Mobile Collateral versus Immobile Collateral

Gary Gorton, Yale and NBER

Tyler Muir, UCLA

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Policy Evaluation

- How can we do policy evaluation?

- - especially with regard to the liquidity coverage ratio (LCR).

- The LCR is the most important new bank regulation to emerge as a result of the Crisis of 2007-2008.

- The LCR is a kind of narrow banking.

Using Economic History to Evaluate Policy

- We use the experience of the U.S. National Banking Era, 1863-1914, to learn about the LCR.
- Under the National Banking Era regulations, banks' notes ("national bank notes") were required to be backed one-for-one with Treasuries.

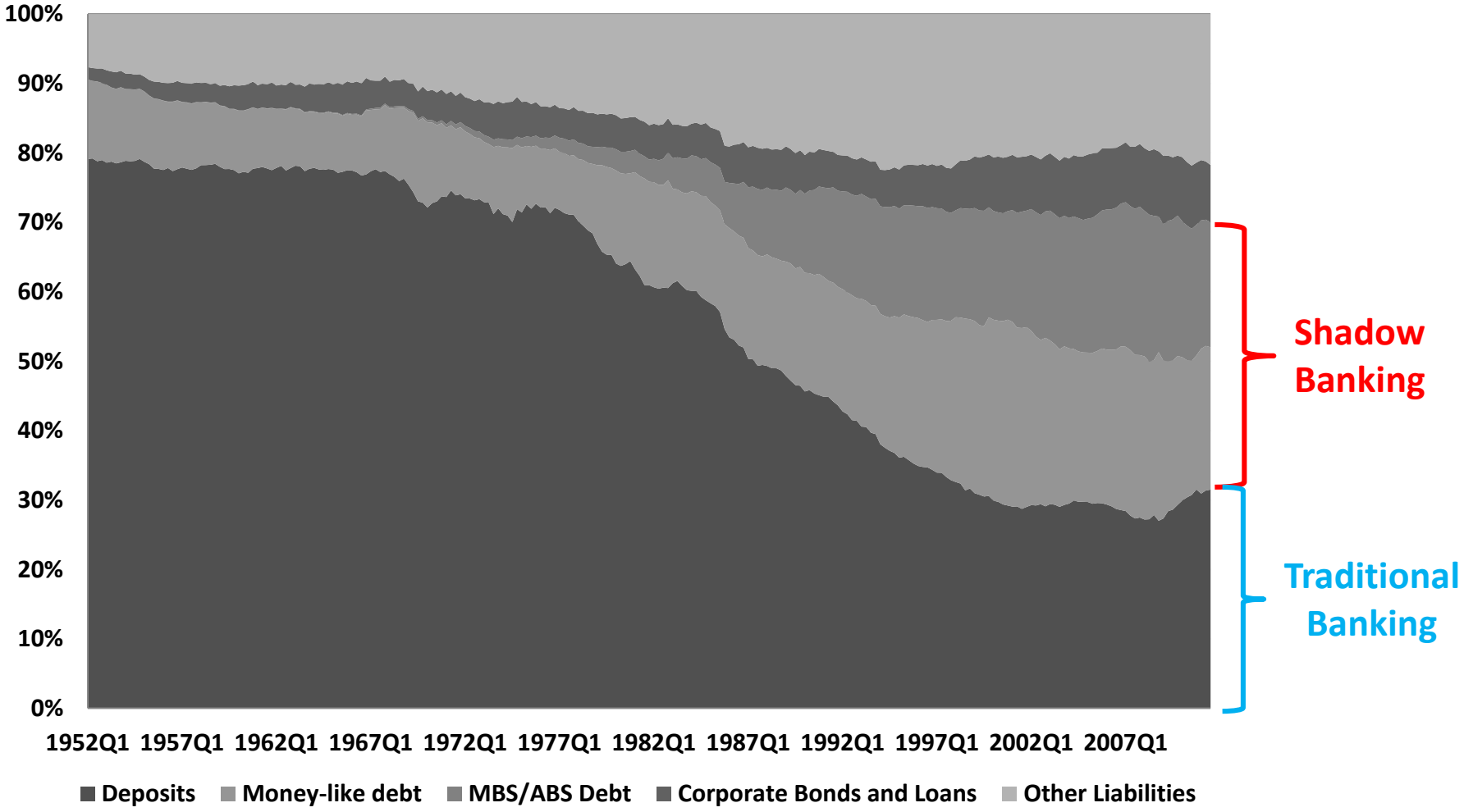
Agenda

- Examine the transformation of the financial system to a system of mobile collateral.
- Provide some new evidence on the scarcity of Treasuries now and prior to the crisis.
- Examine National Banking Era
  - Evidence of a convenience yield on Treasuries
  - Rise of a shadow banking system: demand deposits
  - Conceptual confusion
  - Banking panics
- Implications for the future

The Transformation of the Financial System

- Over the last 30 years prior to the crisis, the architecture of the U.S. financial system changed.
- **Immobile collateral** bank loans→ became **mobile collateral** in the form of MBS and ABS—can be traded, posted in derivative positions, collateral for repo and ABCP, rehypothecated.

Components of Privately-Produced Safe Debt as a Fraction of Total Privately-Produced Safe Debt (U.S.)



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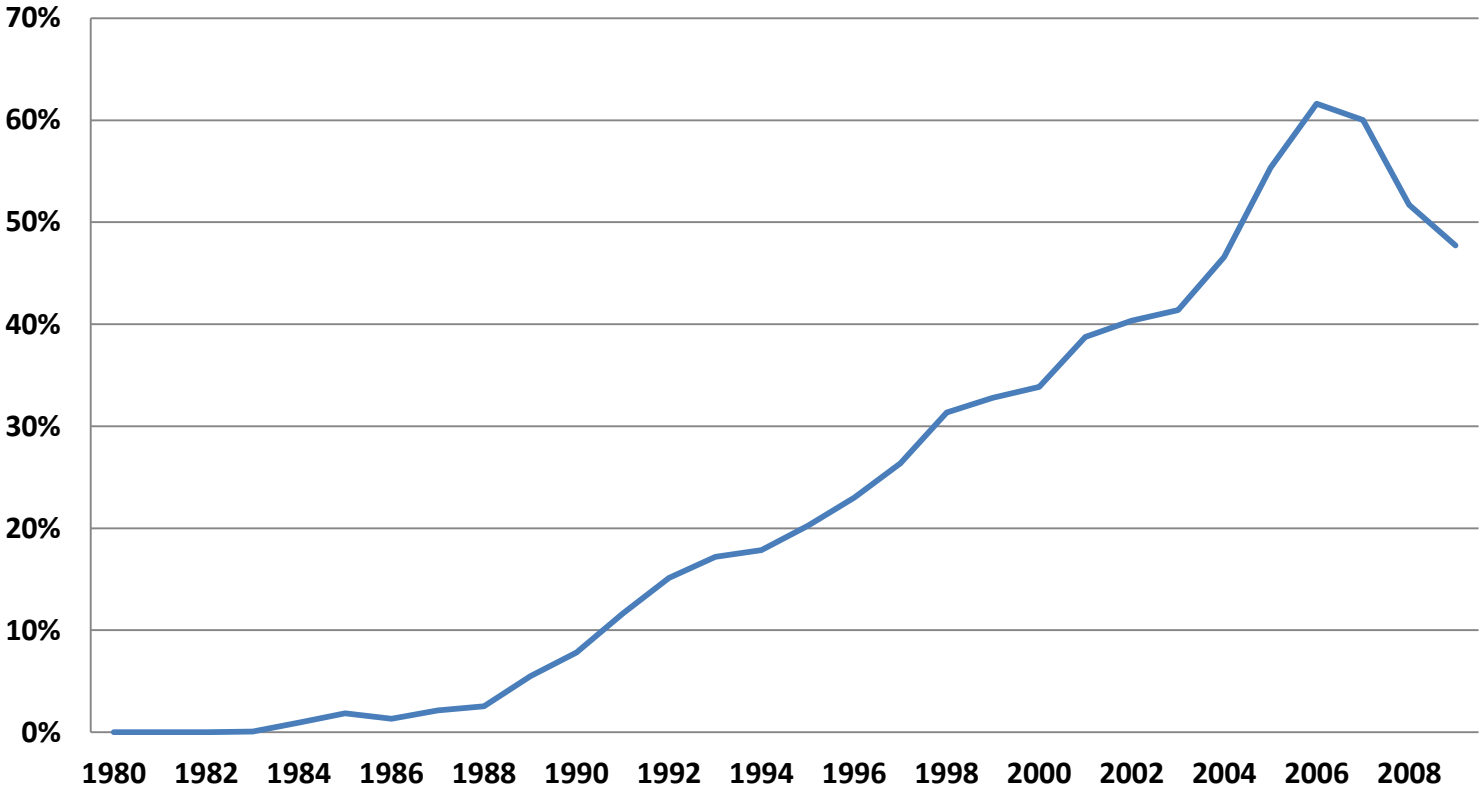
Ratio of Total Private Securitization to Total Bank Loans



Source: Flow of Funds.

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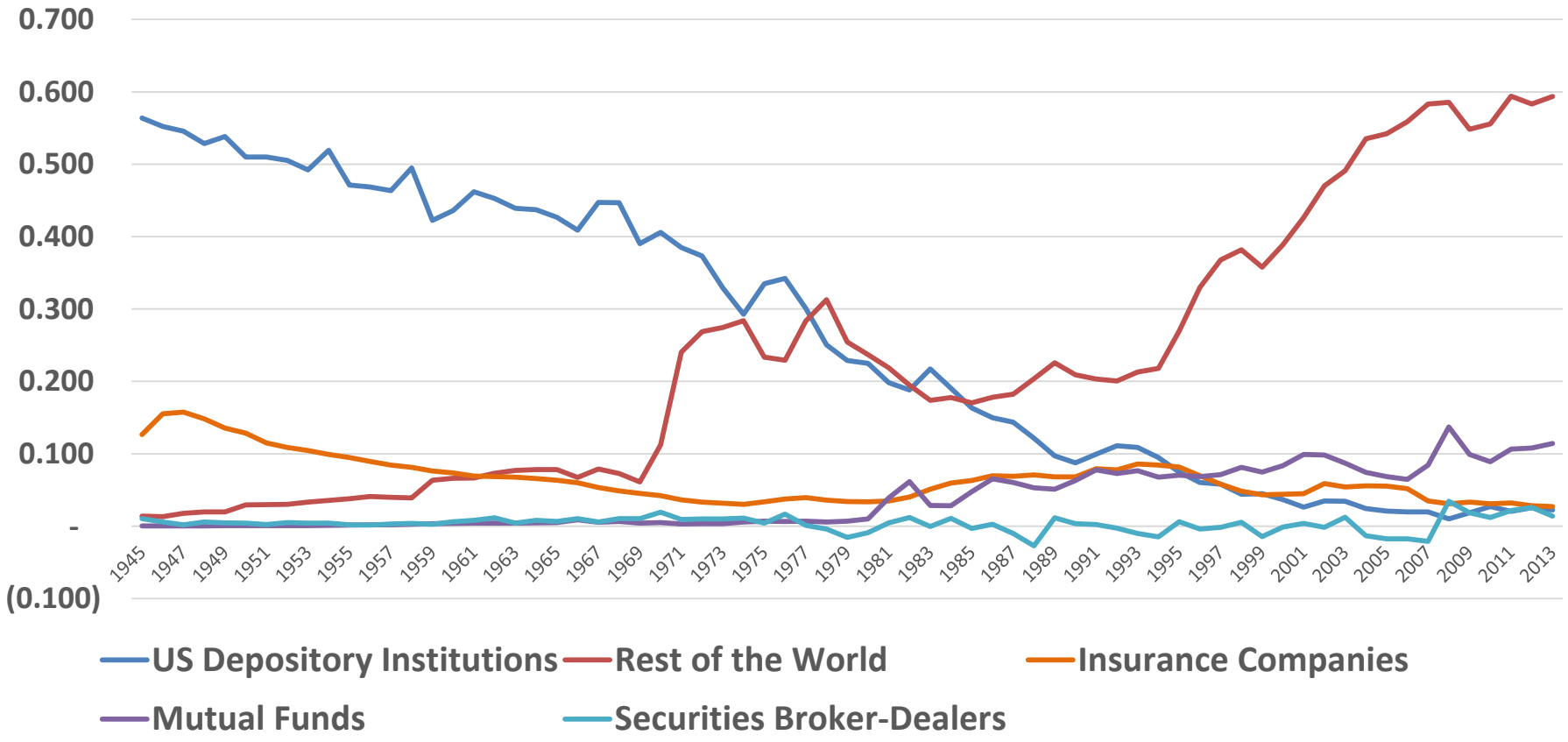
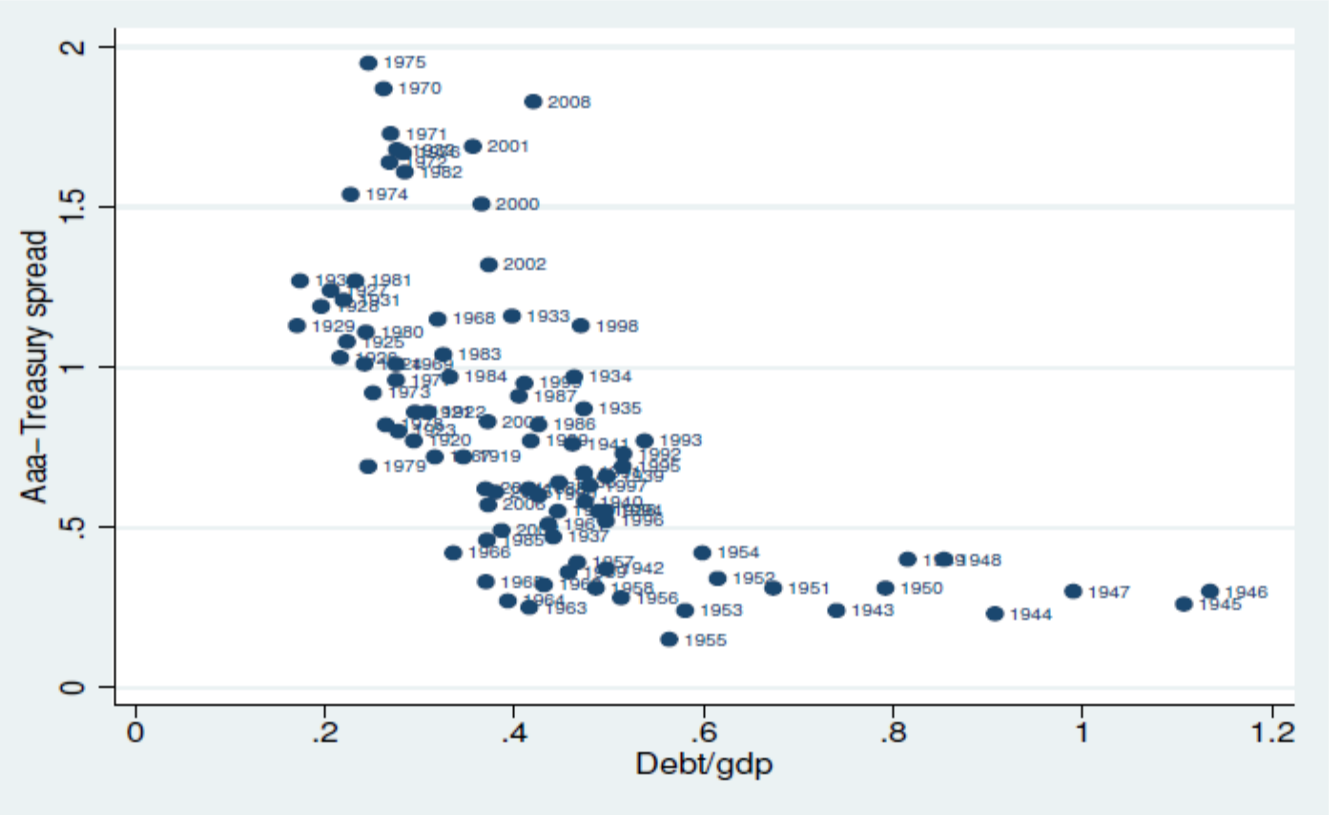
Holders of Treasury Securities as a Fraction of Total Outstanding



Treasuries have a Convenience Yield

Yield spread between Moody's Aaa bond yield and long term Treasury yield, versus Publicly held US Treasury Debt/US GDP. 1919-2008.



Source: Krishnamurthy and Vissing-Jorgensen JPE 2012

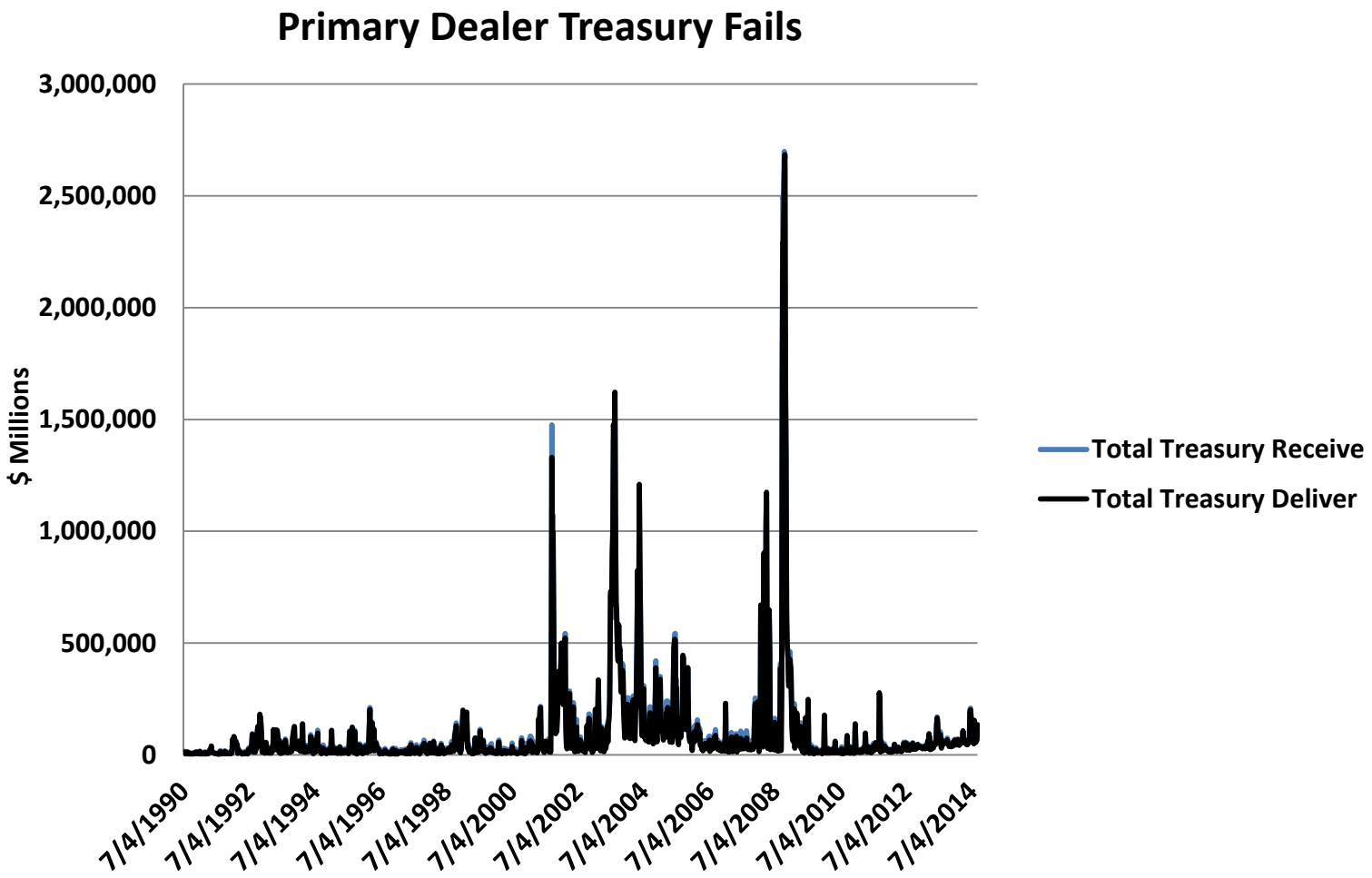
Private Response to Scarcity of Treasuries

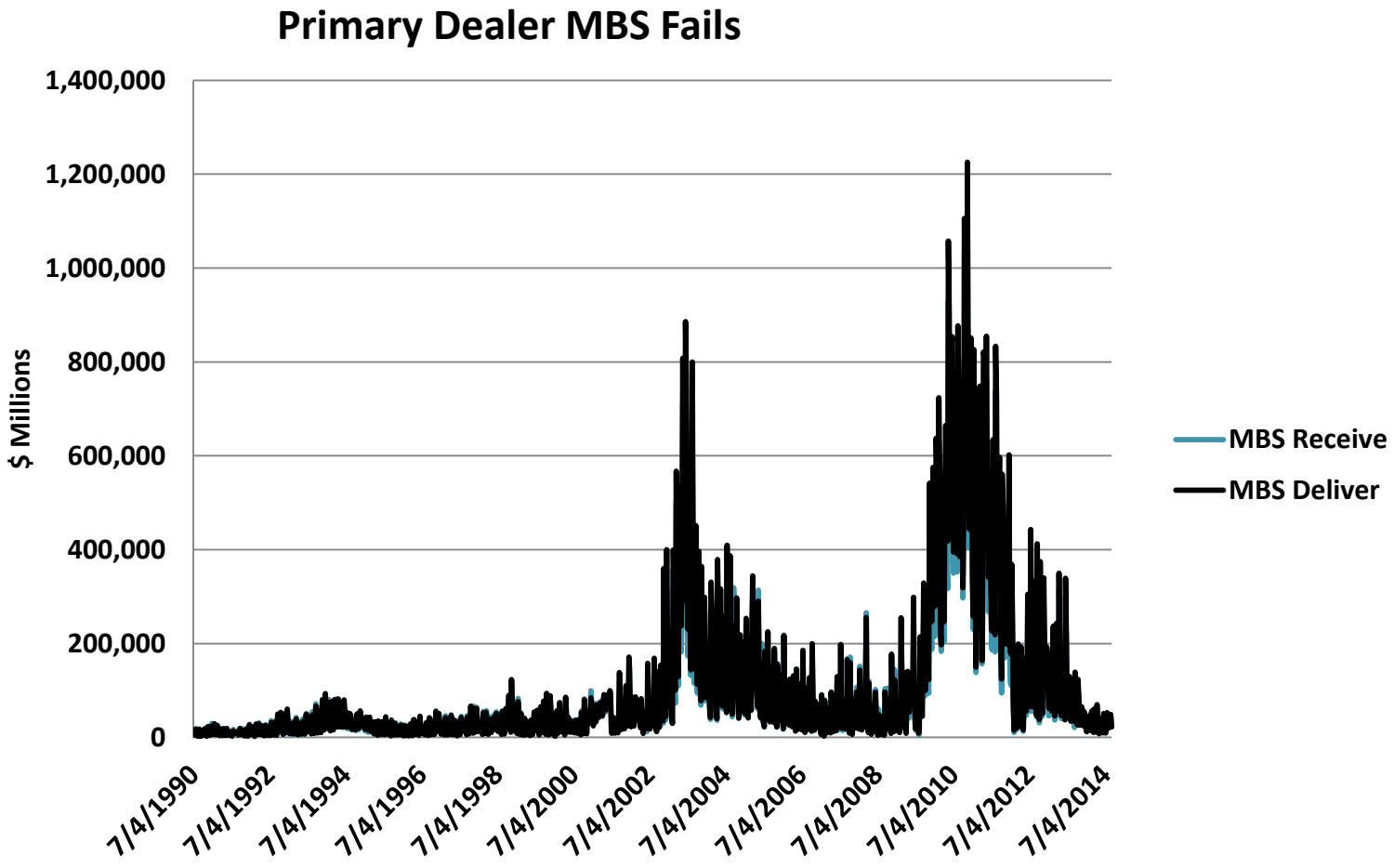
- Lei (2012): Examines *daily* issuance data on 20,000 MBS/ABS deals with 300,000 tranches from 1978-2011.
- Finds that MBS/ABS issuance occurs when convenience yield rises.

- Sunderam (2014) finds the same phenomenon with weekly data on ABCP.

More Evidence of Scarcity

- Repo fails
  - Occur when one side of the contract “fails to deliver” or “fails to receive”
- Question: Are fails due to a shortage of safe debt?


Primary Dealer Treasury Fails
3,000,000
2,500,000
2,000,000
1,500,000
1,000,000
500,000
0
$ Millions
7/4/1990
7/4/1992
7/4/1994
7/4/1996
7/4/1998
7/4/2000
7/4/2002
7/4/2004
7/4/2006
7/4/2008
7/4/2010
7/4/2012
7/4/2014
Total Treasury Receive
Total Treasury Deliver


Primary Dealer MBS Fails
$ Millions
1,400,000
1,200,000
1,000,000
800,000
600,000
400,000
200,000
0
7/4/1990
7/4/1992
7/4/1994
7/4/1996
7/4/1998
7/4/2000
7/4/2002
7/4/2004
7/4/2006
7/4/2008
7/4/2010
7/4/2012
7/4/2014
MBS Receive
MBS Deliver

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MARKETS

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U.S. Stocks Fall on Mixed Earnings

Limited Fallout From Greek Bond Slump

MARKETS

Pressure in Repo Market Spreads

Stresses amplify price swings in government bonds

By **KATY BURNE**

April 2, 2015 6:23 p.m. ET

A shortage of high-quality bonds is disrupting the $2.6 trillion U.S. market for short-term loans known as repurchase agreements, or "repos," creating bottlenecks for a key source of liquidity in the financial system and sending ripples through short-term debt markets.

Stresses in the repo market are amplifying price swings in government bonds and related debt mark

Regressions

- Repo fails related to a rise in the scarcity premium or convenience yield (GC repo spread).

- When Treasuries are scarce, there are more repo fails.

A Measure of Scarcity

- GC Repo minus Treasury (1 month)

	Δ Fails Rec	Δ Fails Rec	Δ Fails Rec	Δ Fails Rec	Δ Fails Rec	Δ Fails Rec
GC Repo-1m T-bill	6.963***	0.695	7.303***	0.640	7.509***	0.620
	(5.57)	(0.41)	(5.78)	(0.38)	(5.91)	(0.36)
L1.GC Repo-1m T-bill			2.609*	0.818	2.951*	0.648
			(2.07)	(0.48)	(2.31)	(0.38)
L2.GC Repo-1m T-bill					2.495*	0.316
					(1.96)	(0.19)
GC Repo-1m T-bill x Break 1		13.35***		13.96***		13.35***
		(5.14)		(5.26)		(5.03)
L1.GC Repo-1m T-bill x Break 1				2.492		1.894
				(0.95)		(0.71)
L2.GC Repo-1m T-bill x Break 1						-2.164
						(-0.82)
GC Repo-1m T-bill x Break 2		39.57***		45.66***		44.08***
		(7.36)		(8.46)		(8.20)
L1.GC Repo-1m T-bill x Break 2				33.27***		37.98***
				(6.55)		(7.46)
L2.GC Repo-1m T-bill x Break 2						32.26***
						(6.43)
GC Repo-1m T-bill x Break 3		-1.485		-1.878		-1.185
		(-0.13)		(-0.16)		(-0.10)
L1.GC Repo-1m T-bill x Break 3				4.103		4.818
				(0.36)		(0.41)
L2.GC Repo-1m T-bill x Break 3						3.120
						(0.27)


Global negative yielding sovereign debt rises to $11.7tn
$tn, sorted by maturity
Less than 1 year
1 - 7 years
More than 7 years
12
10
8
6
4
2
0
Apr
2016
May
Jun
End of April, May | June 27
Source: Fitch Ratings, Adam Samson / FT

Bank Runs

- This new money—repo, ABCP-- was vulnerable to bank runs, just as in most of U.S. history.


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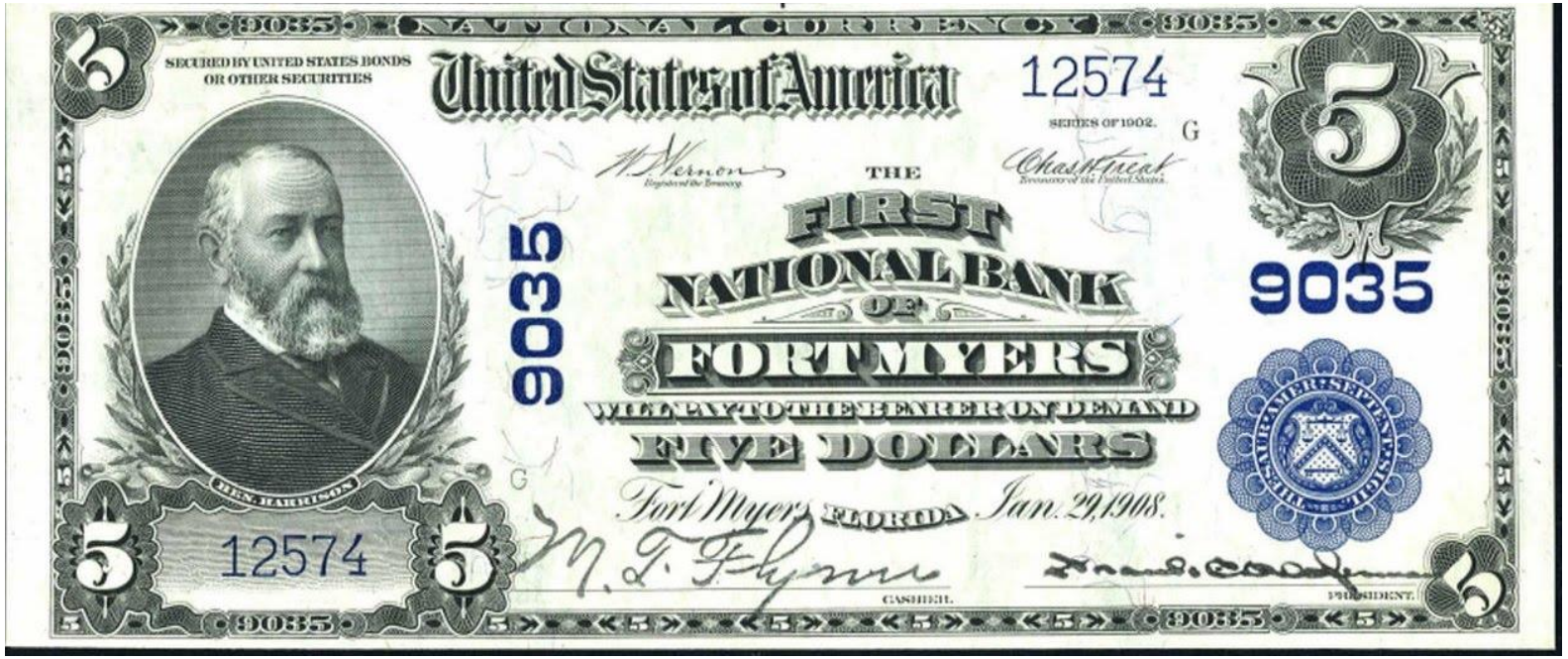
The National Banking Era

- National Banking Act passed in 1863 to finance Civil War.
  - Set up a new system of National Banks
  - These banks could issue bank-specific national bank notes by depositing US Treasuries with the Treasury Dept.
  - Expected to end banking panics.


NATIONAL CURRENCY
SECURED BY UNITED STATES BONDS OR OTHER SECURITIES
United States of America
12574
SERIES OF 1902.
G
THE
FIRST
NATIONAL BANK
OF
FORT MYERS
WILL PAY TO THE BEARER ON DEMAND
FIVE DOLLARS
Fort Myers FLORIDA Jan. 29 1908.
CASHIER.
PRESIDENT.
9035
BEN. HARRISON
5

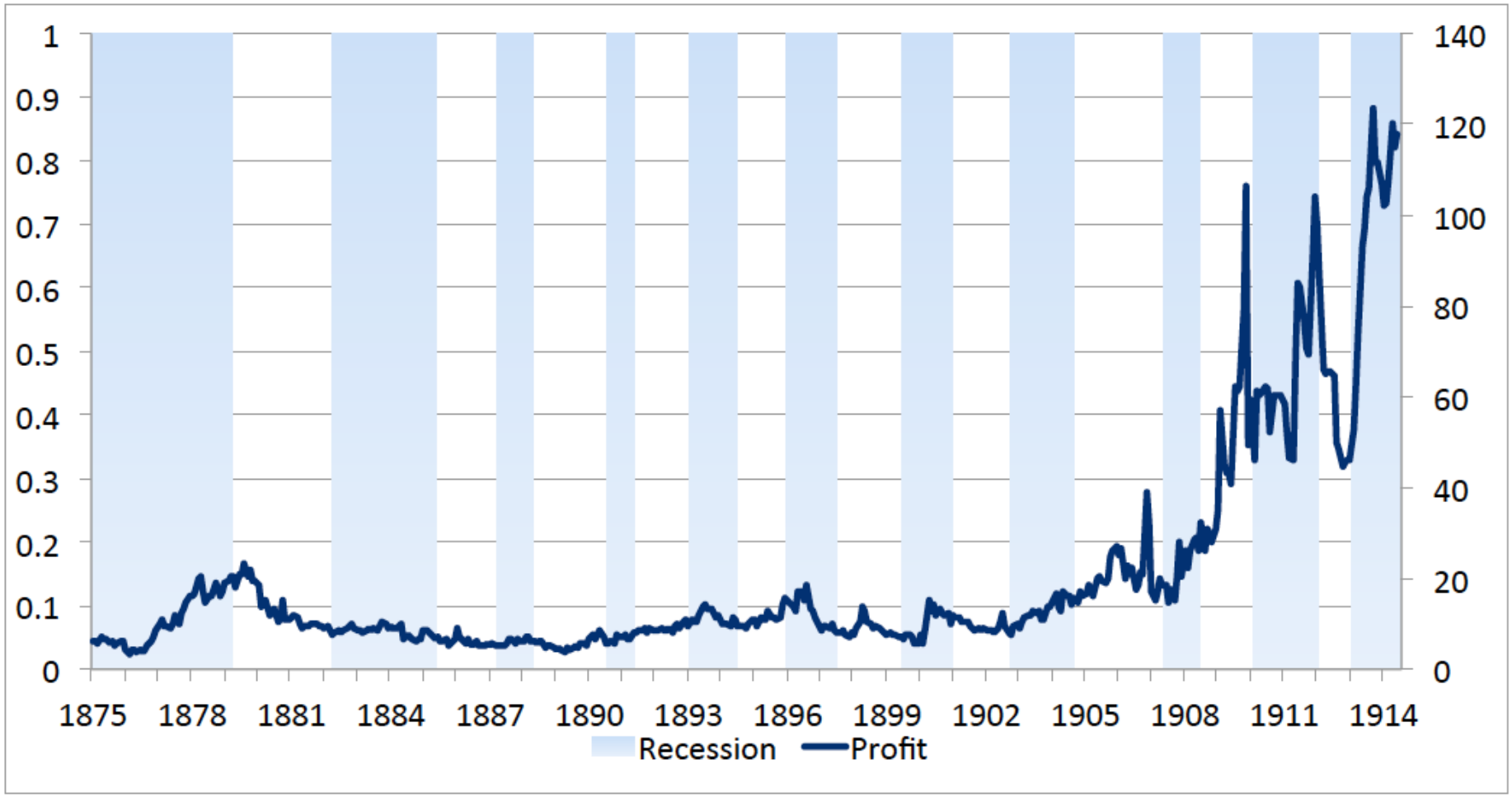
The Under-Issuance Puzzle

- Too little money was issued, the “under-issuance puzzle” - - a puzzle for over a century!

Riskless Arbitrage?

- It was profitable to buy Treasuries, deposit them, and issue bank notes.
- $r \approx \frac{(0.04)(1.10)-(0.017)(0.9)}{1.10-0.9} \approx 14.4\%$
  - Bond price=$1.10 with yield of 4%
  - 0.017 is issuance cost
  - 0.9 is the fraction of the bond that can be issued as notes
  - Denominator is leverage that can be obtained.

Profit Series (shaded areas = recessions)



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But . . .

- There was no arbitrage opportunity. “Profit” due to:
  - a convenience yield on Treasuries
  - and costly bank capital.

- Treasuries were scarce. Costly to borrow, hard to find.
  - “The rate is 1.5 to 2 percent for borrowing bonds”
  - “The real trouble is to find the bonds”

"Arb Profits" Reflect Convenience Yield?

- Measures/Proxies for convenience yield:
  - Follow Krish and V-J: outstanding Treasuries to GDP
  - Also look at "available Treasuries"
  - Muni spreads
- No proxies for bank capital (though likely more costly in recessions).

"Arb Profits" Reflect Convenience Yield?

Panel B: $y = \ln(\text{profit})$

	(1)	(2)	(3)	(4)	GLS (5)
ln(Debt/GDP)	-1.78				
	[-2.35]				
ln(Avail/GDP)		-1.18		-1.03	-0.81
		[-4.85]		[-6.81]	[-5.49]
Muni spread			1.81	0.44	0.38
			[3.83]	[4.49]	[2.05]
AdjR^2	0.36	0.67	0.48	0.74	0.54
N	34	34	137	34	34

Results

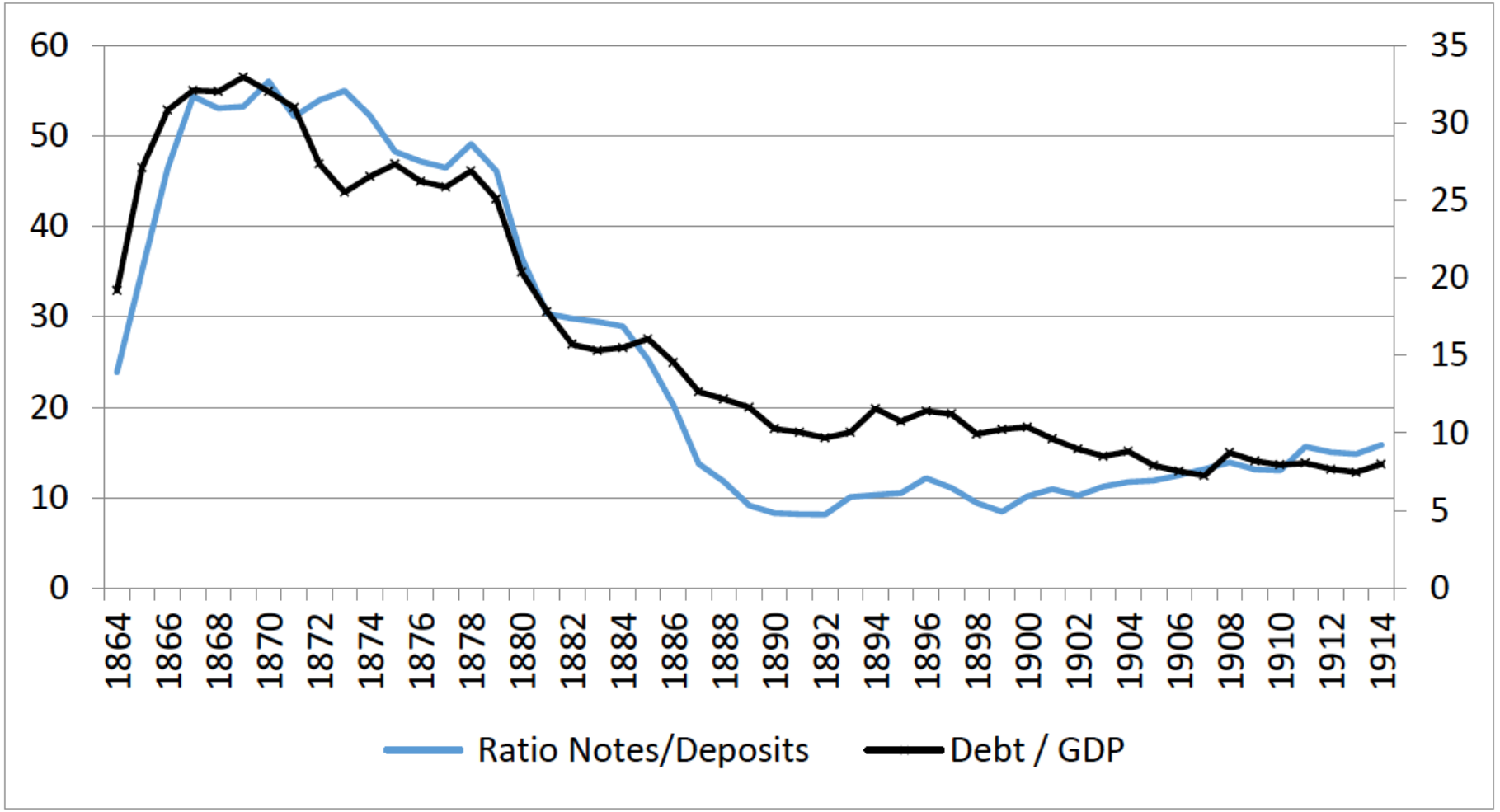
- "Arb profits" at least partly explained by the scarcity of Treasuries (and costs of bank capital).
  - Banks had other uses for Treasuries
  - Insurance companies also demanded Treasuries
  - Arb profits also related to recession when cost of bank capital likely higher

Meanwhile --

- - - - the shadow banking system grew---

- Scarcity of Treasuries / limited note issuance encouraged deposits to grow

Ratio of Notes to Deposits and Treasury Debt to GDP
Correlation = 0.96



Demand Deposits not Understood

- Bray Hammond (1957), in his Pulitzer Prize-winning book Banks and Politics in America, wrote: ". . . the importance of deposits was not realized by most American economists . . . till after 1900" (p. 80).

- Russell C. Leffingwell, the Assistant Secretary of the Treasury wrote as late as 1919: "All of these people who believe in the quantity theory of money . . . choose to call bank deposits money, but bank deposits are not money."

Conclusions

- Design of Nat'l Banking System led to the rise of demand deposits—"shadow banking."
- Crises were not averted. Five major banking panics (1873, 1884, 1893, 1896, 1907).

- Same problems now:
  - Shortage of safe debt
  - Unintended consequences
  - Conceptual issues

“Those who ignore history are entitled to repeat it.”