Appendix 1: Materials used by Ms. Zobel, Mr. Carlson, Ms. Chen, and Mr. Schulhofer-Wohl

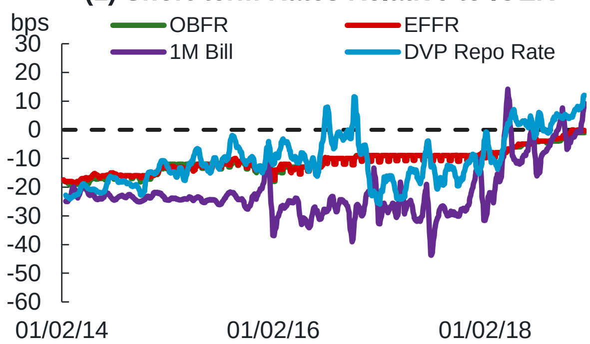
Class II FOMC - Restricted (FR)

Material for Briefing on

Long-Run Monetary Policy Implementation Frameworks

Patricia Zobel, Mark Carlson, Kathryn Chen, and
Sam Schulhofer-Wohl
Exhibits by Dave Na, Carolyn Shen, and Alex Thorp
December 18, 2018

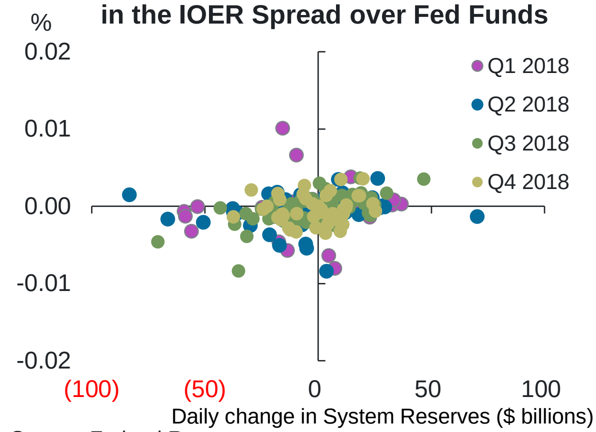
(1) Short-term Rates Relative to IOER



Source: Bloomberg, Federal Reserve

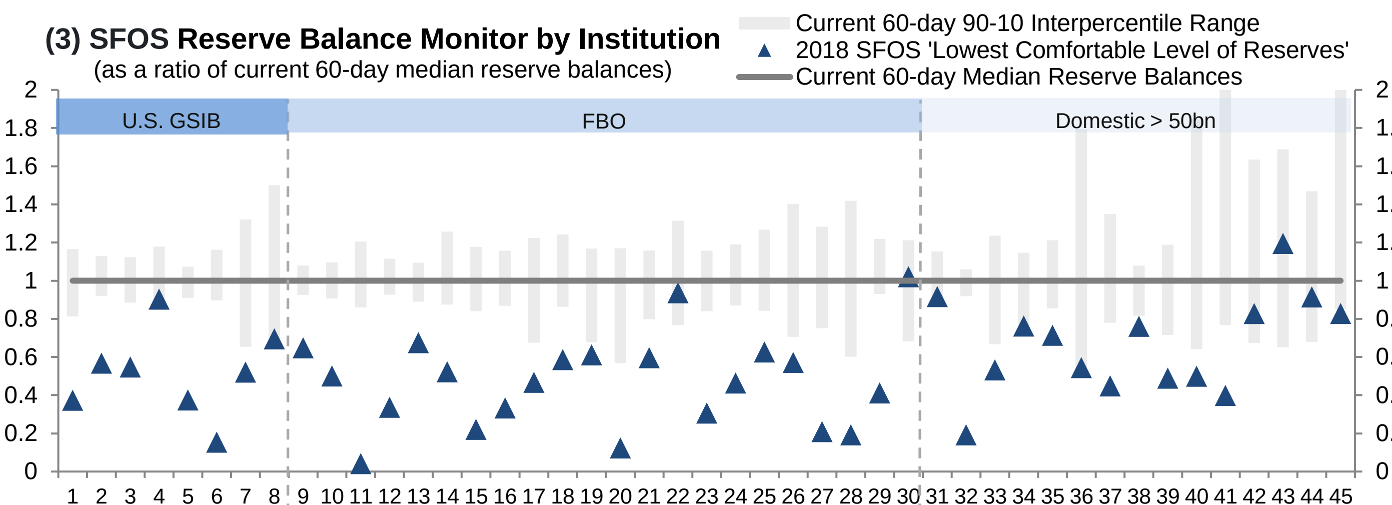
Note: The OBFR data from 10/20/2015 to 2/29/2016 was collected via FR2420 but not published. The OBFR data from 1/2/2014 to 10/19/2015 was collected from brokers and not published.

(2) Changes in Reserve Levels vs. Changes in the IOER Spread over Fed Funds



Source: Federal Reserve

(3) SFOS Reserve Balance Monitor by Institution
(as a ratio of current 60-day median reserve balances)

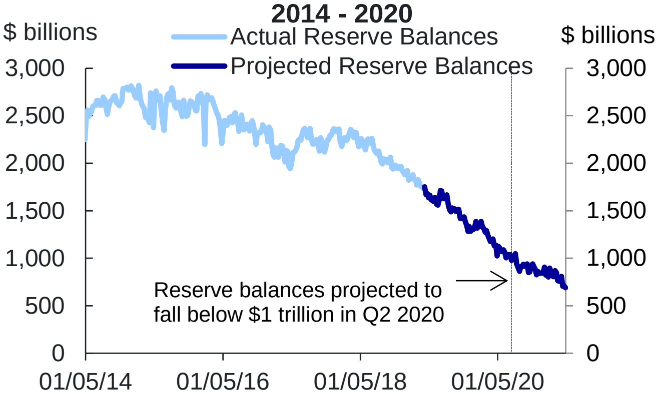


Source: 2018 Senior Financial Officer Survey, Federal Reserve, Desk Calculations

Note: Banks 41 and 45 have 90th percentile reserve levels more than 2 times their median.

As of: 10-09-2018 through 12-07-2018

(4) Actual and Projected Reserve Balances: 2014 - 2020



Source: H.4.1 report: 'Other Deposits held by Depository Institutions', staff projections

(5) Key Takeaways

- During the transition to a lower reserve level money market rates are expected to rise above IOER
  - Rates may rise gradually
  - Some volatiliy may emerge as market participants adapt to declining reserves
  - Eventually, higher rates will signal that the steep part of the demand curve has been reached
- Some actions may promote a smoother transition
  - Smooth the path or slow the pace of reserve declines with open market operations (OMOs)
  - Slow or cease redemptions to slow reserve declines
  - Communicate expectations for a lower reserve level

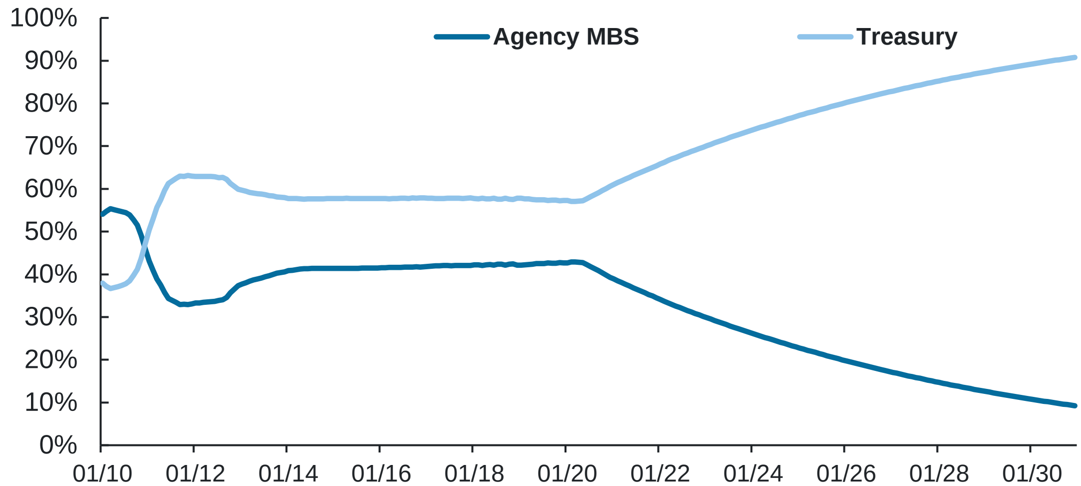
Class II FOMC – Restricted (FR)

Exhibit 2. Interest Rate Control during the Transition to a Long-Run Operating Regime

	Tools and options	Cautions and caveats
Smooth adjustment – no support required	Minimal pressures - Banks effectively manage liquidity - Markets function smoothly	- Frictions or inefficient reserve distribution may put upward pressure on money market rates
Existing tools to mitigate risks to rate control	IOER technical adjustments - Incentivizes banks to adjust Primary credit - Accessible by banks - Deals with distributional issues FHLB advances - Accessible to most banks now - May mitigate distributional frictions	- Limited space to move down without other adjustments - Current rate too high to offer control - Stigma may impede rate control - Not a Federal Reserve tool - FHLBs also subject to broad funding pressures
Incremental measures	Adjust width of the target range - Acknowledges possible volatility - Provides space to use other tools Pace of redemptions - Facilitates smooth adjustment of markets Fixed quantity temporary OMOs - Temporarily adds aggregate reserves - Can be coordinated with T-bill purchases if needed	- Potentially more difficult to articulate the stance of policy - Requires adjustment to Principles - Communications challenges - Difficult to calibrate size/impact - Need markets to distribute reserves
New approaches to using available tools to strengthen rate control	Ceiling tools (generally) - An administered rate can help establish the desired level of control Ceiling using OMO authority - relatively clear that is for monetary policy purposes - less subject to stigma Ceiling using discount window authority - Interact directly with banks - Options regarding collateral	- Challenging to balance rate control versus supporting market incentives to adjust - Need markets to distribute reserves (though might be able to expand the set of eligible counterparties) - Stigma may impede rate control - Challenge to balance access with communicating a clear purpose

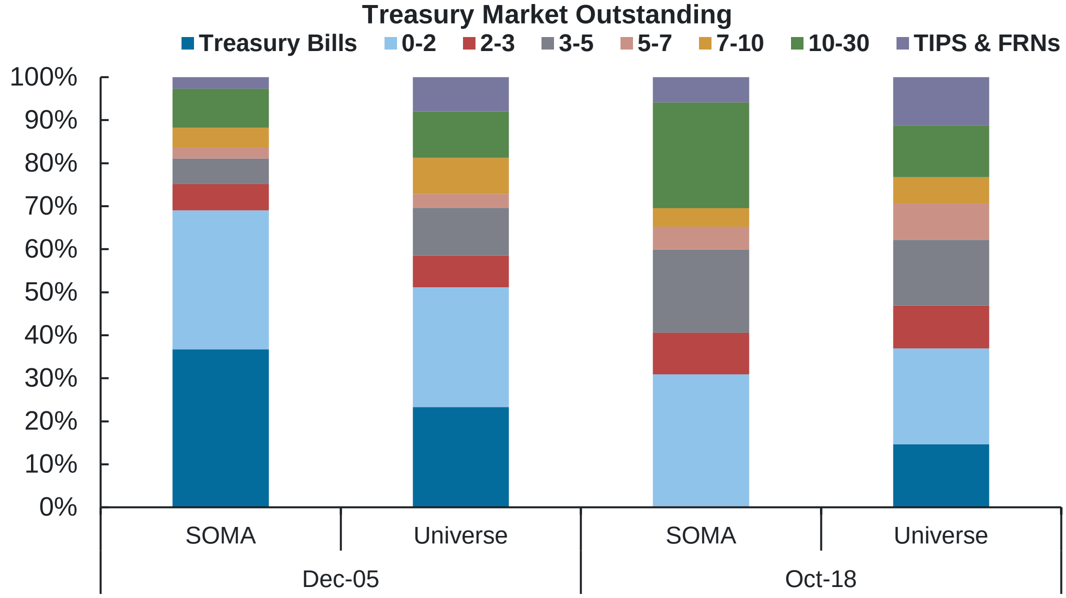
Exhibit 3: Asset Composition

Figure 1: Composition of SOMA Securities Holdings



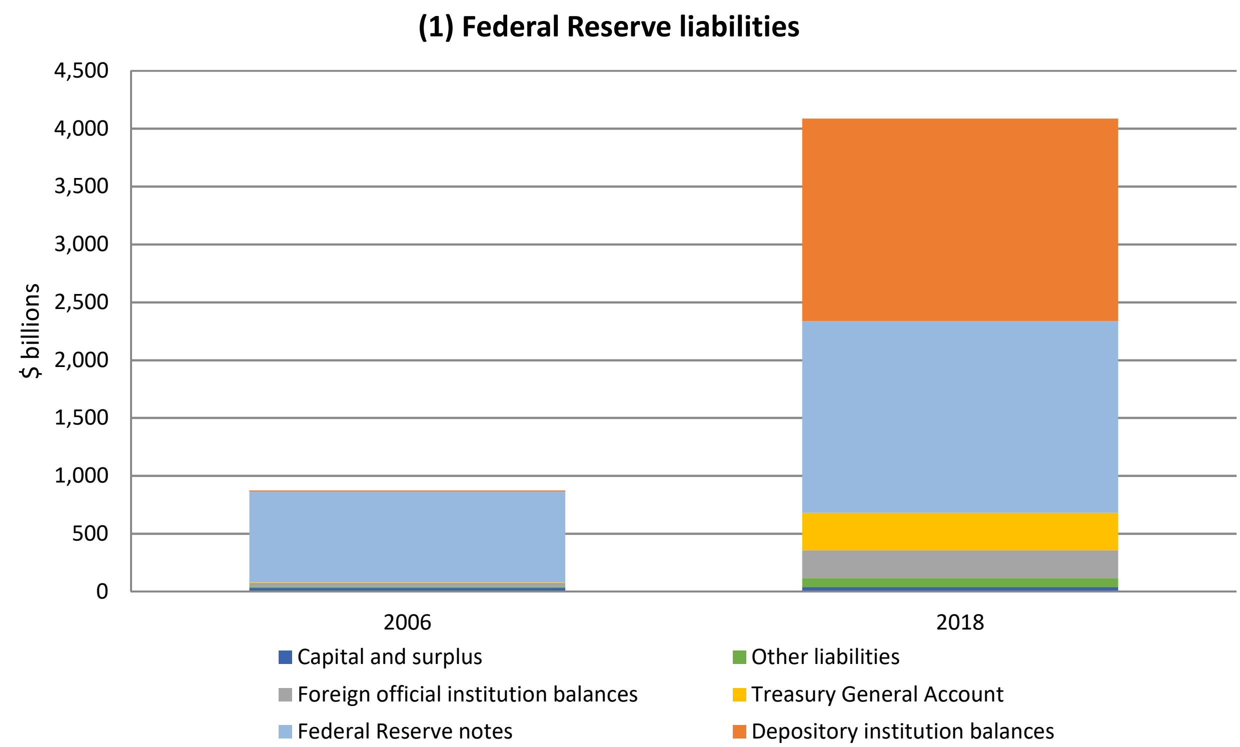
Source: Board of Governors and Federal Reserve Bank of New York.
Note: Projections based on interest rate and liabilities assumptions associated with Tealbook B.

Figure 2: Composition of SOMA Treasury Holdings and Treasury Market Outstanding

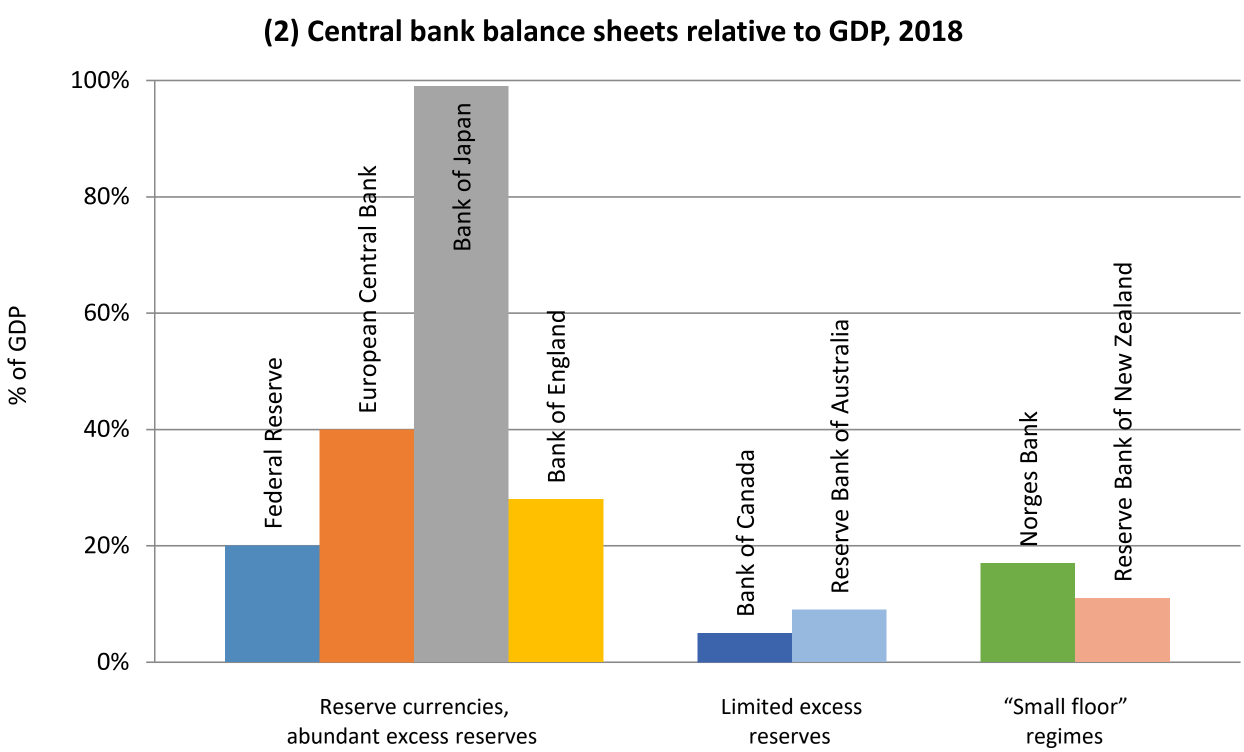


Source: U.S. Treasury and staff calculations

Exhibit 4: The Federal Reserve's balance sheet



Source: H.4.1 report, Board of Governors, data as of 12/27/2006 and 12/12/2018



Source: Haver Analytics, Bloomberg, central banks

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

Class II FOMC - Restricted (FR)

Material for Briefing on

Financial Developments and Open Market Operations

Lorie Logan and Simon Potter
Exhibits by Ashley Rhodes
December 18, 2018

Class II FOMC – Restricted (FR)

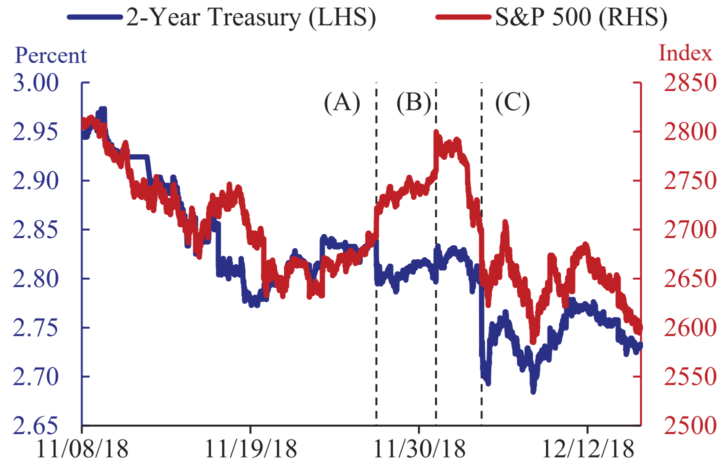
Exhibit 1

(1) Asset Price Changes*

	Dec. IMP	Nov. IMP	Current Level
S&P 500 Index	-7.60%	-3.49%	2600
2-year Nominal Treasury	-22 bps	+12 bps	2.73%
10-year Nominal Treasury	-35 bps	+14 bps	2.89%
IG Credit Spreads	+27 bps	+7 bps	140 bps
HY Credit Spreads	+87 bps	+33 bps	437 bps
U.S. Broad T.W. Dollar Index	+1.4%	+1.3%	129

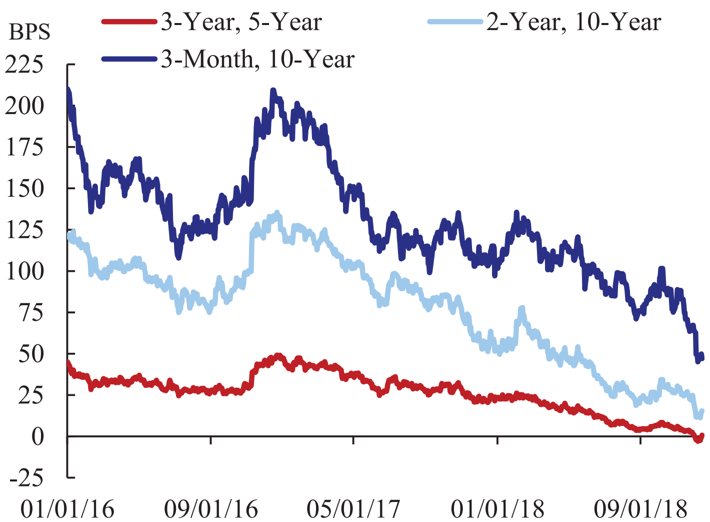
*Red indicates tightening in financial conditions, blue indicates loosening.
Source: Barclays, Bloomberg, Federal Reserve Board

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



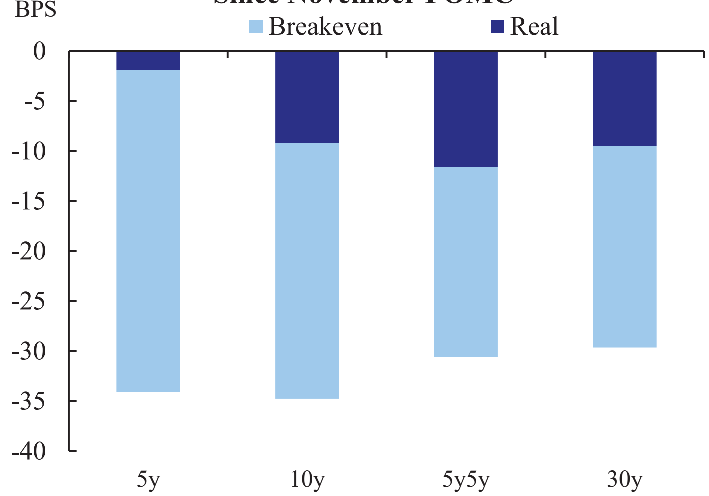
*Intraday data.
(A) Chairman Powell speech on 11/28/18 (B) G20 Meeting (C) Arrest of Huawei executive
Source: Bloomberg

(3) U.S. Treasury Yield Curve Spreads



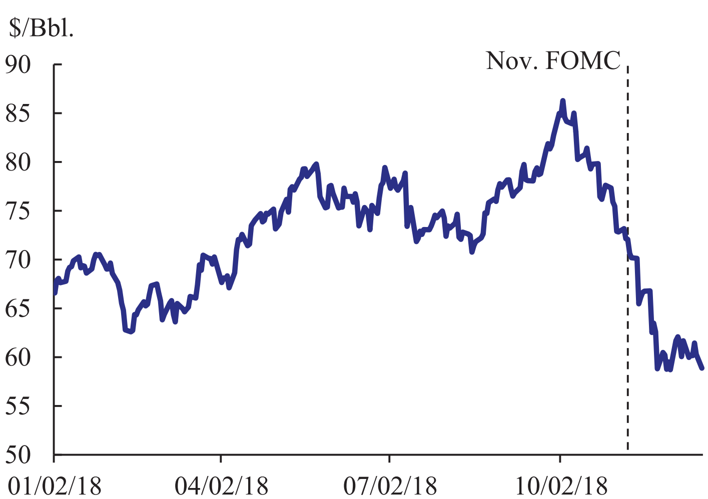
Source: Bloomberg

(4) Decomposition of Nominal Treasury Yields Since November FOMC



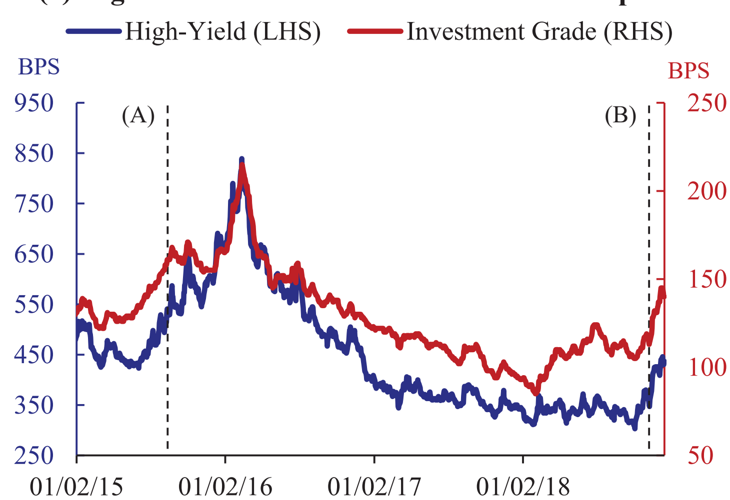
Source: Bloomberg

(5) Front-Month Brent Crude Futures



Source: Bloomberg

(6) High-Yield and Investment Grade Credit Spreads

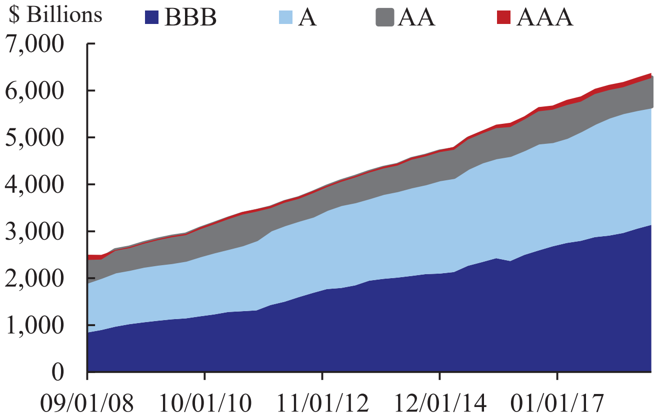


(A) RMB Devaluation (B) November FOMC
Source: Barclays, Bloomberg

Class II FOMC – Restricted (FR)

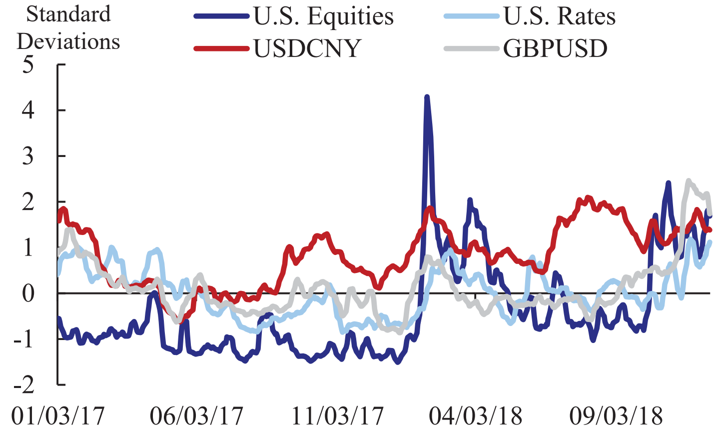
Exhibit 2

(7) Composition of Investment Grade Corporate Bonds Outstanding by Rating*



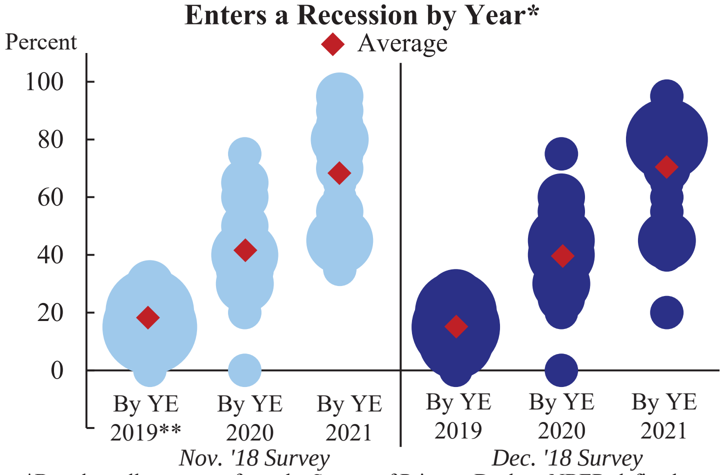
*Data is quarterly. Based on bonds referenced by Bank of America's investment grade (IG) index which is most of the IG universe.
Source: Bloomberg, ICE Bank of America Merrill Lynch

(8) Standardized Implied Volatility Indices*



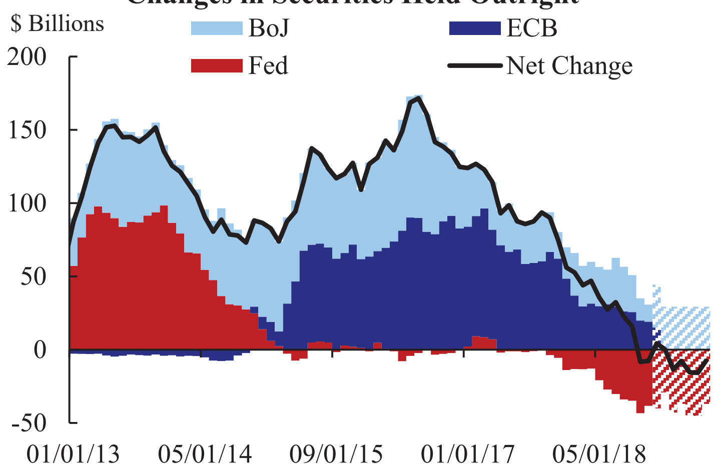
*Standardized implied volatilities since January 2012. Five-day moving average. U.S. Equities: VIX Index, U.S. Rates: 1m2y swaption volatility, USDCNY: 1-month at-the-money (ATM) volatility, GBPUSD: 1-month ATM volatility.
Source: Bloomberg

(9) Cumulative Probability of When the U.S. First Enters a Recession by Year*



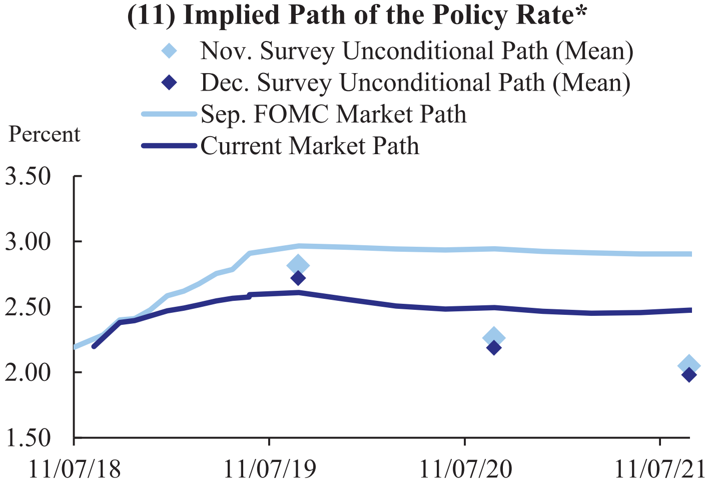
*Based on all responses from the Survey of Primary Dealers. NBER-defined recession.
**Derived by summing probabilties for 2018 and 2019 from Nov. Survey.
Source: FRBNY

(10) Three-Month Rolling Average of Monthly Changes in Securities Held Outright*



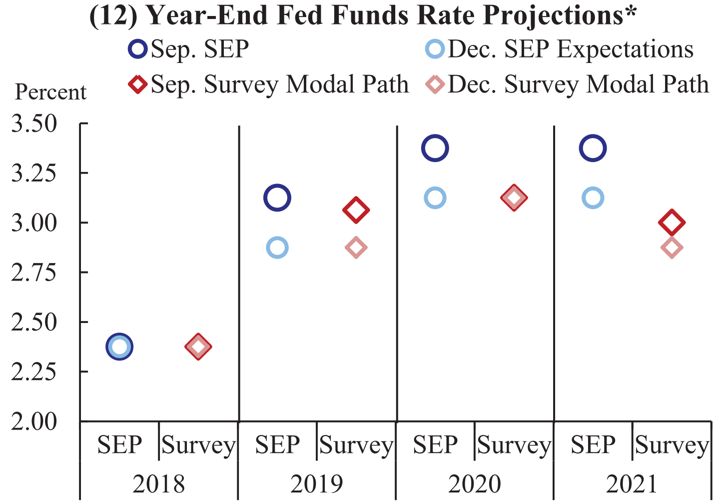
*BoJ data includes all government securities, ETFs, and REITS.
Source: BoJ, Desk Calculations, ECB, Federal Reserve Board, Haver

(11) Implied Path of the Policy Rate*



*Market-implied paths derived from federal funds and Eurodollar futures. Unconditional survey path is the average PDF-implied means from the Surveys of Primary Dealers and Market Participants.
Source: Bloomberg, Desk Calculations, FRBNY

(12) Year-End Fed Funds Rate Projections*

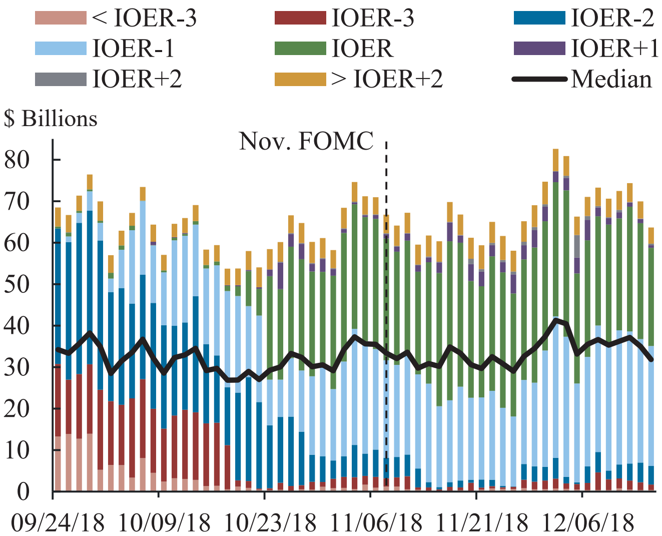


*Based on a matched sample of responses from the Surveys of Primary Dealers and Market Participants. Dec. SEP Expectations includes revision from one respondent received on 12/18/2018.
Source: FRBNY

Class II FOMC – Restricted (FR)

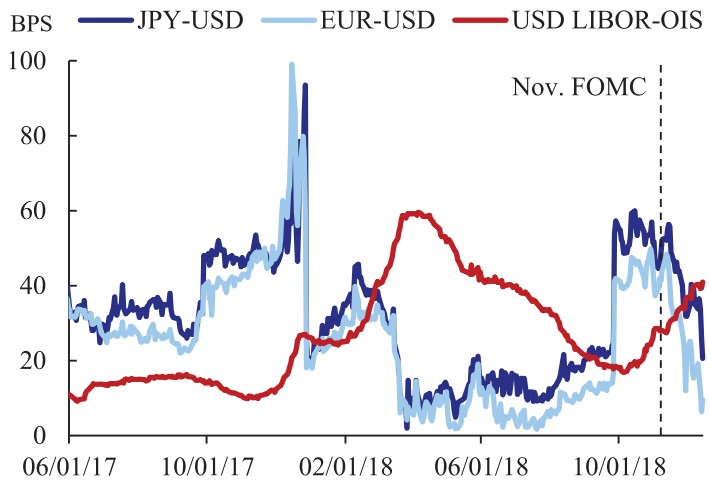
Exhibit 3

(13) Distribution of Fed Funds Volumes by Rate



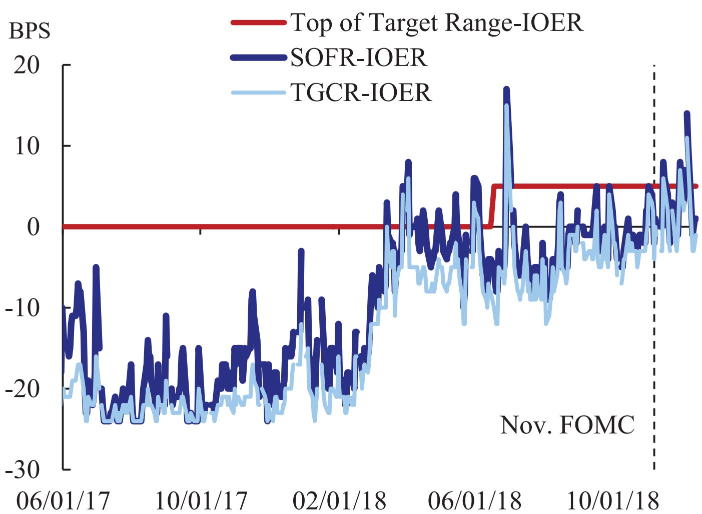
Source: Federal Reserve Board, FRBNY

(14) Three-Month FX Swap-Implied Basis and LIBOR-OIS



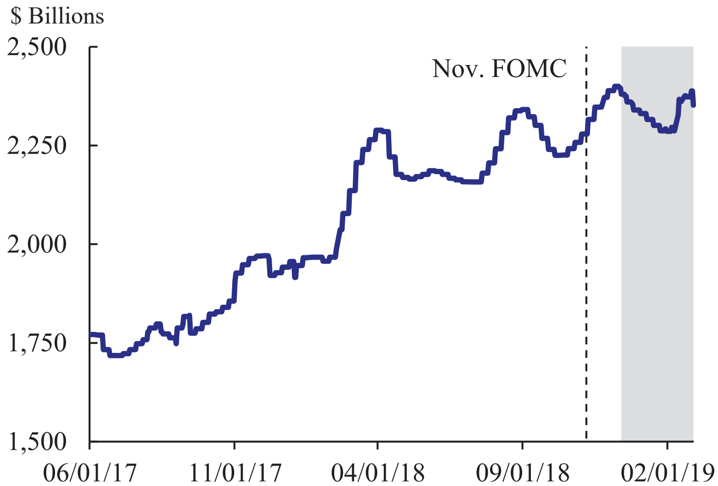
Source: Bloomberg

(15) Select Repo Rates Spread to IOER



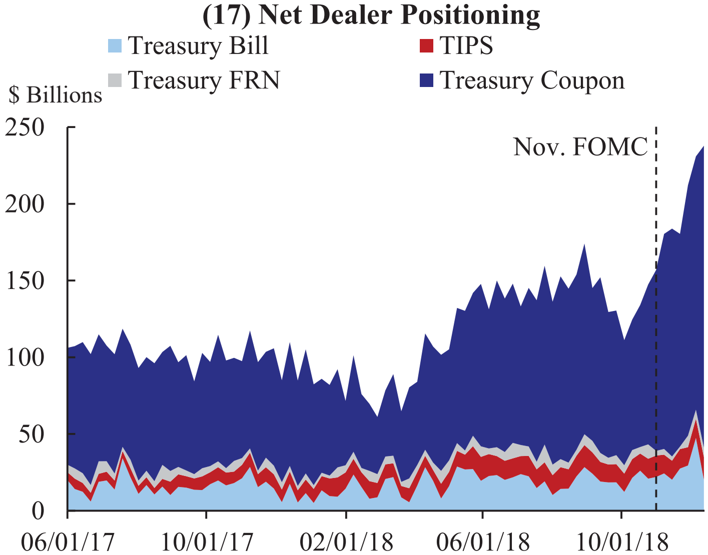
Source: Federal Reserve Board, FRBNY

(16) Treasury Bills Outstanding*



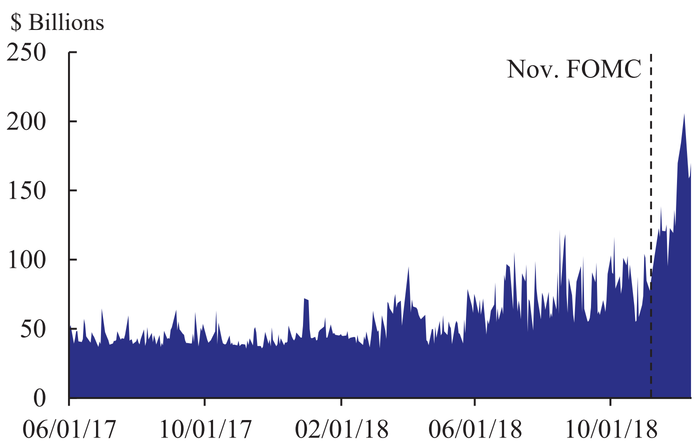
*Shaded area indicates projections.
Source: Desk Calculations, U.S. Treasury

(17) Net Dealer Positioning



Source: FRBNY

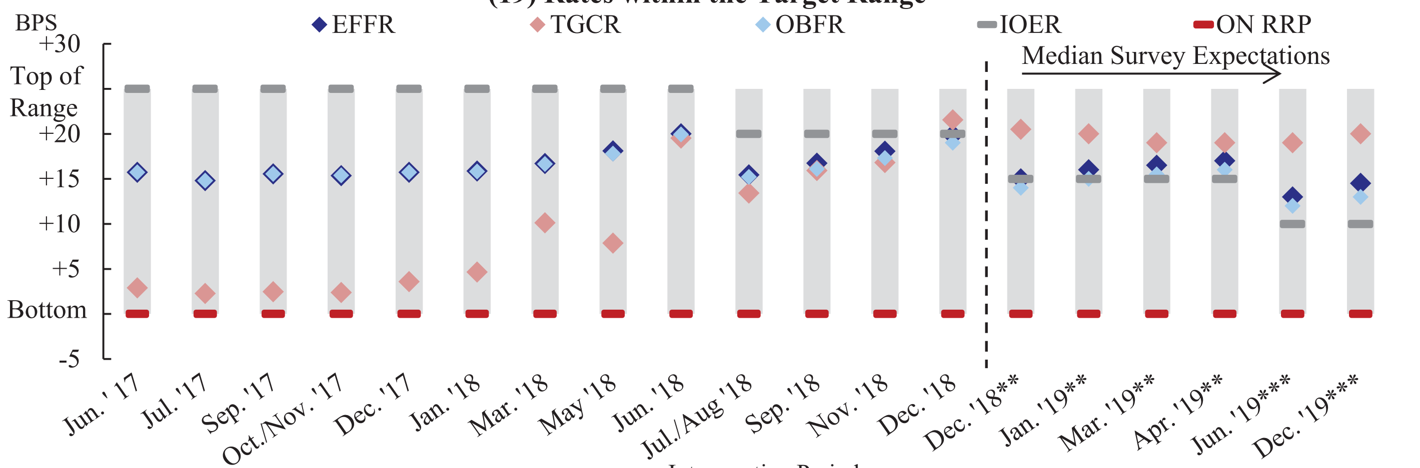
(18) Total Cash Lending in Repo Markets by Depository Institutions of Domestic G-SIBs*



*Treasury collateral only, includes overnight and term lending in centrally cleared bilateral, GCF interdealer, and tri-party repo markets.
Source: BNYM, Desk Calculations, FICC

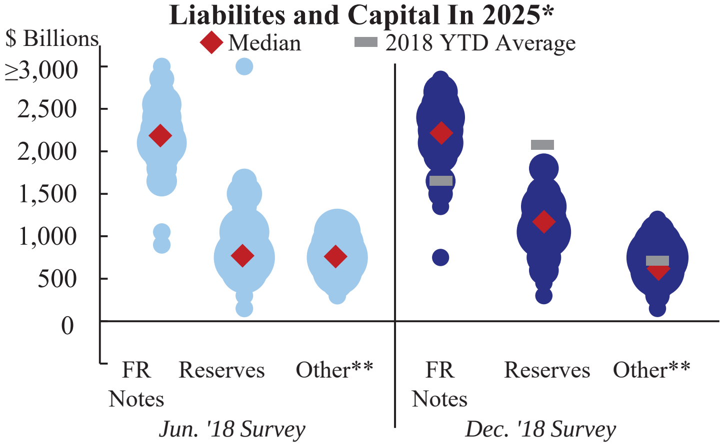
Class II FOMC – Restricted (FR) Exhibit 4

(19) Rates within the Target Range*



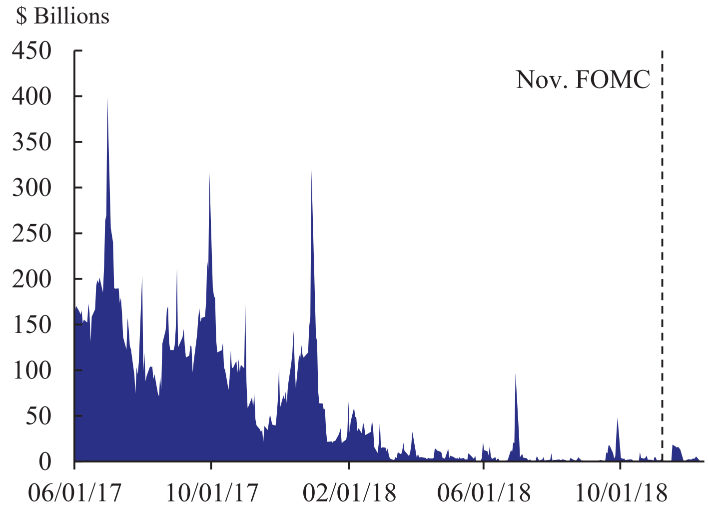
*Average over intermeeting periods for historical data.
**Point estimates after FOMC meeting. Based on all responses from the Dec. Surveys of Primary Dealers and Market Participants.
***Day before period-end date in month. Based on all responses from the Dec. Surveys of Primary Dealers and Market Participants.
Source: Bloomberg, Federal Reserve Board, FRBNY

(20) Expected Average Level of Federal Reserve Liabilites and Capital In 2025*



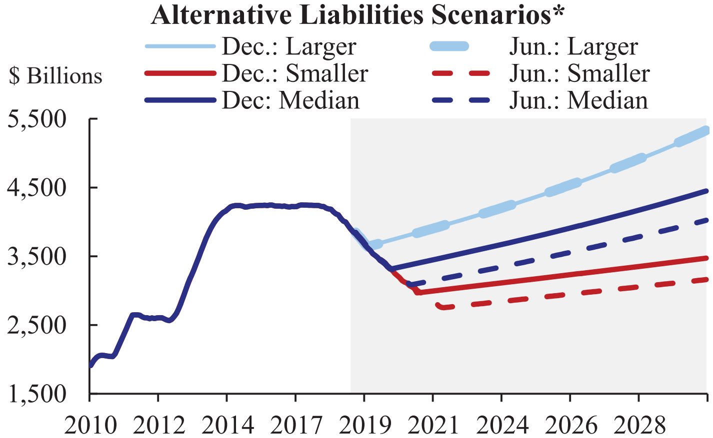
*Based on all responses from the Surveys of Primary Dealers and Market Participants. Conditional on not moving to the ZLB before end of 2025. Dots scaled by percent of respondents.
**Includes TGA, FIMA, RRP, other deposits and all other liabilities and capital.
Source: Federal Reserve Board, FRBNY

(21) ON RRP Take-Up



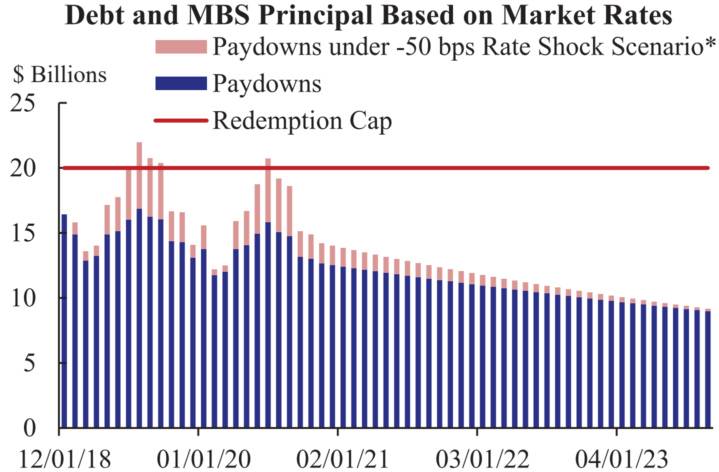
Source: FRBNY

(22) Projected SOMA Domestic Securities Holdings: Alternative Liabilities Scenarios*



*Smaller and larger liabilities are based, respectively, on 25th and 75th percentile responses to a question in Desk surveys about the size and composition of the Fed's balance sheet in 2025 conditional on not returning to ZLB. Shaded area indicates projections.
Source: FRBNY

(23) Projected Paydown Profile of SOMA Agency Debt and MBS Principal Based on Market Rates



*Projections based on a -50 basis point shock to market-implied rates as of 12/14/18, when the 10-year nominal Treasury yield was 2.89 percent.
Source: Desk Calculations, FRBNY

Appendix 1

(1) Summary of Operational Testing

Summary of Operational Tests in prior period:

- Domestic Authorization
  - November 14 to December 18: Outright MBS TBA purchases for $447 million, total*
  - November 15: Overnight repo with Treasury, agency, and agency MBS collateral for $66 million
  - November 19: Overnight reverse repo (with MBS collateral) for $72 million
  - November 27 and 29: Outright MBS sales (specified pool) for $135 million, total
  - November 28: Term reverse repo with Treasury collateral for $95 million
  - December 4: Term repo with Treasury, agency, and agency MBS collateral for $66 million
- Foreign Authorization
  - November 20: Yen-denominated repo with 552 U.S.C. (b)(4) for JPY 100 million
  - December 11: Yen-denominated sovereign debt sales to private counterparties for JPY 100 million

Upcoming Operational Tests:

- One test scheduled under the Domestic Authorization
  - December 20: Outright MBS TBA purchases for up to $40 million**

*The total figure assumes the Desk purchases the maximum operation amount at each of its upcoming outright MBS operations– $87 million on December 17th and $27 million on 18th – for a total of $114 million.

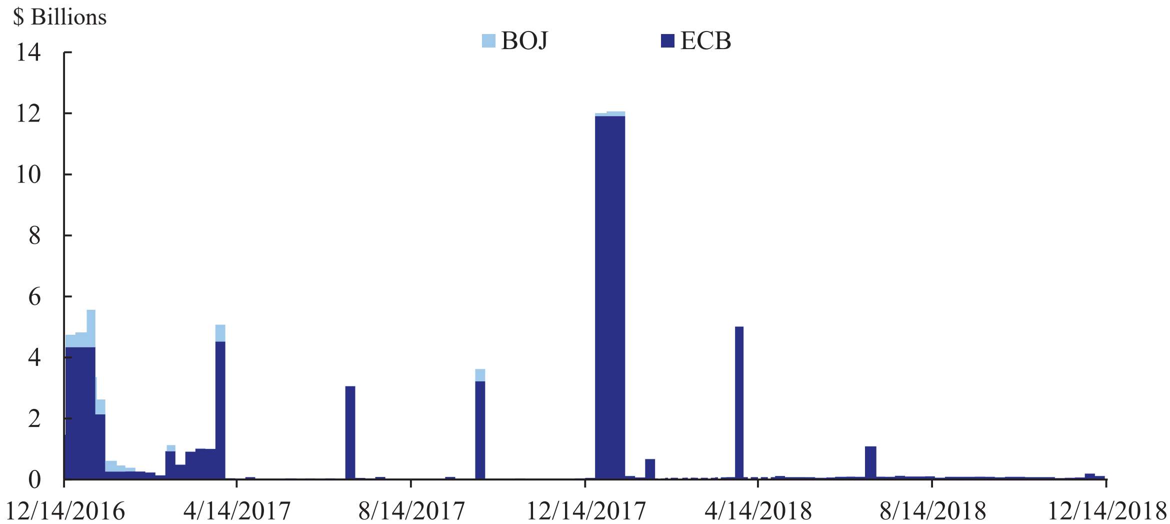
**For monthly agency MBS reinvestment periods where principal receipts are below the cap, the Desk will conduct up to $300 million of small value outright purchases, though due to our operational planning timeline, some or all purchases for the next intermeeting period might not be scheduled as this point. Monthly reinvestment periods run from the 10th business day of the current month to the 9th business day of the following month.

Appendix 2

(1) MBS Purchase Summary Since Cap Implementation Through 12/17/2018 ($ Millions)

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

(2) FX Swaps Outstanding



Source: FRBNY

(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 Messrs. Figura and Erceg

Class II FOMC - Restricted (FR)

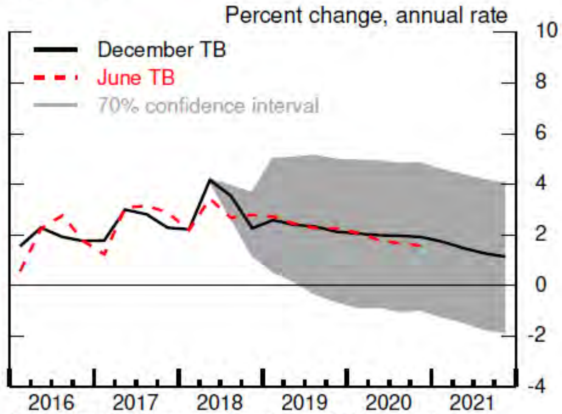
Material for

Staff Presentation on the Economic and Financial Situation

Christopher Erceg and Andrew Figura
Exhibits by Bo Yeon Jang, Patrick Molligo, and Rosemary Rhodes
December 18, 2018

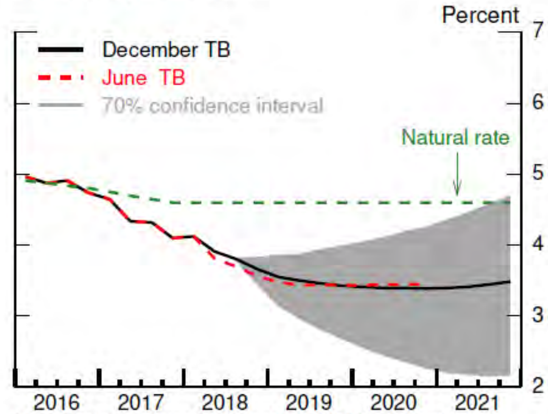
Forecast summary

Real GDP



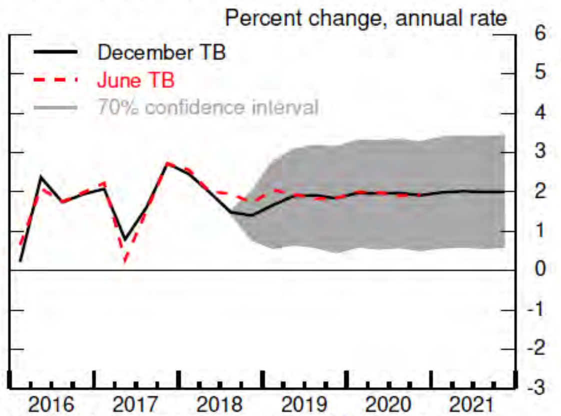
Note: Confidence interval is based on FRB/US stochastic simulations.

Unemployment rate



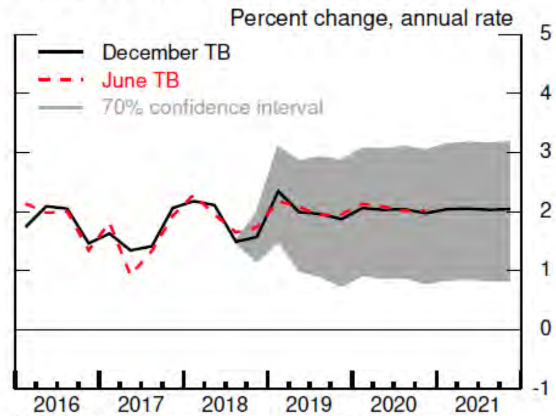
Note: Confidence interval is based on FRB/US stochastic simulations.

Total PCE prices



Note: Confidence interval is based on FRB/US stochastic simulations.

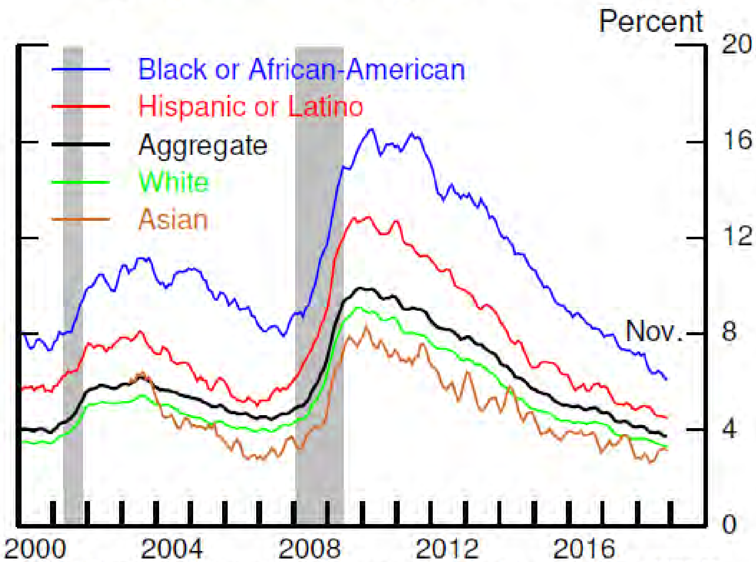
PCE prices excluding food and energy



Note: Confidence interval is based on FRB/US stochastic simulations.

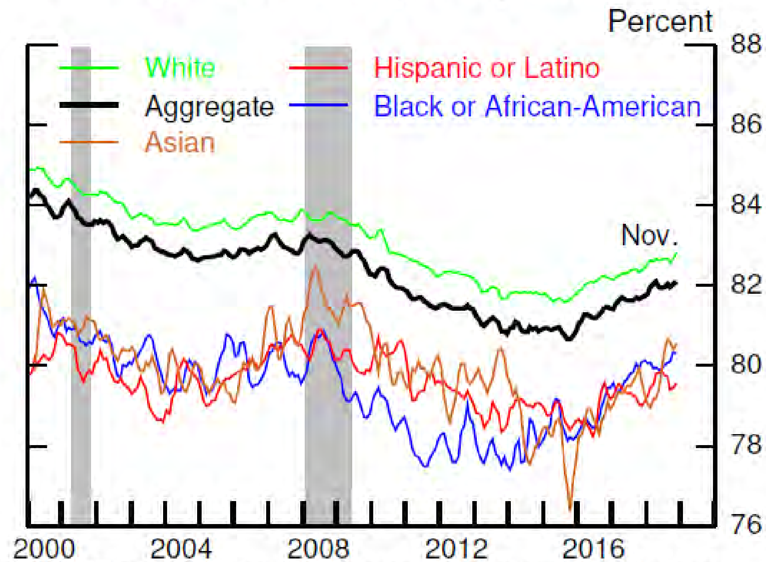
Labor market strengthening broadly shared, but persistent gaps remain

Unemployment rates by race or ethnicity



Note: Three-month moving averages. Shaded bars indicate NBER recessions.

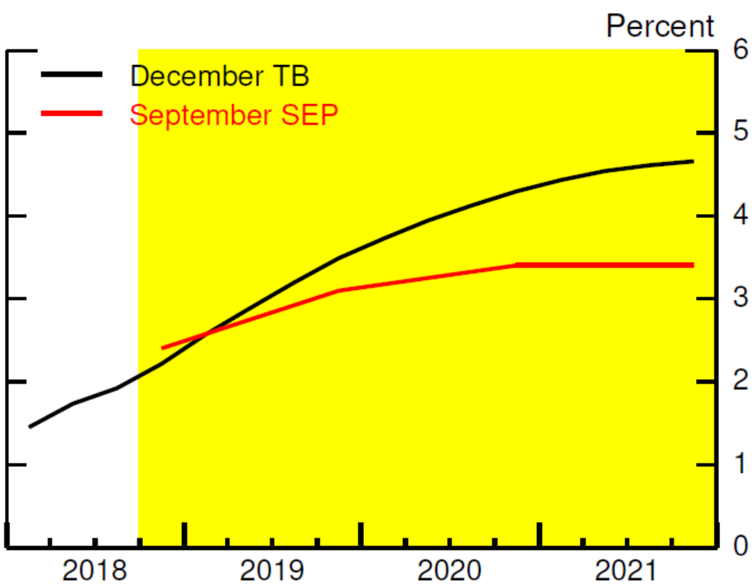
Prime-age labor force participation rates



Note: Three-month moving averages. Data cover persons between the ages of 25 and 54; data by race or ethnicity are seasonally adjusted by Board staff. Shaded bars indicate NBER recessions.

Federal funds rate projection

Staff and SEP federal funds rate projections



Note: Shaded yellow region indicates forecast period. September SEP series is the median projected appropriate policy path for federal funds rate from the Summary of Economic Projections released on September 26, 2018.

Staff federal funds rate projection

- Inflation target of 2 percent
- Real neutral rate of ½ percent
- Output gap rising to nearly 3 percent
- Inertial Taylor rule calls for funds rate to rise to 4¾ percent

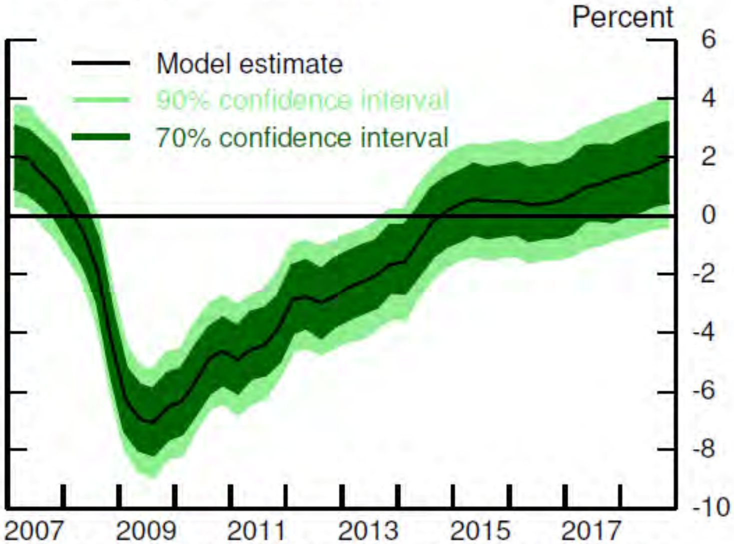
Two risks that staff funds rate projection is too high

- **Risk 1**: Current resource utilization could be significantly lower than the staff estimates.

- **Risk 2**: Economy's self-correcting forces when activity is well above potential could be significantly stronger than staff assumes.

Risk 1: Output gap estimates are highly uncertain

Output gap uncertainty



Note: Shaded regions denote model-computed uncertainty bands.

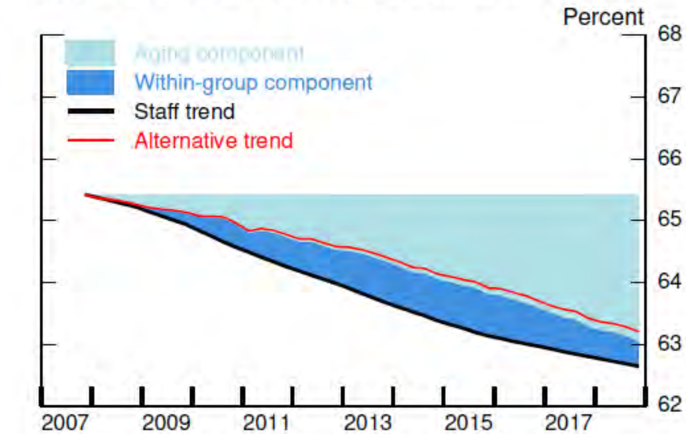
Staff and alternative output gaps in 2018Q4

	Staff	Alternative
1. Output gap	2.2	0.5
Contributions from		
2. Employment-population ratio gap	1.4	0.3
3. Unemployment rate gap	1.0	0.8
4. Participation rate gap	0.4	-0.5
5. Other	0.8	0.2

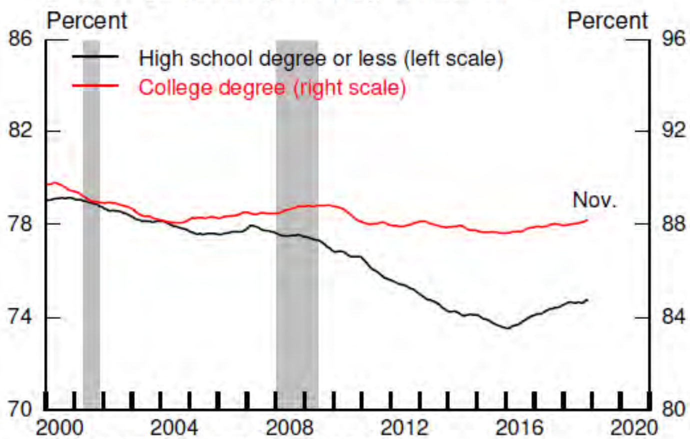
Note: Percent of potential output.

Staff view on trend participation

Staff LFPR trend decomposition since 2007Q4

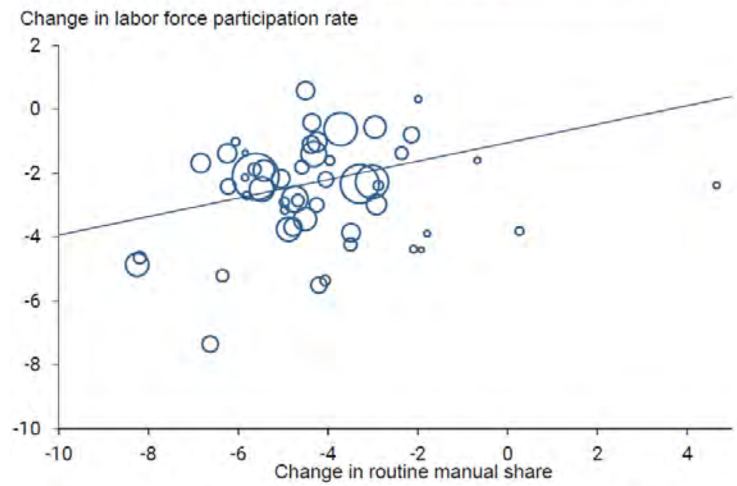


Prime-age participation by education



Note: Shaded bars indicate NBER recessions.
Source: Current Population Survey.

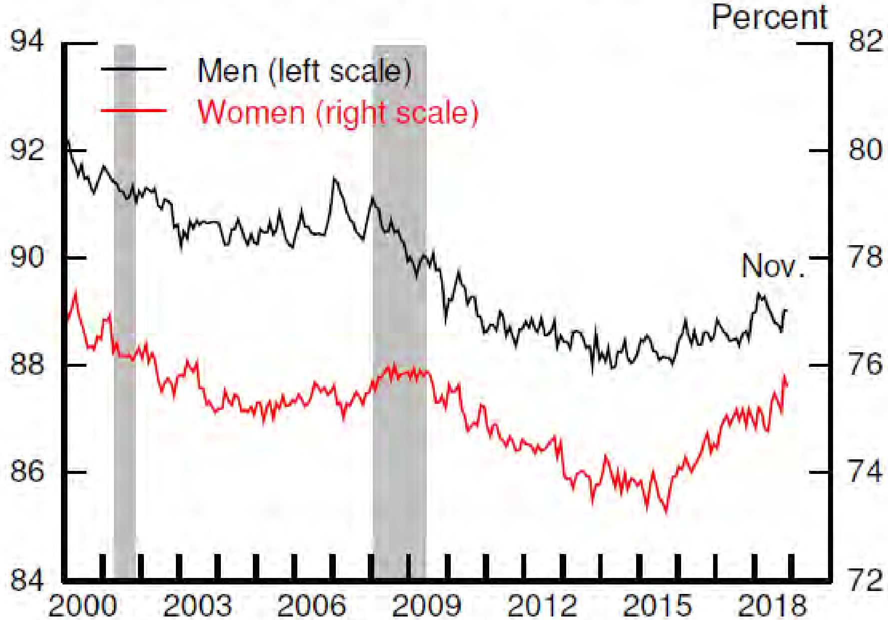
Routine manual share and prime-age labor force participation
(percentage point change between 2017 and 2000 by state)



Source: Bureau of Labor Statistics and authors' calculations. Figure from Valletta, R. and Barlow, N. 2018. "The Prime-Age Workforce and Labor Market Polarization". FRBSF Economic Letter.
Note: Circle sizes and fitted line reflect state shares of the national working-age population. The estimated coefficient of the plotted relationship is 0.29 and is statistically significant (5 percent level). The R^2 from the regression is 0.1.

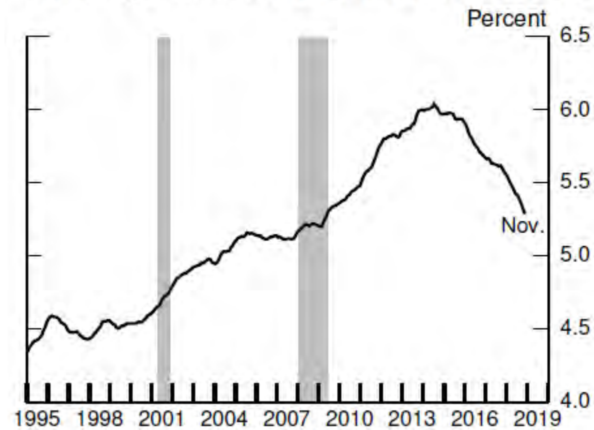
Alternative view on trend participation

Prime-age labor participation rate by sex



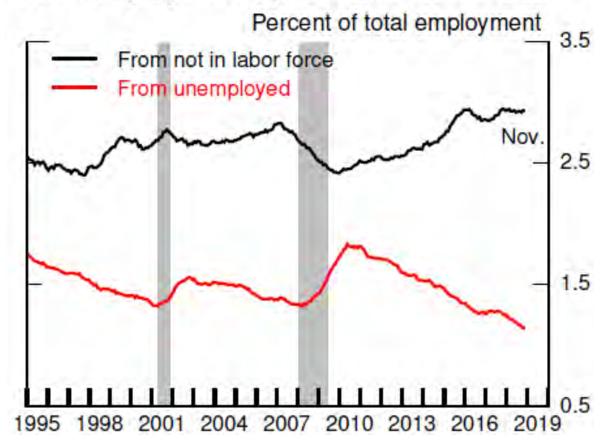
Note: Shaded bars indicate NBER recessions.
Source: Bureau of Labor Statistics.

Prime-age disabled and out of the labor force



Note: 12-month moving averages. Percent of prime-age population.
Shaded bars indicate NBER recessions.
Source: Current Population Survey.

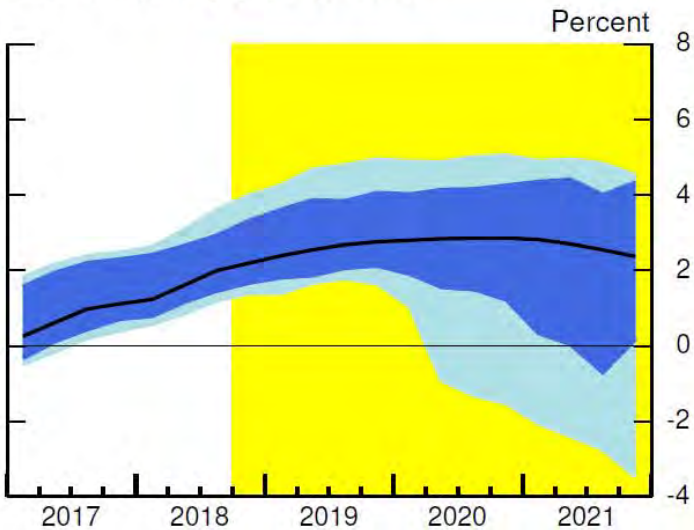
New employees by prior labor force status



Note: 12-month moving averages. Shaded bars indicate NBER recessions.
Source: Current Population Survey.

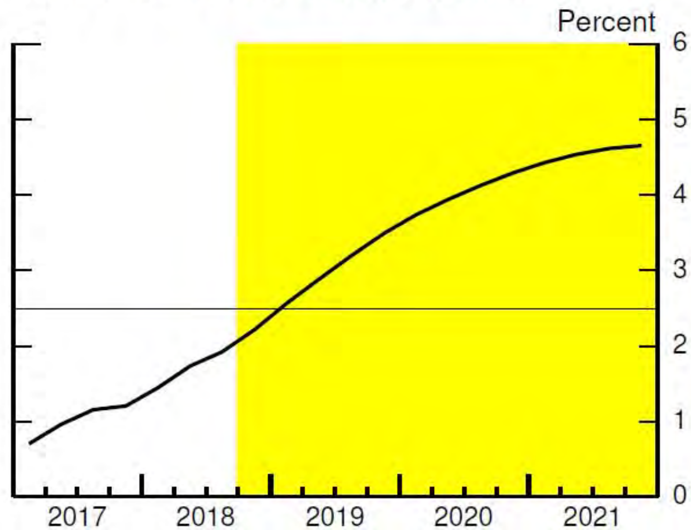
Risk 2: Output gap dynamics are highly uncertain

Staff output gap projection



Note: Shaded yellow region indicates forecast period. Blue shaded regions show the 70 percent and 90 percent confidence intervals of the distribution of historical revisions to the staff's estimates of the output gap.

Staff federal funds rate projection



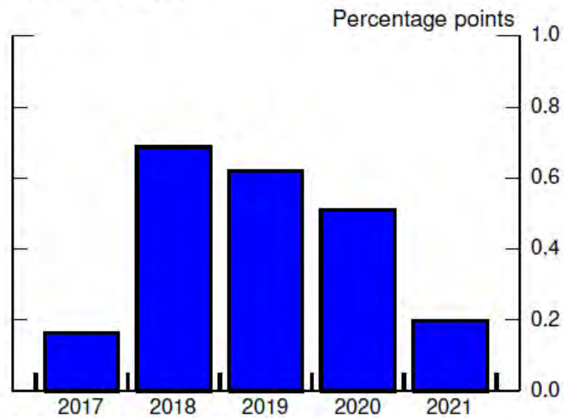
Note: The horizontal line represents the staff estimate of longer-run nominal r*. Shaded yellow region indicates forecast period.

Staff output gap dynamics

Factors behind the staff output gap projection

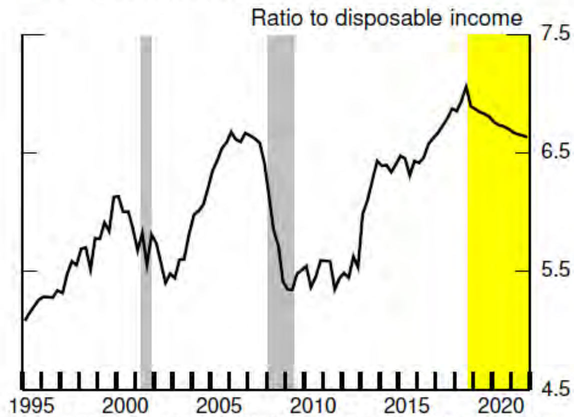
- Substantial fiscal stimulus through 2020
- Elevated consumer confidence
- Wealth-income recently reached new high
- Accommodative credit conditions
- Saving rate remains relatively high

Fiscal impetus



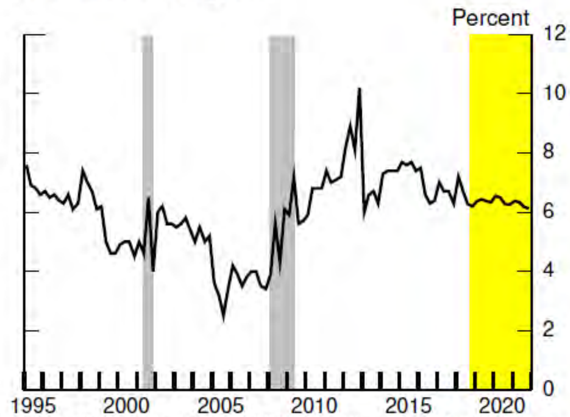
Note: Contributions to Q4/Q4 GDP growth.

Household wealth



Note: Data are ratio of household net worth to disposable personal income. Shaded bars indicate NBER recessions. Shaded yellow region indicates forecast period.

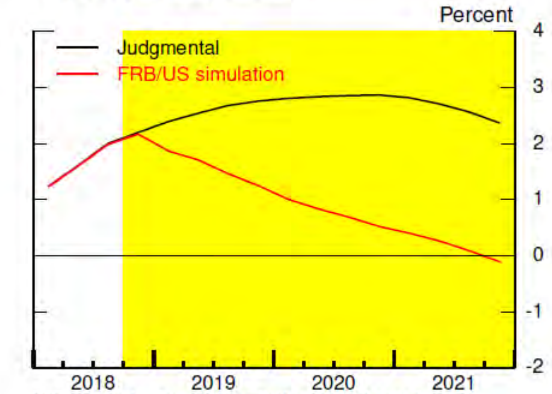
Personal saving rate



Note: Shaded bars indicate NBER recessions. Shaded yellow region indicates forecast period.

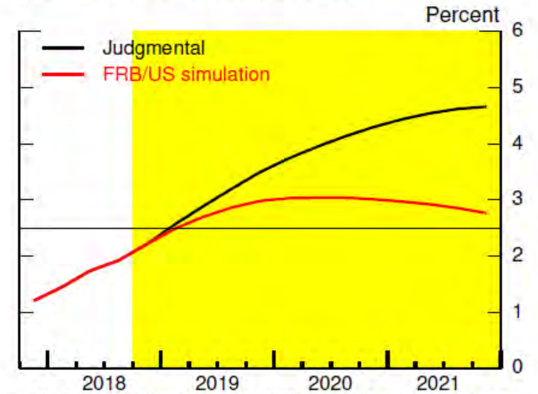
Alternative output gap dynamics

Output gap projections



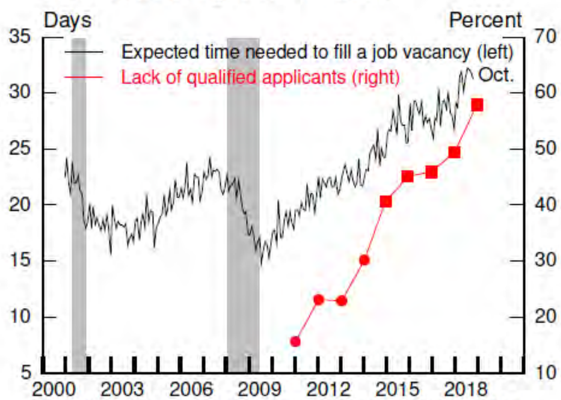
Note: Shaded yellow region indicates forecast period.

Federal funds rate projections



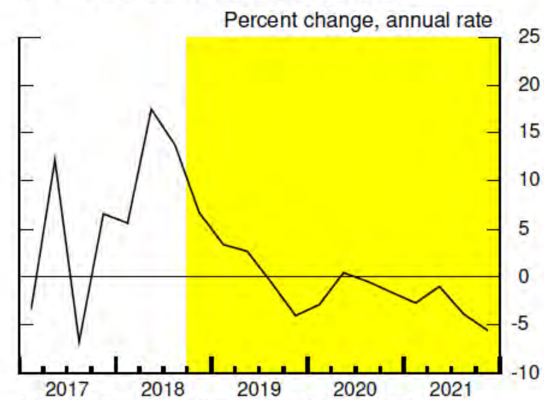
Note: The horizontal line represents the staff estimate of longer-run nominal r*. Shaded yellow region indicates forecast period.

Indicators of tight labor market



Note: Lack of qualified applicants is the percent of firms reporting lack of qualified applicants as a factor restraining hiring. Circles indicate observations from January and squares indicate observations from December of the given year. Shaded bars indicate NBER recessions.
Source: Expected time needed to fill a job vacancy data from JOLTS; Lack of qualified applicants data from Beige Book.

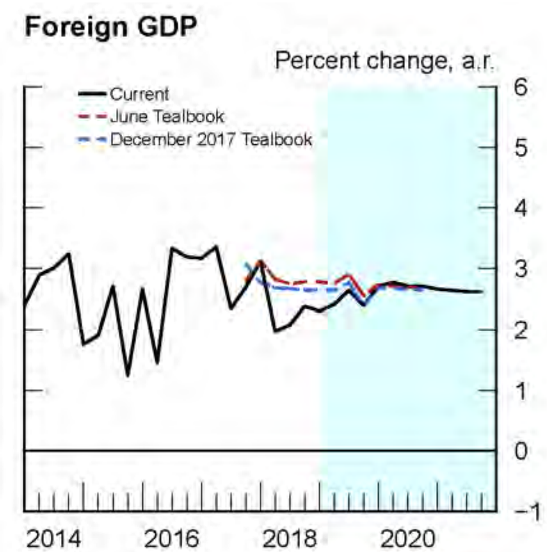
Staff forecast of domestic profits

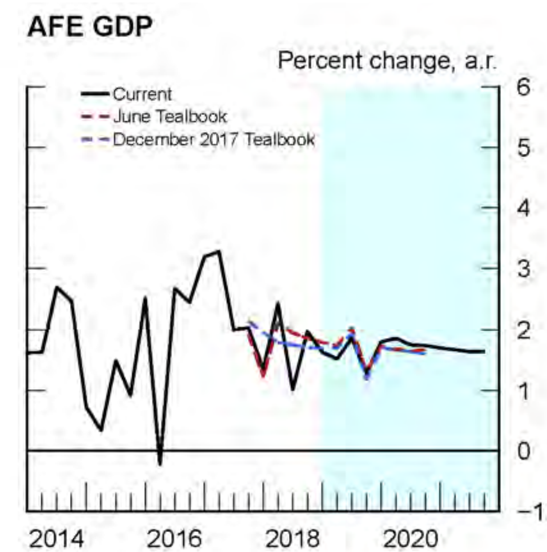


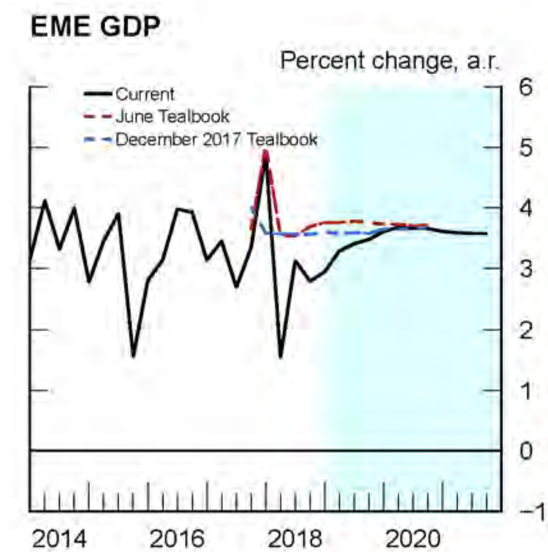
Note: Shaded yellow region indicates forecast period.

Foreign Outlook

- Falling oil prices, weaker-than-expected data, and tightening financial conditions have raised concerns about the health of foreign economies.
- We've revised down our forecast for foreign economies since the last Chart Show in June, but expect that foreign economies will grow near potential going forward.
- Foreign economies faced formidable downside risks and have limited policy space.







Economic conditions weaker, but not weak

- While data have been disappointing, they seem consistent with most foreign economies achieving growth close to potential.
- Some areas of concern including the euro area.
- One little caveat: recessions are hard to predict! But at least the data aren't screaming that a slowdown abroad is imminent.

Foreign Economic Conditions Index

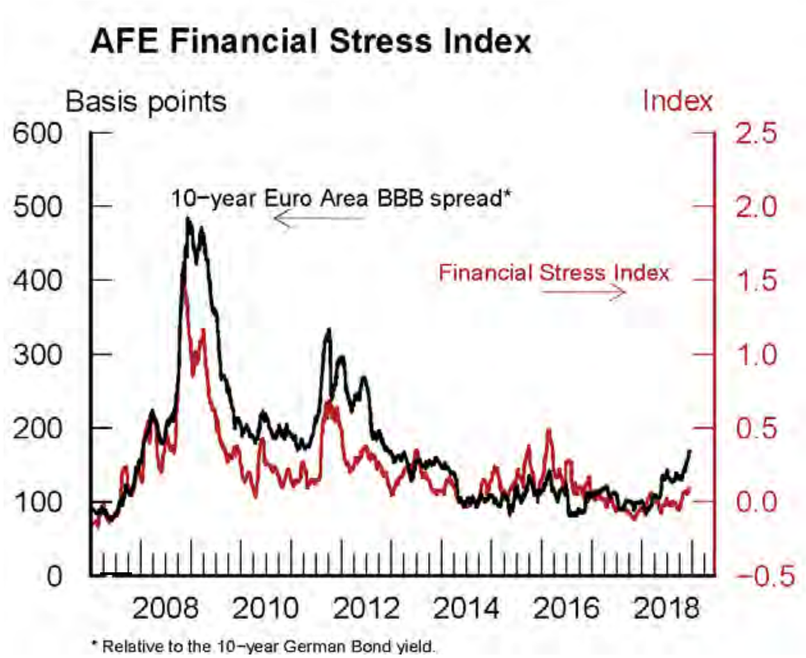
Note: Index is the business cycle condition index as in Aruoba, Diebold, Scotti (2009), constructed by staff using data on (PPP-weighted) foreign GDP, retail sales, industrial production, and new export orders. Shading indicates that countries representing 55% of foreign GDP are classified as in recession.

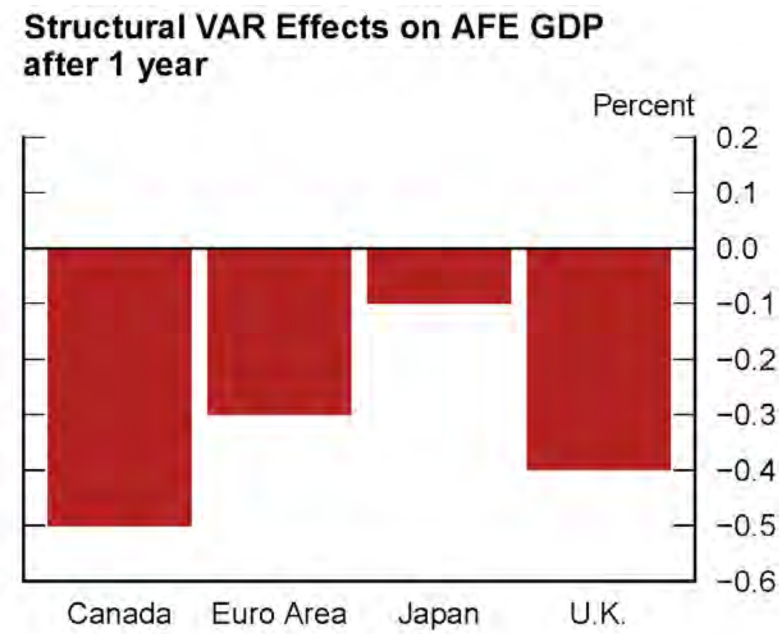
Euro Area PMI

Source: IHS Markit

Financial conditions tighter but still accommodative

- While financial conditions have tightened in both AFEs and EMEs since September, the drag to foreign output is likely to be moderate.
- Indexes of financial stress have only moved up slightly.
- Structural VAR suggests moderate effects from recent increase in financial stress.



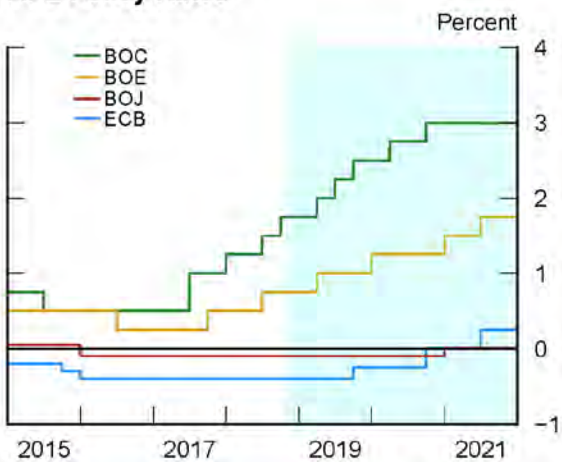


Limited policy space

- Real interest rates in the euro area, UK, and Japan are expected to remain in significantly negative territory through 2020.
  - Then edge up to long-run level of 0-1 percent (Holsten-Laubach-Williams).

- Monetary policy would have limited ability to offset shocks that cause a persistent tightening of financial conditions, and fiscal space also limited.

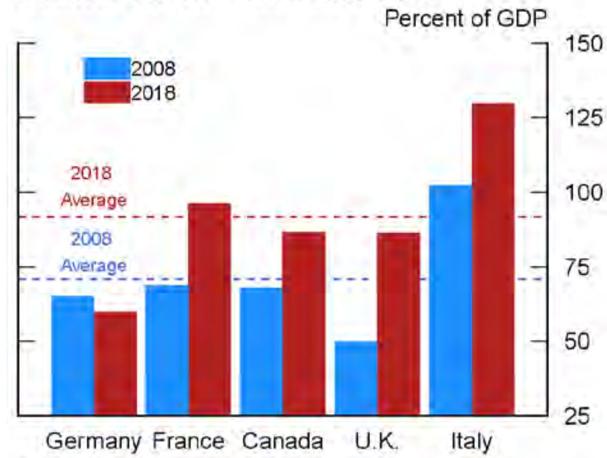
AFE Policy Rates



AFE Real Neutral Rate (Rstar)

Note. Trade-weighted average of long-run Rstar for Canada, the U.K., and the euro area. Estimates based on Holston, Laubach, and Williams (2017)

General Government Gross Debt



Source: IMF WEO.

Brexit: a graceful exit?

- Baseline assumption is that the UK and EU will cobble together a plan for an orderly transition to a close economic partnership post-Brexit.

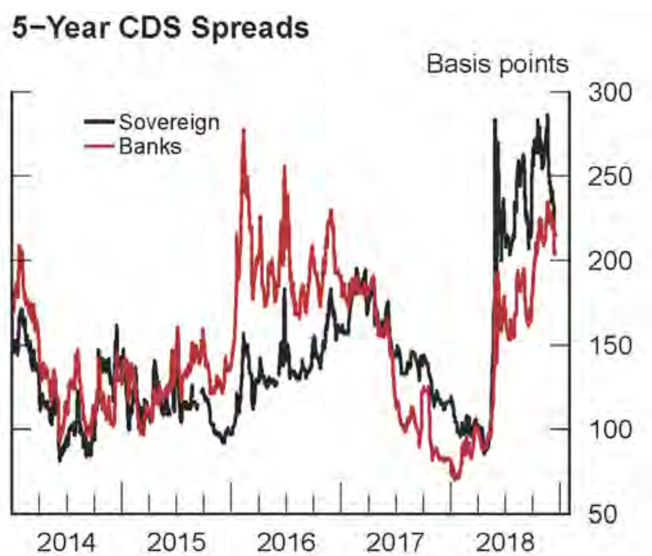
- However, the government faces huge challenges in gaining support for its plan.
  - The Irish border issue appears an intractable sticking point.

- If the government's plan is not approved, outcomes include:
  - Second referendum.
  - No-deal Brexit.

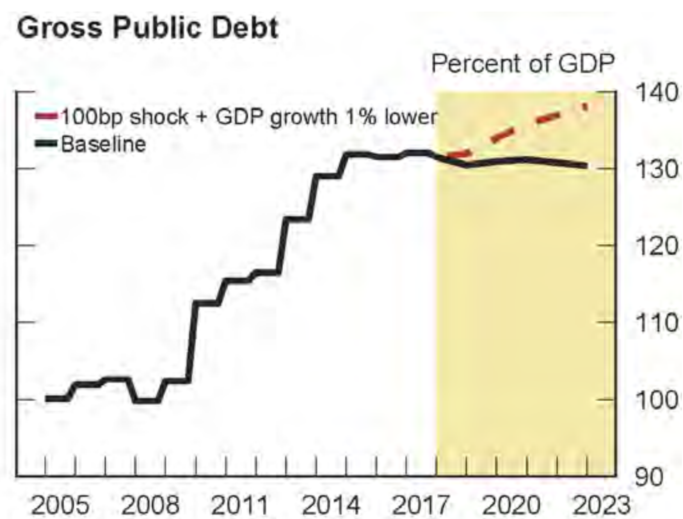
- No-deal Brexit would roil financial markets and plunge U.K. into a recession.

Italy's fiscal standoff with EU

- The Italian government – under threat of EU sanctions – has indicated willingness to aim for smaller budget deficit.
  - Financial conditions have eased, but still much tighter than earlier in the year.
- A prolonged growth slowdown could make government debt unsustainable and hurt Italy's weak banks.
- We expect the government and EU will keep the situation contained, but there is a significant risk of escalation into a full-blown financial crisis.



Source: Markit.



Source: Staff simulation. 100 bp shock shows impact when marginal rate receives 100bp shock that remains level over forecast horizon. GDP growth 1 percentage point slower than baseline simulation.

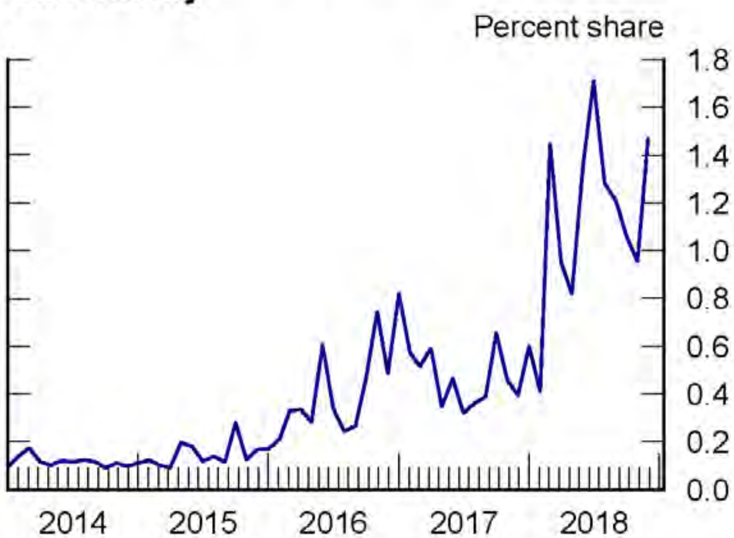
EME risks

- Laundry list of perennial risks
  - Hard landing in China.
  - Financial crises in vulnerable EMEs.
- Latin America continues to look fragile, including Mexico.
  - Mexico’s new populist government appears to be moving to less market-friendly policies.

Tariffs and trade tensions

- Since start of year new tariffs have been imposed on 13 percent of U.S. imports.
  - These actions as well as foreign retaliation projected to depress the level of U.S. GDP about 0.2 percent and boost consumer prices 0.15 percent.
- Some concessions from China, but Administration pressing for rapid progress in opening China's markets.
- We assume the new USMCA will be passed to replace NAFTA, but outcome is not assured.

Newspaper Index of Trade Policy Uncertainty



Source: Staff calculations. Percent share of newspaper articles discussing trade policy in conjunction with words such as "risk" or "uncertainty".

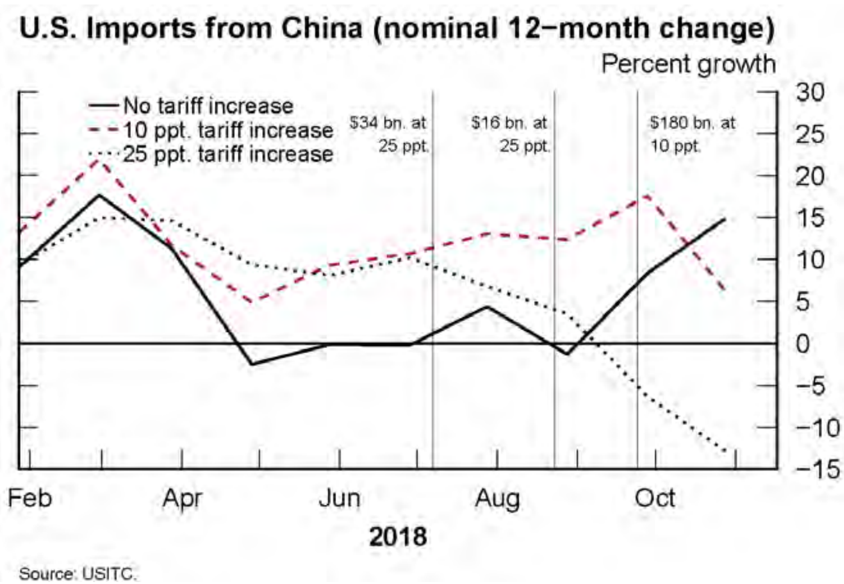
Trade Policy Effects

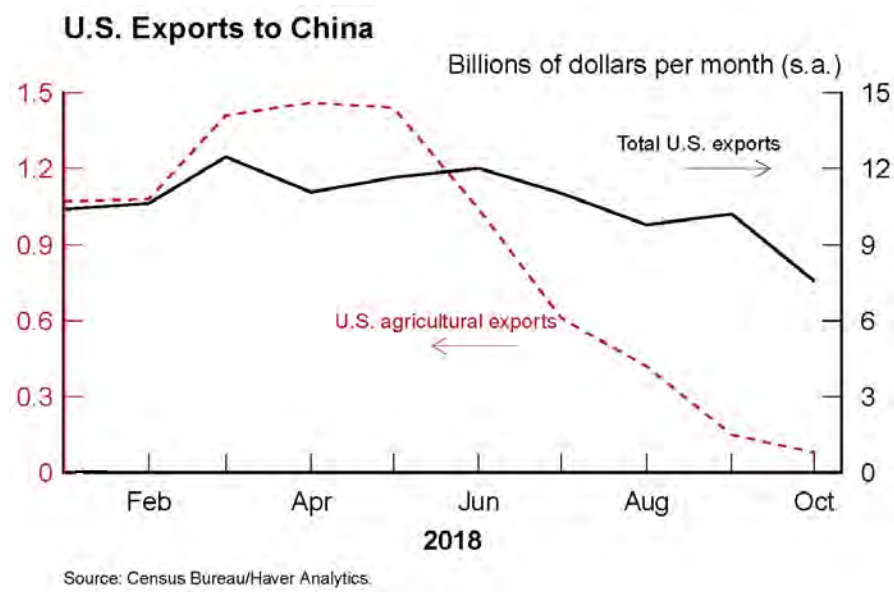
					General Equilibrium Effects on Level	
		Effective Date (Possible)	Tariff increase (ppt.)	Imports affected ($bn.)	Core PCE prices (pct.)	Real GDP (pct.)
Implemented						
1	Solar & Wash. Mach.	1/22	28	10	0.01	-0.02
2	Steel	6/1	25	23	0.02	-0.04
3	Aluminum	6/1	10	16	0.01	-0.01
4	China	7/6	25	34	0.03	-0.05
5	China	8/23	25	16	0.01	-0.02
6	China‡*	9/24	10	180	0.07	-0.1
7	*Total*		*14.6*	*279.0*	*0.15*	*-0.24*
Potential						
8	China*	3/2/19	15	180	0.10	-0.17
9	China (remainder)	TBD	10	275	0.10	-0.17
10	Autos	TBD	20	361	0.26	-0.45
11	*Total*		*15.5*	*816.0*	*0.46*	*-0.79*
12	**Grand Total**		**18.3**	**915**	**0.61**	**-1.03**

‡ We assume retaliation on two-thirds of U.S. exports. All others simulations assume full retaliation.
*These actions raise the tariff rate on the same $180 billion of U.S. imports.

Front-running of imports and falling exports

- While the aggregate value of imports from China has increased markedly in recent months, this may reflect front-running.
- Appears buyers were advancing purchases due to concerns tariffs would be imposed.
- Exports to China have fallen sharply.

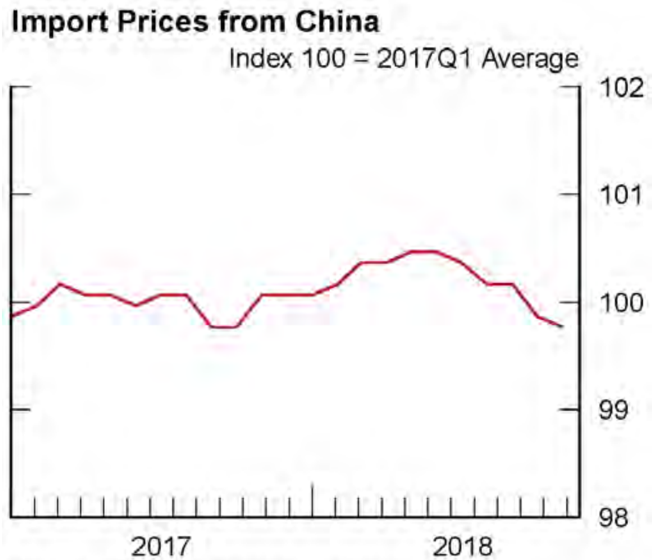




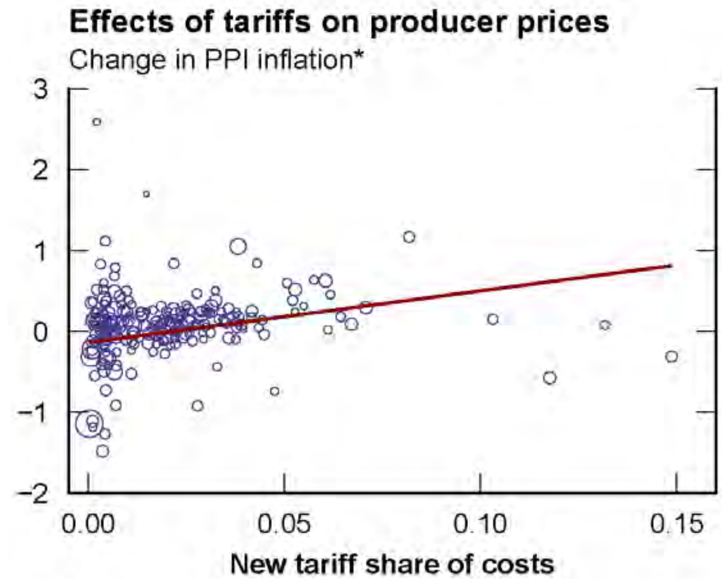
Some evidence that tariffs are raising prices

- Import prices from China (which are measured pre-tariff) have been flat since October.

- Producer prices have risen faster in U.S. manufacturing sectors heavily dependent on imports affected by recent tariffs.



Source: Bureau of Labor Statistics/Haver Analytics.

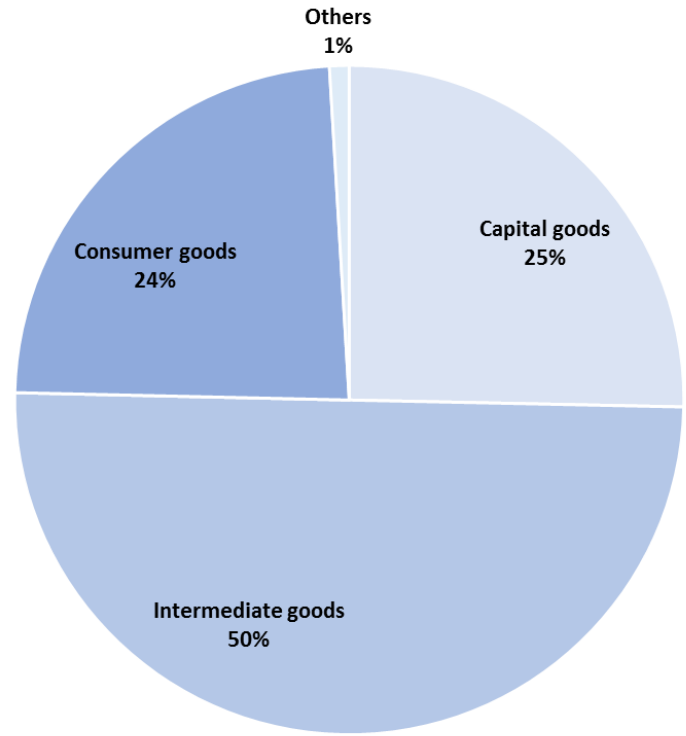


* 2018 year−to−date realtive to same period of 2017.

Tariffs, consumer prices, and monetary policy

- Larger and more broad-based increase in tariffs could put more upward pressure on consumer prices.
- Could confront policymakers with tradeoff between stabilizing output and inflation.
- Plausible that tariffs on intermediate inputs and capital goods may have smaller effects on inflation than tariffs on final consumption goods.
- Most of the recent tariffs on China have been on intermediate and capital goods.

U.S. imports from China subject to recent tariffs of $180 billion



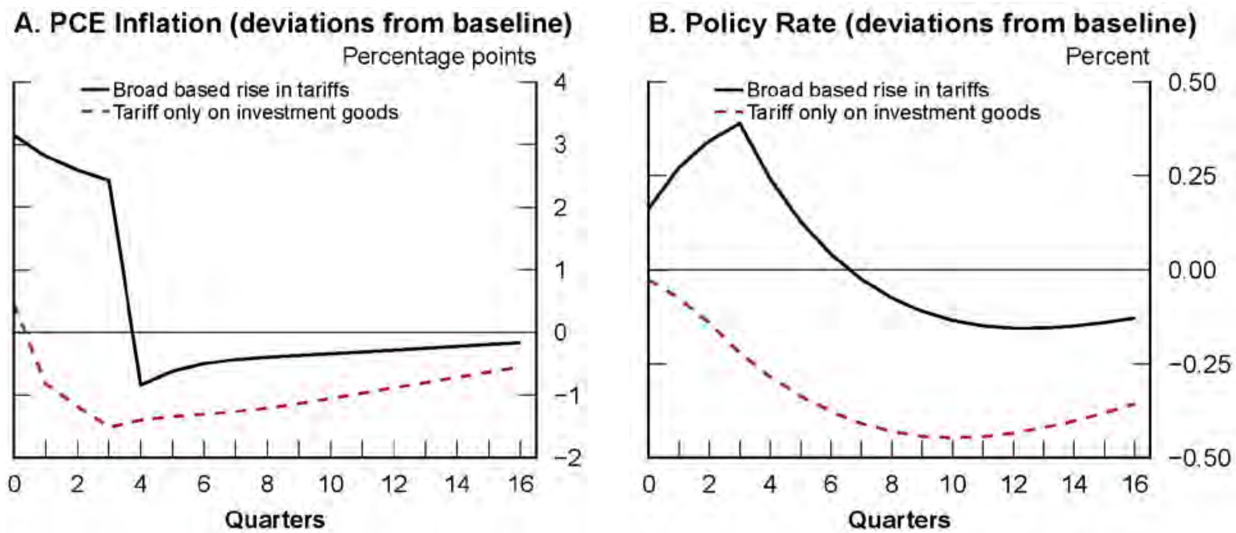
Source: Bown et al. 2018.

The type of import being tariffed matters

- SIGMA simulation compares effects of alternative unilateral tariffs:
  - Broad based rise in tariffs on all imports – consumer and capital goods.
  - Tariffs only on imported capital goods.

- Simulation highlights that effects on consumer prices may depend heavily on composition of the tariffs.

SIGMA simulations: 10% rise in tariffs



Appendix 4: Materials used by Mr. Cavallo

Material for Briefing on

Summary of Economic Projections

Michele Cavallo
Exhibits and support by Erik Larsson and Joshua S. Louria
December 18, 2018

Exhibit 1. Economic projections for 2018–21 and over the longer run (percent)

Change in real GDP

	2018	2019	2020	2021	Longer run
Median	3.0	2.3	2.0	1.8	1.9
September projection	3.1	2.5	2.0	1.8	1.8
Range	3.0 – 3.1	2.0 – 2.7	1.5 – 2.2	1.4 – 2.1	1.7 – 2.2
September projection	2.9 – 3.2	2.1 – 2.8	1.7 – 2.4	1.5 – 2.1	1.7 – 2.1
Memo: Tealbook	3.1	2.4	2.0	1.4	1.7
September projection	3.1	2.5	1.9	1.5	1.7

Unemployment rate

	2018	2019	2020	2021	Longer run
Median	3.7	3.5	3.6	3.8	4.4
September projection	3.7	3.5	3.5	3.7	4.5
Range	3.7	3.4 – 4.0	3.4 – 4.3	3.4 – 4.2	4.0 – 4.6
September projection	3.7 – 3.8	3.4 – 3.8	3.3 – 4.0	3.4 – 4.2	4.0 – 4.6
Memo: Tealbook	3.7	3.4	3.4	3.5	4.6
September projection	3.7	3.3	3.2	3.4	4.6

PCE inflation

	2018	2019	2020	2021	Longer run
Median	1.9	1.9	2.1	2.1	2.0
September projection	2.1	2.0	2.1	2.1	2.0
Range	1.8 – 1.9	1.8 – 2.2	2.0 – 2.2	2.0 – 2.3	2.0
September projection	1.9 – 2.2	2.0 – 2.3	2.0 – 2.2	2.0 – 2.3	2.0
Memo: Tealbook	1.9	1.8	2.0	2.0	2.0
September projection	2.0	1.9	2.0	2.0	2.0

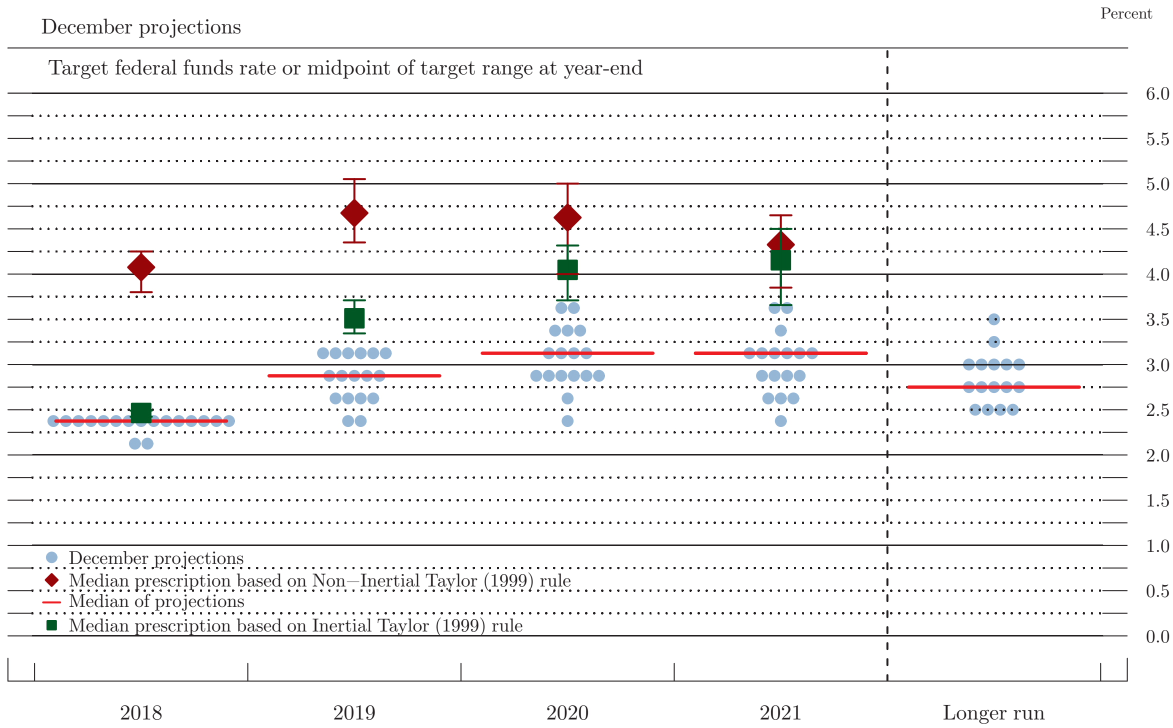
Core PCE inflation

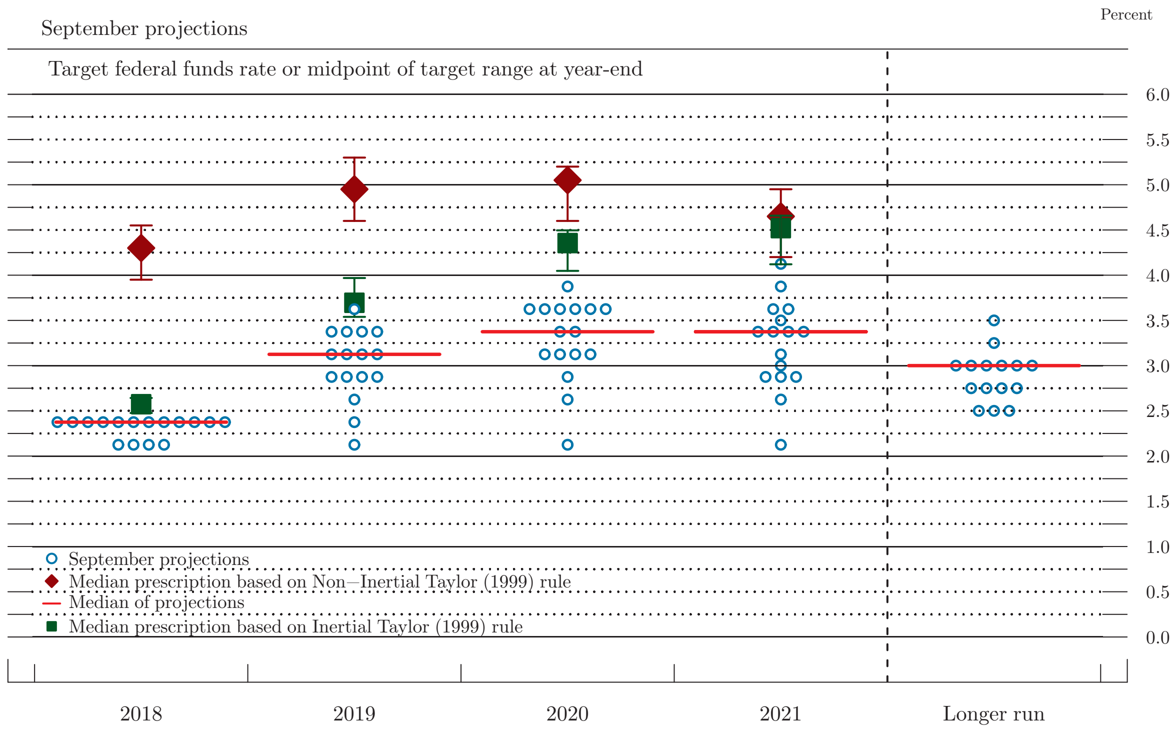
	2018	2019	2020	2021
Median	1.9	2.0	2.0	2.0
September projection	2.0	2.1	2.1	2.1
Range	1.8 – 1.9	1.9 – 2.2	2.0 – 2.2	2.0 – 2.3
September projection	1.9 – 2.0	2.0 – 2.3	2.0 – 2.2	2.0 – 2.3
Memo: Tealbook	1.9	2.0	2.0	2.0
September projection	1.9	2.0	2.1	2.1

NOTE: Updated December Tealbook values are reported. The percent changes in real GDP and inflation are measured Q4/Q4. Projections for the unemployment rate are for the average civilian unemployment rate in the fourth quarter of the year indicated. One participant did not submit longer-run projections for the change in real GDP, the unemployment rate, or the federal funds rate in conjunction with the September 25–26, 2018, meeting, and one participant did not submit such projections in conjunction with the December 18–19, 2018, meeting.

Class I FOMC – Restricted Controlled (FR)

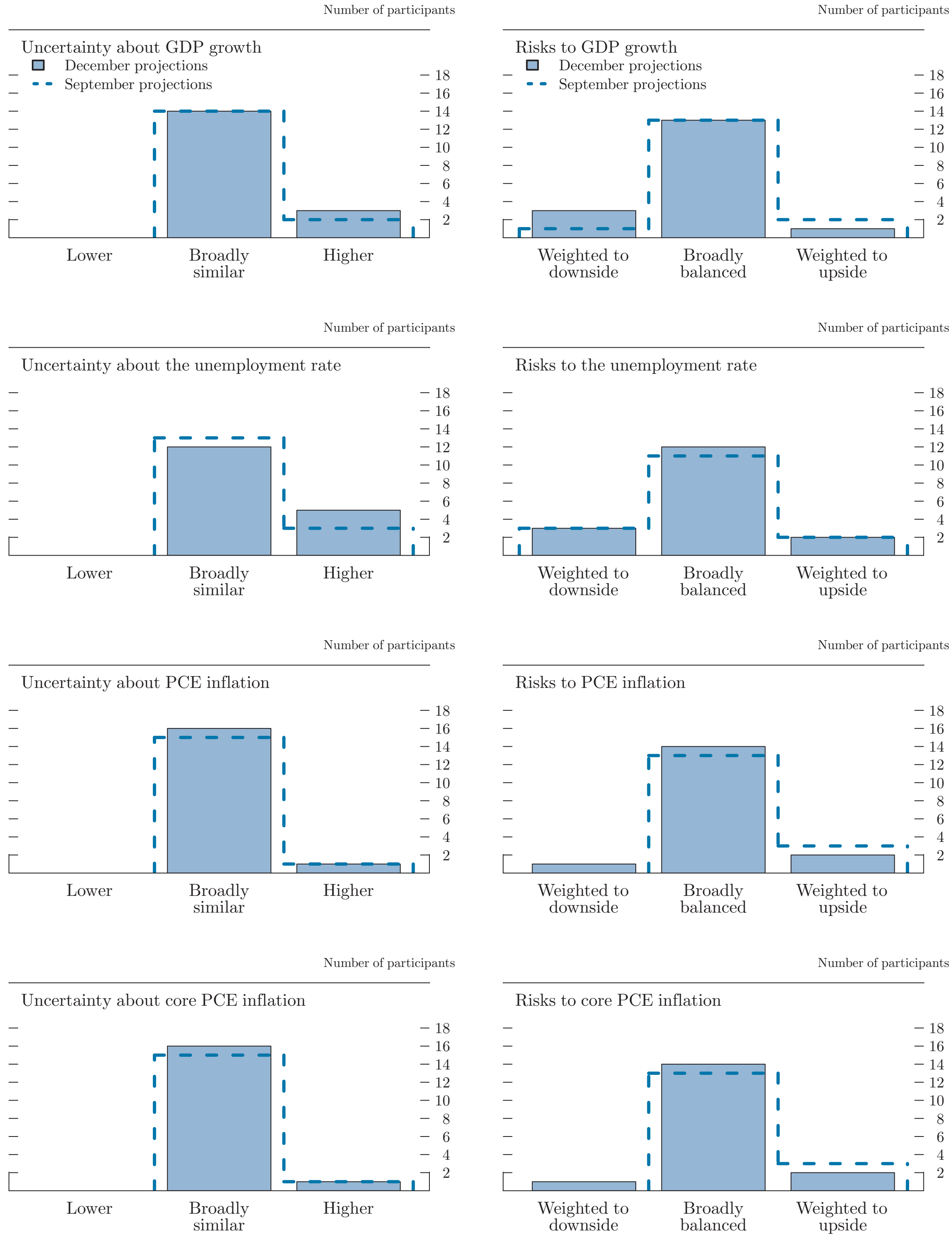
Exhibit 2. Overview of FOMC participants' assessments of appropriate monetary policy





Note: In these two panels, each blue dot indicates the value (rounded to 1/8 percentage point) of an individual participant's judgment of the midpoint of the appropriate target range for the federal funds rate, or the appropriate target level for that rate, at the end of the specified year or over the longer run. Each red diamond is the median value, for the indicated year, of the set of prescriptions for the federal funds rate that are generated by inserting into the non-inertial Taylor (1999) rule each participant's projections of core PCE inflation and the unemployment rate along with the participant's projections of the longer-run nominal federal funds rate and longer-run unemployment rate. The green squares are the medians of prescriptions generated using the inertial Taylor (1999) rule. The red and green whiskers show the central tendency, for each year, of the prescriptions that result from using the non-inertial Taylor (1999) rule and the inertial Taylor (1999) rule, respectively. One participant did not submit longer-run projections for the federal funds rate or unemployment rate.

Exhibit 3. Uncertainty and risks in economic projections



Appendix 5: Materials used by Mr. Laubach

Class I FOMC – Restricted Controlled (FR)

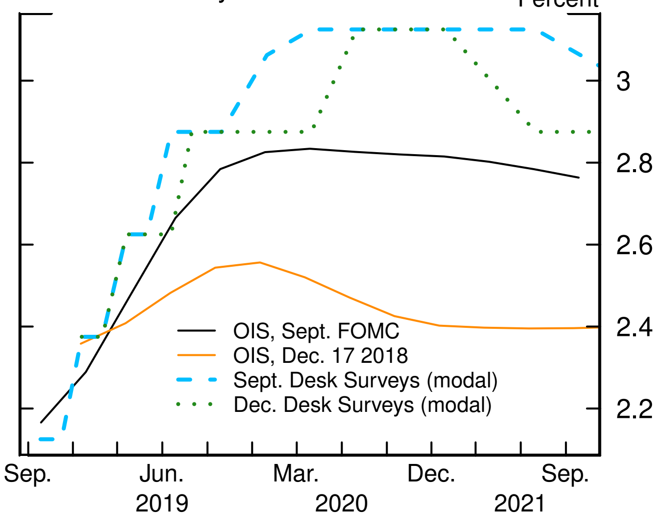
Material for the Briefing on

Monetary Policy Alternatives

Thomas Laubach
Exhibits by Gurubala Kotta
December 18-19, 2018

Monetary Policy Considerations

OIS Rates and Federal Funds Rate Projections from Desk Surveys

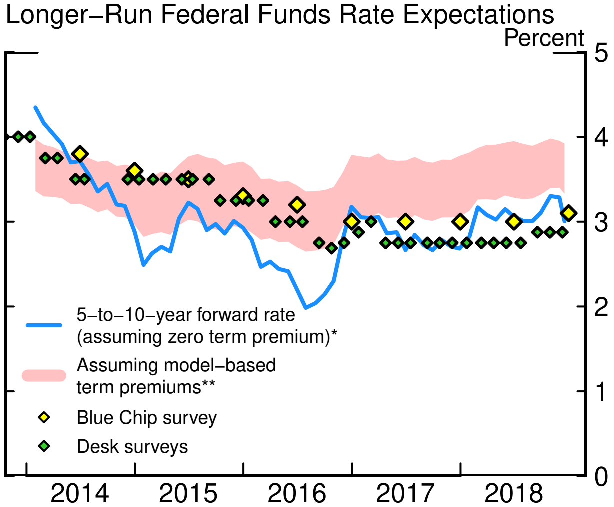


Note: Desk Surveys series' show the median of the respondents' modal paths for the federal funds rate.
Source: Board staff calculations, FRBNY.

Why Have Policy Rate Expectations Moved Down?

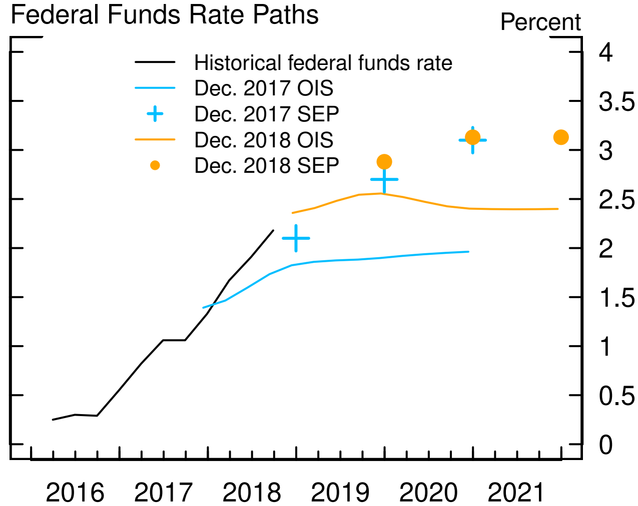
- Do markets perceive a shift in your reaction function?
- Has the baseline outlook shifted down?
- Do markets perceive a significant increase in downside risks, with little change in the modal outlook?

Longer−Run Federal Funds Rate Expectations



*Monthly average 5−to−10−year forward derived from prices of off−the−run Treasury securities.
**Monthly average 5−to−10−year forward rate adjusted for three alternative model−based term premium estimates using Kim and Wright (2005), D'Amico, Kim, and Wei (2018), and Priebsch (2017).
Source: Blue Chip, FRBNY, Board staff estimates.

Federal Funds Rate Paths

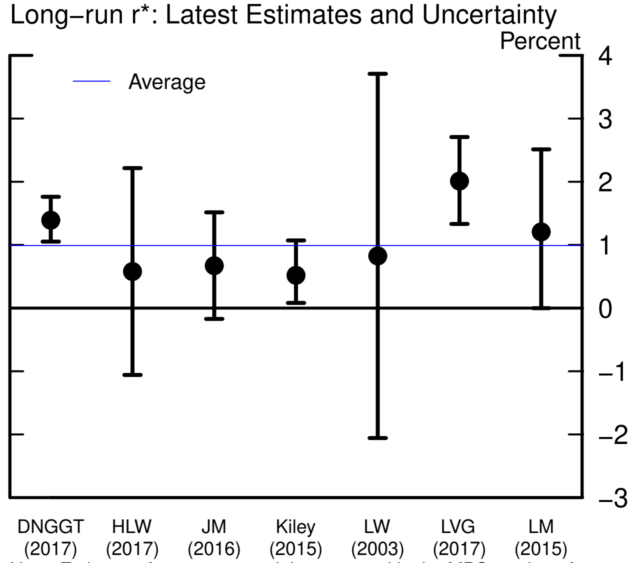


Note: OIS paths generated using SEP dates.
Source: Federal Reserve Board, Board staff calculations, Summary of Economic Projections.

Considerations for Future Statement Language

- Changes in June and September have already cut back on forward guidance.
- Under SEP outlook, "further gradual increases" would likely need to be removed at next hike.
- Might reintroduce thought from previous language that "the actual path of the federal funds rate will depend on the economic outlook as informed by incoming data."

Long−run r*: Latest Estimates and Uncertainty



Note: Estimates from seven models presented in the MPS section of Tealbook A.
Source: Federal Reserve Board, Board staff calculations.

NOVEMBER 2018 FOMC STATEMENT

1. Information received since the Federal Open Market Committee met in September indicates that the labor market has continued to strengthen and that economic activity has been rising at a strong rate. Job gains have been strong, on average, in recent months, and the unemployment rate has declined. Household spending has continued to grow strongly, while growth of business fixed investment has moderated from its rapid pace earlier in the year. On a 12-month basis, both overall inflation and inflation for items other than food and energy remain near 2 percent. Indicators of longer-term inflation expectations are little changed, on balance.

2. Consistent with its statutory mandate, the Committee seeks to foster maximum employment and price stability. The Committee expects that further gradual increases in the target range for the federal funds rate will be consistent with sustained expansion of economic activity, strong labor market conditions, and inflation near the Committee's symmetric 2 percent objective over the medium term. Risks to the economic outlook appear roughly balanced.

3. In view of realized and expected labor market conditions and inflation, the Committee decided to maintain the target range for the federal funds rate at 2 to 2-1/4 percent.

4. 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 DECEMBER 2018

1. Information received since the Federal Open Market Committee met in ~~September~~ **November** indicates that the labor market has continued to strengthen and that economic activity has been rising at a strong rate. Job gains have been strong, on average, in recent months, and the unemployment rate has ~~declined~~ **remained low**. Household spending has continued to grow strongly, while growth of business fixed investment has moderated from its rapid pace earlier in the year. On a 12-month basis, both overall inflation and inflation for items other than food and energy **have softened but** remain near 2 percent. Indicators of longer-term inflation expectations are little changed, on balance.

2. Consistent with its statutory mandate, the Committee seeks to foster maximum employment and price stability. The Committee ~~expects~~ **judges** that ~~further gradual increases in~~ the **current** target range for the federal funds rate ~~will be~~ **at this time is** consistent with sustained expansion of economic activity, strong labor market conditions, and inflation near the Committee's symmetric 2 percent objective over the medium term. Risks to the economic outlook appear roughly balanced.

3. In view of realized and expected labor market conditions and inflation, the Committee decided to maintain the target range for the federal funds rate at 2 to 2-1/4 percent.

4. 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 DECEMBER 2018

1. Information received since the Federal Open Market Committee met in ~~September~~ **November** indicates that the labor market has continued to strengthen and that economic activity has been rising at a strong rate. Job gains have been strong, on average, in recent months, and the unemployment rate has ~~declined~~ **remained low**. Household spending has continued to grow strongly, while growth of business fixed investment has moderated from its rapid pace earlier in the year. On a 12-month basis, both overall inflation and inflation for items other than food and energy remain near 2 percent. Indicators of longer-term inflation expectations are little changed, on balance.

2. Consistent with its statutory mandate, the Committee seeks to foster maximum employment and price stability. The Committee ~~expects~~ **judges** that **some** further gradual increases in the target range for the federal funds rate will be consistent with sustained expansion of economic activity, strong labor market conditions, and inflation near the Committee's symmetric 2 percent objective over the medium term. **The Committee judges that** risks to the economic outlook ~~appear~~ **are** roughly balanced**, but will continue to monitor global economic and financial developments and assess their implications for the economic outlook**.

3. In view of realized and expected labor market conditions and inflation, the Committee decided to ~~maintain~~ **raise** the target range for the federal funds rate ~~at 2~~ to 2-1/4 **to 2-1/2** percent.

4. 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 DECEMBER 2018

1. Information received since the Federal Open Market Committee met in ~~September~~ **November** indicates that the labor market has continued to ~~strengthen~~ **tighten** and that economic activity has been rising at a strong rate. Job gains have been ~~strong, on average,~~ **robust** in recent months, and the unemployment rate ~~has declined~~ **is at multi-decade lows**. Household spending has continued to grow strongly, while growth of business fixed investment has moderated from its rapid pace earlier in the year. On a 12-month basis, both overall inflation and inflation for items other than food and energy remain near 2 percent. Indicators of longer-term inflation expectations are little changed, on balance.

2. Consistent with its statutory mandate, the Committee seeks to foster maximum employment and price stability. The Committee expects that further gradual increases in the target range for the federal funds rate will be ~~consistent with sustained expansion of economic activity, strong labor market conditions, and~~ **warranted to keep** inflation near the Committee's symmetric 2 percent objective **and to sustain the economic expansion and maximum employment** over the medium term. Risks to the ~~economic~~ outlook **for economic activity** appear roughly balanced.

3. In view of realized and expected labor market conditions and inflation, the Committee decided to ~~maintain~~ **raise** the target range for the federal funds rate ~~at 2~~ to 2-1/4 **to 2-1/2** percent.

4. 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 December 2018 Alternative A

Release Date: December 19, 2018

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 ~~November 8~~ **December 19**, 2018:

- The Board of Governors of the Federal Reserve System voted [unanimously] to maintain the interest rate paid on required and excess reserve balances at 2.20 percent, effective ~~November 9~~ **December 20**, 2018.
- 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 ~~November 9~~ **December 20**, 2018, 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 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 2.00 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.

  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 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 2.75 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.

Implementation Note for December 2018 Alternatives B and C

Release Date: December 19, 2018

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 ~~November 8~~ **December 19**, 2018:

- The Board of Governors of the Federal Reserve System voted **[** unanimously **]** to ~~maintain~~ **raise** the interest rate paid on required and excess reserve balances ~~at 2.20~~ **to 2.40** percent, effective ~~November 9~~ **December 20**, 2018. **Setting the interest rate paid on required and excess reserve balances 10 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 ~~November 9~~ **December 20**, 2018, 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 ~~2.00~~ **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 $30 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~~ **a 1/4 percentage point increase in** the primary credit rate ~~at the existing level of 2.75~~ **to 3.00** percent**, effective December 20, 2018**. **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.

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

Leave the interest rates paid on required and excess reserve balances unchanged at 2.20 percent.

Establishment of the primary, secondary, and seasonal credit rates

Approve establishment of the primary credit rate at the existing rate of 2.75 percent and establishment of the rates for secondary and seasonal credit under the existing formulas specified in the staff's December 14, 2018, memo to the Board.

Potential Board actions associated with FOMC Alternatives B & C

Interest on required and excess reserve balances

Raise the interest rate paid on required and excess reserve balances to 2.40 percent, effective December 20, 2018.

Establishment of the primary, secondary, and seasonal credit rates

Approve establishment of the primary credit rate by the Federal Reserve Banks of Boston, Cleveland, Richmond, Atlanta, Chicago, and San Francisco at 3.00 percent effective December 20, 2018. This action will encompass approval of the establishment of a 3.00 percent primary credit rate by each of the remaining Federal Reserve Banks, effective on the later of December 20, 2018, 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 December 14, 2018, memorandum to the Board.