

# Financial Vulnerabilities and the Balance Sheet as a Monetary Policy Tool in the US

Michael T. Kiley

**The analysis and conclusions set forth are those of the author and do not indicate concurrence by the Federal Reserve Board or other members of its staff.**

# Overview

# This discussion is based on

- Aikman, David, Michael T. Kiley, Seung Jung Lee, Michael G. Palumbo, and Missaka N. Warusawitharana (2017). "Mapping Heat in the U.S. Financial System," *Journal of Banking & Finance*, vol. 81, pp. 36-64.
- Kiley, Michael T. Kiley (2014) "The Response of Equity Prices to Movements in Long-Term Interest Rates Associated with Monetary Policy Statements: Before and After the Zero Lower Bound," *Journal of Money, Credit and Banking*, vol. 46(5), pages 1057-1071.
- Kiley, Michael T. (2016) "Monetary policy statements, treasury yields, and private yields: Before and after the zero lower bound," *Finance Research Letters*, Elsevier, vol. 18(C), pages 285-290.
- Kiley, Michael T. (2017) "Quantitative Easing and the 'New Normal' for Monetary Policy", Working Paper.

# Plan for discussion

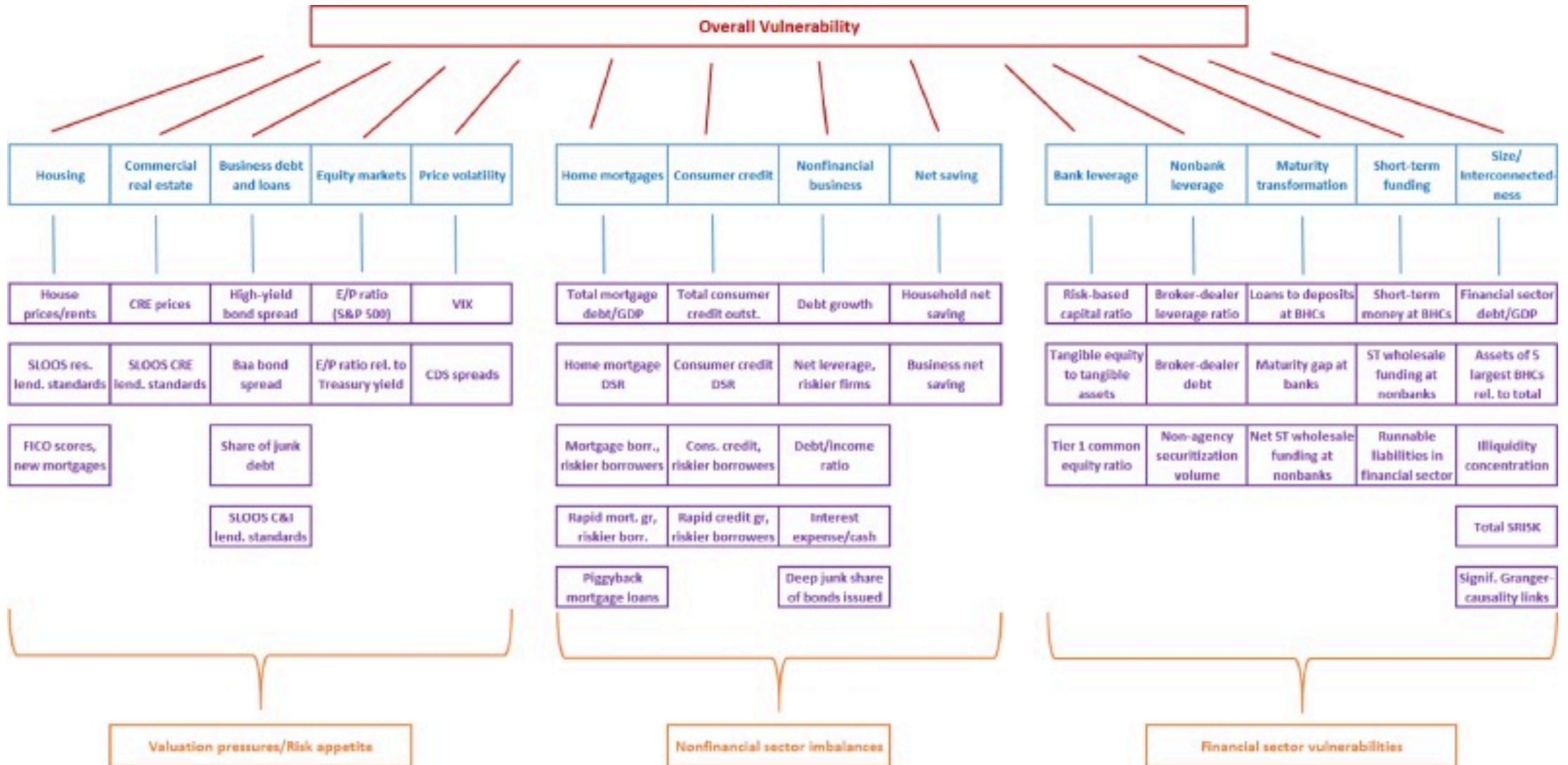
- The US recovery that began in 2009 is well advanced, and analysis has increasingly turned to the potential for emerging imbalances
- A particular concern is the possibility of re-emerging financial imbalances and their relationship to the policy stance
- My discussion
  - Presents a framework for identifying imbalances and highlights current valuation pressures
  - Considers whether low interest rates and quantitative easing (QE) are significant factors
  - Reviews the possible effects of an unwinding of QE and the challenges associated with low rates, particularly focusing on the efficacy of QE in a macro model

# Financial vulnerabilities

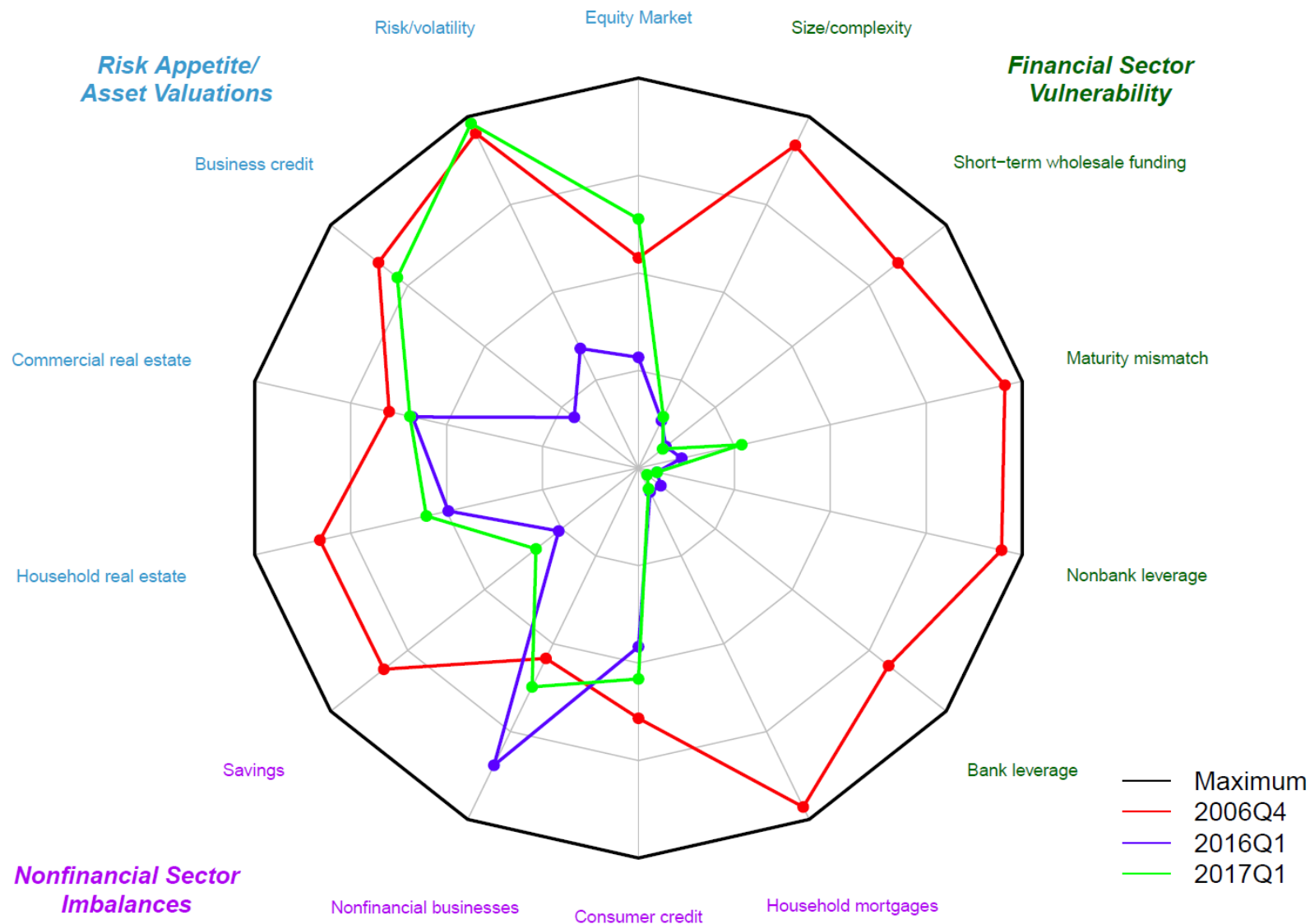
# Measuring heat in the financial system

- Aikman et al (2017) pull together indicators of financial system vulnerabilities
  - Large amount of data
  - Algorithmic and economic (not statistical) approach to summarizing information
- Data visualization tools help summarize and identify patterns in the data

# Categorizing vulnerabilities and indicators

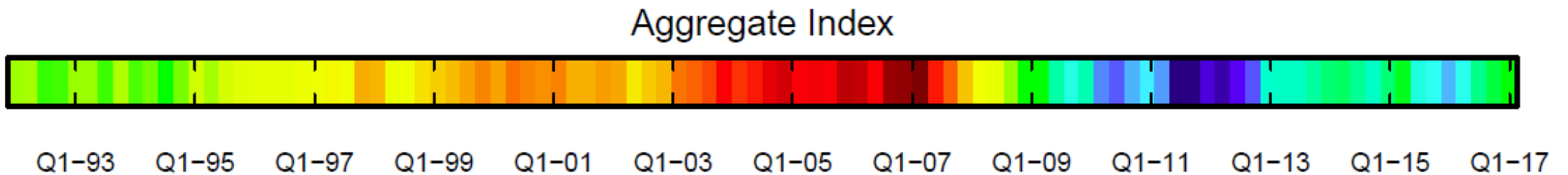


# Vulnerabilities so far in 2017 (and in 2006)



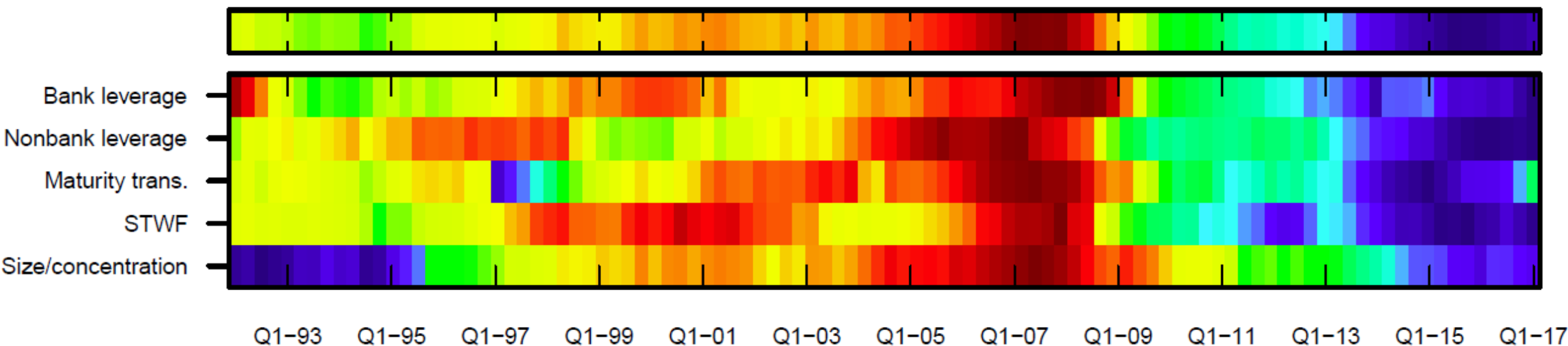


# Vulnerabilities over the past several decades



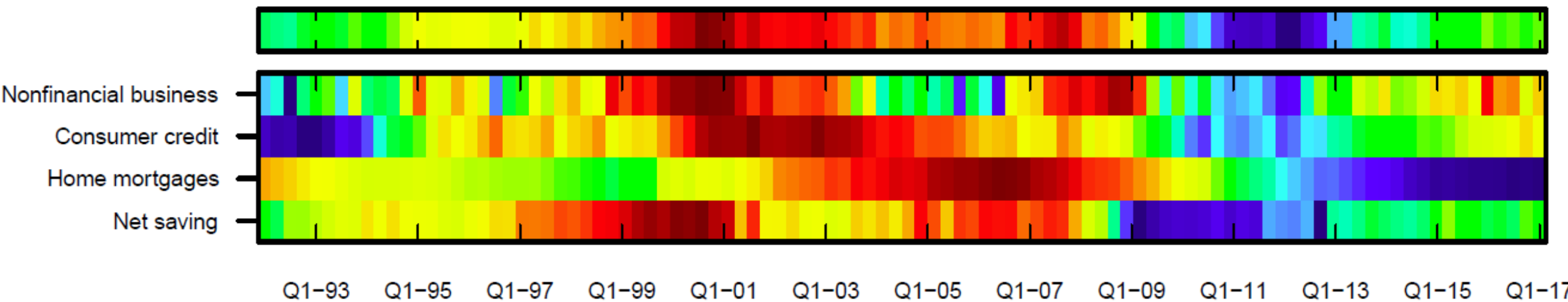
# Vulnerabilities over the past several decades

## B. Financial Aggregate



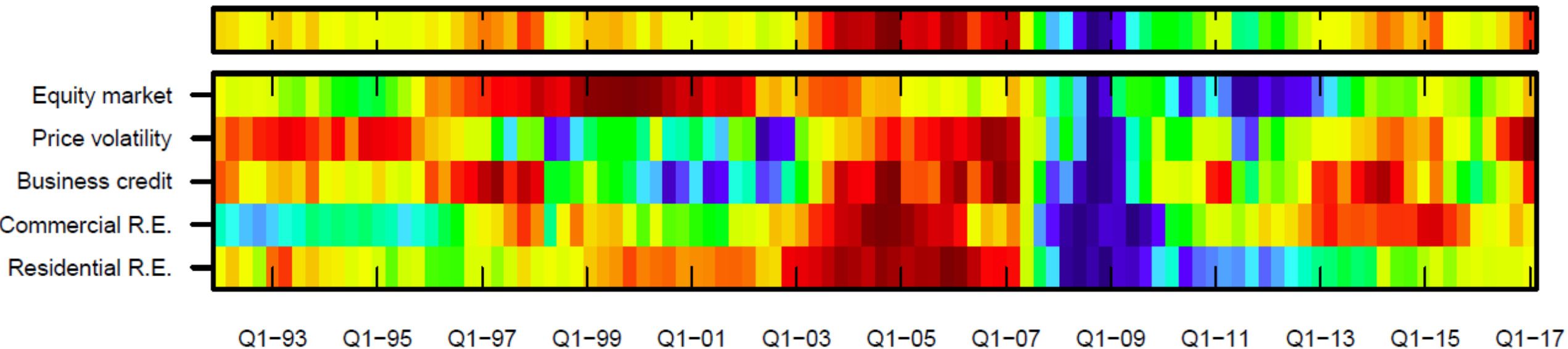
# Vulnerabilities over the past several decades

## C. Nonfinancial Aggregate



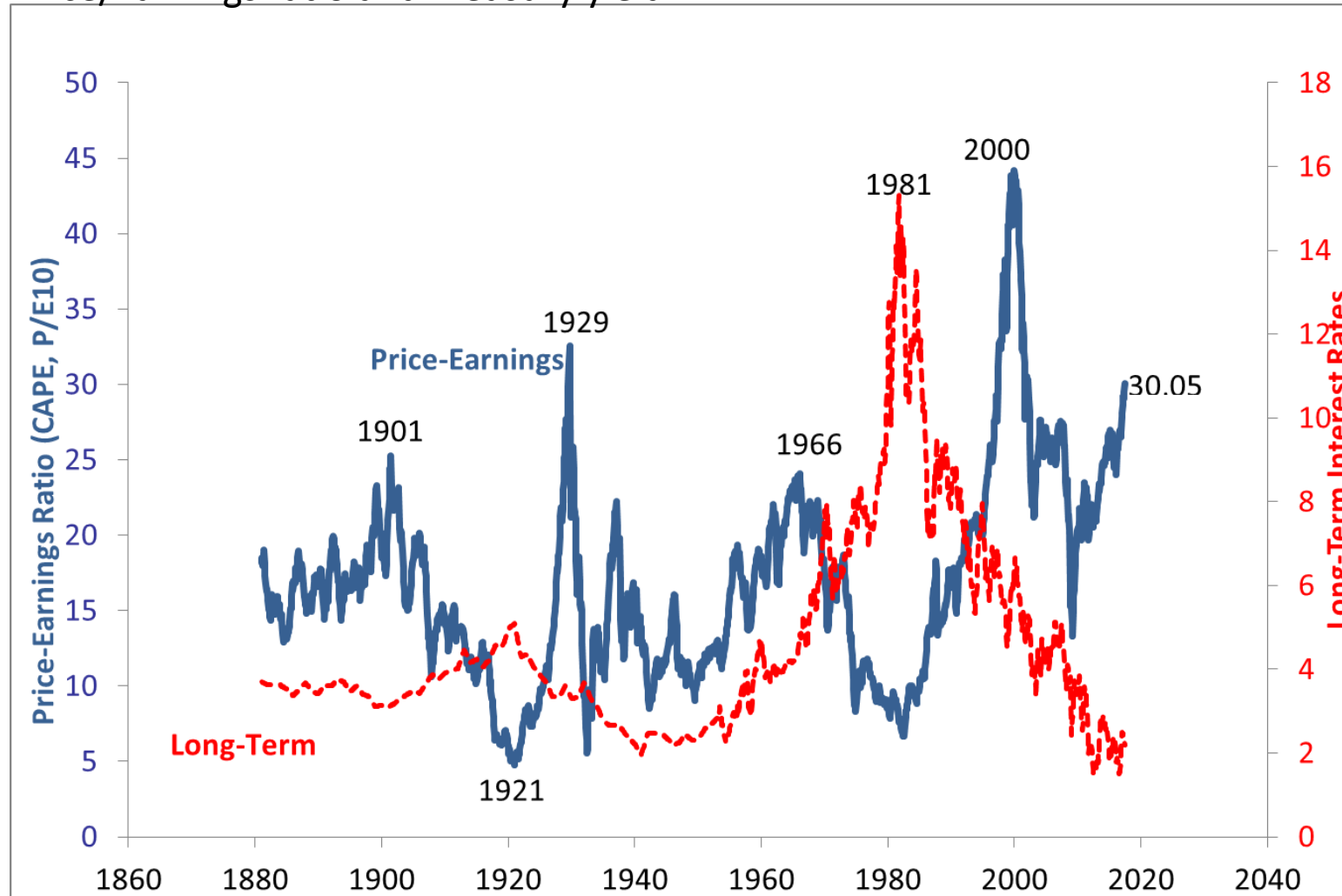
# Vulnerabilities over the past several decades

## A. Risk Appetite Aggregate



# Valuations: Treasury and equity markets

Price/Earnings ratio and Treasury yield



Source: Robert Shiller, <http://www.econ.yale.edu/~shiller/data.htm>

# Valuations: Risky corporate debt



— BofA Merrill Lynch US High Yield Option-Adjusted Spread©

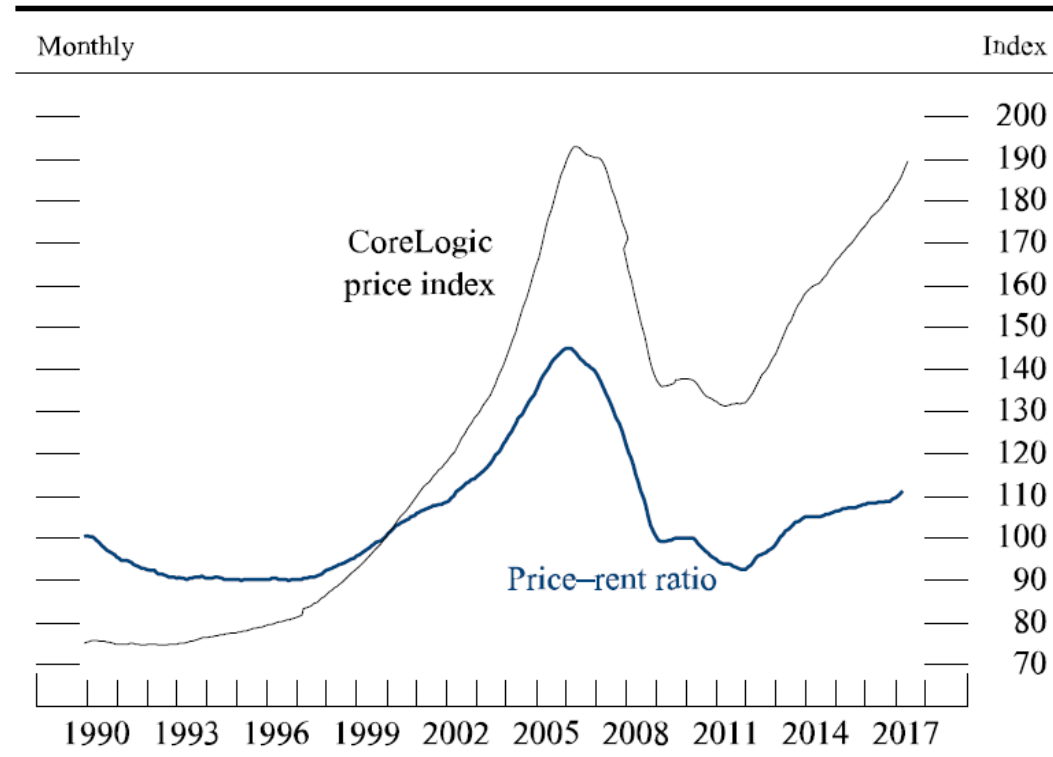


Source: BofA Merrill Lynch  
fred.stlouisfed.org

myf.red/g/erxj

# Valuations: Housing

Nominal house prices and price–rent ratio



NOTE: The data extend through May 2017. The CoreLogic price index is seasonally adjusted by Federal Reserve Board staff. The price–rent ratio is the ratio of nominal house prices to the consumer price index of rent of primary residence. The data are indexed to 100 in January 2000.

SOURCE: For prices, CoreLogic; for rents, Department of Labor, Bureau of Labor Statistics.

# Summary of current state of vulnerabilities

- Asset valuations
  - Are high relative to historical benchmarks (in equity, fixed income, and CRE)
  - Are moderate-to-high relative to Treasury yields
  - Are moderate (nationwide) in residential real estate
- Financial-sector vulnerabilities are moderate-to-low
  - High capital among banks
  - Reduction in maturity transformation and private money creation
- Nonfinancial-sector vulnerabilities
  - Reduced in household sector (where mortgage borrowing has been low)
  - Business sector borrowing has been robust in recent years



# Takeaways

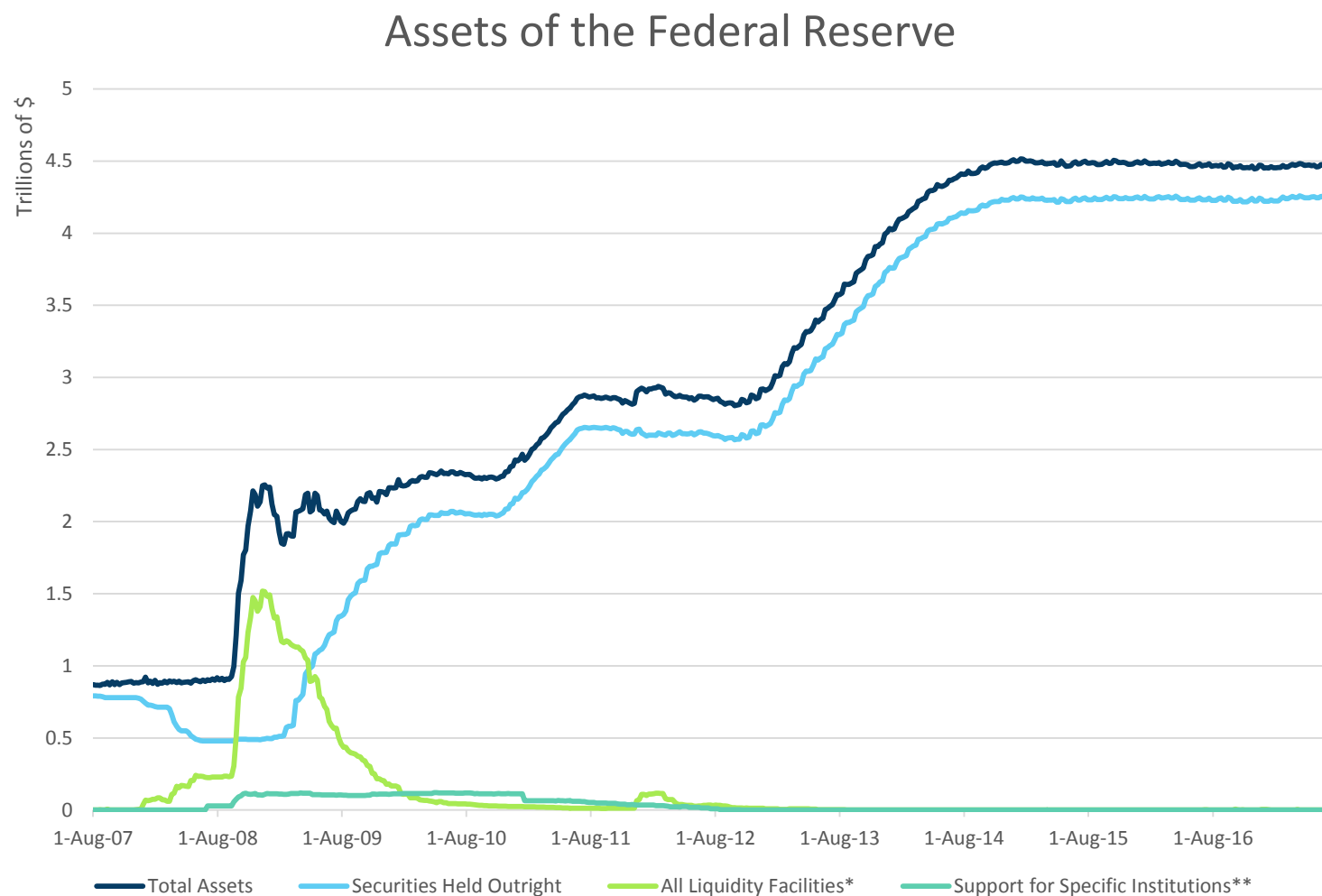
- Asset valuations suggest concerns about the possibility of price reversals in a number of asset classes
- The financial system appears, in broad terms, well-positioned to absorb such shocks

# Low Interest Rates and QE

# Low Treasury yields and monetary policy

- The low level of Treasury yields, and the role of such low yields in valuations, raises the importance of analyzing the factors contributing to low yields and their monetary/financial stability implications
- Low U.S. Treasury yields reflect a shallow expected path for short-term interest rates and low term premiums
- Low term premiums likely reflect a number of factors, including QE
- This is a global phenomenon at different stages in different economies

# QE and the Federal Reserve's balance sheet



Source: Federal Reserve Board

# Low Treasury yields, QE, and valuations

- QE has lowered Treasury yields, by about 100 basis points according to some estimates (Bonis, Ihrig, and Wei (2017))
- As a result, QE has boosted equity prices, lowered corporate bond yields and the exchange value of the dollar, and thereby spurred US growth (e.g., Kiley (2014) & Kiley (2016))
- While these effects are important and their unwinding will be felt should Federal Reserve asset holdings decline, they account for only a small portion of movements in US asset prices in recent years

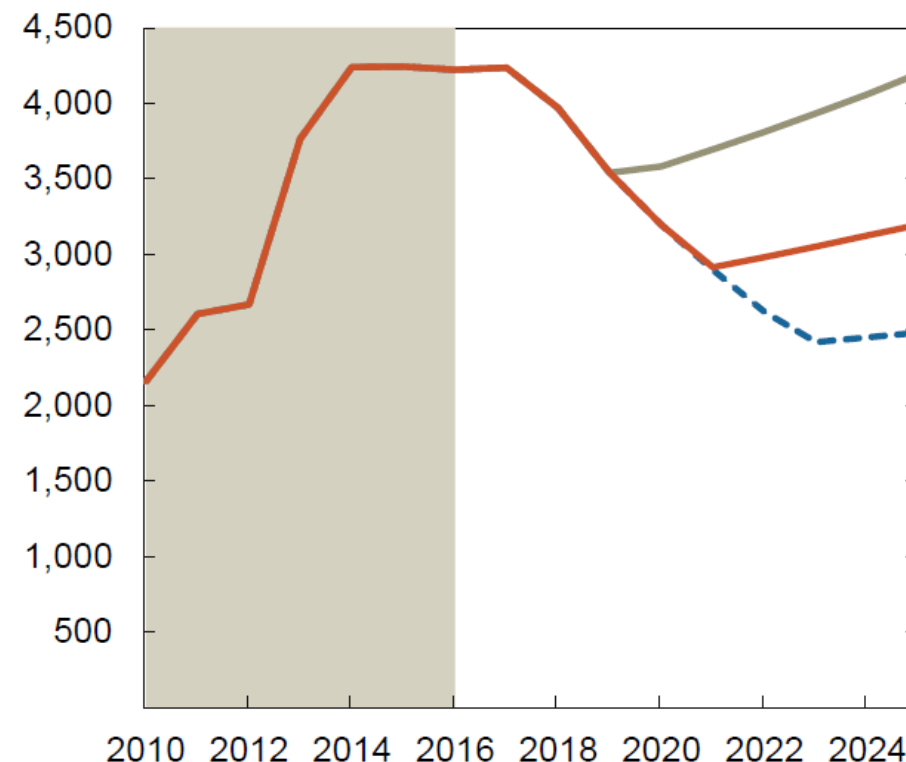
# Possible trajectory of the Fed's balance sheet

- Principles refined in June 2017
- Annual report of the System Open Market Account contains illustrative trajectories under a range of assumptions
- Alternatives reflect uncertainty regarding a number of factors, including demand for currency and reserves

Projected SOMA Domestic Securities Holdings:  
Alternative Liabilities Scenarios

--- Smaller liabilities      — Larger liabilities  
— Median

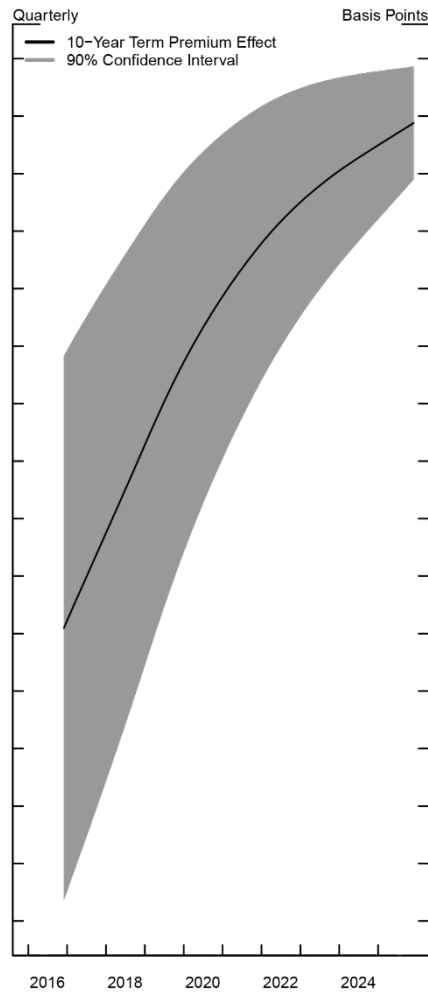
Billions of U.S. dollars



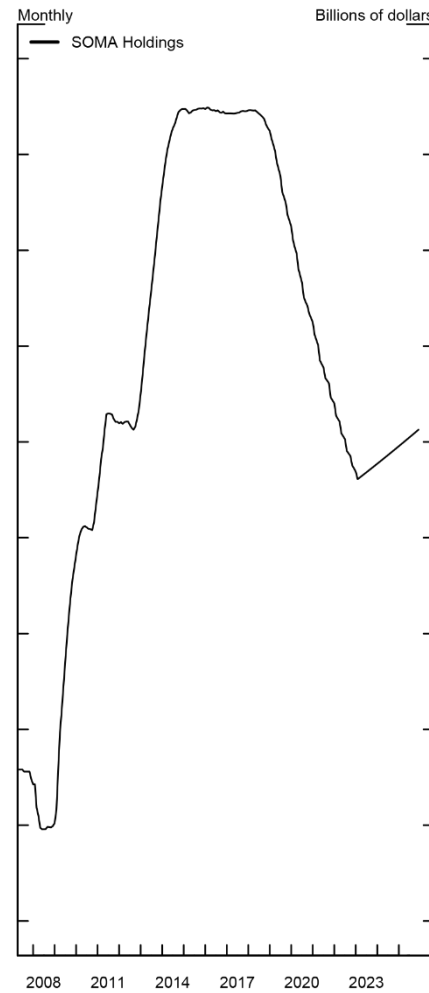
Source: Federal Reserve Bank of New York.

# Possible effects of balance sheet trajectory

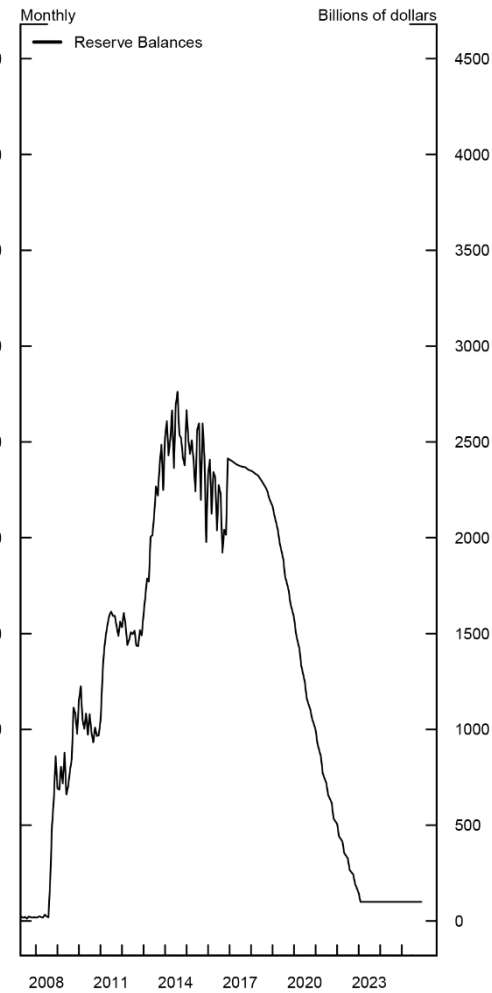
10-Year Term Premium Effect



SOMA Holdings



Reserve Balances



Source: Bonis, Ihrig, and Wei (2017)

# Risks



# Risks

- Unexpected turmoil in US
- Unexpected global spillovers
- The possibility of a return to the ELB if US activity deteriorates

# Global spillovers: QE and EME bond markets

- Unexpected global spillovers could arise in EME bond markets
- Historically, US investment in EME sovereign bonds increased when US interest rates are low (and vice versa)
- Such patterns predate QE, and Burger, Warnock, and Warnock (2017) do not find evidence for an independent effect of QE

# Low rates and a return to the ELB

- FOMC has communicated that it expects the federal funds rate to be the primary monetary policy tool
- What if low interest rates persist and ELB returns? According to analysis in Kiley and Roberts (2017), this risk is significant

Outcomes under balanced approach (Yellen, 2017) rule for alternative values of long-run nominal interest rate

	ELB frequency	Mean duration of ELB	Mean ( $\gamma$ )	mean( $\pi$ ) ( $\pi^*=2$ )	RMSD ( $\gamma$ )	RMSD ( $\pi$ )
DSGE Model						
6	0	NA	0	2.0	2.3	3
3	32.6	12.0	-2.3	0.1	7.3	6.1

# The balance sheet as a monetary policy tool I

- How effectively can QE ameliorate adverse effects of ELB?
- Kiley (2017) analyzes this issue in FRB/US model and finds QE can be effective if it
  - Responds quickly to a deterioration in economic activity
  - Responds in large size
  - Under such conditions, QE removes much of the effect of the ELB even if it is primarily used only when the ELB binds (e.g., is a secondary tool)

# The balance sheet as a monetary policy tool II

Economic performance under alternative QE approaches

	ELB frequency	Mean duration of ELB	mean(y)	mean( $\pi$ ) ( $\pi^*=2$ )	RMSD(y)	RMSD( $\pi$ )
Initiation of purchases (AP(t)) when $y(t) < -5$ at a rate of \$50 billion per quarter per unit of excess output gap						
6	5	4.4	0	2	2.3	1.6
3	29.7	9.1	-0.5	1.6	2.9	1.8
Initiation of purchases (AP(t)) when $y(t) < -2.5$ at a rate of \$50 billion per quarter per unit of excess output gap						
6	3.8	3.9	0.1	2.1	2.2	1.6
3	22.7	7.3	-0.1	1.9	2.5	1.6

Characteristics of the Distribution of Asset Holdings Under QE Approaches for 3 Percent Steady-State Nominal Interest Rate

	Median size	Mean size	75 <sup>th</sup> percentile	90 <sup>th</sup> percentile	95 <sup>th</sup> percentile	Percent $\Delta QE(t) > 0$ & $i(t) > 0.25$
Initiation of purchases (AP(t)) when $y(t) < -5$ at a rate of \$50 billion per quarter per unit of excess output gap						
	\$1 billion	\$332 billion	\$106 billion	\$948 billion	\$2.09 trillion	16.4
Initiation of purchases (AP(t)) when $y(t) < -2.5$ at a rate of \$50 billion per quarter per unit of excess output gap						
	\$133 billion	\$646 billion	\$655 billion	\$1.91 trillion	\$3.20 trillion	6.9

# Summary

# Wrap up

- Leverage and maturity transformation appear moderate, but valuation pressures appear elevated across a number of US markets
- Low interest rates likely contribute to valuations
- And low long-term Treasury yields owe in part to QE
- Given the improvement in the U.S. labor market and expectations for inflation, the FOMC has communicated that it may adjust the size of its balance sheet
- Such adjustments may gradually place upward pressure on U.S. interest rates. Risks include
  - Unforeseen domestic and international volatility
  - The possibility that a deterioration in the outlook returns the economy to the ELB

# References

- Aikman, David, Michael T. Kiley, Seung Jung Lee, Michael G. Palumbo, and Missaka N. Warusawitharana (2017). "Mapping Heat in the U.S. Financial System," *Journal of Banking & Finance*, vol. 81, pp. 36-64.
- Bonis, Brian, Jane Ihrig, and Min Wei (2017). "The Effect of the Federal Reserve's Securities Holdings on Longer-term Interest Rates," FEDS Notes. Washington: Board of Governors of the Federal Reserve System, April 20, 2017, <https://doi.org/10.17016/2380-7172.1977>.
- Burger, John D., Francis E. Warnock, and Veronica Cacadac Warnock "The Effects of U.S. Monetary Policy on Emerging Market Economies' Sovereign and Corporate Bond Markets." NBER Working Paper No. 23628
- Kiley, Michael T. Kiley (2014) "The Response of Equity Prices to Movements in Long-Term Interest Rates Associated with Monetary Policy Statements: Before and After the Zero Lower Bound," *Journal of Money, Credit and Banking*, vol. 46(5), pages 1057-1071.
- Kiley, Michael T. (2016) "Monetary policy statements, treasury yields, and private yields: Before and after the zero lower bound," *Finance Research Letters*, Elsevier, vol. 18(C), pages 285-290.
- Kiley, Michael T. (2017) "Quantitative Easing and the 'New Normal' for Monetary Policy", Working Paper.
- Kiley, Michael T. and John M. Roberts (2017) "Monetary policy in a low interest rate world." Paper prepared for the Brookings Papers on Economic Activity, Spring.