

Appendix 1: Materials used by Messrs. Giannoni, Gagnon, and Curdia

Class II FOMC – Restricted (FR)

Material for Briefing on

Review of Monetary Policy Framework

Marc Giannoni, Etienne Gagnon, and Vasco Cúrdia

Exhibits by Jay Faris, Stephanie Harrington, Patrick Molligo, and Charlotte Singer

July 30, 2019

Supporting memos and contributors listed on final page of packet.

Working definition of the “current framework”

Includes everything in the *Statement on Longer-run Goals and Monetary Policy Strategy*, plus:

- The use of tools that have already been deployed
 - Interest rate policy
 - Forward guidance (FG)
 - Balance sheet policies (BSP)
- “Bygones are Bygones” approach
 - For example, policy does not respond to the history of inflation

The “Consensus” Statement

Statement on Longer-run Goals and Monetary Policy Strategy

- Reiterates dual mandate goals
- Specifies an explicit numerical inflation objective
- Provides a numerical estimate related to maximum employment
- Emphasizes symmetry around the inflation objective
- Articulates “balanced approach”
- Acknowledges importance of balance of risks, including risks to the financial system

Absent from current statement

- Does not specify how framework operates in the vicinity of the ELB
- Does not consider whether anchored expectations are a necessary condition for price stability
- Does not endorse “make-up” policies (average inflation or “over-the-cycle” policies)

Key environmental features stressing the current framework

Lower (and uncertain) r^*

- Implies greater likelihood of hitting ELB

Persistently low inflation has lowered longer-run expectations

- Motivates an exploration of tools that return inflation more quickly to target, and avoid erosion of expectations

Changes in the process governing inflation

- Lower and uncertain natural rate of unemployment U^*
- Flatter and uncertain slope of Phillips curve
 - Harder to move inflation from below or above target
- Other factors leading to persistently lower inflation

Two types of potential alterations to policy

Within current framework

- Different use of existing tool set

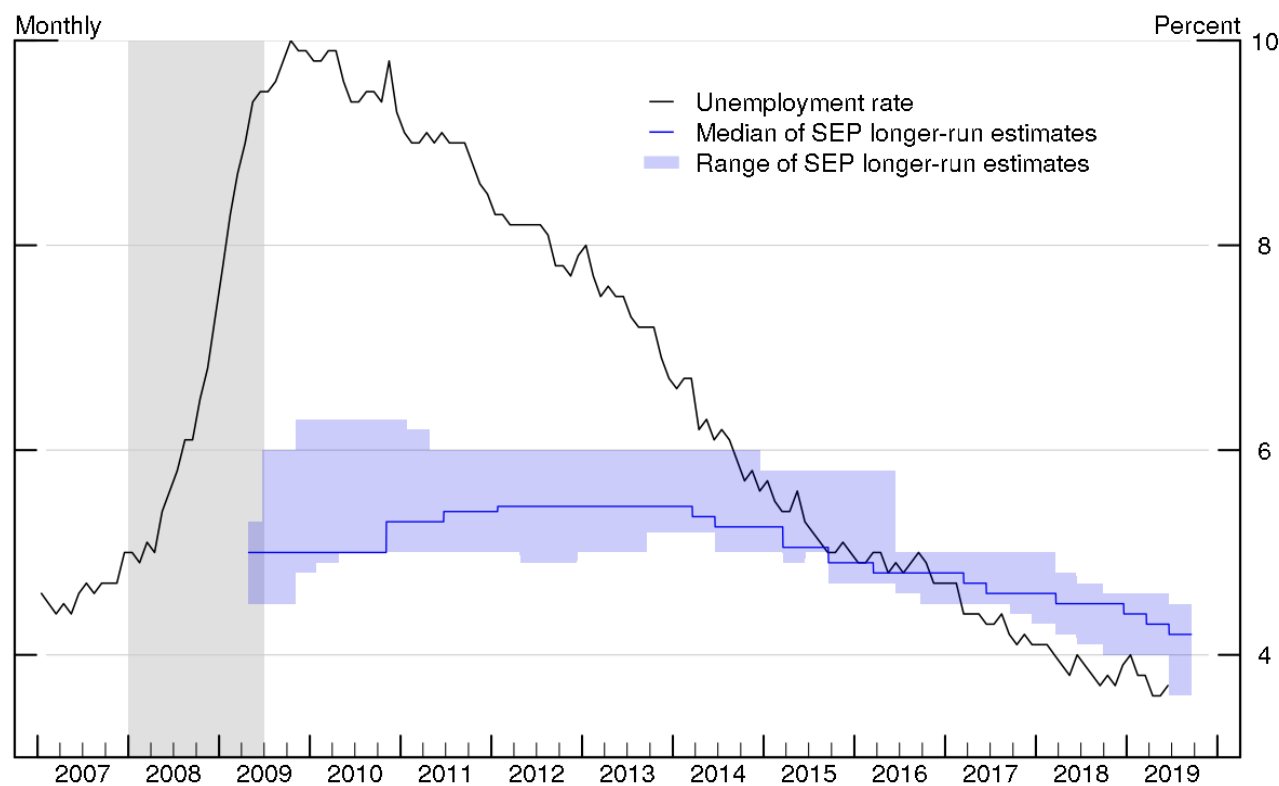
Outside current framework

- Strategies would take 2 percent inflation goal as given
- But allow policies that intentionally move goal variables away from their target values
 - For example, “make-up” policies that seek above-target inflation if historical inflation has been low
 - A number of variants to be discussed

Staff memo focal areas

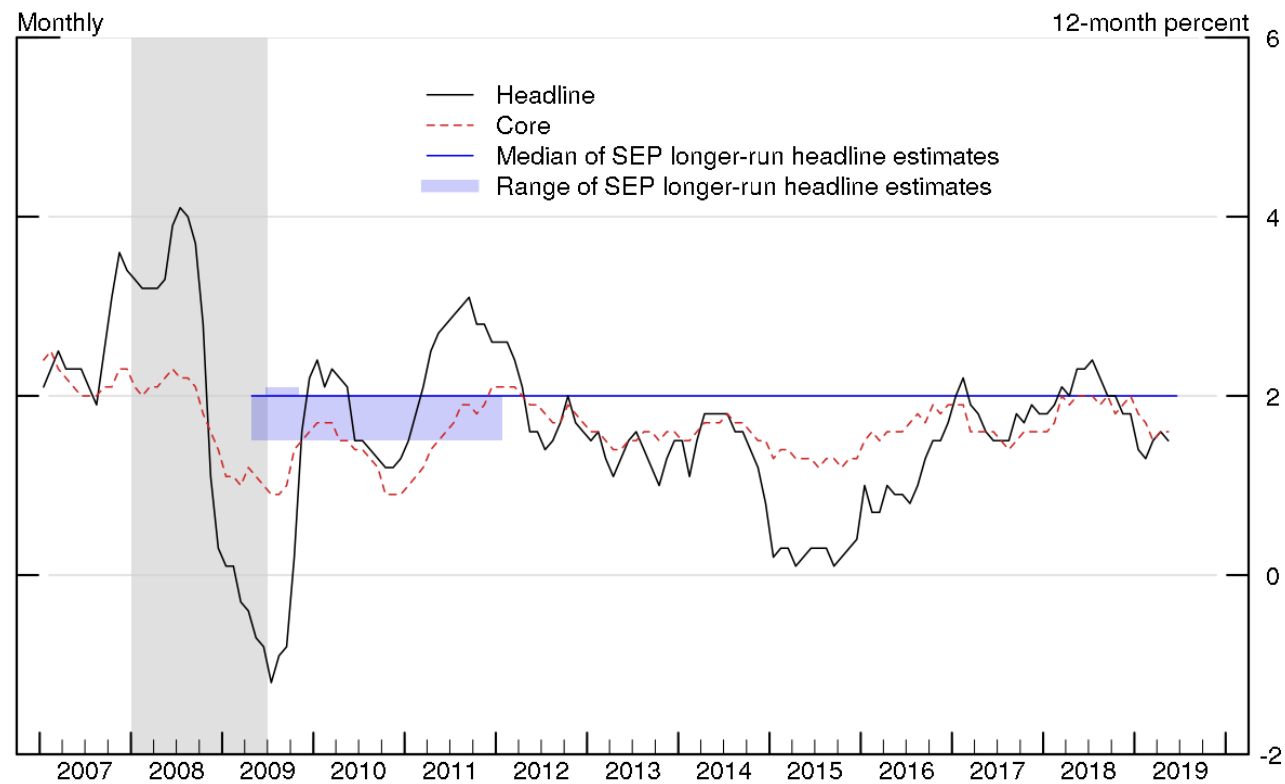
- Examine post-Great Recession period
 - Lessons about the efficacy of our tools and costs entailed in their use
 - Did the framework constrain the Committee in the use of its tools?
- Discuss structural challenges noted earlier
 - What policy challenges and risk trade-offs are posed by these structural changes?
- Looking forward, is the current framework likely to be effective in achieving dual mandate goals, especially given structural challenges, and given the likelihood of hitting the ELB ?
- How do widely-discussed alternative strategies work? How robust are they to alternative assumptions?
- Distributional consequences of monetary policy, augmentations to the use of interest rate, FG and BSP tools.

Unemployment Rate



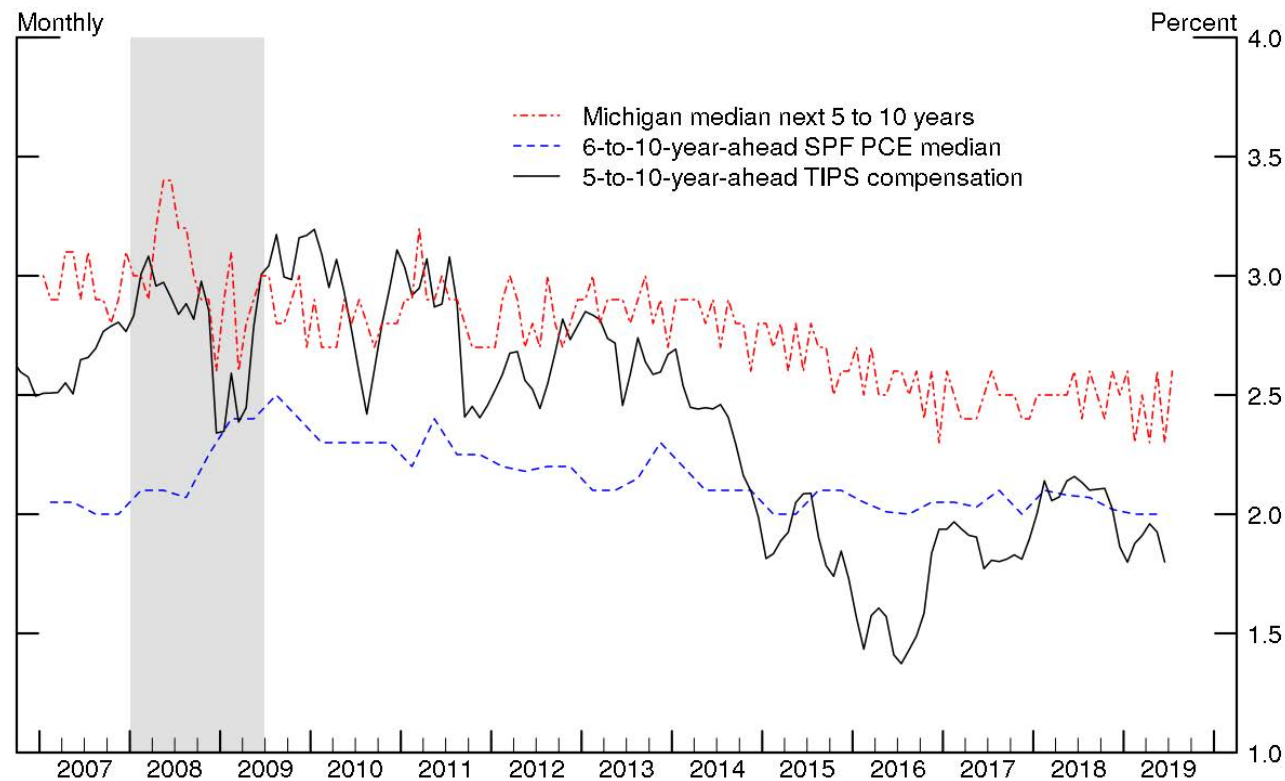
Sources: Federal Reserve Board; FRED, Federal Reserve Bank of St. Louis.

PCE Inflation



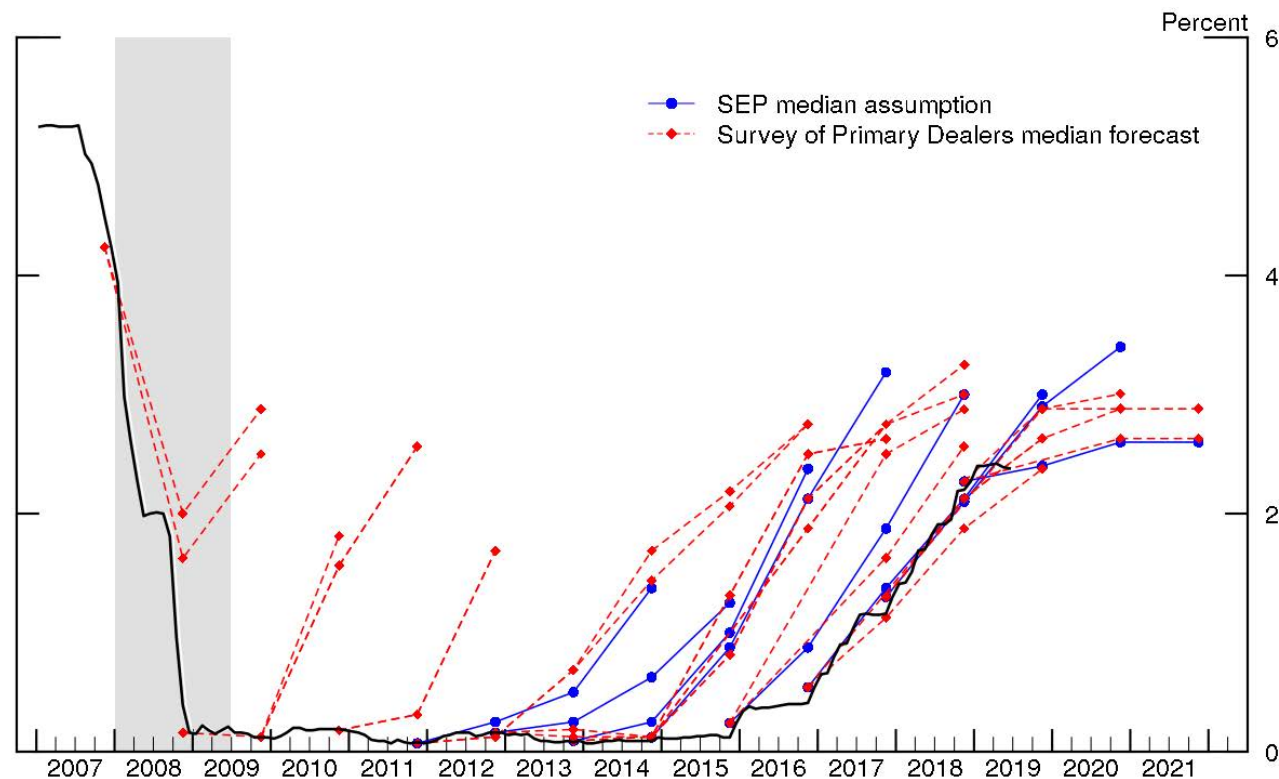
Sources: Federal Reserve Board; FRED, Federal Reserve Bank of St. Louis.

Longer-Term Inflation Expectations and Compensation



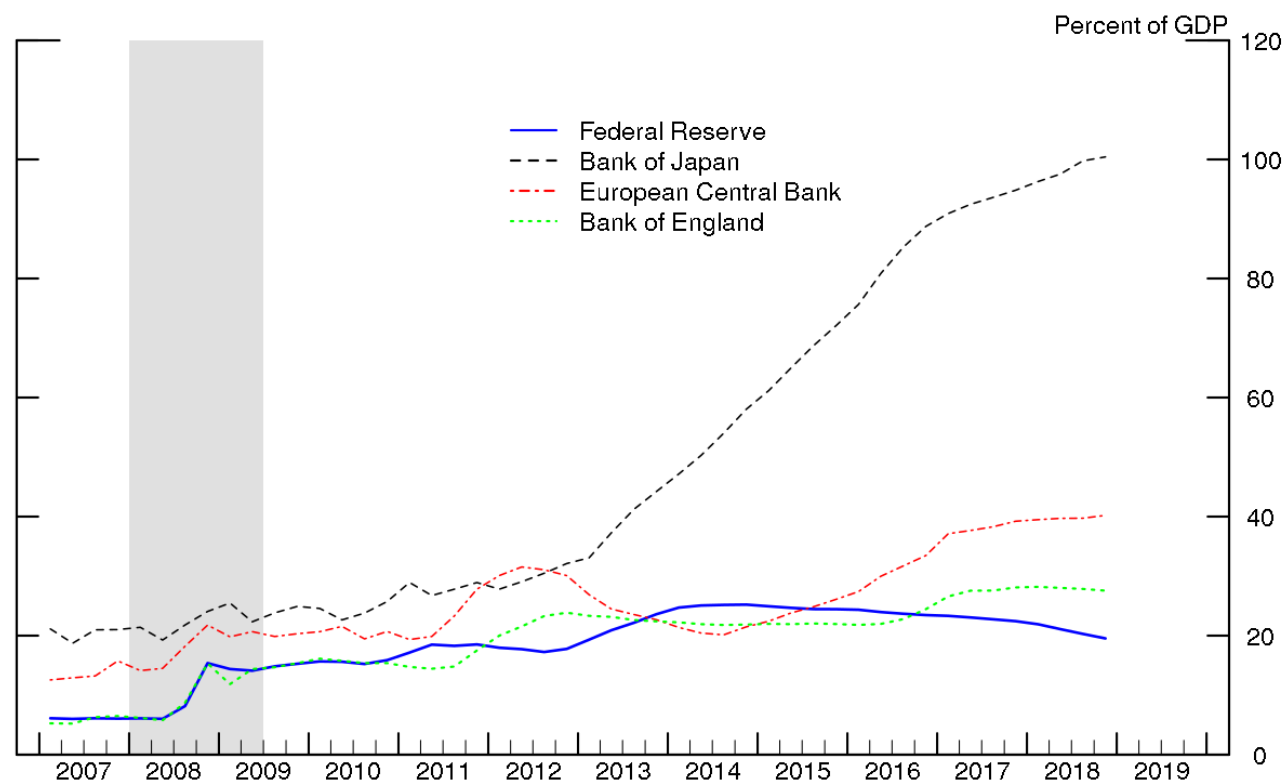
Sources: University of Michigan Survey of Consumers; Federal Reserve Bank of Philadelphia; Federal Reserve Board staff calculations.

Federal Funds Rate



Sources: Federal Reserve Board; Survey of Primary Dealers (SPD), Federal Reserve Bank of New York.
Notes: SEP medians correspond to projections made in the first quarter of each year. SPD medians correspond to survey closest to first-quarter SEP.

Central Bank Balance Sheets



Source: Haver Analytics.

Summary

We draw mixed conclusions about U.S. economic performance and monetary policy under the current framework.

- To some extent, outcomes since the crisis reflect the challenges of conducting monetary policy in a changing economy using untested tools, rather than shortcomings of the current framework.
- Policymakers could act more forcefully in the future even under the current framework.
- A key concern is that inflation has run modestly below 2 percent for many years, and some measures of longer-run inflation expectations are low.

An important unresolved issue is whether the Committee can, under the current framework, keep inflation expectations anchored at levels consistent with achievement of its symmetric inflation goal.

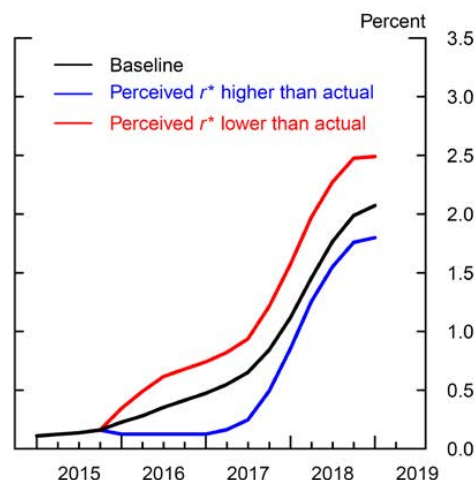
Structural Changes Pose Challenges for Monetary Policy

- Declining and uncertain natural rate of interest (r^*)
- Declining and uncertain natural rate of unemployment (u^*)
- Flatter Phillips curve
- Proximity to the effective lower bound (ELB)
- Concerns about the stability of longer-run inflation expectations

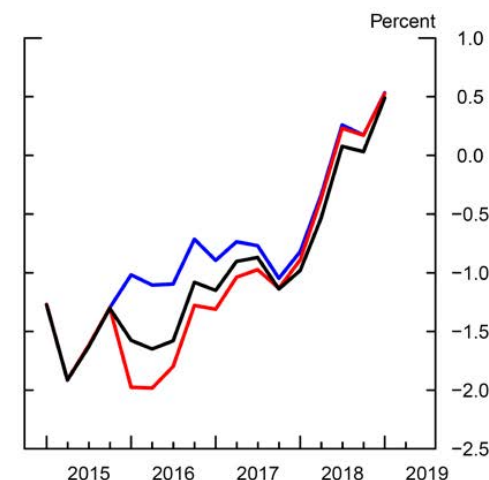
Misperceived r^* Entails Asymmetric Costs

- Uncertainty about r^* and proximity to ELB produce asymmetric risks, may prompt policymakers to err on the side of assuming a lower r^*
- r^* lower by 75 bp than historical path, starting in 2016
 - Private actors know it, the central bank doesn't
- Tighter monetary policy implied by overestimating r^* leads to worse economic outcomes, exacerbated by ELB
- Underestimating r^* eliminates persistent undershoot of inflation

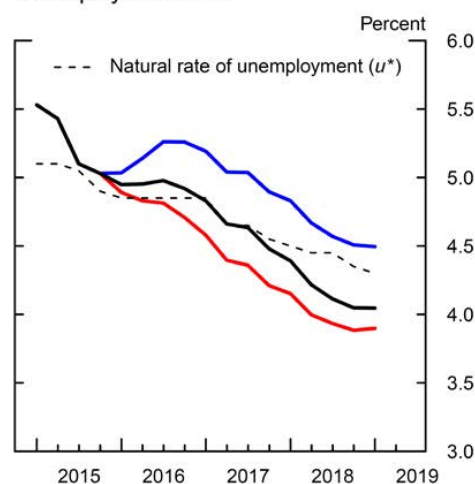
Nominal Federal Funds Rate



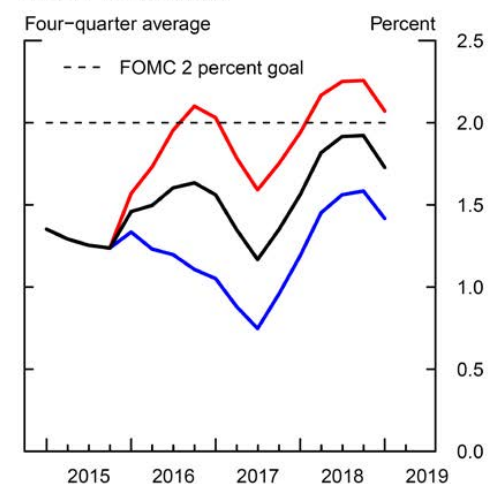
Real Federal Funds Rate



Unemployment Rate



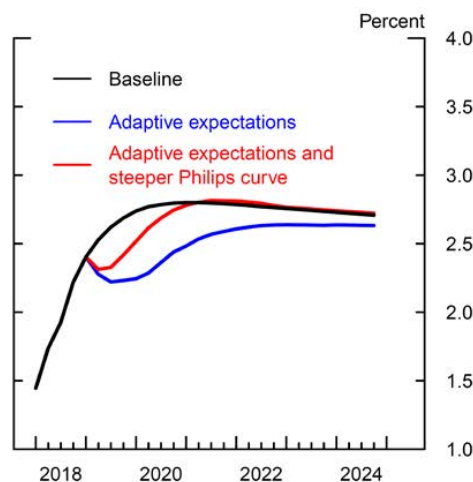
Core PCE Inflation



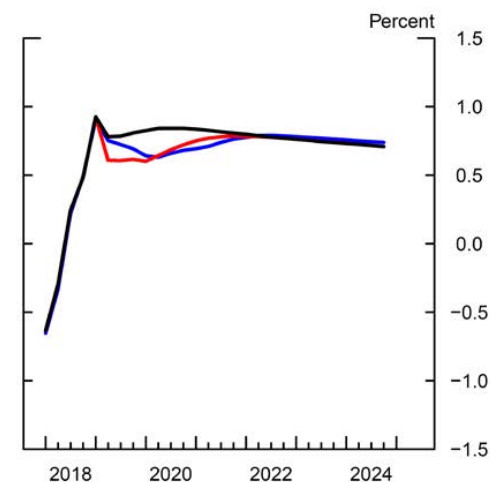
Sluggish Inflation Expectations Pose a Challenge

- Interaction between flatter Phillips curve and low inflation is a challenge, even worse if expectations adjust sluggishly to policy actions
- Simulate economy going forward under optimal control without further shocks
- Adaptive expectations: low inflation realizations feed into persistently low inflation expectations, requiring more accommodative policy
- Steeper Phillips curve requires less unemployment undershooting to stabilize inflation

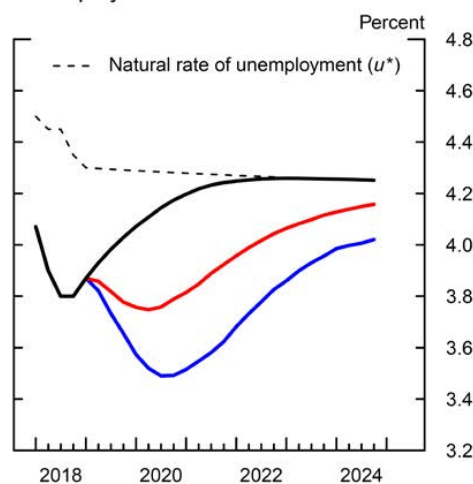
Nominal Federal Funds Rate



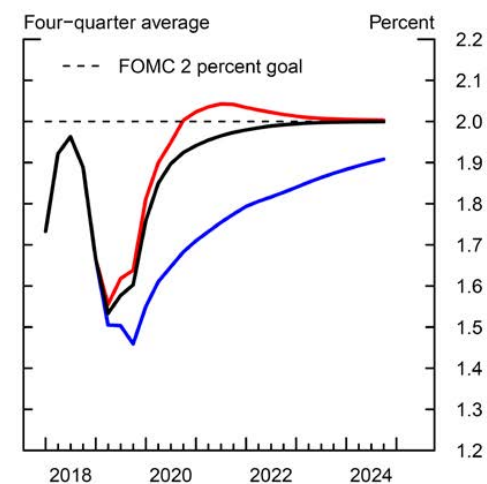
Real Federal Funds Rate



Unemployment Rate



Core PCE Inflation



Summary of Findings

- Uncertainty about r^* and proximity to the ELB produce asymmetric risks, which may prompt policymakers to err on the side of assuming a lower r^*
- The interaction between a flatter Phillips curve and low inflation poses a considerable challenge for policymakers
 - Challenge compounded if expectations adjust sluggishly to policy actions
- Uncertainty about u^* makes the determination of appropriate policy difficult
 - A flatter Phillips curve complicates inference about u^*
- ELB limits policy space in the event of a downturn
 - Given flatter Phillips Curve, a downturn may warrant prolonged period at the ELB
- Prolonged low rates could foster the buildup of financial vulnerabilities
 - Might warrant moderation in the use of low rates for a very long time
 - Limited understanding of linkages between low rates and financial stability

Scope for Improving the Consensus Statement?

- The Statement acknowledges some of the tradeoffs in the paragraph on the balanced approach in promoting the dual mandate when the two objectives are not complementary
- Considerations that became important in recent times are not fully reflected in the Statement
- Could recognize that policy tradeoffs may be affected by the proximity to the ELB
- Could mention risk management considerations in the vicinity of the ELB:
 - Asymmetric risks due to uncertainty regarding r^* and u^*
 - Financial stability risks that may arise during prolonged periods of low interest rates, which might otherwise be desirable

Class II FOMC – Restricted (FR)**Questions for Discussion of Framework Review at the July 2019 FOMC Meeting**

1. In what ways do you think that the current framework has helped the Committee achieve its objectives since the framework was adopted in 2012? In what ways (if any) do you believe that the framework may have constrained the Committee's ability to achieve its Dual Mandate goals over that same period?
2. In light of what the Committee has learned about the efficacy and costs of forward guidance and asset purchases over the past decade, how might you use these tools differently, within the current framework, to minimize the effect of the ELB on economic outcomes?
3. What scope, if any, do you see for enhancing the Statement on Longer-Run Goals and Monetary Policy Strategy to better reflect the challenges posed by the ELB and by uncertainty about U^* and r^* , the role of inflation expectations, risks to financial stability, and possible interactions among these?

Class II FOMC – Restricted (FR)**Supporting Memos and Contributors**

Altig, David, Jeff Fuhrer, Marc Giannoni, and Thomas Laubach (2019). “The Federal Reserve’s Review of Its Monetary Policy Framework: A Roadmap,” memorandum to the Federal Open Market Committee, Board of Governors of the Federal Reserve System, July 12.

Caldara, Dario, Etienne Gagnon, Enrique Martínez-García, and Christopher J. Neely (2019). “Monetary Policy and Economic Performance since the Financial Crisis,” memorandum to the Federal Open Market Committee, Board of Governors of the Federal Reserve System, July 12.

Ajello, Andrea, Isabel Cairó, Vasco Cúrdia, Thomas A. Lubik, and Albert Queralto (2019). “Monetary Policy Tradeoffs and the Federal Reserve’s Dual Mandate,” memorandum to the Federal Open Market Committee, Board of Governors of the Federal Reserve System, July 18.

Appendix 2: Materials used by Mr. Evans

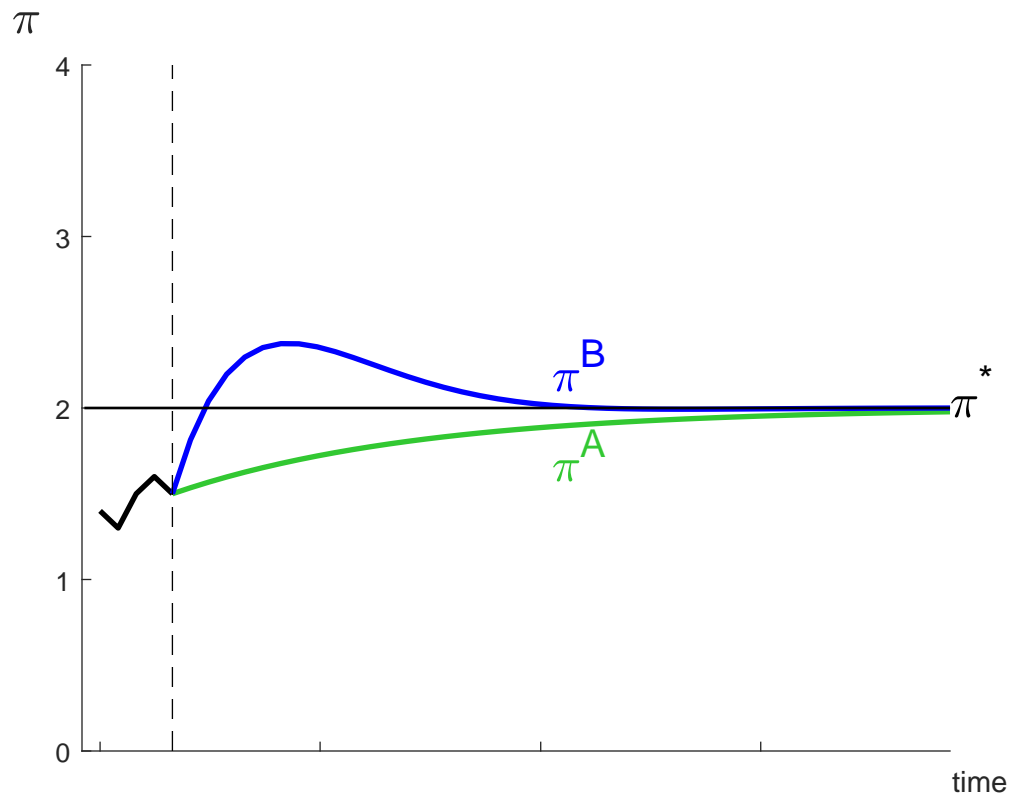
Class I FOMC - Restricted Controlled (FR)

Presentation Materials for

**President Evans' Comments on the Monetary Policy
Framework Review**

Charles L. Evans

July 30, 2019



Appendix 3: Materials used by Ms. Logan

Class II FOMC - Restricted (FR)

Material for Briefing on

**Financial Developments and
Open Market Operations**

Lorie Logan

Exhibits by Ashley Rhodes

July 30, 2019

Class II FOMC – Restricted (FR)

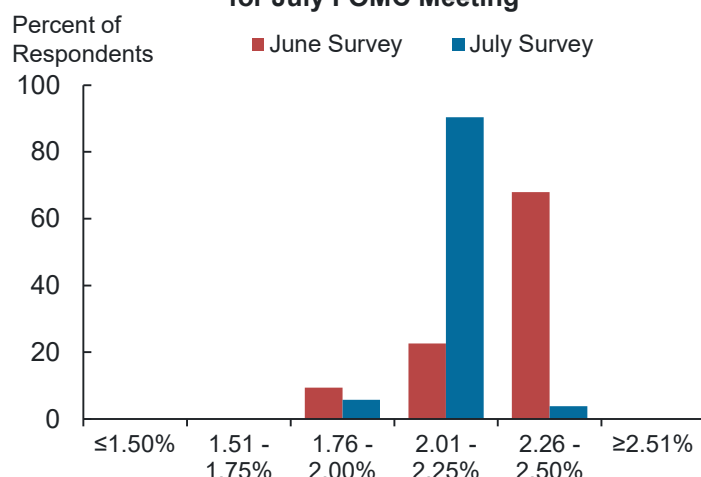
Exhibit 1

(1) S&P 500 Index and 2-Year Treasury Yield

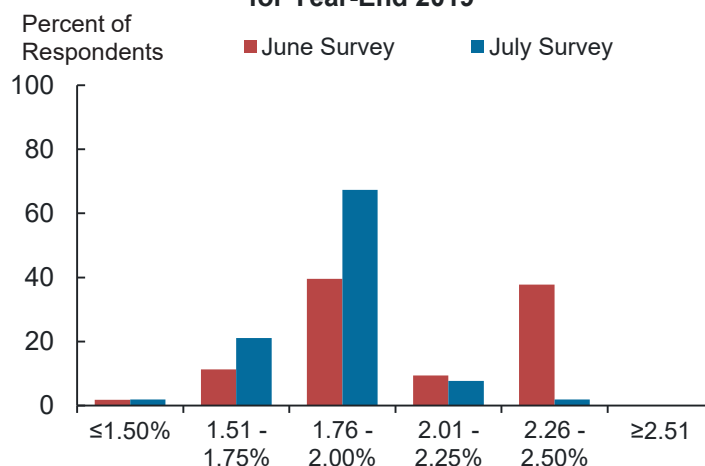
Note: Shaded area indicates July intermeeting period.
Source: Bloomberg

(2) Key Questions

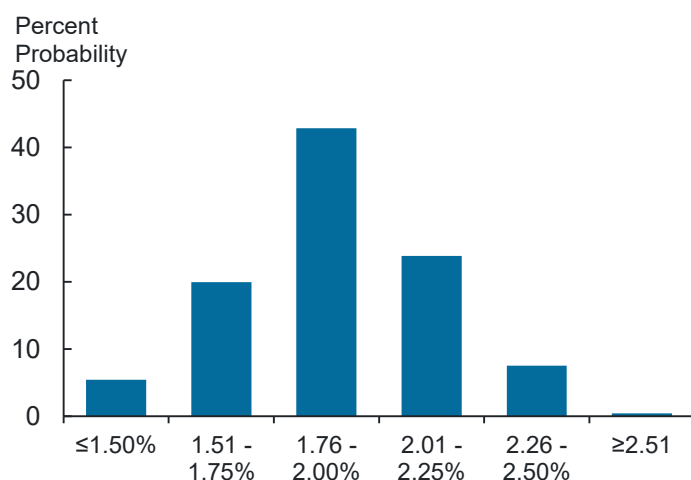
1. How have market participants' expectations for monetary policy evolved in the U.S. and abroad over the intermeeting period?
2. How have shifts in global policy expectations impacted financial conditions?
3. How have market participants' views of global risks changed?

(3) Distribution of Modal Target Rate Forecast for July FOMC Meeting

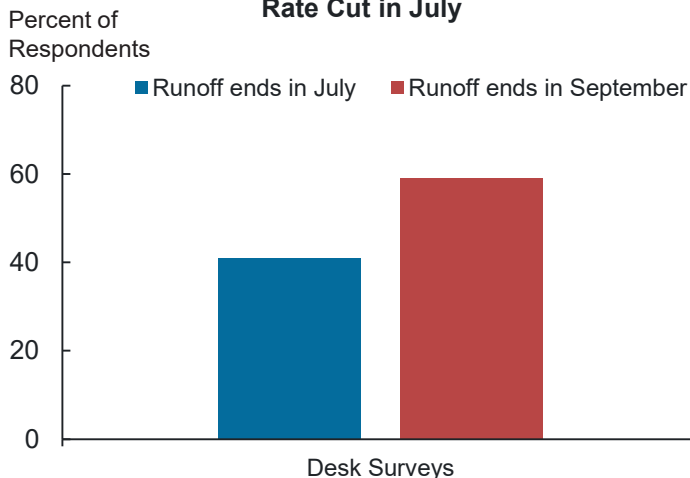
Note: Based on all responses to the Surveys of Primary Dealers and Market Participants.
Source: FRBNY

(4) Distribution of Modal Target Rate Forecast for Year-End 2019

Note: Based on all responses to the Surveys of Primary Dealers and Market Participants.
Source: FRBNY

(5) Year-End 2019 Target Fed Funds Rate PDF

Note: Based on all responses to the July Surveys of Primary Dealers and Market Participants.
Source: FRBNY

(6) Balance Sheet Runoff Expectations, Conditional on a Rate Cut in July

Note: Based on responses to qualitative balance sheet question in the July Surveys of Primary Dealers and Market Participants.
Source: FRBNY

(7) Survey Respondents' Expectations for July FOMC Statement and Press Conference

Statement

- Most expect reference to uncertainties about the outlook to remain in statement
- Many expect “closely monitor” and “act as appropriate” language to remain

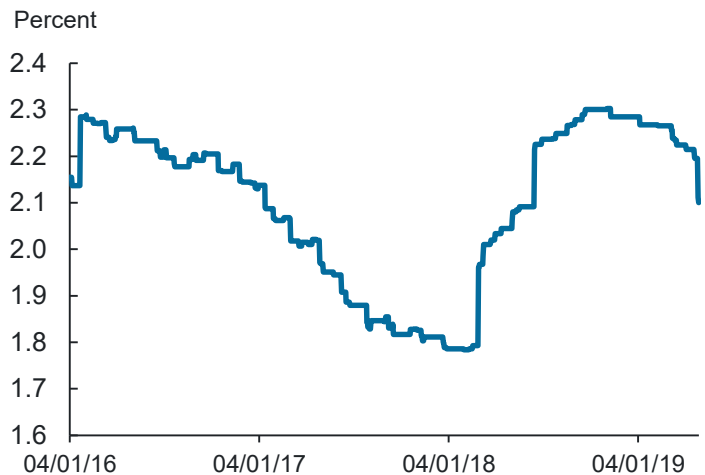
Press Conference

- Some expect rate cut to be described as “precautionary” in light of growth and inflation risks

Note: Based on all responses to the July Surveys of Primary Dealers and Market Participants.

Source: FRBNY

(8) Foreign Central Bank Policy Rate



Note: Includes a mix of 21 DM and EM countries, excluding China. Weighted by GDP.

Source: Bloomberg, World Bank

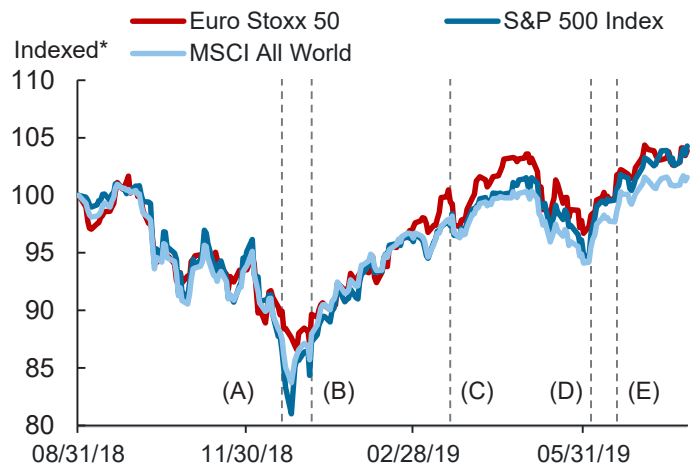
(9) Market-Based Measures of Forward U.S. and Euro Area Inflation Compensation



Note: U.S. measure is derived from TIPS-implied breakevens, euro area derived from inflation swap rates.

Source: Bloomberg, Federal Reserve Board of Governors

(10) Global Equity Indices

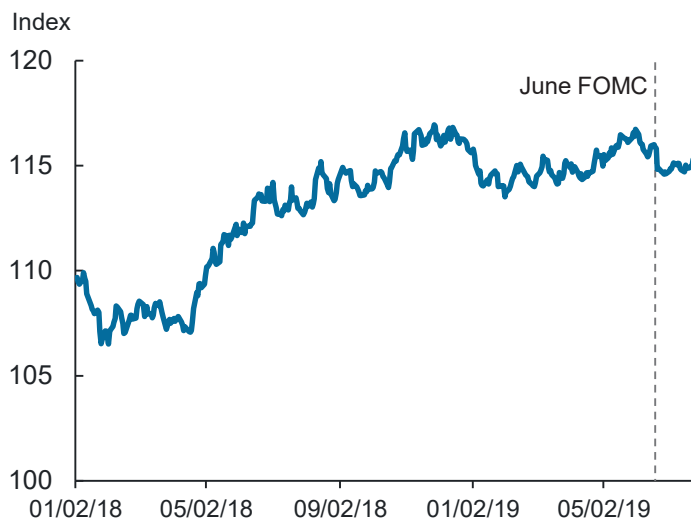


(A) Dec. FOMC (B) Chair Powell's "patient" remarks (C) Mar. FOMC (D) Chair Powell Chicago remarks (E) Jun. FOMC/Pres. Draghi Sintra speech

*Indexed to 08/31/2018.

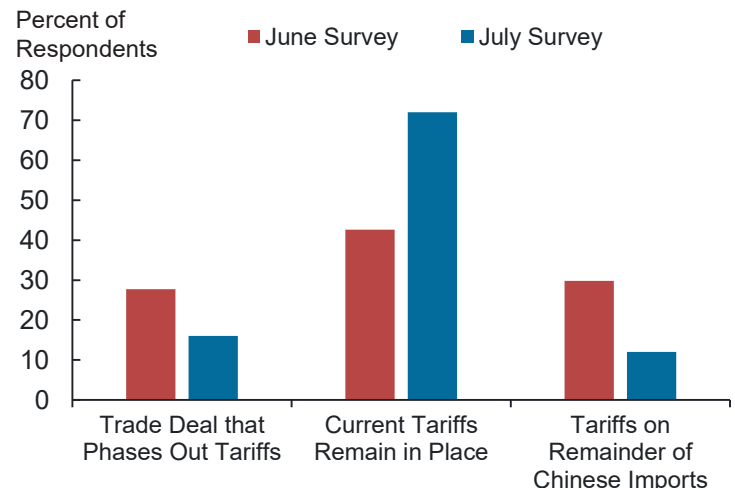
Source: Bloomberg

(11) U.S. Trade-Weighted Broad Dollar Index



Source: Bloomberg, Federal Reserve Board of Governors

(12) Expectations for U.S.-China Trade Policy

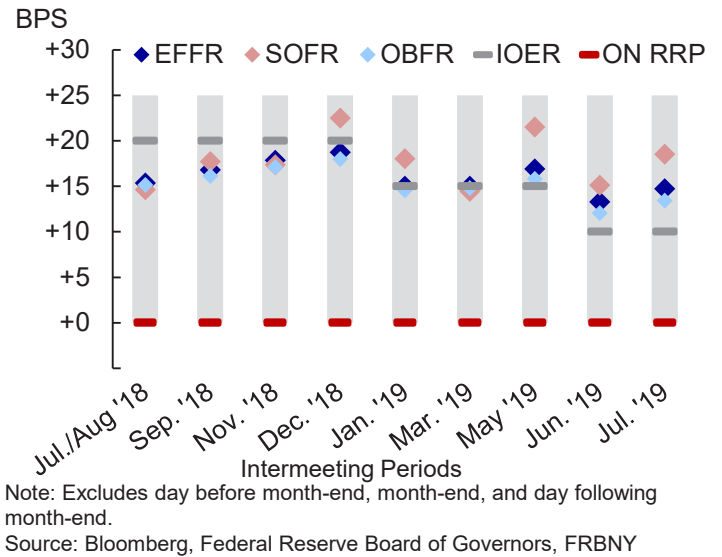
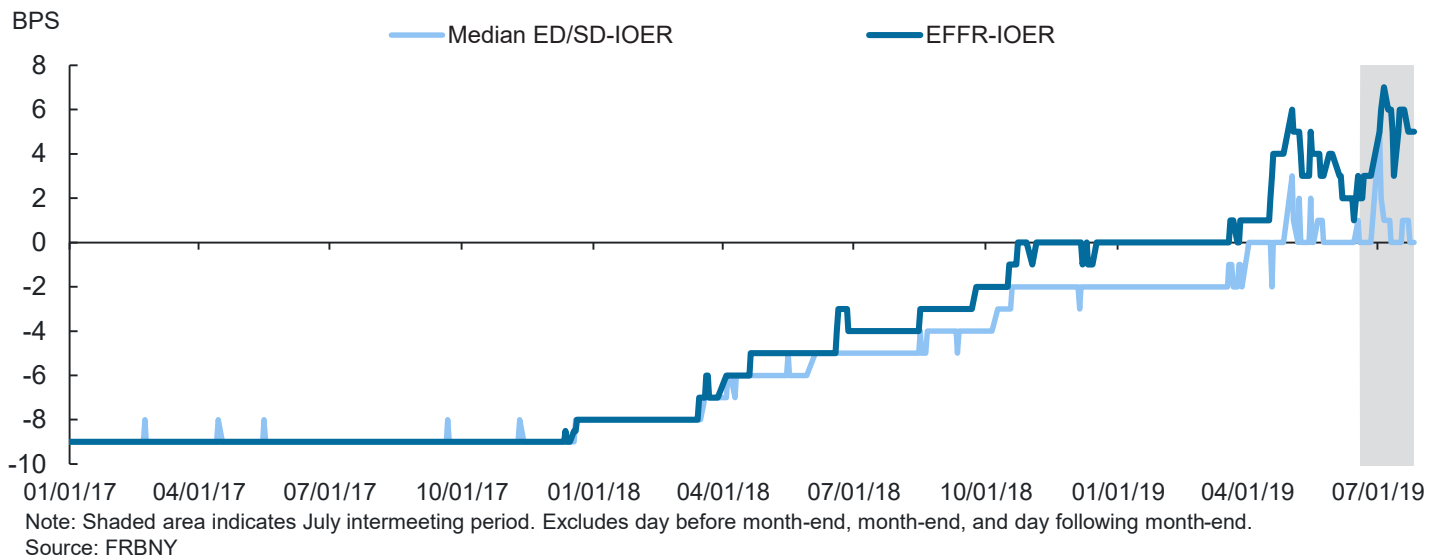
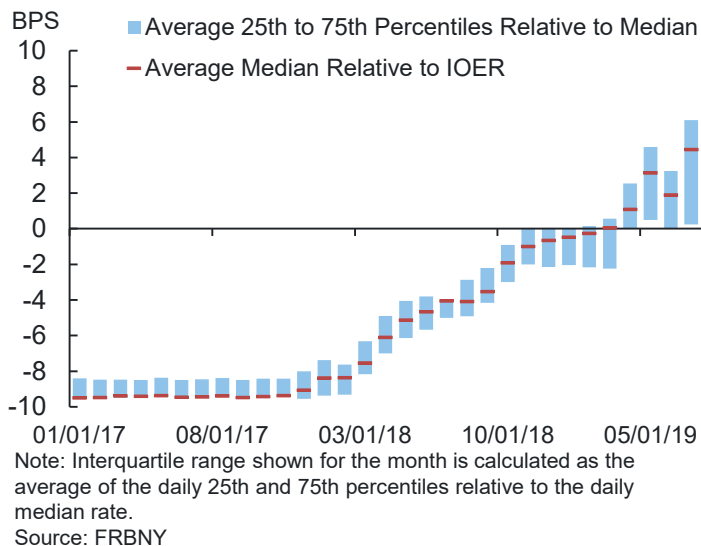
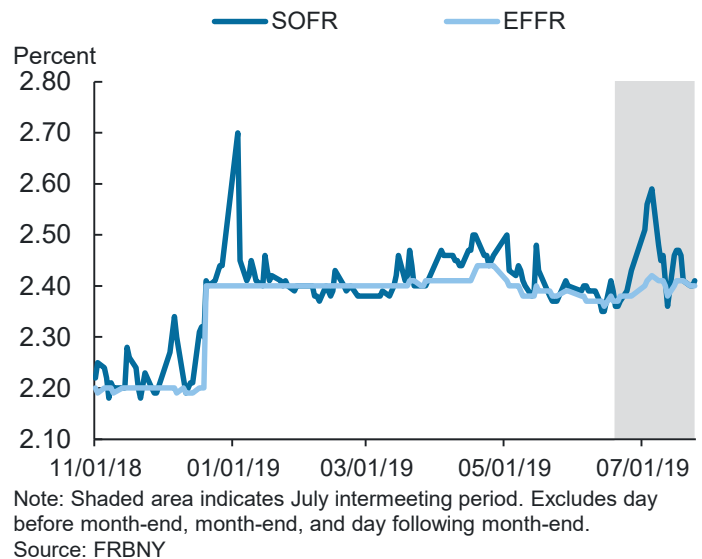


Note: Based on all responses to the Surveys of Primary Dealers and Market Participants.

Source: FRBNY

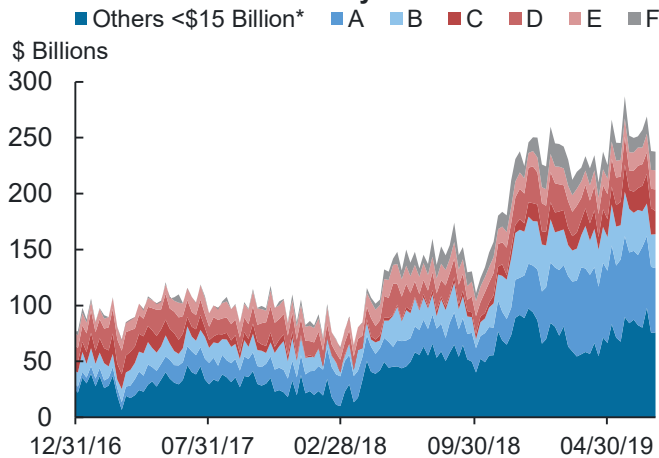
(13) Money Market Overview

- Money market rates were somewhat higher and exhibited more variability over the intermeeting period
- Pass-through from repo rates contributed to this pressure, as banks competed for funding from lenders with repo alternatives
- Ongoing rise in money market rates occurring in the context of longer run trend toward lower reserves

(14) Overnight Rates**(15) Effective Fed Funds Rate and Median Eurodollar/Selected Deposit Rate to IOER****(16) Intraday Dispersion of Fed Funds and Eurodollar Trades Relative to Median****(17) SOFR and EFRF Rates**

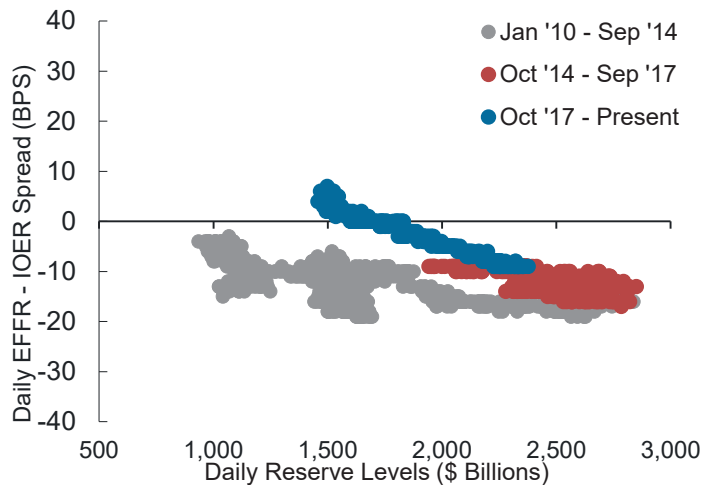
Class II FOMC – Restricted (FR)

Exhibit 4

(18) Net Primary Dealer Inventories of Treasury Securities by Institution

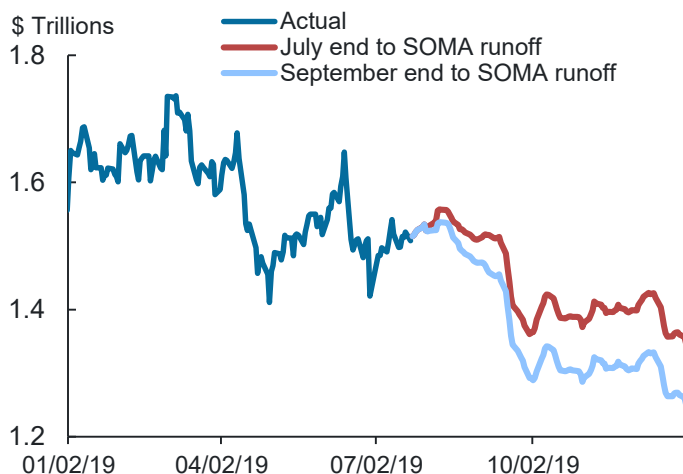
*Includes all primary dealers with less than \$15 billion in Treasury inventories.

Source: FRBNY

(20) Daily Reserve Levels vs Daily EFR-IOER Spread

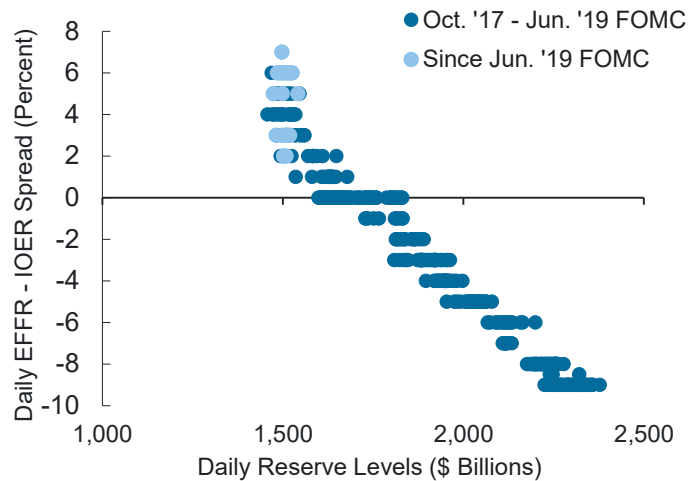
Note: Excludes day before month-end, month-end, and day following month-end.

Source: FRBNY

(22) Actual and Projected Reserve Balances

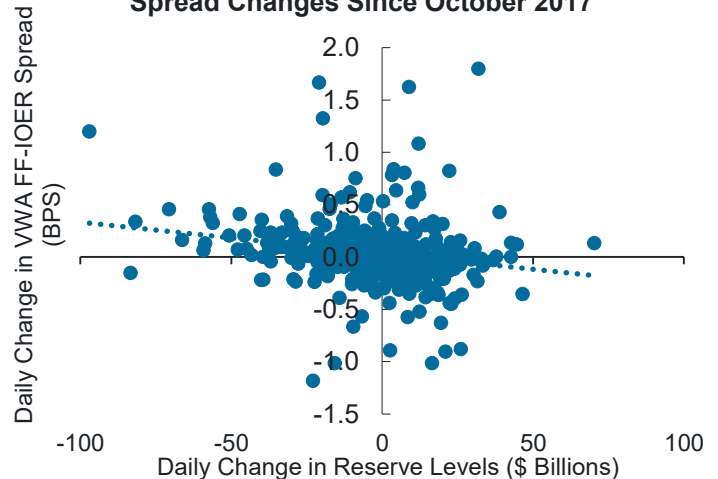
Note: Projections are 5-day moving averages. Projections assume early-August debt ceiling resolution.

Source: Desk Calculations, FRBNY

(19) Daily Reserve Levels vs Daily EFR-IOER Spreads

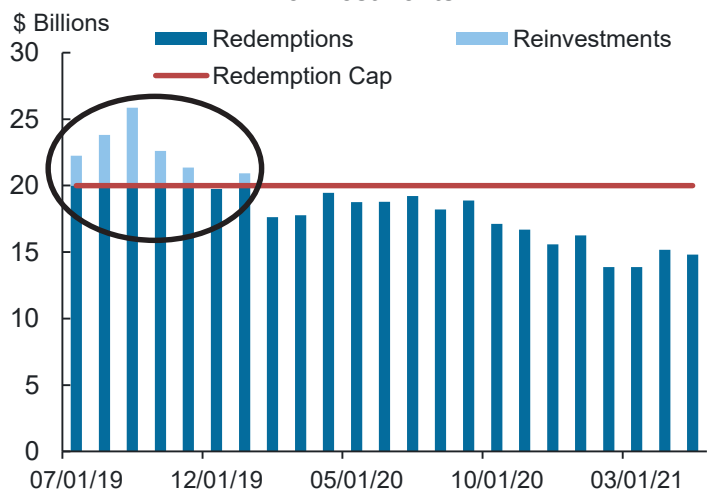
Note: Excludes day before month-end, month-end, and day following month-end.

Source: FRBNY

(21) Daily Reserve Changes vs Daily VWA FF-IOER Spread Changes Since October 2017

Note: Excludes day before month-end, month-end, and day following month-end.

Source: FRBNY

(23) Projected SOMA MBS Redemptions and Reinvestments

Note: Based on market-implied rates.

Source: FRBNY

Appendix 1**(1) Summary of Operational Testing***Summary of Operational Tests in prior period:*

- Domestic Authorization
 - June 25 and 27: MBS specified pool sale for \$143 million, total
 - July 9: Treasury bill maturity of \$2.7 million
 - July 25: Outright FRN purchase for \$50 million

Upcoming Operational Tests:

- One test scheduled under the Domestic Authorization
 - August 6: Treasury bill maturity of \$2.3 million
- Two tests scheduled under the Foreign Authorization
 - August 7: Euro-denominated sovereign debt sale to private counterparties for €1 million
 - TBD: Euro-denominated repo with private counterparties for €1 million*

*This operation was originally scheduled for July 9th. The operation was delayed due to counterparty issues resulting from prolonged inactivity in our account. The Desk intends to conduct this small value operation shortly after the counterparty resolves these issues.

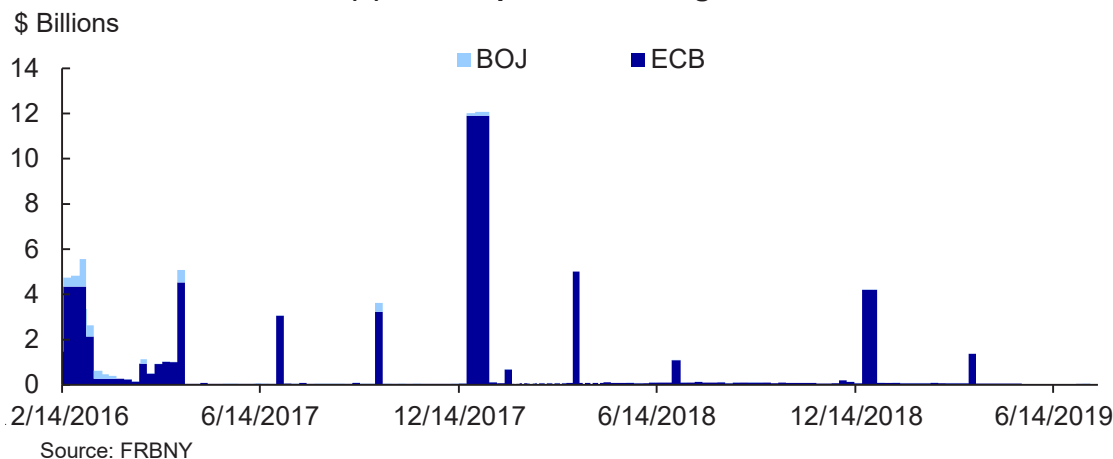
Appendix 2

(1) MBS Purchase Summary Since Cap Implementation Through 07/26/19 (\$ Millions)

Purchase Period	Actual Paydowns	Cap	Reinvestment Purchases	Net Deviation	Cumulative Deviation
17-Oct	24,353	4,000	20,355	2	2
17-Nov *	28,316	4,000	24,327	11	13
17-Dec	24,032	4,000	20,038	6	19
18-Jan	22,909	8,000	14,921	12	31
18-Feb	20,689	8,000	12,684	-5	26
18-Mar	19,294	8,000	11,308	14	40
18-Apr	21,233	12,000	9,234	1	41
18-May	20,793	12,000	8,807	14	55
18-Jun *	24,526	12,000	12,534	8	63
18-Jul	22,729	16,000	6,725	-4	59
18-Aug	21,602	16,000	5,607	5	64
18-Sep	21,759	16,000	5,755	-4	60
18-Oct	17,878	20,000	0	0	60
18-Nov	18,462	20,000	0	0	60
18-Dec	16,424	20,000	0	0	60
19-Jan	15,602	20,000	0	0	60
19-Feb	14,492	20,000	0	0	60
19-Mar *	15,234	20,000	0	0	60
19-Apr	17,636	20,000	0	0	60
19-May	20,221	20,000	221	0	60
19-Jun	22,962	20,000	2,964	2	62
19-Jul	est. 22,260	20,000	-	-	-

*Actual paydowns include agency debt maturities. Nov-17: \$2,366 million; Jun-18: \$1,982 million; Mar-19 \$62 million.

(2) FX Swaps Outstanding



(3) FX Intervention

- There were no intervention operations in foreign currencies for the System's account during the intermeeting period.

Appendix 4: Materials used by Mr. Lebow

Class II FOMC - Restricted (FR)

Material for Briefing on
The U.S. Outlook

David E. Lebow
Exhibits by Rosemary Rhodes and Ashley Sexton
July 30, 2019

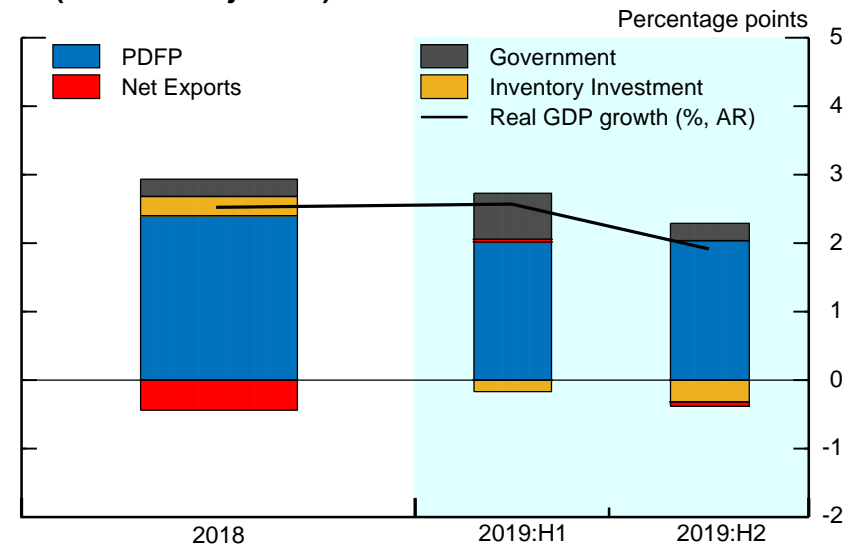
Real Activity

1. Real GDP

	2018	2019		
	Q4/Q4	Q1	Q2	H2
1. Current projection	2.5	3.1	2.1	1.9
2. July Tealbook	3.0	3.1	2.5	1.7
3. June Tealbook	3.0	3.0	1.8	1.7

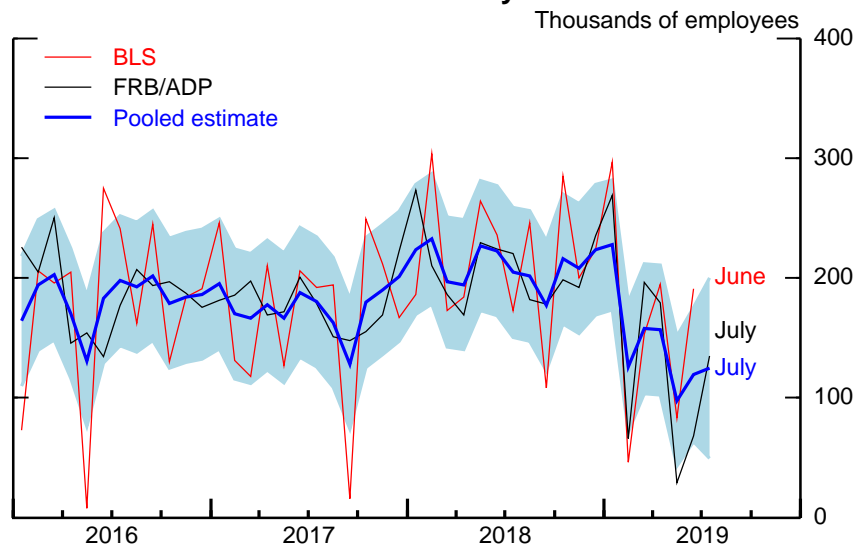
Note: Percent change at annual rate for period shown.

2. Contributions to Real GDP Growth (Current Projection)



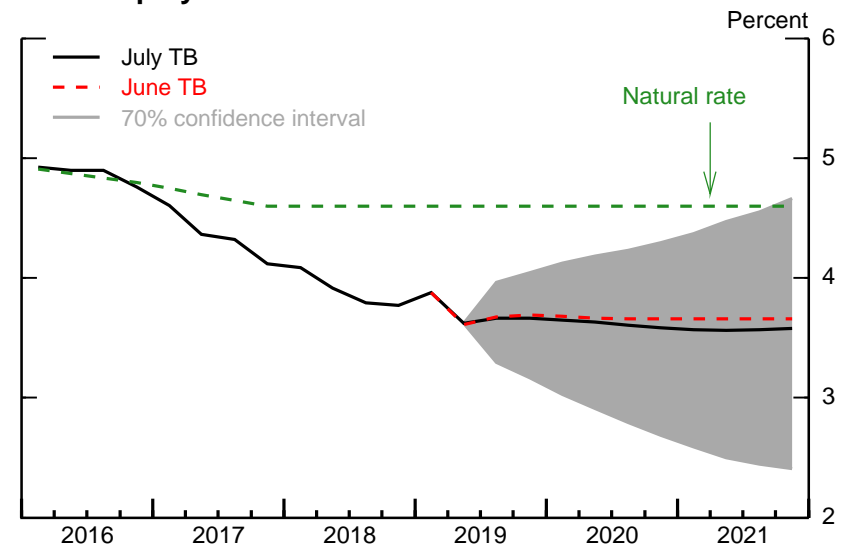
Note: Contributions to annualized percent change in real GDP over period shown. Shaded region indicates forecast period.

3. Estimates of Private Nonfarm Payroll Gains



Note: July FRB/ADP value includes data through 7/20; July pooled estimate treats July BLS observation as missing. Shaded region denotes 90 percent confidence interval for pooled estimate.

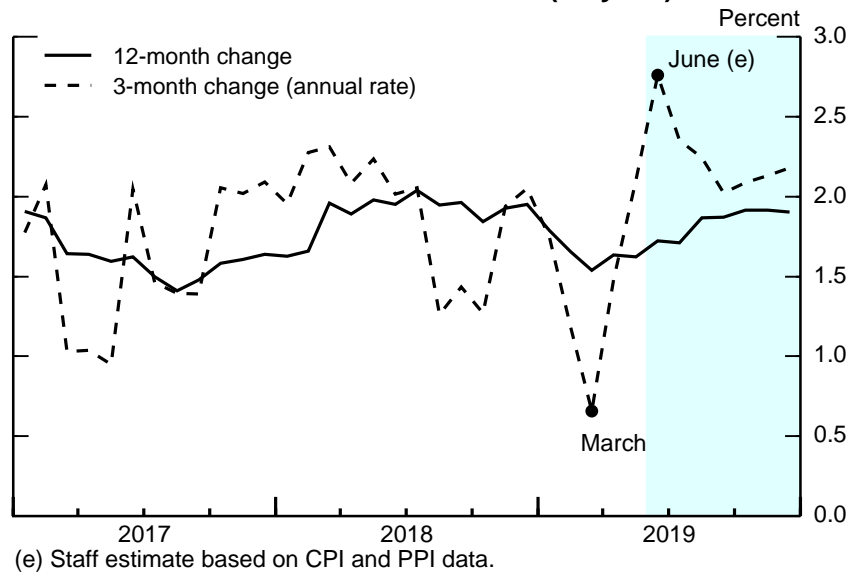
4. Unemployment Rate



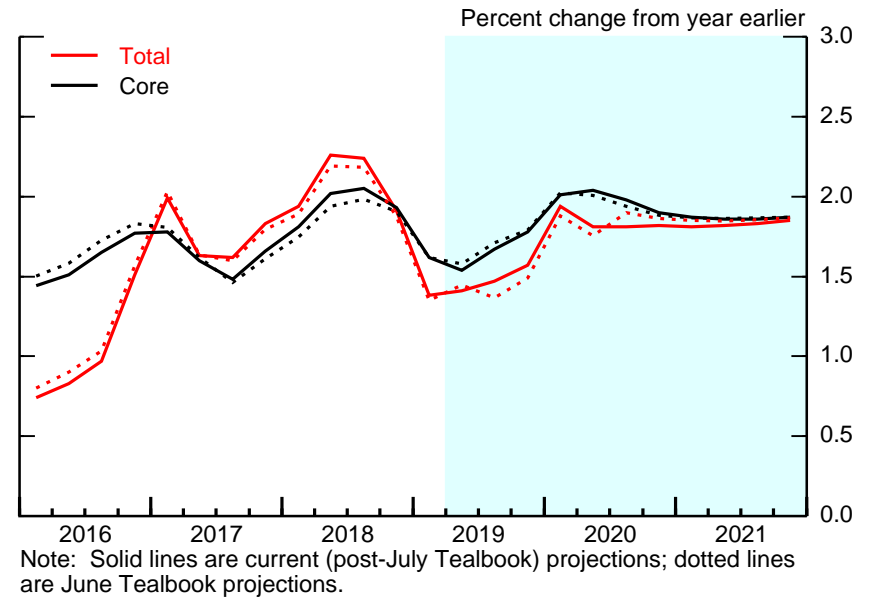
Note: Confidence interval based on FRB/US stochastic simulation.

Inflation

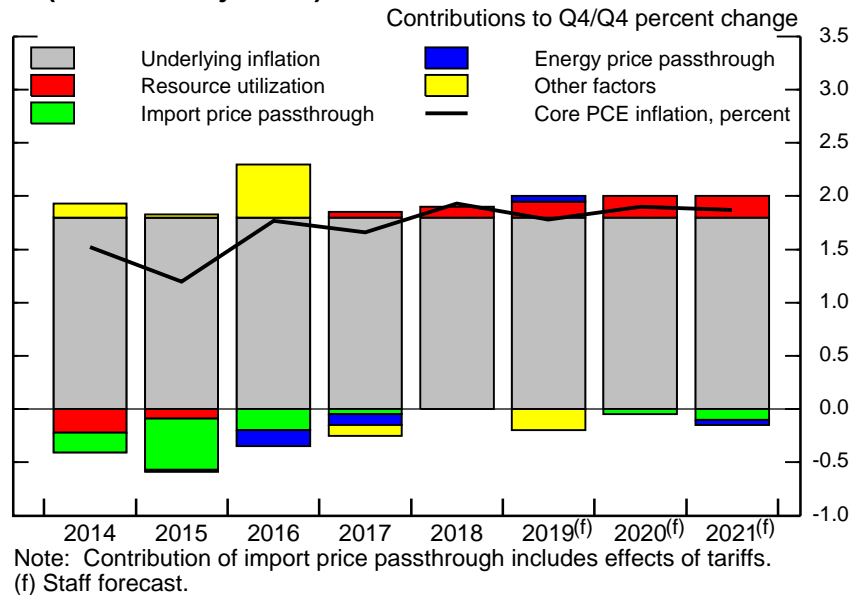
5. Near-Term Core PCE Price Inflation (July TB)



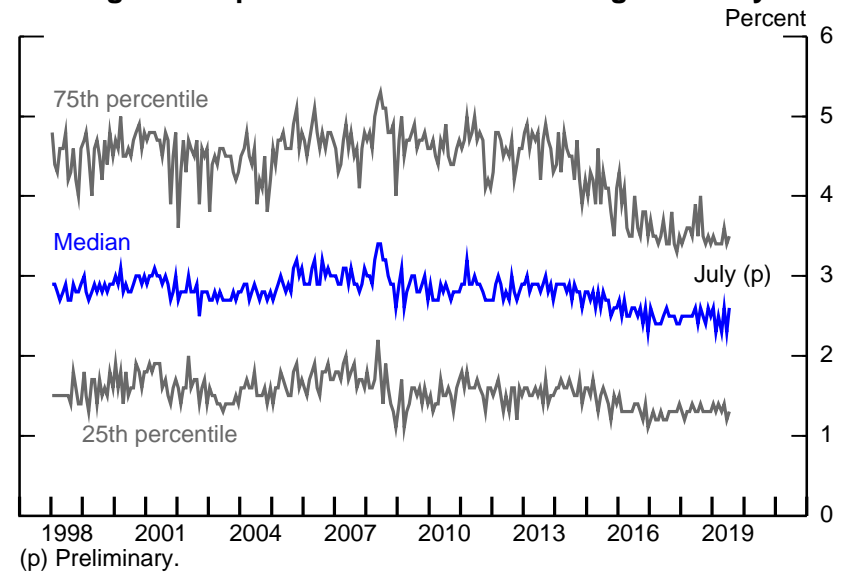
6. Medium-Term PCE Price Inflation



7. Decomposition of Core PCE Price Inflation (Current Projection)



8. Long-Run Expected Inflation from Michigan Survey



Appendix 5: Materials used by Mr. Lebow

Class II FOMC – Restricted (FR)

Material for

PCE Price Index Update

David E. Lebow
July 30, 2019

Class II FOMC—Restricted (FR)

Recent Changes in PCE Price Indexes
(Percent changes)

	Monthly changes			12-month change,
	April	May	June	June 2019
Total	0.3	0.1	0.1	1.4
<i>July TB</i>	<i>0.3</i>	<i>0.2</i>	<i>0.1</i>	<i>1.5</i>
Core	0.2	0.2	0.2	1.6
<i>July TB</i>	<i>0.3</i>	<i>0.2</i>	<i>0.2</i>	<i>1.7</i>
Mkt.-based core	0.2	0.1	0.2	1.6
<i>July TB</i>	<i>0.2</i>	<i>0.1</i>	<i>0.2</i>	<i>1.6</i>

Note: June 2019 PCE price index data released at 8:30 a.m. on July 30, 2019.

Appendix 6: Materials used by Mr. Ahmed

Class II FOMC - Restricted (FR)

Material for Briefing on

The International Outlook

Shaghil Ahmed

Exhibits by Theresa Dinh

July 30, 2019

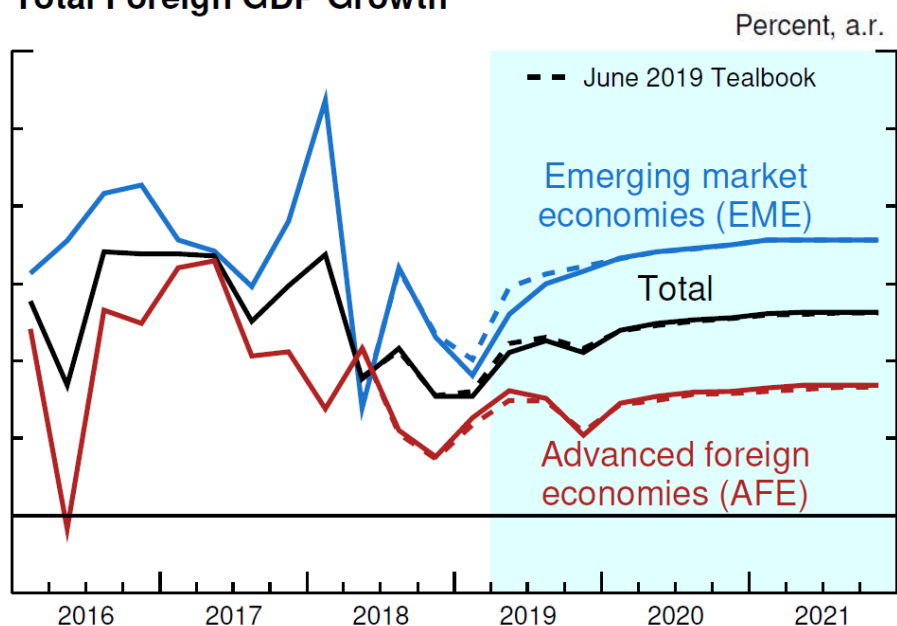
CLASS II FOMC-RESTRICTED (FR)

Outlook: Cloudy skies, possible thunderstorms



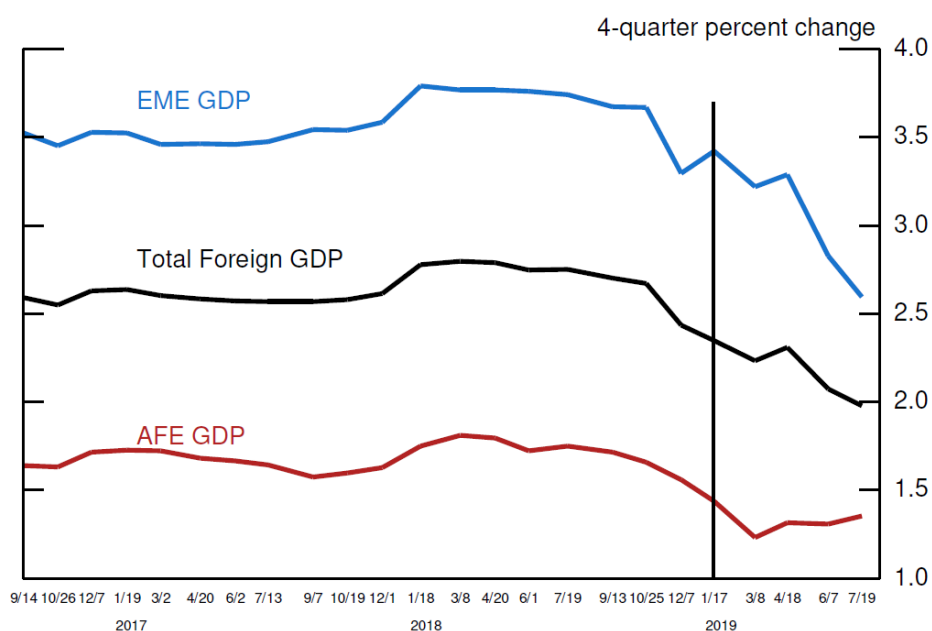
- Pickup in growth in some countries but, overall, evidence is mixed.
- Downside risks have not intensified, but remain elevated.

Total Foreign GDP Growth*



* Weighted by bilateral shares in U.S. merchandise exports.
Source: Haver, staff estimates.

Evolution of the Staff Forecast for 2019

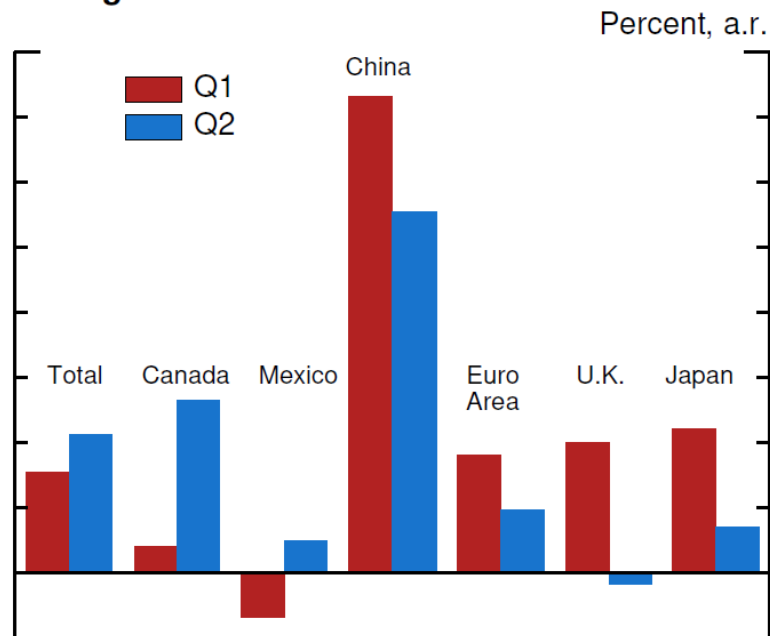


Source: Staff estimates.

Varied growth performance and weak manufacturing

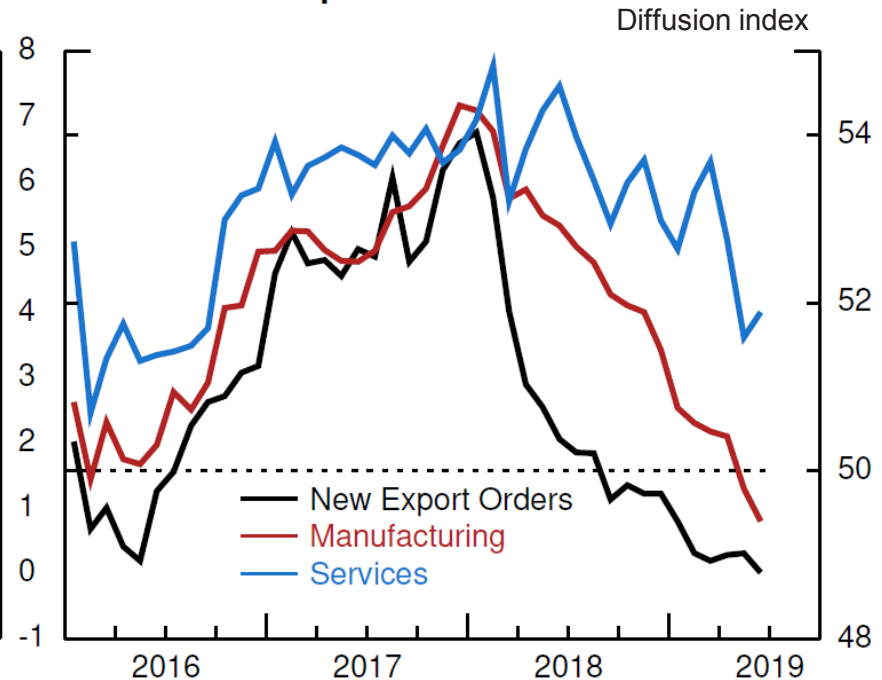
- Second-quarter pickup owes primarily to Canada and Mexico, which have high weights in our U.S. exports-weighted aggregate.
- In China, the euro area, and United Kingdom, growth has declined.
- Malaise in global manufacturing continues, while services still performing relatively better.

Foreign GDP Growth in 2019



Source: Haver, staff estimates.

World PMI: Output

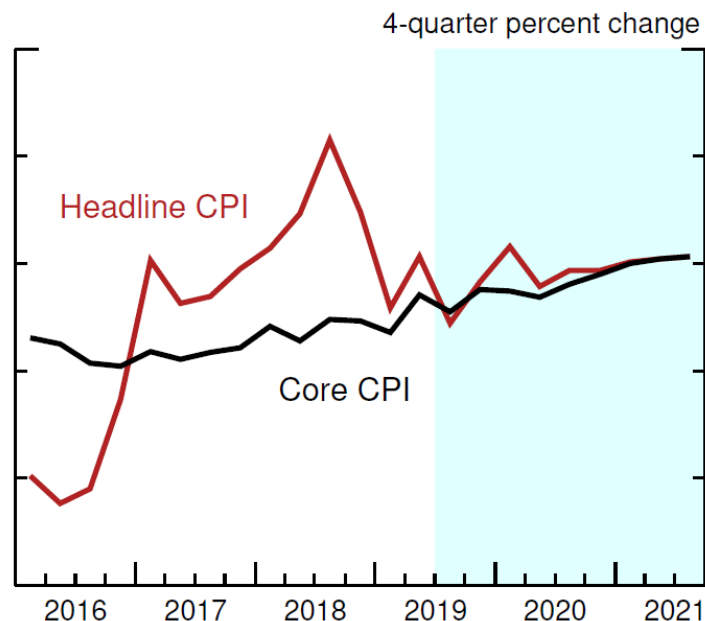


Source: Markit.

More accommodative monetary policies

- AFE inflation bumped up in near term, partly due to high energy prices.
- But underlying inflation pressures are low.
- Amid subdued inflation and growth concerns, lower path of policy rates.

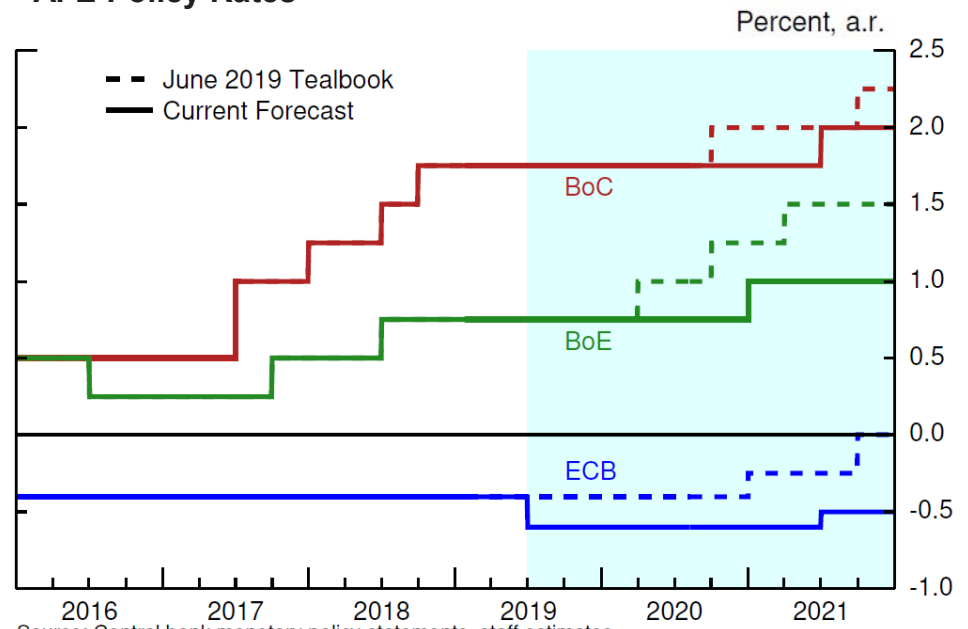
AFE Inflation Forecast*



* CPI aggregates weighted by shares of U.S. non-oil merchandise imports; excludes the effects of the consumption tax hike planned in Japan for October 2019.

Source: Haver, staff estimates.

AFE Policy Rates

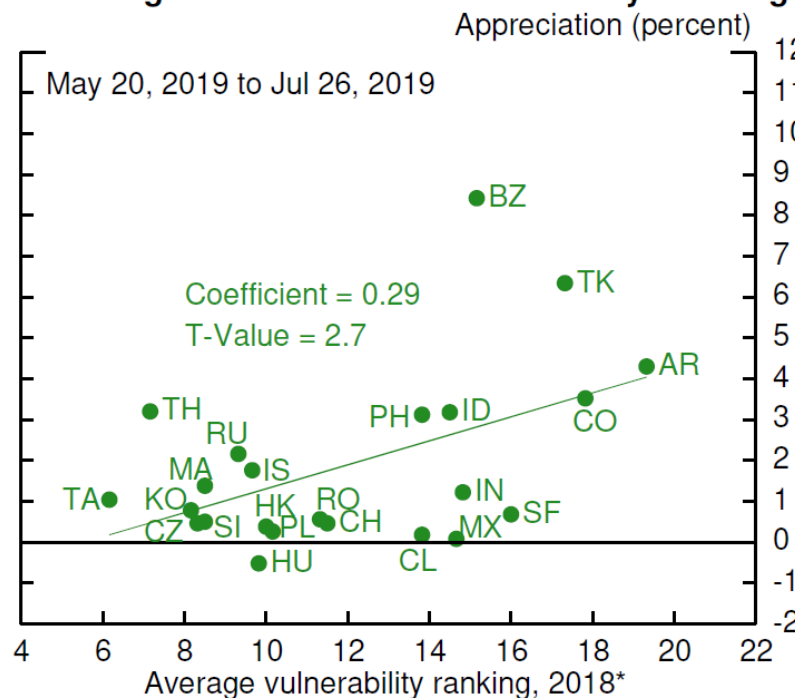


Source: Central bank monetary policy statements, staff estimates.

Lower AE policy expectations benefiting EMEs

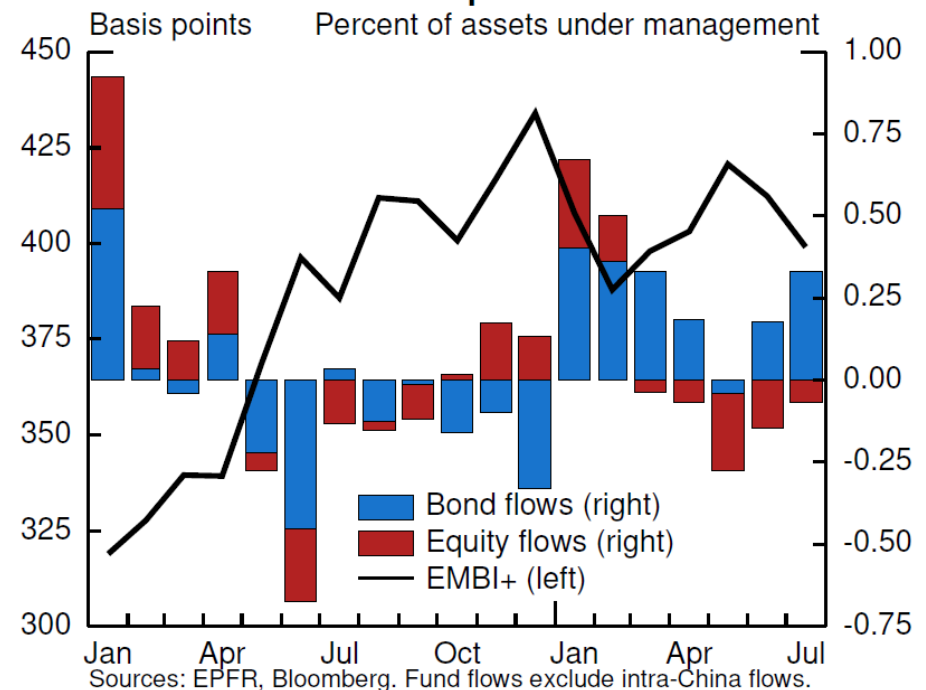
- Since April, EME currencies have appreciated, with greater appreciation in relatively more vulnerable economies.
- EME credit spreads have narrowed recently and flows to EM-dedicated funds have improved.

Exchange Rates vs. 2018 Vulnerability Rankings



*Average of country rankings across 6 indicators.
Sources: Staff calculations, Bloomberg.

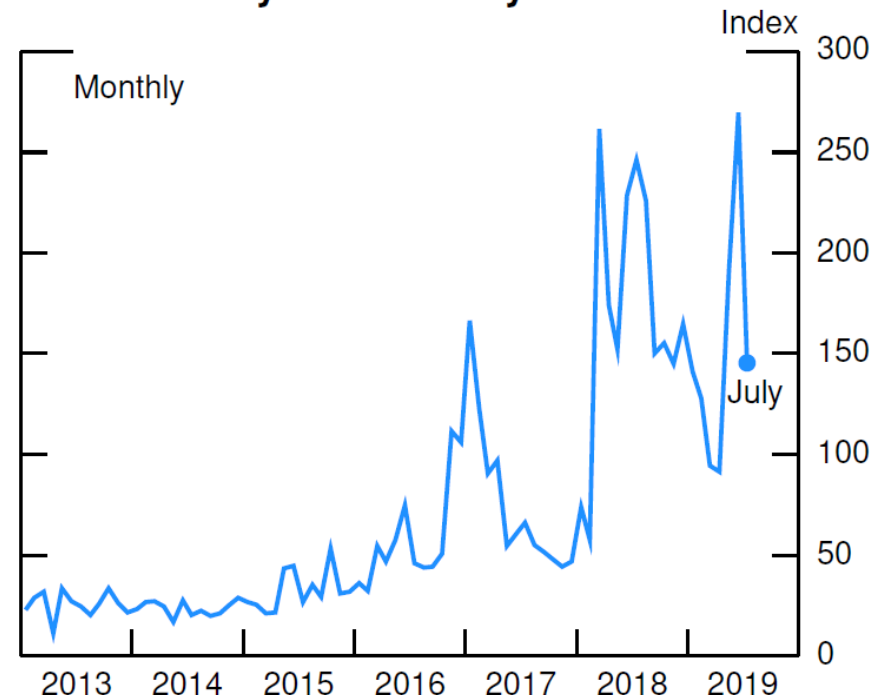
EME Fund Flows and Spreads



Some easing of trade tensions but TPU remains high

- For now, U.S.-Mexico front relatively calm after dropping of immediate threat of tariffs on Mexico.
- U.S.-China “ceasefire”
 - Presidents Trump and Xi agreed at G20 meeting to restart trade negotiations.
 - Further U.S. tariff increases on Chinese imports indefinitely postponed.
- But TPU still elevated.
- Risk of re-escalation of trade tensions and further increases in tariffs remains.

Trade Policy Uncertainty

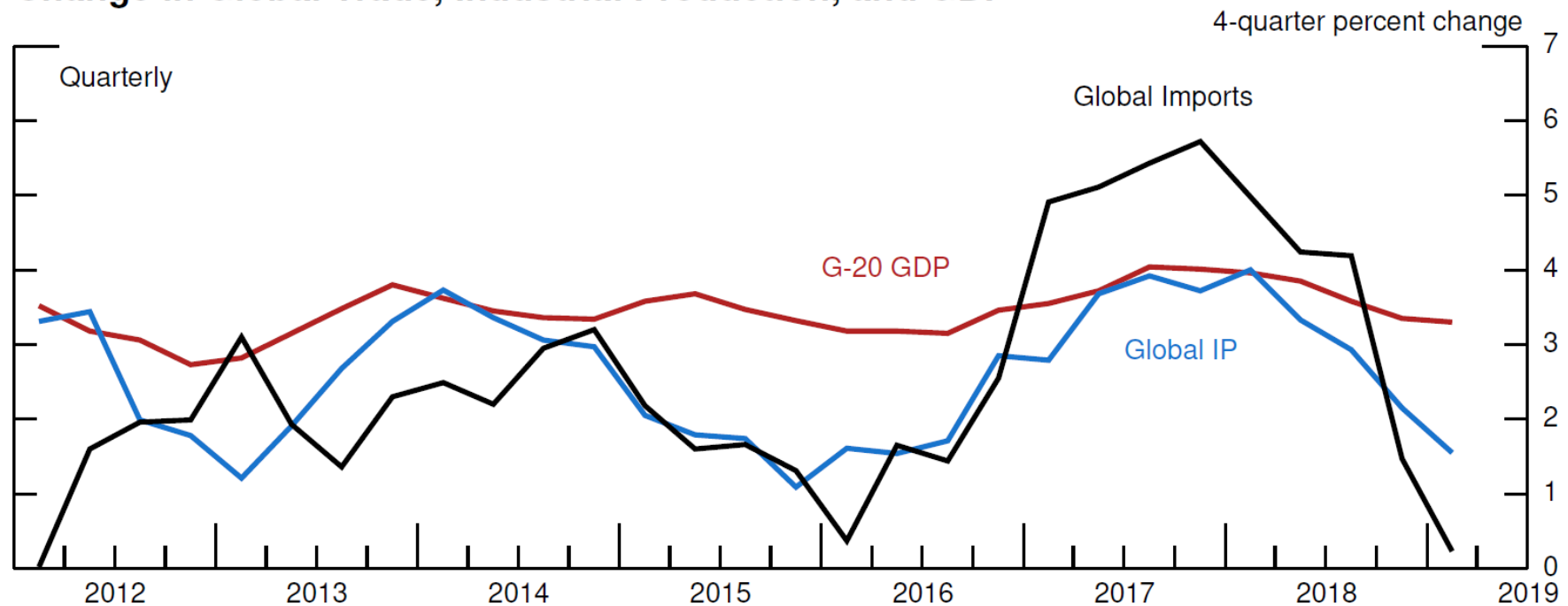


Note: At an index value of 100, 1 percent of news articles contain references to trade policy uncertainty.
Source: Dario Caldara, Matteo Iacoviello, Patrick Molligo, Andrea Prestipino, and Andrea Raffo (2019), The Economic Effects of Trade Policy Uncertainty, manuscript presented at the 91st meeting of the Carnegie-Rochester-NYU Conference on Public Policy, held at New York University, New York, April 12-13.

Both global trade and global production are weak

- How have recent increases in TPU affected activity, and how are the effects likely to play out?
- Role of tariff increases and trade policy uncertainty (TPU) difficult to disentangle from other factors, such as global high tech cycle and country-specific factors.

Change in Global Trade, Industrial Production, and GDP



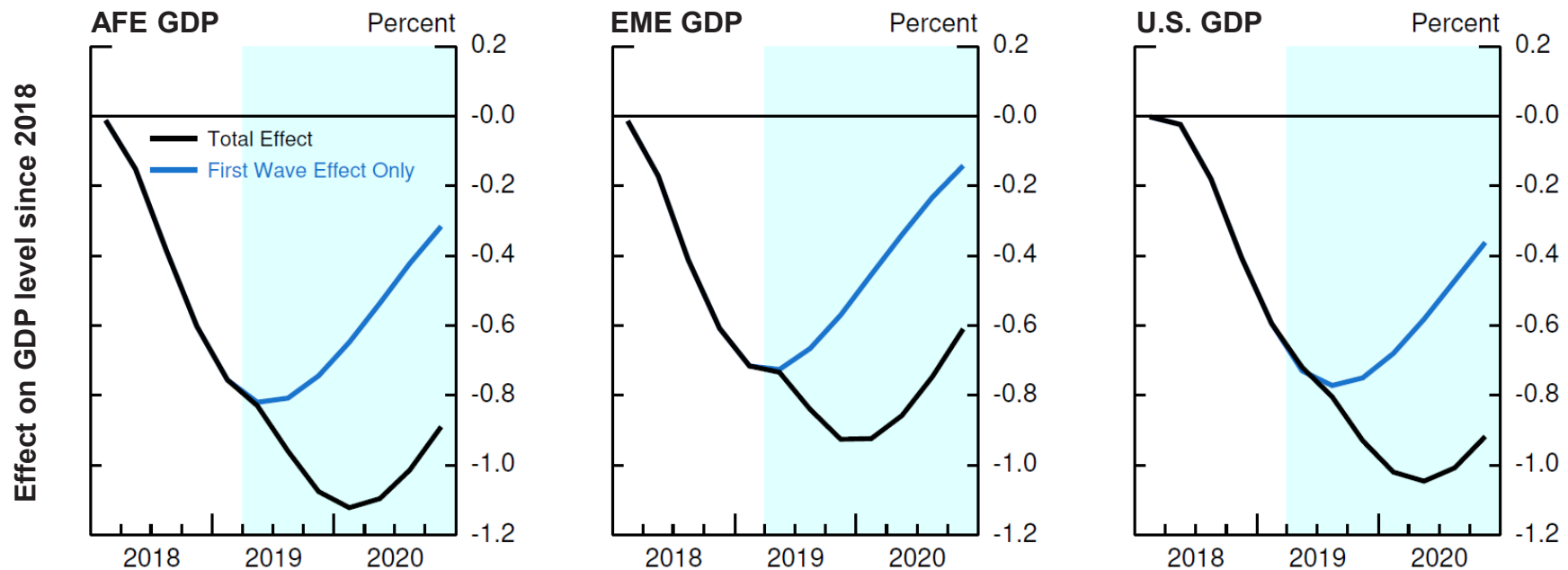
Note: Imports and industrial production (IP) are quarterly averages of monthly data. G-20 GDP is seasonally adjusted gross domestic product (GDP) volume estimates at 2010 purchasing power parities (PPPs) for the Group of 20 economies.

Source: Netherlands Bureau for Economic Policy Analysis, Organisation for Economic Co-operation and Development, Haver Analytics.

TPU affecting activity and could continue to do so

- Structural VAR model (1985-2019): IP, TPU, the dollar, world imports, stock prices, world imports, stock prices, financial spreads, and actual tariffs.
- Effects of TPU on IP converted to GDP effects.
- Trade tensions subtract about 1 percent from the level of GDP.

Effects of Trade Policy Uncertainty on the Level of GDP since 2018

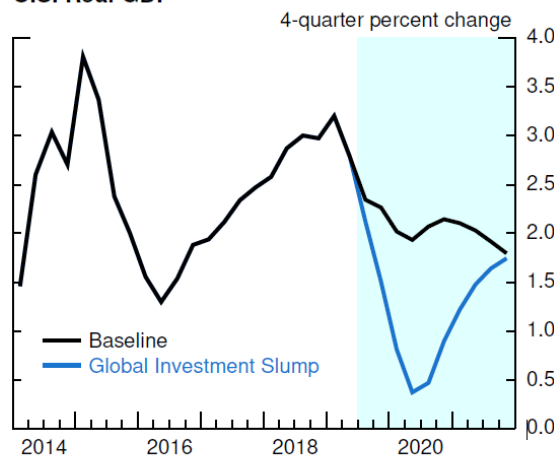


Source: Staff estimates.

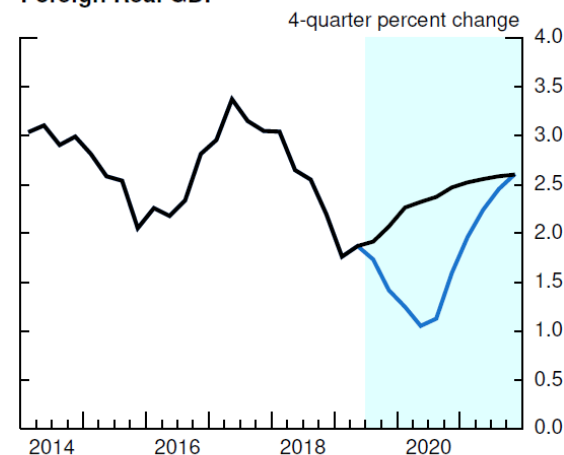
High TPU could set off a global investment slump

- Effects of TPU may yet to play out fully.
- Alt sim: Unprecedented level of TPU hits confidence, setting off global investment slump.
- Safe haven flows lead to substantial dollar appreciation.
- U.S. GDP growth falls 1.5% ppts below baseline, as does foreign growth.
- Federal funds rate declines.

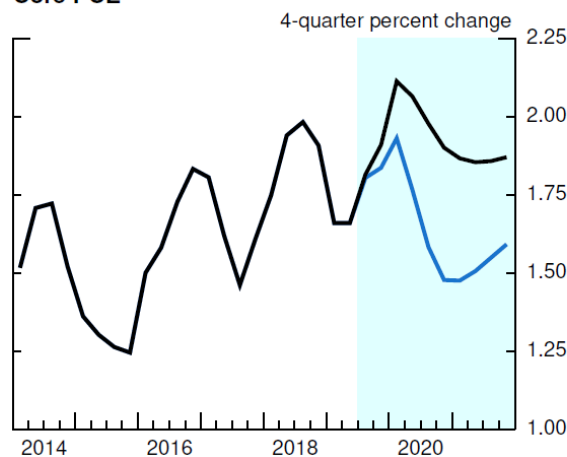
U.S. Real GDP



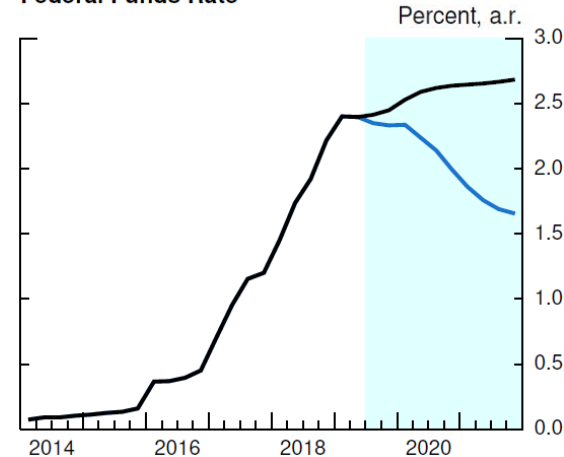
Foreign Real GDP



Core PCE



Federal Funds Rate



Source: Staff estimates.

Appendix 7: Materials used by Ms. Klee

Class II FOMC - Restricted (FR)

Material for Briefing on

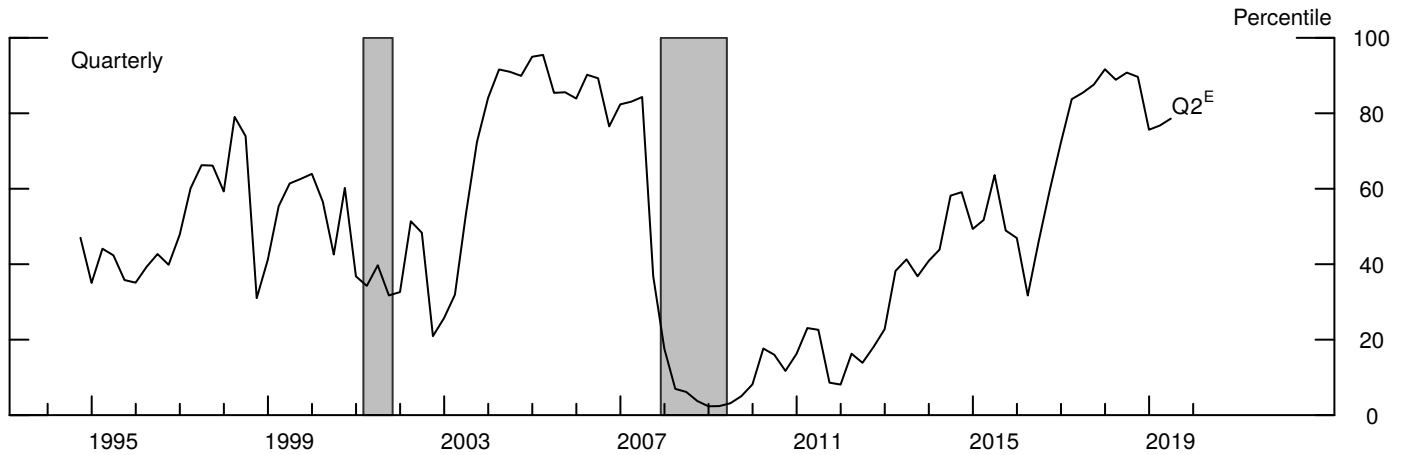
Financial Stability Developments

Elizabeth Klee

Exhibits by Sam Jerow and Trisha Biswas

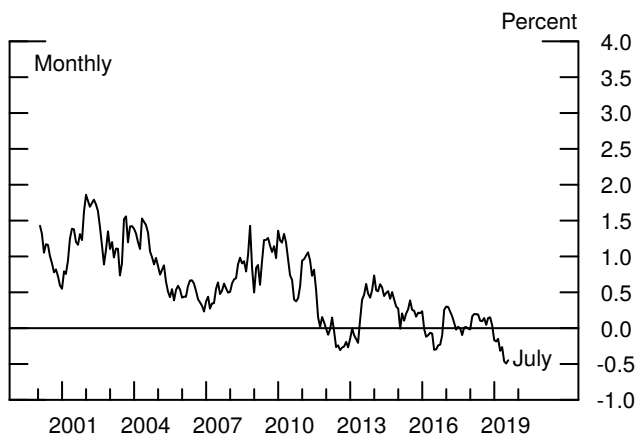
July 30, 2019

Chart 1-1
Summary Measure of Valuation Pressures and Risk Appetite



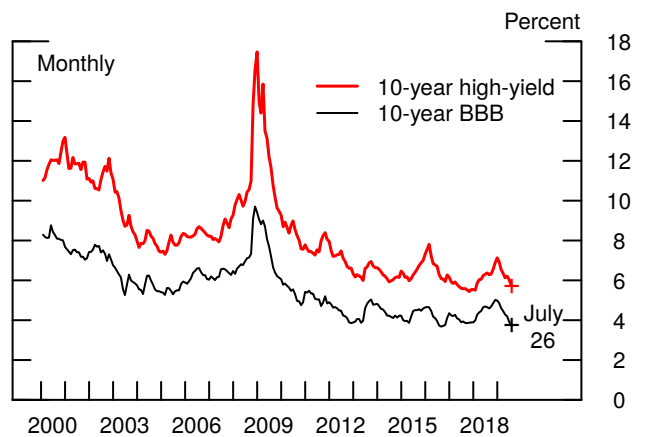
Source: Staff estimates.

Chart 1-2
10-Year Nominal Treasury Term Premium



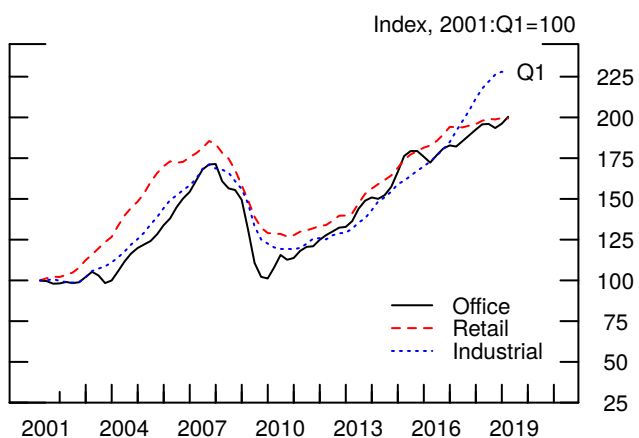
Source: Staff estimates.

Chart 1-3
Corporate Bond Yields



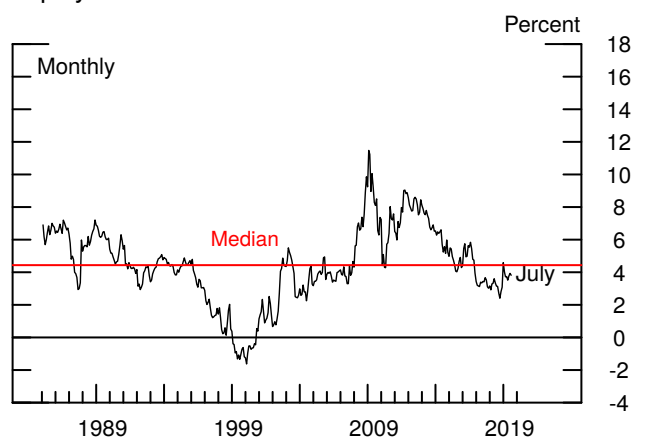
Source: Staff estimates.

Chart 1-4
Commercial Real Estate Prices



Source: CoStar

Chart 1-5
Equity Risk Premium



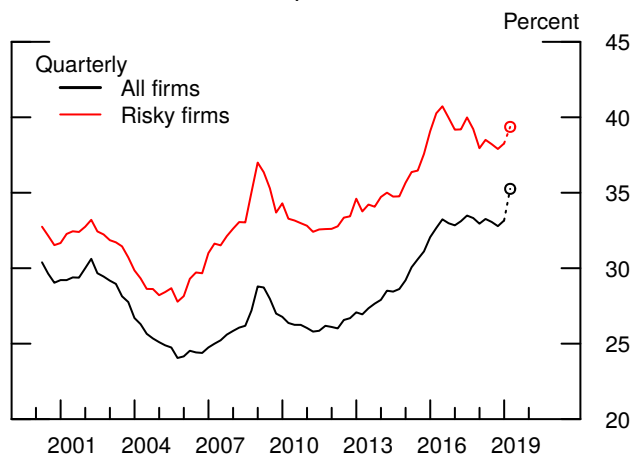
Source: Staff projection.

Class II FOMC - Restricted FR

Exhibit 2

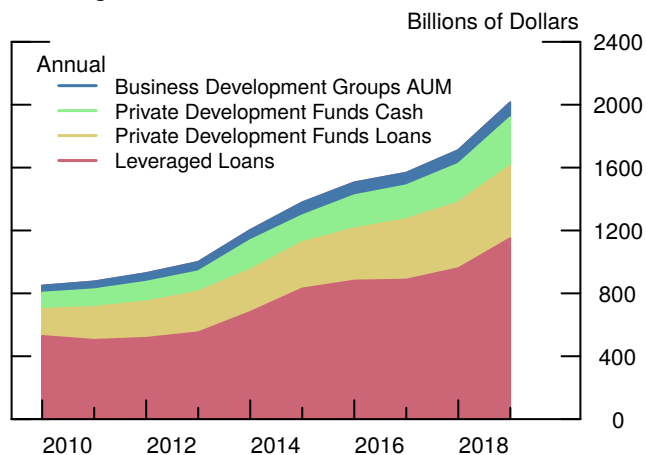
July 30, 2019

Chart 2-1
Gross Balance Sheet Leverage of
Public Nonfinancial Corporations



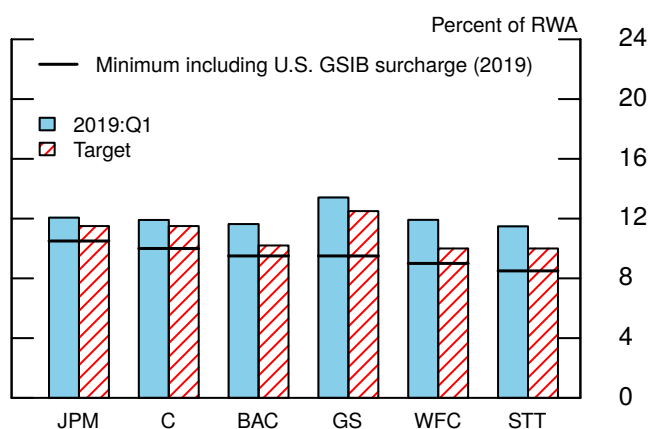
Source: Compustat.

Chart 2-2
Global Private Credit and Institutional
Leveraged Loans



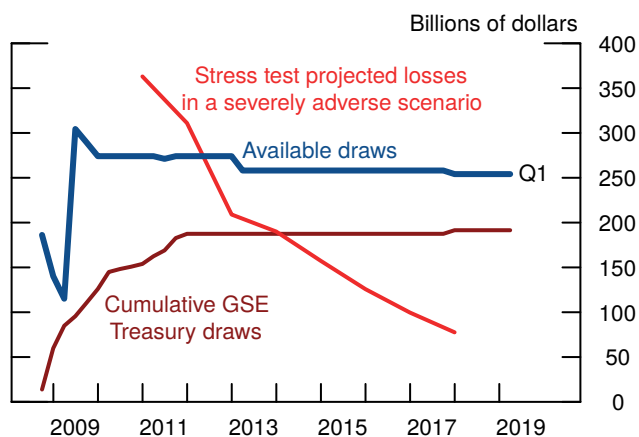
Source: S&P Global; S&P LCD.

Chart 2-3
Common Equity Tier 1 Ratios



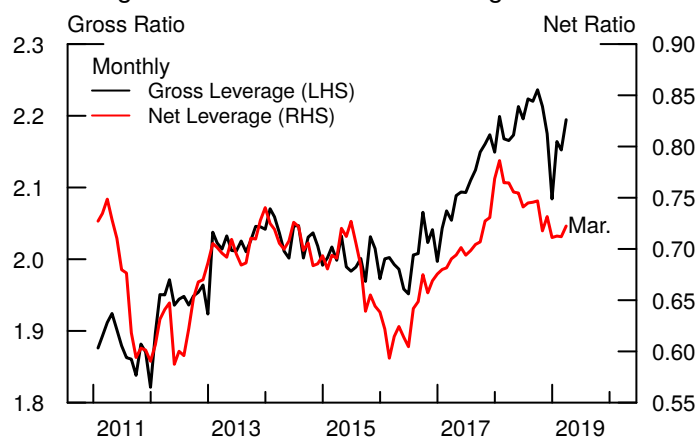
Source: FR-Y9C, Bank Earnings Call Transcripts, FRBNY GBPA.

Chart 2-4
Remaining Combined Treasury Draws Available
for GSEs



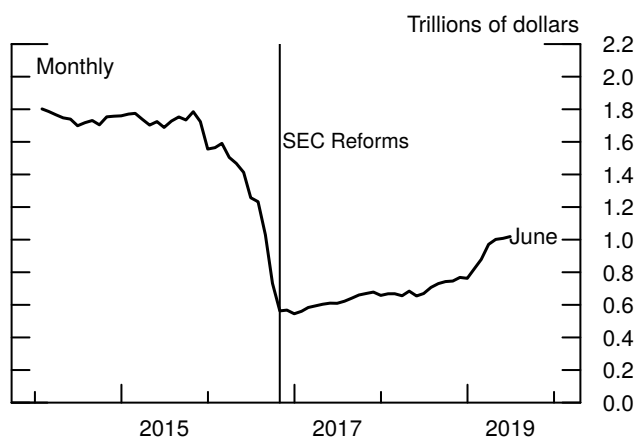
Source: Federal Housing Finance Agency

Chart 2-5
Hedge Fund Gross and Net Leverage



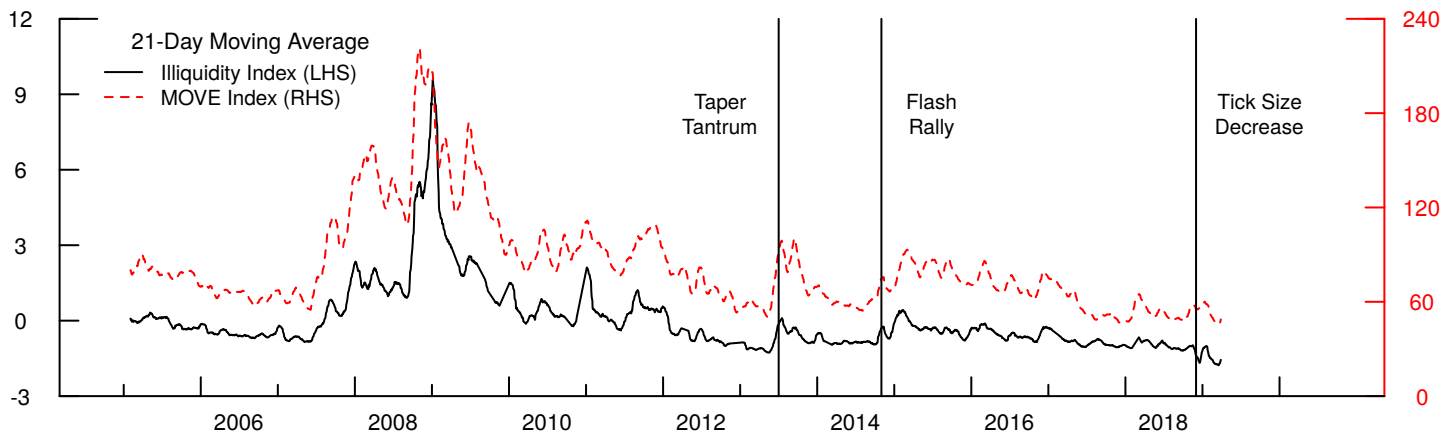
Source: Federal Reserve Bank of New York.

Chart 2-6
Assets in Prime MMFs



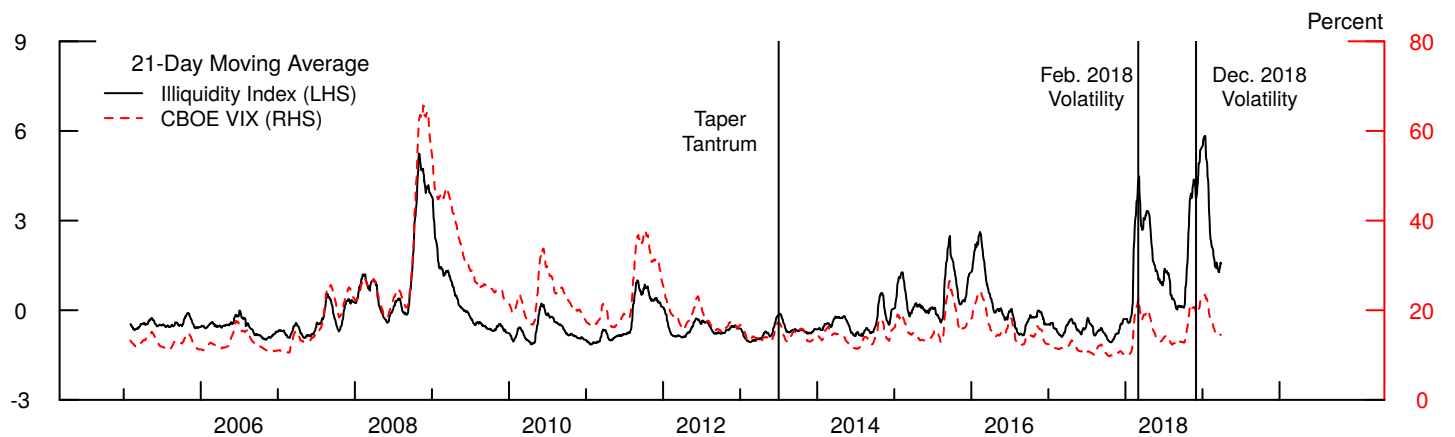
Source: SEC Form N-MFP.

Chart 3-1
U.S. Treasury Market Illiquidity Index and Implied Volatility



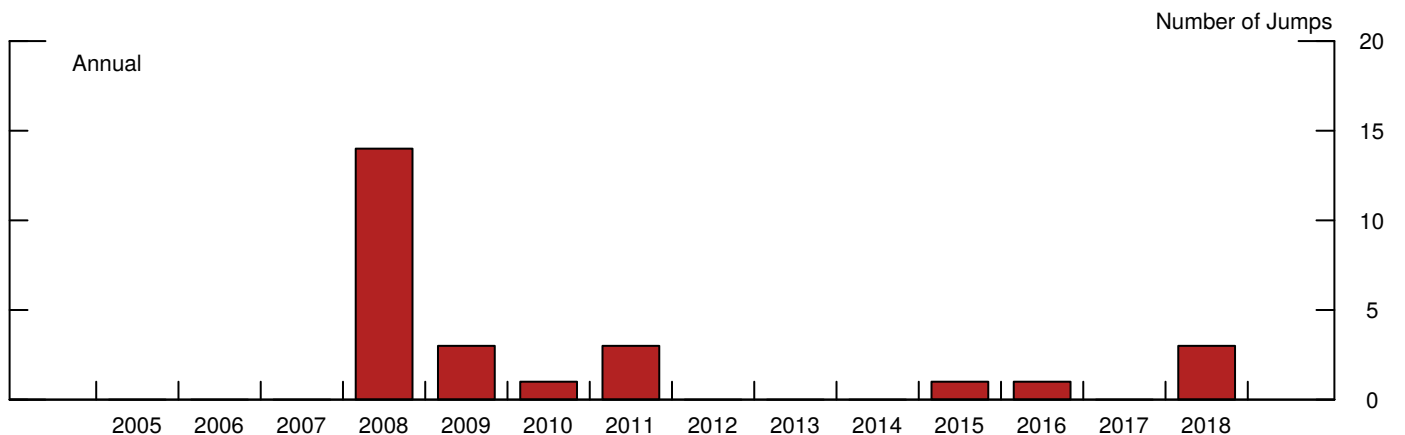
Source: Staff estimates, based on data from BrokerTec.

Chart 3-2
Equity Futures Market Illiquidity Index and Implied Volatility



Source: Staff estimates, based on data from Thompson Reuters Tick History Data.

Chart 3-3
Equity Futures Price Flash Events



Source: Staff estimates, based on data from Thompson Reuters Tick History.

Chart 1-1

The indicator plotted is an aggregate of valuation measures from equity, housing, corporate debt, and commercial real estate markets and of indicators of standards or risk characteristics in these markets. The values are percentiles of the historical distribution for this composite over the time period shown. Shaded bars indicate periods of recession as defined by the National Bureau of Economic Research. E: Q2 is estimated from partial data.

Chart 1-2

Plot includes data up to July 26.

Chart 1-3

Estimated from curve to fit Merrill Lynch bond yields. + denotes last daily observation.

Chart 1-5

Based on a dividend discount model and staff projections. + Denotes the latest daily observation using daily interest rates and stock prices.

Chart 2-1

Gross leverage is the ratio for the book value of total debt to the book value of total assets. The sample of risky firms is composed of firms with positive short-term or long-term debt that either have an S&P firm rating of speculative-grade or have no S&P rating. The dashed line represents the structural break in the series due to the 2019 compliance deadline for Financial Accounting Standards Board rule ASU 2016-02.

Chart 2-3

The solid line shows the CET1 regulatory minimum plus the applicable GSIB surcharge.

Chart 2-4

From 2015-2018, stress tests are Dodd-Frank Act stress tests. Stress test year refers to year stress test is conducted.

Chart 2-5

Gross leverage is calculated as the total market value in prime broker (PB) clients' accounts (long plus short) divided by clients' total equity. Net leverage is calculated as the net market value in PB clients' accounts (long minus short) divided by clients' total equity.

Chart 3-1

The chart plots 21-day moving averages of an illiquidity index for the on-the-run notes in the interdealer market and the Merrill Lynch Option Volatility Estimate (MOVE) index.

Chart 3-2

The chart plots 21-day moving averages of an illiquidity index for the front-month E-mini S&P 500 futures contract and the CBOE Volatility Index (VIX).

Chart 3-3

The chart plots price jumps (five-minute returns that exceed 10 standard deviations in size) that revert by at least 2/3 of the size of the jump within 12 hours.

Appendix 8: Materials used by Mr. Reeve

Class I FOMC – Restricted Controlled (FR)

Material for the Briefing on

Monetary Policy Alternatives

Trevor Reeve

Exhibits by Gurubala Kotta

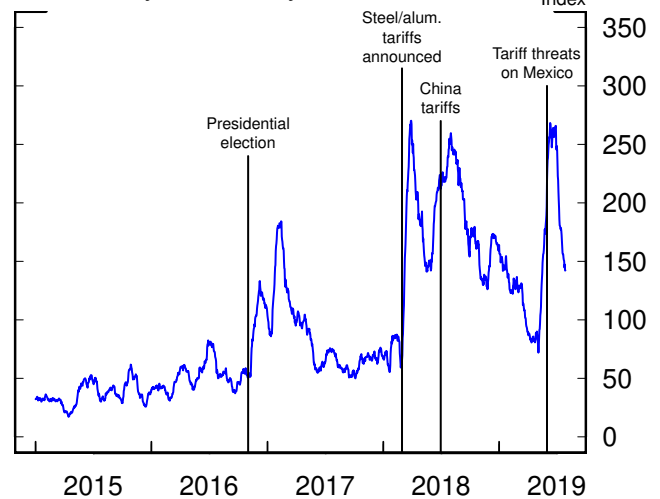
July 30-31, 2019

Monetary Policy Considerations

Policy Considerations

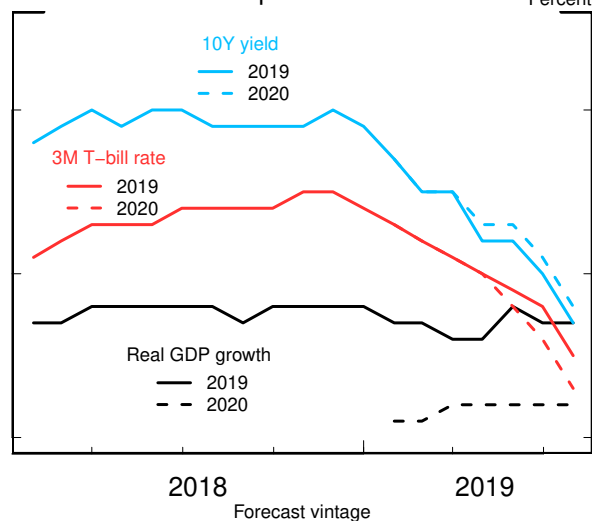
- Incoming data reassuring but mixed.
- Sluggish global growth, downside risks.
- Trade uncertainties eased but elevated.
- Inflation about as expected.

Trade Policy Uncertainty



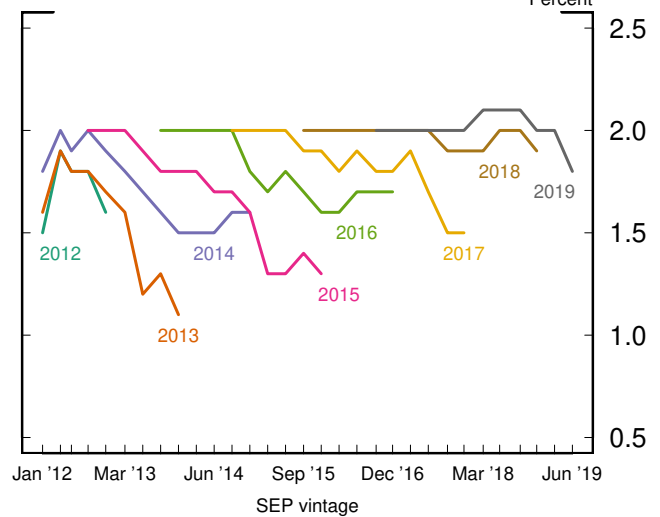
Note: 30-day moving averages.
Source: Board staff calculations.

Evolution of Blue Chip Forecasts



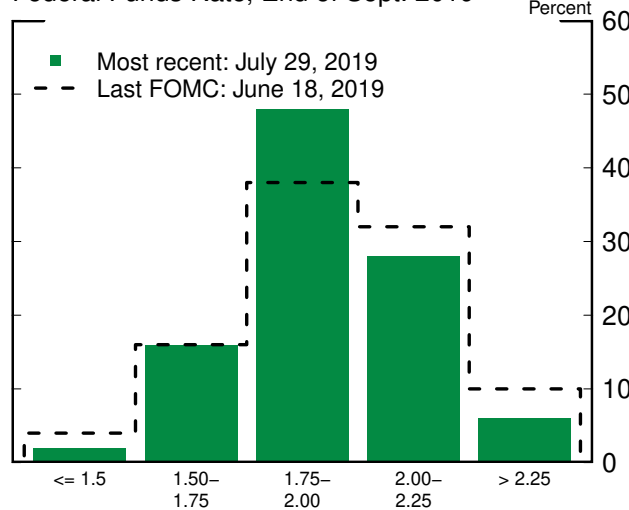
Source: Blue Chip Economic Indicators.

Evolution of Median Projections from the SEP for Core PCE Inflation



Source: Summary of Economic Projections.

Market-Implied Probability Distribution of the Federal Funds Rate, End of Sept. 2019



Source: CME Group; Board staff calculations.

Alternative B

- 25 basis points rate cut confirms evolving views of appropriate policy.
- "Act as appropriate" may signal continued openness to policy adjustments.
- "Continue to monitor" may convey less imminent concern about the outlook.
- Balance sheet decision reinforces flexibility.

JUNE 2019 FOMC STATEMENT

1. Information received since the Federal Open Market Committee met in May indicates that the labor market remains strong and that economic activity is rising at a moderate rate. Job gains have been solid, on average, in recent months, and the unemployment rate has remained low. Although growth of household spending appears to have picked up from earlier in the year, indicators of business fixed investment have been soft. On a 12-month basis, overall inflation and inflation for items other than food and energy are running below 2 percent. Market-based measures of inflation compensation have declined; survey-based measures of longer-term inflation expectations are little changed.
2. Consistent with its statutory mandate, the Committee seeks to foster maximum employment and price stability. In support of these goals, the Committee decided to maintain the target range for the federal funds rate at 2-1/4 to 2-1/2 percent. The Committee continues to view sustained expansion of economic activity, strong labor market conditions, and inflation near the Committee's symmetric 2 percent objective as the most likely outcomes, but uncertainties about this outlook have increased. In light of these uncertainties and muted inflation pressures, the Committee will closely monitor the implications of incoming information for the economic outlook and will act as appropriate to sustain the expansion, with a strong labor market and inflation near its symmetric 2 percent objective.
3. In determining the timing and size of future adjustments to the target range for the federal funds rate, the Committee will assess realized and expected economic conditions relative to its maximum employment objective and its symmetric 2 percent inflation objective. This assessment will take into account a wide range of information, including measures of labor market conditions, indicators of inflation pressures and inflation expectations, and readings on financial and international developments.

ALTERNATIVE A FOR JULY 2019

1. Information received since the Federal Open Market Committee met in ~~May~~ **June** indicates that the labor market remains strong and that economic activity is **has been** rising at a moderate rate. Job gains have been solid, on average, in recent months, and the unemployment rate has remained low. Although growth of household spending ~~appears to have~~ **has** picked up from earlier in the year, ~~indicators~~ **growth** of business fixed investment ~~have~~ **has** been soft. On a 12-month basis, overall inflation and inflation for items other than food and energy are running below 2 percent. ~~Market-based measures of inflation compensation have declined; survey-based measures of longer-term inflation expectations are little changed.~~ **On balance, indicators of longer-term inflation expectations remain low.**
2. Consistent with its statutory mandate, the Committee seeks to foster maximum employment and price stability. In ~~support of these goals~~ **light of the implications of global developments for the economic outlook as well as inflation running persistently below 2 percent**, the Committee decided to ~~maintain~~ **lower** the target range for the federal funds rate at ~~2 1/4 to 2 1/2~~ **to 1-3/4 to 2** percent. **This action supports** the Committee's ~~continues to view~~ **that** sustained expansion of economic activity, strong labor market conditions, and inflation near the Committee's symmetric 2 percent objective as **are** the most likely outcomes, but uncertainties about this outlook ~~have increased~~ **remain**. ~~In light of these uncertainties and muted inflation pressures,~~ The Committee will closely monitor the implications of incoming information for the economic outlook and ~~will act as appropriate~~ **is prepared to make further adjustments in the target range for the federal funds rate** to sustain the expansion, with a strong labor market and inflation near its symmetric 2 percent objective.
3. In determining the timing and size of future adjustments to the target range for the federal funds rate, the Committee will assess realized and expected economic conditions relative to its maximum employment objective and its symmetric 2 percent inflation objective. This assessment will take into account a wide range of information, including measures of labor market conditions, indicators of inflation pressures and inflation expectations, and readings on financial and international developments.
4. **The Committee will conclude the reduction of its aggregate securities holdings in the System Open Market Account in August, two months earlier than previously indicated.**

ALTERNATIVE B FOR JULY 2019

1. Information received since the Federal Open Market Committee met in ~~May~~ **June** indicates that the labor market remains strong and that economic activity is **has been** rising at a moderate rate. Job gains have been solid, on average, in recent months, and the unemployment rate has remained low. Although growth of household spending ~~appears to have~~ **has** picked up from earlier in the year, ~~indicators~~ **growth** of business fixed investment ~~have~~ **has** been soft. On a 12-month basis, overall inflation and inflation for items other than food and energy are running below 2 percent. Market-based measures of inflation compensation ~~have declined~~ **remain low**; survey-based measures of longer-term inflation expectations are little changed.
2. Consistent with its statutory mandate, the Committee seeks to foster maximum employment and price stability. In ~~support of these goals~~ **light of the implications of global developments for the economic outlook as well as muted inflation pressures**, the Committee decided to ~~maintain~~ **lower** the target range for the federal funds rate at ~~to 2 to 2-1/4 to 2-1/2 percent~~. **This action supports** the Committee's ~~continues to view~~ **that** sustained expansion of economic activity, strong labor market conditions, and inflation near the Committee's symmetric 2 percent objective as **are** the most likely outcomes, but uncertainties about this outlook ~~have increased~~ **remain**. ~~In light of these uncertainties and muted inflation pressures~~, The Committee will closely **continue to** monitor the implications of incoming information for the economic outlook and will act as appropriate to sustain the expansion, with a strong labor market and inflation near its symmetric 2 percent objective.
3. In determining the timing and size of future adjustments to the target range for the federal funds rate, the Committee will assess realized and expected economic conditions relative to its maximum employment objective and its symmetric 2 percent inflation objective. This assessment will take into account a wide range of information, including measures of labor market conditions, indicators of inflation pressures and inflation expectations, and readings on financial and international developments.
4. **The Committee will conclude the reduction of its aggregate securities holdings in the System Open Market Account in August, two months earlier than previously indicated.**

ALTERNATIVE C FOR JULY 2019

1. Information received since the Federal Open Market Committee met in ~~May~~ **June** indicates that the labor market remains strong and that economic activity is **has been** rising at a moderate rate. Job gains have been solid, on average, in recent months, and the unemployment rate has remained low. Although growth of household spending ~~appears to have~~ **has** picked up from earlier in the year, ~~indicators~~ **growth** of business fixed investment ~~have~~ **has** been soft. On a 12-month basis, overall inflation and inflation for items other than food and energy are running below 2 percent. Market-based measures of inflation compensation ~~have declined~~ **remain low**; survey-based measures of longer-term inflation expectations are little changed.
2. Consistent with its statutory mandate, the Committee seeks to foster maximum employment and price stability. In support of these goals, the Committee decided to maintain the target range for the federal funds rate at 2-1/4 to 2-1/2 percent. The Committee continues to view sustained expansion of economic activity, strong labor market conditions, and inflation near the Committee's symmetric 2 percent objective as the most likely outcomes, but uncertainties about this outlook ~~have increased~~ **remain elevated**. In light of these uncertainties and muted inflation pressures, the Committee will closely monitor the implications of incoming information for the economic outlook and will act as appropriate to sustain the expansion, with a strong labor market and inflation near its symmetric 2 percent objective.
3. In determining the timing and size of future adjustments to the target range for the federal funds rate, the Committee will assess realized and expected economic conditions relative to its maximum employment objective and its symmetric 2 percent inflation objective. This assessment will take into account a wide range of information, including measures of labor market conditions, indicators of inflation pressures and inflation expectations, and readings on financial and international developments.

Implementation Note for July 2019 Alternative A

Release Date: July 31, 2019

Decisions Regarding Monetary Policy Implementation

The Federal Reserve has made the following decisions to implement the monetary policy stance announced by the Federal Open Market Committee in its [statement](#) on ~~June 19,~~ 2019 **July 31, 2019**:

- The Board of Governors of the Federal Reserve System voted [unanimously] to ~~maintain~~ **lower** the interest rate paid on required and excess reserve balances at ~~2.35~~ **to 1.85** percent, effective ~~June 20, 2019~~ **August 1, 2019**.
- As part of its policy decision, the Federal Open Market Committee voted to authorize and direct the Open Market Desk at the Federal Reserve Bank of New York, until instructed otherwise, to execute transactions in the System Open Market Account in accordance with the following domestic policy directive:

“Effective ~~June 20, 2019~~ **August 1, 2019**, the Federal Open Market Committee directs the Desk to undertake open market operations as necessary to maintain the federal funds rate in a target range of **1-3/4 to 2-1/4** ~~to 2-1/2~~ percent, including overnight reverse repurchase operations (and reverse repurchase operations with maturities of more than one day when necessary to accommodate weekend, holiday, or similar trading conventions) at an offering rate of ~~2.25~~ **1.75** percent, in amounts limited only by the value of Treasury securities held outright in the System Open Market Account that are available for such operations and by a per-counterparty limit of \$30 billion per day.

Effective August 1, 2019, the Committee directs the Desk to ~~continue rolling over at auction the amount of~~ **all** principal payments from the Federal Reserve’s holdings of Treasury securities ~~maturing during each calendar month that exceeds \$15 billion~~, and to ~~continue reinvesting in agency mortgage-backed securities the amount of~~ **all** principal payments from the Federal Reserve’s holdings of agency debt and agency mortgage-backed securities received during each calendar month ~~that exceeds \$20 billion~~. **Principal payments from agency debt and agency mortgage-backed securities up to \$20 billion per month will be reinvested in Treasury securities to roughly match the maturity composition of Treasury securities outstanding; principal payments in excess of \$20 billion per month will continue to be reinvested in agency mortgage-backed securities.** Small deviations from these amounts for operational reasons are acceptable.

The Committee also directs the Desk to engage in dollar roll and coupon swap transactions as necessary to facilitate settlement of the Federal Reserve's agency mortgage-backed securities transactions."

- In a related action, the Board of Governors of the Federal Reserve System voted [unanimously] to approve the establishment of **a 1/2 percentage point decrease in** the primary credit rate ~~at the existing level of 3.00 percent~~ **to 2.50 percent, effective August 1, 2019. In taking this action, the Board approved requests to establish that rate submitted by the Boards of Directors of the Federal Reserve Banks of [...].**

This information will be updated as appropriate to reflect decisions of the Federal Open Market Committee or the Board of Governors regarding details of the Federal Reserve's operational tools and approach used to implement monetary policy.

More information regarding open market operations and reinvestments may be found on the Federal Reserve Bank of New York's [website](#).

Implementation Note for July 2019 Alternative B

Release Date: July 31, 2019

Decisions Regarding Monetary Policy Implementation

The Federal Reserve has made the following decisions to implement the monetary policy stance announced by the Federal Open Market Committee in its [statement](#) on ~~June 19, 2019~~ **July 31, 2019**:

- The Board of Governors of the Federal Reserve System voted [unanimously] to ~~maintain~~ **lower** the interest rate paid on required and excess reserve balances at ~~2.35~~ **to 2.10** percent, effective ~~June 20, 2019~~ **August 1, 2019**.
- As part of its policy decision, the Federal Open Market Committee voted to authorize and direct the Open Market Desk at the Federal Reserve Bank of New York, until instructed otherwise, to execute transactions in the System Open Market Account in accordance with the following domestic policy directive:

“Effective ~~June 20, 2019~~ **August 1, 2019**, the Federal Open Market Committee directs the Desk to undertake open market operations as necessary to maintain the federal funds rate in a target range of **2 to** 2-1/4 ~~to 2-1/2~~ percent, including overnight reverse repurchase operations (and reverse repurchase operations with maturities of more than one day when necessary to accommodate weekend, holiday, or similar trading conventions) at an offering rate of ~~2.25~~ **2.00** percent, in amounts limited only by the value of Treasury securities held outright in the System Open Market Account that are available for such operations and by a per-counterparty limit of \$30 billion per day.

Effective August 1, 2019, the Committee directs the Desk to ~~continue rolling over at auction the amount of~~ **all** principal payments from the Federal Reserve’s holdings of Treasury securities ~~maturing during each calendar month that exceeds \$15 billion~~, and to ~~continue reinvesting in agency mortgage-backed securities the amount of~~ **all** principal payments from the Federal Reserve’s holdings of agency debt and agency mortgage-backed securities received during each calendar month ~~that exceeds \$20 billion~~. **Principal payments from agency debt and agency mortgage-backed securities up to \$20 billion per month will be reinvested in Treasury securities to roughly match the maturity composition of Treasury securities outstanding; principal payments in excess of \$20 billion per month will continue to be reinvested in agency mortgage-backed securities.** Small deviations from these amounts for operational reasons are acceptable.

The Committee also directs the Desk to engage in dollar roll and coupon swap transactions as necessary to facilitate settlement of the Federal Reserve's agency mortgage-backed securities transactions."

- In a related action, the Board of Governors of the Federal Reserve System voted [unanimously] to approve the establishment of a 1/4 percentage point decrease in the primary credit rate ~~at the existing level of 3.00 percent~~ to 2.75 percent, effective August 1, 2019. In taking this action, the Board approved requests to establish that rate submitted by the Boards of Directors of the Federal Reserve Banks of [...].

This information will be updated as appropriate to reflect decisions of the Federal Open Market Committee or the Board of Governors regarding details of the Federal Reserve's operational tools and approach used to implement monetary policy.

More information regarding open market operations and reinvestments may be found on the Federal Reserve Bank of New York's [website](#).

Implementation Note for July 2019 Alternative C

Release Date: July 31, 2019

Decisions Regarding Monetary Policy Implementation

The Federal Reserve has made the following decisions to implement the monetary policy stance announced by the Federal Open Market Committee in its [statement](#) on ~~June 19, 2019~~ **July 31, 2019**:

- The Board of Governors of the Federal Reserve System voted [unanimously] to maintain the interest rate paid on required and excess reserve balances at 2.35 percent, effective ~~June 20, 2019~~ **August 1, 2019**.
- As part of its policy decision, the Federal Open Market Committee voted to authorize and direct the Open Market Desk at the Federal Reserve Bank of New York, until instructed otherwise, to execute transactions in the System Open Market Account in accordance with the following domestic policy directive:

“Effective ~~June 20, 2019~~ **August 1, 2019**, the Federal Open Market Committee directs the Desk to undertake open market operations as necessary to maintain the federal funds rate in a target range of 2-1/4 to 2-1/2 percent, including overnight reverse repurchase operations (and reverse repurchase operations with maturities of more than one day when necessary to accommodate weekend, holiday, or similar trading conventions) at an offering rate of 2.25 percent, in amounts limited only by the value of Treasury securities held outright in the System Open Market Account that are available for such operations and by a per-counterparty limit of \$30 billion per day.

The Committee directs the Desk to continue rolling over at auction the amount of principal payments from the Federal Reserve’s holdings of Treasury securities maturing during each calendar month that exceeds \$15 billion, and to continue reinvesting in agency mortgage-backed securities the amount of principal payments from the Federal Reserve’s holdings of agency debt and agency mortgage-backed securities received during each calendar month that exceeds \$20 billion. Small deviations from these amounts for operational reasons are acceptable.

The Committee also directs the Desk to engage in dollar roll and coupon swap transactions as necessary to facilitate settlement of the Federal Reserve’s agency mortgage-backed securities transactions.”

- In a related action, the Board of Governors of the Federal Reserve System voted [unanimously] to approve the establishment of the primary credit rate at the existing level of 3.00 percent.

This information will be updated as appropriate to reflect decisions of the Federal Open Market Committee or the Board of Governors regarding details of the Federal Reserve's operational tools and approach used to implement monetary policy.

More information regarding open market operations and reinvestments may be found on the Federal Reserve Bank of New York's [website](#).

Potential actions of the Board of Governors of the Federal Reserve System

Potential Board actions associated with FOMC Alternative A

Interest on required and excess reserve balances

Reduce the interest rate paid on required and excess reserve balances to 1.85 percent, effective August 1, 2019.

Establishment of the primary, secondary, and seasonal credit rates

Approve establishment of the primary credit rate by the Federal Reserve Bank of Minneapolis at 2.50 percent effective August 1, 2019. This action will encompass approval of the establishment of a 2.50 percent primary credit rate by each of the remaining Federal Reserve Banks, effective on the later of August 1, 2019, or the date such Reserve Bank informs the Secretary of the Board of such a request; the Secretary of the Board would be authorized to inform each such Reserve Bank of the approval of the Board of Governors upon such notification by the Reserve Bank. Lastly, this vote will also encompass the establishment of the rates for secondary and seasonal credit under the existing formulas specified in staff's July 26, 2019 memorandum to the Board.

Potential Board actions associated with FOMC Alternative B

Interest on required and excess reserve balances

Reduce the interest rate paid on required and excess reserve balances to 2.10 percent, effective August 1, 2019.

Establishment of the primary, secondary, and seasonal credit rates

Approve establishment of the primary credit rate by the Federal Reserve Banks of Philadelphia, Chicago, St. Louis, Dallas, and San Francisco at 2.75 percent effective August 1, 2019. This action will encompass approval of the establishment of a 2.75 percent primary credit rate by each of the remaining Federal Reserve Banks, effective on the later of August 1, 2019, or the date such Reserve Bank informs the Secretary of the Board of such a request; the Secretary of the Board would be authorized to inform each such Reserve Bank of the approval of the Board of Governors upon such notification by the Reserve Bank. Lastly, this vote will also encompass the establishment of the rates for secondary and seasonal credit under the existing formulas specified in staff's July 26, 2019 memorandum to the Board.

Potential Board actions associated with FOMC Alternative C

Interest on required and excess reserve balances

Leave the interest rates paid on required and excess reserve balances unchanged at 2.35 percent.

Establishment of the primary, secondary, and seasonal credit rates

Approve establishment of the primary credit rate at the existing rate of 3.00 percent and establishment of the rates for secondary and seasonal credit under the existing formulas specified in the staff's July 26, 2019, memo to the Board.

Appendix 9: Materials used by Ms. Logan

Class I FOMC - Restricted Controlled (FR)

Material for Briefing on

**Desk Statement Regarding Reinvestments of
Principal Payments from Treasury Securities, Agency
Debt, and Agency Mortgage-Backed Securities**

Lorie Logan

July 31, 2019

Class I FOMC – Restricted Controlled (FR)

Statement Regarding Reinvestments of Principal Payments from Treasury Securities, Agency Debt, and Agency Mortgage-Backed Securities

July 31, 2019

At its meeting on July 30-31, 2019, the Federal Open Market Committee (FOMC) decided to conclude the reduction of aggregate securities holdings in the System Open Market Account (SOMA) two months earlier than previously indicated. The FOMC directed the Open Market Trading Desk (the Desk) at the Federal Reserve Bank of New York to roll over at auction all principal payments from the Federal Reserve's holdings of Treasury securities and to reinvest all principal payments from the Federal Reserve's holdings of agency debt and agency mortgage-backed securities (MBS) effective August 1, 2019. Rollovers of principal payments from maturing Treasury securities will continue to be reinvested in new Treasury securities being issued on the maturity date. Principal payments from agency debt and agency MBS up to a maximum amount of \$20 billion per month will be reinvested in Treasury securities through secondary market purchases; agency debt and agency MBS principal payments in excess of \$20 billion each month will continue to be reinvested in agency MBS.

Treasury securities purchases associated with the reinvestment of agency debt and agency MBS principal payments will be conducted in the secondary market across a range of maturities to roughly match the maturity composition of Treasury securities outstanding. The FOMC will revisit this initial reinvestment plan in connection with its deliberations regarding the longer-run composition of the SOMA portfolio.

Under this guidance, the Desk plans to distribute secondary market Treasury reinvestment purchases across eleven different sectors, including nominal coupons, bills, Treasury Inflation-Protected Securities, and Floating Rate Notes. The amount of purchases in each sector will be approximately proportional to the 12-month average of the par amount of Treasury securities outstanding in each sector relative to the total amount outstanding across all sectors, measured at the end of July 2019.

The Desk will announce the planned monthly amount of secondary market Treasury reinvestment purchases up to the \$20 billion maximum on or around the ninth business day of each month. At that time, the Desk will also release a tentative schedule of purchase operations that will be conducted over the one-month period until the next announcement. The Desk plans to release the first schedule of Treasury purchase operations on August 13, 2019.

Any principal payments from agency debt and agency MBS in excess of \$20 billion per month will continue to be reinvested in agency MBS. For these purchases, the Desk will continue its current practice of announcing the planned amount of agency MBS purchases on or around the ninth business day of each month and releasing a tentative schedule of purchase operations twice a month, on or around the ninth and the nineteenth business days. The Desk plans to release its next schedule of MBS purchase operations on August 13, 2019.

Class I FOMC – Restricted Controlled (FR)

Additional information on Treasury rollovers and Treasury and agency MBS reinvestment purchases can be found in the following locations:

[FAQs: Treasury Reinvestments - Rollovers »](#)

[FAQs: Treasury Reinvestments - Purchases »](#)

[FAQs: Agency MBS Reinvestment Purchases»](#)