



# The effects of a foreclosure moratorium on loan repayment behaviors<sup>☆</sup>



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## A B S T R A C T

During the 2008 housing crisis, lenders were accused of making mistakes when repossessing homes, spurring some policymakers to call for a moratorium on foreclosure filings. Using a New Jersey court-ordered stay on foreclosure-related filings that applied to six high-profile lenders and a difference-in-difference-in-differences strategy, this paper shows that loans impacted by the moratorium are no more likely to be observed as in default as comparable loans not subject to the court order. Borrowers, and lenders, appear to respond in ways that did not result in the strongly negative effects initially predicted by critics at the time, and this policy may have accomplished the intended consumer protection goals.

## 1. The role of courts in mortgage default

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 (Raotal, 2011). During the housing bust of the late 2000s, courts became overwhelmed by the volume of cases in which lenders were not following legal due process for foreclosure cases. The popular press (Gopa, 2010; Yeebo, 2011; MartinandStreitfeld, 2010; Dennis, 2010), reports (for example Morton, 2011), and even Congressional hearings (USSenate, 2010) focused attention on the issue nationally. Large banks routinely used contractors to prepare documents to file foreclosures. Thousands of documents were signed at high volumes and a rapid pace, operating like robots, or so-called “robot signers.” Improperly repossessing property is a violation of property rights, 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 by certain well-known lenders could result in some borrowers at risk of repossession losing trust in the process and withholding payments, fearing lenders will have an unfair advantage and unjustly repossess their properties.

As news reports of robo-signing increased, by October 2010, 61 percent of respondents to a Washington Post online poll responded

that a national foreclosure moratorium as a “good idea” (Bhattarai, 2010; Novick, 2010).<sup>1</sup> No national policy was implemented, but New Jersey implemented a substantive moratorium within that state in the first half of 2011 targeted at six large mortgage servicers implicated as failing to follow proper foreclosure processes.<sup>2</sup> At the same time, lending industry responded with predictions based on moral hazard, concluding that actions like New Jersey’s 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).

Using a difference-in-difference-in-differences (DDD) strategy that exploits variation by mortgage servicer, across states, and over time, we document that the New Jersey moratorium actually did not result in increased defaults. Borrowers subject to the moratorium in New Jersey who were delinquent before the start of the moratorium were more likely to be labeled 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.<sup>3</sup> We observe no changes in mortgage servicers offering borrowers more modifications or more generous modification terms due to the moratorium. However, loans subject to the policy are no more or less likely to experience a repossession in the longer run (three years later).

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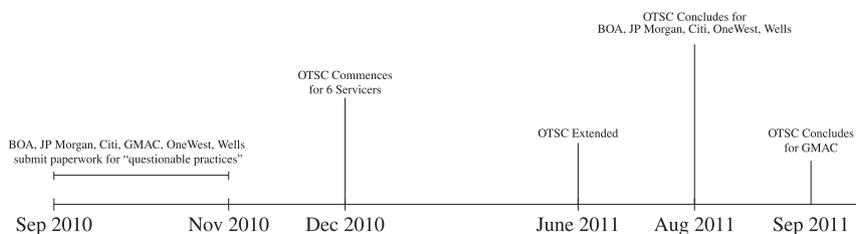
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<sup>1</sup> Historically, moratoria have been used in cases of natural disasters, such as in the aftermath of hurricanes (Davis, 2006; Zacks, 2012), in the context of farm foreclosures (Alston, 1984), or even during the Great Depression (Wheelock, 2008).

<sup>2</sup> These six lenders were required to respond to charges of “questionable practices” in October and November of 2010.

<sup>3</sup> Borrower rates of prepaying loans are small in this sample, where less than one percent of delinquent loans prepay in full. This is consistent across comparison groups. Further, only 19 loans in the sample were repurchased.



## Major Problems Reported Related to Foreclosure Procedures

- Sept 10, 2010 Ally admits 'technical defects' in filings
- Sept 30, 2010 JPMorgan Chase suspends foreclosures in judicial states for 6 weeks
- Oct 10, 2010 Bank of America suspends foreclosure sales nationwide for 7 days
- Oct 27, 2010 Wells Fargo submits 55,000 'supplemental' affidavits in judicial states
- Nov 18, 2010 Citi Mortgage director testifies at Congress hearing

**Fig. 1.** Timeline of the New Jersey Court Order To Show Cause (OTSC).

These results suggest that the dire expectations posited by industry experts did not come to fruition. While we cannot point to a specific mechanism for this finding, we posit three possibilities, each of which could operate concurrently. First, higher cure rates are in part a simple mechanical process in that the moratorium simply added more time and borrowers had a longer window around which to access liquidity, gather information, and accumulate payments. Second, if borrowers perceive that lenders will take the property through an "unfair" foreclosure and repossession process, more time alone would not create incentives to make payments, but increased trust in the process would. With the moratorium, the court signaled to borrowers that their legal rights would be respected during foreclosure, making capricious takings by widely mistrusted lenders less likely. Third, the moratorium may have forced loan servicers to pay more attention to these loans covered by the court ruling, changing how these loans were treated and how payments were handled.

## 2. New Jersey mortgage moratorium

In the summer of 2010, the national media covered stories of mortgage loan servicers using questionable methods in serving foreclosure documents, including hiring robo-signing firms to prepare court documents with no official review.<sup>4</sup> By fall, a number of large national lenders faced increasing scrutiny for procedural failures, as shown in Fig. 1. In New Jersey, six lenders were 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 the state in 2010. On November 4, 2010, Legal Services of New Jersey provided Chief Justice Rabner of the State Supreme Court a report on the flaws in 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 (Grant, 2010). Chief Justice Rabner stated (New Jersey Judiciary, 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.*

<sup>4</sup> We use the terms lender and servicer interchangeably in this paper. Payment processing and foreclosure filings are usually conducted by mortgage servicers, who are not always the lender.

The Order to Show Cause (OTSC) required certain lenders to suspend uncontested foreclosure filings and foreclosure sales immediately. 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 Court intended for the OTSC to reinforce the use of proper legal processes for foreclosure cases among lenders for whom the court had documented a pattern of problems (Portlock, 2011). Lenders unsuccessfully attempted to block the OTSC, accusing the New Jersey Supreme Court of overreaching the rights of lenders (Kraus, 2011).

The OTSC suspended all uncontested foreclosure cases until the court was satisfied that the lenders could "show cause why the processing of uncontested residential mortgage foreclosure actions they have filed should not be suspended." The OTSC applied to any motion from the six lenders, except for cases where the borrower had already contested the lender's foreclosure claim. The court ordered a signed affidavit for every OTSC-covered filing, including (1) what information was communicated to borrowers, when, and by whom, (2) who reviewed the documents being submitted, and confirmed their accuracy, and (3) confirmation that all documents in the filing comport with all legal and regulatory requirements. The court provided lenders a form to organize these materials on January 31, 2011, and then gave the targeted lenders 60 days to file all documents.

The court received the OTSC affidavits on April 1, 2011 and reviewed these documents until May 26, 2011. The Court stipulated a future court order would be issued to each lender, at which time that lender could proceed with foreclosure filings and repossessions through the normal judicial process. Five of the six lenders received court orders relieving them of the OTSC on August 17, 2011, with GMAC remaining under the OTSC until September 12, 2011. It is important to note that the OTSC was only a regulation on legal filings with the court. Lenders could still contact borrowers, collect payments and offer workouts. Borrowers could also continue to accumulate late fees and back-payments. The OTSC did not directly change the loan terms or conditions, nor did it require actions by borrowers to participate.

## 3. Predicted effects of moratorium on foreclosure

Because the OTSC extends the number of months a borrower can stay in her home rent-free before repossession and eviction, one prediction is that borrowers would withhold payments during the OTSC. Some borrowers may use this period as a way to forestall repossession, using mortgage payments for other consumption (Meltzer, 2016). Indeed, Zhu and Pace, 2015 found that borrowers in states with longer foreclosure processes have higher rates of default, and that borrowers appear to maximize the time from the first missed payment to repossession.

However, not all borrowers are likely to exercise the option to skip payments. Borrowers with otherwise good credit would take on the cost of derogatory payment records, which increase the costs of other forms of credit in the future (BootandThakor, 1994). Borrowers with bad credit, however, already have derogatory items in their credit reports. For these borrowers the moral hazard prediction is more likely to withhold payments during the OTSC.

However, there are also potential positive effects of a moratorium. We propose three mechanisms that could result in an increase in borrower repayments, curing delinquencies, as well as reduced incidences of missing payments.

### 3.1. Extended time

A longer time horizon increases the period over which borrowers can access formal and informal liquidity, including adding to income or income sources or liquidating other assets. Given that the OTSC provided more time for borrowers to evaluate the costs and benefits of curing a loan in default, the court's action may have facilitated positive expectations about future payments (Bruine de Bruin et al., 2010). The announcement of the OTSC gave borrowers about three months to sell assets, restructure other forms of credit, gather resources from social networks, and earn income, including federal income tax refunds.<sup>5</sup> Given the OTSC affidavit deadline was public information, borrowers would have focused on making full payment on or before April, 2011.

### 3.2. Administrative reclassification

The court OTSC, including the public deadlines of the affidavit, may have forced loan servicers to pay more attention to mortgages on homes located in New Jersey. All of the loan servicers included in the OTSC have national portfolios of loans—they did not have New Jersey specific operations. Yet, the court OTSC was issued to each lender, meaning that legal and leadership/managerial staff were likely to have instructed frontline staff and data managers to analyze any loans impacted by the OTSC in that state. Indeed, a prior analysis of a different state action in Maryland finds that simply reporting about loans in default has a “sunshine” effect on loan servicer behavior (Collins and Urban, 2014). In the case of the OTSC, the servicers may have spent more time making sure payments were posted, perhaps taking other efforts to reduce the number of loans potentially requiring a costly and time consuming affidavit process.

### 3.3. Borrower protections

According to Google Trends, media headlines about “foreclosure robo-signing” was not discussed in 2009, mentioned 569 times in 2010, 1,041 times in 2011, and 940 times in 2012. After February 2012, the topic ceased to be a frequent media story. Examples in the media included stories like “Facing Foreclosure Without Missing A Payment: One Couple's Housing Nightmare” (Yeebo, 2011). By the time of the OTSC, public trust in the foreclosure system appeared to be in question.<sup>6</sup> The perception of fair treatment is a factor in how people

<sup>5</sup> Tax refunds are not observed in our data. Households with children in New Jersey might qualify for federal and state tax credits of \$7000 or more. We tested if IRS Statistics of Income data for 2011 could identify zip codes with larger average refunds; there was no differential response to OTSC or change in delinquencies during income tax filing season, however.

<sup>6</sup> The rate of fraud or serious mistakes for foreclosures was not as high as media reports portrayed: about 4.5 percent of foreclosures included flaws that could materially harm borrowers (Federal Reserve Board, 2014). Nevertheless, in 2011 before other data was available, borrowers could rationally perceive lenders, as potentially having problems. The 2012 National Mortgage Settlement distributed relief to over 300,000 borrowers who lost their homes but were not provided due process (Smith and August, 2013). Calculated from the National Mortgage Servicer Consumer Relief Data <https://www.jasmithmonitoring.com/omso/reports/final-progress-report/>.

decide to engage with the system (Tyler, 2001). In fact, Acemoglu and Johnson, 2005 demonstrate that third party oversight, such as that provided by a court, facilitates contract enforcement. 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 rely on trust by each party (see Glaeser et al., 2000, for example). If one party lacks trust that the contract process will not be upheld as prescribed, breach may be the optimal choice (Göran and Hägg, 1994). Casas Arce and Saiz, 2010 argue that judicial foreclosure systems may benefit lenders overall, despite longer times and higher costs, due to increased borrower cooperation and trust in the market.

Borrowers who accumulate payments and have the ability to cure delinquent payments may not be willing to send in their payments, if they perceive that the lender will wrongly pursue foreclosure. After the moratorium, borrowers from OTSC lenders in New Jersey were distinct in that these loans were given a more detailed review from the courts, including a special report finding specific cases of lenders violating consumer protections. The time of the OTSC helped borrowers to restructure their balance sheets and cash flows. But it also provided a formal role for the courts to establish for the public and to provide assurance to targeted borrowers that their payments would be properly credited when they were able to make payments again.

## 4. 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. Fig. 2 shows the metropolitan statistical areas (MSAs) we use in the state of New Jersey, each of which include another state: Allentown–Bethlehem–Easton (PA-NJ), New York–Newark–Jersey City (NY-NJ-PA), and Philadelphia–Camden–Wilmington (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 (DDD) analysis. This method 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 (Agarwal et al., 2010; Cordell et al., 2009; Foote et al., 2008).

We can compare loans over time relative to the pre- and post-OTSC periods. Fig. 1 shows the chronology of events around the OTSC in late 2010 into 2011. The key time period in New Jersey is December 2010 to August 2011, when the court refused to proceed on any foreclosure filing from the six lenders targeted by the OTSC.

Since our main interest is in borrowers curing, or catching up on behind payments, the outcome is binary. We are also not focused on borrowers engaging in spells of payments, but rather borrowers at least once achieving the threshold of being caught up. We choose a hazard approach, which has the added advantage of dealing with censoring of failed loans from prior periods.<sup>7</sup> In this way, we can estimate when borrowers catch up and then not allow those borrowers to directly influence estimates in later periods. Once a loan is cured, it is dropped from the analysis; curing is treated as a terminal state.

Generally, our strategy is to examine monthly repayment rates for a sample of loans that are at least 30 days behind as of December 2009.<sup>8</sup> We select this date in order (1) to focus on loans at some risk of

<sup>7</sup> We use STATA for this analysis using the `stcox` procedure, where we use robust standard errors that are clustered at the loan level (i).

<sup>8</sup> Our results are robust to shorter and longer periods, although as the sample size is reduced so is the power to detect effects.

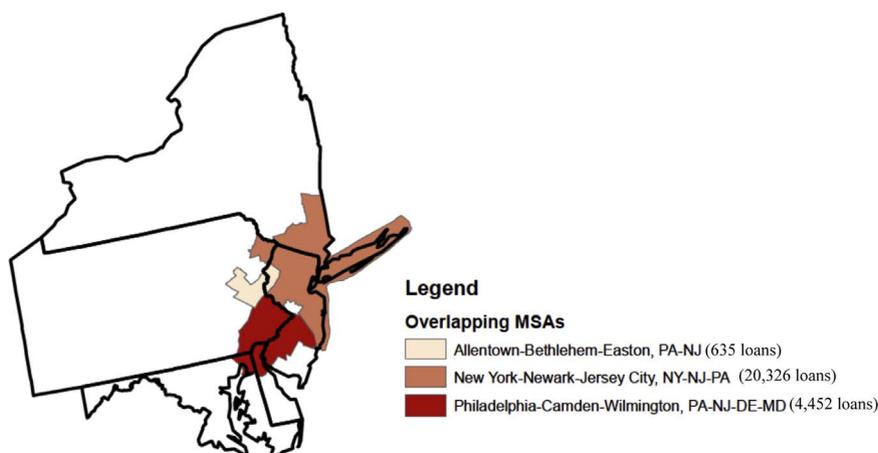


Fig. 2. Metropolitan Statistical Areas Crossing New Jersey State Lines.

foreclosure, and (2) to select loans before the robo-signing controversy might have influenced borrower behavior. The main loan behavior of interest is the rate of loans curing to a non-delinquent state. Most estimates are presented as relative hazard ratios or rates among loans on which borrowers have the chance to start paying each month. Specifically, we estimate the following equation:

$$Y_{i,t} = \beta_0 + \beta_1 TT_i + \beta_2 NJ_i + \beta_3 TS_i + \gamma_1(TT \times TS)_{i,t} + \gamma_2(TT \times NJ)_{i,t} + \gamma_3(NJ \times TS)_{i,t} + \delta(TT \times NJ \times TS)_{i,t} + \eta(PTT \times NJ \times TS)_{i,t} + \lambda X_{i,t} + \kappa_{MSA} + \epsilon_{i,t}$$

This specification is a 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 hence, whether or not the OTSC would be binding, and *TS* is a dummy for the OTSC lenders, meaning those subject to the OTSC. The coefficient of interest,  $\delta$ , will be the DDD estimator in this model, estimating the effect of the OTSC. We also identify  $\eta$ , which is the causal effect of the OTSC on borrower behavior in the period after the OTSC concludes. *PTT* is an indicator for the time period after the OTSC concludes, and interactions of *PTT* with the OTSC lender and *NJ* dummies identify any persistent effects.<sup>9</sup> Each loan-month is coded as being bound or not bound by the moratorium based on the state in which it was located and the lender being subject to OTSC.

Contained in *X* are loan and borrower characteristics, a dummy for an adjustable rate mortgage (ARM), the note interest rate, logged months delinquent in December 2009, contemporaneous loan-to-value ratio (LTV) buckets,<sup>10</sup> FICO score buckets (in quartiles), income buckets at origination (including no documented income),<sup>11</sup> and a minority race indicator. Only LTV, FICO, and interest rate can change over time. LTV updates the loan's LTV at origination by capturing changes in both the current balance of the loan and the average price drop in the borrower's ZIP code from origination to each period using monthly ZIP code-level data from Zillow.<sup>12</sup> We include MSA fixed effects,  $\kappa_{MSA}$ , similar to the structure provided in the DDD model used in Chetty et al., 2009.

We make the following assumptions:

<sup>9</sup> These coefficients are not statistically different from one in each specification, and thus, the post period behavior returns to equilibrium pre-OTSC behavior. For this reason, we do not report them in our tables.

<sup>10</sup> We choose the following LTV buckets:  $\leq 0.5$ ,  $0.5 - 0.75$ ,  $0.75 - 1$ ,  $1 - 1.25$ , and  $> 1.25$ , as these come close to representing quantiles in the data and make intuitive sense.

<sup>11</sup> The income buckets we choose are the following: none reported, 0–\$50,000, \$50,000–\$75,000, \$75,000–\$100,000, \$100,000–\$125,000, \$125,000–\$150,000, \$150,000–\$200,000, and over \$200,000, as these cutoffs come close to equally distributed the data into categories.

<sup>12</sup> We are not able to observe other credit measures, second mortgages, debt-to-income ratio, borrower employment status, or borrower occupation.

1. The payment trends of OTSC and non-OTSC lenders would be similar in the absence of the OTSC;
2. The payment trends across states/MSAs would be similar in the absence of the OTSC;
3. Borrowers do not select their lenders based on knowledge of the OTSC; and,
4. The OTSC is binding for lenders and borrowers have information about the OTSC.

We can confirm (1) and (2) are likely to be valid given the pre-post and cross-MSA trends for the rate of delinquency cures, loan modifications, and loans worsening in status in Fig. 4. These assumptions are further confirmed using a regression framework in Table 2. The pre-periods (left of the line at December 2010), the OTSC, and non-OTSC plots follow similar patterns. Assumption (3) seems plausible, although is not testable in data. It is highly unlikely the OTSC was anticipated by borrowers before the month it was announced. Borrowers also have little direct control over which lender owns and services their loans, so they could not somehow switch to an OTSC lender in December 2010. Assumption (4) can be directly observed in the foreclosure filings data. Foreclosure filings dropped precipitously in New Jersey in the first half of 2011. Fig. 3 plots the total foreclosure filings by ZIP code using data from RealtyTrac on all foreclosure filings. Lenders appear to have dramatically reduced foreclosure actions. The media also covered the robo-signing controversy, the New Jersey OTSC, and the resulting moratorium closely, making it likely that information was available to borrowers in this period.

## 5. Data

Corporate Trust Services (CTS) is a nationwide database comprised of individual monthly loan payments from mortgage backed securities pooled across more than 50 different lenders. The CTS data serves as a remittance 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. Most of the loans in the data have lower credit scores and a larger percentage of adjustable rate loans (versus fixed rate) than loans that conformed to Freddie Mac and Fannie Mae standards. We follow loans that changed to or from OTSC servicers due to acquisitions to ensure that each loan was accurately labeled as subject to the OTSC or not. These data have been described by White (2009) and Quercia and Ding (2009) and have been the basis of several studies, including Collins and Urban (2015); Collins et al. (2013), and Collins and Urban (2014).

The CTS data used in this study cover the period from December 2009 until July 2012 (with one cross section of December 2013 to

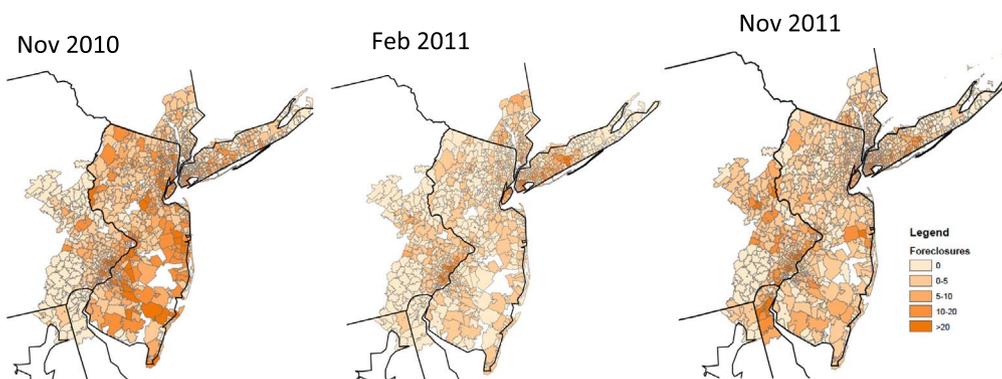


Fig. 3. New Jersey ZIP Code Level Foreclosures: Before (Nov 2010), During (Feb 2011), and After (Nov 2011) OTSC.

examine long run foreclosures). Only owner-occupied, single-family homes where the mortgage is the primary or first position lien are included, since second mortgages have different incentive structures (Piskorski et al, 2010). In order to account for demographic characteristics of borrowers, we 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. Note that the number of loans is slightly smaller when we use loan-level controls due to the mismatch between CTS and HMDA.

Table 1 Panel A presents summary statistics as of December 2009, the first observed period, conditional on loans being at least 30 days delinquent. Other than home values, the samples are similar. Mean FICO scores are just above 680, greater than 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, although the DDD framework addresses this..

Table 1  
Descriptive statistics.

	Border Non-OTSC	Border OTSC	NJ Non-OTSC	NJ OTSC
<b>Panel A: Loan Characteristics at Start of Panel (December 2009)</b>				
ARM Indicator	0.600 (0.490)	0.503 (0.500)	0.690 (0.462)	0.550 (0.498)
Interest Rate	6.472 (1.608)	6.431 (1.174)	6.387 (1.678)	6.388 (1.266)
LTV	0.825 (0.225)	0.803 (0.219)	0.922 (0.232)	0.898 (0.225)
Income (000 s)	141.30 (100.74)	165.12 (114.93)	139.57 (96.38)	156.19 (106.42)
Origination Year	2005.45 (0.91)	2005.52 (0.83)	2005.55 (0.88)	2005.50 (0.78)
FICO (divided by 100)	6.859 (0.662)	6.836 (0.871)	6.860 (0.660)	6.847 (0.853)
Minority	0.524 (0.500)	0.441 (0.497)	0.465 (0.500)	0.494 (0.499)
<b>Panel B: Loan Status at End of OTSC (August 2011)</b>				
Cure	0.24 (0.42)	0.15 (0.36)	0.17 (0.38)	0.15 (0.36)
Modified	0.39 (0.49)	0.22 (0.42)	0.37 (0.48)	0.24 (0.43)
Worse	0.035 (0.18)	0.018 (0.13)	0.033 (0.18)	0.013 (0.11)
Number of Loans	13,410	6,307	5,904	2,785

Source: Panel A: CTS data conditional on loan being delinquent as of December 2009. Panel B: CTS Data August 2011. 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 Wilk’s lambda at the 10% level. Total number of loans is lower than in Fig. 2 due to small numbers of missing variables. 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.

House prices may be endogenous with both lender decisions to foreclose and borrower decisions to cure a delinquency (Frame, 2010). We use ZIP code-level house price data provided by Zillow to calculate parcel-level changes in home values at time  $t$  to update the LTV at origination for each period. These loan-level values are more useful than applying MSA values. The typical borrower holds a loan on a home that has declined in value since purchase, which could leave this borrower in an “underwater” equity position, that is, with LTV that exceeds 1. Note, too, that New York has the highest median origination price, while New Jersey experienced the greatest decline in this period, roughly 19 percent.

## 6. Results

The intent of this analysis is to document repayments among borrowers at risk of being involved in a foreclosure filing with one of the six lenders implicated by the court as failing to protect borrower rights. These borrowers receive more time to catch up on back payments. The OTSC had an initial deadline of April 2011 for lenders to complete affidavits on outstanding cases, so borrowers could count on a foreclosure moratorium of at least three months. The OTSC may have potentially improved borrowers’ confidence on how the court protected them in the legal process, specifically because their property rights were strengthened (or at least borrowers’ perceptions of the respect given to their property rights by the courts improved). This was especially important in the face of the unfavorable perception borrowers had of the six implicated lenders.

Table 1 Panel B shows loans in New Jersey and border areas at the conclusion of the OTSC (August 2011) that were delinquent as of the start of the panel. In the far right column are the 2423 OTSC loans in New Jersey. About 15 percent of OTSC loans in New Jersey experienced a cure, 24 percent were modified by the lender, and 1.3 percent transitioned to a worse foreclosure status (as opposed to status quo or better status). These average rates offer some context for the hazard rates calculated in the following estimates.

### 6.1. Hazard rates for loan repayment among delinquent loans

Table 3 shows DDD estimates for  $\delta$ . This table includes estimates during the OTSC in Panel A, compared to before the OTSC.<sup>13</sup> The second column replicates these estimates with controls. Panel B estimates a DD across states (within OTSC lenders), and Panel C estimates a DD across OTSC lenders (within New Jersey).<sup>14</sup>

In Columns (1) and (2), Table 3 shows a hazard specification for the rate of delinquent borrowers starting to make payments again. These

<sup>13</sup> Estimates for OTSC lenders in New Jersey in the post period when compared to the before period ( $\eta$  in the equation) show no significant results.

<sup>14</sup> If we instead look at only loans that were cured without modifications or loans that cured without paying in full, our results remain consistent.

**Table 2**  
Hazard: verifying the pre-trends assumptions.

Dependent Variable	Cure		Modification	
	(1)	(2)	(3)	(4)
<b>Panel A, DDD: OTSC in NJ</b>				
<i>OTSC × NJ × 2009<sub>q4</sub></i>	1.097 (0.150)	0.986 (0.145)	0.632* (0.162)	0.754 (0.197)
<i>OTSC × NJ × 2010<sub>q1</sub></i>	1.022 (0.0193)	1.050** (0.0230)	0.989 (0.0891)	0.910 (0.0895)
<i>OTSC × NJ × 2010<sub>q3</sub></i>	1.168 (0.181)	1.085 (0.181)	0.871 (0.207)	0.870 (0.214)
<i>OTSC × NJ × 2010<sub>q4</sub></i>	0.928 (0.176)	0.920 (0.180)	1.059 (0.285)	1.079 (0.309)
Observations	122,925	106,628	300,996	246,613
<b>Panel B, DD: OTSC Only</b>				
<i>NJ × 2009<sub>q4</sub></i>	0.843 (0.146)	0.882 (0.165)	0.918 (0.268)	1.032 (0.311)
<i>NJ × 2010<sub>q1</sub></i>	0.963 (0.172)	1.076 (0.206)	1.339 (0.358)	1.320 (0.367)
<i>NJ × 2010<sub>q2</sub></i>	0.827 (0.110)	0.930 (0.133)	1.304 (0.295)	1.125 (0.267)
<i>NJ × 2010<sub>q4</sub></i>	0.835 (0.176)	0.965 (0.212)	1.031 (0.297)	0.920 (0.279)
Observations	34,923	30,517	100,308	81,105
<b>Panel C, DD: Loans in NJ Only</b>				
<i>OTSC × 2009<sub>q4</sub></i>	1.078 (0.178)	1.011 (0.181)	0.800 (0.241)	0.857 (0.262)
<i>OTSC × 2010<sub>q1</sub></i>	0.937 (0.156)	0.936 (0.167)	1.178 (0.330)	1.208 (0.346)
<i>OTSC × 2010<sub>q2</sub></i>	1.036 (0.128)	1.036 (0.140)	0.769 (0.165)	0.743 (0.165)
<i>OTSC × 2010<sub>q4</sub></i>	0.785 (0.154)	0.816 (0.167)	0.986 (0.298)	1.062 (0.334)
Observations	37,356	32,189	91,885	75,340
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, logged months delinquent in period one, LTV buckets ( $\leq 0.5$ ,  $0.5 - 0.75$ ,  $0.75 - 1$ ,  $1 - 1.25$ , and  $> 1.25$ ), interest rate, ARM indicator. HMDA controls include FICO score buckets (in quartiles), borrower race, and income buckets (none reported, 0-\$50,000, \$50,000-\$75,000, \$75,000-\$100,000, \$100,000-\$125,000, \$125,000-\$150,000, \$150,000-\$200,000, and over \$200,000).  $NJ = 1$  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.

cures are defined as a terminal state, such that a borrower who goes from delinquent to current is then dropped from the sample. All loans are delinquent in December 2009, so each uncured loan can cure in each subsequent period. The DDD hazard ratio (Panel A) 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 positive effects of the OTSC on delinquent borrowers catching up, with approximately 42 percent faster rates of cure without controls, and 30 percent with controls. It is reassuring that trends hold across the estimates in Panels B and C, 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 offering more loan modifications. Facing longer delays, lenders might believe that modifying a loan could be less costly than pursuing

**Table 3**  
The moratorium sped up cure rates but not modifications.

Dependent Variable	Cure		Modification	
	(1)	(2)	(3)	(4)
<b>Panel A, DDD: All Loans</b>				
<i>During x NJ x OTSC</i>	1.416*** (0.134)	1.296** (0.131)	1.220 (0.208)	1.221 (0.221)
Number of loans	28,815	23,669	28,815	23,673
Observations	212,009	185,315	608,354	499,409
<b>Panel B, DD: OTSC Only</b>				
<i>During x NJ</i>	1.264*** (0.0974)	1.174* (0.0965)	1.038 (0.169)	1.135 (0.196)
Number of loans	11,848	9820	11,848	9820
Observations	68,377	60,573	222,664	182,890
<b>Panel C, DD: Loans in NJ Only</b>				
<i>During x OTSC</i>	1.274*** (0.0950)	1.210** (0.0965)	1.031 (0.156)	0.969 (0.154)
Number of loans	8870	7296	8870	7297
Observations	63,343	54,741	185,506	152,166
<u>Includes</u>				
Controls	No	Yes	No	Yes

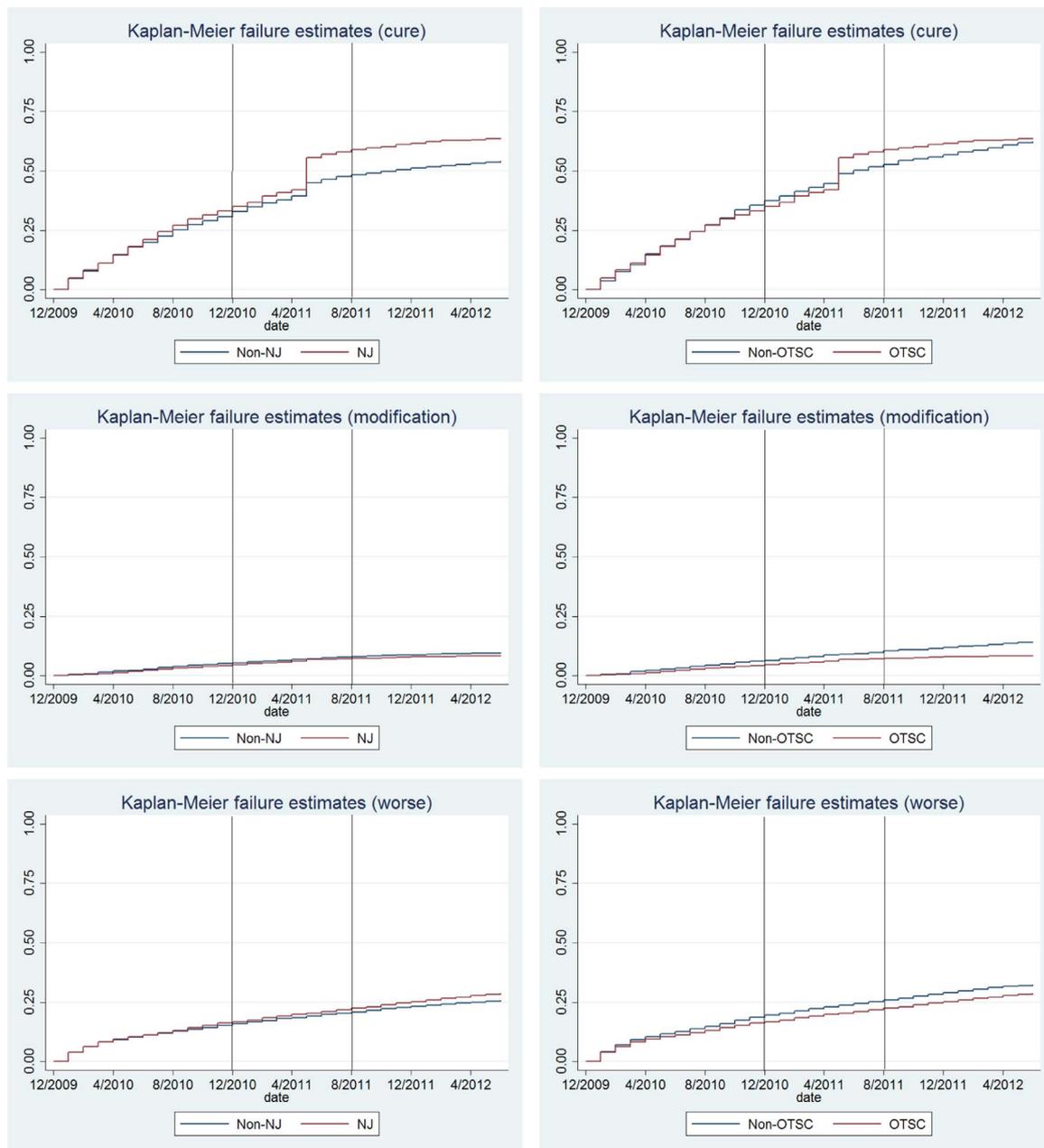
Source: CTS data December 2009 - July 2012. Conditional on loan being delinquent as of the first period (December 2009). Notes: Hazard rates presented with robust standard errors clustered at the loan-level in parentheses. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$  Each observation is a loan-month. All models include MSA fixed effects, logged months delinquent in period one, LTV buckets ( $\leq 0.5$ ,  $0.5 - 0.75$ ,  $0.75 - 1$ ,  $1 - 1.25$ , and  $> 1.25$ ), interest rate, ARM indicator. HMDA controls include FICO score buckets (in quartiles), borrower race, and income buckets (none reported, 0-\$50,000, \$50,000-\$75,000, \$75,000-\$100,000, \$100,000-\$125,000, \$125,000-\$150,000, \$150,000-\$200,000, and over \$200,000).  $NJ = 1$  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.

foreclosures during the moratorium, making modifications more likely. Columns (3) and (4) show lenders in New Jersey subject to the OTSC during the moratorium tend to make modifications of loan terms at higher rates. However, these estimates are not statistically significant. Loan modifications do not seem to be the mechanism for additional cures.

The DD estimates are also shown in Fig. 4. The cure rates in Fig. 4 show a spike in repayments on delinquent loans in May 2011, which reflects remittance reports for the prior month (paid in April). Borrowers and servicers were aware the court set an April 2011 deadline for OTSC affidavits, meaning the moratorium could be lifted in April. Fig. 4, is striking, and suggests either servicers may have engaged in a systemic reclassification of loans in April, or borrowers strategically paid off delinquent balances by this date.

### 6.2. Heterogeneous effects by loan risk

Table 4 shows the same DDD estimates ( $\delta$ ) as those in Table 3 for a subset of borrower LTV ratio and credit score categories. If there is simply a reclassification of loans, it is unlikely that there will be heterogeneity in cure rates across borrower characteristics. 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 during the OTSC. About 31 percent of mortgage loans in the data were underwater—the estimated value of the home was less than the mortgage amount as of December 2010. Whereas servicers might be more likely to offer added leeway lower LTV loans, it is less likely they would do so for higher risk, higher LTV loans. The repayments of higher LTV loans



**Fig. 4.** DD Plots: 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 DD trends across OTSC and non-OTSC lenders within New Jersey only. The second column presents DD trends across New Jersey and border state lenders within OTSC lenders only.

is more consistent with borrowers being more likely to cure delinquent payments.

Credit scores in Table 4 are divided by FICO score at 690 or above measured at loan origination. About 48 percent of borrowers in these data have scores at or above 690. FICO scores are designed to predict payment behaviors, so these cures are at least partially explained by the underlying traits of borrowers. Indeed, higher FICO borrowers cure twice as fast due to the OTSC (Panel B in Table 4). A foreclosure will also cause relatively more harm to the credit record of these borrowers, since lower-score borrowers have less margin to decline further. The hazard rates for lower-score borrowers are all greater than one, but much smaller and not statistically different from one. Higher-score borrowers may be focused on preserving their credit as well as more attentive to the OTSC. Loan servicers may also provide these borrowers with greater exceptions in order to classify them as being current.

Borrowers with higher LTVs and higher FICO scores making

payments to OTSC lenders at higher rates is also consistent with borrowers perceiving the OTSC as assurance that their payments would count and their rights would be protected in the judicial foreclosure process. Panel C of Table 4 shows that high-LTV and high-FICO borrowers are driving the effect, when compared to low-FICO and low-LTV borrowers also subject to the OTSC. The six lenders targeted by the OTSC were subject to a great deal of negative press and scrutiny; the external oversight provided by the OTSC may have shifted borrower perceptions and reduced incentives for withholding payments. It remains unclear whether the effect is driven more by borrower's renewed trust in lenders subject to the OTSC or simply by more time being automatically provided to borrowers with loans from lenders covered by the OTSC. These results could also be driven by loan servicers upgrading the payment status of troubled loans, attempting to avoid the OTSC regulatory burden.

**Table 4**  
The moratorium sped up cure rates more for underwater and higher FICO borrowers.

Dependent Variable: Cure				
	LTV < 1		LTV ≥ 1	
	(1)	(2)	(3)	(4)
<b>Panel A, DDD by LTV</b>				
During x NJ x OTSC	1.151 (0.239)	1.000 (0.225)	1.219 (0.190)	1.394** (0.225)
Number of Loans	17,020	13,749	7679	6677
Observations	105,777	91,277	94,784	84,470
<b>Panel B, DDD by FICO</b>				
During x NJ x OTSC	1.876*** (0.275)	1.586*** (0.254)	1.192 (0.149)	1.199 (0.154)
Number of Loans	15,961	12,346	12,860	11,323
Observations	73,796	61,743	138,213	123,572
<b>Panel C, DDD by LTV and FICO</b>				
During x NJ x OTSC	1.686** (0.449)	2.160*** (0.627)	1.206 (0.287)	1.092 (0.280)
Number of Loans	2967	2498	6623	5793
Observations	28,551	24,778	65,503	58,118
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, logged months delinquent in period one, LTV buckets ( $< = 0.5$ ,  $0.5 - 0.75$ ,  $0.75 - 1$ ,  $1 - 1.25$ , and  $> 1.25$ ), interest rate, ARM indicator. HMDA controls include FICO score buckets (in quartiles), borrower race, and income buckets (none reported,  $0 - \$50,000$ ,  $\$50,000 - \$75,000$ ,  $\$75,000 - \$100,000$ ,  $\$100,000 - \$125,000$ ,  $\$125,000 - \$150,000$ ,  $\$150,000 - \$200,000$ , and over  $\$200,000$ ).  $NJ = 1$  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 by LTV. Panel B splits the sample by high and low FICO scores, where high is above 690 and low is below 690. Panel C compares high LTV and high FICO to low LTV and low FICO.

### 6.3. Principal payments

Another question is are delinquent borrowers, even if they fail to cure, making any payments around the OTSC? Table 5 is an ordinary least squares (OLS) panel regression estimate for the change in the monthly principal balance, controlling for all prior independent variables and adding month-by-year fixed effects. The intent here is to look at borrowers who may or may not completely cure a delinquency but are making headway on paying off principal. The dependent variable is the natural log of the change in monthly balance (the log was of  $(1 + \Delta)$  balance to adjust for zero values).<sup>15</sup> These estimates can be interpreted as mean monthly percent changes in principal payoff. During the OTSC borrowers with loans subject to the OTSC paid off 5.6 percent more per month relative to the DDD, and 12.3 percent more with controls (including initial balance).<sup>16</sup> The DD estimates are all positive and statistically significant, as well. These results suggest that the OTSC encouraged borrowers to pay balances off at higher rates, in addition to the estimates of higher cure rates in Table 3. Making payments, especially loan principal payments,

<sup>15</sup> We chose a log transformation to preserve normality in the data.

<sup>16</sup> Most loans had similar amortization terms (30 years) and most loans were initially made in 2006, which simplifies these comparisons.

**Table 5**  
The moratorium increased payments.

Dependent Variable=Made Payment		
	(1)	(2)
<b>Panel A, DDD: All Loans</b>		
During x NJ x OTSC	0.00656*** (0.00202)	0.00790*** (0.00261)
Observations	569,860	467,934
<b>Panel B, DD: OTSC Only</b>		
During x NJ	0.00753*** (0.00270)	0.00507* (0.00286)
Observations	210,193	172,804
<b>Panel C, DD: Loans in NJ Only</b>		
During x OTSC	0.0160** (0.00646)	0.0184*** (0.00651)
Observations	173,592	142,431
Controls	No	Yes
Mean DV	0.674	0.672

Source: CTS data December 2009 - July 2012. Conditional on loan being delinquent as of the first period (December 2009). Notes: OLS estimates with month by year fixed effects 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. The dependent variable equals one if the borrower made a payment in the given month. All models include MSA fixed effects, logged months delinquent in period one, LTV buckets ( $< = 0.5$ ,  $0.5 - 0.75$ ,  $0.75 - 1$ ,  $1 - 1.25$ , and  $> 1.25$ ), interest rate, ARM indicator. HMDA controls include FICO score buckets (in quartiles), borrower race, and income buckets (none reported,  $0 - \$50,000$ ,  $\$50,000 - \$75,000$ ,  $\$75,000 - \$100,000$ ,  $\$100,000 - \$125,000$ ,  $\$125,000 - \$150,000$ ,  $\$150,000 - \$200,000$ , and over  $\$200,000$ ).  $NJ = 1$  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.

suggests there is trust that the process will uphold the borrower's rights and protections even if foreclosure processes recommence.

### 6.4. Loan modification terms

Another question that could explain these findings is: Did OTSC lenders encourage repayments by making more generous loan modifications to OTSC covered borrowers when they did allow modifications? Table 6 shows the terms of loan modifications by type of lender based on a cross section of loans that were modified. There is no evidence in these estimates that OTSC lenders were offering deeper concessions on loan terms during the OTSC and in New Jersey, conditional on making a modification. Lender loan modifications alone cannot explain the improved cure rate shown in prior tables.<sup>17</sup>

### 6.5. Transitioning to worsened status

Finally, we ask: Did delinquent borrowers respond by becoming further behind? Or did borrowers who were previously current on their loans begin to miss payments? The panel begins with loans that are all 30 days behind, but loans can transition from 30 days to 60 days behind, or from 60 days to 90 or more days behind. Table 7 shows a hazard estimate of the rate of loans moving to worse status. Columns (1) and (2) confirm that delinquent loans subject to the OTSC were not more likely to worsen in status. Counter to industry predictions, delinquent borrowers are not stopping payments, even though these

<sup>17</sup> We also find that lenders are not offering other forms of loss mitigation including forbearance, interest reductions, or other changes in terms that are not formal modifications. For this, we use the approach employed by Adelino et al. (2013), where loans with changes in terms are flagged as temporary. These results are available upon request.

**Table 6**  
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)
<b>Panel A, DDD: All Loans</b>								
During x NJ x OTSC	0.0353 (0.0575)	0.0319 (0.0897)	4.5999 (13.0504)	16.2751 (17.1674)	0.0004 (0.0873)	0.0753 (0.1339)	0.0416 (0.1048)	0.0497 (0.1614)
Observations	2245	960	2245	960	2053	877	1863	791
<b>Panel B, DD: OTSC Only</b>								
During x NJ	0.0319 (0.0430)	-0.1821 (0.1353)	15.2834* (9.1886)	30.8060 (23.9654)	-0.0660 (0.0572)	-0.2282 (0.2419)	-0.0357 (0.0819)	-0.3348 (0.2513)
Observations	1079	574	1079	574	992	526	910	479
<b>Panel C, DD: Loans in NJ Only</b>								
During x OTSC	0.0208 (0.0525)	0.0978 (0.0820)	-0.5675 (12.0343)	17.7837 (15.1018)	-0.1208 (0.0830)	-0.0563 (0.1139)	-0.0298 (0.0983)	-0.1133 (0.1419)
Observations	721	339	721	339	669	312	601	282
<u>Includes</u>								
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

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, logged months delinquent in period one, LTV buckets ( $\leq 0.5$ ,  $0.5 - 0.75$ ,  $0.75 - 1$ ,  $1 - 1.25$ , and  $> 1.25$ ), interest rate, ARM indicator. HMDA controls include FICO score buckets (in quartiles), borrower race, and income buckets (none reported, 0-\$50,000, \$50,000-\$75,000, \$75,000-\$100,000, \$100,000-\$125,000, \$125,000-\$150,000, \$150,000-\$200,000, and over \$200,000).  $NJ = 1$  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**  
The moratorium did not transition delinquent loans to "Worse".

	Dependent Variable: Worse			
	Delinquent Loans		Current Loans	
	(1)	(2)	(3)	(4)
<b>Panel A, DDD: All Loans</b>				
During x NJ x OTSC	1.089 (0.131)	1.089 (0.131)	1.250 (0.172)	1.183 (0.174)
Observations	150,041	132,295	393,042	311,181
<b>Panel B, DD: OTSC Only</b>				
During x NJ	0.964 (0.113)	0.964 (0.113)	1.001 (0.135)	1.125 (0.162)
Observations	43,999	39,717	144,768	114,067
<b>Panel C, DD: Loans in NJ Only</b>				
During x OTSC	0.943 (0.108)	0.943 (0.108)	1.079 (0.143)	1.095 (0.155)
Observations	42,798	37,704	121,345	96,014
Controls	No	Yes	No	Yes

Source: CTS data December 2009 - July 2012. Sample in Columns (1)-(2) are conditional on loan being delinquent as of the first period (December 2009). Sample in Columns (3)-(4) are conditional on loan being current as of first period (Dec 2009). 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, logged months delinquent in period one, LTV buckets ( $\leq 0.5$ ,  $0.5 - 0.75$ ,  $0.75 - 1$ ,  $1 - 1.25$ , and  $> 1.25$ ), interest rate, ARM indicator. HMDA controls include FICO score buckets (in quartiles), borrower race, and income buckets (none reported, 0-\$50,000, \$50,000-\$75,000, \$75,000-\$100,000, \$100,000-\$125,000, \$125,000-\$150,000, \$150,000-\$200,000, and over \$200,000).  $OTSC = 1$  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.

borrowers have a lower marginal cost of missing payments, since they already have tarnished credit.

Columns (3) and (4) use a different sample, unlike the models above, where all loans that were current in December 2009 are included (prior estimates are based on loans that started in the sample as being delinquent on payments). Loans subject to the OTSC appear somewhat

**Table 8**  
Foreclosure filings and repossessions (REO) 3 years after OTSC announced (December 2013).

	Ever REO		Ever Foreclose	
	(1)	(2)	(3)	(4)
OTSC x NJ	-0.00136 (0.00518)	0.00353 (0.00594)	-0.0112 (0.0128)	-0.0126 (0.0133)
OTSC Servicer	0.000724 (0.00267)	0.00244 (0.00305)	-0.0225*** (0.00693)	-0.0000243 (0.00725)
Loan in NJ	0.00602* (0.00311)	0.00631* (0.00351)	-0.0660*** (0.00764)	-0.0422*** (0.00807)
Controls	No	Yes	No	Yes
Observations	24,787	20,513	24,787	20,513

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, logged months delinquent in period one, LTV buckets ( $\leq 0.5$ ,  $0.5 - 0.75$ ,  $0.75 - 1$ ,  $1 - 1.25$ , and  $> 1.25$ ), interest rate, ARM indicator. HMDA controls include FICO score buckets (in quartiles), borrower race, and income buckets (none reported, 0-\$50,000, \$50,000-\$75,000, \$75,000-\$100,000, \$100,000-\$125,000, \$125,000-\$150,000, \$150,000-\$200,000, and over \$200,000).  $OTSC \times$  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.

more likely to miss payments, conditional on starting at current status.<sup>18</sup> These results are not confirmed with the DD setup, however.

### 6.6. Long run effects

Overall, these results show no evidence that delinquency increases due to the OTSC among already delinquent borrowers and weak evidence of delinquencies among current borrowers. This effect does not appear to be driven by lender actions alone (via modifications or reclassifications).

A key question remains: Does the OTSC shift the trend in long run loan outcomes, especially related to foreclosure repossessions? Table 8 shows loans as a cross section as of the last period available, December 2013. This allows foreclosures to matriculate through the legal process. The dependent variable is an indicator of a loan going to repossession or REO (real estate owned by the lender) in Columns (1)–(2), and a dummy variable equal to one if a foreclosure action was ever filed in Columns (3)–(4). Since all loans are exposed to the same time periods, it is only possible to estimate a difference-in-differences model (not a DDD). Importantly, OTSC-covered loans are no more or less likely to experience a repossession. However, Columns (3) and (4) do not show differential foreclosure rates among OTSC-covered loans in New Jersey. OTSC lenders are less likely to file for foreclosure overall, and loans in New Jersey are more likely to have a filing overall. Borrowers cure at a higher rate, but in the longer run the OTSC did not result in any significant change in foreclosure rates or repossessions.

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. But borrowers do not appear to have made short-term gains only to eventually fall behind and lose their homes. In the longer run, borrower protections granted under the OTSC also did not result in fewer foreclosures. The OTSC may have just brought the six targeted lenders back to the levels of typical lenders who were not implicated in the robo-signing controversy. This result underscores the importance of trust in property rights, contracts, and the judicial process for a well-functioning financial system.

### 6.7. Discussion

Beginning with seminal work by Grossman and Katz [Grossman and Katz \(1983\)](#) on the effects of plea bargains on social welfare, economists have been interested in the role of the courts in producing economically efficient outcomes. [Cooter and Rubinfeld, 1989](#) and later [Miceli, 1996](#) reiterate the importance of courts in influencing economic behavior, as they redistribute resources in ways that can distort the costs and benefits of future behavior. This paper contributes to this literature by examining a change in court enforcement of mortgage contracts. The closest work to this study is [Gerardi et al \(2012\)](#), which examines a right-to-cure law that added more time for borrowers. Using a difference-in-differences identification strategy across states and over time, the authors conclude that the added time of the state's protection did not facilitate higher cure rates. The authors show right-to-cure laws decrease the short run rate of foreclosures but not loan modifications or long run foreclosure rates. In another paper, [Mayer et al. \(2014\)](#) examine a change in one lender's process for modifying mortgage contracts, showing an increase in loan defaults in order to qualify for advantageous loan terms. Like [Gerardi et al. \(2012\)](#), borrowers appear to respond to incentives to default if they are economically meaningful.

Our results are generally consistent with those of [Gerardi et al, 2012](#), although our primary analysis is of loans with a history of delinquency and not all loans in the state. The important distinction is that under the right-to-cure law, borrowers had to actively respond to lenders to be eligible. Right-to-cure thus involves some borrower selection, where

borrowers did not obtain the 150-day “free rent” if they did not respond to the lender's contact within 30 days. The OTSC was not optional; all borrowers with OTSC loans were subject to the moratorium. However, as in [Gerardi et al. \(2012\)](#), we show heterogeneous responses to mortgage contract rule changes by borrower type. [Gabriel et al, \(2017\)](#) show that foreclosure prevention provisions that provided borrowers more time and increased incentives for lenders to find alternatives to repossession had positive effects for borrowers in California at the height of the housing crisis. The authors estimate over 380,000 borrowers benefited from this policy, in part because it forced lenders to work with borrowers on alternatives to foreclosure. The New Jersey provision was more time-limited, and focused on paperwork processing procedures, but appears to have a similar effect, although not only in terms of lenders offering modifications and reducing long-term foreclosure filings, but also borrowers catching up on delinquent loans.

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 the possibility that these lenders were engaged in increased borrower outreach or public relations during or after the OTSC. The attention brought on by the OTSC could have encouraged delinquent borrowers to make payments, or simply influenced lender practices to offer more lenient payment policies to avoid further scrutiny. The OTSC has advantages in terms of identifying impacted loans and comparison groups, but may have more limited external validity to other contexts.

Finally, it is important to note that New Jersey is a recourse state. 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.<sup>19</sup> The threat of recourse adds an incentive for a borrower who owes more than the home is worth to avoid foreclosure if possible, and lenders to avoid repossession situations. These results may therefore not be generalizable to non-recourse states.

## 7. 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 at risk of default and with poor credit, to retain their mortgage payments for other consumption and live rent free for a few months. We find that relative to border areas and noncovered lenders, loans subject to the New Jersey OTSC show higher recorded repayment rates. This behavior is consistent with borrowers and lenders evaluating the long run expected value of the foreclosure process. Moreover, three years later, loans subject to the OTSC moratorium are no more or less likely to experience a repossession due to foreclosure. The OTSC results in about a 5 percentage point greater cure rate from a baseline average rate of 15 percent. The six lenders subject to the OTSC had just under 30,000 loans statewide in default or foreclosure in late 2010. A back-of-the-envelope estimate based on these numbers is about 1500 additional loans in default that cured due to the OTSC, if cure rates of all loans in the state mirror that of the data in our study.

The combination of more time, added public scrutiny, a deadline (that was eventually extended), and enhanced trust for a subset of lenders/servicers with tarnished reputations are key features of the OTSC. The circumstances of the OTSC were unique, however. The court in New Jersey acted quickly when problems became public and zeroed in on the largest and presumably most problematic lenders. This action

<sup>19</sup> See New Jersey permanent statutes Title 2A(50). All of the states in this analysis use judicial foreclosure processes, and all have recourse provisions that allow lenders to levy a deficiency judgment on a borrower.

<sup>18</sup> One estimate is marginally statistically different from one at the 10 percent level.

may have supported borrowers' expectations of being protected by court in a period when trust in these specific lenders was being questioned. The results do not offer predictions about how a more general moratorium might shift payment patterns, or how enhanced protections would affect lenders who were not implicated in wrongdoing, however. It does suggest the OTSC moratorium did not have strongly negative effects on loan outcomes in the short- or long-term.

Courts and policymakers might want to consider how borrowers at risk of default will perceive any changes to the legal review process related to collections, foreclosures or repossessions. When financial institutions lose the trust of borrowers, mechanisms to facilitate borrowers' cooperation and increase servicer attention to how loan payments are treated may prove useful. While it imposed a financial and administrative cost on lenders, the OTSC may have had a positive effect on borrowers at least in the short run. Court oversight may also influence lender behavior, including better-quality legal filings, and more positive loan status appraisals, including expanding how loans payments are classified as being ontime.

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