

Know Thyself: Free Credit Reports and The Retail Mortgage Market

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Amit Kumar

PhD Finance

Hong Kong University of Science and Technology

Email: amit.kumar@connect.ust.hk

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Research Question

What is the effect of lowering consumers' economic cost of credit reports on mortgage market outcomes?

How may credit reports affect mortgage market outcomes? [▶ Sample Report](#)

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Suggested mechanism: Consumer self-learning

- Better self-assessment of creditworthiness.
 - ▶ Consumers mis-estimate creditworthiness ([Perry, 2008](#)) and debt ([Brown et al., 2011](#)).
- An opportunity to review credit decision and to take corrective action, if needed.
 - ▶ New creditworthy consumers may enter the market.
 - ▶ Those with bad record may choose subprime lenders or not apply for credit.
 - ▶ 46% of credit reports in the U.S. had a missing credit limit ([Avery et al., 2004](#)).

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Outcomes:

- Approval Ratio: \uparrow , due to more-informed applicants.
- Demand for credit: \uparrow or \downarrow , depends on prior beliefs on creditworthiness.

Empirical Setting: Natural Experiment

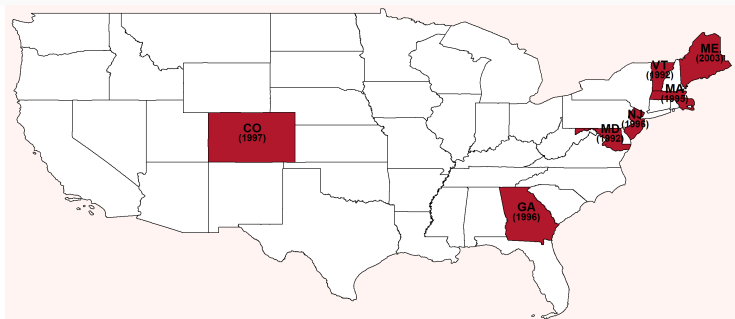
Fair and Accurate Transactions Act of 2003 (FACTA): Free credit reports annually. [▶ More](#)


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- Difference-in-differences (DID) setting:
 - ▶ **Control:** The seven pre-FACTA states.
 - ▶ **Treatment:** States surrounding control states.
 - ▶ **Event:** Establishment of `www.annualcreditreport.com` in Jan 2005.

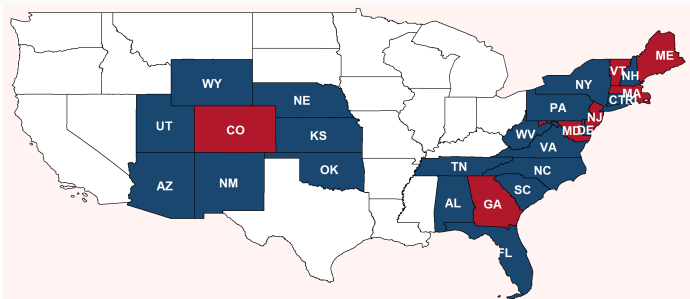


 Pre-FACTA States

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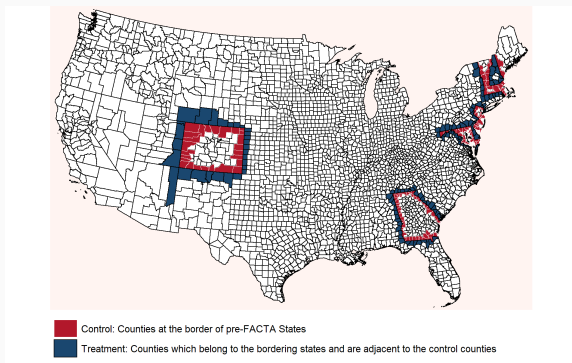


- Control: Pre-FACTA States
- Treatment: States surrounding the pre-FACTA states

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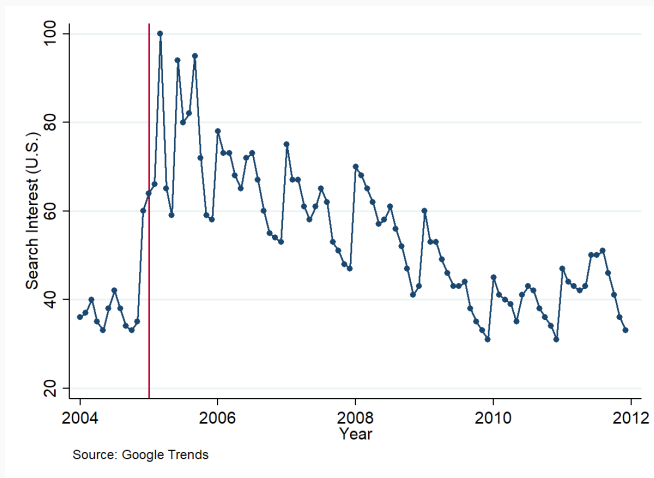


$$y_{icjt} = \beta_0 + \beta_1 Treatment_{ic} \times Post_T + \alpha_i + \gamma_{j,t} + \delta \times Economic_controls + \epsilon_{it}$$

- Observation unit is at the census tract level.
- $Post_T = 1$ for year ≥ 2005
- α_i : Census tract fixed effects. \rightarrow Fine geographic control. Accounts for differences across tracts.
- $\gamma_{j,t}$: “Border \times Year” fixed effects.
 - ▶ Corresponds to each region corresponding to a control state
 - ▶ Flexibly accounts for any regional **time varying** shocks
- Economic controls:
 - ▶ Annual growth rate of county income per-capita, county aggregate employment and state gross domestic product (GDP)

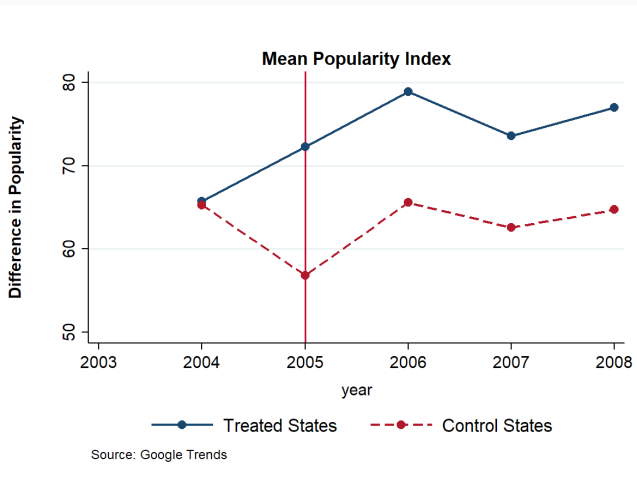
Consumer Interest in Credit Reports

Search interest on Google for “Free Credit Reports” suggests increase in consumer interest after the event.



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- Application-level data: Home Mortgage Disclosure Act (HMDA) and Fannie Mae and Freddie Mac.
- Equifax data on county-level subprime population.
- Others: Data from Census 2000, FED Call Reports, and survey data from SCF, SCE and County Business Pattern.

Results

Summary Statistics

	Full Sample				Control Group (C)				Treatment Group (T)			
	N	Mean	SD	Med.	N	Mean	SD	Med.	N	Mean	SD	Med.
Num of App per 1000 adult	86817	83.42	74.76	66.41	36494	98.42	77.58	77.74	50323	72.54	70.68	56.48
Approval Ratio	82713	0.63	0.13	0.64	35879	0.65	0.12	0.66	46834	0.61	0.13	0.62
Deny Credit Hist Ratio	82713	0.06	0.04	0.05	35879	0.05	0.04	0.04	46834	0.06	0.05	0.05
Deny Debt-to-inc Ratio	82713	0.03	0.03	0.03	35879	0.03	0.02	0.03	46834	0.03	0.03	0.03
Withdrawn Ratio	82713	0.12	0.05	0.12	35879	0.12	0.04	0.11	46834	0.12	0.06	0.12
Δ Inc per capita	2295	0.04	0.06	0.04	1143	0.04	0.05	0.04	1152	0.05	0.07	0.04
Δ Emp	2298	0.01	0.09	0.01	1138	0.01	0.09	0.01	1160	0.01	0.09	0.01
Δ State GDP	81	0.04	0.02	0.05	31	0.05	0.02	0.04	50	0.04	0.03	0.05

Results: Baseline Result

Baseline Result

	(1)	(2)	(3)	(4)	(5)	(6)
	N	N	Aprv.	Aprv.	Δ HPI	Δ HPI
Treat \times Post	13.28*** (2.94)	15.39*** (3.63)	0.01** (2.42)	0.02*** (2.82)	1.74* (1.83)	1.82* (1.82)
Economic Controls	No	Yes	No	Yes	No	Yes
Census Tract FE	Yes	Yes	Yes	Yes	Yes	Yes
Border \times Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Cluster (County)	Yes	Yes	Yes	Yes	Yes	Yes
R ² (Adj.)	0.807	0.808	0.748	0.744	0.683	0.686
Observations	86806	84789	82665	80667	25390	25365

Takeaway:

- Mortgage applications \uparrow by 13.8—16.0% (\$38.1 billion).
 - ▶ More consumers learned that they are creditworthy.
- Approval ratio \uparrow by 1–2 pp (~\$5.5 billion).
 - ▶ Improved borrower pool.
- Good borrowers select-in. Bad borrowers exit/search suitable lenders.
 - ⇒ Improvement in borrower pool and Increase in mortgage demand .

Result: Treatment Effect by Year

Baseline Result: Treatment by Year

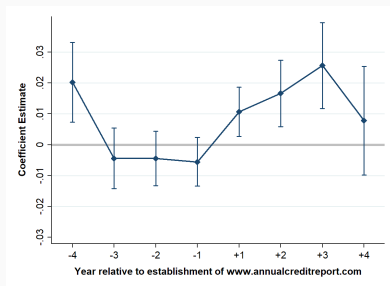


Figure 1. Coefficient Estimates

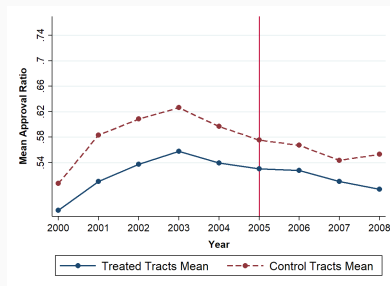


Figure 2. Raw Plot

Subprime Population

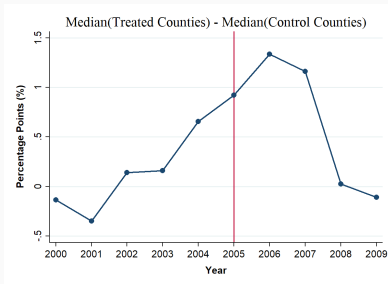


Figure 3. Median Subprime Population %

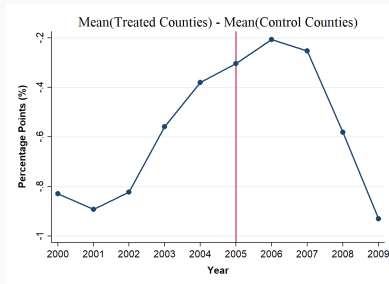


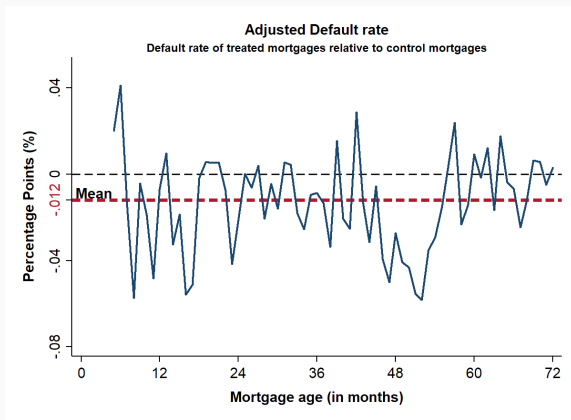
Figure 4. Mean Subprime Population %

$$\text{Median Difference} = \text{Median}(\text{Subprime \%})_{Treated} - \text{Median}(\text{Subprime \%})_{Control}$$

Takeaways:

- ↓ Sub-prime population % \Rightarrow Improved consumer pool.
- Treated areas saw improvement in consumer pool.

Mortgage Default



$$\begin{aligned} \text{Adjusted default rate}_{age} = & (Def_{2005,age} - Def_{2004,age})_{trt} \\ & - (Def_{2005,age} - Def_{2004,age})_{ctrl} \end{aligned}$$

where *Age* is measured in months since origination, and *Def* is default rate measured as fraction of total mortgages in mortgage's vintage year that defaults in a given month.

Interest rates on GSE-purchased mortgages (Application-level regression)

	Interest Rate (in percentage points)	
	(1)	(2)
	%	%
Treat × Post	0.009*** (13.68)	0.011*** (12.60)
Loan Controls	No	Yes
Zip3-State FE	Yes	Yes
Border × Qtr FE	Yes	Yes
Cluster Zip3-State	Yes	Yes
R ² (Adj.)	0.728	0.758
Observations	7739882	3548884

Takeaway: Both the price and quantity of the mortgages increased, suggesting primarily a demand-driven effect.

Heterogeneous Effect: Lender Density

Heterogeneous Effect by Lender Density

	Volume (in 1000 USD) per Adult				Approval Ratio			
	(1) Low	(2) High	(3) Low	(4) High	(5) Low	(6) High	(7) Low	(8) High
Treat × Post	0.002** (2.20)	0.001 (1.16)	0.002*** (2.87)	0.002* (1.83)	0.016** (2.52)	0.011* (1.94)	0.017*** (2.87)	0.012** (2.28)
Difference [High - Low]		-0.001		-0.001		-0.005		-0.005
p-value		(0.595)		(0.600)		(0.610)		(0.592)
Economic Controls	No	No	Yes	Yes	No	No	Yes	Yes
Census Tract FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Border × Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cluster (County)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R ² (Adj.)	0.643	0.571	0.633	0.563	0.758	0.728	0.754	0.723
Observations	60704	25808	59207	25293	57628	24938	56144	24429

Takeaway: There is no difference in mortgage origination or the approval ratios in areas with high- and low-lenders density.

Mechanism

First-time Homebuyers

[Data sample: Mortgages purchased by the GSEs]

	Denominator - Applications with Known Status		Denominator - All Applications	
	(1) % First-time	(2) % First-time	(3) % First-time	(4) % First-time
Treat × Post	0.01** (2.55)	0.01** (2.31)	0.01** (2.00)	0.01* (1.78)
Economic Controls	No	Yes	No	Yes
Zip3-State FE	Yes	Yes	Yes	Yes
Border × Qtr FE	Yes	Yes	Yes	Yes
Cluster Zip3-State	Yes	Yes	Yes	Yes
R ² (Adj.)	0.691	0.692	0.691	0.691
Observations	7706	7706	7711	7711

Takeaway: Increase in the first-time homebuyers fraction points to new entry by credit-worthy borrowers.

Confident Search

	(1)	(2)
	% Application Withdrawn	% Application Withdrawn
Treat \times Post	-0.009*** (-2.82)	-0.011*** (-3.51)
Economic Controls	No	Yes
Census Tract FE	Yes	Yes
Border \times Year FE	Yes	Yes
Cluster (County)	Yes	Yes
R ² (Adj.)	0.340	0.341
Observations	82665	80667

Takeaway: Drop in in-process application withdrawal fraction suggests increase in confident searching ex-ante.

Mechanism: Credit History-related Rejections

Drop in Credit History-related Rejections

	All Areas		High Denial Areas		All Areas		High Denial Areas	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	% C.Hist	% C.Hist	% C.Hist	% C.Hist	% DTI	% DTI	% DTI	% DTI
Treat × Post	-0.003 (-1.49)	-0.003 (-1.51)	-0.003** (-2.04)	-0.003* (-1.89)	-0.002 (-1.08)	-0.001 (-0.96)	-0.002 (-1.49)	-0.002 (-1.20)
Economic Controls	No	Yes	No	Yes	No	Yes	No	Yes
Census Tract FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Border × Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cluster (County)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R ² (Adj.)	0.542	0.538	0.575	0.575	0.267	0.266	0.319	0.322
Observations	82665	80667	39069	38692	82665	80667	39069	38692

Takeaway: Drop in rejection due to credit history is consistent with improvement in learning among consumers of credit history.

Heterogeneous effect across Creditworthiness:

▶ County Measure

▶ Tract Measure

Heterogeneous effect across Income:

▶ Applications

▶ Approval Ratio

Is increased securitization behind increased origination?

▶ Securitization

Is subprime lending behind increased origination?

▶ Subprime

Did the demand come from investment-motivated mortgage buyers?

▶ With-in owner-occupied category

▶ Fraction of non-owner-occupied category

Effect on banks:

▶ Bank's Performance

1. **Lower economic cost of credit reports \Rightarrow Improved borrower pool**
 - ▶ More credit-flow to creditworthy borrowers.
 - ▶ \downarrow in mortgage defaults and subprime population fraction.
 - ▶ \uparrow approval ratio and first-time homeowners.
2. The findings generalize to any consumer credit market, not just mortgages.
3. The findings are policy-relevant as creditworthiness awareness among consumers still remains low:
 - ▶ 12% of the U.S. consumers don't know their credit score (SCE, 2013–2020).
 - ▶ 20% never checked, or checked reports more than 2 years ago (SCE, 2013–2020).

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You can request your credit reports for free, once a week, from each of the nationwide consumer reporting agencies through April 2021. Learn how to request your credit reports.



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Thank You

Any suggestions, questions, or comments are welcome.

Email: akumarac@ust.hk

Amit Kumar

Hong Kong University of Science and Technology (HKUST)

Summary Page of a Sample Free Credit Report

1. Summary

Review this summary for a quick view of key information contained in your Equifax Credit Report.

Report Date	Apr 14, 2020
Credit File Status	No fraud indicator on file
Alert Contacts	0 Records Found
Average Account Age	5 Months
Length of Credit History	8 Months
Accounts with Negative Information	0
Oldest Account	DISCOVER BANK (Opened Aug 29, 2019)
Most Recent Account	AMERICAN EXPRESS (Opened Jan 10, 2020)

Credit Accounts

Your credit report includes information about activity on your credit accounts that may affect your credit score and rating.

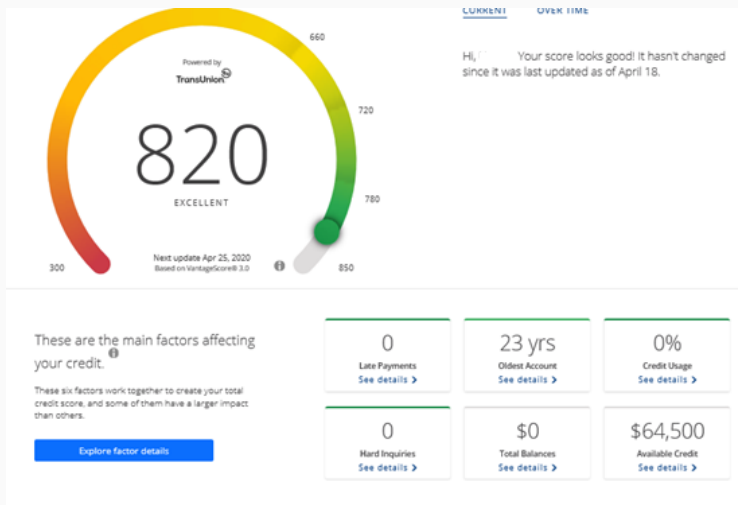
Account Type	Open	With Balance	Total Balance	Available	Credit Limit	Debt-to-Credit	Payment
Revolving	2	2	\$606	\$11,044	\$11,650	5.0%	\$70
Mortgage							
Installment							
Other							
Total	2	2	\$606	\$11,044	\$11,650	5.0%	\$70

Other Items

Your credit report includes your Personal Information and, if applicable, Consumer Statements, and could include other items that may affect your credit score and rating.

Consumer Statements	0 Statements Found
Personal Information	3 Items Found
Inquiries	2 Inquiries Found
Most Recent Inquiry	DISCOVER BANK Aug 27, 2019
Public Records	0 Records Found
Collections	0 Collections Found

Summary Page of a Sample Free Credit Report



Legal Background: Timing and Other Information

The timing of FACTA enactment:

- Before FACTA, the *Fair Credit Reporting Act (FCRA)* was in place.
- In 1996 amendment of FCRA, its provisions were set to expire in 2003.
- Most FCRA provisions became FACTA, with new addition being free credit reports.
- Not critical concern that other FACTA provisions might drive the results.

Industry's view on FACTA:

- Consumer credit rating industry: Wary of cost implications.
 - ▶ *Ex-post*, for banks, Experian raised the cost by 8%, which was 37 cents earlier.
- Lender's position: In favor of perpetuating the FCRA provisions.

Wells Fargo Bank Group Head, Terry Baloun: *Availability of financial services, such as mortgages for our customers, and the flows of information required to meet those services available don't stop at State borders or corporate structures.* (U.S. Senate. 108th Congress, 2004)

Credit Report Usage in Pre-event Period

Since FACTA allowed free credit reports to all states, are control also getting treated?

- Higher take-up rates in pre-treatment period for control states alleviates this concern
- The usage in control states higher than the national average by:
 - GA 250%
 - MD 204%
 - CO 153%
 - NJ 35%
 - MA 25%
- Leads to conservative estimates than the ideal case.
- Credit environment was better in the control states (pre-FACTA states):
 - ▶ Consumer bankruptcy: Vermont had lowest and Massachusetts second lowest (2002).
 - ▶ Interest rate on conventional mortgage: Below country median for the above two states.

Heterogeneous Effect: Creditworthiness

Creditworthiness: County based measure

Sample division: Mean fraction of subprime population county in 1999 ([Mian et al., 2009](#)).

	High Creditworthiness (Prime Counties)				Low Creditworthiness (Subprime Counties)			
	(1) N	(2) N	(3) Aprv.	(4) Aprv.	(5) N	(6) N	(7) Aprv.	(8) Aprv.
Treat \times Post	16.74** (2.30)	18.09** (2.58)	0.02** (2.31)	0.02** (2.55)	8.49 (1.65)	10.63** (2.24)	0.01 (1.58)	0.01* (1.90)
Economic Controls	No	Yes	No	Yes	No	Yes	No	Yes
Census Tract FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Border \times Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cluster (County)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R ² (Adj.)	0.802	0.803	0.774	0.771	0.826	0.828	0.697	0.697
Observations	39254	37692	38175	36625	47258	46808	44391	43948

Takeaway: Number of applications and approval ratios increase more in prime counties.

Heterogeneous Effect: Creditworthiness

Creditworthiness: Census-tract based measure

Sample division: Regional mean number of payday lenders in census tracts.

	High Creditworthiness (# Payday Lenders - Low)				Low Creditworthiness (# Payday Lenders - High)			
	(1) N	(2) N	(3) Aprv.	(4) Aprv.	(5) N	(6) N	(7) Aprv.	(8) Aprv.
Treat × Post	68.43*** (5.31)	72.78*** (5.36)	0.06*** (3.52)	0.06*** (3.57)	43.72*** (3.82)	43.27*** (4.00)	0.02 (0.94)	0.02 (0.98)
Economic Controls	No	Yes	No	Yes	No	Yes	No	Yes
Census Tract FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Border × Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cluster (County)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R ² (Adj.)	0.790	0.793	0.732	0.731	0.816	0.818	0.794	0.795
Observations	1452	1452	1395	1395	872	872	865	865

Takeaway: Number of applications and approval ratios increase more in prime census tracts.

Heterogeneous Effect: Borrower's Income

Effect among Income Quartiles: Applications

	Income Quartile 1		Income quartile 2		Income Quartile 3		Income quartile 4	
	(1) N	(2) N	(3) N	(4) N	(5) N	(6) N	(7) N	(8) N
Treat \times Post	0.05 (0.04)	0.06 (0.04)	1.82** (2.32)	2.10*** (2.84)	2.62** (2.45)	3.06*** (3.24)	4.33** (2.00)	5.29*** (2.80)
Economic Controls	No	Yes	No	Yes	No	Yes	No	Yes
Census Tract FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Border \times Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cluster (County)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R ² (Adj.)	0.763	0.765	0.776	0.778	0.745	0.747	0.659	0.660
Observations	88282	86255	88282	86255	88282	86255	88282	86255

Heterogeneous Effect: Borrower's Income

Effect among Income Quartiles: Approval Ratio

	Income Quartile 1		Income quartile 2		Income Quartile 3		Income quartile 4	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Aprv.	Aprv.	Aprv.	Aprv.	Aprv.	Aprv.	Aprv.	Aprv.
Treat \times Post	0.01** (2.06)	0.01** (2.59)	0.01 (0.93)	0.01 (1.03)	0.01 (0.87)	0.01 (0.89)	0.01 (1.32)	0.01 (1.27)
Economic Controls	No	Yes	No	Yes	No	Yes	No	Yes
Census Tract FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Border \times Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cluster (County)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R ² (Adj.)	0.344	0.346	0.391	0.388	0.404	0.399	0.363	0.357
Observations	71879	70132	72428	70661	72548	70771	71995	70219

Takeaway: Approval ratios increase is more in lower income quartile consumers, while lenders' propensity to lend to them is small.

Consistent with improvement in pool.

Results: Owner-Occupied Mortgages Only

Estimation within owner-occupied mortgage category only

	(1)	(2)	(3)	(4)
	N	N	Aprv.	Aprv.
Treat \times Post	12.78*** (2.89)	14.95*** (3.61)	0.01** (2.26)	0.01*** (2.60)
Economic Controls	No	Yes	No	Yes
Census Tract FE	Yes	Yes	Yes	Yes
Border \times Year FE	Yes	Yes	Yes	Yes
Cluster (County)	Yes	Yes	Yes	Yes
R ² (Adj.)	0.808	0.810	0.661	0.654
Observations	86806	84789	86619	84602

Results: Fraction of Non-owner-occupied Mortgages

Fraction of total (successful) applications which are non-owner-occupied in columns 1 and 2 (3 and 4)

	Fraction of total app.		Fraction of successful app.	
	(1) Non-ocp.	(2) Non-ocp.	(3) Non-ocp.	(4) Non-ocp.
Treat \times Post	0.01** (1.99)	0.01** (2.03)	0.01** (2.02)	0.01** (2.13)
Economic Controls	No	Yes	No	Yes
Census Tract FE	Yes	Yes	Yes	Yes
Border \times Year FE	Yes	Yes	Yes	Yes
Cluster (County)	Yes	Yes	Yes	Yes
R ² (Adj.)	0.088	0.087	0.087	0.086
Observations	82665	80667	82579	80581

Can Private Securitization Explain the Increase in Origination?

Was increased securitization behind increased origination?

Examine the fraction of successful mortgages (1) kept on lenders' book, (2) sold to the GSEs, and (3) sold to non-GSEs

	Sold to Non-GSE		Sold to GSE		Not Sold	
	(1) Fraction	(2) Fraction	(3) Fraction	(4) Fraction	(5) Fraction	(6) Fraction
Treat \times Post	-0.004 (-0.35)	-0.001 (-0.10)	0.047** (2.54)	0.050*** (2.76)	0.000 (0.05)	0.004 (0.94)
Economic Controls	No	Yes	No	Yes	No	Yes
Census Tract FE	Yes	Yes	Yes	Yes	Yes	Yes
Border \times Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Cluster (County)	Yes	Yes	Yes	Yes	Yes	Yes
R ² (Adj.)	0.009	0.003	0.004	0.002	0.055	0.035
Observations	82665	80667	82665	80667	82665	80667

Takeaway: There is no significant increase in private securitization.

Was subprime lending behind the surge in demand and approval?

Prime consumer: Credit score ≥ 620

	(1)	(2)	(3)	(4)
	N-Prime	N-Prime	N-Subprime	N-Subprime
Treat \times Post	308.58*** (3.39)	312.51*** (3.33)	10.48** (2.12)	10.78** (2.16)
Economic Controls	No	Yes	No	Yes
Zip3-State FE	Yes	Yes	Yes	Yes
Border \times Qtr FE	Yes	Yes	Yes	Yes
Cluster Zip3-State	Yes	Yes	Yes	Yes
R ² (Adj.)	0.757	0.758	0.792	0.792
Observations	7711	7711	7711	7711

Takeaway: Increase in prime mortgage origination is more than the increase in subprime mortgages origination in the treated areas, relative to the control areas.

Financial Performance of Banks

	(1)	(2)	(3)	(4)	(5)	(6)
	NIM (%)	NIM (%)	RoE (%)	RoE (%)	RoA (%)	RoA (%)
Treat × Post	0.06*** (5.55)	0.06*** (6.00)	0.74*** (5.05)	0.74*** (5.25)	0.07*** (5.17)	0.07*** (5.53)
Bank Controls	No	Yes	No	Yes	No	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Year-Qtr FE	Yes	Yes	Yes	Yes	Yes	Yes
Cluster (Bank)	Yes	Yes	Yes	Yes	Yes	Yes
R ² (Adj.)	0.807	0.814	0.586	0.597	0.556	0.573
Observations	86323	86323	86323	86323	86323	86323

Takeaway: Higher origination led to better financial performance of lenders.

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