Does Mortgage Deregulation Increase Foreclosures? Evidence from Cleveland

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Financial Crisis and Financial Regulation

- The financial crisis of 2007 has re-ignited a debate about the impact of regulating consumer mortgage markets.

- Several scholars and prominent policymakers argue that the deregulation of mortgage lending markets has caused the large number of loan defaults and foreclosures (Warren [2007]).

- However, Ben Bernanke argues that lighter regulation of mortgage markets can spur financial innovations that broadly benefit low income households (Bernanke [2009]).

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Mortgage Deregulation and Foreclosures

- Does deregulation on mortgage markets enable lenders to take advantage of uninformed borrowers?

  - If so, we would observe that deregulation would cause bad loans as a share of overall loans to increase.

- Or, does deregulation enable more credit-worthy borrowers to obtain good loans?

  - If so, we would observe that the share of bad loans following a deregulation does not increase.

- This paper uses a court-ordered repeal of home mortgage regulations in Cleveland Ohio in order to answer these questions.

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Evidence from Cleveland: A Natural Experiment

- My paper examines how a court-mandated repeal of a local predatory lending law in Cleveland affected home mortgage foreclosure and origination.

- The difference-in-difference (DID) estimations indicate that following the deregulation,

  - loan foreclosures increased by 49%.

  - overall loan originations did not change.

  - loans with subprime interest rates increased by 30% and loans issued by subprime lenders increased by 40%.

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Literature

- State mortgage regulations and subprime lending: Ho and Pennington-Cross [2006], Bostic et al. [2008].

- State Mortgage regulations and foreclosure rates: Ding et al. [2011]

- State foreclosure laws and home mortgage lending: Clauretie and Herzog [1990] and Pence [2006].

- Social and economics impact of foreclosures: Immergluck and Smith [2006b], Cui [2010], Immergluck and Smith [2005], Immergluck and Smith [2006a]; Schloemer et al. [2006], Mian et al. [2011].

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Repeal of Cleveland Predatory Lending Law

- On November 20, 2006, the Ohio Supreme Court ruled Cleveland's predatory lending ordinances unconstitutional.

- The court rule sided with American Financial Services Association (AFSA), a national organization that challenged the city law shortly after the enactment in 2002.

- Cleveland law regulated the loans secured by owner-occupied residential properties located within the city limit of Cleveland.

- This deregulation makes Cleveland a desirable subject of a natural experiment to study the impact of lending deregulation.

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Federal, State and Local Predatory Lending Laws

- Following Home Ownership and Equity Protection Act (HOEPA) enacted by Congress, most state and local predatory lending laws are also defined in two parts:

  - The first part defines the coverage of the laws by product types, interest rate triggers and fees triggers.

  - The second part imposes certain disclosures and lending restrictions on the covered loans.

- Typically, the state and local laws enhance both the coverage and the restrictions of the federal law.

A Comparison of Ohio Law and Cleveland Law

- Covered Loan Types:
  - Ohio: home equity loans;
  - Cleveland: all home loans, including home-purchase loans.

- Interest rate triggers (first-lien):
  - Ohio: 8 percentage points above the treasury rate;
  - Cleveland: 4.5 and 8 percentage points above the treasury rate.

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A Comparison of Ohio Law and Cleveland Law

In addition to the restrictions implemented by state law, the Cleveland Ordinance imposed restrictions on:

- loan flipping, balloon payments, negative amortization,

- an increased interest rate on default, advance payments, mandatory arbitration, prepayment penalties, financing of credit insurance,

- lending without counseling, lending without due regard to prepayment, and payments to home improvement contractors under certain circumstances.

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Difference-in-difference Identification

- A natural experiment

    - Treatment group: census tracts in Cleveland.

    - Control group: census tracts in the suburban municipalities.

    - Treatment: deregulation.

- The causal inference of the DID estimation assumes common time trends in the absence of the deregulation.

- The DID method identifies the impact of deregulation as the deviation between time trends of Cleveland and the suburban municipalities following deregulation.

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Data

- The Loan Origination and Foreclosure Matched Data of Cuyahoga County: loans made during 2005-2008, foreclosures by the end of December, 2009.

- The sample included home purchase loans for 1- to 4-family housing units secured by owner-occupied housing properties in Cuyahoga county.

- Early foreclosure is defined by foreclosure complaints filed by lenders within 30 months after origination.

- The constructed longitudinal data set includes loan counts at tract-month level during June 2006 – May 2007.
    - 458 tracts, 5496 monthly observations;
    - 6 months before and after the deregulation.

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Panel Poisson Estimation

$$E(y_{it}|X) = \exp(\theta_i + \eta_t + \alpha_1\delta^c + \alpha_2\gamma^R + \alpha_3(\delta^c \times \gamma^R)) \qquad (1)$$

- y_{it} is the loan count for census tract i in month t.
- θ_i is the tract fixed effects, and η_t is the month fixed effect.
- δ^c is a dummy for tracts in Cleveland.
- γ^R is a dummy for the periods after the repeal.
- α_3 measures the treatment effect.

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Panel Poisson Estimation

$$E(y_{it}|X) = \exp(\theta_i + \eta_t + \alpha_1\delta^c + \alpha_2\gamma^R + \alpha_3(\delta^c \times \gamma^R)) \qquad (2)$$
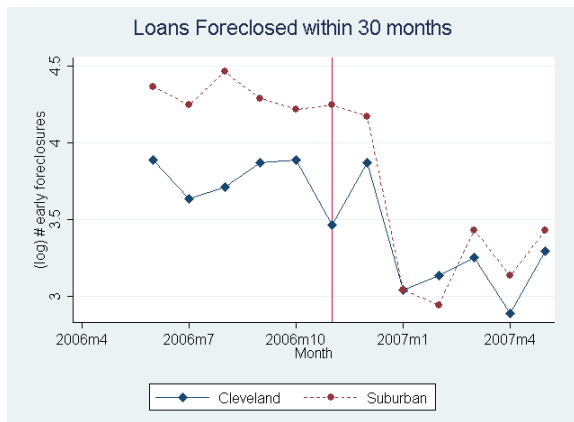
- α_3 can be interpreted as the log odds ratio.

$$\alpha_3 = \log \frac{E(y_{Cleveland,after}|X)}{E(y_{Cleveland,before}|X)} \Big/ \frac{E(y_{Subs,after}|X)}{E(y_{Subs,before}|X)} \qquad (3)$$

- Panel Poisson specification assumes the treatment group and the control group have proportional changes in outcome variables over time in the absence of the treatment.

- $\alpha_3 > 0 \implies$ odds ratio$>1 \implies$ the event is more likely in Cleveland after deregulation.

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Difference-in-difference: Foreclosures

Figure 1: Time Trends, June 2006 – May 2007

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Difference-in-difference: Foreclosures

Figure 2: Time Trends, June 2006 – May 2007
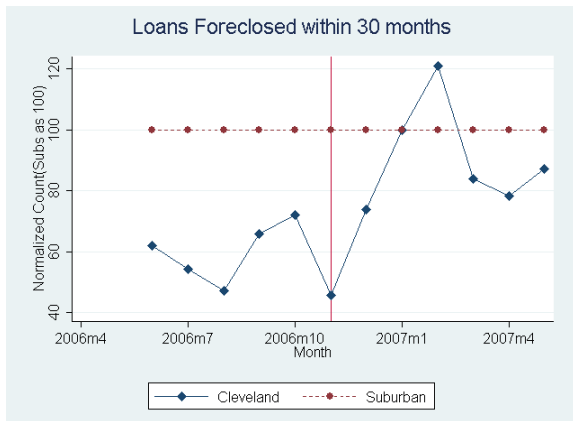
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Does Mortgage Deregulation Increase Foreclosures? Evidence from Cleveland

Difference-in-difference: Foreclosures

Table 1: Impact of Deregulation on Foreclosures

VARIABLES	(1) Baseline
Cleveland×Repeal	0.40***
	(0.14)
Observations	4,200
Number of tracts	350
Tract FE	YES
Month FE	YES
Control	NO

Notes: The point estimate of 0.4 translates into an odds ratio of 1.49 and implies a 49% increase in the number of loans with early foreclosures in Cleveland after the repeal.

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Does Mortgage Deregulation Increase Foreclosures? Evidence from Cleveland

Difference-in-difference: Foreclosures

Table 1: Impact of Deregulation on Foreclosures

VARIABLES	(1) Baseline	(2) Non-preempted
Cleveland×Repeal	0.40***	0.47***
	(0.14)	(0.16)
Observations	4,200	2,681
Number of tracts	350	313
Tract FE	YES	YES
Month FE	YES	YES
Control	NO	NO

Notes: The point estimate of 0.4 translates into an odds ratio of 1.49 and implies a 49% increase in the number of loans with early foreclosures in Cleveland after the repeal.

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Does Mortgage Deregulation Increase Foreclosures? Evidence from Cleveland

Difference-in-difference: Foreclosures

Table 1: Impact of Deregulation on Foreclosures

VARIABLES	(1) Baseline	(2) Non-preempted	(3) b=3 months
Cleveland×Repeal	0.40***	0.47***	0.36**
	(0.14)	(0.16)	(0.18)
Observations	4,200	2,681	1,560
Number of tracts	350	313	260
Tract FE	YES	YES	YES
Month FE	YES	YES	YES
Control	NO	NO	NO

Notes: The point estimate of 0.4 translates into an odds ratio of 1.49 and implies a 49% increase in the number of loans with early foreclosures in Cleveland after the repeal.

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Does Mortgage Deregulation Increase Foreclosures? Evidence from Cleveland

Difference-in-difference: Foreclosures

Table 1: Impact of Deregulation on Foreclosures

VARIABLES	(1) Baseline	(2) Non-preempted	(3) b=3 months	(4) Border
Cleveland×Repeal	0.40***	0.47***	0.36**	0.44*
	(0.14)	(0.16)	(0.18)	(0.24)
Observations	4,200	2,681	1,560	1,332
Number of tracts	350	313	260	111
Tract FE	YES	YES	YES	YES
Month FE	YES	YES	YES	YES
Control	NO	NO	NO	NO

Notes: The point estimate of 0.4 translates into an odds ratio of 1.49 and implies a 49% increase in the number of loans with early foreclosures in Cleveland after the repeal.

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Does Mortgage Deregulation Increase Foreclosures? Evidence from Cleveland

Difference-in-difference: Foreclosures

Table 1: Impact of Deregulation on Foreclosures

VARIABLES	(1) Baseline	(2) Non-preempted	(3) b=3 months	(4) Border	(5) 24-month
Cleveland×Repeal	0.40***	0.47***	0.36**	0.44*	0.49***
	(0.14)	(0.16)	(0.18)	(0.24)	(0.16)
Observations	4,200	2,681	1,560	1,332	3,804
Number of tracts	350	313	260	111	317
Tract FE	YES	YES	YES	YES	YES
Month FE	YES	YES	YES	YES	YES
Control	NO	NO	NO	NO	NO

Notes: The point estimate of 0.4 translates into an odds ratio of 1.49 and implies a 49% increase in the number of loans with early foreclosures in Cleveland after the repeal.

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Does Mortgage Deregulation Increase Foreclosures? Evidence from Cleveland

Falsifications: Timing and Locality

Table 2: Falsifications for Early Foreclosures

	(1) Nov. 2005 6 month
City×Repeal	-0.13
	(0.11)
Observations	4,524
Number of tracts	377
Tract FE	YES
Month FE	YES
Control	NO

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Does Mortgage Deregulation Increase Foreclosures? Evidence from Cleveland

Falsifications: Timing and Locality

Table 2: Falsifications for Early Foreclosures

	(1) Nov. 2005 6 month	(2) May 2006 6 month
City×Repeal	-0.13	-0.17
	(0.11)	(0.12)
Observations	4,524	4,320
Number of tracts	377	360
Tract FE	YES	YES
Month FE	YES	YES
Control	NO	NO

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Does Mortgage Deregulation Increase Foreclosures? Evidence from Cleveland

Falsifications: Timing and Locality

Table 2: Falsifications for Early Foreclosures

	(1) Nov. 2005 6 month	(2) May 2006 6 month	(3) Inner Subs 6 month
City×Repeal	-0.13	-0.17	0.02
	(0.11)	(0.12)	(0.20)
Observations	4,524	4,320	2,544
Number of tracts	377	360	212
Tract FE	YES	YES	YES
Month FE	YES	YES	YES
Control	NO	NO	NO

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Falsifications: Timing and Locality

Table 2: Falsifications for Early Foreclosures

	(1) Nov. 2005 6 month	(2) May 2006 6 month	(3) Inner Subs 6 month	(4) Pittsburgh 6 month
City×Repeal	-0.13	-0.17	0.02	0.32
	(0.11)	(0.12)	(0.20)	(0.24)
Observations	4,524	4,320	2,544	2,412
Number of tracts	377	360	212	201
Tract FE	YES	YES	YES	YES
Month FE	YES	YES	YES	YES
Control	NO	NO	NO	NO

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Does Mortgage Deregulation Increase Foreclosures? Evidence from Cleveland

Falsifications: Timing and Locality

Table 2: Falsifications for Early Foreclosures

	(1) Nov. 2005 6 month	(2) May 2006 6 month	(3) Inner Subs 6 month	(4) Pittsburgh 6 month	(5) Pittsburgh 3 month
City×Repeal	-0.13	-0.17	0.02	0.32	-0.02
	(0.11)	(0.12)	(0.20)	(0.24)	(0.39)
Observations	4,524	4,320	2,544	2,412	756
Number of tracts	377	360	212	201	126
Tract FE	YES	YES	YES	YES	YES
Month FE	YES	YES	YES	YES	YES
Control	NO	NO	NO	NO	NO

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Does Mortgage Deregulation Increase Foreclosures? Evidence from Cleveland

Falsifications: Housing Bubble and Bad Economy

Table 3: Social and Economic Conditions Before and After the Repeal

	(1) Sales Price
Cleveland×Repeal	-7,537.35
	(11,087.85)
Observations	28,006
Tract FE	YES
Month FE	YES
Control	NO

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Does Mortgage Deregulation Increase Foreclosures? Evidence from Cleveland

Falsifications: Housing Bubble and Bad Economy

Table 3: Social and Economic Conditions Before and After the Repeal

	(1) Sales Price	(2) Sales Price
Cleveland×Repeal	-7,537.35	-6,678.26
	(11,087.85)	(11,032.27)
Observations	28,006	28,006
Tract FE	YES	YES
Month FE	YES	YES
Control	NO	YES

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Does Mortgage Deregulation Increase Foreclosures? Evidence from Cleveland

Falsifications: Housing Bubble and Bad Economy

Table 3: Social and Economic Conditions Before and After the Repeal

	(1) Sales Price	(2) Sales Price	(3) Foreclosed Homes
Cleveland×Repeal	-7,537.35	-6,678.26	-0.07
	(11,087.85)	(11,032.27)	(0.13)
Observations	28,006	28,006	4,032
Tract FE	YES	YES	YES
Month FE	YES	YES	YES
Control	NO	YES	NO

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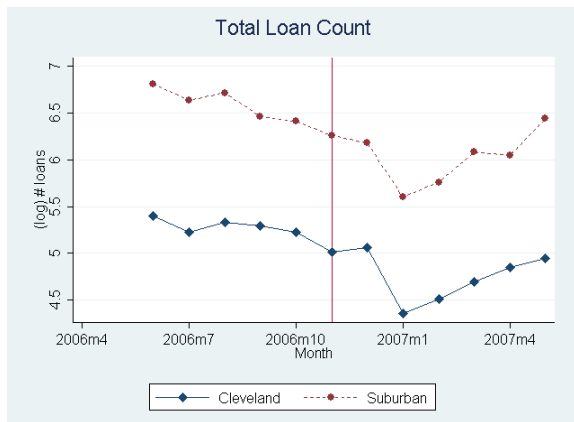
Foreclosure: By Loan Types and Lender Types

Table 4: Early Foreclosures by Types

	(1) All	(2) Subprime	(3) Prime	(4) Subprime	(5) Prime
Cleveland×Repeal	0.40***	0.50***	0.39	0.44*	0.32*
	(0.14)	(0.17)	(0.27)	(0.23)	(0.18)
Observations	4,200	3,528	1,722	2,664	3,444
Number of tracts	350	294	186	222	287
Tract FE	YES	YES	YES	YES	YES
Month FE	YES	YES	YES	YES	YES
Control	NO	NO	NO	NO	NO

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Difference-in-difference: Originations

Figure 3: Total Loan Count, June 2006 – May 2007

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Difference-in-difference: Originations

Table 5: Impact of Deregulation on Loan Count

VARIABLES	(1) Baseline
Cleveland×Repeal	0.02
	(0.05)
Observations	5,496
Number of tracts	458
Tract FE	YES
Month FE	YES
Control	NO

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Does Mortgage Deregulation Increase Foreclosures? Evidence from Cleveland

Difference-in-difference: Originations

Table 5: Impact of Deregulation on Loan Count

VARIABLES	(1) Baseline	(2) Non-preempted
Cleveland×Repeal	0.02	0.03
	(0.05)	(0.06)
Observations	5,496	3,517
Number of tracts	458	436
Tract FE	YES	YES
Month FE	YES	YES
Control	NO	NO

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Does Mortgage Deregulation Increase Foreclosures? Evidence from Cleveland

Difference-in-difference: Originations

Table 5: Impact of Deregulation on Loan Count

VARIABLES	(1) Baseline	(2) Non-preempted	(3) b=3 months
Cleveland×Repeal	0.02	0.03	0.01
	(0.05)	(0.06)	(0.08)
Observations	5,496	3,517	2,622
Number of tracts	458	436	437
Tract FE	YES	YES	YES
Month FE	YES	YES	YES
Control	NO	NO	NO

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Does Mortgage Deregulation Increase Foreclosures? Evidence from Cleveland

Difference-in-difference: Originations

Table 5: Impact of Deregulation on Loan Count

VARIABLES	(1) Baseline	(2) Non-preempted	(3) b=3 months	(4) Border
Cleveland×Repeal	0.02	0.03	0.01	-0.04
	(0.05)	(0.06)	(0.08)	(0.09)
Observations	5,496	3,517	2,622	1,560
Number of tracts	458	436	437	130
Tract FE	YES	YES	YES	YES
Month FE	YES	YES	YES	YES
Control	NO	NO	NO	NO

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Loan Origination: By Loan Types and Lender Types
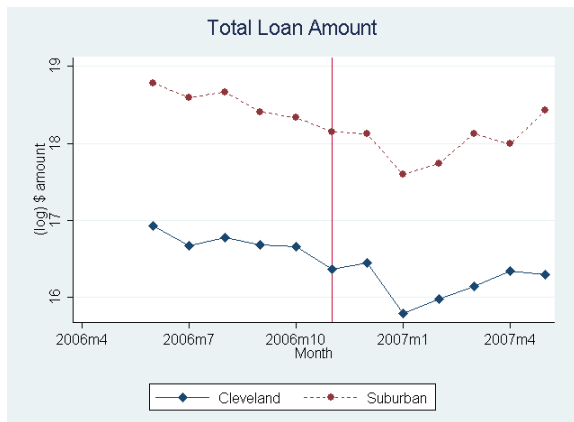
Table 6: Loan Count by Types

	(1) All	(2) Subprime	(3) Prime	(4) Subprime	(5) Prime
Cleveland×Repeal	0.02	0.27***	0.02	0.34**	0.06
	(0.05)	(0.09)	(0.07)	(0.16)	(0.06)
Observations	5,496	4,980	5,148	4,128	5,412
Number of tracts	458	415	429	344	451
Tract FE	YES	YES	YES	YES	YES
Month FE	YES	YES	YES	YES	YES
Control	NO	NO	NO	NO	NO

A coefficient of 0.27 translates into an odds ratio of 1.31 and implies a
30% increase in the subprime loans.

A coefficient of 0.34 translates into an odds ratio of 1.40 and implies a
40% increase in the loans made by subprime lenders.

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Does Mortgage Deregulation Increase Foreclosures? Evidence from Cleveland

Difference-in-difference: Loan Amount

Figure 4: Total Loan Amount, June 2006 – May 2007

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Does Mortgage Deregulation Increase Foreclosures? Evidence from Cleveland

Difference-in-difference: Loan Amount

Table 7: Impact of Deregulation on Loan Amount

VARIABLES	(1) Baseline	(2) Non-preempted	(3) b=3 months	(4) Border
Cleveland×Repeal	-0.03	-0.01	-0.01	-0.07
	(0.06)	(0.06)	(0.09)	(0.13)
Observations	5,496	3,517	2,622	1,560
Number of tracts	458	436	437	130
Tract FE	YES	YES	YES	YES
Month FE	YES	YES	YES	YES
Control	NO	NO	NO	NO

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Does Mortgage Deregulation Increase Foreclosures? Evidence from Cleveland

Loan Amount: By Loan Types and Lender Types

Table 8: Loan Amount by Types

	(1) All	(2) Subprime	(3) Prime	(4) Subprime	(5) Prime
Cleveland×Repeal	-0.03	0.23**	-0.01	0.34*	0.00
	(0.06)	(0.10)	(0.08)	(0.18)	(0.07)
Observations	5,496	4,980	5,148	4,128	5,412
Number of tracts	458	415	429	344	451
Tract FE	YES	YES	YES	YES	YES
Month FE	YES	YES	YES	YES	YES
Control	NO	NO	NO	NO	NO

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Does Mortgage Deregulation Increase Foreclosures? Evidence from Cleveland

Conclusions

- This paper uses a court mandated repeal of predatory lending law in Cleveland, OH as a natural experiment to study the impact of deregulation on credit flow and loan quality.

- Empirical results indicate that deregulation caused a 49 percent increase in early foreclosures while it did not increase total loan volume, implying that bad loans as a share of overall loans increased substantially.

- Deregulation also increased the number of high-interest loans by 30 percent, increased loans made by subprime lenders by 40 percent.

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Does Mortgage Deregulation Increase Foreclosures? Evidence from Cleveland

Conclusions

- The robustness checks and falsification tests provide evidence that the increased early foreclosures are not driven by the definition of early foreclosure or the seasonal pattern of foreclosure.

- Moreover, the social and economic environment in which the loans are made, and the shock from the subprime crisis are not the reasons for the increased foreclosures after deregulation.

- These results suggest that the Cleveland predatory lending law, without reducing the credit supply, implemented restrictions under which the originated loans would survive longer.

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