

Appendix 1: Materials used by Messrs. Schulhofer-Wohl and Martin

Class I FOMC - Restricted Controlled (FR)

Material for Briefing on

Long-Run Composition of the SOMA Portfolio

Sam Schulhofer-Wohl and Antoine Martin

**Exhibits by Stephen Azzolino, Sofia Baig, Chris Curfman,
and James M. Trevino**

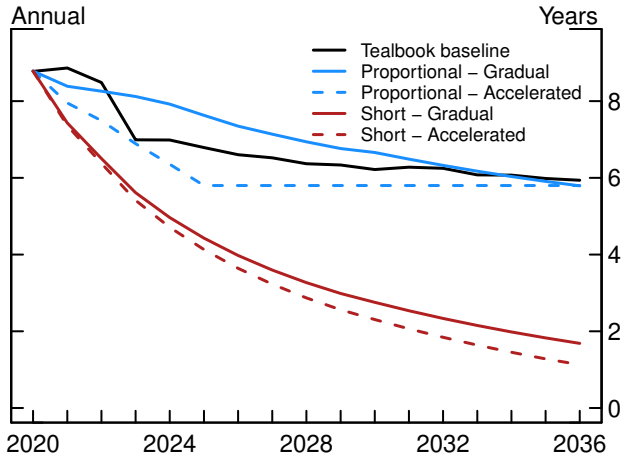
April 30, 2019

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Illustrative scenarios

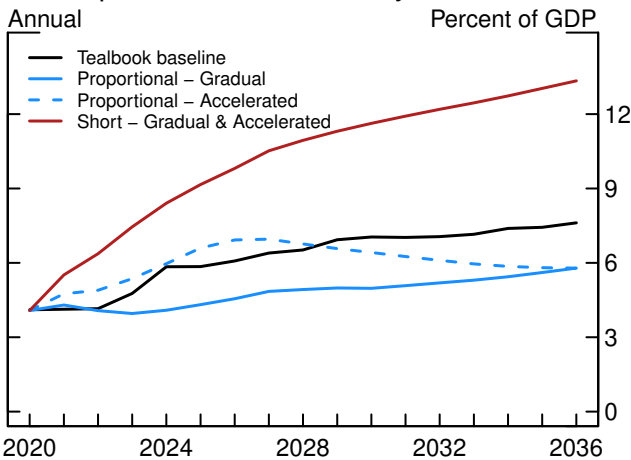
- **Long-run target portfolio compositions**
 - *Proportional*: similar to universe of Treasuries outstanding today
 - *Short*: similar to Treasuries outstanding today with residual maturity < 3 years
- **Transition approaches**
 - *Gradual*: open market purchases spread across target portfolio
 - *Accelerated*: open market purchases initially directed to T-bills

SOMA Treasury Portfolio Weighted Average Maturity (WAM)



Source: Board staff estimates.

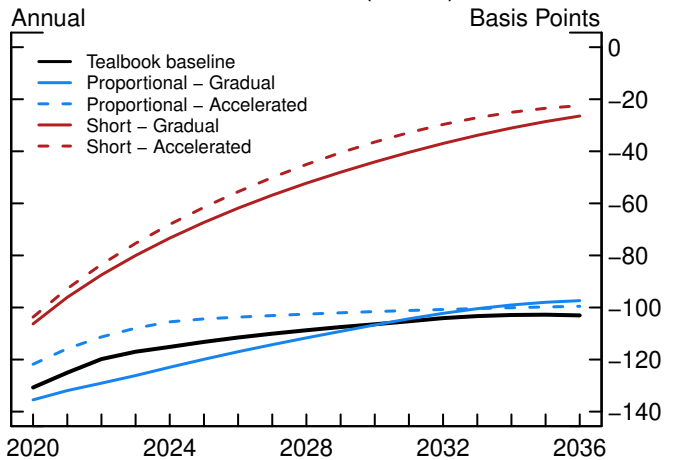
MEP Space in SOMA Treasury Portfolio



Note: MEP space is Treasury securities with <3 years of remaining maturity, relative to GDP.

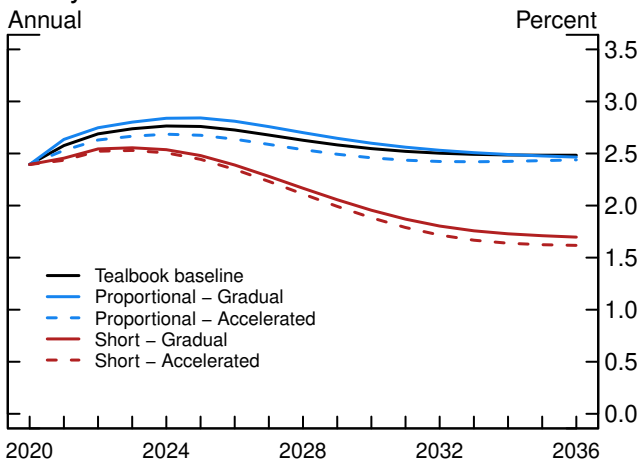
Source: Board staff estimates.

Total Term Premium Effect (TTPE)



Source: Board staff estimates.

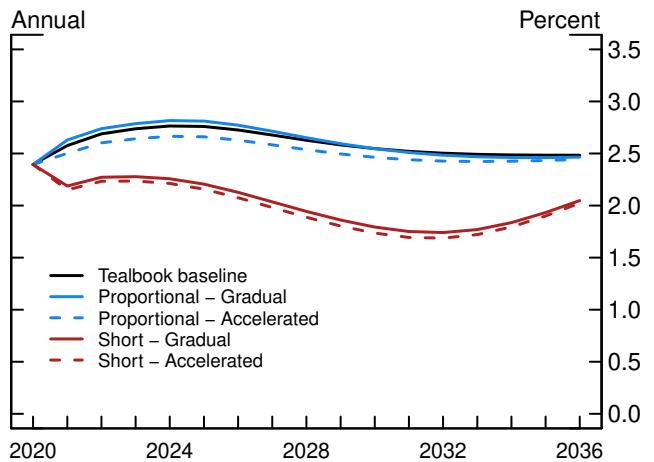
Policy Rate Paths



Note: Federal funds rate paths consistent with Tealbook baseline outcomes, assuming SOMA holdings do not affect composition of Treasury debt issuance.

Source: Board staff estimates.

Policy Rate Paths if Term Premium Effects Fade



Note: Federal funds rate paths consistent with Tealbook baseline outcomes, assuming SOMA holdings do not affect term premiums in the long run.

Source: Board staff estimates.

Appendix 2: Materials used by Mr. Potter and Ms. Logan

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Material for Briefing on

**Financial Developments and
Open Market Operations**

Lorie Logan and Simon Potter

Exhibits by Ashley Rhodes

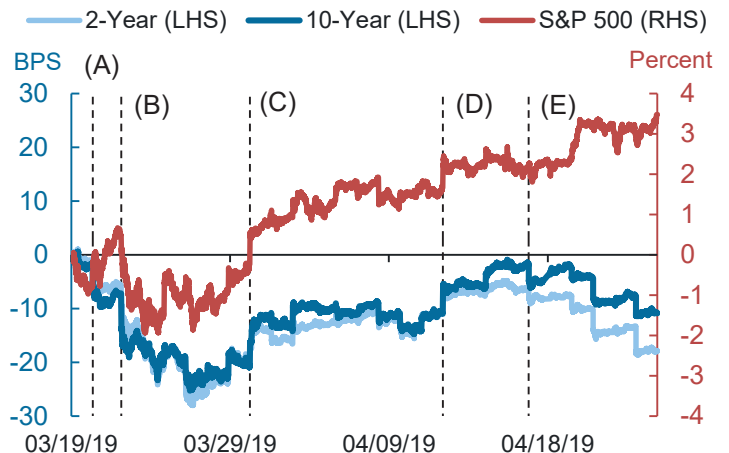
April 30, 2019

(1) Asset Price Changes*

	Since Mar. FOMC	Since Sep. FOMC	Current Level
2y Nominal Treasury Yield	-19 bps	-56 bps	2.28%
10y Nominal Treasury Yield	-11 bps	-60 bps	2.50%
5y, 5y Forward Inflation Comp.	+9 bps	-12 bps	2.03%
S&P 500 Index	+3.8%	+0.8%	2940
HY Credit Spreads	-23 bps	+42 bps	359 bps
Brent Crude Oil	+6.7%	-11.87%	\$72.15
Bloomberg Dollar Index	+1.2%	+2.3%	1204
VIX Index	-1 ppts	+0 ppts	13 ppts

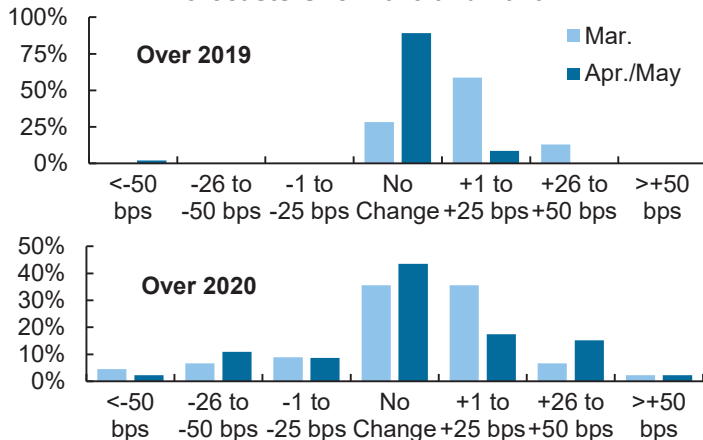
*Red indicates tightening in financial conditions, blue indicates loosening. Source: Barclays, Bloomberg, Federal Reserve Board

(2) Cumulative Changes in U.S. Treasury Yields and S&P 500 Index*



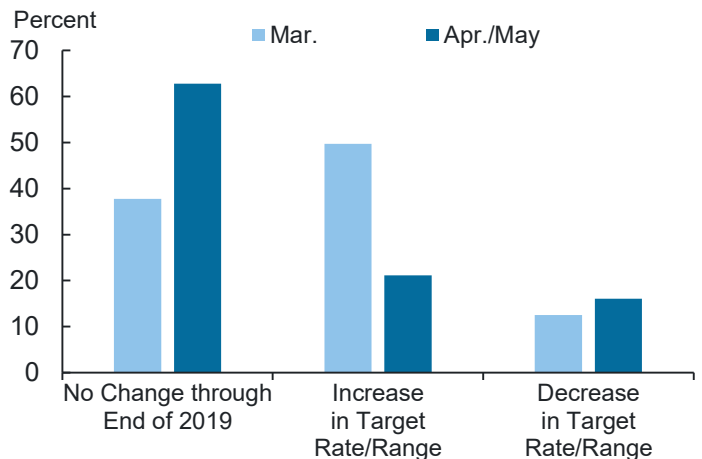
*Intraday data. (A) March FOMC (B) Euro area PMIs (C) Chinese PMI (D) Chinese aggregate financing data (E) US Retail Sales and euro area PMIs Source: Bloomberg

(3) Distribution of Net Changes in Modal Fed Funds Forecasts Over 2019 and 2020*



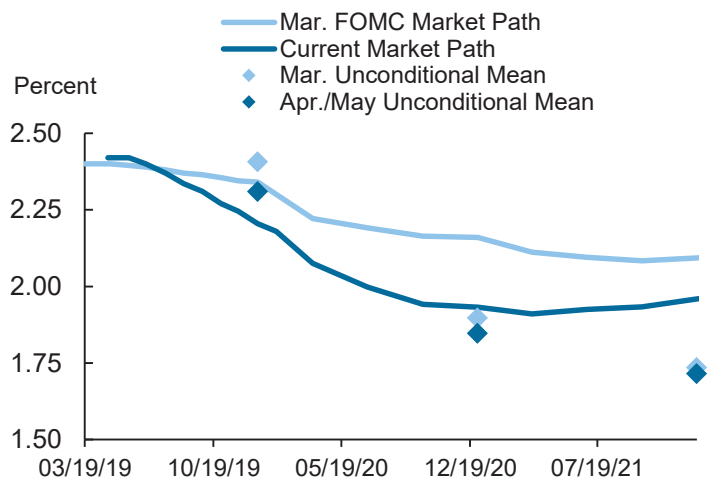
*Excludes 3 respondents who expect a hike or hikes followed by cuts in 2020. Based on a matched sample of respondents to the Survey of Primary Dealers and Market Participants. Source: FRBNY

(4) Average Probability of Next Policy Action Between Now and End 2019*



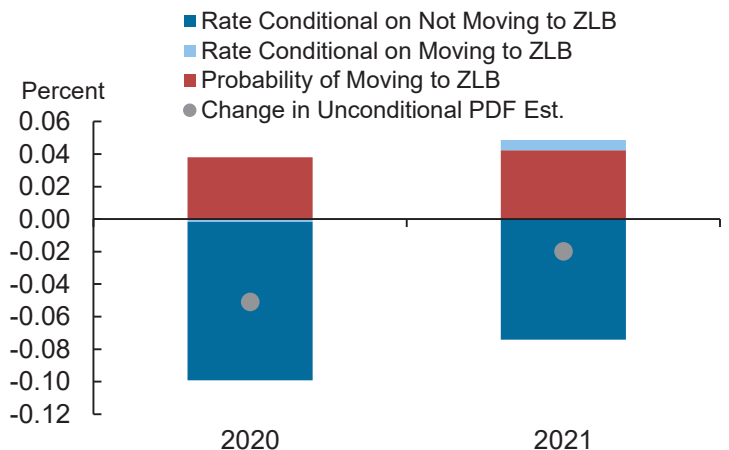
*Based on all responses to the Surveys of Primary Dealers and Market Participants. Source: FRBNY

(5) Survey- and Market-Implied Path of the Policy Rate*



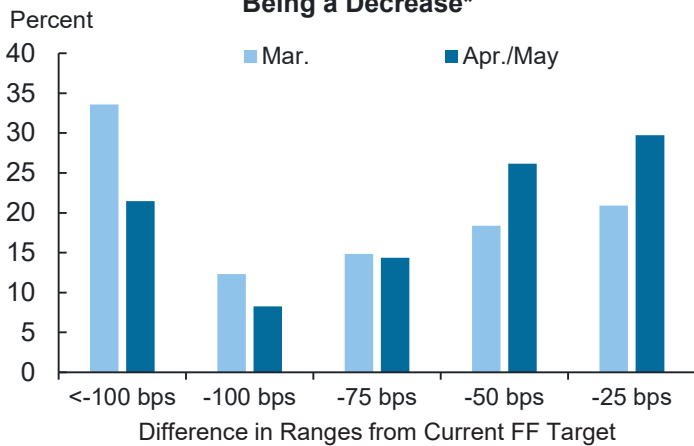
*Based on all responses to the Surveys of Primary Dealers and Market Participants. Source: FRBNY

(6) Decomposition of Changes in Unconditional Mean FF from Mar. to Apr./May*



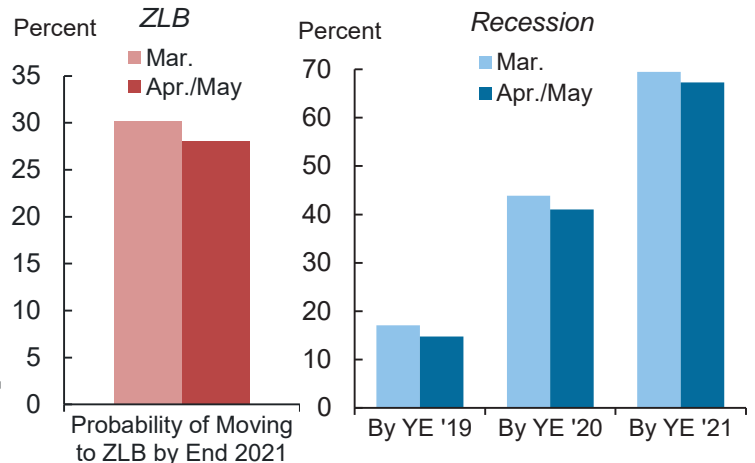
*Based on all responses to the Surveys of Primary Dealers and Market Participants. Source: FRBNY

(7) Average Probability Distribution of Year-End 2019 Target Federal Funds, Conditional on the Next Change Being a Decrease*



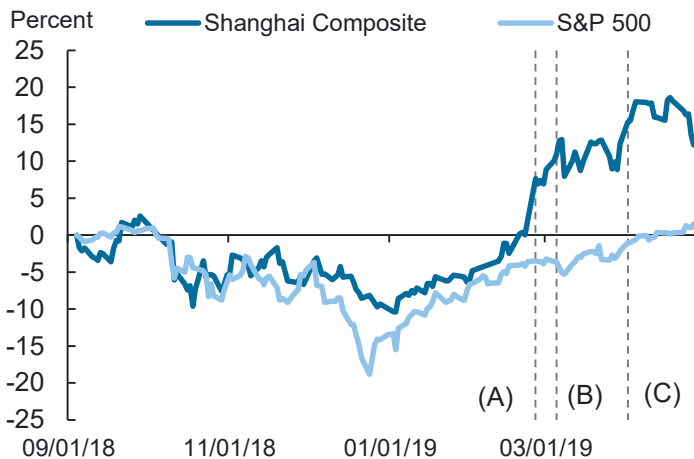
*Based on all responses to the Surveys of Primary Dealers and Market Participants. <- 100 bps bucket is sum of ≤0.5%, 0.51-0.75%, 1.01-1.25%. Source: FRBNY

(8) Average Probability of Moving to the ZLB and Probability of Year in Which US First Enters a Recession*



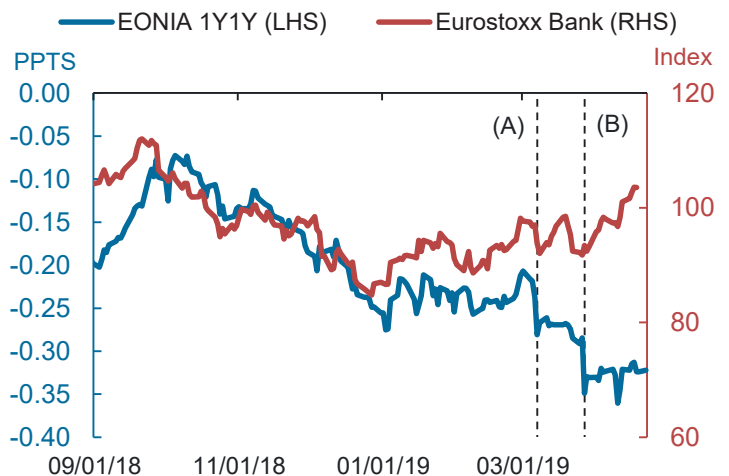
*Based on all responses from the Surveys of Market Participants and Primary Dealers. NBER-defined recession. Source: FRBNY

(9) Cumulative Percent Changes in Shanghai Composite and S&P 500 Index



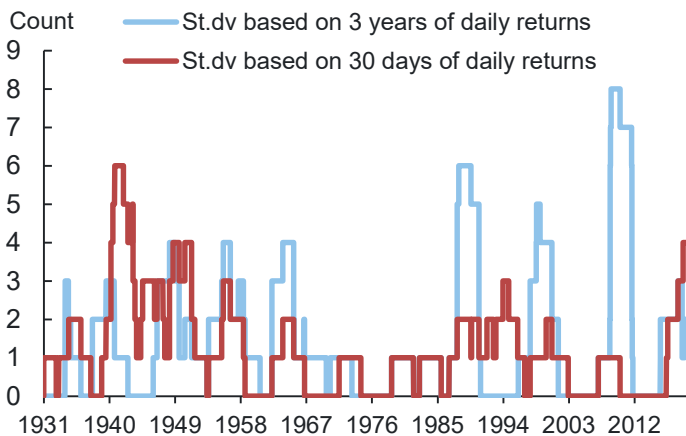
(A) Reported progress in U.S.-China trade negotiations (B) Announcement of Chinese Fiscal Measures (C) Chinese PMI Source: Bloomberg

(10) 1-Year, 1-Year Forward EONIA Futures and Eurostoxx Bank Index



(A) March ECB Meeting (B) ECB Deposit Rate Tiering Discussion Source: Bloomberg

(11) Measure of Frequency of “Volatility Events” in the S&P 500*



*“Volatility Events” defined as one-day returns being five standard deviations away from the daily average return of the preceding 30 days (red line) and 3 years (blue line). Source: Bloomberg, Desk Calculations

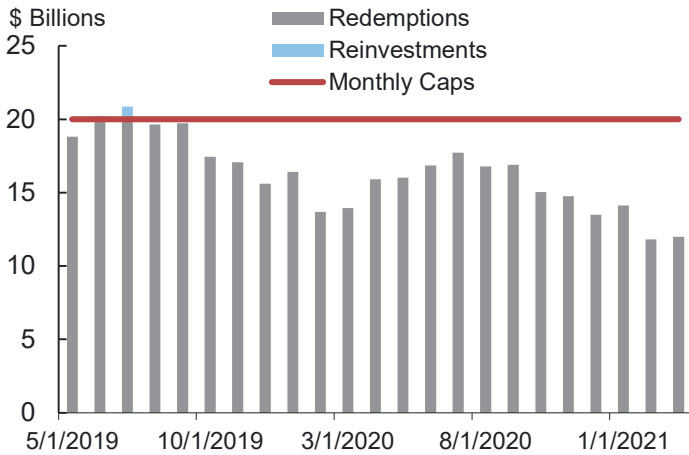
(12) Insights from Structured Outreach to Market Participants

- Growing market debate regarding volatility “events”:
 - Becoming more frequent or difficult to measure and count?
 - What drives volatility events: changes in market structure or typical response to uncertainty and shocks?
- Observations on systematic strategies (little human discretion):
 - Reduce (add) positions with high (low) volatility in a pro-cyclical way
 - Heterogeneity of investment horizons and volatility triggers
 - Assets under management much smaller than those of managed funds

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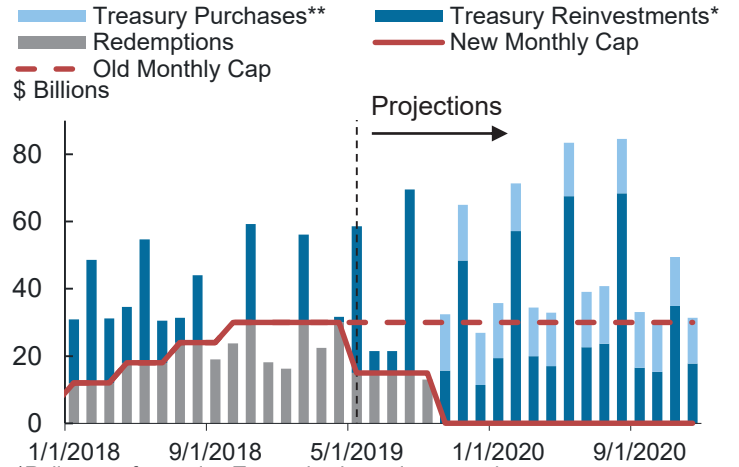
Exhibit 3

(13) Projected SOMA MBS Redemptions and Reinvestments*



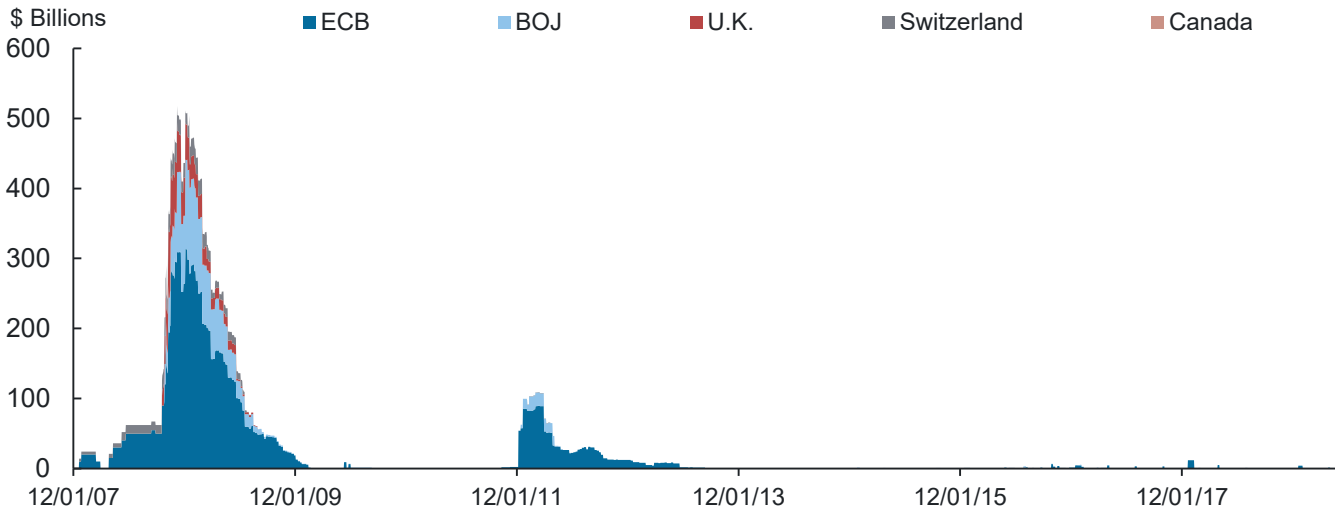
*Starting in October '19, MBS principal receipts below the cap will be reinvested into Treasury securities.
Source: BlackRock, Desk Calculations, FRBNY

(14) Realized and Projected SOMA Treasury Security Redemptions, Reinvestments, and Purchases



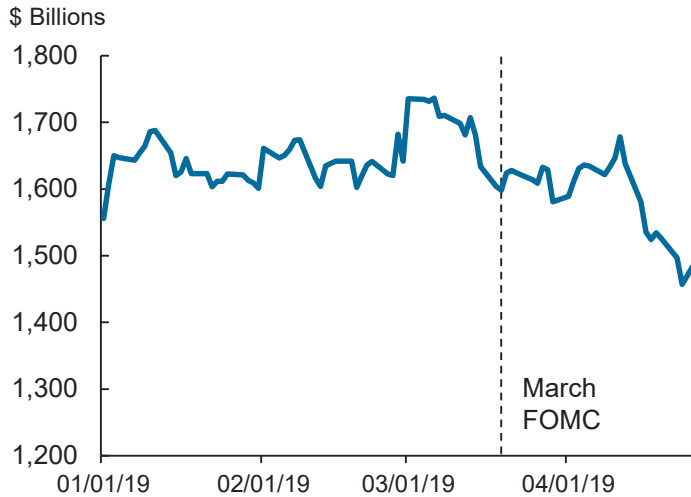
*Rollovers of maturing Treasuries into primary market.
**Secondary market purchases reinvesting MBS principal receipts.
Source: Desk Calculations, FRBNY

(15) FX Swaps Outstanding



Source: FRBNY

(16) Reserve Balances of Depository Institutions



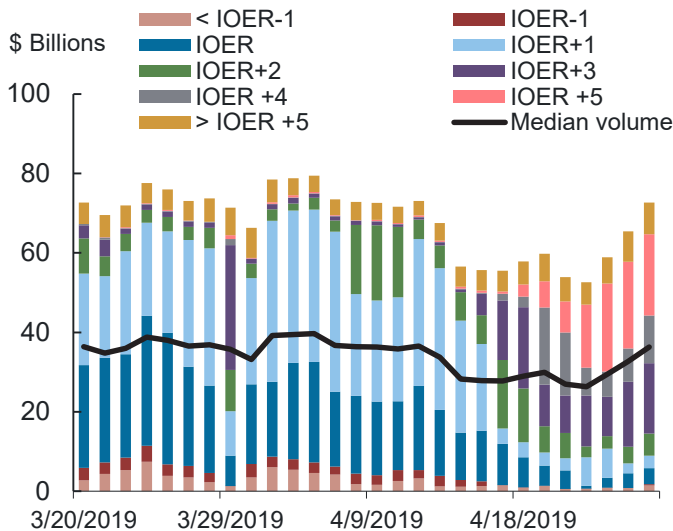
Source: Federal Reserve System H.4.1 Statistical Release

(17) Federal Reserve Balance Sheet (\$ Billions)

Assets	3/20/2019 Level	4/26/2019 Level	Change
Treasuries	2,175.5	2,153.7	-21.8
MBS and Agency Debt	1,601.9	1,577.8	-24.1
Other	185.3	187.9	2.5
Total Assets	3,962.7	3,919.4	-43.4
Liabilities and Capital			
Reserves	1,623.8	1,473.4	-150.5
TGA	314.7	401.2	86.4
Fed Reserve Notes	1,674.5	1,679.5	5.0
Other	349.7	365.3	15.6
Total Liabilities and Capital	3,962.7	3,919.4	-43.4

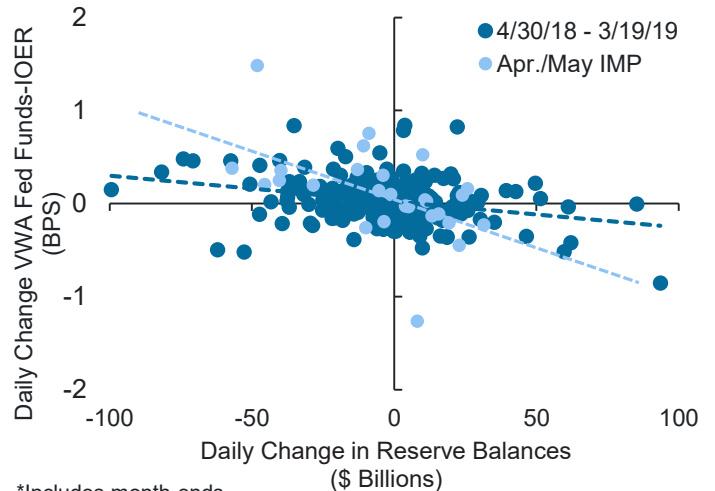
Source: Federal Reserve System H.4.1 Statistical Release

(18) Fed Funds Volume Rate Distribution



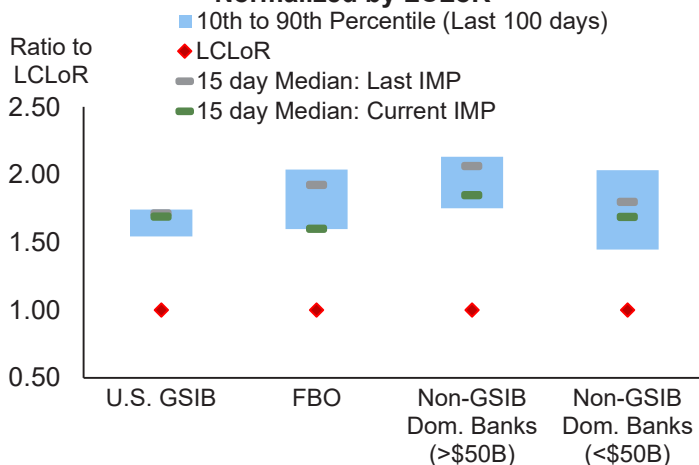
Source: FR2420

(19) Daily Change in Reserve Balances vs. Daily Change in Volume Weighted Average FF – IOER Spread*



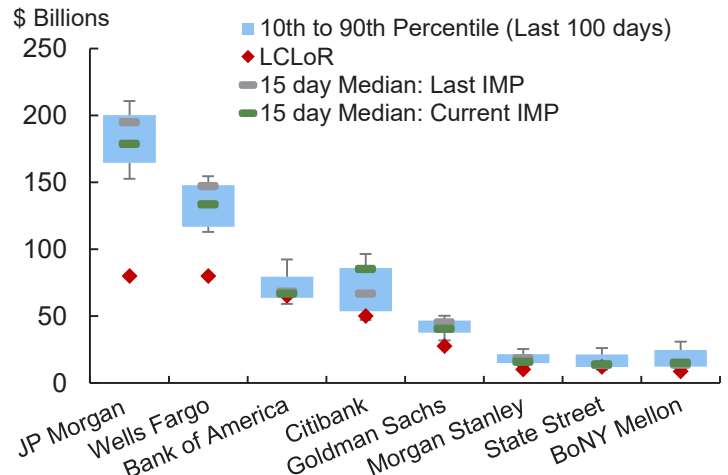
*Includes month-ends. Source: FRBNY

(20) SFOS Surplus Reserves by Bank Category Normalized by LCLoR*



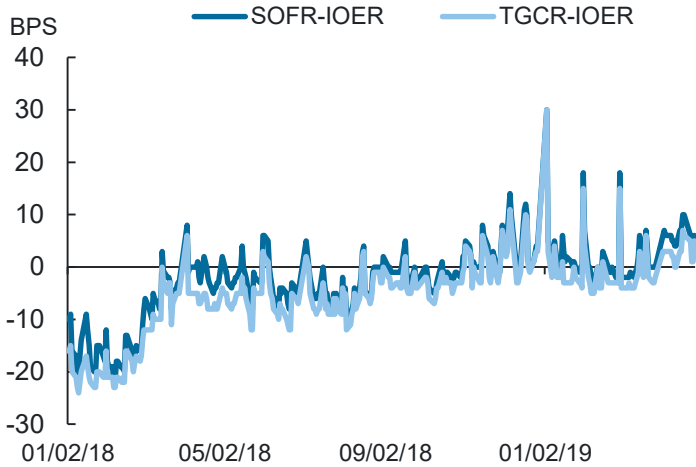
*LCLoR is Lowest Comfortable Level of Reserves. LCLoR and reserve balances are divided by LCLoR. Date Range is 1/15/19 to 4/24/19. Source: 2019 H1 Senior Financial Officer Survey, NRBL

(21) U.S. GSIB Reserve Levels Relative to LCLoR*



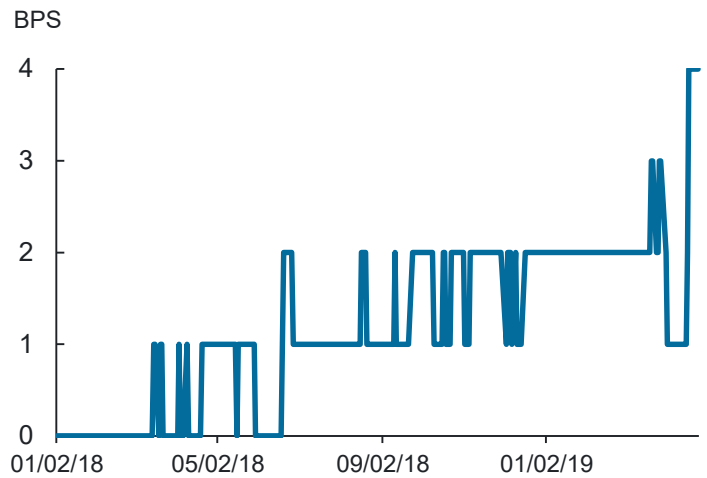
*LCLoR is Lowest Comfortable Level of Reserves. Date Range is 1/15/19 to 4/24/19. Source: 2019 H1 Senior Financial Officer Survey, NRBL

(22) SOFR and TGCR Spreads to IOER*



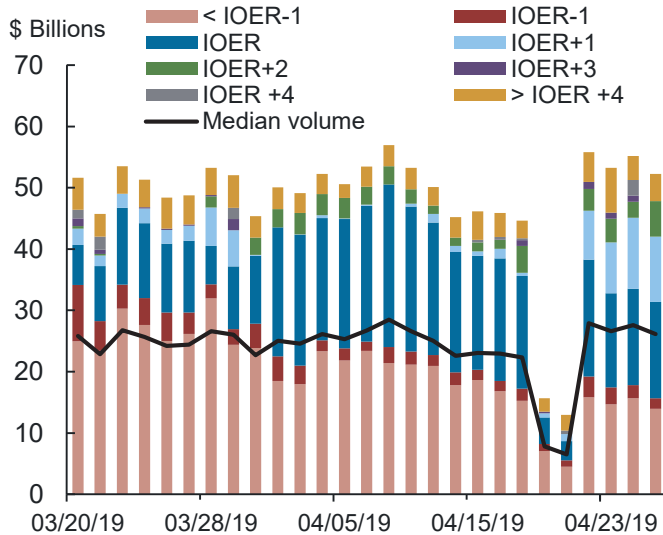
*Excludes day before quarter-ends, quarter-ends, and day after quarter-ends.
Source: FRBNY

(23) Effective Fed Funds Rate – Volume Weighted Median Eurodollar Rate Spread*



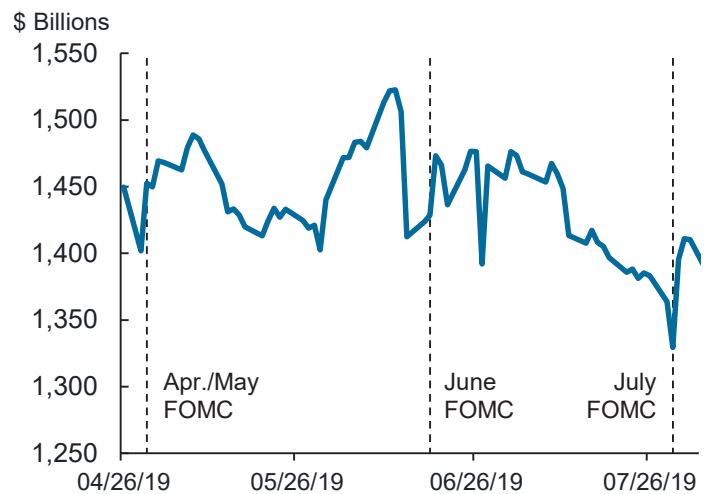
*Excludes month-ends.
Source: FR2420

(24) Eurodollar Volume Rate Distribution



Source: FR2420

(25) Projected Reserve Levels



Source: Desk Calculations, FRBNY

(26) Policy Considerations

1. Staff assesses that a 5 basis point technical adjustment to Interest on Required Reserves (IORR) and Interest on Excess Reserves (IOER) rates would be appropriate at this time, lowering both rates to 2.35 percent. If implemented, IOER would be 15 bps below the top of the target range and 10 bps above the bottom of the range and ON RRP.
2. A technical adjustment would provide time for the FOMC to learn more about the effects of distributional frictions on money market rates, and whether the gentle slope steepens further as reserves fall to new lows.
3. This would reduce the spread between IOER and ON RRP to 10 bps, the smallest since the introduction of the ON RRP facility. If it becomes appropriate in the future to further lower the IOER rate to foster trading in the federal funds market well within the target range, the Committee might first consider where to set the ON RRP offer rate relative to the range.
4. If a technical adjustment is implemented, this would be the first time such an adjustment would occur without a simultaneous increase in the target range. Even so, a change at this time, rather than between meetings, would have the benefit of concurrent communications at the Chair's press conference emphasizing the change as a technical adjustment and not a change in the stance of policy.

Appendix 1

(1) Summary of Operational Testing

Summary of Operational Tests in prior period:

- Domestic Authorization
 - March 21 to April 23: Outright MBS TBA purchases for \$340 million, total
 - April 2 and 3: MBS dollar roll sales for \$20 million, total
 - April 4: Outright UMBS purchase for \$13 million, total*
 - April 24: Treasury bill purchase for \$100 million
- Foreign Authorization
 - April 9: Euro-denominated sovereign debt sale to private counterparties for €1 million
 - April 16: Yen-denominated sovereign debt sale to private counterparties for ¥100 million

Upcoming Operational Tests:

- Seven tests scheduled under the Domestic Authorization
 - May 2 to May 13: Outright MBS TBA purchases for up to \$145 million**
 - May 7 and 8: Coupon swap with unsettled agency MBS holdings for \$20 million, total
 - May 8: Term repo for no more than \$75 million
 - May 13: Overnight repo for no more than \$75 million
 - May 15: Term reverse repo for no more than \$175 million
 - May 15: Treasury outright sale for up to \$50 million
 - May 21: Overnight reverse repo with MBS collateral for no more than \$175 million
 - June (TBD): Treasury bill rollover, TBD***
- One test scheduled under the Foreign Authorization
 - May 22: Canadian dollar liquidity swap for CAD 51,000

*The Desk conducted a purchase of the new Single Security UMBS TBA contract for June settlement. This operation was done separately from the regular monthly small value agency MBS purchases.

**For monthly Agency MBS reinvestment periods where principal receipts are below the cap, the Desk will conduct up to \$300 million of small value outright purchases, though due to our operational planning timeline, purchases for the next intermeeting period are only scheduled through May 13th as this point. Monthly reinvestment periods run from the 10th business day of the current month to the 9th business day of the following month.

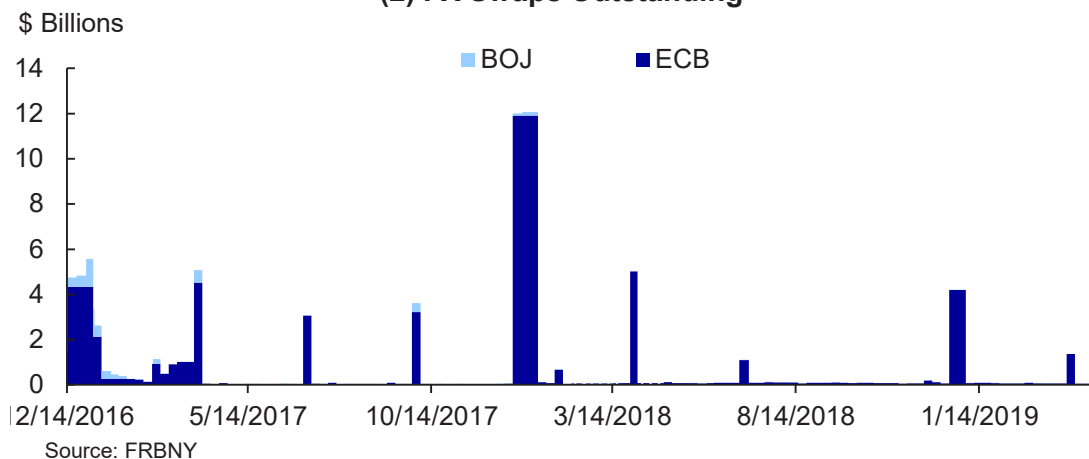
***The date and amount of the rollover is dependent on the small value Treasury outright sale scheduled for May 15th.

Appendix 2

(1) MBS Purchase Summary Since Cap Implementation (\$ Millions)

Period	Cumulative Actual Paydowns	Cumulative Reinvestment Purchases	Cumulative Net Deviations
Oct. 2017 - Sep. 2018	272,235	152,295	60

(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 3: Materials used by Ms. Tevlin

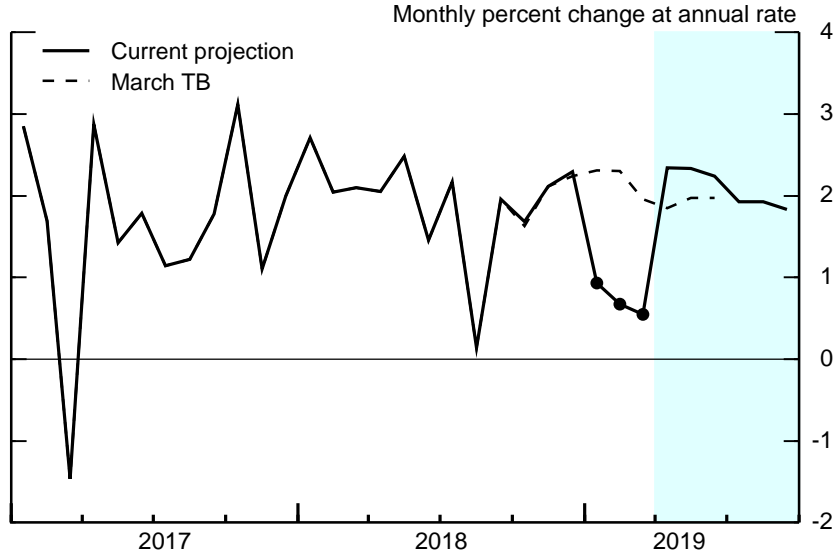
Class II FOMC - Restricted (FR)

Material for Briefing on
The U.S. Outlook

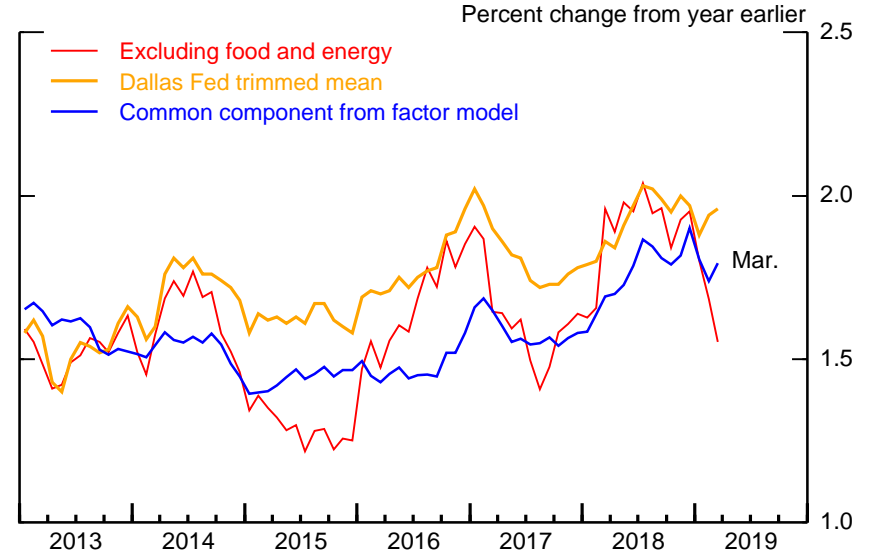
Stacey Tevlin
Exhibits by Bo Yeon Jang and Rosemary Rhodes
April 30, 2019

Latest Data on Inflation and GDP

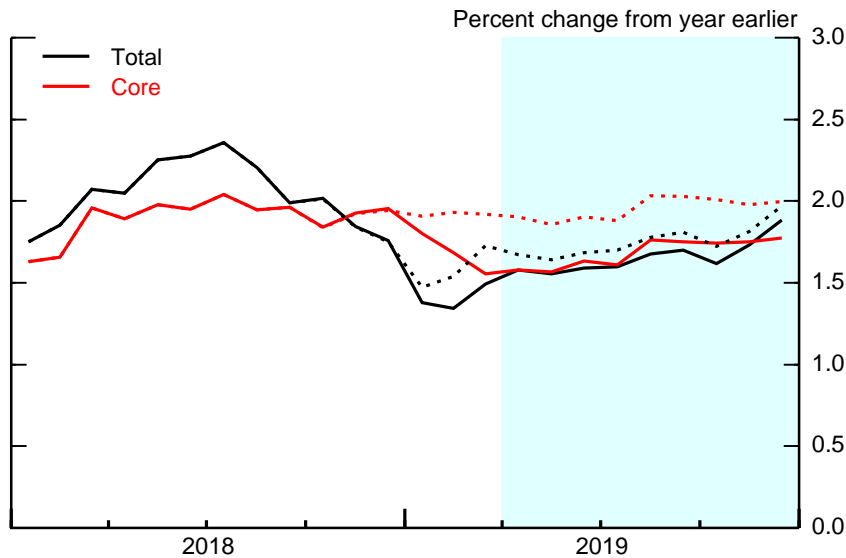
1. Monthly Core PCE Price Inflation



2. Alternative Measures of PCE Price Inflation



3. PCE Price Inflation



Note: Dotted lines are March TB projections; solid lines are current projections.

4. Near-term GDP Forecast

	2018	2019		Avg.*
	Q4	Q1 ^e	Q2 ^f	
1. Real GDP**	2.2	3.2	1.7	2.3
2. (March TB)	(2.6)	(1.0)	(2.6)	(2.1)
Contributions from***				
3. PDPF	2.2	1.1	1.7	
4. (March TB)	(2.5)	(0.8)	(2.3)	
5. Government	-0.1	0.4	0.6	
6. Inventory investment	0.1	0.7	0.1	
7. Net exports	-0.1	1.0	-0.8	

* Average percent change at annual rate for three quarters shown.

** Percent change at annual rate. *** Percentage points.

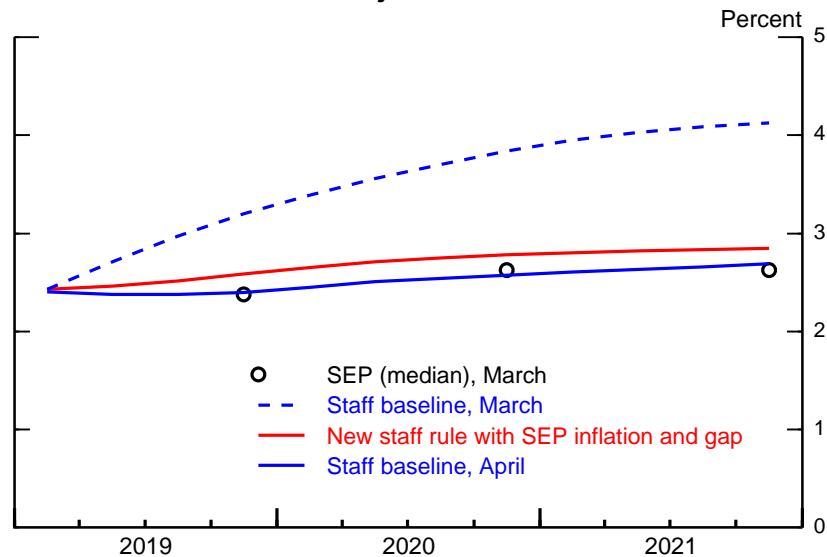
e. Staff estimate. f. Staff forecast.

A New Policy Rule

5. Objectives for Policy Rule

- A transparent mechanism
- Unchanging from round to round
- Consistent with FOMC communications
- Yields a reasonable projection

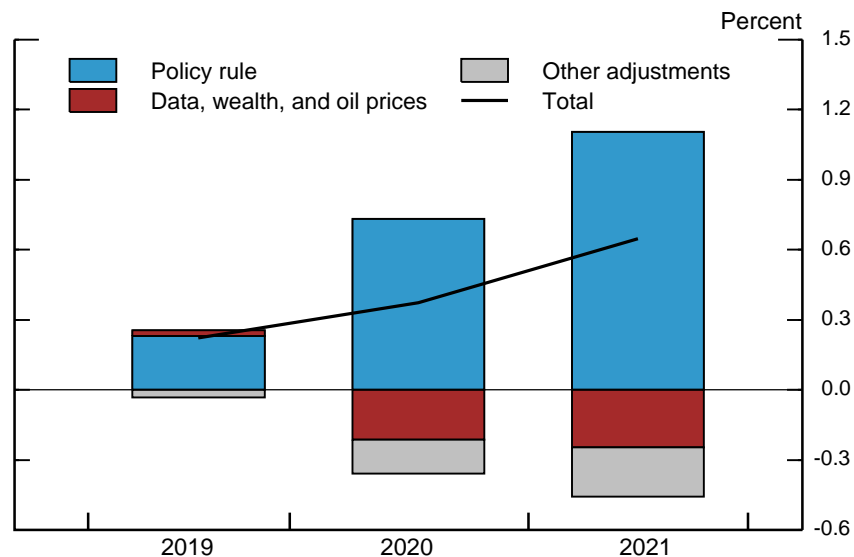
6. Federal Funds Rate Projections



7. Modifications to the Policy Rule

- Considered several alternatives
- Down-weighted output gap
- Not necessarily optimal policy
- Not likely to align with FOMC actions under all conditions

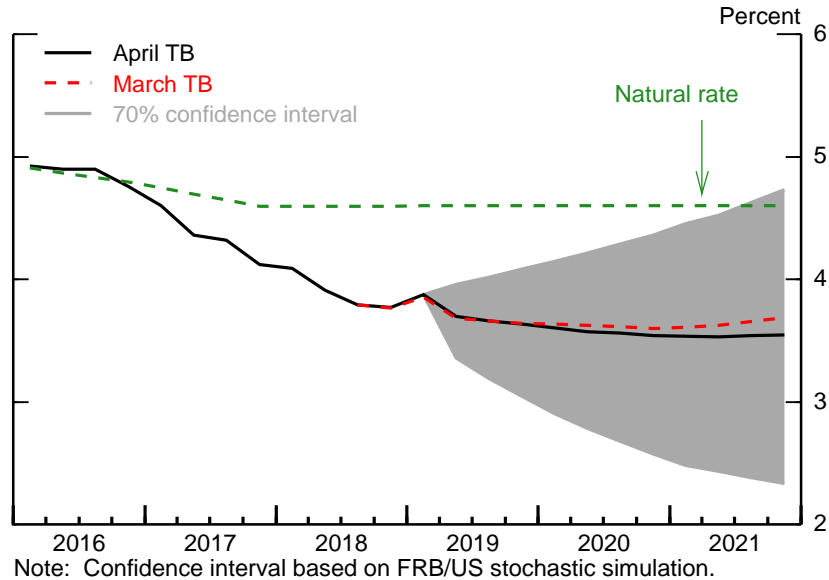
8. Sources of Revisions to the GDP Outlook



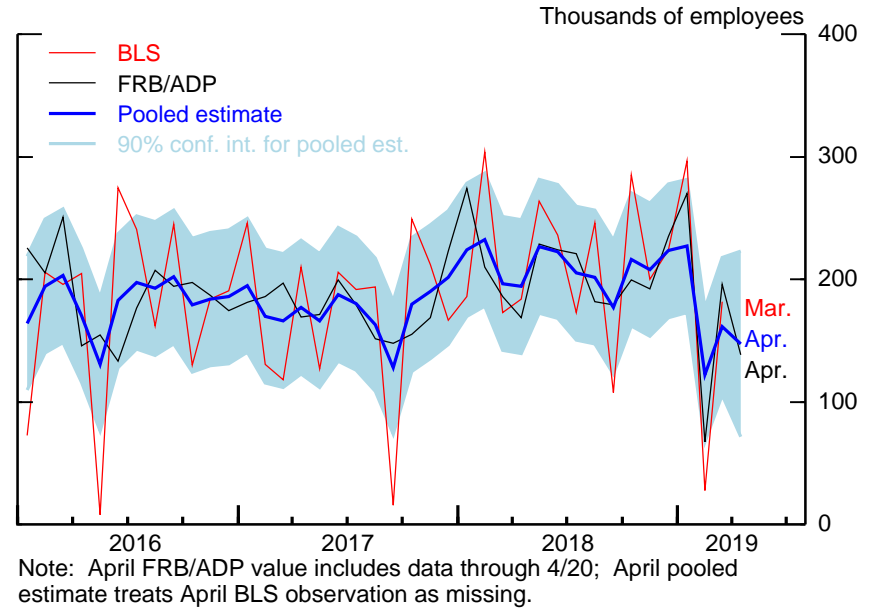
Note: Each contribution gives the effect on the level of real GDP in the fourth quarter of the specified year.

Labor Market and Inflation

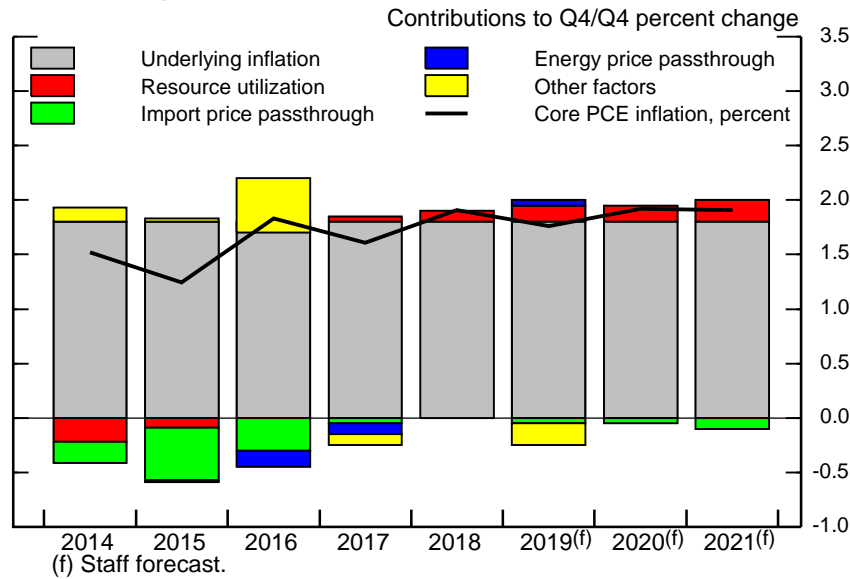
9. Unemployment Rate



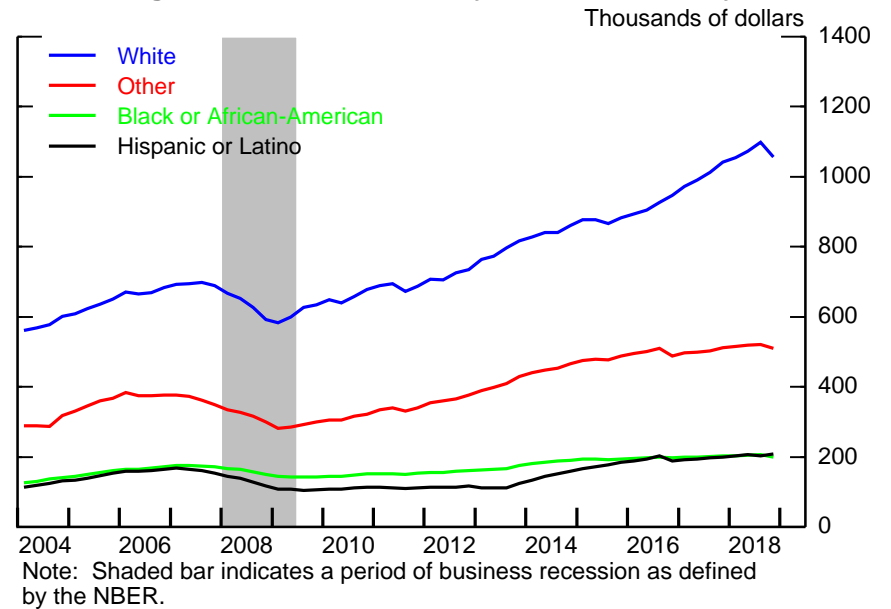
10. Estimates of Private Nonfarm Payroll Gains



11. Decomposition of Core PCE Price Inflation



12. Average Household Wealth by Race or Ethnicity



Appendix 4: Materials used by Ms. Wilson

Class II FOMC – Restricted (FR)

Material for Briefing on

The International Outlook

Beth Anne Wilson

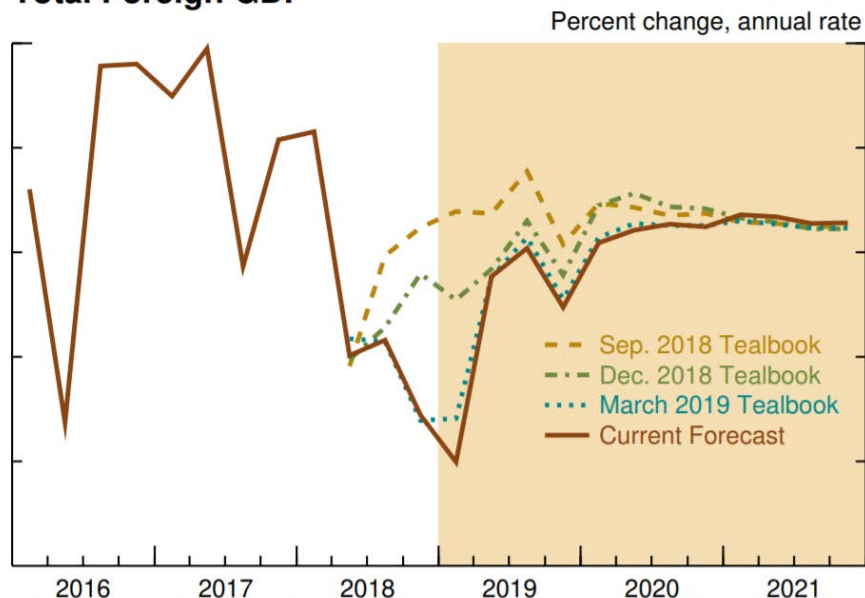
Exhibits by Mandy Bowers

April 30, 2019

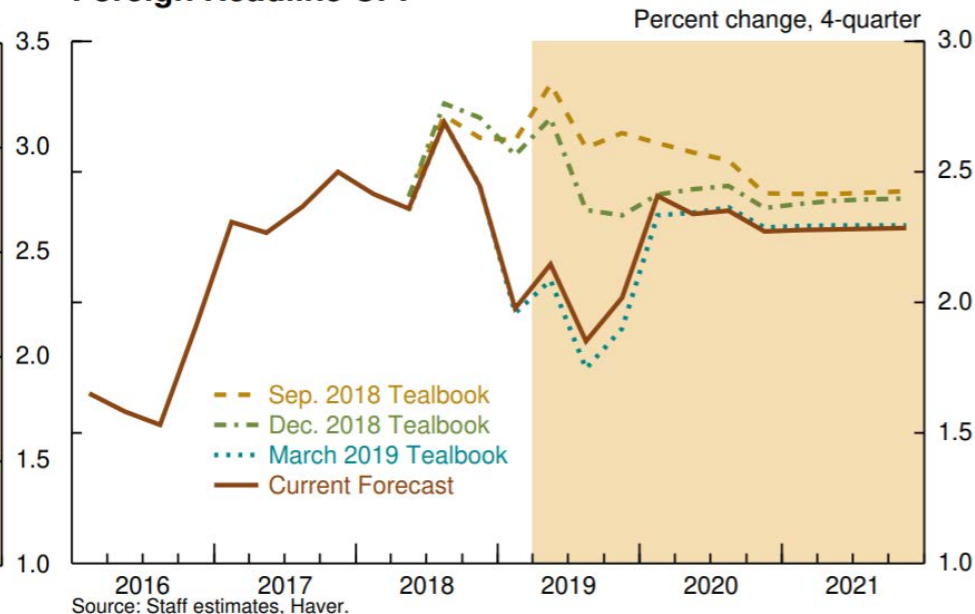
Foreign GDP and Inflation

- Incoming data mixed, but suggest global economy may be bottoming out.
- Inflation, due to oil prices, looks a touch better.
- Although medium-term risks endure, near-term risks have waned.
- That said, path of underlying GDP growth and inflation is more subdued.

Total Foreign GDP*



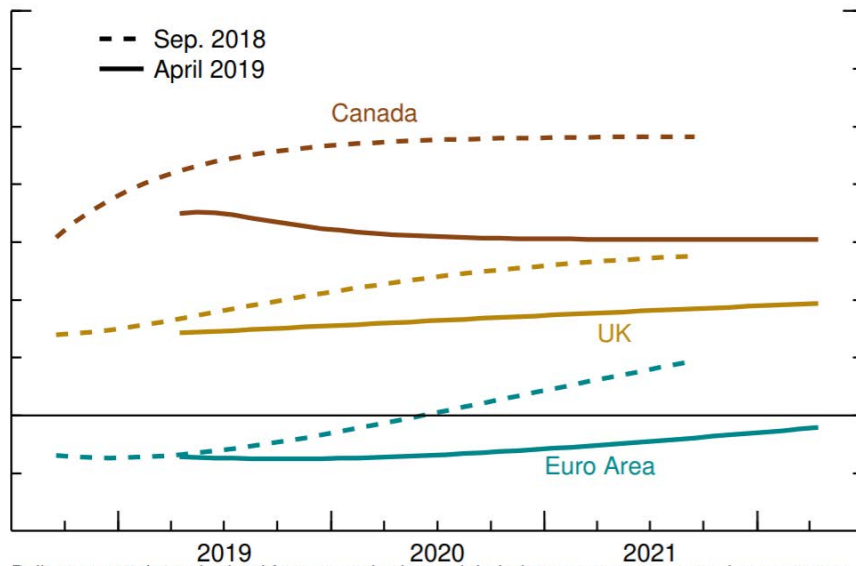
Foreign Headline CPI



Monetary Policy

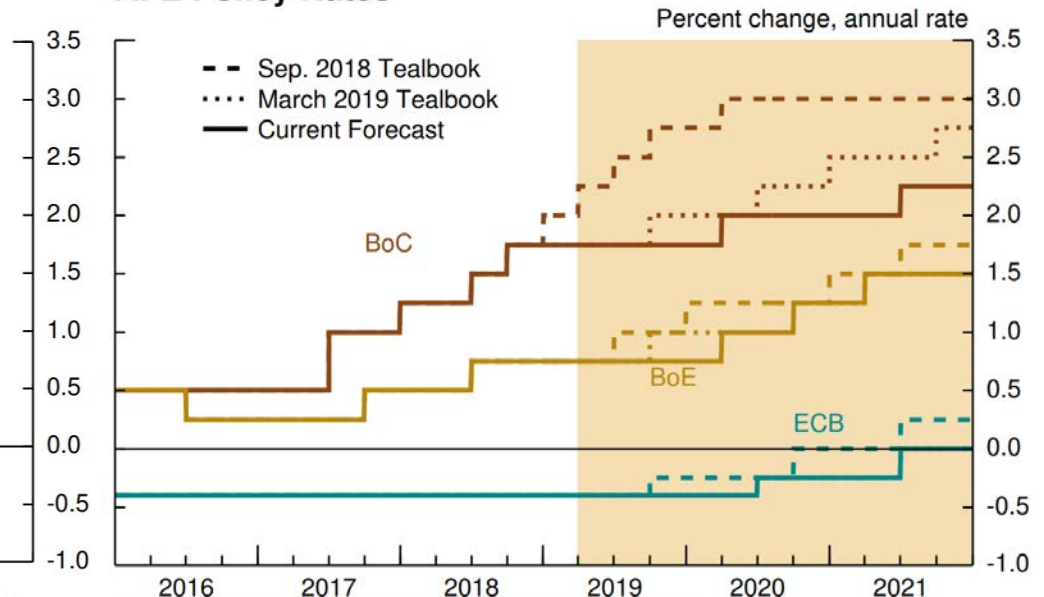
- Significantly more monetary policy accommodation underpins outlook than in September.

Policy Expectations



Policy expectations obtained from smoothed overnight index swap curves assuming zero term premiums. Sep. 25, 2018 and April 29, 2019 shown. Source: Bloomberg, staff estimates.

AFE Policy Rates

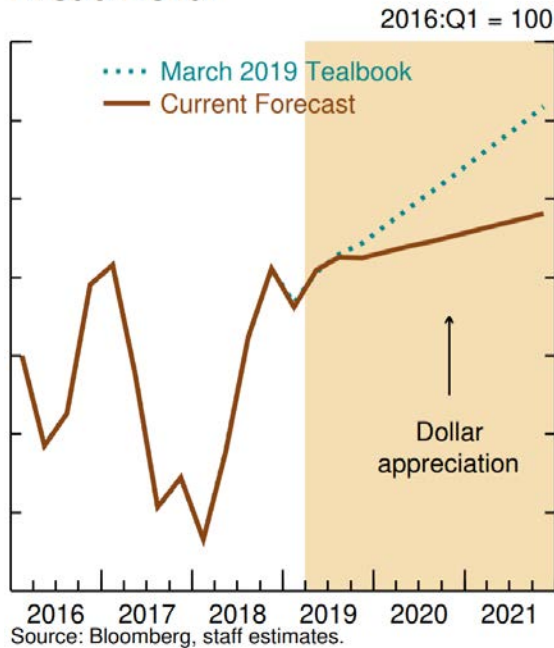


Source: Central bank monetary policy statements, staff estimates.

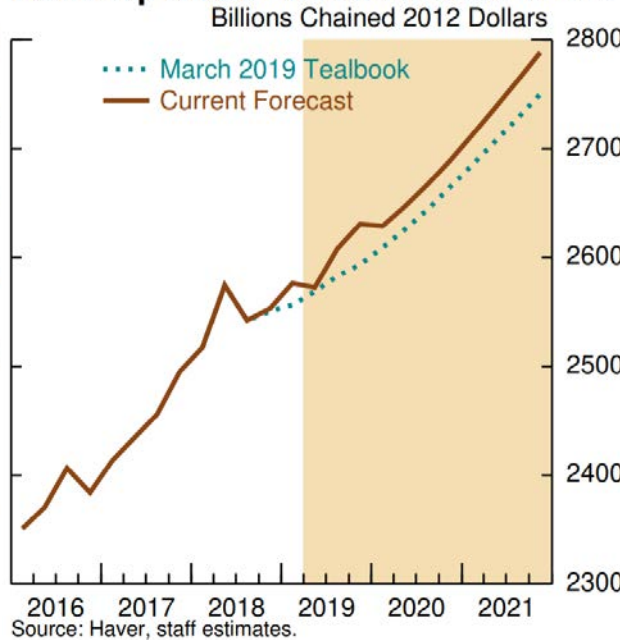
Impact of Domestic Revisions

- More robust U.S. outlook and lower interest rates
 - Boost foreign GDP
 - Lessen dollar appreciation
 - Raise exports and weigh on imports

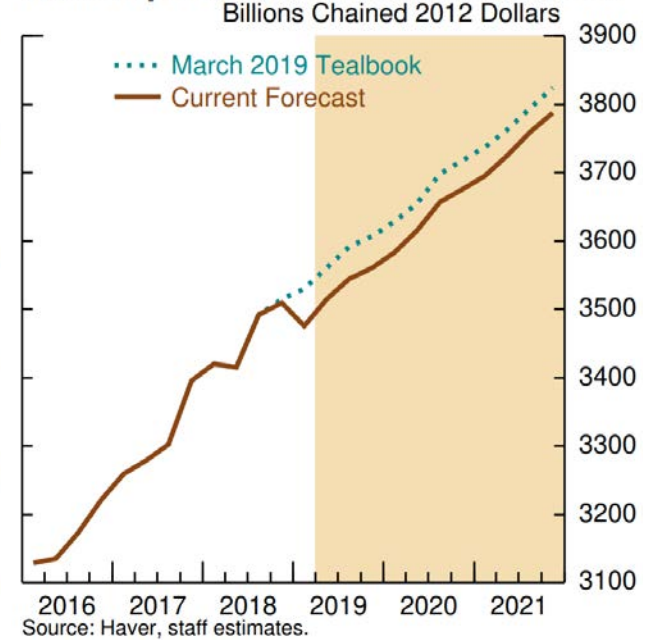
Broad Dollar



Real Exports of Goods and Services



Real Imports of Goods and Services

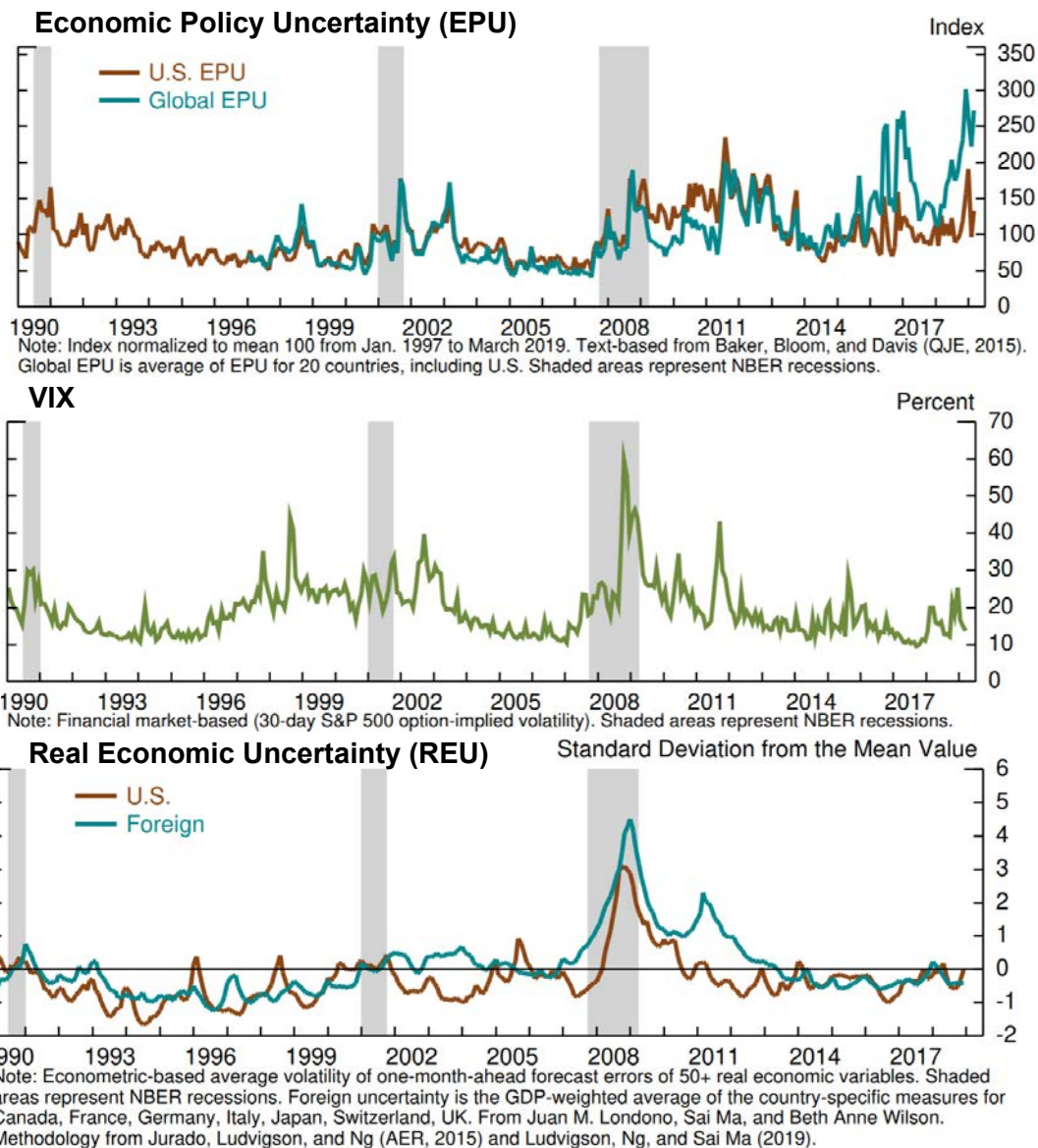


A GRUV-Y Literary Interlude

- April 30, 1859, marked the first installment of Dickens' "A Tale of Two Cities."
 - "It was the best of times, it was the worst of times, it was the age of wisdom, it was the age of foolishness, it was the epoch of belief, it was the epoch of incredulity, it was the season of Light, it was the season of Darkness, it was the spring of hope, it was the winter of despair, we had everything before us, we had nothing before us, we were all going direct to heaven, we were all going direct the other way."
 - Dickens: Confused or two-handed?
- Global Risk, Uncertainty, and Volatility (GRUV) network shares research and thinking on sources, measurement, and impact of uncertainty.
- Two important international-related sources of uncertainty:
 - Foreign economic growth
 - Trade policy

A Tale of Foreign Economic Uncertainty

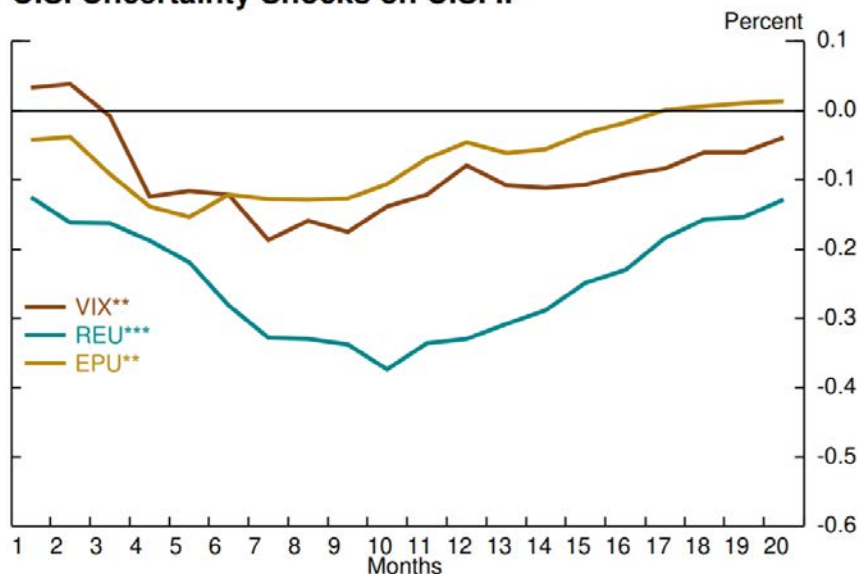
- Uncertainty metrics
 - Economic Policy Uncertainty (EPU)
 - VIX
 - Real Economic Uncertainty (REU)
 - Measures predictability of economy.
 - Jurado, Ludvigson, and Ng (AER, '15)
- Foreign REU
 - Construct forecasts for a broad range of indicators for foreign G7 economies and Switzerland
 - Calculate volatility of forecast errors.
- EPU and VIX moved up notably recently, REU more subdued.



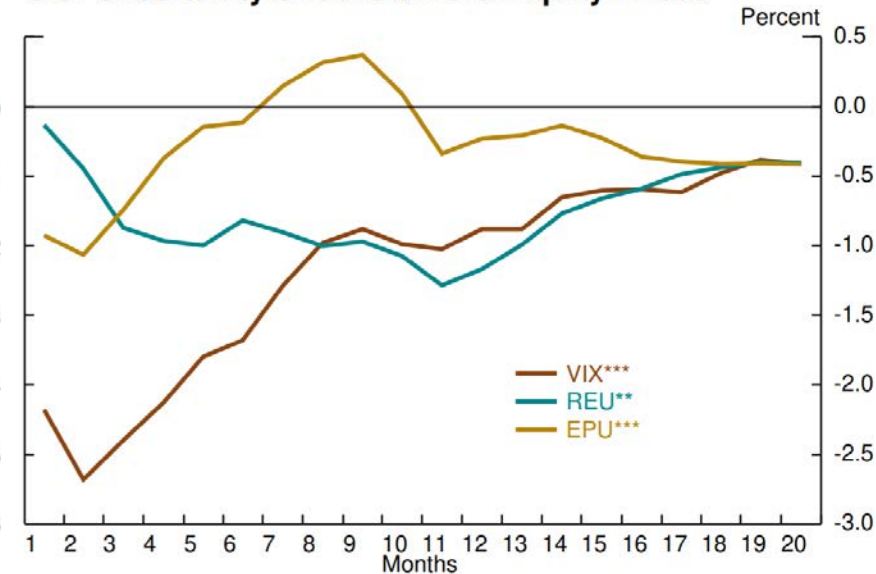
Effect of U.S. Uncertainty

- Higher U.S. uncertainty associated with a decline in IP.
 - Decline is more pronounced and statistically significant for shock to real economic uncertainty.
- All measures weigh on equity prices.

U.S. Uncertainty Shocks on U.S. IP



U.S. Uncertainty Shocks on U.S. Equity Prices

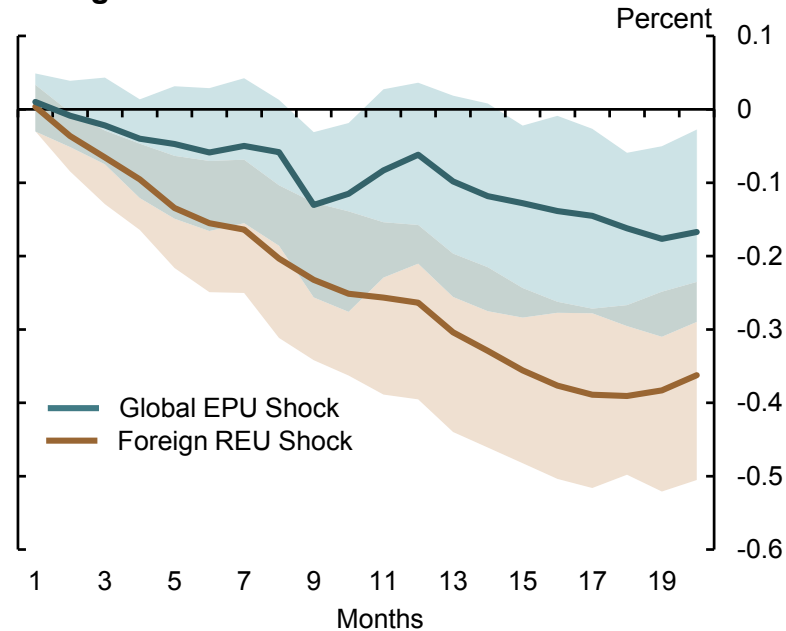


Note: Shows change in log U.S. IP and change in log S&P 500 prices, respectively, following a one-standard deviation change in uncertainty. VAR is estimated using Cholesky Decomposition. Order of variables in VAR: (Uncertainty measure, log S&P500 index, Fed Fund Rates, log U.S. Employment, log U.S. CPI, log U.S. IP). Sample 1985m1 to 2018m12. *, **, and *** denotes significance at the 10, 5, and 1% level for the maximum (negative) effect.

Foreign Uncertainty Pass-through to U.S.

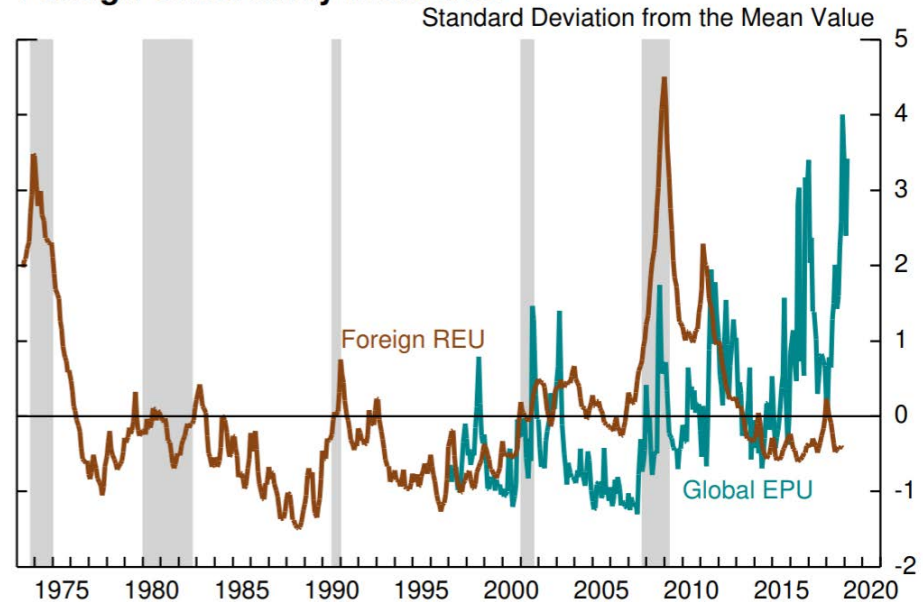
- Foreign real economic uncertainty has significant negative effect on U.S. IP.

Foreign REU and Global EPU shocks on U.S. IP



Note: Shows change in log U.S. IP following a one-standard deviation change in foreign REU or global EPU. Order of variables in VAR for REU: (VIX, Foreign REU, U.S. REU, log S&P500 index, Fed Fund Rates, log U.S. Employment, log U.S. CPI, log U.S. IP). Sample 1973m5 to 2018m12. Order of variables in VAR for EPU: (Foreign EPU, U.S. EPU, log S&P500 index, Fed Fund Rates, log U.S. Employment, log U.S. CPI, log U.S. IP). Sample 1997m1 to 2018m12. Bootstrapped 68% Confidence Bands.

Foreign Uncertainty Measures

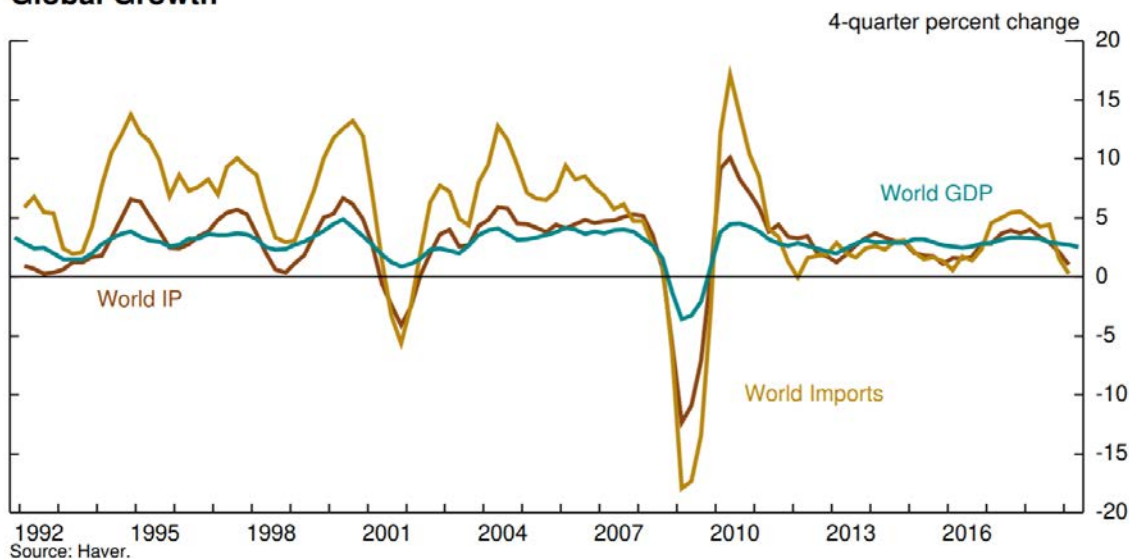


Note: GDP-weighted, one-month ahead uncertainty. Shaded areas represent NBER recessions. Global EPU is text-based average of 20 countries, including U.S., from Baker, Bloom, and Davis (QJE, 2015). Global EPU data Jan. 1997 to March 2019. Foreign REU Countries: Canada, France, Germany, Italy, Japan, Switzerland, UK. Foreign REU Data May 1973 to Dec. 2018. REU Source: Londono, Ma, and Wilson.

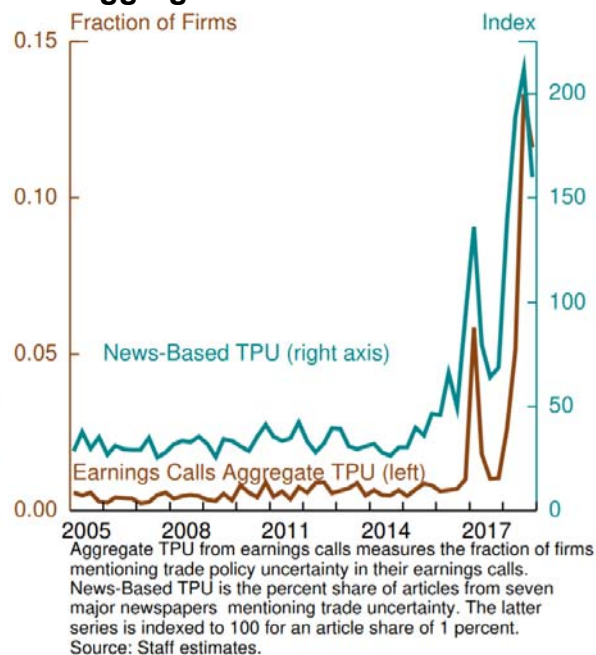
A Tale of Trade Policy Uncertainty

- World GDP, IP, and imports have slowed sharply.
- And trade policy uncertainty (TPU) has soared.
- What is the quantitative impact of the spike in uncertainty?

Global Growth



Aggregate TPU



Three Approaches to Assessing TPU Effect

- (1) Aggregate VAR – extend TPU to capture variation in the 1960s and 1970s.
- (2) Firm-level Regressions – exploit sizable firm-level variation.
- (3) DSGE model w/tariffs, retaliation, and uncertainty – assume lengthy anticipation of tariff hikes and general rise in uncertainty.

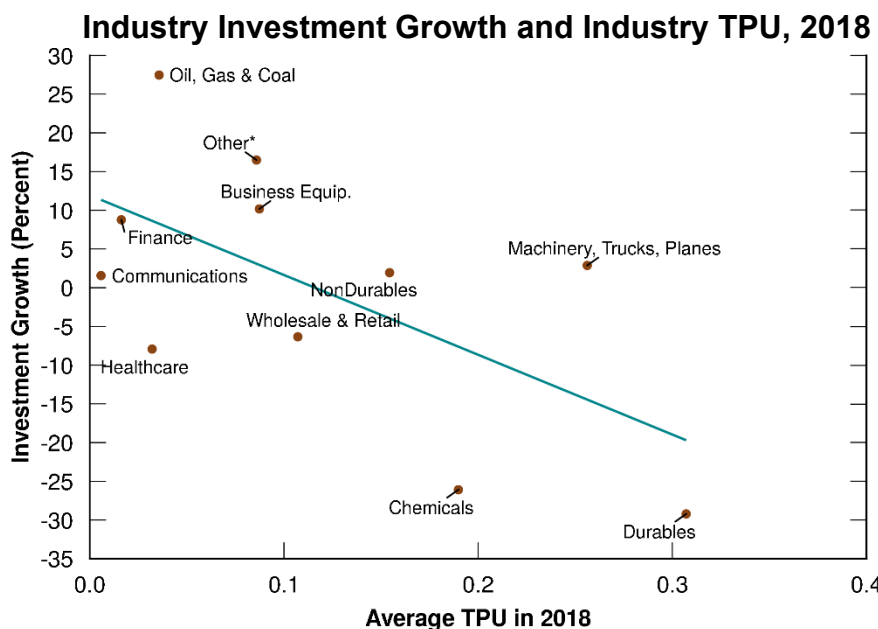
=> Approaches differ but results are remarkably consistent – modest drag.

Predicted Effect on Aggregate U.S. Fixed Investment of Recent Increase in TPU (%)	
1. Aggregate VAR	-1.5
2. Firm-level Regression	-1.0
3. DSGE Simulation	-1.0

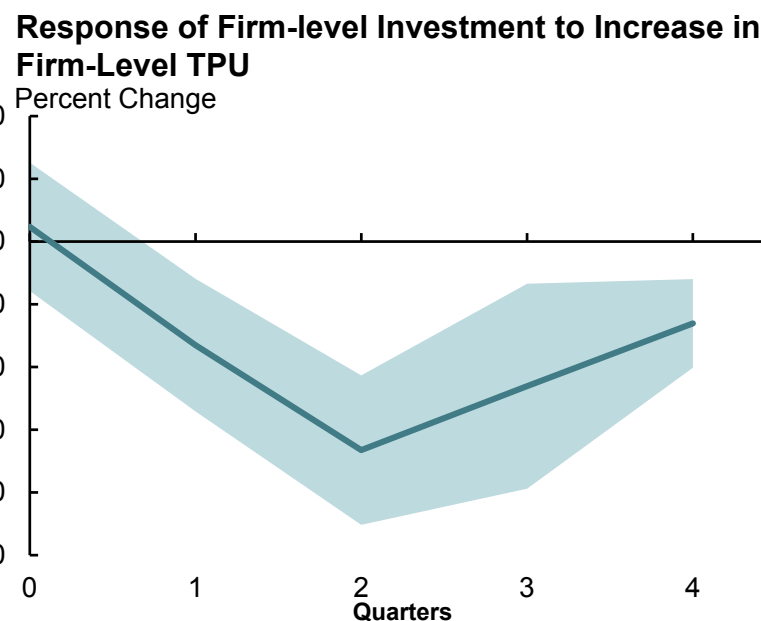
(1) Aggregate VAR: VAR on news-based TPU, investment, import tariffs, and other standard macroeconomic variables (1960:Q1-2018:Q3); two-std shock to TPU.
 (2) Firm-level regression: manufacturing firms (2015:Q1-18:Q4). Effect on firm investment of rise in TPU from zero to median of all firms with positive TPU. Aggregate investment effect is equal to the firm-level response (-24%), times the share of firms hit by high TPU in 2018 (10%), times the asset share of manufacturing firms in total U.S. fixed assets (43%).
 Sources: Staff Calculations, Haver, COMPUSTAT.
 Caldara, Iacoviello, Molligo, Prestipino, and Raffo “The Economic Effects of Trade Policy Uncertainty” (2019).

Why such concern about TPU?

- Hit to investment can be large
 - For specific industries
 - For individual firms
- That said, this and other evidence suggest that, so far, the rise in TPU is unlikely to explain the bulk of the global slowdown in trade and GDP.



*Other includes mines, construction, and building materials.
 Note: Industries grouped according to the Fama-French 12 Industry Classification.
 Source: Caldara et al. (2019), and authors' calculations.



Note: Response of firm-level investment at different quarters following an increase in firm-level TPU, based on a regression of quarterly firm-level capital expenditures on TPU, firm-level controls, firm and sector-by-quarter fixed effects. 68 percent confidence interval shown. Source: Caldara et al. (2019), and authors' calculations.

Appendix 5: Materials used by Mr. Bassett

Class II FOMC - Restricted (FR)

Material for Briefing on

Financial Stability Developments

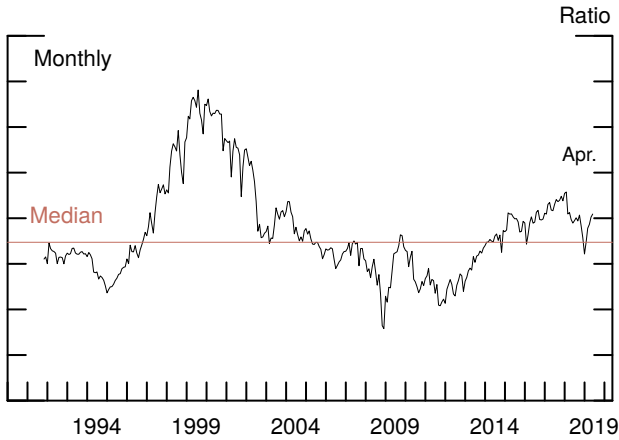
William F. Bassett

Exhibits by Kevin Kiernan

April 30, 2019

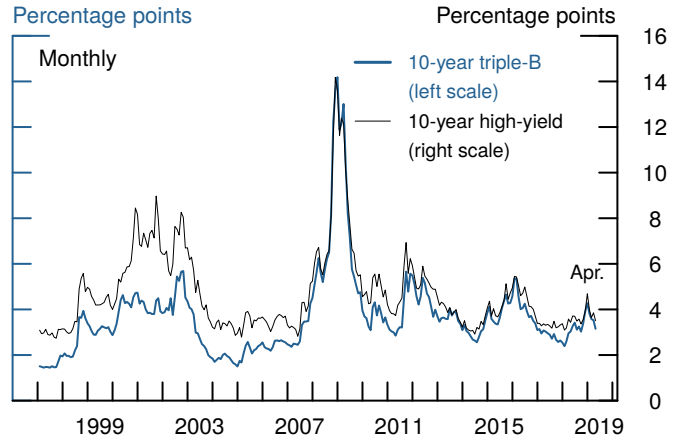
Asset Valuations and Nonfinancial Debt

1. Forward Price-to-Earnings Ratio of S&P 500 Firms*

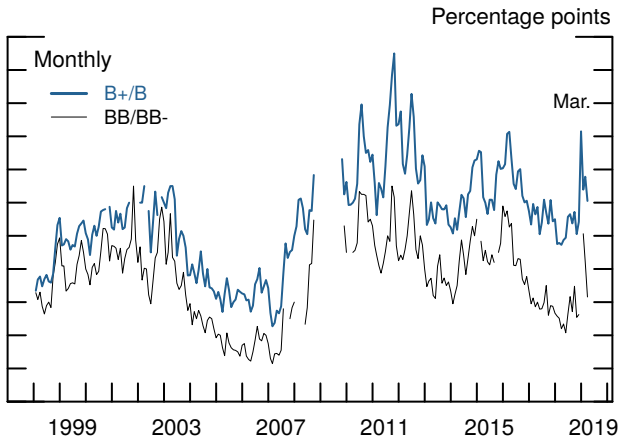


*Footnotes and sources in Appendix.

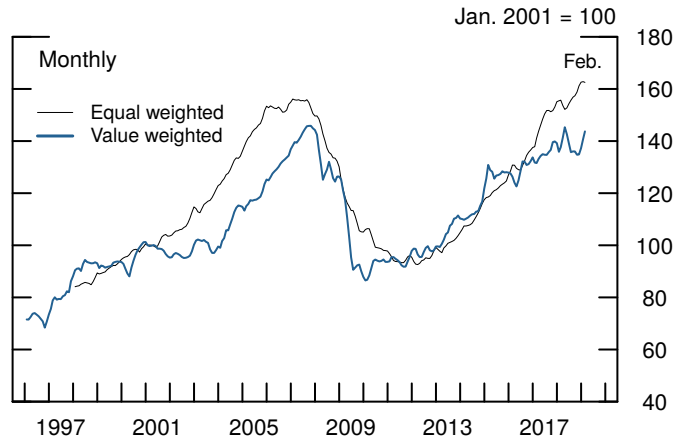
2. Corporate Bond Spreads to Similar-Maturity Treasury Securities



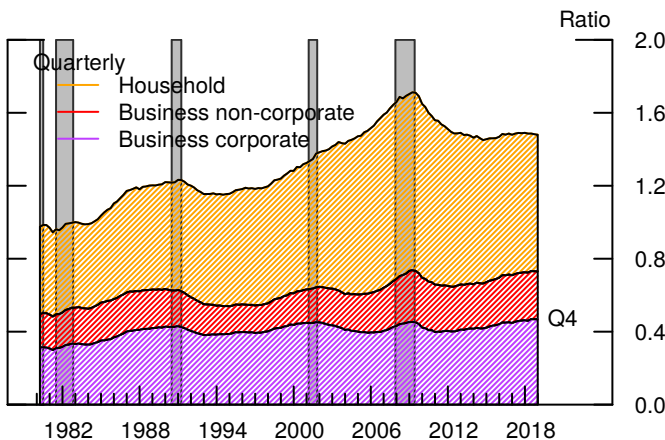
3. Spreads on New Institutional Leveraged Loans



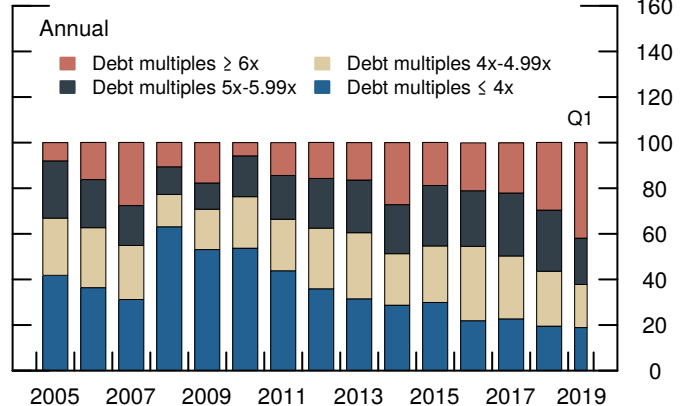
4. Commercial Real Estate Prices (Real)



5. Private Nonfinancial Sector Credit-to-GDP Ratios: Disaggregated by Borrower

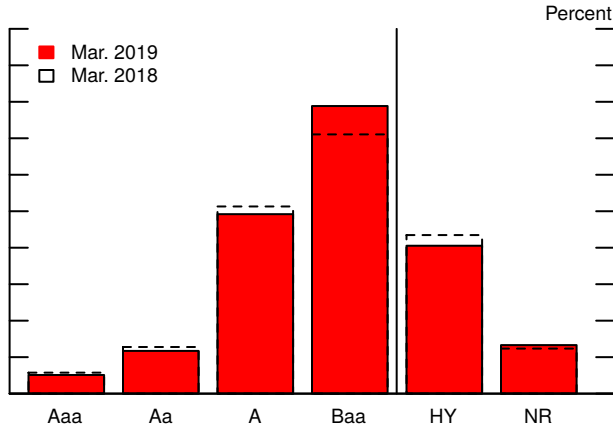


6. Debt-to-EBITDA Ratio on New Leveraged Loans Weighted by Volume

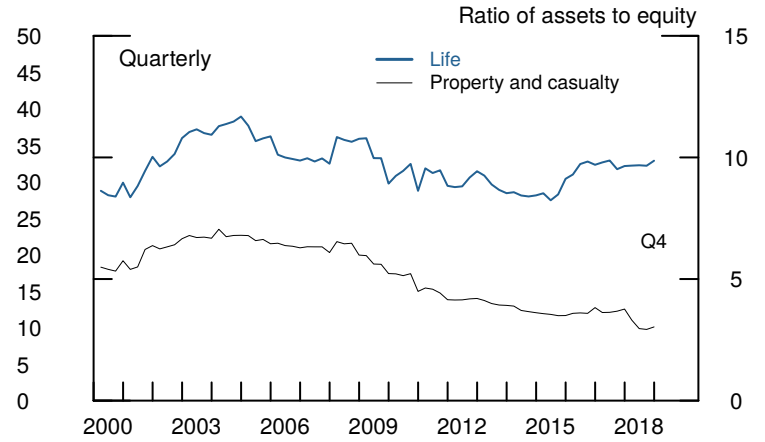


Leverage and Funding Risk

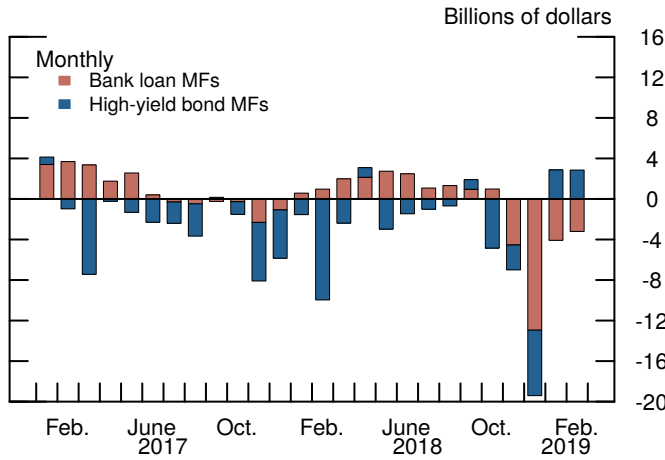
7. Percent of Total Non-Financial Bonds Outstanding by Rating



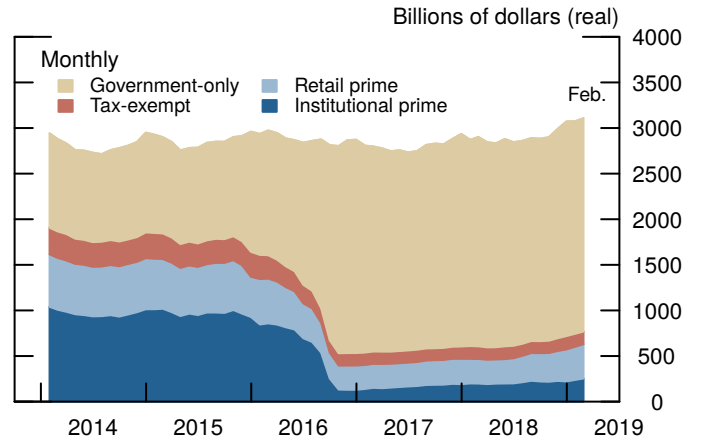
8. Leverage of Insurance Companies



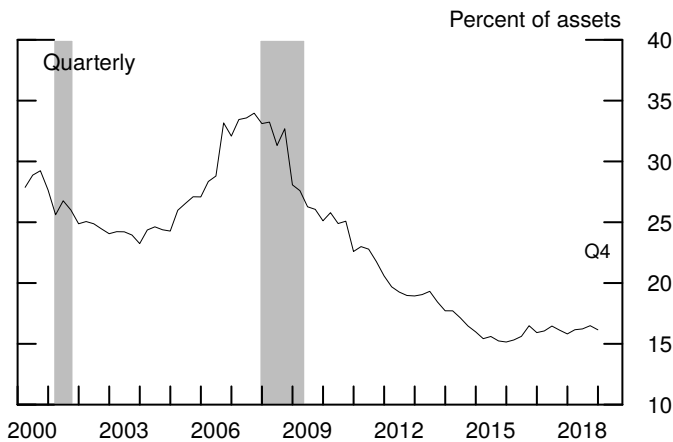
9. Mutual Fund Net Flows



10. Domestic Money Market Fund Assets

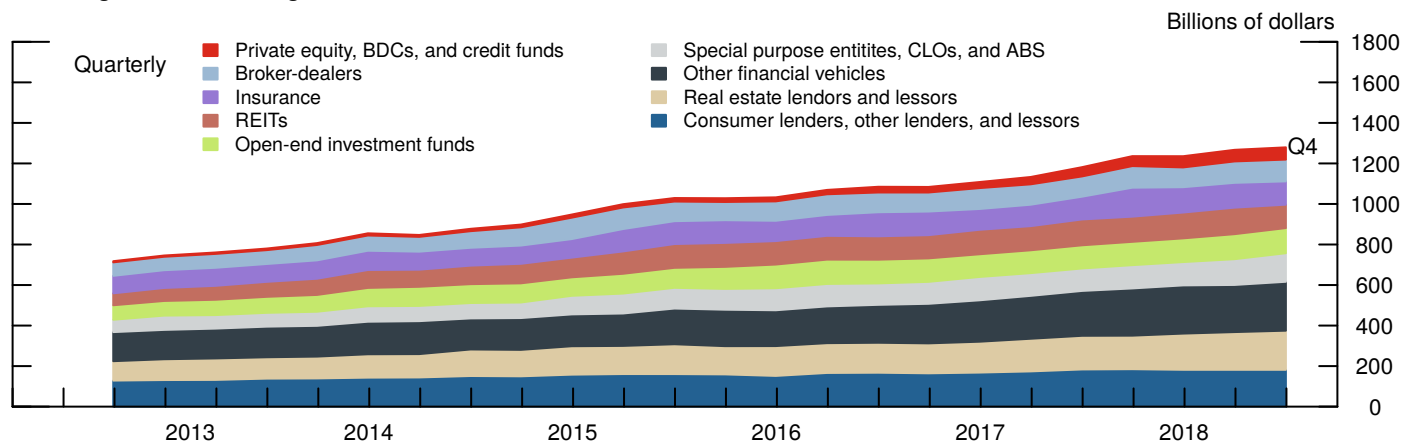


11. Short-Term Wholesale Funding of Banks



Interconnectedness

12. Large Bank Lending to Nonbank Financial Firms: Committed Amounts



Appendix – Notes and Sources

Figure 1: Spread of Forward Earnings-to-Price Ratio of S&P 500 Firms to 10-Year Real Treasury Yield

Source: Federal Reserve Board staff calculations using Refinitiv (formerly Thomson Reuters), IBES Estimates; Department of the Treasury; Survey of Professional Forecasters.

Note: Aggregate forward earnings-to-price ratio of S&P 500 firms. Based on expected earnings for 12 months ahead. Real treasury yields are calculated from the 10-year CPI inflation forecast and the smoothed nominal yield curve estimated from off-the-run securities.

Figure 2: Corporate Bond Spreads to Similar-Maturity Treasury Securities

Source: ICE Data Indices, LLC, used with permission; Department of the Treasury.

Note: The 10-year triple-B reflects the effective yield of the ICE BofAML 7-to-10-year triple-B U.S. Corporate Index (C4A4), and the 10-year high-yield reflects the effective yield of the ICE BofAML 7-to-10-year U.S. Cash Pay High Yield Index (J4A0). Treasury yields from smoothed yield curve estimated from off-the-run securities.

Figure 3: Spreads on New Institutional Leveraged Loans

Source: S&P Global, Leveraged Commentary & Data.

Note: Breaks in the series represent periods with no issuance. Spreads are calculated against three-month LIBOR (London interbank offered rate). The spreads do not include up-front fees.

Figure 4: Commercial Real Estate Prices (Real)

Source: CoStar Group Inc., CoStar Commercial Repeat Sale Indices (CCRSI); Bureau of Labor Statistics consumer price index via Haver Analytics.

Note: Series deflated using the consumer price index and seasonally adjusted by Board staff.

Figure 5: Private Nonfinancial Sector Credit-to-GDP Ratios: Disaggregated by Borrower

Source: Financial Accounts of the United States and NIPA

Figure 6: Debt-to-EBITDA Ratio on New Leveraged Loans

Source: S&P Global, Leveraged Commentary & Data.

Note: The data for 2019 are quarterly. Volumes are for large corporations with earnings before interest, taxes, depreciation, and amortization (EBITDA) greater than \$50 million and exclude existing tranches of add-ons and amendments as well as restatements with no new money.

Figure 7: Percent of Total Non-Financial Bonds Outstanding by Rating

Source: Mergent FISD.

Note: HY is high-yield. NR is not rated.

Figure 8: Leverage of Insurance Companies

Source: S&P Global, Inc., S&P Market Intelligence.

Note: The data extend through 2018:Q4. Ratio is calculated as (total assets - separate account assets)/(total capital - accumulated other comprehensive income).

Figure 9: Mutual Fund Net Flows

Source: ICI.

Note: Monthly data are from Investment Company Institute (ICI) through January 2019.

Figure 10: Domestic Money Market Fund Assets

Source: Federal Reserve Board staff calculations based on Investment Company Institute data; Bureau of Labor Statistics, consumer price index via Haver Analytics.

Note: The data are converted to constant 2018 dollars using the consumer price index.

Figure 11: Short-Term Wholesale Funding of Banks

Source: Federal Reserve Board, Form FR Y-9C, Consolidated Financial Statements for Holding Companies.

Note: Short-term wholesale funding is defined as the sum of large time deposits with maturity less than one year, federal funds purchased and securities sold under agreements to repurchase, deposits in foreign offices with maturity less than one year, trading liabilities (excluding revaluation losses on derivatives), and other borrowed money with maturity less than one year. The shaded bars indicate periods of business recession as defined by the National Bureau of Economic Research.

Figure 12: Large Bank Lending to Nonbank Financial Firms: Committed Amounts

Source: Federal Reserve Board, Form FR Y-14Q (Schedule H.1), Capital Assessments and Stress Testing.

Note: Committed amounts on credit lines and term loans extended to nonbank financial firms by a balanced panel of 26 bank holding companies that have filed Form FR Y-14Q in every quarter since 2013:Q1. Nonbank financial firms are identified based on reported NAICS (North American Industry Classification System) codes. In addition to NAICS codes, a name-matching algorithm is applied to identify specific entities such as real estate investment trusts (REITs), special purpose entities, collateralized loan obligations (CLOs), and asset backed securities (ABS). REITs incorporate both mortgage (trading) REITs and equity REITs. Broker-dealers also include commodity contracts dealers and brokerages and other securities and commodity exchanges. Other financial vehicles include closed-end investment and mutual funds and financial planning and pension funds.

Appendix 6: Materials used by Mr. Laubach

Class I FOMC – Restricted Controlled (FR)

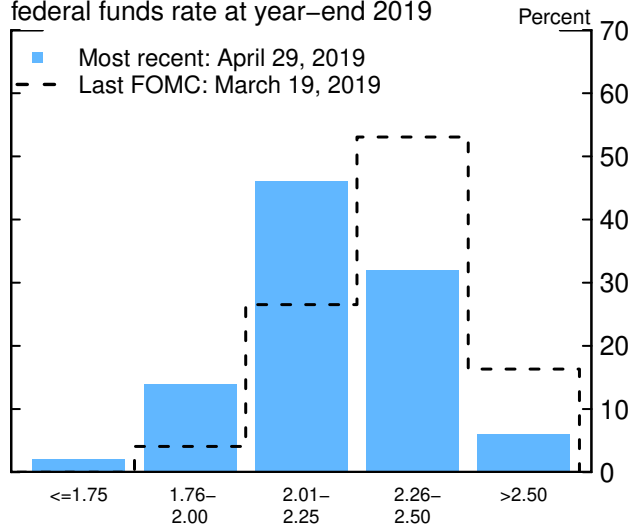
Material for the Briefing on

Monetary Policy Alternatives

Thomas Laubach
Exhibits by Gurubala Kotta
April 30-May 1, 2019

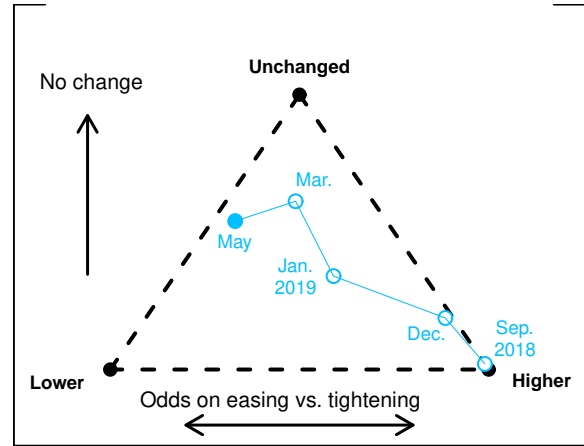
Monetary Policy Considerations

Market-implied probability distribution of the federal funds rate at year-end 2019



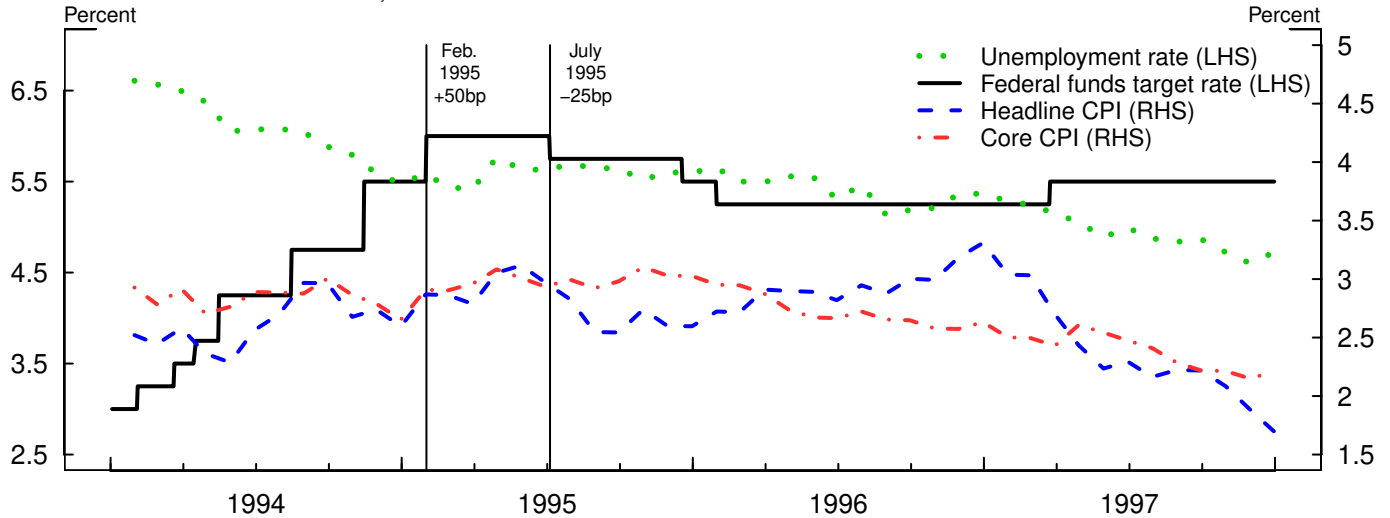
Source: CME Group; Board staff calculations.

Option-implied distribution of policy rate six months ahead



Note: Points within the dashed triangle represent the option-implied probabilities, as of the day before the indicated FOMC meeting, that the average federal funds rate during the contract month six months after the month of the meeting will be below, within, or above the target range in effect on the eve of the meeting. The Nov. 2018 meeting is omitted.
Source: CME Group; Board staff calculations.

Macroeconomic conditions, 1994–1997

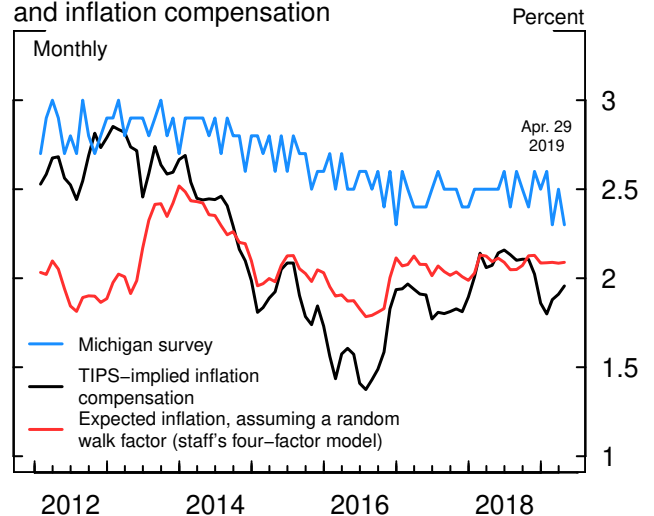


Note: Headline inflation is measured as the 12-month percent change in the consumer price index (CPI). Core inflation is measured as the 12-month percent change in CPI, excluding food and energy. Headline and core inflation data are taken from the November 1998 vintage release.
Source: BLS; Philadelphia Fed; Federal Reserve Board.

Policy Alternatives

- Alternative B
 - Signals that recent low inflation readings have not altered modal outlook.
 - Measures of longer-term inflation expectations are little changed, on balance, since late 2016.
- Alternative A
 - Signals greater concern about persistently low inflation.
 - Would need to avoid false sense of pessimism about economic outlook.

5–10-year inflation expectations and inflation compensation



Source: Board staff calculations; Thomson Reuters/University of Michigan Survey of Consumers.

MARCH 2019 FOMC STATEMENT

1. Information received since the Federal Open Market Committee met in January indicates that the labor market remains strong but that growth of economic activity has slowed from its solid rate in the fourth quarter. Payroll employment was little changed in February, but job gains have been solid, on average, in recent months, and the unemployment rate has remained low. Recent indicators point to slower growth of household spending and business fixed investment in the first quarter. On a 12-month basis, overall inflation has declined, largely as a result of lower energy prices; inflation for items other than food and energy remains near 2 percent. On balance, market-based measures of inflation compensation have remained low in recent months, and 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. In light of global economic and financial developments and muted inflation pressures, the Committee will be patient as it determines what future adjustments to the target range for the federal funds rate may be appropriate to support these outcomes.
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 APRIL/MAY 2019

1. Information received since the Federal Open Market Committee met in ~~January~~ **March** indicates that the labor market remains strong ~~but~~ **and** that ~~growth of~~ economic activity ~~has slowed from its~~ **rose at a** solid rate ~~in the fourth quarter~~. Payroll employment was ~~little changed in February, but~~ Job gains have been solid, on average, in recent months, and the unemployment rate has remained low. ~~Recent indicators point to slower~~ Growth of household spending and business fixed investment **slowed** in the first quarter. On a 12-month basis, overall inflation ~~has declined, largely as a result of lower energy prices;~~ **and** inflation for items other than food and energy ~~remains near~~ **have declined and are running below** 2 percent. On balance, market-based measures of inflation compensation have remained low in recent months, and 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. **To support these outcomes** in light of ~~global economic and financial developments and muted~~ **softening** inflation pressures, the Committee will be patient as it determines what future adjustments to **assess whether it may soon become appropriate to adjust** the target range for the federal funds rate ~~may be appropriate to support these outcomes~~.
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 B FOR APRIL/MAY 2019

1. Information received since the Federal Open Market Committee met in ~~January~~ **March** indicates that the labor market remains strong ~~but~~ **and** that ~~growth of economic activity has slowed from its~~ **rose at a** solid rate ~~in the fourth quarter~~. ~~Payroll employment was little changed in February, but~~ Job gains have been solid, on average, in recent months, and the unemployment rate has remained low. ~~Recent indicators point to slower~~ Growth of household spending and business fixed investment **slowed** in the first quarter. On a 12-month basis, overall inflation ~~has declined, largely as a result of lower energy prices;~~ **and** inflation for items other than food and energy ~~remains near~~ **have declined and are running below** 2 percent. On balance, market-based measures of inflation compensation have remained low in recent months, and 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. In light of global economic and financial developments and muted inflation pressures, the Committee will be patient as it determines what future adjustments to the target range for the federal funds rate may be appropriate to support these outcomes.
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 C FOR APRIL/MAY 2019

1. Information received since the Federal Open Market Committee met in...
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. **To support these outcomes** in light of ~~global economic and financial developments and muted inflation pressures~~ [**firmer inflation readings | tightening resource utilization | diminished risks to the outlook**], the Committee will ~~be patient as it determines what future adjustments to~~ **assess whether it may soon become appropriate to adjust** the target range for the federal funds rate ~~may be appropriate to support these outcomes.~~
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 May 2019

Release Date: May 1, 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 ~~March 20, 2019~~ **May 1, 2019**:

- The Board of Governors of the Federal Reserve System voted [unanimously] to ~~maintain~~ **set** the interest rate paid on required and excess reserve balances at ~~2.40~~ **2.35** percent, effective ~~March 21, 2019~~ **May 2, 2019**. **Setting the interest rate paid on required and excess reserve balances 15 basis points below the top of the target range for the federal funds rate is intended to foster trading in the federal funds market at rates well within the FOMC's target range.**
- 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 ~~March 21, 2019~~ **May 2, 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.

Effective May 2, 2019, 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 \$30 **\$15** billion. ~~and~~ **The Committee directs the Desk** 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 Alternatives A, B, or C

Interest on required and excess reserve balances

Reduce the interest rate paid on required and excess reserve balances to 2.35 percent, effective May 2, 2019.

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 April 26, 2019, memo to the Board.¹

¹ On May 1, 2019, requests will be pending from the Reserve Banks of Boston, Cleveland, Atlanta, Chicago, Kansas City, Dallas and San Francisco.