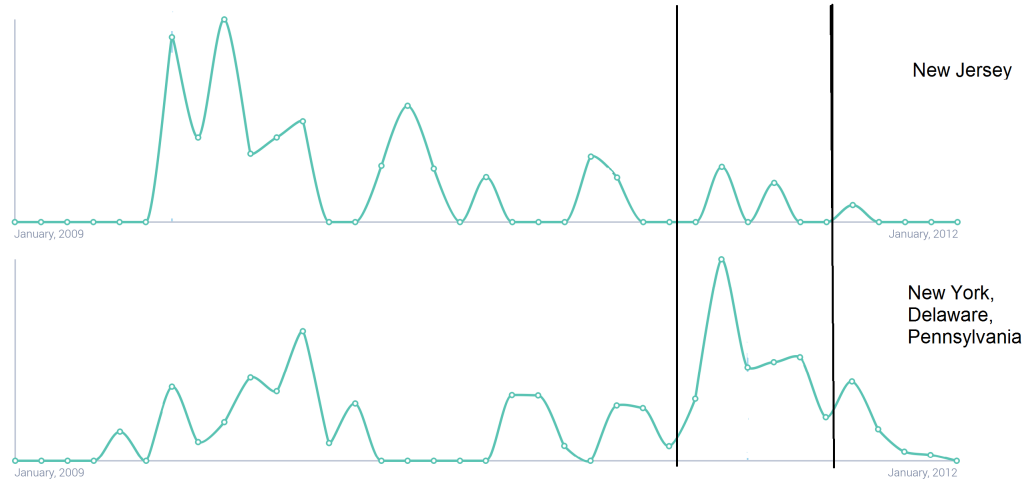
Source: Authors' calculations.

Figure 5. : DDD, DD Plots: NJ \times OTSC, New Jersey only (across OTSC), and OTSC only (across states)



Notes: The figures above show Kaplan-Meier failure functions for cures (row 1), modifications (row 2), and when loans moving to worsened delinquency status (row 3). The first column presents the DDD trends, where the functions are grouped by combinations of OTSC lenders and being located in New Jersey. The second column presents DD trends across OTSC and non-OTSC lenders within New Jersey only. The third column presents DD trends across New Jersey and border state lenders within OTSC lenders only.

Figure 6. : Social Media During OTSC Do Not Show Heightened Discussions of Foreclosure Counseling in New Jersey Relative to Neighboring States



Source: atlas.infegy.com. Infegy Atlas search for internet for New Jersey New York, Delaware, Pennsylvania Jan 2009-Dec 2012 for online discussions of 'default OR mortgage OR foreclosure AND counseling' normalized by online population. Filtered for spam to measure mentions and discussions.

IX. Tables

Table 1—: Number of Mortgage Loans By MSA and State

MSA		DE	MD	NJ	NY	PA	Total
<u>Allentown</u>							
	Total			97		538	635
	OTSC			35		563	198
<u>New York</u>							
	Total			6,629	13,697		20,326
	OTSC			2,135	4,345		6,480
<u>Philadelphia</u>							
	Total	458	82	924		2,988	4,452
	OSTC	131	34	246		930	1,341
Total		458	82	7,650	13,697	3,526	25,413

Source: CTS data conditional on loan being delinquent as of December 2009;
Loans observed as of November 2010 (the month prior to the OTSC).

Table 2—: Median Home Value Changes Since Loan Origination

State	Origination	Dec 2010	% Decline
DE	\$245,538	\$214,862	-0.12
MD	\$236,789	\$216,924	-0.08
NJ	\$388,312	\$314,426	-0.19
NY	\$512,194	\$467,130	-0.09
PA	\$216,571	\$203,399	-0.06
All	\$428,188	\$379,216	-0.11

Source: Home value at origination based on loan records in CTS data (the average loan was taken out in 2005). Value as of November 2010 (the month prior to the OTSC) estimated based on Zillow Home Value Index.

Table 3—: Descriptive Statistics

	Border Non-OTSC	Border OTSC	NJ Non-OTSC	NJ OTSC	Total
ARM Indicator	0.601 (0.499)	0.498 (0.500)	0.692 (0.462)	0.550 (0.498)	0.592 (0.492)
Interest Rate	6.49 (1.61)	6.45 (1.17)	6.40 (1.68)	6.39 (1.26)	6.452 (1.51)
Home Value (000s)	470.36 (279.66)	548.28 (319.40)	391.84 (230.87)	433.92 (248.94)	467.79 (281.92)
Income (000s)	144.45 (138.73)	168.32 (146.51)	142.19 (122.79)	164.63 (250.52)	151.16 (152.11)
Origination Year	2005.46 (0.91)	2005.53 (0.83)	2005.50 (0.88)	2005.50 (0.78)	2005.49 (0.87)
FICO (divided by 100)	6.851 (0.661)	6.835 (0.869)	6.856 (0.660)	6.845 (0.853)	6.848 (0.732)
Minority	0.528 (0.499)	0.445 (0.497)	0.496 (0.500)	0.467 (0.499)	0.497 (0.500)
Number of Loans	11,439	5,369	5,040	2,423	24,271

Source: CTS data conditional on loan being delinquent as of December 2009. Notes: Means reported, standard deviations in parentheses. Across all variables for all groups, we reject the null of equality across groups using Wilks' lambda at the 10% level. Total number of loans lower than in Table ?? due to small numbers of missing variables.

Table 4—: Loan Status at End of OTSC (August 2011) among Loans Delinquent as of December 2010

	Cure	Modified	Self Cure	Worse
Border x Control	0.24 (0.42)	0.39 (0.49)	0.044 (0.20)	0.035 (0.18)
	n=3,055 loans			
NJ x Control	0.17 (0.38)	0.37 (0.48)	0.034 (0.18)	0.033 (0.18)
	n=1,276 loans			
Border x OTSC	0.15 (0.36)	0.22 (0.42)	0.042 (0.20)	0.018 (0.13)
	n=2,349 loans			
NJ x OTSC	0.15 (0.36)	0.24 (0.43)	0.039 (0.19)	0.013 (0.11)
	n=915 loans			
<hr/>				
Total Loans Across Groups =7,595				
<hr/>				

Source: CTS Data August 2011. Conditional on loan being delinquent as of December 2010. Notes: Means reported, standard deviations in parentheses. Border loans are loans in an MSA shared with New Jersey but located outside of that state. Comparison loan are loans serviced by non-OTSC lenders. Self Cure equals one if the loan went from delinquent to being current without a modification. Worse means that a loan went from current to first delinquency, one month behind to two months behind, or two months behind to three months behind.

Table 5—: Hazard: The Moratorium did not Transition Loans to “Worse”

Dependent Variable: Worse		
	(1)	(2)
Panel A, DDD: All Loans		
During x NJ x OTSC	1.067 (0.129)	1.171 (0.158)
Observations	520,180	399,648
Panel B, DD: OTSC Only		
During x NJ	0.949 (0.112)	1.122 (0.149)
Observations	178,197	133,427
Panel C, DD: Loans in NJ Only		
During x OTSC	0.947 (0.178)	1.042 (0.194)
Observations	157,769	119,586
<u>Includes</u>		
Controls	No	Yes

Source: CTS data December 2009 - July 2012. Conditional on loan being delinquent as of the first period (December 2009). Notes: Hazard, where time to failure is if the loan gets worse, meaning that it went from current to first delinquency, one month behind to two months behind, or two months behind to three months behind. Robust standard errors clustered at the loan-level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ Each observation is a loan-month. All models include MSA fixed effects.

Controls include home value (log), FICO score quartiles, borrower race, loan amount (log), interest rate, and an ARM indicator. $NJ = 1$ if the loan is in NJ. $OTSC = 1$ if the lender was subject to the OTSC in any state. $During = 1$ if the loan-month was during the moratorium period. Panel A provides the DDD estimator, Panel B provides a DD estimator across states within OTSC lenders, Panel C provides a DD estimator across lenders within New Jersey.

Table 6—: Hazard: The Moratorium Sped Up Cure Rates but not Modifications

Dependent Variable	Cure		Modification	
	(1)	(2)	(3)	(4)
Panel A, DDD: All Loans				
During x NJ x OTSC	1.492*** (0.146)	1.355*** (0.145)	1.262 (0.215)	1.328 (0.253)
Number of loans	28,448	21,862	28,448	21,862
Observations	189,510	154,685	526,224	401,711
Panel B, DD: OTSC Only				
During x NJ	1.347*** (0.104)	1.223** (0.104)	0.905 (0.148)	0.990 (0.177)
Number of loans	11,464	8,771	11,464	8,771
Observations	58,373	46,684	187,548	140,261
Panel C, DD: Loans in NJ Only				
During x OTSC	1.280*** (0.0990)	1.228** (0.103)	0.983 (0.149)	0.929 (0.156)
Number of loans	8752	6666	8752	6666
Observations	56,904	45,201	160,352	121,083
<u>Includes</u>				
Controls	No	Yes	No	Yes

Source: CTS data December 2009 - July 2012. Conditional on loan being delinquent as of the first period (December 2009). Notes: Hazard rates presented with robust standard errors clustered at the loan-level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ Each observation is a loan-month. All models include MSA fixed effects. Controls include home value (log), FICO score quartiles, borrower race, loan amount (log), interest rate, and an ARM indicator. $NJ = 1$ if the loan is in New Jersey. $OTSC=1$ if the lender was subject to the OTSC in any state. $During=1$ if the loan-month was during the moratorium period. Panel A provides the DDD estimator, Panel B provides a DD estimator across states within OTSC lenders, Panel C provides a DD estimator across lenders within New Jersey.

Table 7—: Hazard: The Moratorium Sped Up Cure Rates More for Underwater Borrowers

	Dependent Variable: Cure			
	LTV < 1		LTV ≥ 1	
	(1)	(2)	(3)	(4)
Panel A, DDD: All Loans				
During x NJ x OTSC	1.150 (0.242)	0.898 (0.221)	1.521*** (0.173)	1.435*** (0.177)
Number of Loans	17,028	12,867	11,807	9,263
Observations	105,929	85,669	106,414	87,685
Panel B, DD: OTSC Only				
During x NJ	0.905 (0.160)	0.780 (0.168)	1.304*** (0.119)	1.211** (0.118)
Number of Loans	6206	4582	3959	3092
Observations	35,901	28,498	32,509	26,351
Panel C, DD: Loans in NJ Only				
During x OTSC	0.969 (0.182)	0.816 (0.179)	1.308*** (0.110)	1.278*** (0.119)
Number of Loans	4068	2999	4807	3759
Observations	20,384	15,487	43,021	34,937
<u>Includes</u>				
Controls	No	Yes	No	Yes

Source: CTS data December 2009 - July 2012. Conditional on loan being delinquent as of the first period (December 2009). Notes: Hazard rates presented for panel. Robust standard errors clustered at the loan-level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ Each observation is a loan-month.

All models include MSA fixed effects. Controls include home value (log), FICO score quartiles, borrower race, loan amount (log), interest rate, and an ARM indicator. $NJ = 1$ if the loan is in New Jersey. $OTSC = 1$ if the lender was subject to the OTSC in any state. $During = 1$ if the loan-month was during the moratorium period. Panel A provides the DDD estimator, Panel B provides a DD estimator across states within OTSC lenders, Panel C provides a DD estimator across lenders within New Jersey.

Table 8—: Hazard: The Moratorium Sped Up Cure Rates More for Higher FICO Borrowers

Dependent Variable: Cure				
	FICO \geq 690		FICO<690	
	(1)	(2)	(3)	(4)
Panel A, DDD: All Loans				
During x NJ x OTSC	1.950*** (0.291)	1.788*** (0.303)	1.255* (0.168)	1.218 (0.178)
Number of Loans	15,726	11,259	12,728	10,599
Observations	66,404	50,729	123,106	103,956
Panel B, DD: OTSC Only				
During x NJ	1.589*** (0.175)	1.629*** (0.193)	1.106 (0.124)	1.043 (0.130)
Number of Loans	5,977	4,767	4,139	3,367
Observations	19,750	15,907	38,623	31,636
Panel C, DD: Loans in NJ Only				
During x OTSC	1.742*** (0.196)	1.782*** (0.215)	1.109 (0.123)	1.078 (0.133)
Number of Loans	4,826	3,851	3,928	3,225
Observations	19,510	15,583	37,394	30,961
<u>Includes</u>				
Controls	No	Yes	No	Yes

Source: CTS data December 2009 - July 2012. Conditional on loan being delinquent as of the first period (December 2009). Notes: Hazard rates presented for panel. Robust standard errors clustered at the loan-level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ Each observation is a loan-month.

All models include MSA fixed effects. Controls include home value (log), FICO score quartiles, borrower race, loan amount (log), interest rate, and an ARM indicator. $NJ = 1$ if the loan is in New Jersey. $OTSC = 1$ if the lender was subject to the OTSC in any state. $During = 1$ if the loan-month was during the moratorium period. Panel A provides the DDD estimator, Panel B provides a DD estimator across states within OTSC lenders, Panel C provides a DD estimator across lenders within New Jersey.

Table 9—: Modifications During the Moratorium were not Different than those Before or After

Dependent Variable	Payment Change	Balance Change	6-Month Re-default	12-Month Re-default				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A, DDD: All Loans								
During x NJ x OTSC	0.0353 (0.0575)	-0.0065 (0.0942)	4.5999 (13.0504)	11.2384 (18.2043)	0.0004 (0.0873)	0.0578 (0.1394)	0.0416 (0.1048)	0.0274 (0.1695)
Observations	2,245	696	2245	696	2053	692	1863	684
Panel B, DD: OTSC Only								
During x NJ	0.0319 (0.0430)	-0.1338 (0.1498)	15.2834* (9.1886)	30.7208 (24.7740)	-0.0660 (0.0572)	-0.2034 (0.2375)	-0.0357 (0.0819)	-0.4170* (0.2437)
Observations	1,079	452	1079	452	992	451	910	445
Panel C, DD: Loans in NJ Only								
During x OTSC	0.0208 (0.0525)	0.0733 (0.0877)	-0.5675 (12.0343)	6.7883 (18.0247)	-0.1208 (0.0830)	-0.1273 (0.1299)	-0.0298 (0.0983)	-0.1394 (0.1606)
Observations	721	238	721	238	669	237	601	233
Includes								
Controls	No	Yes	No	Yes	No	Yes	No	Yes
State Fixed Effects	No	Yes	No	Yes	No	Yes	No	Yes
Service Fixed Effects	No	Yes	No	Yes	No	Yes	No	Yes

Source: CTS data reshaped to a cross section of modified loans from December 2009 - July 2012. Notes: All models are OLS regressions, where payment change and balance change are pre and post modification. Re-default follows the loan for an additional 6 or 12 months, and equals one of the loan became at least 60 days behind after receiving a modification and 0 otherwise. Each observation is a cross section of modified loans. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Robust standard errors in parentheses. All models include MSA fixed effects. Controls include home value (log), FICO score quartiles, borrower race, loan amount (log), interest rate and ARM indicator. $NJ = 1$ if the loan is in New Jersey OTSC=1 if the lender was subject to the OTSC in any state. During=1 if the loan-month was during the moratorium period. Panel A provides the DDD estimator, Panel B provides a DD estimator across states within OTSC lenders, Panel C provides a DD estimator across lenders within New Jersey.

Table 10—: Hazard: The Moratorium Sped Up Self Cure Rates

Dependent Variable: Self Cure		
	(1)	(2)
Panel A, DDD: All Loans		
During x NJ x OTSC	1.471*** (0.189)	1.260* (0.175)
Number of Loans	28,448	21,858
Observations	262,546	214,377
Panel B, DD: OTSC Only		
During x NJ	2.049*** (0.201)	1.855*** (0.193)
Number of Loans	10412	7891
Observations	76,189	60,906
Panel C, DD: Loans in NJ Only		
During x OTSC	1.861*** (0.178)	1.898*** (0.194)
Number of Loans	8,752	6,665
Observations	76,928	61,274
<u>Includes</u>		
Controls	No	Yes

Source: CTS data December 2009 - July 2012. Conditional on loan being delinquent as of the first period (December 2009). Notes: Hazard rates presented with robust standard errors clustered at the loan-level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ Each observation is a loan-month. Self cures are defined as loans that went from delinquent to current without a modification. All models include MSA fixed effects. Controls include home value (log), FICO score quartiles, borrower race, loan amount (log), interest rate, and an ARM indicator. $NJ = 1$ if the loan is in NJ. $OTSC = 1$ if the lender was subject to the OTSC in any state. $During = 1$ if the loan-month was during the moratorium period.

Panel A provides the DDD estimator, Panel B provides a DD estimator across states within OTSC lenders, Panel C provides a DD estimator across lenders within New Jersey.

Table 11—: Hazard: The Moratorium Did Not Change Loss Mitigation Rates

Dependent Variable: Loss Mitigation		
	(1)	(2)
Panel A, DDD: All Loans		
During x NJ x OTSC	0.561 (0.275)	0.639 (0.340)
Number of Loans	28448	21856
Observations	626,498	484,184
Panel B, DD: OTSC Only		
During x NJ	0.572 (0.274)	0.668 (0.350)
Number of Loans	9340	12133
Observations	209,875	157,732
Panel C, DD: Loans in NJ Only		
During x OTSC	0.624 (0.289)	0.596 (0.303)
Number of Loans	8,752	6,664
Observations	188,825	144,142
<u>Includes</u>		
Controls	No	Yes

Source: CTS data December 2009 - July 2012. Conditional on loan being delinquent as of the first period (December 2009). Notes: Hazard rates presented with robust standard errors clustered at the loan-level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ Each observation is a loan-month. Repurchases are defined as loans that went from delinquent to loss mitigation in the given period. Loss mitigation does NOT include modifications. All models include MSA fixed effects. Controls include home value (log), FICO score quartiles, borrower race, loan amount (log), interest rate, and an ARM indicator. $NJ = 1$ if the loan is in New Jersey. $OTSC=1$ if the lender was subject to the OTSC in any state. $During=1$ if the loan-month was during the moratorium period. Panel A provides the DDD estimator, Panel B provides a DD estimator across states within OTSC lenders, Panel C provides a DD estimator across lenders within New Jersey.

Table 12—: Foreclosure Filings and Repossessions (REO) 3 Years After OTSC Announced (December 2013)

	Ever REO		Ever Foreclose	
	(1)	(2)	(3)	(4)
OTSC x NJ	-0.00487 (0.00581)	0.000359 (0.00688)	-0.0105 (0.0143)	-0.0125 (0.0148)
OTSC Servicer	-0.00693** (0.00317)	-0.00577 (0.00369)	-0.0529*** (0.00779)	-0.0284*** (0.00793)
Loan in NJ	0.00628* (0.00364)	0.00645 (0.00417)	0.00727 (0.00830)	0.0250*** (0.00866)
<u>Includes</u>				
Controls	No	Yes	No	Yes
Observations	24255	18692	24255	18692

Source: CTS data reshaped to a cross section of loans that were active during the moratorium, followed for up to 3 years after the moratorium commenced. Data spans December 2010 - December 2013.

Notes: OLS for last observed month. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ Robust standard errors in parentheses. Each observation is a cross section of loans in their final period, where data spans December 2013. All models include MSA fixed effects. Controls include home value (log), FICO score quartiles, borrower race, loan amount (log), interest rate, and an ARM indicator. OTSC x New Jersey equals one if the loan was serviced by a servicer subject to the moratorium and active in NJ. MSA dummies are also included in all models. $NJ = 1$ if the loan is in New Jersey and zero otherwise. OTSC=1 if the servicer was subject to the moratorium in any state and zero otherwise. During=1 if the month, year pairing was during the moratorium period and zero otherwise.

Table 13—: Hazard: The Moratorium Sped Up Cure Rates and Reduced Delinquencies More for Democratic-Voting Counties in New Jersey

	Democratic County		Republican County	
	(1)	(2)	(3)	(4)
Panel A, DD: Hazard Cures, Loans in NJ Only				
During x OTSC	1.589*** (0.180)	1.355** (0.166)	1.058 (0.114)	1.103 (0.131)
Number of Loans	3880	2898	4871	3766
Observations	19896	15225	37007	29975
Panel B, DD: Hazard Modifications, Loans in NJ Only				
During x OTSC	0.920 (0.220)	0.943 (0.245)	1.026 (0.201)	0.942 (0.206)
Number of Loans	3880	2899	4871	3766
Observations	71972	53170	88378	67911
<u>Includes</u>				
Controls	No	Yes	No	Yes

Source: CTS data December 2009 - July 2012. Conditional on loan being delinquent as of the first period (December 2009). Notes: Hazard rates presented with robust standard errors clustered at the loan-level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ Each observation is a loan-month. All models include MSA fixed effects. Controls include home value (log), FICO score quartiles, borrower race, loan amount (log), interest rate, and an ARM indicator. OTSC=1 if the lender was subject to the OTSC in any state. During=1 if the loan-month was during the moratorium period. All estimates provide a DD estimator across lenders within New Jersey.

Table 14—: The Moratorium Did Not Change House Prices

Dependent Variable = $HPI_{z,t}$ in (000s)		
	(1)	(2)
NJ	-128.6166*	66.4099
	(37.7611)	(61.9284)
During × NJ	-8.6399	-8.0354
	(3.9119)	(5.3062)
ZIP Codes	1111	1111
Observations	66981	66981
<u>Includes</u>		
MSA Fixed Effects	Yes	No
County Fixed Effects	No	Yes
Month Fixed Effects	Yes	Yes

Source: Zillow Home Value Index data by ZIP code, month December 2006 - July 2012. Any OTSC loans from CTS data and determined monthly at the ZIP code level. Notes: Least squares model presented with robust standard errors clustered by the month-by-year level in parenthesis.* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ Each observation is a ZIP code by month. During=1 if the time period was during the moratorium. Total Loans is the total number of loans in the ZIP code for that given month.

X. Appendix

Table 15—: National Timeline Foreclosure Procedural Problems by Lender

Bank of America	
Oct. 8, 2010	Bank of American Home Loans announced a freeze on foreclosure sales, pending a review of foreclosure documents in all 50 states
Oct. 18, 2010	Bank of America Home Loans announced that it would resubmit affidavits in 102,000 foreclosure actions in judicial states and proceed to resume filings
JPMorgan Chase	
Sep 30, 2010	Announced a suspension of foreclosures in all judicial states, pending a review of procedures
Early Nov 2010	Announced that it would begin re-filing foreclosures
Citi Residential	
Nov 18, 2010	Managing director of Citi Mortgage informed the House Financial Services Committee that Citi initiated review of 10,000 affidavits
Ally Financial (GMAC)	
Sep-10	Announced a temporary freeze on evictions in judicial states, citing “an important but technical defect in filings
Wells Fargo	
Oct. 27, 2010	Wells announced that it would submit supplemental affidavits for approximately 55,000 foreclosures in all judicial states

Source: New Jersey Department of Justice

Table 16—: Hazard: Verifying the Pre-trends Assumptions

Dependent Variable	Cure		Modification	
	(1)	(2)	(3)	(4)
Panel A, DDD: OTSC in NJ				
$OTSC \times NJ \times 2009_{q4}$	1.020 (0.0185)	1.040* (0.0214)	1.006 (0.0927)	0.946 (0.0957)
$OTSC \times NJ \times 2010_{q1}$	1.162 (0.163)	1.003 (0.160)	0.628* (0.162)	0.775 (0.215)
$OTSC \times NJ \times 2010_{q3}$	1.190 (0.189)	1.213 (0.220)	0.893 (0.215)	0.921 (0.243)
$OTSC \times NJ \times 2010_{q4}$	0.930 (0.179)	0.934 (0.196)	1.067 (0.289)	1.054 (0.318)
Observations	121915	99307	297168	227651
Panel B, DD: OTSC Only				
$NJ \times 2009_{q4}$	0.800* (0.108)	0.828 (0.129)	1.329 (0.304)	1.182 (0.299)
$NJ \times 2010_{q1}$	0.860 (0.152)	0.787 (0.160)	0.885 (0.263)	1.056 (0.346)
$NJ \times 2010_{q2}$	0.964 (0.177)	1.002 (0.209)	1.379 (0.379)	1.694* (0.506)
$NJ \times 2010_{q4}$	0.831 (0.178)	0.883 (0.210)	1.028 (0.303)	0.783 (0.257)
Observations	34741	27348	99891	73788
Panel C, DD: Loans in NJ Only				
$OTSC \times 2009_{q4}$	1.048 (0.135)	0.990 (0.147)	0.749 (0.163)	0.753 (0.178)
$OTSC \times 2010_{q1}$	1.105 (0.190)	0.995 (0.197)	0.766 (0.233)	0.866 (0.284)
$OTSC \times 2010_{q2}$	0.964 (0.169)	0.959 (0.190)	1.215 (0.346)	1.404 (0.435)
$OTSC \times 2010_{q4}$	0.767 (0.156)	0.775 (0.175)	0.961 (0.293)	1.071 (0.362)
Observations	37063	29476	90645	68652
Includes				
Controls	No	Yes	No	Yes

Source: CTS data December 2009 - December 2010. Conditional on loan being delinquent as of the first period (December 2009). Notes: Hazard rates presented for panel with robust standard errors clustered at the loan-level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ Each observation is a loan-month. All models include MSA fixed effects. Controls include home value (log), FICO score quartiles, borrower race, loan amount (log), interest rate, and an ARM indicator. $NJ = 1$ if the loan is in NJ. $OTSC=1$ if the lender was subject to the OTSC in any state. $Post=1$ if the loan-month was during or after the moratorium period. Panel A provides the DDD estimator, Panel B provides a DD estimator across states within OTSC lenders, Panel C provides a DD estimator across lenders within New Jersey. Combines the period during and the period after the moratorium.