"Foreclosures, House Prices, and the Real Economy"
Atif Mian
Amir Sufi
Francesco Trebbi

[NOT FOR PUBLICATION]

Appendix Table 1: Addressing the Mortgage Bankers Association Data

The Mortgage Bankers' Association makes available state by year data on foreclosure starts. The MBA leaves it to servicers to report whether they have initiated a foreclosure. However, the advice they provide is that a foreclosure start represents any time a servicer has made a decision that a foreclosure is going to be initiated either through a referral or a court filing. As a result, a foreclosure start in the MBA data will be very closely linked to the initial legal filing that begins the foreclosure process.

It is crucial to understand that there are two stages of the foreclosure process: the pre-auction stage (a "notice of default" or "lis pendens" filing) and the auction stage (a "notice of trustee sale" filing or a "notice of foreclosure sale" filing). As explained in Section I, our analysis is focused on foreclosures at the <u>auction stage</u> where foreclosed homes come to the market.

Unfortunately, the MBA data <u>do not measure</u> what is crucial for our analysis: when a home enters the auction stage of the foreclosure process. Instead, the MBA data are more accurate in measuring when the foreclosure process starts, which will often be when an initial pre-auction filing occurs.

More specifically, in states where a pre-auction filing is required, the MBA data will report a foreclosure start <u>before</u> the auction stage that we would like to measure. It is for this reason the RealtyTrac data are so valuable. They allow us to measure when the foreclosure process reaches the auction stage. In general, the MBA data do not measure the relevant stage of foreclosure for our analysis.

Further, this measurement problem means that one cannot use the MBA data to measure foreclosure auction differences across judicial and non-judicial states. Doing so leads to a <u>mechanical</u> and <u>systematic</u> bias. The reason is two-fold. First, all states that require a judicial foreclosure require a pre-auction filing. Of the 30 states that do not require a judicial foreclosure, 16 do not require a pre-auction filing. As a result, if one <u>incorrectly</u> uses the MBA data to measure foreclosure <u>auctions</u>, he would <u>systematically and mechanically overstate the number of foreclosure auctions in judicial states relative to non-judicial states</u>. Because many non-judicial states do not require a pre-auction filing, the MBA data will <u>mechanically</u> show lower foreclosure starts in non-judicial states.

Second, even if all non-judicial states required a pre-auction filing, we know from Section I that foreclosures move from the pre-auction stage to the auction stage much more quickly in non-judicial states. As a result, the foreclosure start data from the MBA for non-judicial states would

more accurately reflect actual auctions, whereas they would systematically overstate auctions for judicial states.

Appendix Table 1 shows evidence supporting the arguments above. In column 1, we repeat the first stage regression relating foreclosure auctions per homeowner in 2008 to the judicial requirement indicator variable. It shows the negative and statistically significant coefficient that is the basis of our empirical strategy. Column 2 reports the same specification but with the left hand side being pre-auction filings per homeowner as of 2008 according to RealtyTrac. It shows a positive and statistically significant coefficient. This reflects a *mechanical* result given that 16 states with no judicial requirement do not require a pre-auction filing. In column 3 we exclude these 16 states and the coefficient is cut by 60% and is statistically insignificant.

In column 4, we use as the left hand side variable foreclosure starts from the MBA, which is measured as a fraction of total mortgages serviced in their survey. It shows a coefficient of 0. This should not be surprising given the analysis above. The MBA data are measuring foreclosure starts and not foreclosure auctions.

There is another implication of these facts that is worth mentioning: the foreclosure <u>inventory</u> data from the MBA--which measures foreclosures that have not yet reached the auction stage--will also be <u>mechanically</u> higher for judicial states. This is because some non-judicial states do not require a pre-auction filing. For these non-judicial states, many foreclosures will never enter the MBA inventory because the first filing will be the auction filing. There is therefore higher inventory in judicial states, but this is mechanical. Alternatively, even in non-judicial states that require a pre-auction filing, we know that the total time from pre-auction filing to auction is faster in non-judicial states. Again, this will mean that there will be higher foreclosure inventory in judicial states at any point in time, as foreclosures leave the inventory after the auction. As a result, part of the MBA-measured higher foreclosure inventory in judicial states will be mechanical, and part will be a function of the faster time to foreclose in non-judicial states.

Appendix Figure 1: House Price Growth and Foreclosure Correlation across States

Appendix Figure 1 shows the scatter plot of house price growth from 2007 to 2009 against foreclosures during the same time period. This figure corresponds with Table 2 in the text.

Appendix Table 2: Ex Ante Credit Supply

In Appendix Table 1, we report results from our estimation of the following equation:

$$Outcome_{zbsx} = \alpha_{bsx} + \theta * JudicialForeclosureRequirement_s + \eta_{zbsx}$$

where an outcome in zip code z near state border b in state s is regressed on a border-state-10-mile strip fixed effect and the judicial foreclosure requirement indicator variable. In Panel A of Appendix Table 1, we first replicate the first stage where the outcome variable is the foreclosure rate. As column 1 shows, the foreclosure rate per homeowner is significantly lower in judicial states. The magnitude of the effect is similar to the state level evidence in Table 4. Column 2

shows that the foreclosure per delinquency ratio is also much lower in zip codes on the judicial state side of the border.

In column 3, we examine whether the average mortgage for home purchase in a zip code is smaller if the zip code is in a judicial state. This specification is similar to the one reported in Pence (2006) except we are using the average in a zip code instead of the underlying loans and we are examining the 2005 loans instead of 1994 and 1995 loans. The mortgage data come from HMDA. In column 4, we use an alternative left hand side variable, which is the total amount of mortgages for home purchase in a zip code scaled by total income from the IRS in that zip code. As the estimates in columns 3 and 4 show, we find no evidence that average loan sizes or total lending are significantly lower in judicial states, despite the fact that ex post foreclosure rates are significantly lower. The standard errors are sufficiently small that we can reject at the 10% level the hypothesis that loans sizes or loans to income are 3/4 standard deviation lower in zip codes on the judicial state side of the border.

To further explore this issue, Panel B presents the same coefficients as in columns 3 and 4 but for every year going back to 1992. While statistical power is clearly an issue, we find very similar point estimates as Pence (2006) in the early part of the sample: lenders extended smaller and fewer loans to zip codes in judicial states. However, beginning in the middle 1990s and lasting throughout the housing boom, the coefficient estimates move toward zero and then turn positive. In other words, lenders during the housing boom did not take into account the ex post differences in foreclosure rates between judicial and non-judicial states.

We also isolate the sample to loans that were not sold to GSEs given the argument that GSEs may not discriminate between judicial and non-judicial foreclosure states. The results are similar. The standard errors across all specifications are small enough that we can reject at the 10% level of confidence that lenders extended loan amounts or loan sizes to judicial states in any year from 2000 to 2004 that were 1/2 standard deviation lower than non-judicial states.

We conclude based on this evidence that there is no differential credit supply effect in non-judicial versus judicial states in the years before the foreclosure crisis.

Appendix Table 3: Other state-level foreclosure and delinquency laws

State laws requiring foreclosures to take place through courts are only one of many legal differences in mortgage markets across states. To assess the importance of the additional legal differences, we employ the Rao and Walsh (2009) taxonomy of consumer protection clauses included in state foreclosure statutes.[1] Our goal is to examine whether other legal differences are (1) responsible for our results on judicial foreclosure requirement and (2) important in their own right.

Rao and Walsh (2009) list the following six pre-sale protections: Access to court review; loss mitigation requirement before foreclosure; right to cure before acceleration; right to reinstate before sale; personal service requirement for complaint or sale notice; and housing emergency

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[1] We thank Christopher James for pointing us in this direction.

assistance fund. They also list four common post-sale protections: Right to redeem; deficiency judgments; accounting of sale proceeds; prompt return of surplus. While some of these dimensions correlate quite highly with judicial foreclosures (access to court review has a positive correlation of 69%), others display almost no correlation (right to reinstate before sale has a negative correlation of -1%).

In regressions some of which are reported in Appendix Table 2, we estimate augmented versions of the four main specifications in the top panel of Table 4. We regress the outcomes of interest on an indicator variable for whether the state requires judicial foreclosure with the addition of a discrete control variable taking value 1 if any of the ten consumer protection clauses in Rao and Walsh (2009) is present in a strong form, 1/2 if present but weak, and 0 if missing. We add each clause individually to the specification and the whole set of ten clauses simultaneously. This latter case is reported in the appendix.

Examining the foreclosure per homeowner ratio in 2008 and 2009, the judicial foreclosure indicator maintains its original size and significance in each of the ten augmented specifications and in the specification with all clauses simultaneously (column 1). Foreclosure rates appear significantly lower in judicial foreclosure states. The judicial foreclosure variable eliminates the statistical significance of all of the other Rao and Walsh (2009) clauses except for the "right to redeem." The results are similar if we control for delinquencies per homeowner in 2008 and 2009 and when the left-hand-side variable is the foreclosure per delinquency ratio in 2008 and 2009.

Mortgage delinquencies do not display a correlation with whether states require judicial foreclosure, and they also display no strong correlation with any of the ten consumer protection clauses in Rao and Walsh (2009). We are unable to reject at the 10% level the hypothesis that delinquencies per homeowner are significantly different along any of these ten legal dimensions. In sum, we find that the judicial foreclosure requirement is the most relevant legal difference for explaining foreclosure rates and we find no evidence that any other legal difference is polluting our first stage estimate.

Appendix Figure 2: S&P 17 and OFEHO

Given that the zip code level FCSW and Zillow house price indices are not available for public use, in Appendix Figure 3 we replicate our findings using publicly available S&P/Case-Shiller and FHFA CBSA level data. For the S&P CS indices, we exclude three MSAs that cross the borders of states that differ in their judicial foreclosure requirement laws (Chicago, IL; Charlotte, NC; and Washington, DC). The relative drop in non-judicial states using the S&P CS publicly available data is 12%, and the relative drop using FHFA is 3%. FHFA data excludes non-conforming (mostly subprime and jumbo loans) loans in its construction and hence tends to underestimate house price changes driven by the mortgage crisis. This figure corresponds with Figure 5 in the text.

Appendix Table 4: House Price Growth from 2009 to 2010

We repeat the state-level 2SLS specification of house price growth on foreclosures for house price growth from 2009 to 2010. The first stage coefficient of foreclosures on the judicial requirement indicator variable is almost identical for 2010 as for 2009, as seen in Figure 3 in the main text. The results in columns 2 and 4 of Appendix Table 4 show that house price growth is not statistically significantly related to foreclosure activity in 2010.

Appendix Table 5: County-Level Border Analysis for Auto Sales and Residential Investment

One concern with the results in Tables 9 and 10 of the text is that omitted variables across states or CBSAs pollute the two-stage least squares estimates for residential investment and auto sales. Unlike the house price data, we do not have zip code level information on auto sales or residential investment. However, the original data from the Census and R.L. Polk are at the county level. This allows for a less granular border discontinuity design where the units of observation are counties that are very near the border of two states that have differing foreclosure rules.

The exact specification isolates the sample to counties that are within 10 miles of the border of two states which differ on whether judicial foreclosure is required. The specification utilizes border fixed effects and is clustered at the border level. In other words, the two-stage least squares estimates exploit variation in foreclosures for two counties right across the border from another, where one county is in a state that requires judicial foreclosure while the other county is not.

The county-level border discontinuity second stage results are in Appendix Table 5. For residential investment, the standard errors are quite large. The point estimates are within the same range as the CBSA level results in Table 9, but there is almost no precision. The results for auto sales using the border discontinuity specification are similar in magnitude as the CBSA level results in Table10. The standard errors are smaller, and we can reject the null of no effect at the 10% level in columns 4 and 5.

Appendix Tables 6-8, Appendix Figures 3-4: The Classification of Massachusetts

RealtyTrac classifies Massachusetts as a state that requires judicial approval for a foreclosure. Their justification for this classification is as follows:

"While Massachusetts provides for a non-judicial foreclosure, prior to sale, an action must be filed with the Land Court to obtain a judgment that the owners of the subject property are not protected under the Soldiers' and Sailors' Civil Relief Act of 1940, as amended. A complaint is filed with the Land Court and the court provides an Order of Notice which must be served, published and recorded prior to judgment entering."

The foreclosure rate evidence strongly supports the view that foreclosures in Massachusetts take more time and are less likely than in other non-judicial states in the region. There are two states

that border Massachusetts (New Hampshire and Rhode Island) that are unambiguously states that do not have a judicial foreclosure requirement. According to RealtyTrac, the period of time it takes to conduct a foreclosure is longer in Massachusetts than in either New Hampshire or Rhode Island.

In Appendix Table 6 Panel A, we show using our data that foreclosure rates per homeowner are in fact significantly lower in Massachusetts than in New Hampshire and Rhode Island, two states that unambiguously do not require a legal filing for foreclosure. Massachusetts has a foreclosure rate per homeowner that is 2.5% compared to 3.6% in New Hampshire and 4.5% in Rhode Island. In fact, New Hampshire has a *lower* number of delinquencies than Massachusetts despite having a *higher* number of foreclosures. The pass-through rate to foreclosure is much lower in Massachusetts than in either New Hampshire or Rhode Island.

In Panel B, we use zip codes in these three states to show that foreclosures per homeowner are statistically and economically significantly lower in Massachusetts than New Hampshire and Rhode Island. After conditioning on delinquencies and all control variables, Massachusetts continues to show a 1.3% lower rate of foreclosures per homeowner, which is over 1/3 the mean in the zip code level sample.

Further, as columns 3 and 4 show, the rate of delinquencies is close to identical in the three states. So the evidence is incontrovertible that foreclosures are lower in Massachusetts than New Hampshire and Rhode Island, and this difference is not a function of delinquencies or a large set of control variables. It seems reasonable that the RealtyTrac classification is correct in that the legal filing requirement in Massachusetts is an impediment to a quick foreclosure.

Regardless, in Appendix Table 7 we replicate the state level coefficients of the core results switching Massachusetts from a judicial to a non-judicial state. The results are largely similar. In Appendix Table 8, we show how the zip code border sample changes if we change the classification of Massachusetts from judicial to non-judicial. Appendix Figure 3 shows that the border sample first stage graphs look very similar even when classifying Massachusetts as a non-judicial state.

In summary, the RealtyTrac classification of Massachusetts as a judicial requirement state is consistent with the lower foreclosure rate in Massachusetts relative to New Hampshire and Rhode Island. This lower foreclosure rate is not driven by delinquencies or other control variables. Further, our results are qualitatively similar even if we classify Massachusetts as a non-judicial state.

Appendix Table 9: Exclusion of Arizona and Nevada

Appendix Table 9 presents the main results of the paper with the exclusion of Arizona and Nevada. We exclude these two states because they have very high rates of foreclosure relative to other states. All results are materially unchanged. The only results that show some movement in the coefficients are the house price growth results using FCSW. Recall that FCSW is only

available for 24 states in the sample, and so a reduction in the sample size of 2 is a significant reduction.

Appendix Table 10: 2001 Placebo Test

Appendix Table 10 presents the 2001 placebo test. The concern we are addressing is that non-judicial states are inherently more cyclical and therefore more prone to booms and busts. We use the 2001 recession as a placebo test because we know that house price declines and foreclosures were largely absent relative to the 2007 to 2009 recession. As the results show, the reduced form relation between auto sales and residential investment growth and judicial foreclosure requirement is positive and significant during the 2007 and 2009 recession. But there is no correlation during the 2001 recession. The standard errors are small and we can reject at the 5% level of confidence the hypothesis that the coefficient is the same during the 2001 recession as the 2007 to 2009 recession. This placebo test mitigates the concern that states without a judicial requirement for foreclosure are inherently more cyclical.

References:

Rao, John and Geoff Walsh, 2009, "Foreclosing a Dream" National Consumer Law Center Inc.

Appendix Table 1
Exploration of MBA foreclosure start data

This table relates foreclosure filings as measured by RealtyTrac (RT) and the Mortgage Bankers' Association National Delinquency Survey to whether a state has a judicial requirement for foreclosure.

	(1) Foreclosure auction filings per homeowner, RT, 2008	(2) Foreclosure pre-auction filings per homeowner, RT, 2008	(3) Foreclosure pre-auction filings per homeowner, RT, 2008	(4) Foreclosure starts per mortgage, MBA, 2008
Judicial foreclosure requirement	-0.009**	0.005*	0.002	-0.000
	(0.003)	(0.002)	(0.002)	(0.000)
Delinquencies per homeowner, 2008	0.416**	0.285**	0.356**	0.144**
	(0.054)	(0.038)	(0.039)	(0.009)
Constant	-0.004	-0.012**	-0.014**	-0.000
	(0.004)	(0.003)	(0.003)	(0.001)
Sample	Full	Full	States requiring pre-auction filing	Full
N	51	51	35	51
R^2	0.600	0.563	0.725	0.838

Appendix Table 2
Ex Ante Credit Supply, Zip Codes Near Border Sample

This table presents evidence on whether zip codes in judicial versus non-judicial states experience differential credit supply before the foreclosure crisis in 2008 and 2009. The sample for all specifications is the border discontinuity zip code sample, and all specifications include border-strip fixed effects. Columns 1 and 2 of Panel A replicate the first stage in the border discontinuity sample. Loan size is defined to be the average loan size of mortgages originated for the purpose of home purchase in a zip code. Loans to income is the total amount of mortgages originated for the purpose of home purchase scaled by total aggregate IRS income in the zip code. Non-GSE loans are mortgages that are not sold to a GSE within a year of origination. In Panel B, each coefficient is from a separate regression for the dependent variable in the column heading and the year in the row heading. Standard errors in all specifications are clustered at the border-strip level.

	Panel A: First Stage and 2005 Credit Supply Measures			
	(1)	(2)	(3)	(4)
	Foreclosures per homeowner 08-09	Foreclosures per delinquency 08-09	Ln(loan size 05)	Loans/Income, 05
Judicial foreclosure requirement	-0.021*	-0.118*	0.045	-0.008
	(0.008)	(0.052)	(0.061)	(0.019)
Delinquencies per homeowner, 08-09	0.586**			
	(0.073)			
Constant	-0.002	0.413**	5.101**	0.164**
	(0.008)	(0.030)	(0.035)	(0.011)
N	870	869	866	866
R^2	0.713	0.457	0.441	0.256

Panel B: Coefficients by Year

	Ln(loan size)		Loans/Income		Non-GSE Loans/Income	
	Coeff	Std Error	Coeff	Std Error	Coeff	Std Error
1992	-0.0381	(0.054)	-0.0153	(0.010)	-0.0069	(0.005)
1993	-0.0365	(0.063)	-0.0245	(0.019)	-0.0079	(0.006)
1994	-0.0262	(0.066)	-0.0136	(0.018)	-0.0048	(0.009)
1995	-0.0012	(0.062)	-0.0127	(0.016)	-0.0061	(0.009)
1996	0.0260	(0.074)	-0.0106	(0.020)	-0.0025	(0.011)
1997	0.0245	(0.076)	-0.0084	(0.020)	-0.0017	(0.010)
1998	0.0429	(0.071)	-0.0083	(0.025)	-0.0022	(0.012)
1999	0.0576	(0.073)	-0.0058	(0.022)	0.0004	(0.011)
2000	0.0735	(0.072)	-0.0031	(0.017)	0.0041	(0.010)
2001	0.0841	(0.073)	0.0101	(0.015)	0.0073	(0.008)
2002	0.0941	(0.084)	0.0100	(0.016)	0.0096	(0.009)
2003	0.0546	(0.064)	0.0074	(0.015)	0.0067	(0.010)
2004	0.0502	(0.054)	0.0088	(0.019)	0.0087	(0.016)
2005	0.0452	(0.061)	-0.0081	(0.019)	-0.0060	(0.018)
2006	0.0089	(0.056)	-0.0125	(0.018)	-0.0093	(0.015)
2007	-0.0204	(0.051)	-0.0064	(0.014)	-0.0025	(0.010)

**,*,+ Coefficient statistically different than zero at the 1%, 5%, and 10% confidence level, respectively

Appendix Table 3
Foreclosure Statutes in Detail

The table presents coefficients from the first stage regression of foreclosures on whether a state requires a judicial foreclosure and all the consumer protection provisions reported in Rao and Walsh (2009). Standard errors are heteroskedasticity-robust.

	First Stage		
	(1) Foreclosures per homeowner 08-09	(2) Foreclosures per delinquency 08-09	(3) Delinquencies per homeowner 08-09
Judicial foreclosure requirement	-0.020**	-0.160**	-0.006
	(0.005)	(0.049)	(0.015)
Delinquencies per homeowner, 08-09	0.625**	1.351*	
	(0.100)	(0.517)	
Access to court review	0.008	0.071	-0.017
	(0.006)	(0.059)	(0.013)
Loss mitigation	-0.004	0.014	0.064
	(0.011)	(0.096)	(0.040)
Right to cure	-0.001	-0.054	-0.002
	(0.007)	(0.060)	(0.025)
Right to reinstate	-0.004	0.023	0.007
	(0.008)	(0.059)	(0.019)
Personal service requirement	-0.012	-0.092	-0.002
	(0.008)	(0.056)	(0.013)
Housing emergency fund	0.001	0.013	-0.023
	(0.007)	(0.060)	(0.018)
Right to redeem	-0.013*	-0.103+	-0.013
	(0.006)	(0.052)	(0.019)
Deficiency judgment	0.010	0.065	-0.014
	(0.007)	(0.060)	(0.014)
Accounting for sale proceeds	0.007	-0.014	0.015
	(0.011)	(0.084)	(0.022)
Prompt return of surplus	-0.011	-0.078	0.004
	(0.011)	(0.083)	(0.023)
Constant	-0.015	0.266**	0.102**
	(0.010)	(0.063)	(0.011)
N	51	51	51
R^2	0.748	0.517	0.163

Appendix Table 4
Foreclosures and House Prices through 2010, State-Level 2SLS

This table presents coefficients of the second stage of a 2SLS specification of house price growth on foreclosures. The first stage, reported in Table 4, regresses foreclosures on whether a state has a judicial foreclosure requirement. Standard errors are heteroskedasticity-robust.

	Zillow house price growth		FCSW house price growth	
	2007-2009	2009-2010	2007-2009	2009-2010
	(1)	(2)	(3)	(4)
Foreclosures per homeowner, 08-09	-1.904*		-1.860*	
	(0.859)		(0.873)	
Delinquencies per homeowner, 08-09	-1.188*		-1.402*	
	(0.582)		(0.594)	
Foreclosures per homeowner, 2010		-0.251		0.311
		(0.978)		(0.729)
Delinquencies per homeowner, 2010		-0.412		-0.570
		(0.430)		(0.356)
Constant	0.067*	-0.024	0.048	-0.002
	(0.028)	(0.017)	(0.038)	(0.014)
N	48	48	24	24
R^2	0.677	0.121	0.750	0.139

**,*,+ Coefficient statistically different than zero at the 1%, 5%, and 10% confidence level, respectively

Appendix Table 5
Foreclosures, Residential Investment, and Auto Sales
Counties Near Border Sample 2SLS

This table presents coefficients of the second stage of a 2SLS specification of residential investment growth or auto sales on foreclosures. The sample includes only counties that are within 10 miles of the border of a state with the opposite judicial foreclosure law. All regressions include border fixed effects. The first stage regresses foreclosures on whether a state has a judicial foreclosure requirement. Standard errors are heteroskedasticity-robust and clustered at the border level.

	Residential permits growth, 08-09			Auto sales growth, 08-09		
	(1)	(2)	(3)	(4)	(5)	(6)
Foreclosures per homeowner, 09	-11.980	-6.026	-13.061	-6.021+	-6.334+	-4.644
	(22.593)	(6.340)	(21.451)	(3.305)	(3.325)	(2.903)
Delinquencies per homeowner, 08-09	-0.767	-1.149	4.039	0.047	0.107	-0.544
	(2.643)	(2.143)	(3.880)	(0.422)	(0.426)	(0.645)
Dependent variable growth, 02-06		-0.063	-0.175+		-0.088	-0.119
		(0.043)	(0.092)		(0.090)	(0.082)
Dependent variable growth, 06-07		-0.079	-0.102		-0.090	-0.012
		(0.112)	(0.090)		(0.105)	(0.084)
Delinquencies squared, 08-09			-24.346			2.414
			(18.804)			(3.282)
New mortgages/income, 2005			0.384			0.298
			(1.570)			(0.216)
Debt to income increase, 02-05			0.091			-0.000
			(0.137)			(0.023)
Subprime consumer fraction, 2000			0.404			-0.281
			(1.329)			(0.199)
Income, 2005			-0.238			-0.002
			(0.446)			(0.081)
income < 25K fraction, 2005			-1.127			0.380
			(1.855)			(0.319)
Unemployment rate, 2000			1.290			1.495*
			(3.574)			(0.616)
Poverty fraction, 2000			-0.171			-0.449+
			(2.066)			(0.264)
Black fraction, 2000			0.526			0.148
			(0.913)		0.0	(0.166)
Hispanic fraction, 2000			-0.270			0.295*
			(0.857)			(0.151)
< high school education fraction, 2000			-0.147			-0.382+
			(1.252)			(0.217)
Urban fraction, 2000			-0.058			0.016
			(0.219)			(0.037)
N	409	400	400	416	416	416
R^2	0.004	0.068	0.066	-0.299	-0.323	-0.010

**,*,+ Coefficient statistically different than zero at the 1%, 5%, and 10% confidence level, respectively

Appendix Table 6

Foreclosures Lower in Massachusetts than New Hampshire and Rhode Island

This table shows that foreclosure rates are lower in Massachusetts relative to New Hampshire and Rhode Island, the latter two being states in New England where foreclosures require no legal filings. Panel A shows the mean differences. Panel B shows the regression coefficient on a Massachusetts indicator variable for zip codes in these three states. Standard errors for the coefficients in Panel B are clustered at the state level.

Panel A: Foreclosure Rates in MA, NH, and RI			
	(1)	(2)	(3)
	Foreclosures per homeowner, 2008-2009	Delinquencies per homeowner, 2008-2009	Foreclosures per delinquency, 2008-2009
Massachusetts	0.025	0.079	0.251
New Hampshire	0.036	0.070	0.413
Rhode Island	0.045	0.096	0.345

Panel B: Regression Coefficient on Massachusetts Indicator Variable in Zip Code Level Data

	Foreclosures per homeowner		Delinquencies per homeowner	
	(1)	(2)	(3)	(4)
		With all controls listed in Table 6, column 3		With all controls listed in Table 6, column 3
Massachusetts Indicator	-0.015**	-0.013*	0.001	0.003
	(0.001)	(0.003)	(0.006)	(0.003)
Delinquencies per homeowner	0.337*	0.215*		
	(0.052)	(0.007)		
Constant	0.015	-0.070+	0.079**	-0.043
	(0.005)	(0.022)	(0.006)	(0.127)
N	791	629	792	629
R^2	0.41	0.76	0.00	0.60

**,*,+ Coefficient statistically different than zero at the 1%, 5%, and 10% confidence level, respectively

Appendix Table 7
Results Switching Massachusetts to Non-Judicial State

This table replicates the first and second specifications for each dependent variable (from Tables 6, 10, and 11) when switching Massachusetts to a non-judicial state.

	State level	
	Only Delinquency Control	Delinquency and lagged dependent variable growth controls
	Zillow house price growth, 2007 to 2009	
Foreclosures per homeowner, 2008-2009	-1.962*	-1.423*
	(0.866)	(0.648)
	FCSW house price growth, 2007 to 2009	
Foreclosures per homeowner, 2008-2009	-1.699*	-1.159
	(0.844)	(0.774)
	Permit growth, 2007 to 2009	
Foreclosures per homeowner, 2008-2009	-5.606*	-5.089*
	(2.598)	(2.384)
	Auto sales growth, 2007 to 2009	
Foreclosures per homeowner, 2008-2009	-2.574+	-2.842+
	(1.529)	(1.578)

**,*,+ Coefficient statistically different than zero at the 1%, 5%, and 10% confidence level, respectively

Appendix Table 8
List of Borders of States with Different Foreclosure Rules, After Switching Massachusetts

This table shows the borders of states where the judicial foreclosure requirement laws differ. It also shows the number of zip codes in the sample that are near those borders. The total sample is restricted to zip codes for which the border in question is the closest state border and for which FCSW house price data are available. This table differs from Table 3 of the text because Massachusetts has been switched to a non-judicial state

Total

Border	Number of zip codes
Connecticut - Massachusetts	295
Connecticut - Rhode Island	64
Georgia - South Carolina	53
Illinois - Wisconsin	150
Michigan – Ohio	151
North Carolina - South Carolina	85

Appendix Table 9
Results without Arizona and Nevada

This table replicates the first and second specifications for each dependent variable (from Tables 6, 10, and 11) after removing the two states (Arizona and Nevada) with the highest foreclosure rates.

	State level	
	Only Delinquency Control	Delinquency and lagged dependent variable growth controls
	Zillow house price growth, 2007 to 2009	
Foreclosures per homeowner, 2008-2009	-1.936+	-1.387+
	(1.079)	(0.789)
	FCSW house price growth, 2007 to 2009	
Foreclosures per homeowner, 2008-2009	-1.599	-0.920
	(1.283)	(1.284)
	Permit growth, 2007 to 2009	
Foreclosures per homeowner, 2008-2009	-6.689*	-5.882+
	(3.187)	(3.032)
	Auto sales growth, 2007 to 2009	
Foreclosures per homeowner, 2008-2009	-3.333+	-3.616+
	(1.991)	(1.953)

**,*,+ Coefficient statistically different than zero at the 1%, 5%, and 10% confidence level, respectively

Appendix Table 10
2001 Recession Placebo Test

This table presents the reduced form relation between permits and auto sales growth during the 2007 to 2009 recession and the 2001 recession. The 2001 recession represents a placebo test because there were negligible foreclosures and house prices did not decline. All specifications include a control variable for household delinquencies per homeowner during the same time period as the left hand side variable.

Panel A: Residential permits

	Residential permits growth, 2007 to 2009	Residential permits growth, 2000 to 2001	Residential permits growth, 2000 to 2002
Judicial foreclosure requirement	0.124*	-0.009	-0.015
	(0.058)	(0.025)	(0.041)
N	51	51	51

Panel B: Auto sales

	Auto sales growth, 2007 to 2009	Auto sales growth, 2000 to 2001	Auto sales growth, 2000 to 2002
Foreclosures per homeowner	0.062+	0.015	0.005
	(0.033)	(0.014)	(0.021)
N	51	51	51

**,*,+ Coefficient statistically different than zero at the 1%, 5%, and 10% confidence level, respectively

Appendix Figure 1
State Level Correlation of Foreclosures with House Price Growth
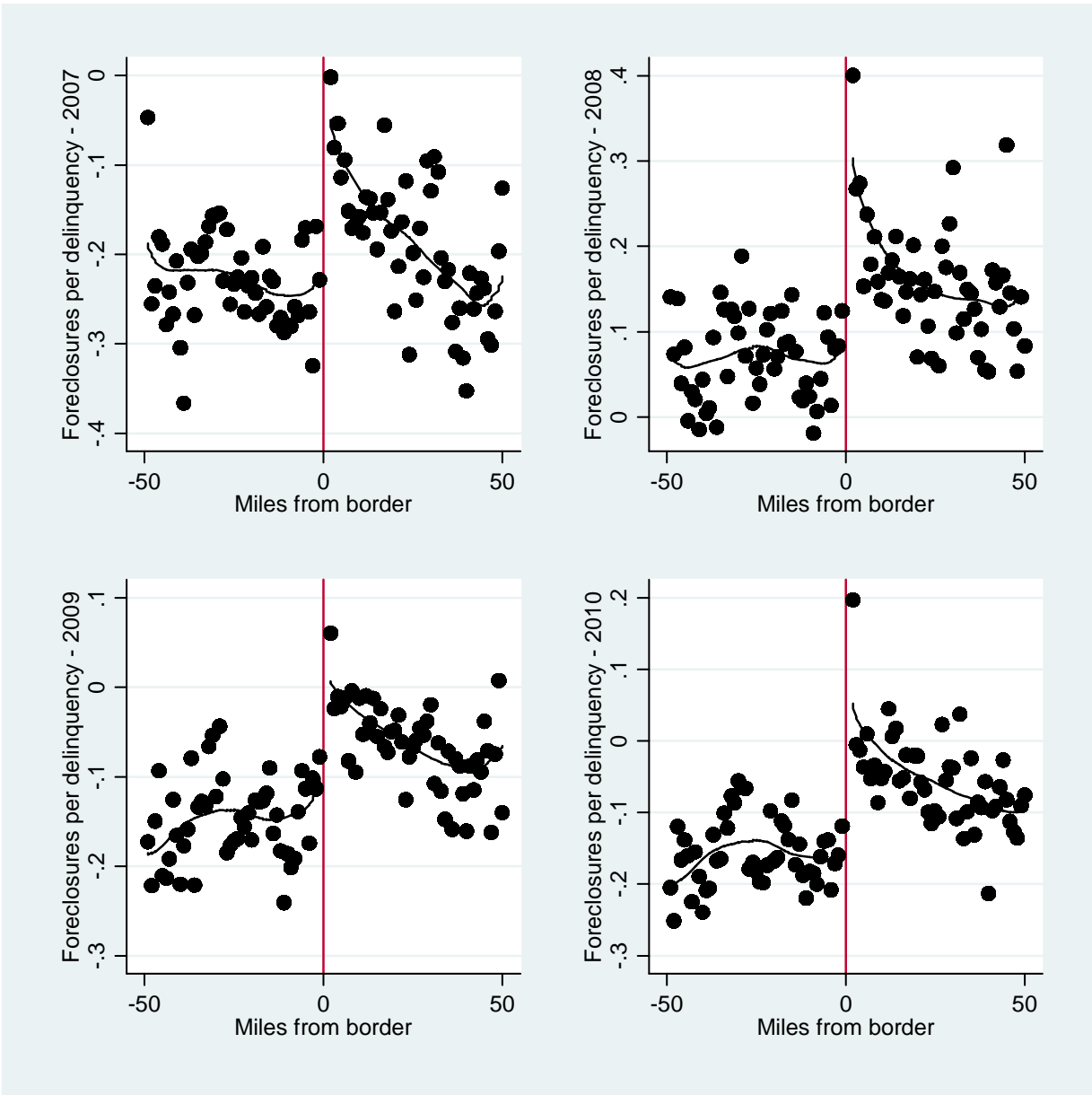
Appendix Figure 2
Foreclosures and House Prices using Publicly Available Data, Reduced Form
The figures plots house price growth in judicial and non-judicial states from 2004 to 2009. The averages are weighted by total population.
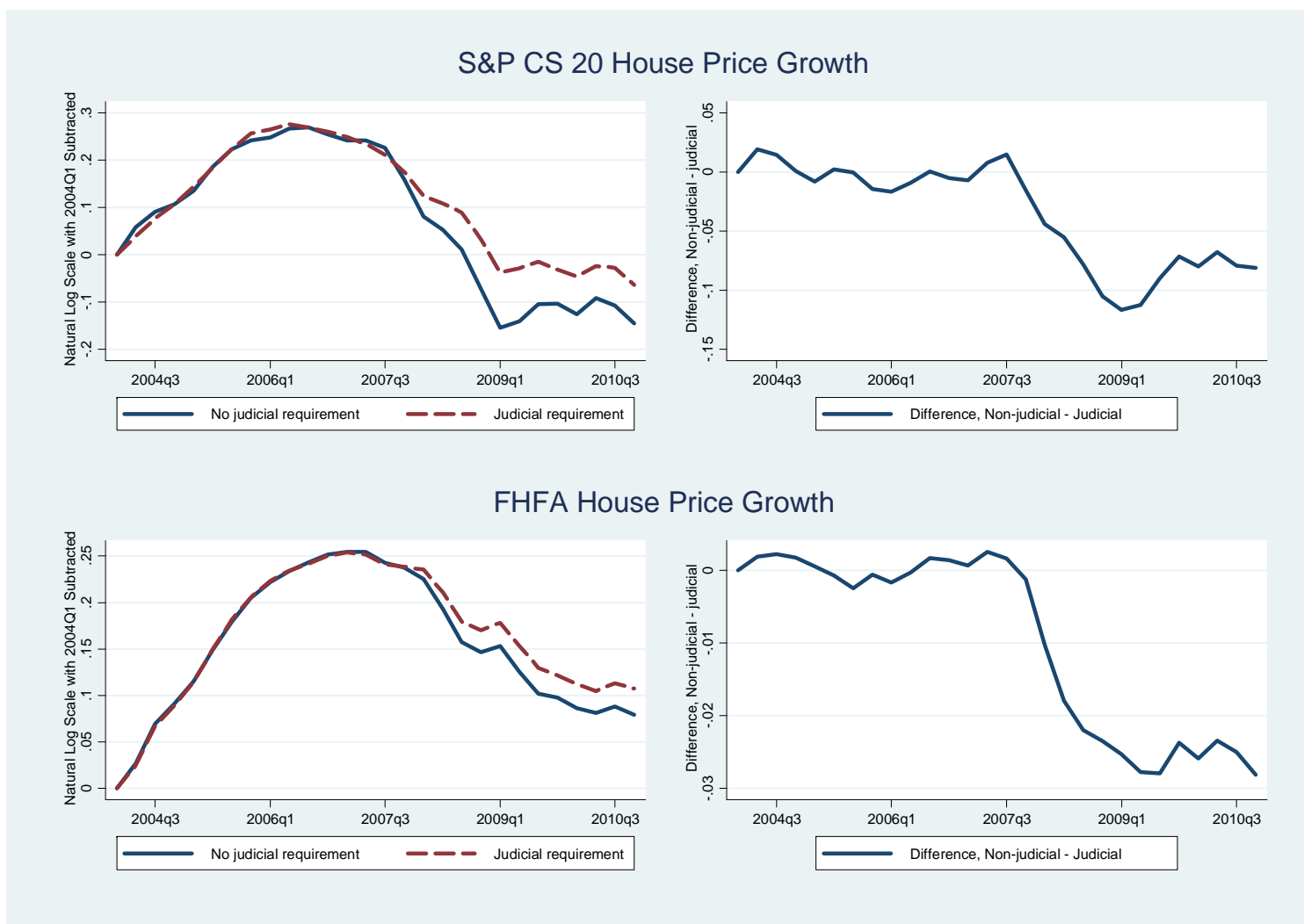
Appendix Figure 3
Judicial Foreclosure Requirement and Actual Foreclosures
Zip Codes Near Border Sample

This figure replicates Figure 4 but with Massachusetts switched to a non-judicial state

Appendix Figure 4
Judicial Foreclosure Requirement and House Prices
Zip Codes Near Border Sample

This figure replicates the top two panels of Figure 7 but with Massachusetts switched to a non-judicial state