Mortgage Moratoria, Foreclosure Delays, Moral Hazard and Willingness to Repay

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Abstract

In the midst of the housing crisis that started in 2008, some policymakers called for a freeze on foreclosure filings. Yet, any remedy that relieves borrowers of the sanction of losing their home runs the risk of distorting borrower behavior in favor of default. Using an 8 month moratorium for large 6 lenders in New Jersey, this paper shows that this moratorium did not increase mortgage payment delinquencies for impacted loans or across the state in general. In fact, we find the opposite, with borrowers in default more likely to make payments during (and after) the moratorium. Two factors appear to underlie this behavior. First, the moratorium lengthened the timeframe for borrowers for form expectations about increasing house prices and their ability to acquire liquidity for future payments. Second, as borrower confidence in the legal process increased, they were more willing to make payments to lenders. This foreclosure moratorium appears to be associated with lower repossessions of homes up to three years after it began. This finding highlights the importance of the how borrowers perceive the role of courts in the enforcement of contract provisions, especially related to lenders repossessing property. A borrower who lacks trust in due process may be less willing to cooperate with their lender and make payments.

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1 Introduction

Mortgages are contracts where borrowers pledge their property as collateral for a loan from a lender. The process of a lender taking of a property in the case of default has a long established process in the law, dating back to English Common Law and Roman Law. Repossessing property improperly is a form of theft, and legal regimes have evolved to balance the rights of the borrower while protecting lenders the lender's right to enforce the mortgage contract. Periodically, courts or public policies weaken the ability of lenders to repossess property. This, too, has a long historic precedent, where foreclosures are suspended in times of war or natural disaster. Indeed, in the United States during the Great Depression, 27 states, especially those with high proportions of agricultural property, imposed some form of a moratorium on mortgage foreclosures.

In the late 2000s, courts implemented various forms of foreclosure moratoria, but not due to a natural disaster. Courts were overwhelmed by the volume of cases in which lenders were not following legal due process for foreclosure cases.[2] By October 2010, 61 percent of respondents to a Washington Post online poll viewed a national moratorium as a 'good idea', although there was no push for a change in policy. New Jersey, however, implemented a substantive moratorium. Courts in the state implemented what turned into an 8 month moratorium on foreclosures targeted to just 6 servicers in the first half of 2011.

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 to make payments will decide to stop at least for the duration of the moratorium' (MBA 2010). Assuming borrowers make rational inferences on the costs and benefits of missing payments, and the benefits exceed the costs, the prediction of added defaults seems reasonable given the costs of default remain lower than the benefits of current consumption of mortgage payments. The industry further predicted that borrowers would fail to catch up and be able to become current again, worsening an already bleak situation for borrowers in financial trouble(MBA 2010).

However, we document that the moratorium actually did not result in increased defaults, but rather was associated with increased rates of borrowers in default *making payments*. We observe no changes in lender behavior related to offering borrowers more generous terms due

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[2]See National Council of State Legislatures (2011) report for more details on court responses.

to the moratorium. Borrowers who were delinquent before the moratorium began were more likely to pay and pay more relative to their loan size during the moratorium period if they were subject to the moratorium compared to loans with the same lenders in nearby states as well as other lenders not subject to the moratorium within the same state.

This presents a potentially curious finding. The moral hazard incentive is not strong enough to encourage defaults among borrowers who are current, likely since the long run costs of default are high. But the fact that borrowers who are behind, and face low marginal costs of missing another payment, actually repay at higher rates suggests that the moratorium shifted how borrowers considered the net present value of their home and mortgage. 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 form expectations of future house prices and their ability to access liquidity for future payments. Given more time periods, borrowers were more likely to believe home values were stabilizing and more willing to make payments towards their property in expectation of greater returns later. However, this would suggest lenders might regularly grant more time to borrowers in order to facilitate repayments, if indeed 'more time' systematically induced borrowers in default to start making payments. But more time in itself might not lead to repayments, since the borrower likely fears that he may still lose the property in the end through the foreclosure process. If borrowers do not trust the courts and legal process to protect their interests, they may perceive the net present value of retaining the home was lower and then be unlikely to make payments. The imposition of the moratorium may have signaled to borrowers that their legal rights would be respected during foreclosure—making a capricious takings by mistrusted lenders less likely.

The remainder of the paper begins with background on the legal process surrounding foreclosures and explains the foreclosure moratorium in New Jersey. The following section (Section 4) reviews the methods used and the data from which we empirically test the impact of the moratorium on borrower behaviors. We then explain the empirical framework based on the natural experiment used for this analysis (Section 5) . Finally, in Section 6 we discuss the results of the models and in Section 7 we provide further discussion of this work and its implications for research and policy.

2   Background

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." (Martin 2011) Policymakers struggled to respond as the volume of people losing their homes to repossessions by lenders.

Federal policy responses to the housing crisis have included the Home Affordable Modification Program (HAMP), counseling hotlines, and other attempts to facilitate borrowers to seek out alternatives to foreclosure. In judicial foreclosure procedure states, where the courts to adjudicate foreclosures filings through a legal hearing, courts experienced a large increase in foreclosure case filings. Reports began to surface shortly after the boom in foreclosures that lender legal filings failed to follow proper procedures, made errors and even falsified missing documents. Concerns about due process coalesced into calls for a moratorium on foreclosure cases in courts.[3] There was even a call for a national level moratorium, though the Obama Administration rejected this proposal (Bohan and Daly 2010).[4] In the past, policymakers have initiated moratoria in cases of natural disasters, such as in the aftermath of Hurricanes Katrina, Rita, and Wilma.[5]

2.1   New Jersey Foreclosure Moratorium: Order to Show Just Cause

New Jersey, like 24 other states, requires lenders to go to court to present a legal case to prove the borrower is in breech 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 a series of steps to engage the borrower including requiring at a minimum each of these 5 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;

2. Service of Complaint Filing— the legal filing defining the violation(s) of the terms of mortgage contract;

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[3] For example, see "California Activists Call for Foreclosure Moratorium" in DSNEWS.com (2011). See Pierce and Tan (2007) for more on specific recent state policies and policy proposals.

[4] For a review the legal process of imposing a moratoria see Zacks (2012)

[5] Almost 30 years ago, Alston (1984) studied mortgage moratorium legislation within the specific context of farm foreclosures during the 1980s farm crisis. More recently, Wheelock (2008) summarized approaches used during the Great Depression, and Davis (2006) studied foreclosure moratoria for borrowers in areas harmed by hurricanes Katrina, Rita, and Wilma.

3. Default Notice —informs borrower that the mortgage contract is in breech and is required to appear to contest the dispute in court;

4. Notice to Right to Cure—informs the borrower that payments can re-instate 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 (or REO) by the bank.

Each of these filings must be delivered at specified time intervals using certified mail. Lenders are required to make efforts to locate borrowers and show evidence borrowers received each document. Lenders are also required to organize 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 . Lenders are expected to provide signed mortgage documents with the terms of the contract. In judicial states the lender files these documents with the court but borrowers are accountable to object to any documents or processes that were not accurate or complete as part of the foreclosure hearing.

In the summer of 2010 the national media covered stories of mortgage loan servicers using questionable methods in serving foreclosure filings, including hiring firms to sign court documents with almost no 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 pending repossessions scheduled under prior filings. Media and political attention focused on problems with foreclosure filing procedures from mid-summer through fall of 2010, although by November, lenders had generally resumed foreclosure and repossession processes.

In New Jersey, however, a small number of 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 over 29,000 of the 65,000 foreclosure filings in 2010 in the state. On November 4, 2010, the Chief Justice for the State

Supreme Court received a report on foreclosure document preparation and filing practices by these lenders prepared by Legal Services of New Jersey. On December 20, 2010, Administrative Order 01-2010 created a moratorium on new foreclosure filings by these lenders2010. Cheif Justice Rabner stated (2010) :

> 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 Plantiffs". The OTSC took effect on December 20, 2010 and applied to 6 lenders only.

Under a recommended stipulation proposed by the Court on March 18, 2011, the 6 targeted lenders were required to file OTSC documentation by April 1, 2011 demonstrating that their foreclosure practices were in compliance with the Court. On May 26, 2011 each lender replied to the Court, with the Court then promising a future court order to each lender that would allow that lender to proceed with foreclosure fillings and repossessions through the normal judicial process. Five of the 6 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 1 for a timeline).

The Court was not intending for the OTSC as a moratorium period for borrowers to catch up on payments, but rather make sure that proper legal processes were being followed (Portlock 2011).[6] However, people who defaulted on their mortgages in 2010 could have reasonably expected, on average, to stay in their homes for almost 20 months in New Jersey (a similar time frame as nearby judicial foreclosure states). When the OTSC was announced, borrowers with effected loans could have expected an extended foreclosure process, although the court did not place a firm timeline on when foreclosures might resume for each lender until August 2011.

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[6]Kraus (2011) 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.

The experience of New Jersey, the fact that only a subset of lenders are impacted, and that the same lenders were active in similar housing markets in neighboring states provides a unique opportunity to test borrower payment behavior during a foreclosure moratorium. 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. Figure 2 shows the metropolitan areas we use in this study.[7]

By using Metropolitan Statistical Areas (MSAs) in New Jersey that overlap into bordering states without any moratoria, we can study the effects of the OTSC moratorium. Comparing MSAs within New Jersey, as well as lenders that were and were not subject to the OTSC moratorium over time, provides a natural setting for a difference-in-difference-in-difference (DDD) analysis.

3 Theoretical Predictions

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

1. Introduce a dis-incentive for payment, especially among borrowers already in default who have low marginal costs of one more missed payment;

2. Increase the time 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.

3.1 Moral Hazard

When borrowers are released from the immediate consequence of the legal process of foreclosure, the costs of default are lowered. The OTSC could drive borrowers re-assess 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

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[7]We use 3 metropolitan areas in New Jersey that share a border with another state: AllentownBethlehemEaston (PA-NJ), New York-Newark-Jersey City (NY-NJ-PA) and PhiladelphiaCamdenWilmington (PA-NJ-DE)

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 to the lender of default are also increased. The borrower has to assess how long they can remain in the home if they do and do 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 3 or more years (Boot and Thakor 1994). 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, Zhu and Pace (2010) find that states with longer foreclosure process also have increased probabilities of borrower default. The authors show borrowers behave as if they are seeking to maximize the time from the first missed payment to repossession, or the period of "free rent." Gerardi *et al.* (2012), use 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. Collins *et al.* (2011) finds that judicial foreclosure requirements across states create incentives for borrowers and lenders to engage in a mortgage modifications, but has no direct effects on foreclosures. Each of these studies use time invariant, state-by-state differences in foreclosure processes rather than a change in over time, which limits these conclusions to some extent.

3.2   Longer Time Horizon to Form Expectations

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 on the borrower.[8] Given already long foreclosure timelines and soft re-sale markets, lenders may pursue the recourse option (or at least threaten to do so) with borrowers[9]. The threat of recourse also adds an incentive for a borrower who owes more than the home is worth to delay if they expect house prices to rise (or move faster if house prices are on the decline). A longer time horizon also also increases the period over which borrowers can form expectations about their ability to

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[8]If the lender seeks a judgment, the borrower's redemption period is extended from 10 days to 6 months. The borrower can present a cash payment to return title to the property. However unlikely, this ties up the property from re-sale and may discourage lenders from exercising the recourse option.

[9]See New Jersey permanent statutes Title 2A(50) for details

access formal and informal liquidity, including adding to income or income sources. This time horizon may upwardly bias expectations such that paying in the current period is more likely (Bruine de Bruin *et al.* 2010).

From 2008 onward house price trends in the state were generally flat or declining. By late 2010 the prospects of future growth in house prices may have seemed more possible. Likewise strengthening labor markets may have lead a borrower to have increasing optimism about future liquidity and his ability to service debt. It would have been unclear to borrowers, *ex ante*, how long the moratorium would last, although the initial OTSC included a 3 month review. While a 6 month extension could have reasonably been predicted by borrowers, the full 8 months (or 9 for GMAC borrowers) would likely have been longer than expected. Payments made during the moratorium would represent positive expectations about the prospects of the mortgage and property in the future. Deferring payments would reflect more negative prospects for the future. All borrowers and lenders operated in the same housing and labor markets, however, which may suggest any variations we see across lenders and time is a result of the OTSC.

3.3 Increased Trust in Foreclosure Process

There is a robust literature on the role of trust in markets (see Glaeser *et al.* (2000) for example). But there has not been an extensive discussion 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 and 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, breech may be the optimal option (Göran and Hägg 1994). In the absence of that trust, the borrower may not be willing to make payments. By introducing strong oversight by the courts, borrower confidence or trust might be increased under the OTSC.

Tyler (2001) shows over 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 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. Casas-Arce and Saiz (2010) argue that judicial systems may in fact benefit lenders overall, despite longer times through the foreclosure process. Acemoglu and Johnson (2005) demonstrates that third party oversight, such as 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 costly 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 laws, but mainly focus on the costs (and to a lesser extent benefits) of borrower rights in the foreclosure process. For example, Calomiris and Higgins (2010) discusses the costs of delayed foreclosures, but not the role of legal rights in re-assuring borrowers about the process. Gerardi *et al.* (2012) suggests that states that offer more legal rights to borrowers may also improve borrower confidence in the mortgage contract, but they make no assertions about how that changes borrower behavior.

This paper is unique in that there is a shift in state policy which plausibly could be related to how the borrower views the likelihood of receiving fair treatment in the foreclosure process. Borrowers, especially those who are working with a lender 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.

4   Empirical Methods

We empirically evaluate the effect of the OTSC moratorium on borrower behavior using comparisons across time, lenders and geography. Figure 1 shows the timeline of the OTSC by the state Court. The key period is December 2010 to August 2011, when the court refused to proceed on any foreclosure filing from the 6 targeted lenders. This period was just after the conclusion of a national controversy related to most of these same lenders, which received wide media attention (see Appendix for more details). The OTSC was announced by the court in early December; this would leave January 2011 as the first month to see effects on the next mortgage payment due. Comparing Figures 2 and 3, it is clear the rate of foreclosure filings dropped in the state of New Jersey during the OTSC.

This analysis uses the state of New Jersey as well as the MSAs that overlap with surrounding states. We can compare loans in New Jersey to loans in neighboring states within the New York City-Newark-Edison MSA, Allenton-Bethlehem-Easton MSA, Philadelphia-Camden-Wilmington MSA.[10] This is helpful for creating more homogeneous regions to test for the effects of the OTSC. Other studies have found a high degree of heterogeneity in mortgage default by geographic location (Agarwal *et al.* 2010; Cordell *et al.* 2009; Foote *et al.* 2008).

We employ the difference-in-differences strategy in the following equation:

$$
\begin{aligned}
Y_{i,s,t} \; = \; & \alpha_0 + \beta_1 TT + \beta_2 NJ + \beta_3 TS + \gamma_1 (TT \times TS) + \gamma_2 (TT \times NJ) + \gamma_3 (NJ \times TS) \\
& + \; \delta (TT \times NJ \times TS) + \theta_1 (PTT \times TS) + \theta_2 (PTT \times NJ) + \theta_3 (PTT \times NJ \times TS) \\
& + \; \boldsymbol{\lambda X} + \eta_t + \kappa_{\mathrm{MSA}} + \epsilon
\end{aligned}
\tag{1}
$$

where TT is a dummy 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 a dummy 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 subject to the moratorium in the state. The coefficient of interest, δ, will be the difference-in-difference-in-differences (DDD) estimator in this model, estimating the effect of the OTSC. We also include PTT which is a dummy for the time period after the moratorium concludes, and interactions with the OTSC lender and state to identify any persistent effects.

In the above specification, we include time fixed effects for each month, η_t, as well as MSAfixed effects, κ_{MSA}, similar to the structure provided in the DDD model used in Chetty *et al.* (2009). Contained in $\mathbf{X}$, are loan and borrower characteristics, including log(Home Value), log(original loan value), a dummy for an adjustable rate mortgage, the interest rates, log(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.

Each loan-month is coded as being bound by the moratorium or not based on the state in

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[10]See Figure 2 for the specific locations of each of these MSAs.

which it was located and the lender being subject to OTSC. Our dependent variables include the probability of a default, the probability of a foreclosure filing and then REO, the probability of the borrower curing the loan, and and the probability and terms of any modification of the original terms of the mortgage.[11] A foreclosure filing (or start) marks the month in which formal foreclosure filings were served and remains 1 until the loan becomes REO or is cured.

There are a variety of specifications used in the mortgage performance literature, including linear probability models (LPM), hazards, multinomial logits, among others. We are not concerned about refinance or home sales as a competing risk, but rather mainly interested in borrowers making payments (or a 'cure') by any mean, versus mortgages completing foreclosure and being repossessed (REO). For most models, we only examine loans in delinquency, since borrowers of these loans both have the acute option to cure or lose the home to REO. Once either occurs, we consider that a terminal outcome, to prevent a loan from cycling between cured and default in the data (which is a rare occurrence). When we examine delinquency itself, as well as REO in the final period of observation, we use an LPM (Ai and Norton 2003). While LPMs can sometimes generate unrealistic fitted values when dependent variables are binary, they perform reasonably well in estimating the marginal effects of policies (Angrist and Pischke 2008), and also aid in the ease of interpretation. We also use a hazard model, where we begin with a sample of delinquent loans as of December 2009 and determine the rate of self-cures by borrowers. Specifically, we estimate the model in Equation 2 for these models.

$$
\begin{aligned}
logit[\lambda(Y_{i,s,t,j})] = {} & \beta_0 + \beta_1 TT_{i,s,t} + \beta_2 NJ_{i,s,j} + \beta_3 TS_{t,j} + \gamma_1(TT \times TS) + \gamma_2(TT \times NJ) \\
& \gamma_3(NJ \times TS) + \delta(TT \times NJ \times TS) + \boldsymbol{\lambda X} + \kappa_{\text{MSA}} + \epsilon
\end{aligned}
\tag{2}
$$

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.

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[11]Modifications are recorded only after any trial periods are completed and the terms are finalized.

We can confirm (1) and (2) are likely to be valid from the data (pre-post and cross-MSA trends are similar). 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 of 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.

5 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. 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.

The CTS data used in this study covers December 2009 until July 2012 (with one cross-section of December 2013 to examine long run REOs). The data are organized as a monthly panel. As loans are paid off, repossessed or sold off, the sample decreases in size. There were a

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[12] One 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.

[13] See White (2009) and Quercia et al. (2009) for more on the quality of the CTS data.

total of 28,406 loans (15,228 in New Jersey) at the start, and then 20,350 (11,027 in New Jersey) at the end of this sample. Of the 8,056 lost, 6,054 went to foreclosure, the remainder were sold, refinanced or the loan was transfered to another security. Table A (below) summarizes the loan count as of November 2010, just before the start of the OTSC moratorium. The sample is dominated by the very large New York MSA, but that group still has a large number of loans in New Jersey, including loans by OTSC lenders. The Philadelphia subgroup includes 3 additional states (Delaware, Maryland and Pennsylvania). The Allentown MSA is especially sparse but also includes loans in Pennsylvania.

Table A: Number of Mortgage Loans By MSA and State
(OTSC Lender in Parenthesis)

MSA	DE	MD	NJ	NY	PA	Total
Allentown	-	-	97[35]	-	538[163]	635[198]
New York	-	-	6,629[2,135]	13,697[4,345]	-	20,326[6,480]
Philadelphia	458[131]	82[34]	924[246]	-	2,988[930]	4,452[1,341]

Source: CTS Data as of November 2010 (month prior to OTSC)

Only owner occupied, single family homes where the mortgage is the primary or first position lien are included.[14] We only include loans that active and in default by the first period of observation (one year prior to the OTSC).[15] 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 this data only as a robustness check.

We are concerned that house price changes are endogenous with both lender decisions to foreclose and borrower decisions to cure a delinquency.[16] 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 at a small area. These non-seasonally adjusted estimates offer a reasonable

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[14]See Piskorski and Vig (2010) for a discussion of the role of securitization on lender behavior.

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

[16]See Frame (2010) for a review of the correlations between foreclosures and home values.

mechanism to calculate parcel level changes in home values since 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 each MSA has identical housing market characteristics.

Table B, below, shows the states used in this study and the estimated approximate percentage decline in home values among these CTS loans since the loan was first made. This is suggestive that a significant portion of borrowers may now hold mortgages worth more than their home. This puts them in an 'underwater' equity position with a loan to value (LTV) ratio that exceeds 1. This situation increases the odds that a borrower will exercise his default option and not make payments or cure a delinquency.

Table B: Decline in Home Values

(since Origination by State)

State	Origination	Dec 2010	Pct 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: CTS and Zillow Data

Table 1 presents summary statistics as of December of 2009, the first period in which we follow loans, conditional on 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 show high shares of racial minorities. It is clear lenders subject to OTSC have statistically different portfolios—this might result in differential cures, defaults and REOs. The differences-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.

Table 2 shows loans in New Jersey and border areas as of the start of the OTSC and at the conclusion of the OTSC. About 15 percent of OTSC loans in New Jersey cure by the end of the moratorium. This is slightly higher than loans by OTSC lenders outside the state (14 percent), but lower than cure rates by non-OTSC lenders in the state (10 percent). Borrowers appear more likely to make payments to OTSC lenders, within and across states, but less likely to receive a loan modification. OTSC lenders in New Jersey are less likely to repossess homes (REO), largely due to the moratorium itself barring such activity. However, as shown in Table 1, loans subject to the OTSC moratorium tend to have lower risk factors such as delinquency and credit score. Thus the simple means shown in this table likely fail to capture important factors that could explain delinquency, foreclosure and modifications. The DDD framework provides a more robust estimate.

6 Results

Tables 3 through 8 use the same basic difference-in-difference-in-differences (DDD, hereafter) estimates, displaying the marginal effect of the δ estimate in Equation 1. Each table includes estimates during the OTSC moratorium, compared to before and after the moratorium. Most estimates include columns of estimates replicated with loan-level controls for home value, FICO score, minority race status, loan amount(log), interest rate, ARM, in addition to month and MSA fixed effects, as discussed in the prior section.

Table 3 begins with an LPM model to estimate loan defaults, where a loan can be in default in any loan-month (default defined as 60 days, or two payments, late). Here, *unlike* in most of the other estimates, *all loans* are included (not just delinquent loans). These estimates confirm there is no increase in defaults among OTSC loans relative to the pre-period or the post-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.

Table 4 switches to a hazard specification where borrowers with delinquent loans start to make payments again. These 'cures' are set up as a terminal state, such that a borrower who goes from delinquent to making a payment is then dropped from the sample. 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. 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 estimated ratios show relatively large effects of the moratorium on delinquent borrowers catching up, with approximately 21 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 modifying a loan could be less 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 marginally significant and do not hold up within the DD comparisons. It seems unlikely modifications are mechanically driving loan cures. Borrowers appear to be more likely to make payments during the OTSC period.

Table 5 replicates Table 4 but showing positive effects of the moratorium on cures for OTSC covered loans in New Jersey during and after the OTSC took effect, relative to before the court made the ruling. The effect sizes are similar in magnitude as the prior table. The DD holds for OTSC lenders within MSAs across states, but not across OTSC and non-OTSC lenders within the state. This implies borrowers were more likely to make payments to OTSC lenders after the court imposed its additional oversight and not just during the moratorium. This is consistent with borrowers perceiving this ruling as assurance that their payments would 'count' and their rights would be protected in the judicial foreclosure process. It does not provide strong evidence (although coefficients are the appropriate direction) that borrowers with other lenders in New Jersey shifted their rate of repayment due to an overall increase in the foreclosure process in the state. It is possible the 6 targeted lenders, all of whom were subject to negative press and regulatory scrutiny over the prior year, had weakened levels of perceived trust by borrowers, relative to other lenders. The OTSC provided and external, court imposed, oversight that may

have shifted borrower perceptions.

Table 6 shows the same types of estimates, 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 loan. About 31 percent of mortgage loans in the data were larger than the estimated value of the home 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 home given expectations about the foreclosure process.

Like Table 6, Table 7 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 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 significant. 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. Table 8 combines the two subgroups described above, showing that high FICO and high LTV—that is borrowers with good credit but underwater loans— are most responsive in terms of relative hazard rates during the moratorium among OTSC lenders in New Jersey.

Following up on the potential problem of lenders offering modifications resulting in loan

repayments among OTSC covered loans, Table 9 shows the terms of loan modifications by type of lender using the same DDD and DD strategies as the prior tables. 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.

Finally, Table 10 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. The dependent variables here are a loan going to repossession, or REO, as well as if a foreclosure action was ever filed with the court. In a post period cross section we can only estimate DD models (since all are expose to the same time periods). It appears that OTSC-covered loans in New Jersey, compared to all OTSC loans or all loans in New Jersey, are actually less likely to experience a repossession. 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.

Overall, we find that delinquencies remain unchanged for OTSC-covered loans during and after the OTSC moratorium. This specification is robust to including individual borrower-level controls in column and suggests borrowers are still paying even during to the moratorium. Borrowers are more likely to pay their mortgage after the OTSC is implemented among targeted lenders. These effects do not appear to be driven by mortgage modifications, or more generous repayment terms. It is feasible that some borrowers were actually able to "catch up" during this period given the added time offered by the moratorium. It seems at least partially plausible that the court's actions under the OTSC functioned to reassure borrowers that payments on the loan would not be captured by capricious lenders through a sloppy legal processes.

7   Conclusions

The financial industry predicted borrowers in default would stop working with their loan servicer, reducing the cure rate among defaulted loans during a foreclosure moratorium. We do not find patterns consistent with such moral hazard. Instead we find evidence borrowers behaved as if the OTSC increased their willingness to make payments on otherwise troubled

loans.

A foreclosure moratorium extends the foreclosure process for targeted borrowers and lenders. We find that relative to border areas and non-covered lenders, the New Jersey moratorium resulted in rising repayments among borrowers in default, which continued after the OTSC concluded. 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 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 payment delinquencies. The OTSC moratorium on foreclosures may even be associated with lowering foreclosure filings by targeted lenders and keeping people in their homes, at least up to 3 years after the OTSC was released. Lower rates of home repossessions was not the goal of the court in implementing the moratorium, but may be instructive to policymakers concerned about foreclosures.

The lengthened timeframe for borrowers to repay under the moratorium could influence borrower expectations about future house prices future ability to acquire liquidity. Borrowers may also gain confidence in the legal process through the OTSC. Both of these factors could make borrowers more willing to make payments.

To the extent borrowers are making payments based on an enhanced trust of the legal process, these results underscore the importance of the enforcement of contract provisions 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 their 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, and how repayment patterns will respond.

Several caveats are worth noting. First, the New Jersey moratorium focused on 6 large lenders, all with relatively low default rates and strongly negative public attention on shoddy 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 these lenders could have predicted with precision when the moratorium would begin—or even if it would begin—or when it would end. But 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. That such a strategy could be achieved at scale (and limited to New Jersey) does not seem likely, however.

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 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 case. Unfortunately we cannot observe any of these processes

This moratorium was criticized on several grounds, including this 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 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 coming years. Although lenders may find that the net costs of foreclosures could be lowered if borrowers are more likely to cure with strong court oversight.

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8   Tables and Figures

Figure 1: Timeline: NJ Foreclosure
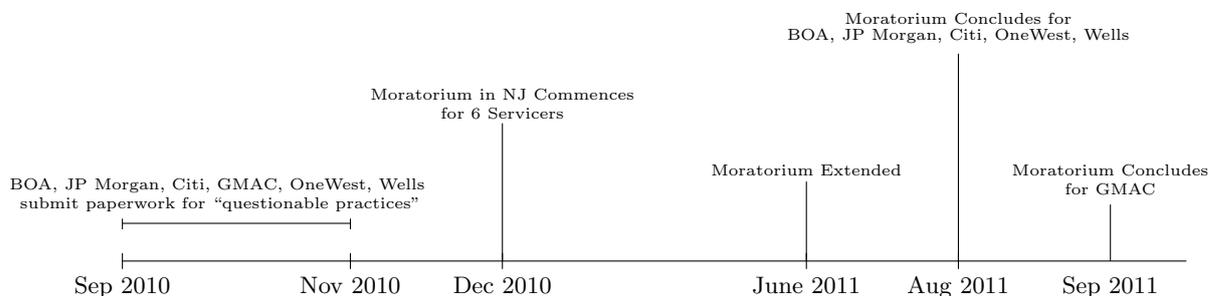
Table 1: Summary Statistics for Delinquent Loans: By Location and Lender Type

	Border	NJ	Control Lender	OTSC Lender	Total
ARM Indicator	0.569	0.645***	0.491***	0.564	0.592
	(0.4952)	(0.4784)	(0.4999)	(0.4960)	(0.4914)
Interest Rate	6.459	6.388***	6.060	5.997	6.437
	(1.4834)	(1.5577)	(1.5068)	(1.4597)	(1.7786)
Home Value (thousands)	607.9	448.1***	559.1	529.4	536.0
	(2617.9413)	(1790.9499)	(2396.7113)	(1757.0600)	(2441.4357)
Income (thousands)	155.4	150.5**	153.9	167.5***	150.6
	(156.0810)	(176.6812)	(162.6044)	(203.7098)	(160.9392)
Origination Year	2005.47	2005.49**	2005.48	2005.51***	2005.47
	(0.8839)	(0.8479)	(0.8731)	(0.8196)	(0.8752)
FICO (divided by 100)	6.852	6.856	6.853	6.844	6.845
	(0.7349)	(0.7271)	(0.7325)	(0.8453)	(0.7211)
Minority	0.4976	0.4844**	0.4936	0.4567***	0.5023
	(0.5000)	(0.4998)	(0.5000)	(0.4982)	(0.5000)

Notes: Means reported, standard deviations in parentheses. All means calculated for loans that were delinquent as of December 2009 for that month. ***, ** differ from each other at the 1 and 5% levels, respectively.

Figure 2: NJ and Surrounding MSAs

Legend

Overlapping MSAs

Allentown-Bethlehem-Easton, PA-NJ

New York-Newark-Jersey City, NY-NJ-PA

Philadelphia-Camden-Wilmington, PA-NJ-DE-MD
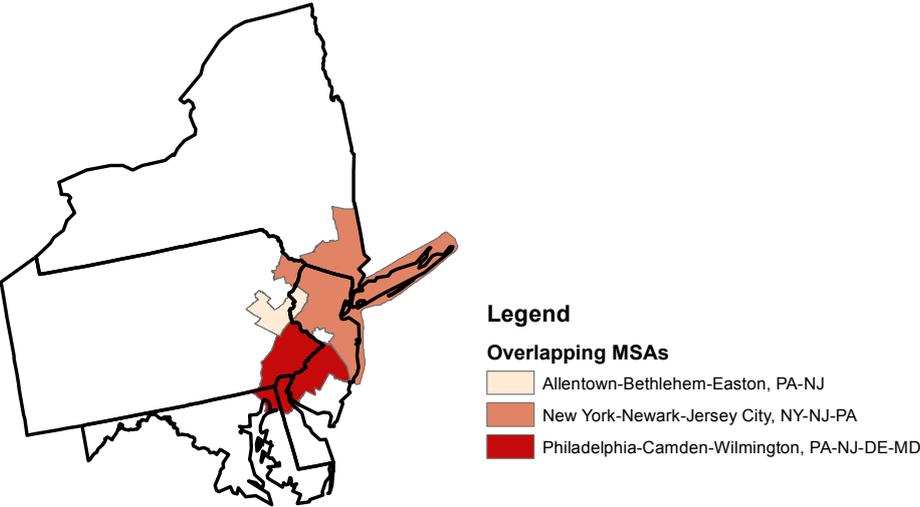
Figure 3: NJ Zip Code Level Foreclosures: November 2010

Legend
Foreclosures
- 0
- 0-5
- 5-10
- 10-20
- >20
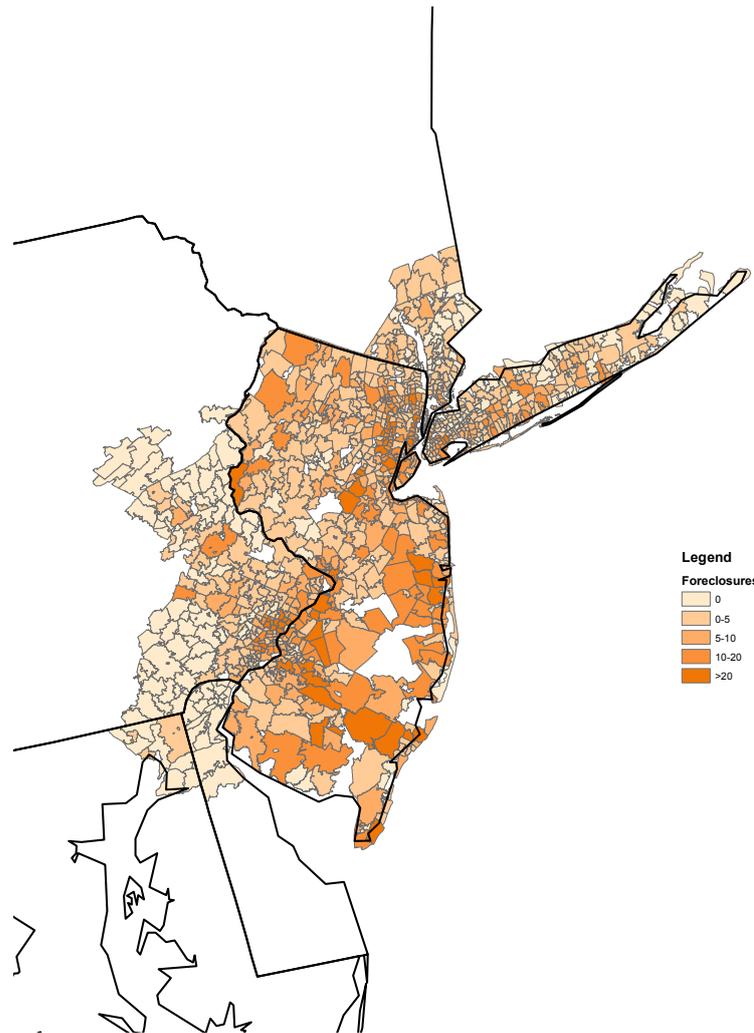
Figure 4: NJ Zip Code Level Foreclosures: February 2011

Legend
Foreclosures-Feb 2011
- 0
- 0-5
- 5-10
- 10-20
- >20
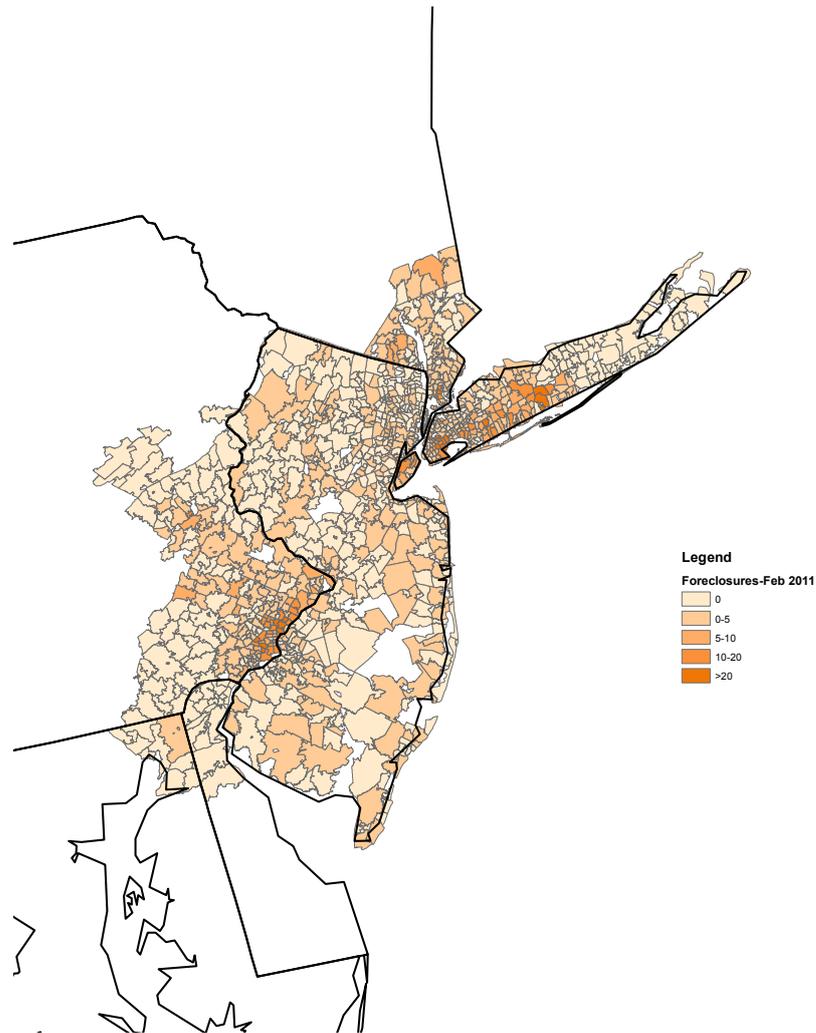
Table 2: Loan Status at Start and End of OTSC among Loans Delinquent Dec 2010

	Cure		Any Payment		Modified		REO	
	Dec2010	Sep2011	Dec2010	Sep2011	Dec2010	Sep2011	Dec2010	Sep2011
BorderxNot	-	0.23	0.53	0.54	0.21	0.39	0.05	0.04
	-	(0.42)	(0.50)	(0.50)	(0.40)	(0.49)	(0.22)	(0.20)
NJxNot	-	0.18	0.48	0.48	0.23	0.38	0.09	0.03
	-	(0.38)	(0.50)	(0.50)	(0.42)	(0.48)	(0.28)	(0.17)
BorderxOTSC	-	0.14	0.50	0.57	0.15	0.22	0.06	0.03
	-	(0.35)	(0.50)	(0.50)	(0.36)	(0.42)	(0.24)	(0.17)
NJxOTSC	-	0.15	0.49	0.53	0.15	0.25	0.10	0.03
	-	(0.35)	(0.50)	(0.50)	(0.36)	(0.43)	(0.29)	(0.18)

Source: CTS Data for start and end of OTSC period. Conditional on loan being delinquent as of December 2010. Notes: Means reported, standard deviations in parentheses. Border are loans in MSA shared with new Jersey but located outside the state. Comparison as loan by non-OTSC lenders.

Table 3: LPM: Differences in Delinquency Rates

	DDD		DD-x State		DD-x Lender	
Dependent Variable = 1 if the loan was at least 60 days behind						
	(1)	(2)	(3)	(4)	(5)	(6)
During x NJ x OTSC	-0.0050	-0.0059				
	(0.0047)	(0.0050)				
During x OTSC	-0.0277***	-0.0297***			-0.0311***	-0.0293***
	(0.0026)	(0.0028)			(0.0041)	(0.0043)
During x NJ	-0.0017	0.0034	-0.0069*	0.0037		
	(0.0028)	(0.0030)	(0.0040)	(0.0042)		
NJ	-0.0338***	-0.0223***	-0.0402***	-0.0242***		
	(0.0007)	(0.0008)	(0.0011)	(0.0012)		
OTSC	-0.0213***	-0.0234***			-0.0214***	-0.0282***
	(0.0006)	(0.0007)			(0.0011)	(0.0012)
Post x OTSC	0.0223***	0.0393***			0.0027	0.0188***
	(0.0035)	(0.0037)			(0.0054)	(0.0058)
Post x NJ	0.0135***	0.0258***	-0.0107**	0.0006		
	(0.0042)	(0.0046)	(0.0049)	(0.0052)		
Post x NJ x OTSC	-0.0237***	-0.0295***				
	(0.0063)	(0.0068)				
Includes						
Controls	No	Yes	No	Yes	No	Yes

Notes: OLS Panel. Robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ Each observation is a loan-month. Controls include home value (log), FICO score, borrower race, loan amount (log), interest rate, ARM indicator, and month-year and MSA dummies. $NJ = 1$ 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. Columns (1), (2) provide the DDD estimator, Columns (3), (4) provide a DD estimator across states within OTSC lender, Columns (5), (6) provide a DD estimator across lenders within New Jersey.

Table 4: Hazard: The Moratorium Sped Up Cure Rates but not Modifications

Dependent Variable	Cure		Modification	
	(1)	(2)	(3)	(4)
DDD: OTSC in NJ During Moratorium				
During x NJ x OTSC	1.492***	1.318***	1.262	1.380*
	(0.146)	(0.141)	(0.215)	(0.263)
DD: OTSC Only				
During x NJ	1.347***	1.210**	0.905	1.003
	(0.104)	(0.102)	(0.148)	(0.185)
DD: Loans in NJ Only				
During x OTSC	1.280***	1.231**	0.983	1.002
	(0.0990)	(0.104)	(0.149)	(0.168)
<u>Includes</u>				
Controls	No	Yes	No	Yes

Notes: Hazard rates presented for panel. Robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ Each observation is a loan-month. Controls include home value (log), FICO score, borrower race, loan amount (log), interest rate, ARM indicator, and month-year and MSA dummies. $NJ = 1$ 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. Only loans that were delinquent as of December 2009 included. 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 NJ.

Table 5: Hazard: The Moratorium Sped Up Cure Rates but not Modifications (Post = during and after OTSC periods combined)

Dependent Variable	Cure		Modification	
	(1)	(2)	(3)	(4)
DDD: OTSC in NJ During Moratorium				
Post x NJ x OTSC	1.442***	1.371***	1.208	1.300
	(0.130)	(0.135)	(0.180)	(0.219)
DD: OTSC Only				
Post x NJ	1.292***	1.210**	0.860	0.960
	(0.0925)	(0.0948)	(0.126)	(0.160)
DD: Loans in NJ Only				
Post x OTSC	1.123	1.123	0.964	0.954
	(0.0816)	(0.0886)	(0.132)	(0.146)
Includes				
Controls	No	Yes	No	Yes

Notes: Hazard rates presented for panel. Robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ Each observation is a loan-month. Controls include home value (log), FICO score, borrower race, loan amount (log), interest rate, ARM indicator, and month-year and MSA dummies. $NJ = 1$ 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. Only loans that were delinquent as of December 2009 included. 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 NJ. Combines the period during and the period after the moratorium.

Table 6: Hazard: The Moratorium Sped Up Cure Rates More for Underwater Borrowers

	Dependent Variable: Cure			
	LTV<1		LTV≥1	
	(1)	(2)	(3)	(4)
DDD: OTSC in NJ During Moratorium				
During x NJ x OTSC	1.150	0.881	1.521***	1.405***
	(0.242)	(0.217)	(0.173)	(0.173)
DD: OTSC Only				
During x NJ	0.905	0.783	1.304***	1.202*
	(0.160)	(0.169)	(0.119)	(0.118)
DD: Loans in NJ Only				
During x OTSC	0.969	0.836	1.308***	1.269**
	(0.182)	(0.184)	(0.110)	(0.118)
Includes				
Controls	No	Yes	No	Yes

Notes: Hazard rates presented for panel. Robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ Each observation is a loan-month. Controls include home value (log), FICO score, borrower race, loan amount (log), interest rate, ARM indicator, and month-year and MSA dummies. $NJ = 1$ 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. Only loans that were delinquent as of December 2009 included. 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 NJ.

Table 7: Hazard: The Moratorium Sped Up Cure Rates More for Higher FICO Borrowers

	Dependent Variable: Cure			
	FICO≥690		FICO<690	
	(1)	(2)	(3)	(4)
DDD: OTSC in NJ During Moratorium				
During x NJ x OTSC	1.950***	1.929***	1.255*	1.205
	(0.291)	(0.312)	(0.168)	(0.178)
DD: OTSC Only				
During x NJ	1.589***	1.637***	1.106	1.022
	(0.175)	(0.194)	(0.124)	(0.129)
DD: Loans in NJ Only				
During x OTSC	1.742***	1.764***	1.109	1.069
	(0.196)	(0.212)	(0.123)	(0.132)
<u>Includes</u>				
Controls	No	Yes	No	Yes

Notes: Hazard rates presented for panel. Robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ Each observation is a loan-month. Controls include home value (log), FICO score, borrower race, loan amount (log), interest rate, ARM indicator, and month-year and MSA dummies. $NJ = 1$ 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. Only loans that were delinquent as of December 2009 included. 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 NJ.

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

	Dependent Variable: Cure			
	FICO≥690 & LTV ≥ 1		FICO<690 OR LTV <1	
	(1)	(2)	(3)	(4)
DDD: OTSC in NJ During Moratorium				
During x NJ x OTSC	1.894***	1.872***	1.251*	1.193
	(0.281)	(0.300)	(0.166)	(0.174)
DD: OTSC Only				
During x NJ	1.578***	1.620***	1.094	1.019
	(0.173)	(0.191)	(0.122)	(0.127)
DD: Loans in NJ Only				
During x OTSC	1.708***	1.729***	1.147	1.106
	(0.190)	(0.206)	(0.127)	(0.136)
Includes				
Controls	No	Yes	No	Yes

Notes: Hazard rates presented for panel. Robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ Each observation is a loan-month. Controls include home value (log), FICO score, borrower race, loan amount (log), interest rate, ARM indicator, and month-year and MSA dummies. $NJ = 1$ 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. Only loans that were delinquent as of December 2009 included. 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 NJ.

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)
DDD: OTSC Servicers in NJ During Moratorium								
During x NJ x OTSC	0.0353	-0.0171	4.5999	3.3406	0.0004	0.0035	0.0416	-0.0534
	(0.0575)	(0.0960)	(13.0504)	(19.7094)	(0.0873)	(0.1380)	(0.1048)	(0.1687)
Observations	2245	696	2245	696	2053	692	1863	684
DD: OTSC Only								
During x NJ	0.0319	-0.1196	15.2834*	34.6058	-0.0660	-0.1726	-0.0357	-0.3741
	(0.0430)	(0.1509)	(9.1886)	(25.3013)	(0.0572)	(0.2402)	(0.0819)	(0.2484)
Observations	1079	452	1079	452	992	451	910	445
DD: Loans in NJ Only								
During x OTSC	0.0208	0.0488	-0.5675	8.2668	-0.1208	-0.1214	-0.0298	-0.1378
	(0.0525)	(0.0869)	(12.0343)	(17.2081)	(0.0830)	(0.1275)	(0.0983)	(0.1552)
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
Servicer Fixed Effects	No	Yes	No	Yes	No	Yes	No	Yes

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. Controls include home value (log), FICO score, borrower race, loan amount (log), interest rate and 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 NJ.

Table 10: Foreclosure Filings and Repossessions (REO) 3 Years After OTSC Announced (December 2013)

	Ever REO		Ever Foreclose	
	(1)	(2)	(3)	(4)
OTSC x NJ	-0.0739***	-0.0747***	0.00426	0.0141
	(0.00590)	(0.00660)	(0.0120)	(0.0119)
OTSC Servicer	0.00444	0.00935**	-0.0680***	-0.0647***
	(0.00342)	(0.00385)	(0.00673)	(0.00657)
Loan in NJ	0.0457***	0.0468***	0.0328***	0.0294***
	(0.00470)	(0.00535)	(0.00784)	(0.00779)
Includes				
Controls	No	Yes	No	Yes
Observations	27839	21408	27839	21408

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

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. Controls include home value (log), FICO score, borrower race, loan amount (log), interest rate and ARM indicator. DDD=1 if the loan was active in New Jersey during the moratorium and was serviced by a servicer subject to the moratorium. MSA dummies are also included in all models. $NJ = 1$ if the loan is in NJ an 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.

9   Appendix

Table 11: 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: NJ Department of Justice

Table 12: Summary Statistics of Loan Status at Start of OTSC (December 2010)

| | By Lender | | |
	Control Lender	OTSC Lender	Total
Payment Made	0.624	0.657	0.638
	(0.484)	(0.475)	(0.480)
Delinquent this month	0.348	0.363***	0.354
	(0.476)	(0.481)	(0.478)
Modification Indicator	0.286	0.158***	0.231
	(0.452)	(0.365)	(0.421)
Begin Foreclosure	0.215	0.221	0.218
	(0.411)	(0.415)	(0.413)
	By Location		
	Loan in Border MSA	Loan in NJ	Total
Payment Made	0.646	0.620**	0.638
	(0.478)	(0.486)	(0.480)
Delinquent this month	0.354	0.355	0.354
	(0.478)	(0.479)	(0.478)
Modification Indicator	0.236	0.218**	0.231
	(0.425)	(0.413)	(0.421)
Begin Foreclosure	0.213	0.227	0.218
	(0.410)	(0.419)	(0.413)

Source: CTS Data December 2010 (start of OTSC). Notes: Means reported, standard deviations in parentheses. ***, ** differ from each other at the 1 and 5% levels, respectively.

Table 13: Hazard: The Moratorium Did Not Speed Up Modification Rates at any level of LTV.

Dependent Variable: Modification				
	LTV≤0.75		LTV≥1	
	(1)	(2)	(3)	(4)
DDD: OTSC Servicers in NJ During Moratorium				
During x NJ x OTSC	0.748	0.428	1.050	1.513
	(0.480)	(0.457)	(0.373)	(0.626)
DD: OTSC Servicers Only Cross State Comparison				
During x NJ	1.016	0.497	0.686	0.830
	(0.554)	(0.425)	(0.224)	(0.322)
DD: Loans in NJ Only Cross Servicer Type				
During x OTSC	0.899	0.271	0.948	0.944
	(0.628)	(0.293)	(0.257)	(0.283)
Includes				
Controls	No	Yes	No	Yes