The role of reserves in reshaping monetary policy implementation and interbank markets in the US

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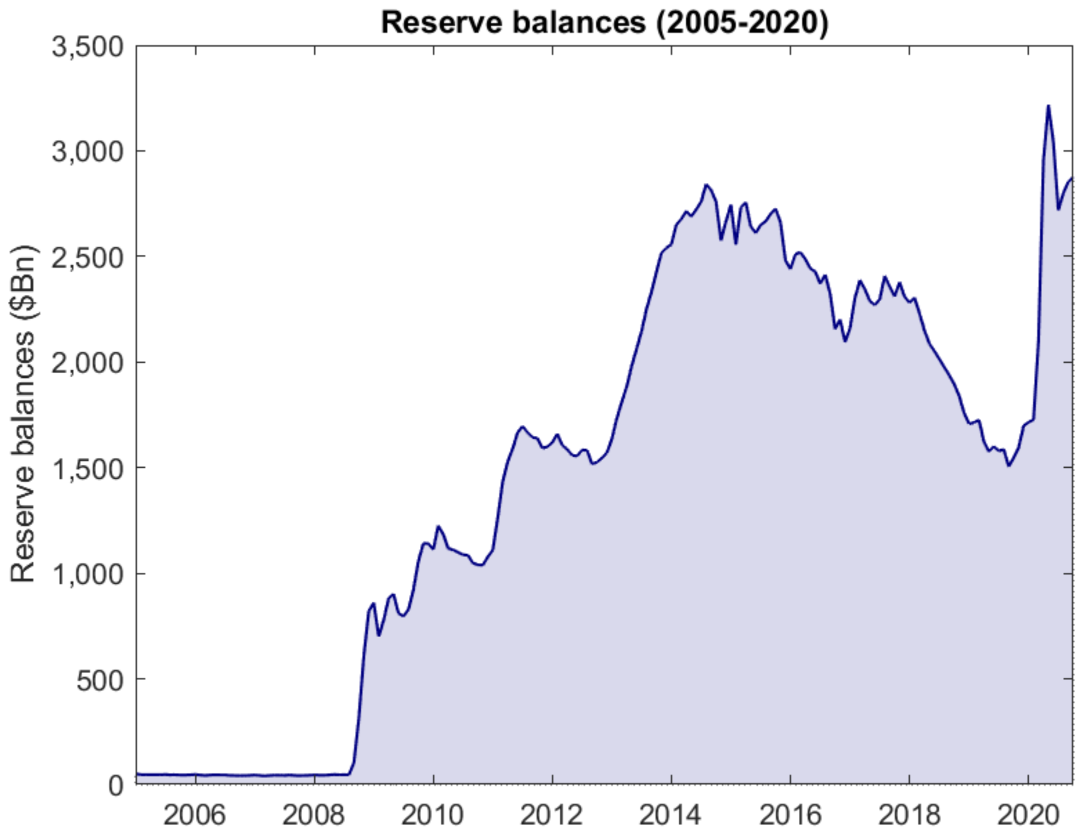
Reserves and interbank markets in the US

- Money markets have changed starkly over the past 15 years
  - Size, participants and interconnectedness

- Focus on interbank markets
  - Channel liquidity across the banking system
  - Setting of interest rate with the shortest maturity
  - Key role in monetary policy implementation

- Reserves play central role in monetary policy implementation and across money markets

Evolution of reserves in the US



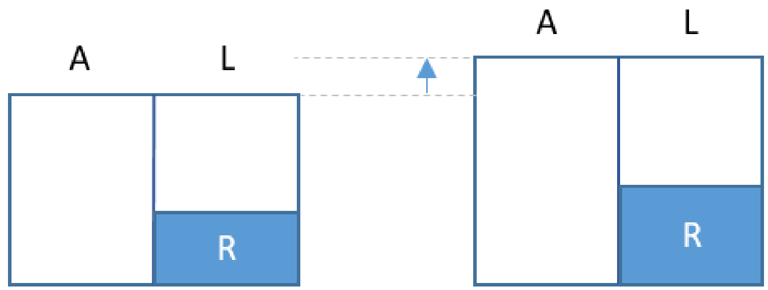
Reserves balances

◇ Deposits that depository institutions maintain in their accounts at Federal Reserve Banks

◇ Level of aggregate reserves changes when

1. Size of Fed balance sheet changes
2. Composition of Fed balance sheet changes

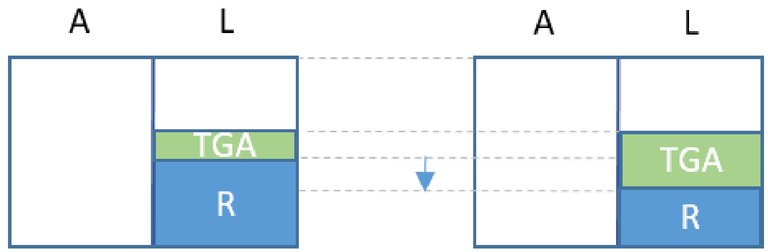
Changes in reserves balances. An example



Assets		Liabilities	
Securities	3,929	Reserves	1,896
Other	621	Currency	1,827
		Treasury General Account	363
		Other deposits	171
		Other	294
Total	**4,550**	Total (Mar 18, 2020)	4,550

Assets		Liabilities	
Securities	4,187	Reserves	2,187
Other	869	Currency	1,860
		Treasury General Account	390
		Other deposits	279
		Other	341
Total	**5,057**	Total (Mar 25, 2020)	5,057

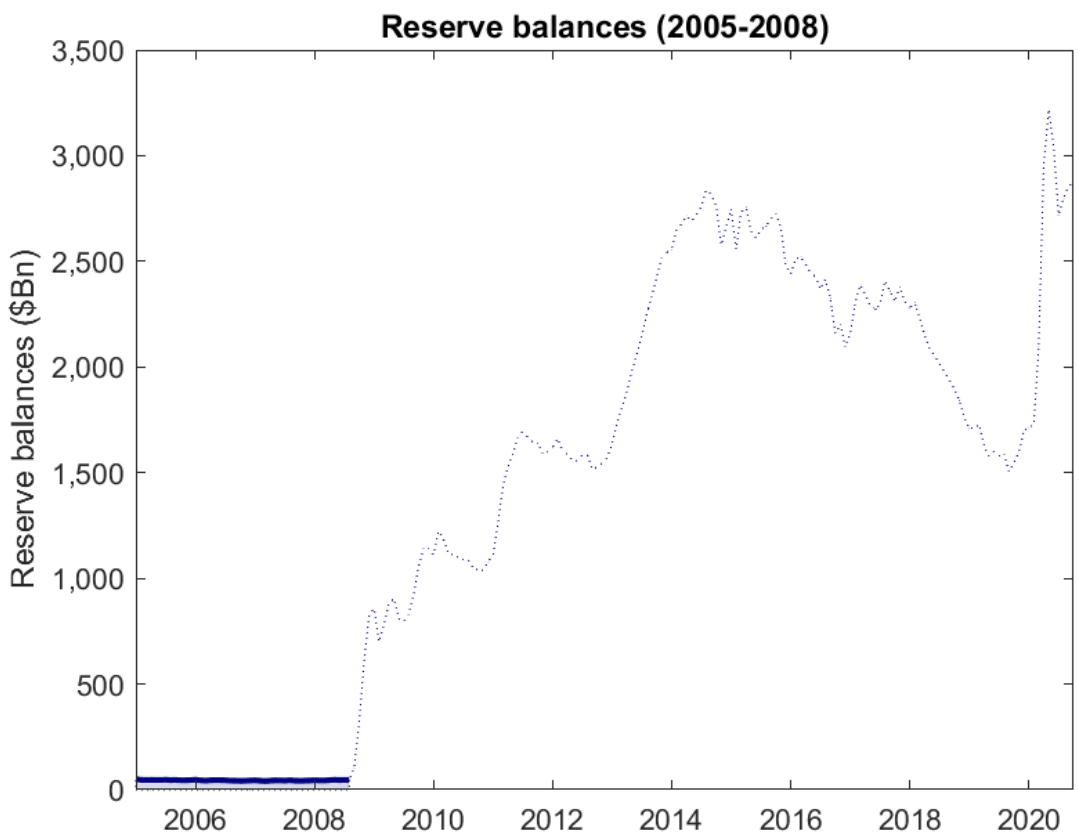
Changes in reserves balances. Another example



Assets		Liabilities	
Securities	3,590	Reserves	1,457
Other	223	Currency	1,766
		Treasury General Account	185
		Other deposits	63
		Other	343
Total	**3,814**	Total (Sept 11, 2019)	3,814

Assets		Liabilities	
Securities	3,593	Reserves	1,394
Other	244	Currency	1,762
		Treasury General Account	250
		Other deposits	81
		Other	349
Total	**3,837**	Total (Sept 18, 2019)	3,837

Pre-2008 financial crisis reserves



Pre-2008 financial crisis: A scarce reserves regime

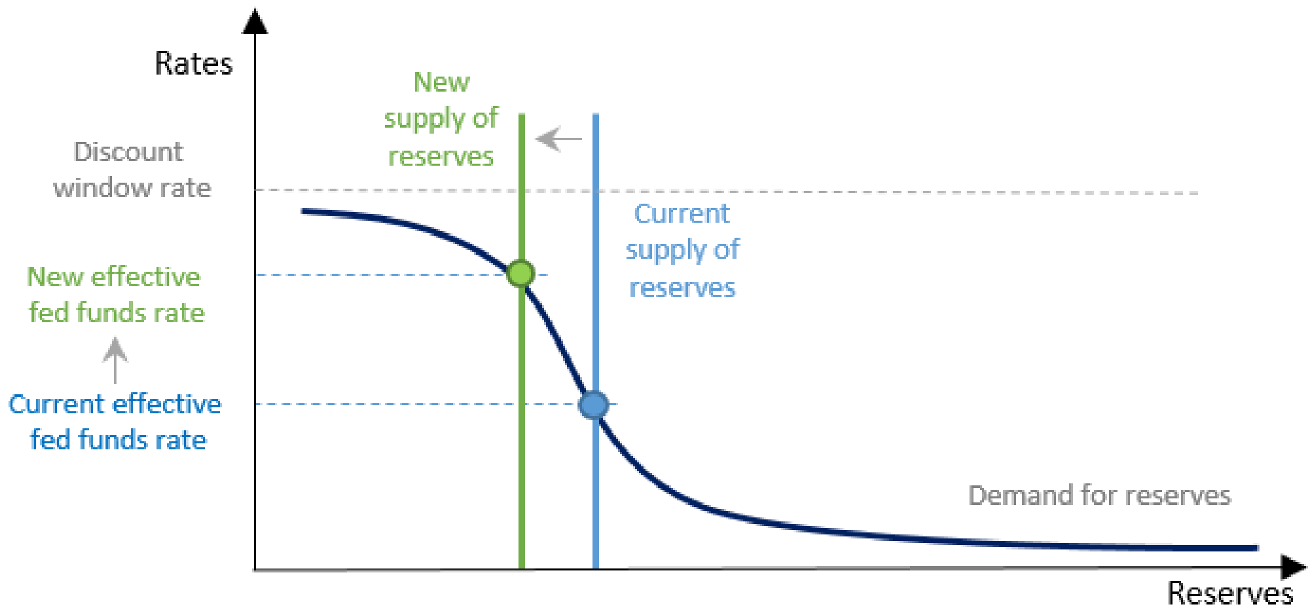
- Reserves
  - Tens of $ billion
  - Not remunerated

- Demand for reserves
  - Meet reserve requirements: $\frac{\text{Required reserves}}{\text{Total reserves}} > 80\%$
  - Avoid overnight overdrafts

- Reserves traded in the interbank market

- Monetary policy framework
  - Corridor system (Poole (1968), Ennis and Keister (2008))

Implementation in a scarce reserves regime



"Reserves demand curve"

Fed funds market with scarce reserves

◇ Early literature

- Poole (1968), Ho and Saunders (1985), Furfine (1999), Ennis and Keister (2008)

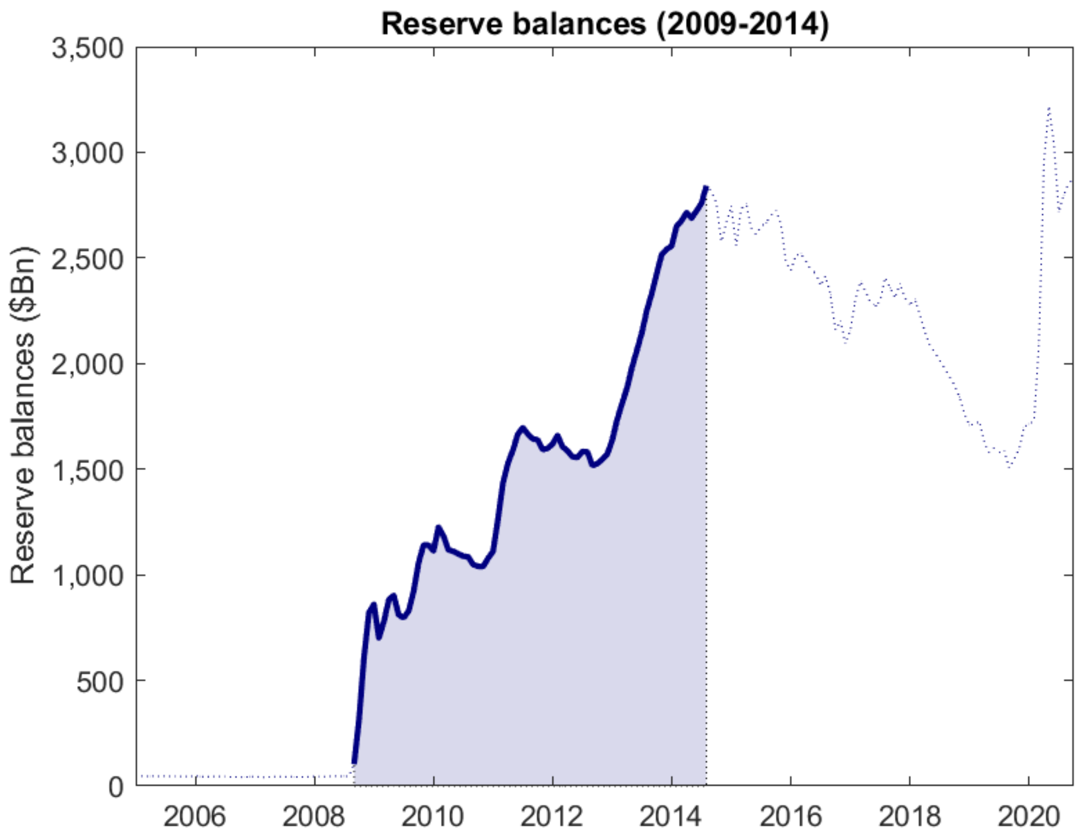
◇ Over-the-counter market

- Ashcraft and Duffie (2007), Afonso and Lagos (2015)

Pre-2008 fed funds market dynamics

- Active market
  - Daily volume $\sim$ \$125-175 billion - Afonso and Lagos (2014)
  - Daily participants $\sim >$100 - Afonso, Kovner and Schoar (2011)
- Intermediation
  - Afonso and Lagos (2014, 2015)
- Trading motives: insurance against liquidity shocks
  - Afonso, Kovner, and Schoar (2013)
- Resiliency in distress times
  - Afonso, Kovner and Schoar (2011), Kuo, Skeie and Vickery (2010)

From a scarce to an abundant reserves regime

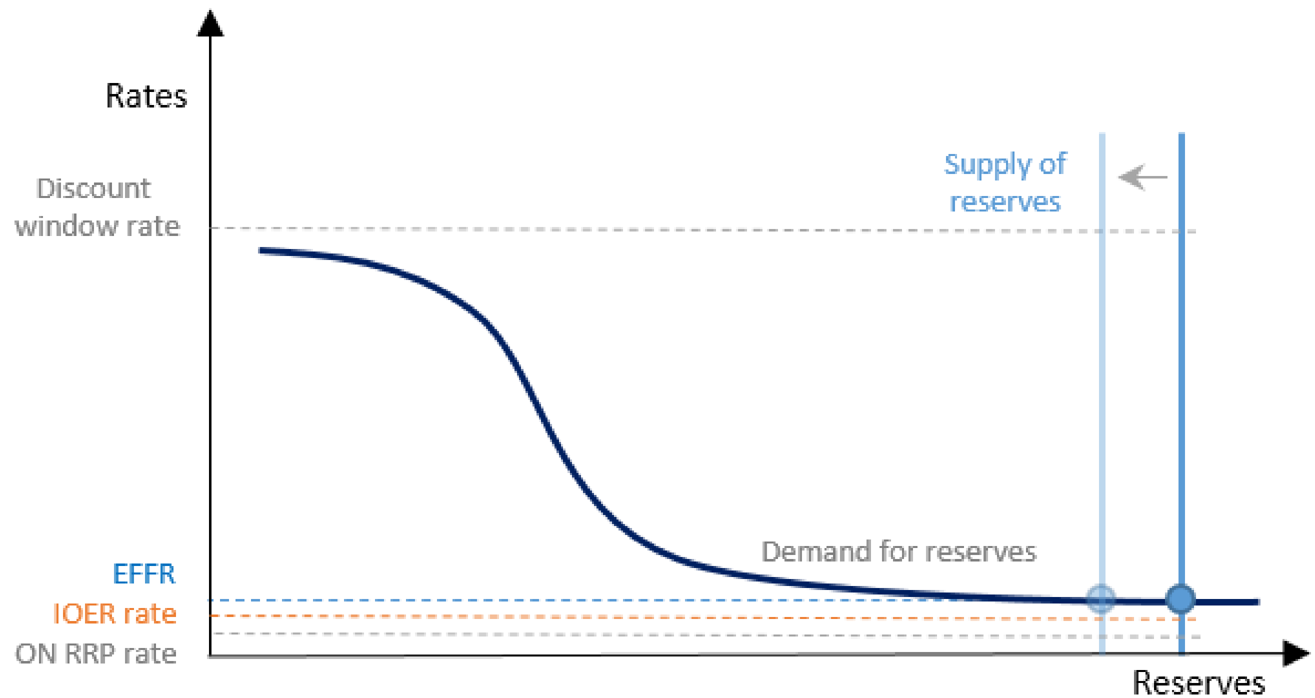


Towards an abundant reserves regime

- Reserves
  - \$ Trillion
  - $\frac{\text{Required reserves}}{\text{Total reserves}} < 5\%$

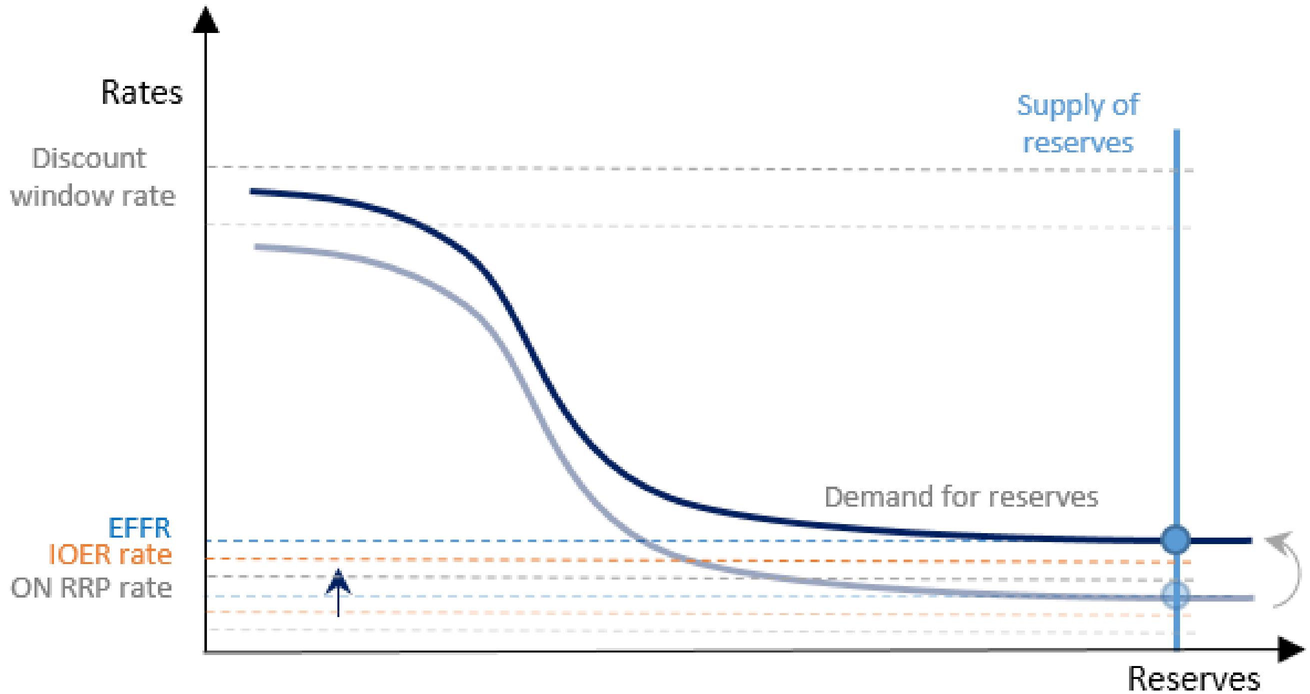
- Monetary policy framework
  - Floor system
  - New tools:
    - Interest on excess reserves (IOER) rate
      - Depository institutions
    - Overnight reverse repurchase agreement (ON RRP) rate
      - Depository institutions, government-sponsored enterprises (GSEs, including Federal Home Loan Banks), SEC-registered 2a-7 funds

Implementation in an abundant reserves regime



In the flat region of the “reserves demand curve,” shifts in the supply of reserves no longer influence fed funds rates

Implementation in an abundant reserves regime



Fed funds market with abundant reserves

◇ Low daily volume $\sim$ \$50-75 billion - Afonso and Stern (2016)

- No role for intermediation
- Low bank-to-bank trading

◇ Few participants

- Key role of Federal Home Loan Banks (FHLBs) $\sim$ \$70-80% lending

◇ Rates below IOER

◇ Arbitrage

◇ Armenter and Lester (2017); Bech and Klee (2011), Schulhofer-Wohl and Clouse (2018); Banegas and Tase (2016); Keating and Macchiavelli (2017)

Exit strategy: Monetary policy normalization

◇ Discussions on exit strategy (2010-2011)

◇ Policy Normalization Principles and Plans (September 17, 2014)

- "When economic conditions and the economic outlook warrant a less accommodative monetary policy, the Committee will raise its target range for the federal funds rate. [. . .] the Federal Reserve intends to move the federal funds rate into the target range set by the Committee primarily by adjusting the interest rate it pays on excess reserve balances."

- "The Committee intends that the Federal Reserve will, in the longer run, hold no more securities than necessary to implement monetary policy efficiently and effectively, and that it will hold primarily Treasury securities"

Exit strategy: Monetary policy normalization

◇ Lift-off (December 16, 2015)

◇ Addendum to the Policy Normalization Principles and Plans (June 14, 2017)

- "Gradually reducing the Federal Reserve's securities holdings will result in a declining supply of reserve balances [. . .] to a level appreciably below that seen in recent years but larger than before the financial crisis; the level will reflect the banking system's demand for reserve balances and the Committee's decisions about how to implement monetary policy most efficiently and effectively in the future "

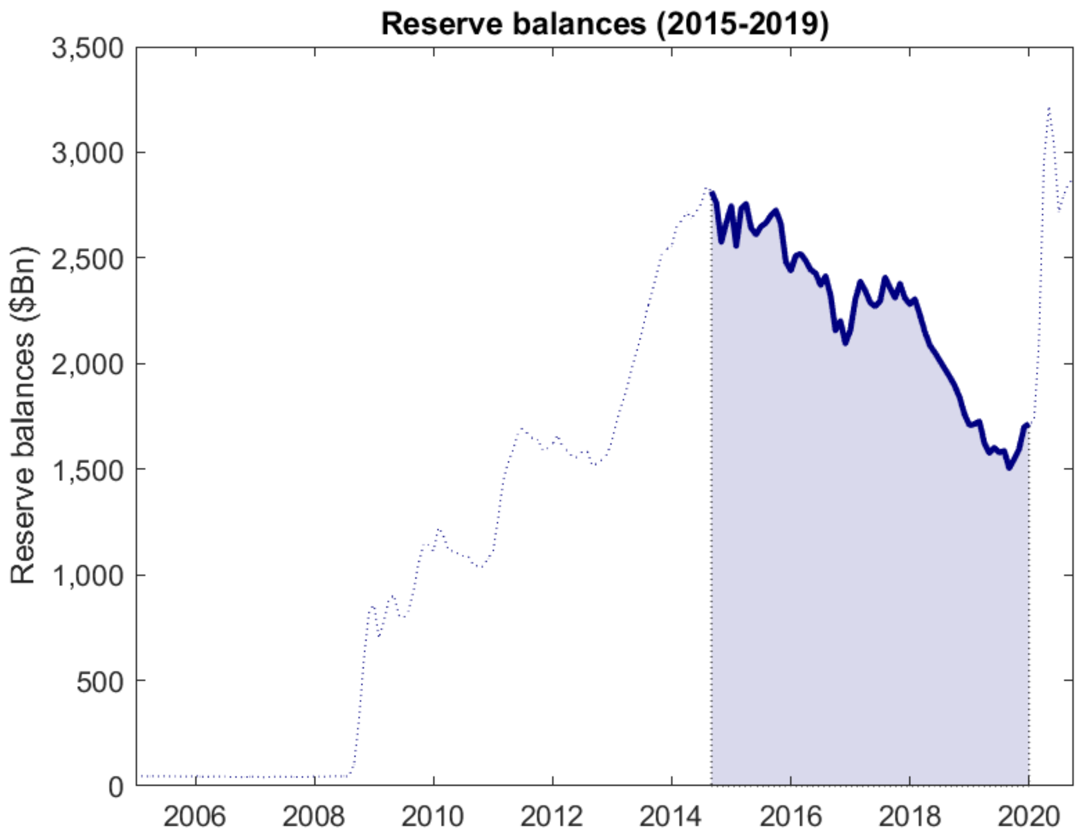
Exit strategy: Monetary policy normalization

◇ Statement Regarding Monetary Policy Implementation and Balance Sheet Normalization (January 30, 2019)

- "The Committee intends to continue to implement monetary policy in a regime in which an ample supply of reserves ensures that control over the level of the federal funds rate and other short-term interest rates is exercised primarily through the setting of the Federal Reserve's administered rates, and in which active management of the supply of reserves is not required"

- "The Committee continues to view changes in the target range for the federal funds rate as its primary means of adjusting the stance of monetary policy"

From an abundant to an ample reserves regime



Understanding demand for reserves

◇ New regulatory framework

◇ Internal liquidity-risk management

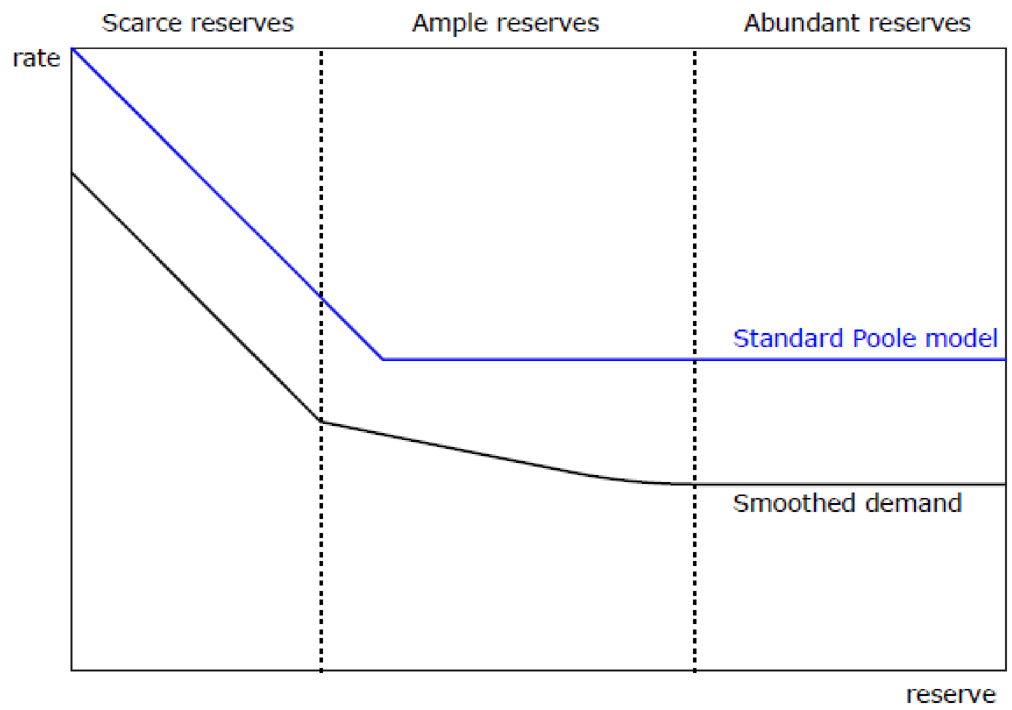
◇ Intraday payments

◇ Potential deposit outflows

◇ Absence of bank-to-bank interbank market

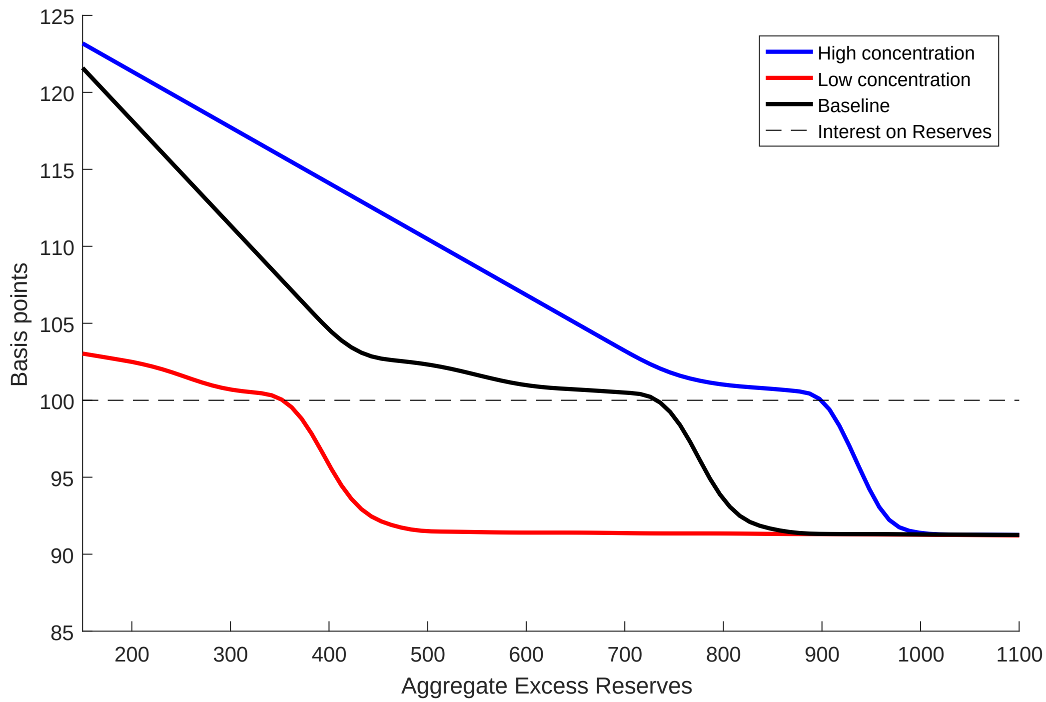
◇ Duffie and Krishnamurthy (2016); Bech and Keister (2017); Ihrig, Kim, Kumbhat, Vojtech and Weinbach (2017); Logan (2019)

Implementation in an ample reserves regime



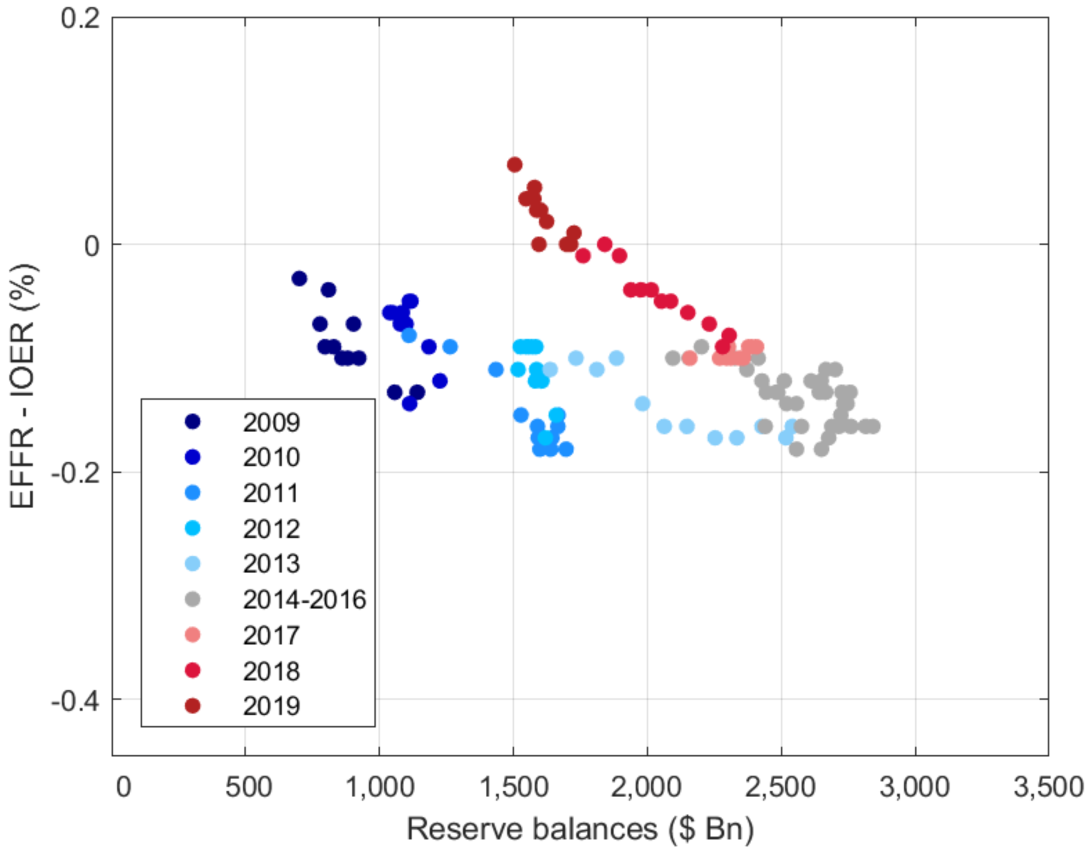
Afonso, Kim, Martin, Nosal, Potter and Schulhofer-Wohl (2020), Figure 5

Distribution of reserves matters



Afonso, Armenter and Lester (2019), Figure 8

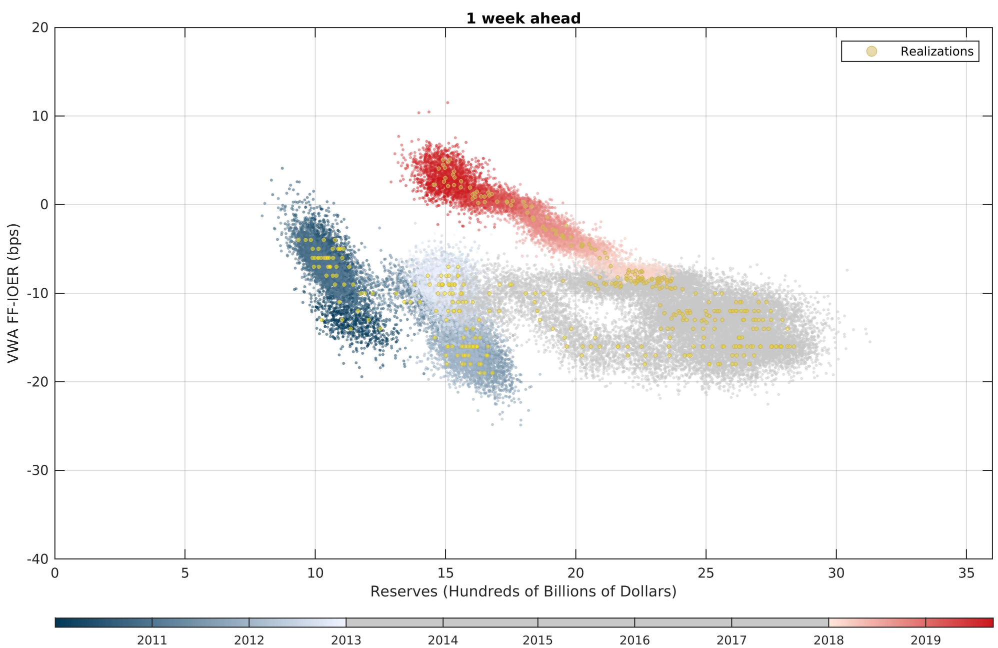
Demand curve or demand curves?



Structural change in reserves demand curve?

Estimating demand for reserves over time

- ◇ Hamilton (1997) (1987-1991)
- ◇ Afonso, Giannone and La Spada (2020) (2010-2020)

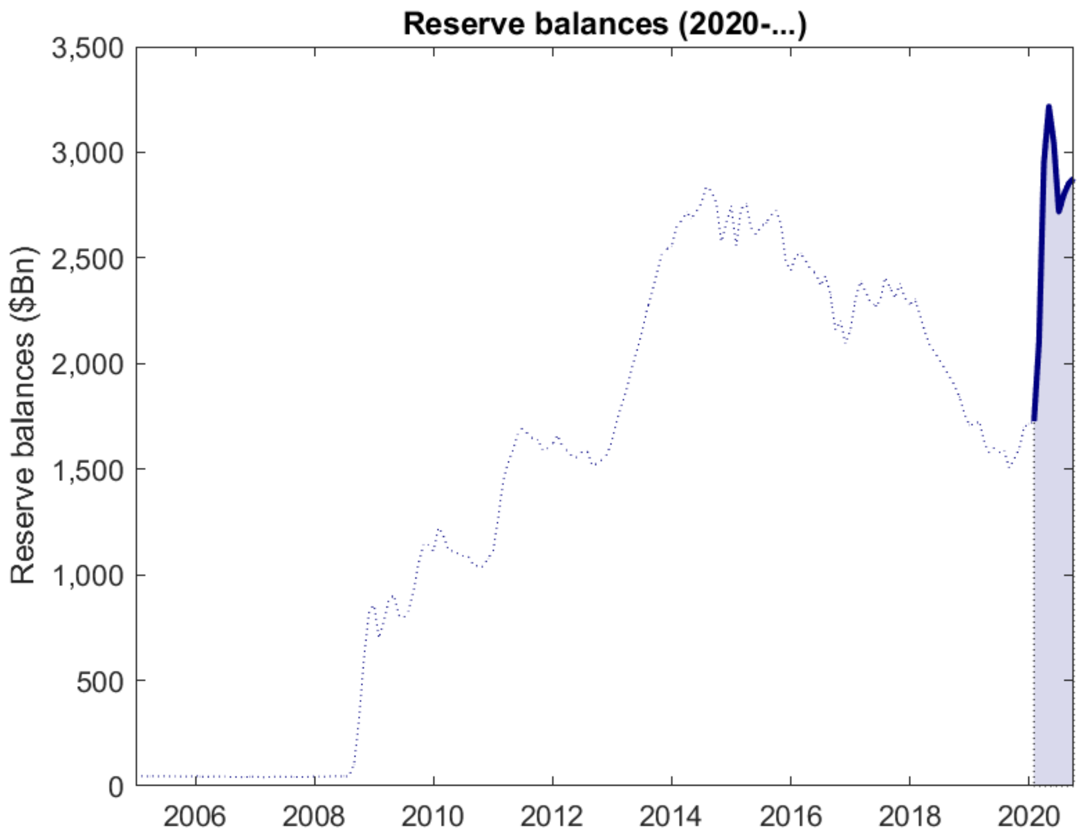


Reserves demand curve (2010-2019)

Identifying ample reserves

- Balancing footprint vs. rate control and financial stability
- Operational implementation presents challenges
  - "Reserves-at-Risk" measures - Afonso, Giannone and La Spada (2020)
- Reserves no longer abundant
  - September 2019 money market disruptions
    - Afonso, Cipriani, Copeland, Kovner, La Spada and Martin (2020); Anbil, Anderson and Senyuz (2020); Schulhofer-Wohl (2019); Correa, Du and Liao (2020)
  - Increased coordination of payments
    - Afonso, Duffie, Rigon and Shin (2020)

From an ample to a super abundant reserves regime



Looking ahead

- Support US economy - FOMC statement (November 4-5, 2020)
  - "The Federal Reserve is committed to using its full range of tools to support the U.S. economy in this challenging time"
  - "over coming months the Federal Reserve will increase its holdings of Treasury securities and agency mortgage-backed securities at least at the current pace to sustain smooth market functioning and help foster accommodative financial conditions"
- Re-normalization?