Exporting Liquidity: Branch Banking and Financial Integration

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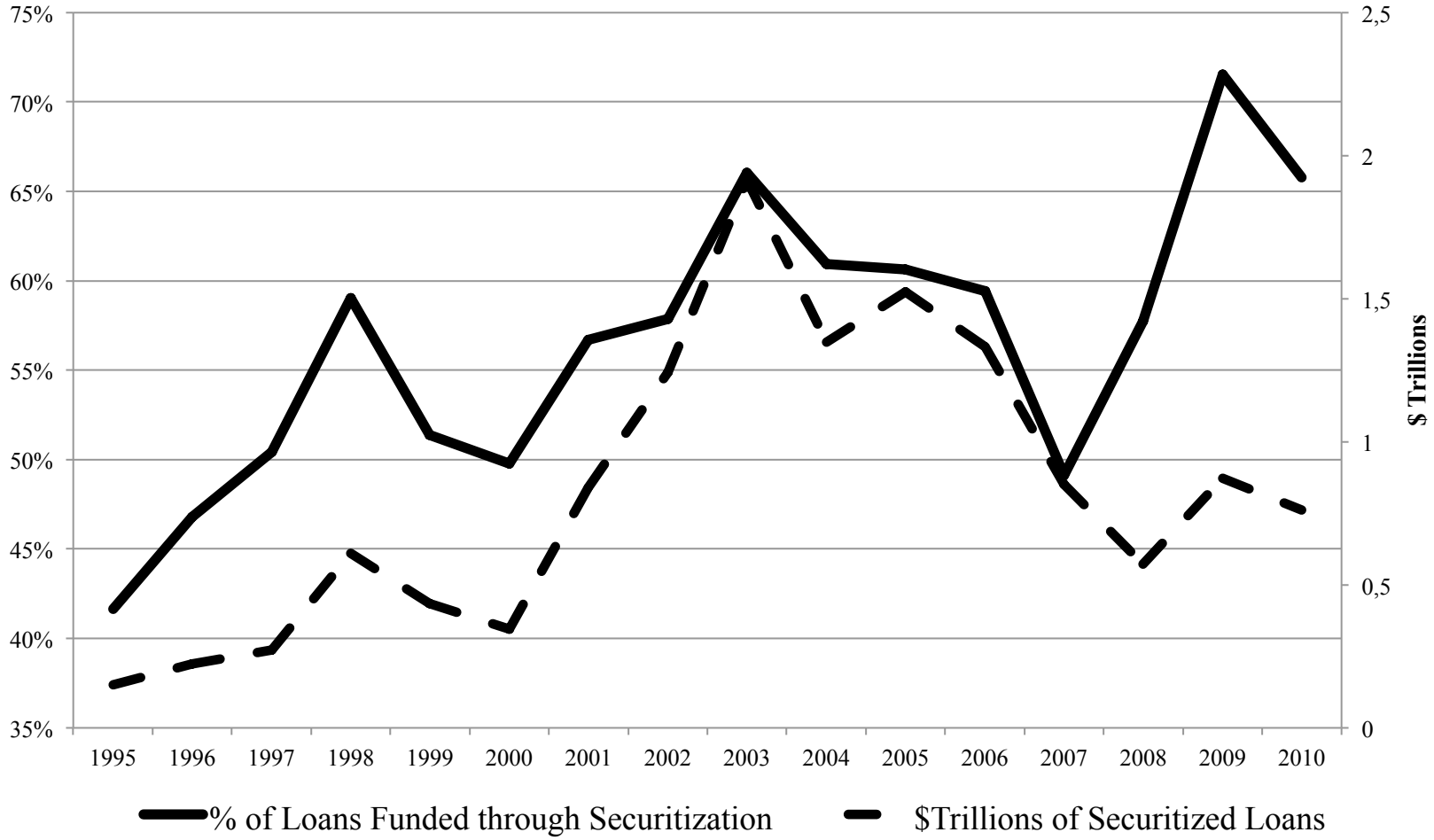
BEROC Conference
May, 2014

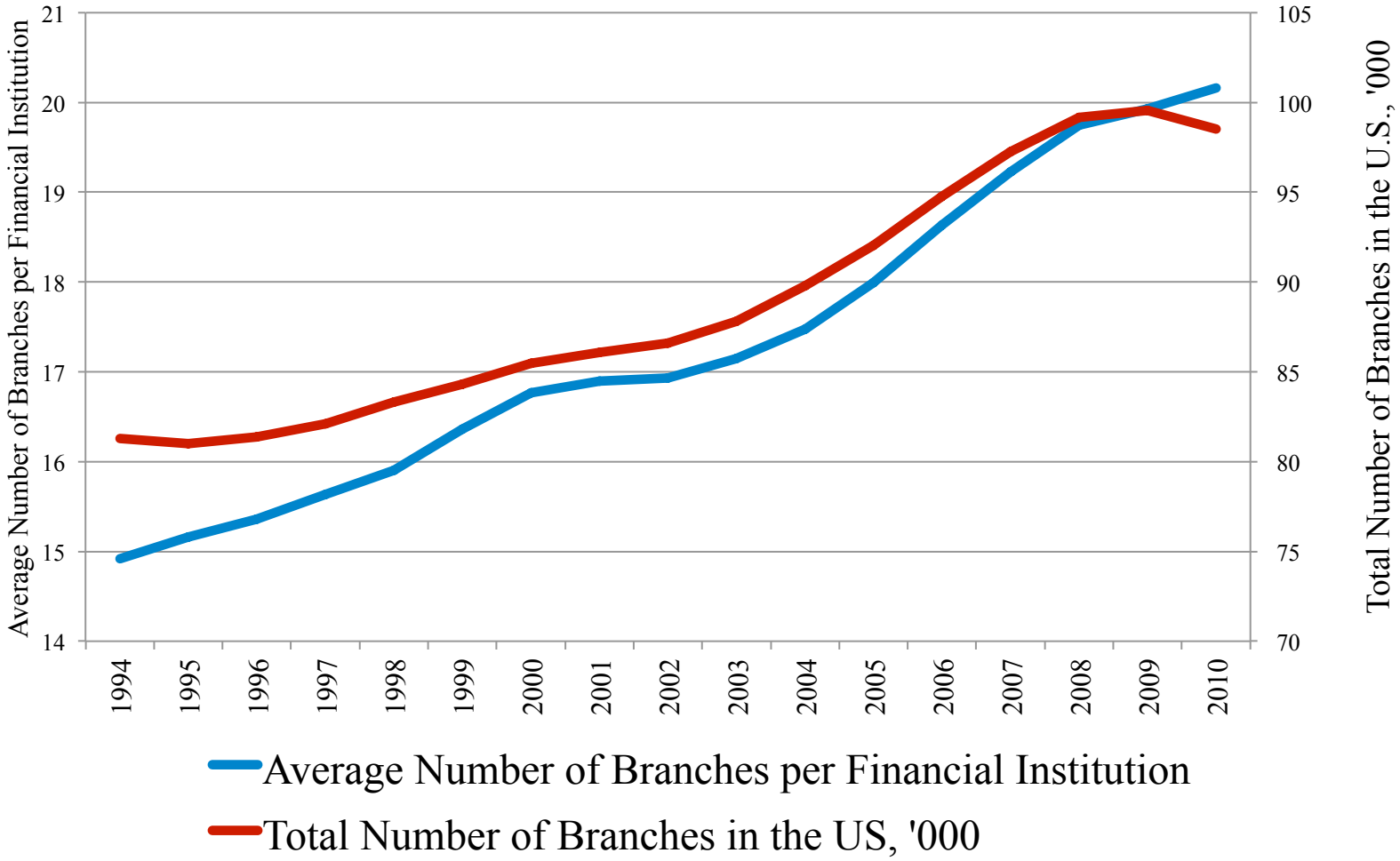
Key Change Integrating US Local Markets

- *Financial integration: savings in one market finances consumption & investment in another.*
- Extension of Bank Branch Networks
  - Deregulation within state (1970s ad 1980s)
  - Deregulation across states (1990s and 2000s)
- Economic Effects
  - Lower cost of credit (Rice & Strahan, 2010)
  - Better allocation of capital (Strahan & Stiroh, 2003)
  - More economic dynamism (Kerr & Nanda, 2009)
  - Higher overall growth (Jayaratne & Strahan, 1996)
  - Lower volatility & better risk-sharing (Morgan et al (2004); Demyanyk et al (2007))
  - …
- Has the development of capital markets changed the picture?

Securitization → New Era of Banking



New Era of Banking?



This Paper: Findings

1) Do branch networks foster financial integration? YES
   - Exploit the exogenous liquidity shocks increase mortgage lending in counties connected via branch networks
   - Magnitudes are large, average shocked bank grows lending 7% more, relative to banks not exposed to shocks (sample average is 11%)

2) What types of loans are branch networks important for?
   - Credit that is harder to securitize
     - Loans retained on the balance sheet increase
     - Purchase/HELOC increase, not refinancing (proxy for ability to sell)
     - Loans for borrowers that are close to lenders increase (proxy for information)

Bank braches integrate credit markets unreachable for direct finance.

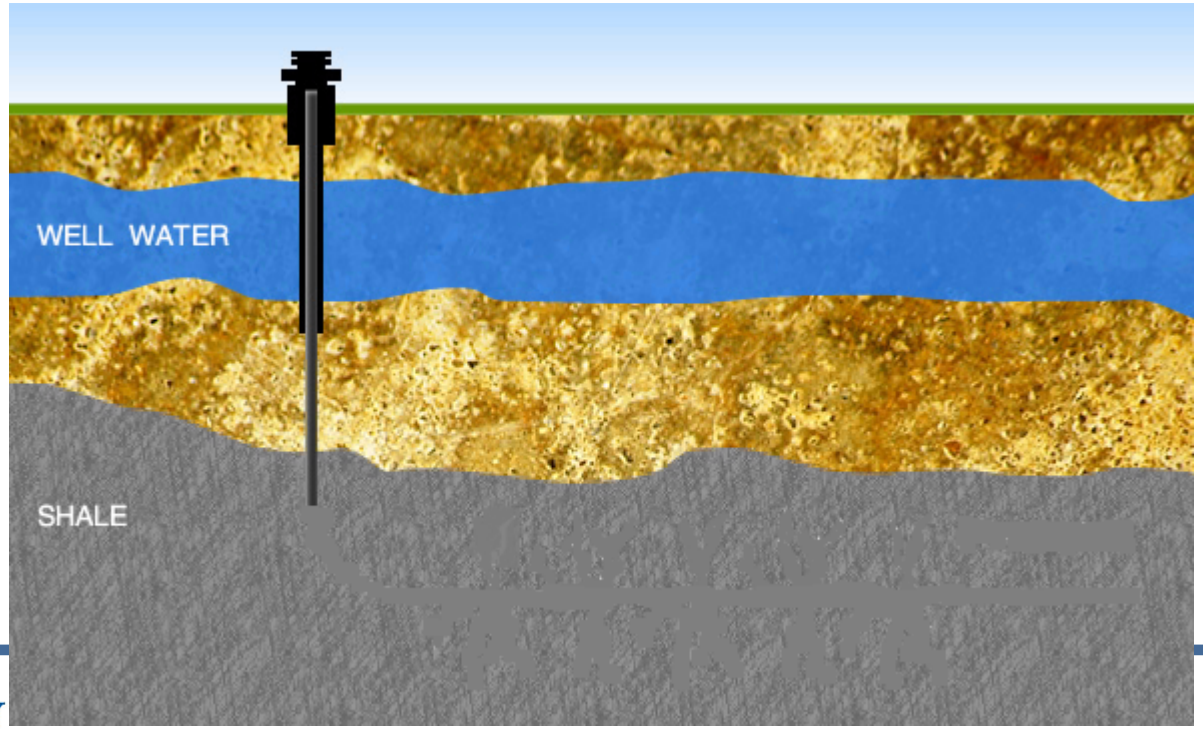
Can "Securitization" Fully Integrate Mortgage Markets?

- Arm length financing is powerful but ***limited*** in its reach
  - lenders have better information than investors
  - incentives for lenders to screen & monitor sold loans
    - Gorton and Pennacchi, 1995, Holmstrom and Tirole, 1997, Keys et al, 2010; Loutskina and Strahan, 2011
- ***Soft information*** production is still important in the mortgage market
- Bank branches
  - Provide ***informational advantage*** in local markets: Cortes, 2012
  - Allow to mitigate contracting frictions

Shale Booms as a Natural Experiment

Shale discoveries are *Unexpected*	→	Wealth windfalls	→	Deposit shocks and credit supply shocks

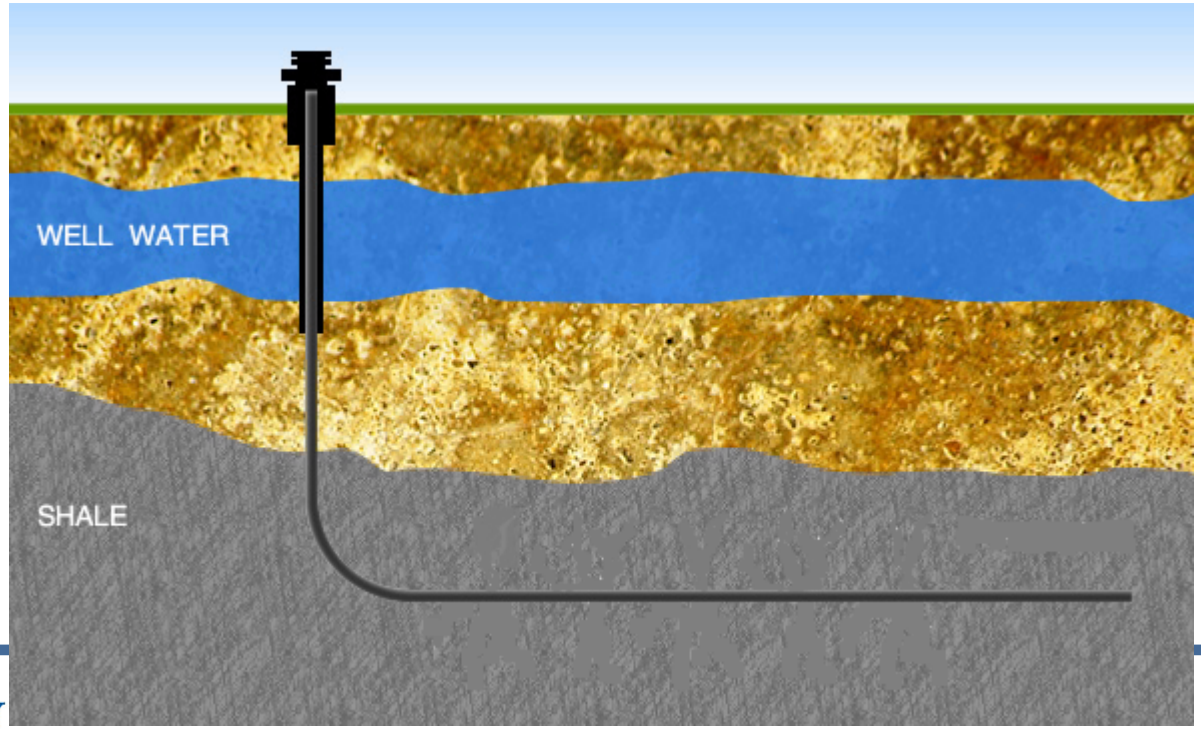
- Why is a shale discovery exogenous?



Shale Booms as a Natural Experiment

Shale discoveries are *Unexpected* → Wealth windfalls → Deposit shocks and credit supply shocks

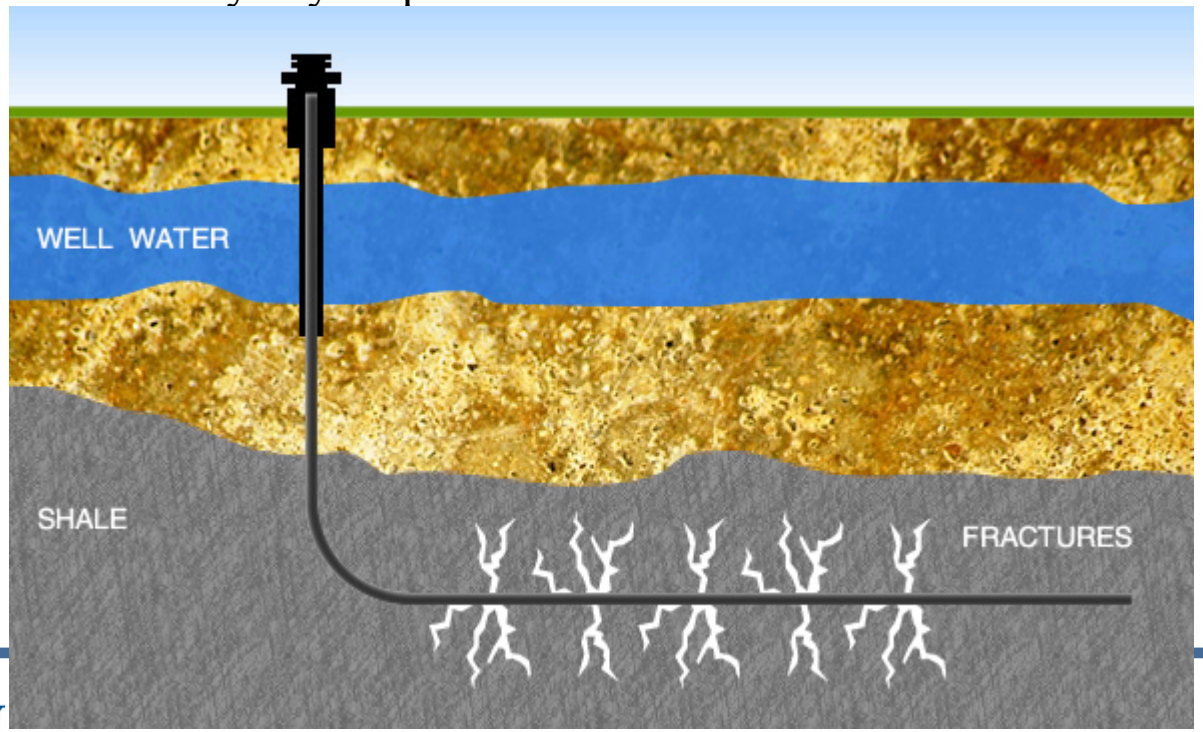
- Why is a shale discovery exogenous?
  - Technological breakthroughs in 2002-2003: Horizontal Drilling and "Fracking"



Why are Shale Booms a good natural experiment?

Shale discoveries are *Unexpected* → Wealth windfalls → Deposit shocks and credit supply shocks

- Why is a shale discovery exogenous?
  - Technological breakthroughs in 2002-2003: Horizontal Drilling and "Fracking"
  - Chevron CEO John Watson: The technological advances associated with "fracking" took the industry "by surprise"

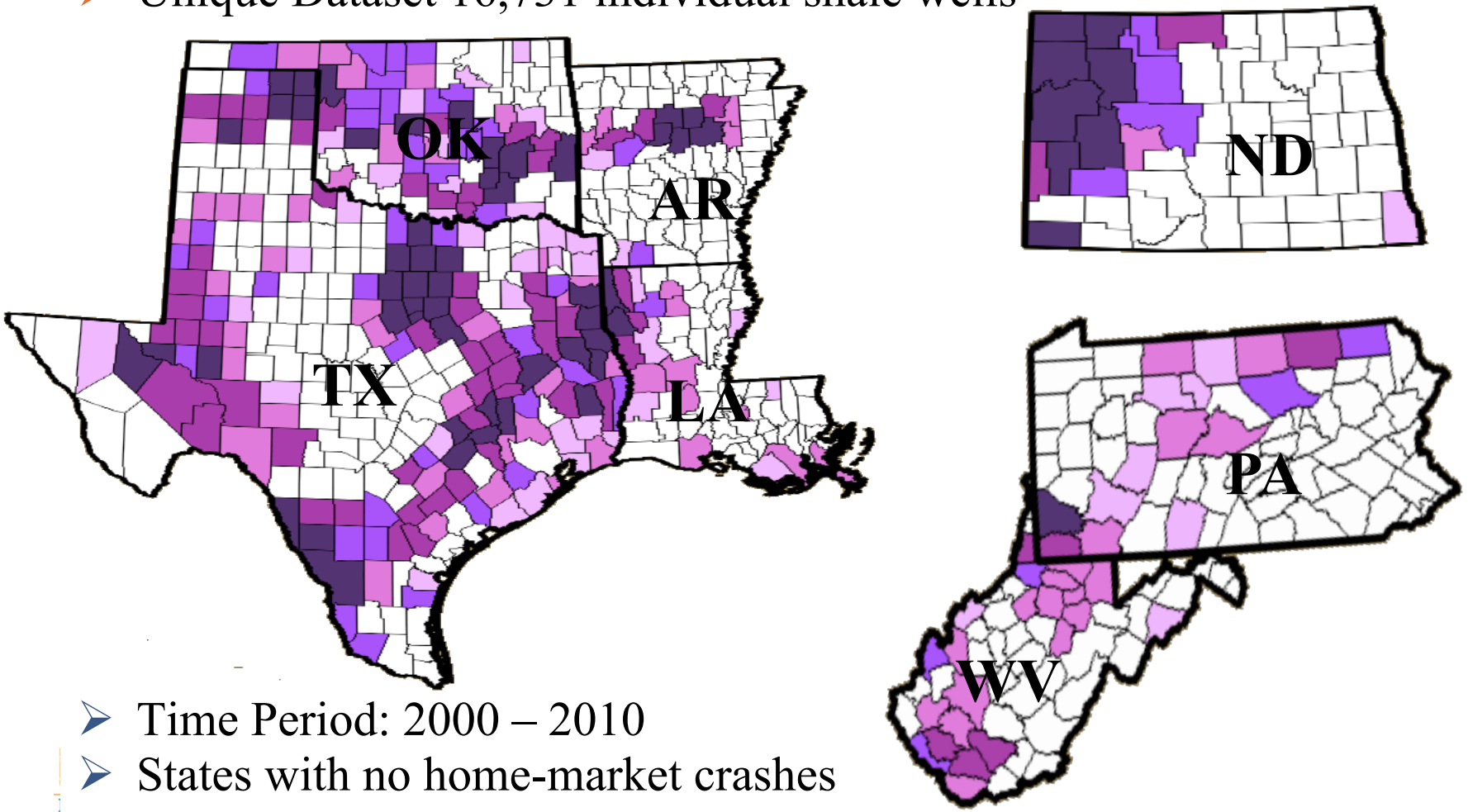


New Energy Supply = 42 Years of U.S. Gasoline consumption

Shale Booms as a Natural Experiment

Shale Discoveries are *Unexpected*	→	Wealth windfalls	→	Deposit shocks and credit supply shocks

- Unique Dataset 16,731 individual shale wells



- Time Period: 2000 – 2010
- States with no home-market crashes

Shale Booms as a Natural Experiment

- Wealth windfalls
  - Drilling rights must be leased, often from private individuals
    - Terms: $30,000/acre Bonus + 25% Royalty
    - Example: 1 square mile = $19.2 Million + 25% Royalty of gas

"I got a check for over a million, in less than two weeks"

- Mike Smith, Bossier City, Louisiana Mineral Owner

- Increase in bank deposits and loan repayment

"We have had depositors come in with more than a million dollars at a whack"

- H.B. "Trip" Ruckman III, President, The Karnes County National Bank

"Where we used to hunt for money, we don't have to hunt anymore."

- Mike Wilson, President and CEO of Security State Bank, Texas

Bank-Specific Liquidity Shock

- Measure Shale Booms With Unique Dataset
  - Smith International Rig Count: All well drilling activity in the U.S.
- Bank Deposit and Branching Data
  - FDIC summary of Deposits
- Bank *i* Exposure to the Boom (j sums across all counties)

$$Share\ of\ Branches\ in\ Boom\ Counties\ i,t = \sum_j \frac{Branches_{i,j,t} * I(BoomCounty)_{j,t}}{TotalBranches_{i,t}}$$

$$Growth\ in\ Shale\ Well\ Exposure\ i,t = \sum_j \frac{Branches_{i,j,t} * ShaleWellGrowth_{j,t}}{TotalBranches_{i,t}}$$

Effect of Boom on Deposits

- Unit of Observation: Bank *i*, year *t*

$$Deposit\ Var_{i,t} = \beta_1 BankBoomExposure_{i,t} + ControlVar_{i,t} + BankFE_i + TimeFE_t + \ldots$$

	Dependent Variable			
	Deposit Growth		Cost of Deposits	
	(1)	(2)	(3)	(4)
Share of Branches in Boom Count	0.0567***	-	-0.0015***	-
	(4.03)	-	(2.66)	-
Growth in Shale Well Exposure$_{i,t}$	-	0.0264***	-	-0.001938***
	-	(4.42)	-	(3.00)
Bank fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Observations	13,694	13,694	13,864	13,864
R-squared	54.1%	54.1%	47.6%	47.7%

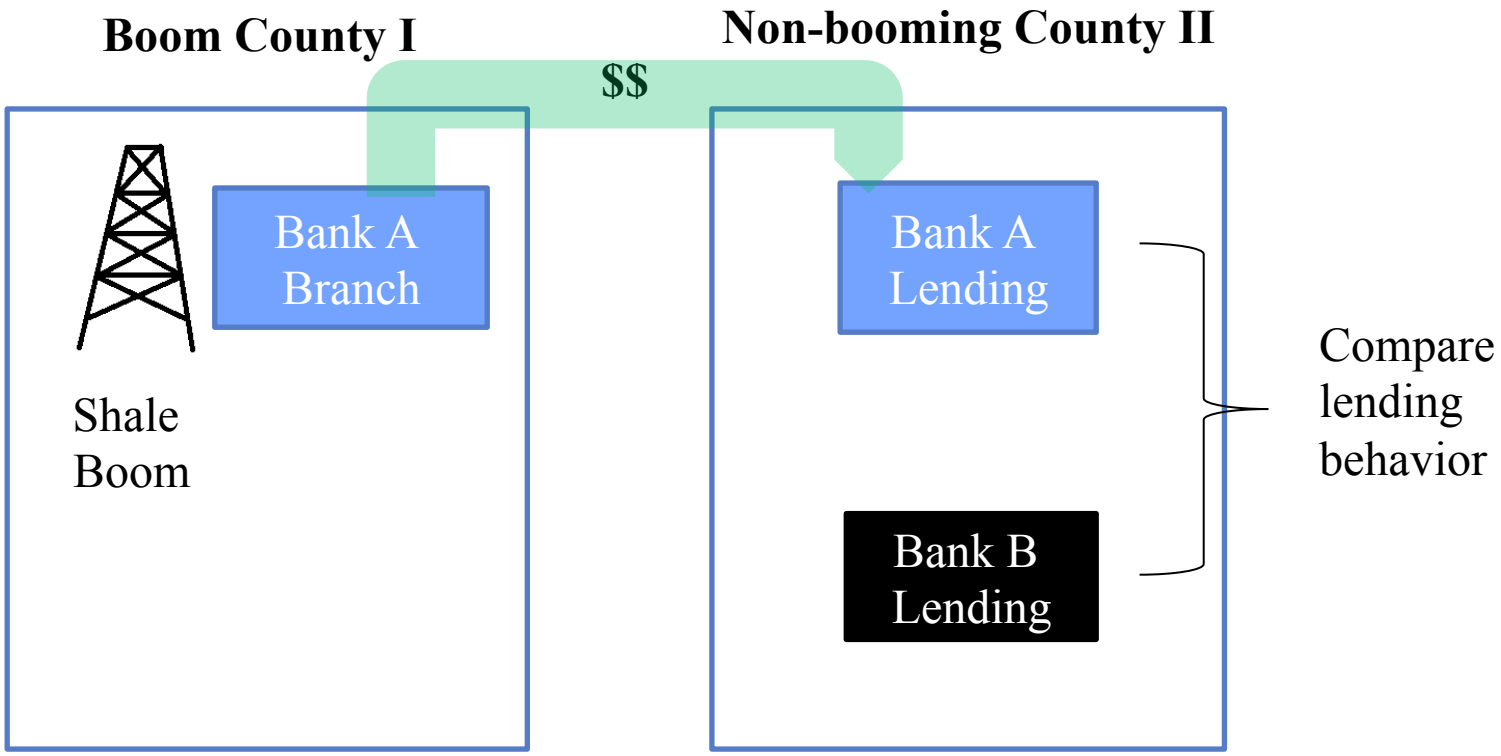
Do Banks Chase Funds?

- Unit of Observation: Bank *i,* year *t*

$$\text{Share of Branches In Boom Counties}_{i,t} = \beta_1 \text{ExposureBasedOn2002BranchDistribution}_{i,t} + \text{AppGrowth}_{i,t-1} + \text{BankFE}_i + \text{TimeFE}_t + \varepsilon_{i,t}$$

	Dependent Variable = Share of Branches in Boom Counties					
	(1)	(2)	(3)	(4)	(5)	(6)
Exposure Based on 2002 Branch Distribution$_{i,t}$	0.941***	0.945***	0.945***	0.912***	0.909***	0.909***
	(92.47)	(91.77)	(91.40)	(53.00)	(50.88)	(50.97)
Application Volume Growth$_{i,t-1}$	0.0002	-	0.0001	-0.0002	-	-0.001
	(0.34)	-	(0.02)	(0.26)	-	(0.65)
Application Volume Growth$_{i,t-2}$	-	0.001	0.001	-	0.001	0.001
	-	(1.64)	(1.33)	-	(1.09)	(0.71)
Year Effects	Yes	Yes	Yes	Yes	Yes	Yes
Bank Financial Controls	-	-	-	Yes	Yes	Yes
Bank Effects	-	-	-	Yes	Yes	Yes
Observations	9,049	8,482	8,322	7,549	7,065	6,948
R-squared	92.5%	93.1%	93.2%	96.7%	96.8%	96.9%

Empirical Design



Saturate model with county-year fixed effects

Effect of Shale Boom on Lending

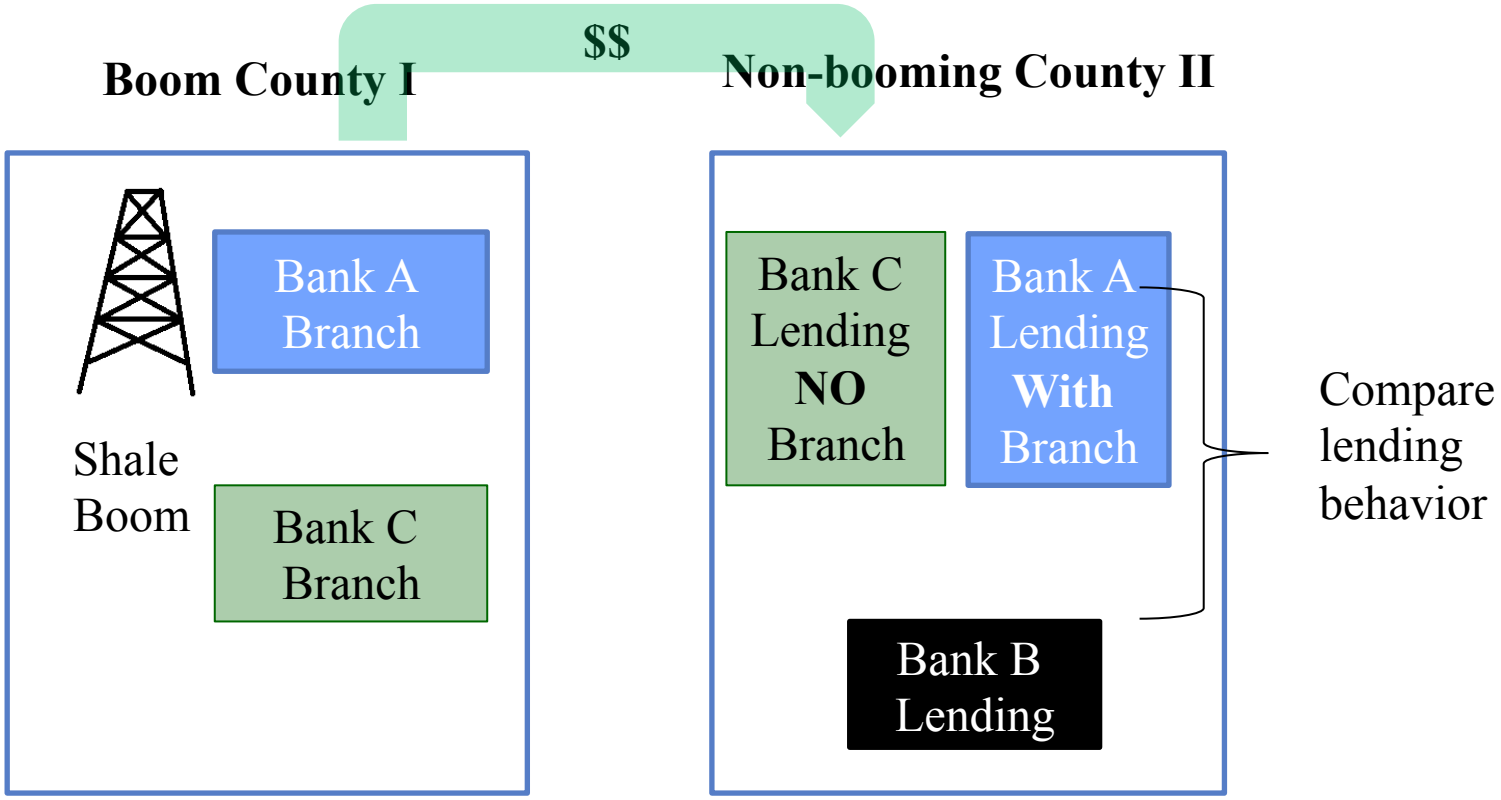
- Unit of observations: loan growth for bank *i*, county *j*, time *t*

$$MortgageGrowth_{i,j,t} = \beta_1 BankBoomExp_{i,t} + CountyYearFE_{j,t} + \ldots$$

	Mortgage Growth		Retained Growth		Sold Growth	
	(1)	(2)	(3)	(4)	(5)	(6)
Share of Branches in Boom Counties$_{i,t}$	0.146**	-	0.325**	-	0.202	-
	(2.17)	-	(2.26)	-	(1.26)	-
Growth in Shale Well Exposure$_{i,t}$	-	0.0533**	-	0.223***	-	0.0674
	-	(1.97)	-	(2.69)	-	(1.37)
Borrower Controls	Yes	Yes	Yes	Yes	Yes	Yes
County*Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Bank Clustered St Errors	Yes	Yes	Yes	Yes	Yes	Yes
Observations	92,144	92,144	71,034	71,034	49,427	49,427
R-squared	7.3%	7.3%	7.9%	8.0%	13.0%	13.0%

- Economic Magnitude
  - Average exposed bank mortgages grow 7% faster (mean of 11%)
  - Average exposed bank retained mortgages grow 14% faster

Empirical Design



Saturate model with county-year fixed effects

How Important is Local Branch Presence?

$$MortgageGrowth_{i,j,t} = \beta_1 LocalLenderIndicator_{i,j,t} + \beta_2 BankBoomExposure_{i,t} + \beta_3 LocalLenderIndicator_{i,j,t} * BankBoomExposure_{i,t} + CountyYearFE_{j,t} + Bank\&L$$

	Dependent Variable = Mortgage Growth			
	All Lenders		Local Lenders Only	
	(1)	(2)	(3)	(4)
Local-Lender Indicator$_{i,j,t}$	0.008	0.008	-	-
	(0.48)	(0.54)	-	-
Share of Branches in Boom Counties$_{i,t}$	0.100	-	0.234**	
	(1.30)	-	(2.35)	
Growth in Shale Well Exposure$_{i,t}$	-	0.035	-	0.103**
	-	(1.00)	-	(2.03)
Share of Branches in Boom Counties$_{i,t}$ *	0.231**	-	-	-
Local-Lender Indicator$_{i,j,t}$	(2.17)	-	-	-
Growth in Shale Well Exposure$_{i,t}$	-	0.126**	-	-
Local-Lender Indicator$_{i,j,t}$	-	(1.99)	-	-
Borrower Controls	Yes	Yes	Yes	Yes
County*Year FE	Yes	Yes	Yes	Yes
Bank Clustered St Errors	Yes	Yes	Yes	Yes
Observations	93,739	93,739	22,316	22,316
R-squared	7.3%	7.2%	20.2%	20.2%

- Economic Interpretation: Average exposed bank with local branch presence grows lending 10% faster (sample mean 11%)

Which Credit Market Segments Are Affected?

	Home Purchase Mortgages	*Home Equity Loans*	*Refinancings*
Panel A of Table 7	(1)	(2)	(3)
Local-Lender Indicator	-0.0350**	-0.0372	-0.00673
	(2.55)	(1.20)	(0.33)
Share of Branches in Boom Counties	0.0626	-0.172	0.188*
	(0.89)	(0.98)	(1.91)
Share of Branches in Boom Counties * Local-Lender Indicator	0.245**	0.592***	0.0642
	(2.44)	(2.74)	(0.50)
Borrower & Lender controls	Yes	Yes	Yes
County*Year FE	Yes	Yes	Yes
Bank Clustered St Errors	Yes	Yes	Yes
Observations	64,860	34,839	66,237
R^2	9%	16%	15%
z-statistic for: (1)==(2)		(1.457)	
z-statistic for: (2)==(3)		(2.099)	
z-statistic for: (1)==(3)		(1.106)	

Agency Problem? Do Banks Make Bad Loans?

- Unit of Observation: Bank *i,* year *t*

$$ChargeOffAndDelinquencies_{i,t} = \beta_1 BankBoomExposure_{i,t} + ControlVar_{i,t} + BankFE_i + TimeFE_t + \varepsilon_{i,t}$$

	Dependent Variable = (Mortgage Charge Offs + Delinquencies)$_{t+1}$ / Mortgages$_t$	
	(1)	(2)
Share of Branches in Boom Counties$_{i,t}$	-0.00206	-
	(0.68)	-
Growth in Shale Well Exposure$_{i,t}$	-	-0.00202**
	-	(2.14)
Bank fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
Observations	12,995	12,995
R-squared	50.5%	50.5%

How are the funds being allocated? Un-served Demand & Bank Capital

- Unit of observations: loan growth for bank *i*, county *j*, time *t* **(local loans only)**

	Dependent Variable = Mortgage Growth					
	Share of Branches in Boom County			Growth in Shale Well Exposure		
	(1)	(2)	(3)	(4)	(5)	(6)
Share of Branches in Boom Counties	0.888	-0.176	0.417	-	-	-
	(1.34)	(0.45)	(0.58)	-	-	-
Share of Branches in Boom Counties *	-0.799*		-0.731**	-	-	-
Lagged Mortgage Approval Rate	(1.68)		(2.01)	-	-	-
Share of Branches in Boom County *	-	3.582***	4.132*	-	-	-
Lagged Bank Capital Ratio	-	(2.92)	(1.85)	-	-	-
Growth in Shale Well Exposure	-	-	-	0.423	-0.104	0.155
	-	-	-	(1.17)	(0.49)	(0.46)
Growth in Shale Well Exposure	-	-	-	-0.409*	-	-0.389**
Lagged Mortgage Approval Rate	-	-	-	(1.86)	-	(1.97)
Growth in Shale Well Exposure	-	-	-	-	2.131**	4.61**
Lagged Bank Capital Ratio	-	-	-	-	(1.97)	(2.13)
Lender Controls	Yes	Yes	Yes	Yes	Yes	Yes
Borrower Controls	Yes	Yes	Yes	Yes	Yes	Yes
County*Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Bank Clustered St Errors	Yes	Yes	Yes	Yes	Yes	Yes
Lagged Mortgage Approval Rate & Lagged Bank Capital	Yes	Yes	Yes	Yes	Yes	Yes
Observations	22,316	22,316	22,316	22,316	22,316	22,316
R-squared	21.30%	20.20%	21.34%	21.30%	20.20%	21.35%

Conclusions

- Branch banking helps integrate credit markets
  - Liquidity windfalls increase lending if lender has branch in both areas
  - Effect observed for harder-to-securitize categories
  - Effects stronger when lagged acceptance rate is low and at bank less constrained by capital

- Provides explanation of continued expansion of branch networks (in parallel with growth of securitization markets)

- Provides explanation for why branch deregulation – by integrating credit markets - was so important!

Contribution

- Financial integration literature:
  - 2 mechanisms behind effect of financial integration
    - Enhanced competition (… too many studies to cite)
    - Capital can flow to markets with more projects and away from those with excess liquidity.
- The role of distance in lending
  - Effect on information production and monitoring
    - Petersen and Rajan, 2002, Berger et al, 2005, Degryse and Ongena, 2005; Agrawal and Hauswald, 2010
  - Lender specialization
    - Loutskina and Strahan, 2011
- How bank liquidity shocks affect credit supply
  - Schnabl, 2012, Paravisini, 2008, and others

THANK YOU