Appendix 1: Materials used by Ms. Klee and Mr. Chung

Class II FOMC - Restricted (FR)

Material for Briefing on

Review of Monetary Policy Framework

Beth Klee and Hess Chung
Exhibits by Morgan Elliott and Tyler Pike
January 28, 2020

Supporting memos and contributors listed on final page of packet.

Monetary Policy Strategies and Tools: Financial Stability Considerations

JONATHAN GOLDBERG (BOARD), BETH KLEE (BOARD), NED PRESCOTT (FRB-CLEVELAND), AND PAUL WOOD (BOARD)

JANUARY 28, 2020

Strategies, tools and financial stability

- We examine potential interactions between financial stability and monetary policy strategies and tools
  - “Makeup strategy”: inflation goal of 2 percent is achieved on average over time.
  - Unconventional policy tools: forward guidance at the ELB, balance sheet tools.
- Strategies and tools are typically beneficial for macroeconomic and financial stability.
  - Concerns about financial vulnerabilities may lead Committee to limit use.

The backdrop and the tradeoff

- Backdrop
  - Low neutral rate ➔ low policy rate needed to achieve dual mandate goals
    - Regardless of strategies and tools
- Tradeoff
  - Strategies and tools support economy and anchor inflation expectations ➔ Promotes financial stability
  - Low rates ➔ Boost financial vulnerabilities
    - Increased borrowing, financial leverage, and asset price pressures.

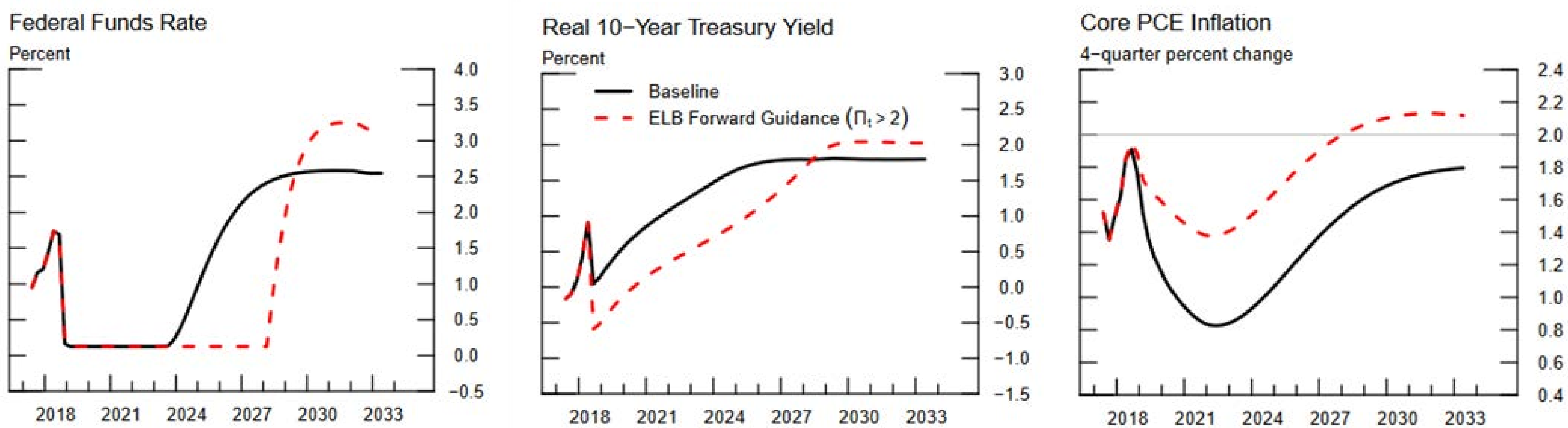
Interest rates and vulnerabilities

Effect of 100 bp easing on asset valuations	
Measure	**Effect**
Corporate bond spread	20 basis points
Excess corporate bond premium	15 basis points
Stock prices	3.6 to 4.7 percent
House prices	1.5 to 3.3 percent
10-year Treasury yield	15 basis points
10-year Treasury term premium	7-16 basis points

- Low rates can contribute to financial imbalances
- Elasticities are modest
- Changes in monetary policy have limited effects on financial stability

Sources: Corporate bond spread: Caldara and Herbst (2019); Excess corporate bond premium: Gertler and Karadi (2015); Stock prices: Bernanke and Kuttner (2005), Swanson (2017); House prices: Del Negro and Otrok (2007), Jarociński and Smets (2008), Kiley (2018), Musso et al. (2011); 10-year Treasury yield: Gertler and Karadi (2015), Gilchrist, López-Salido, Zakrajšek (2015); 10-year Treasury term premium: Gertler and Karadi (2015), Gilchrist, López-Salido, Zakrajšek (2015).

Makeup strategies in a severe recession



- Under a makeup strategy, rates are roughly 50 basis points lower
- Lower rate path keeps inflation closer to 2 percent, but would likely imply higher financial vulnerabilities.

Source: Chung et. al (2019). Monetary Policy Options at the Effective Lower Bound: Assessing the Federal Reserve's Current Policy Toolkit, Finance and Economics Discussion Series 2019-003.

Monetary policy tools

- Forward guidance at the ELB
  - "Reach for yield": Transmission channel, but can go too far
  - Low uncertainty: Build-up in leverage

- Balance sheet policies
  - Reduce longer-term rates: Business and households might borrow more
  - Flatter yield curve: Disrupt financial institution business models
  - Narrowing of risk premiums: Treasury securities, other instruments

- Experience is limited

Should vulnerabilities arise…

- Macroprudential tools
  - Relatively new
  - Limitations: Affect only banks, interagency coordination, no borrower standards

- Communications strategy
  - Supports minimizing vulnerabilities by avoiding destabilizing change in rates
  - Financial stability "escape clauses" allows deviating if financial vulnerabilities become significant.

Considerations Regarding Inflation Ranges

- Deviations of inflation from the objective have been frequent and will be unavoidable
- Variability of inflation motivates exploring the use of inflation ranges
- We consider ways in which inflation ranges can support or interfere with strategies designed to cope with challenging current environment

Taxonomy: Uncertainty Range

An **uncertainty range** informs the public about the Committee's assessment of the magnitude of inflation variations under appropriate policy.

- Inflation stabilization limited by many factors, including imperfect information, trade-offs between inflation and employment objectives

Taxonomy: Operational Range

An **operational range** signals to the public that, under some conditions, the Committee prefers inflation to be away from its long-run objective for a time.

- Example (average inflation targeting): Committee states that, when inflation has run below 2 percent for an extended period, it prefers for inflation to rise to between 2 and 2½ percent until average inflation over several years is roughly 2 percent.

Taxonomy: Indifference Range

An **indifference range** indicates to the public that monetary policy will not respond to deviations from the inflation objective within the indifference range.

- Might appear appropriate if costs to public of reacting to changes in policy are significant, even for very small changes

Foreign Experience with Inflation Ranges

- Most advanced-economy central banks use a range (mostly uncertainty ranges).

- No central banks publically describe their range as an indifference or operational range.
  - A couple (RBA, SNB) have ranges without point targets, suggesting some level of indifference in practice.

- Ranges often play a role in accountability.
  - At the BOE, BOC, Norges Bank and Riksbank, additional communication required if inflation moves 1 percentage point or more away from target.

Advantages and Disadvantages of Inflation Ranges

- Common Concerns
  - Ranges focus attention on the magnitude of deviations, but other features (nature of the shock, its persistence) also matter.
  - Risk of confusing the public's understanding of the point inflation objective.
  - Introducing an inflation range when inflation has been persistently below 2 percent may also reduce point objective's credibility.

Advantages and Disadvantages of Inflation Ranges

	Uncertainty Range	Operational Range	Indifference Range
Advantages	• Acknowledges challenges of stabilizing inflation • Widely used among central banks	• Prepares public for intentional temporary deviation from inflation objective • Alleviates concerns about degree of acceptable inflation deviation	• Avoids public having to adjust to small fluctuations • Raises average inflation, if range is asymmetric above the target
Disadvantages	• May damage credibility, if inflation falls outside the range	• May damage credibility, if inflation falls outside the range • May allow public beliefs about funds rate to remain diffuse.	• Increases dispersion and persistence of inflation deviations • May allow long-term inflation expectations to drift • May allow self-confirming expectations

Supporting Memos and Contributors

Jonathan Goldberg, Beth Klee, Ned Prescott and Paul Wood (2020). “Monetary Policy Strategies and Tools: Financial Stability Considerations,” memorandum to the Federal Open Market Committee, Board of Governors of the Federal Reserve System, January 10.

Hess Chung, Brian Doyle, James Hebden, and Michael Siemer (2020). “Considerations Regarding Inflation Ranges,” memorandum to the Federal Open Market Committee, Board of Governors of the Federal Reserve System, January 2020.

Appendix 2: Materials used by Ms. Klee and Mr. Chung

Class II FOMC – Restricted (FR)

Questions for Discussion of Framework Review at the January 2020 FOMC Meeting

1. Earlier memos examined the potential benefits of alternative monetary policy strategies and tools, without explicitly considering the effects that the use of such strategies and tools might have on financial vulnerabilities. How do you weigh the benefits of alternative monetary policy strategies and tools for achieving the Committee's objectives against the effects their use might have on financial vulnerabilities?

2. What do you see as the benefits and costs of various concepts of inflation target ranges? How should the Committee's communications balance the focus on its symmetric price stability objective of 2 percent annual PCE inflation against an acknowledgement that deviations of inflation from this objective are likely to occur, intentionally or unintentionally?

Appendix 3: Materials used by Mses. Logan and Zobel

Material for Briefing on

Financial Developments and Open Market Operations

Lorie Logan and Patricia Zobel
Exhibits by Ashley Rhodes
January 28, 2020

Class II FOMC – Restricted (FR) Exhibit 1

(1) Overview

- Broad financial market developments
- Money market conditions over year-end
- Transition to steady-state ample reserves operations

(2) Asset Price Changes

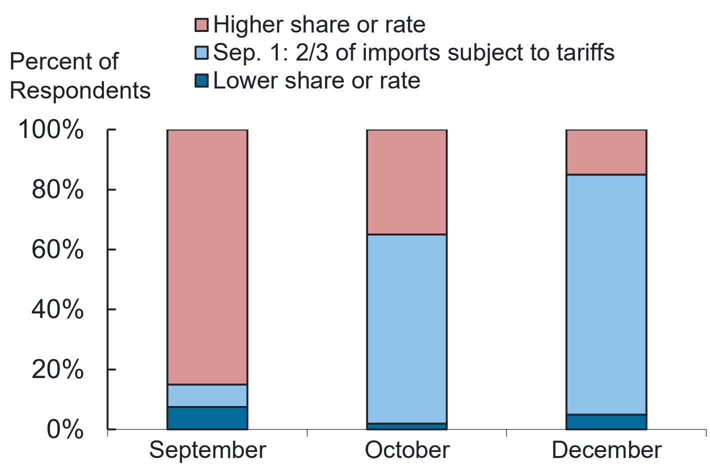
	Since Dec. FOMC*	Since Oct. 1, 2019	Jan. 24 Level
2Y Treasury	-13 bps	-5 bps	1.49%
10Y Treasury	-12 bps	+5 bps	1.68%
Fed 5Y5Y Breakeven Inflation	+0 bps	+12 bps	1.72%
S&P 500 Index	+5.1%	+12.1%	3,295
HY Credit Spread	+5 bps	-30 bps	356 bps
U.S. TW Broad Dollar	-0.5%	-2.0%	116

Note: Changes are through close of business on 01/24/2020. Blue indicates loosening financial conditions, red the opposite.
*Change is since just before statement release.
Source: Barclays, Bloomberg, Board of Governors

(3) Key Drivers

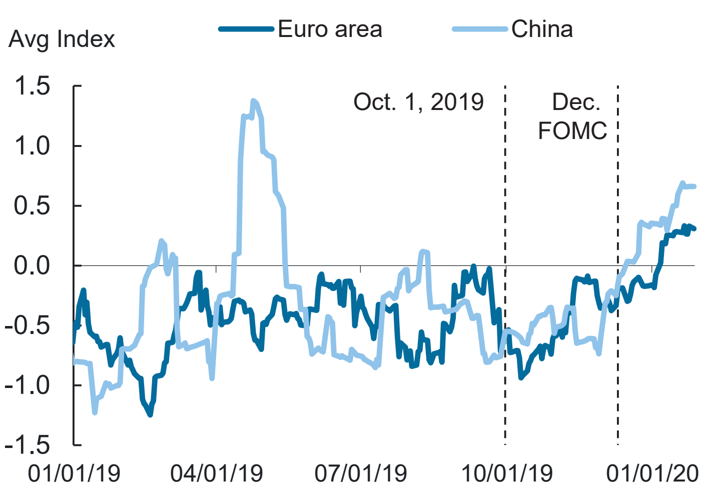
- Reduction in downside risks, particularly U.S.-China trade and Brexit
- Foreign data pointing to stabilization in global growth
- Investors perceive a high bar to FOMC hikes and expect accommodative foreign central bank policy

(4) Expectations for Tariffs on Imports from China (Relative to the Sep. 1 Regime)



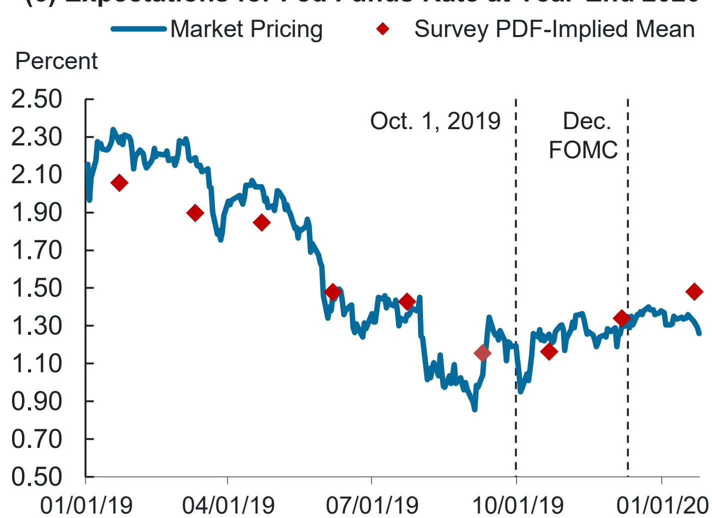
Note: Based on staff scoring of all responses from the Surveys of Primary Dealers and Market Participants.
Source: FRBNY

(5) Economic Surprise Indices



Note: Average of normalized indexes of Bloomberg, Citi, Goldman and JPM.
Source: Bloomberg, Staff Calculations

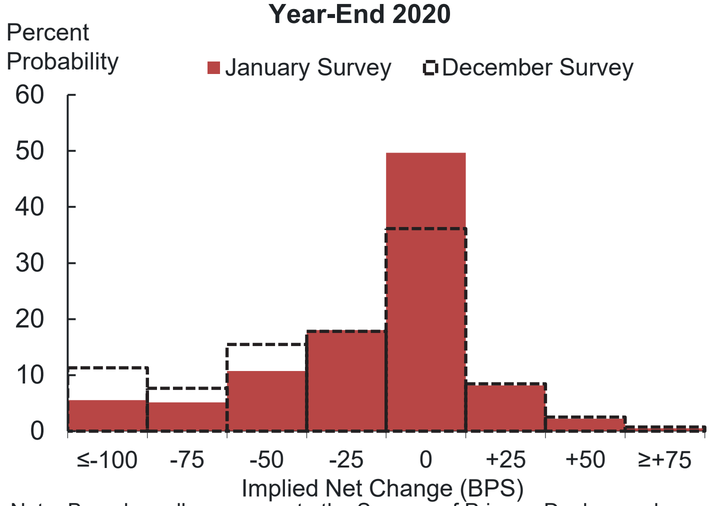
(6) Expectations for Fed Funds Rate at Year-End 2020



Note: Market pricing taken from January 2021 fed funds futures contract.
Source: Bloomberg, FRBNY

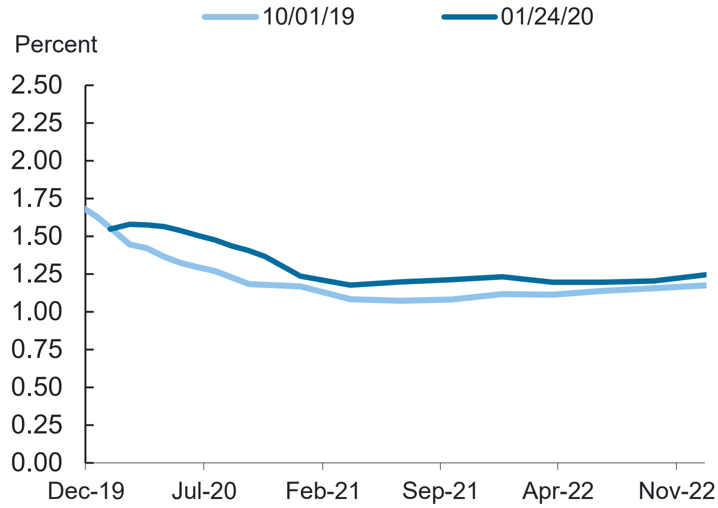
Class II FOMC – Restricted (FR) Exhibit 2

(7) Average PDF for Implied Target Range Changes by Year-End 2020



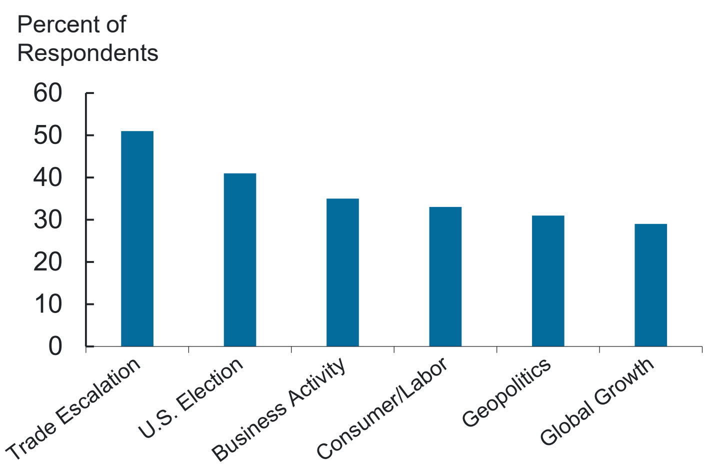
Note: Based on all responses to the Surveys of Primary Dealers and Market Participants.
Source: FRBNY

(8) Market-Implied Path of Policy Rate



Source: Bloomberg, Staff Calculations

(9) Main Highlighted Downside Risks

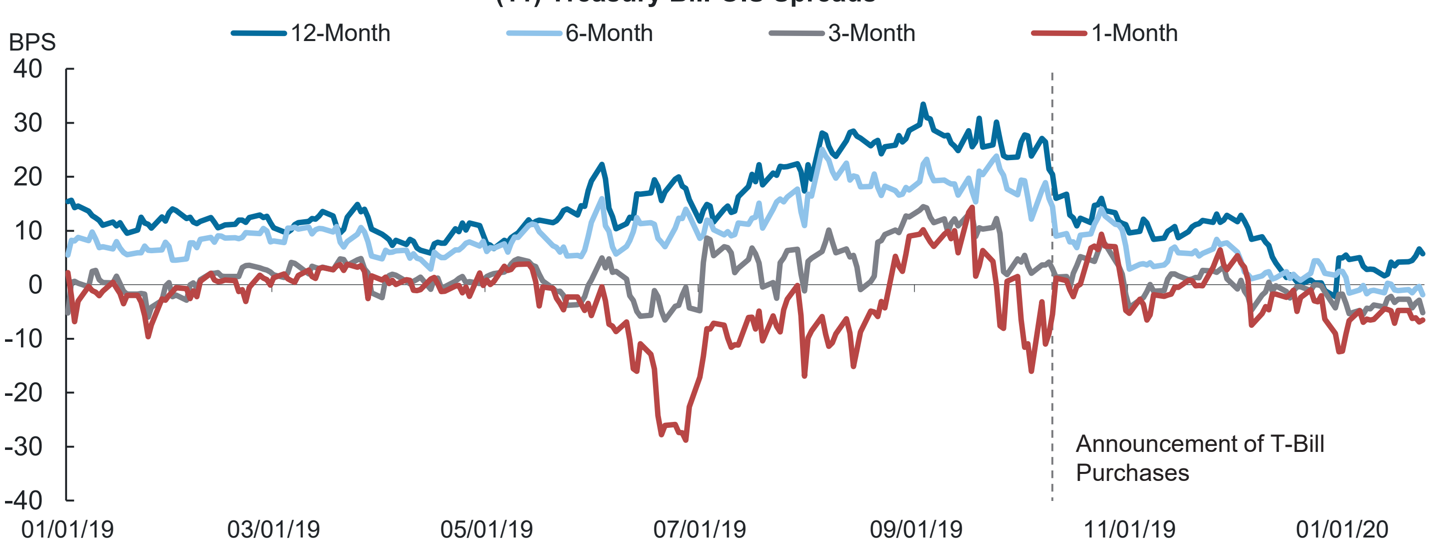


Note: Based on all responses to the Surveys of Primary Dealers and Market Participants.
Source: FRBNY

(10) Fed Balance Sheet and Equities/Risk Assets

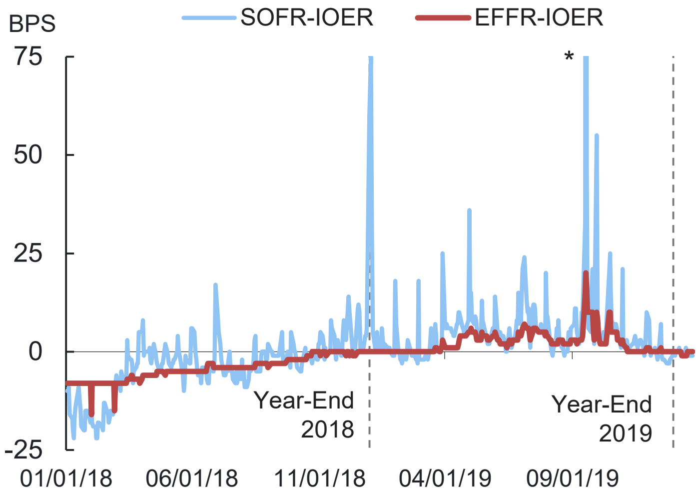
- Some evidence of an effect in T-bill-OIS spreads
- Evidence of broader effects less clear, but market beliefs can be self-fulfilling for a while
- Underscores the importance of transparent communications re: transition to steady-state ops

(11) Treasury Bill-OIS Spreads



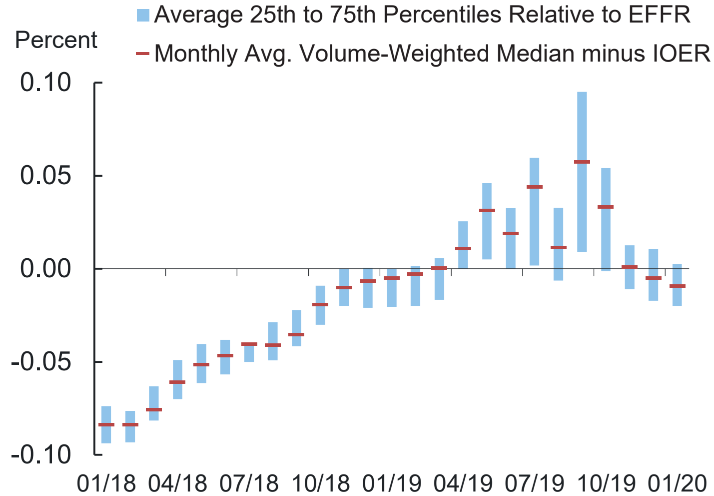
Source: Bloomberg

(12) EFFR and SOFR Spreads to IOER



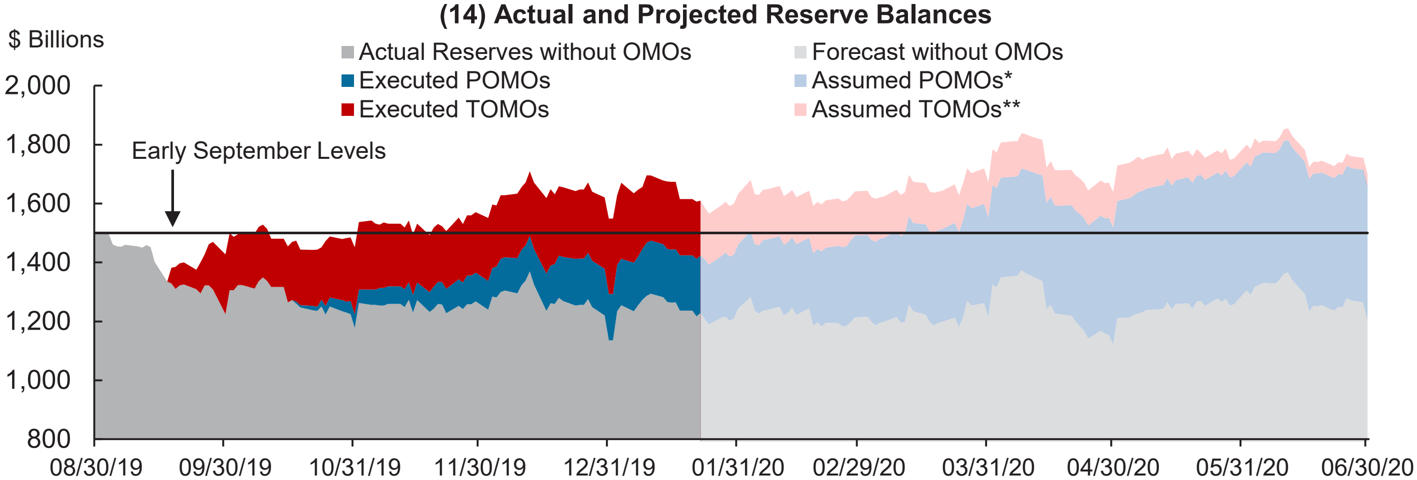
*On 09/17/19, SOFR was 315 basis points above IOER, not shown.
Source: FRBNY

(13) Intraday Dispersion of Fed Funds and Eurodollar Rates



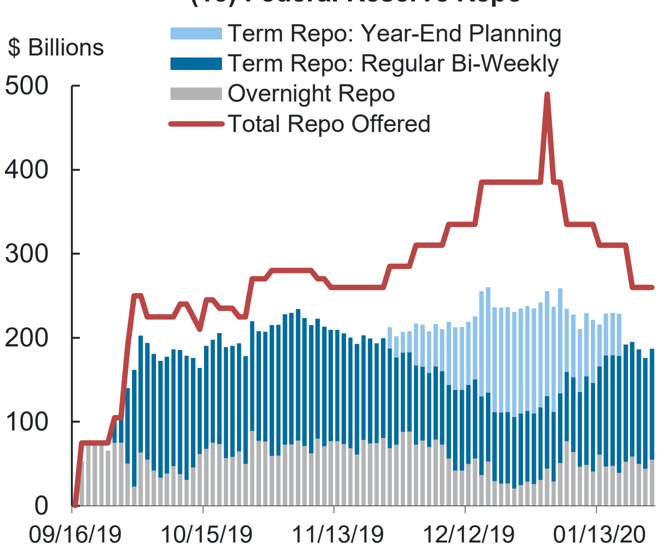
Source: FRBNY, Staff Calculations

(14) Actual and Projected Reserve Balances



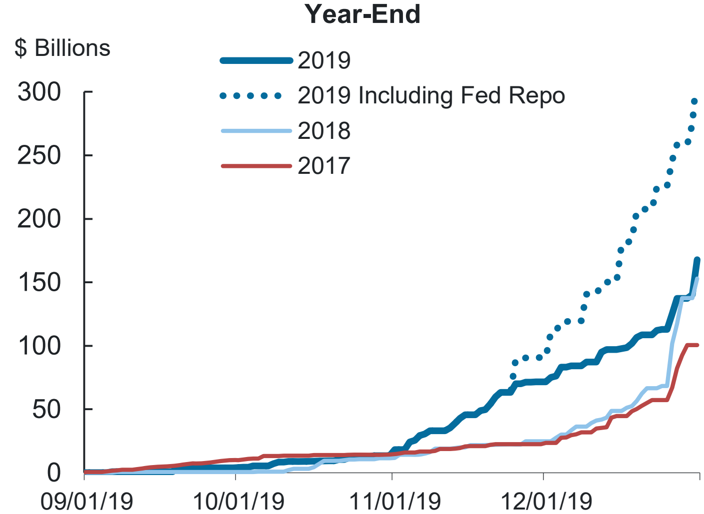
Note: Forecast as of 1/14/2020.
* Assumes $60 billion of purchases per month through April, $37.5 billion in May, and $15 billion in June.
** Assumes ON repo take-up is $40 billion through the end of June; assumes term repo tapers from current levels to zero by the first week of June.
Source: FRBNY, Staff Calculations, Daily H.4.1 data from Board of Governors.

(15) Federal Reserve Repo



Source: FRBNY

(16) Cumulative Treasury Triparty Repo Spanning Year-End



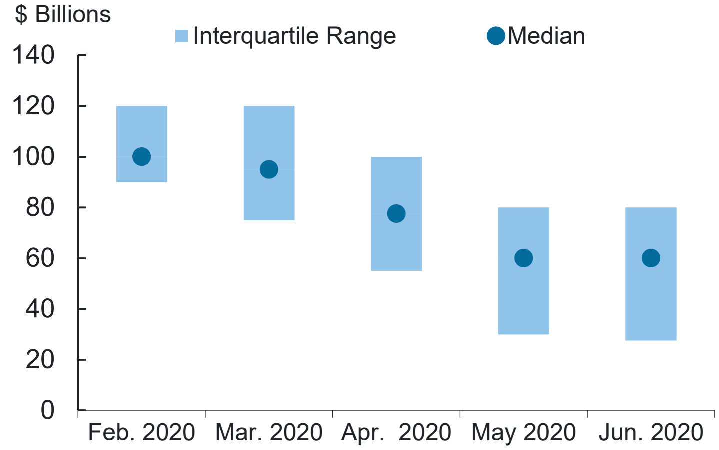
Note: Trades maturing in January of the subsequent year.
Source: BNYM

Class II FOMC – Restricted (FR) Exhibit 4

(17) Steady-State Ample Reserves Operations

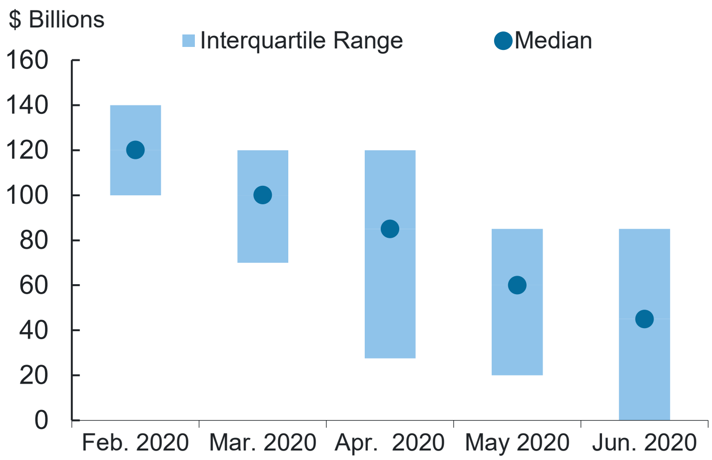
- Slower pace of reserve management purchases
- Reserves vary with normal swings in non-reserve liabilities
- Fed funds rate trades near IOER; IOER closer to middle of range and ON RRP at bottom of range
- Repo operations not necessary to add reserves; FOMC can consider whether to maintain repo operations at higher rates

(18) Expectations for Maximum Overnight Repo Offered Amounts



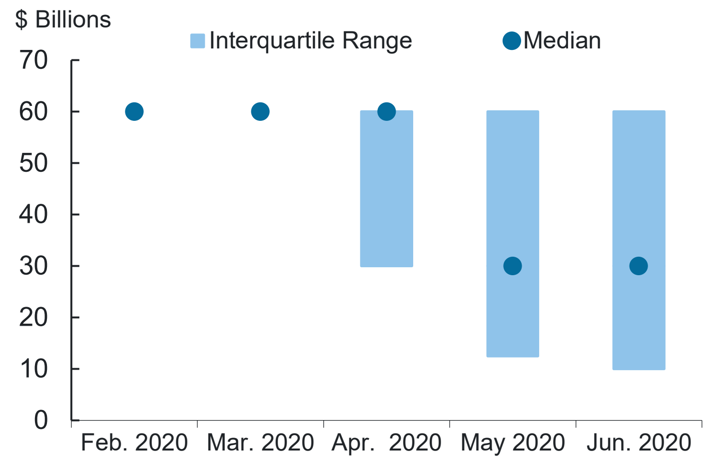
Note: Based on all responses to the Surveys of Primary Dealers and Market Participants.
Source: FRBNY

(19) Expectations for Maximum Term Repo Offered Amounts



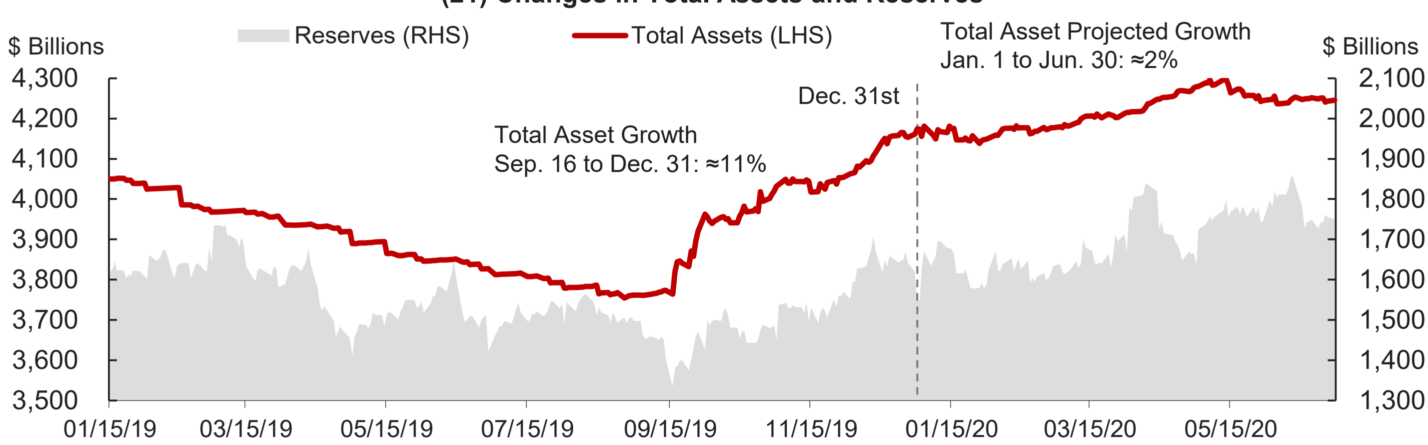
Note: Based on all responses to the Surveys of Primary Dealers and Market Participants.
Source: FRBNY

(20) Expectations for Monthly Pace of Treasury Bill Purchases



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

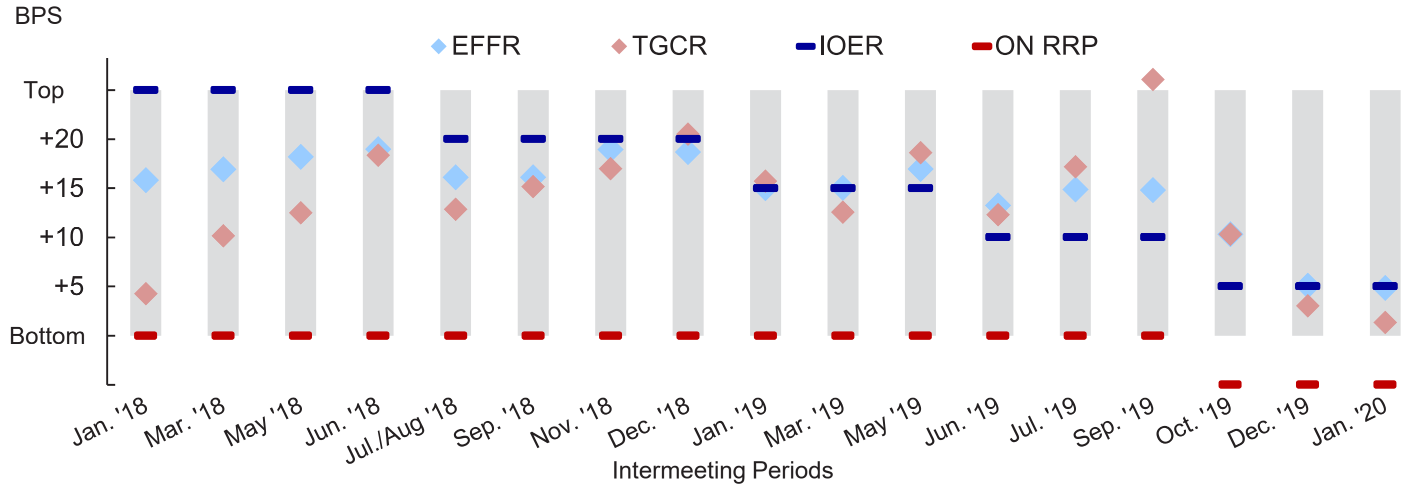
(21) Changes in Total Assets and Reserves



Note: Forecasts as of 01/14/2020. Forecasts include the assumption of $60 billion of purchases per month through April, $37.5B in purchases in May, and $15 billion in June; as well as ON repo take-up of $40 billion through the end of June; and assumes term repo tapers from current levels to zero by the first week of June.
Source: FRBNY, Staff Calculations, Daily H.4.1 data from Board of Governors

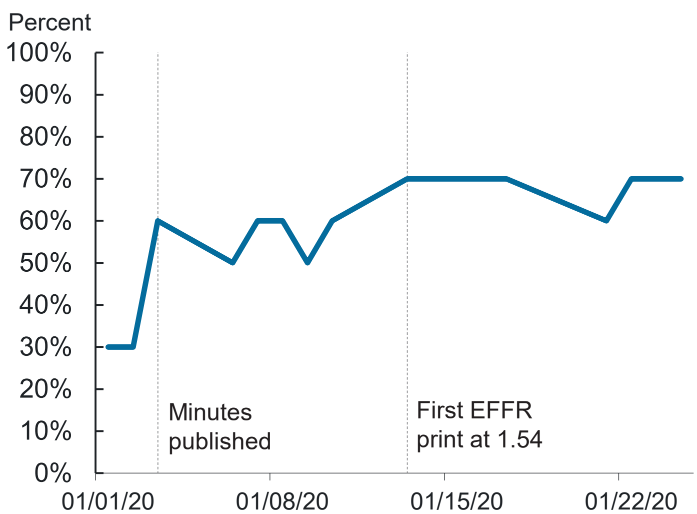
Class II FOMC – Restricted (FR) Exhibit 5

(22) Average Overnight Rates over Intermeeting Periods



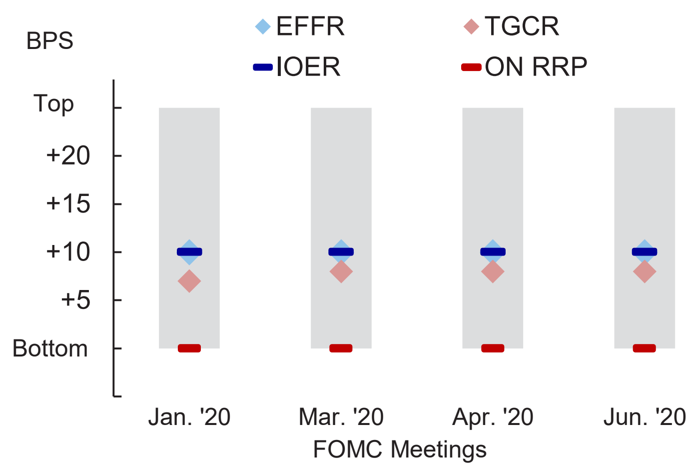
Note: Averages for the intermeeting period ending in the specified FOMC meeting date. Excludes day before, day of, and day after month-end.
Source: Board of Governors, FRBNY

(23) Futures-Implied Probability of IOER Adjustment



Source: Bloomberg, Desk calculations

(24) Survey Expectations for Overnight Rates



Note: Based on median responses to the Surveys of Primary Dealers and Market Participants. Expectations for rates immediately following the specified FOMC meeting date.
Source: FRBNY

Appendix 1

(1) Summary of Operational Testing

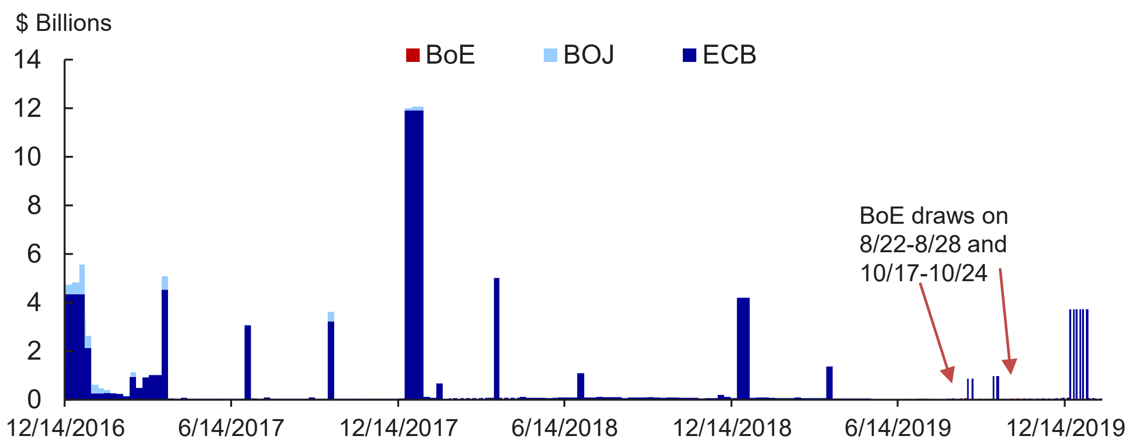
Summary of Operational Tests in prior period:

- Domestic Authorization
    - December 18: Overnight repo (using the backup tool) for $62 million

Upcoming Operational Tests:

- One test scheduled under the Domestic Authorization
    - February 19: Overnight reverse repo (with back-up tool) for up to $150 million
- Five tests scheduled under the Foreign Authorization
    - February 6: Swiss franc liquidity swap for CHF 51,000
    - February 11: Euro-denominated sovereign debt purchase for €1.1 million
    - February 18: Euro-denominated sovereign debt sale to private counterparties for €1.1 million
    - March 10: Yen-denominated sovereign debt purchase for ¥300 million
    - March 10: Yen-denominated sovereign debt sale to private counterparties for ¥ 300 million

(2) FX Swaps Outstanding



Note: First draw on the USD swap lines by the Bank of England since 2009, due to precautionary demand for testing purposes by BOE counterparties.
Source: FRBNY

(3) FX Intervention

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

Appendix 2

(1) MBS Purchase Summary Since Cap Implementation through 01/14/2020 ($ Millions)

Purchase Period	Actual Paydowns	Cap	Reinvestment Purchases	Net Deviation	Cumulative Deviation Since 10/2017
Jul. '19	22,260	20,000	2,258	-2	60
Aug. '19	25,270	20,000	5,273	3	63
Sep. '19	26,414	20,000	6,410	-4	58
Oct. '19	27,088	20,000	7,087	-1	57
Nov. '19	29,586	20,000	9,587	1	58
Dec. '19	25,101	20,000	5,107	6	64

Note: From Oct. '17 to Jun. '19 the cumulative net deviation w as $62 million.

(2) Treasury Purchase Summary through 01/14/2020 ($ Millions)

Purchase Period	Target Reserve Management Amount	Target Reinvestment Amount	Purchases	Net Deviation	Cumulative Deviation Since 08/2019
Aug. '19		20,000	20,009	9	9
Sep. '19		20,000	20,011	11	20
Oct. '19	60,000	20,000	80,019	19	39
Nov. '19	60,000	20,000	80,019	19	58
Dec. '19	60,000	20,000	80,015	15	73

Appendix 4: Materials used by Mr. Wascher

Class II FOMC - Restricted (FR)

Material for Briefing on

The U.S. Outlook

William Wascher
Exhibits by Rosemary Rhodes and Ashley Sexton
January 28, 2020

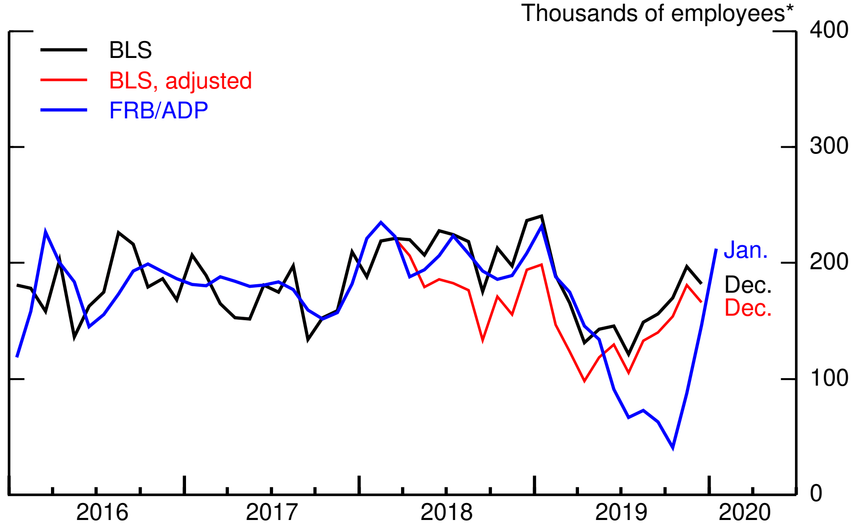
Outlook for Real Activity

1. Updated Near-Term GDP Projection

	2019			2020
	H1	Q3	Q4[f]	H1[f]
1. Real GDP*	2.6	2.1	2.1	2.1
2. (November TB)		***(2.1)***	***(1.3)***	***(2.2)***
Contributions to GDP growth**				
3. PDFP	2.1	2.0	1.2	2.1
4. Inventory investment	-0.2	0.0	-0.5	-0.3
5. Net exports	0.0	-0.1	1.1	0.0
6. Government	0.7	0.3	0.4	0.2
Memo:				
7. GDP ex. special factors*	2.7	2.4	2.2	2.1
8. (November TB)		***(2.4)***	***(1.4)***	***(1.9)***

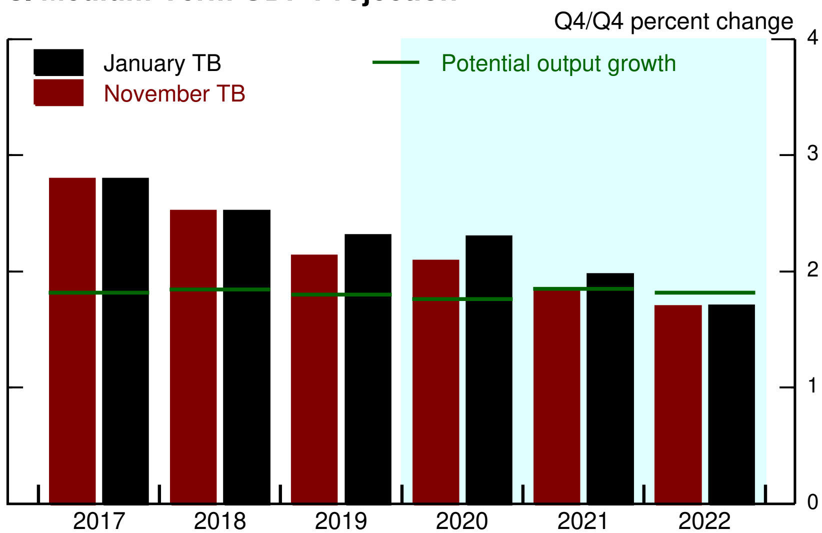
* Percent change at annual rate. ** Percentage points. f. Staff forecast.
Note: "Special factors" are GM strike and Boeing production disruptions. Detail may not sum to total because of rounding.

2. Estimates of Private Nonfarm Payroll Gains

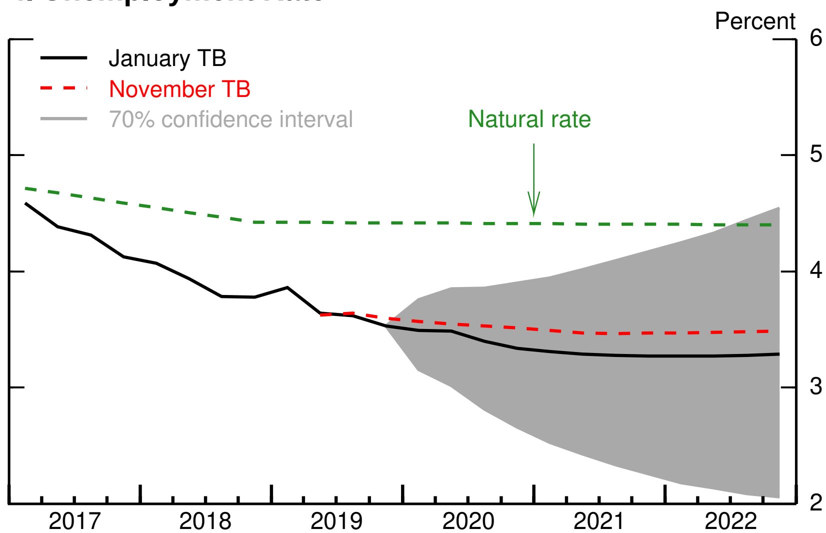


Note: January FRB/ADP value includes data through 1/18. Adjusted BLS series incorporates estimated effect of upcoming CES benchmark revision.
* 3-month moving average.

3. Medium-Term GDP Projection



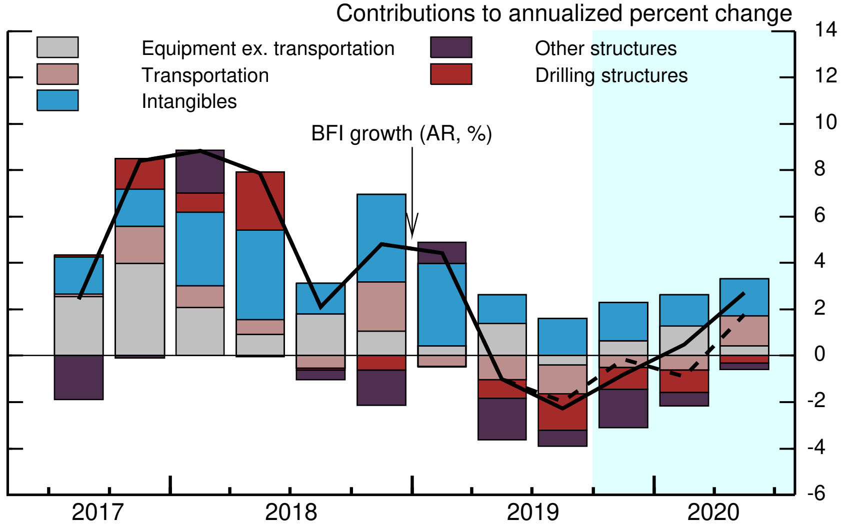
4. Unemployment Rate



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

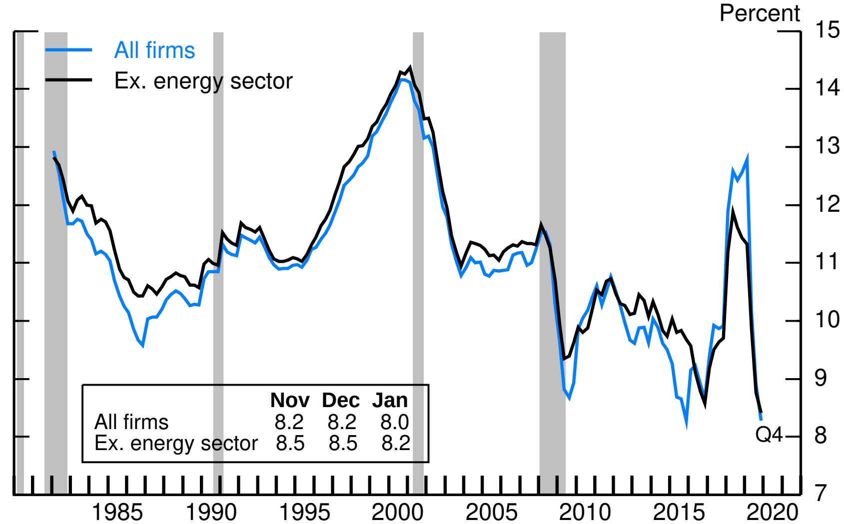
Trade Policy Uncertainty

5. Decomposition of BFI Growth



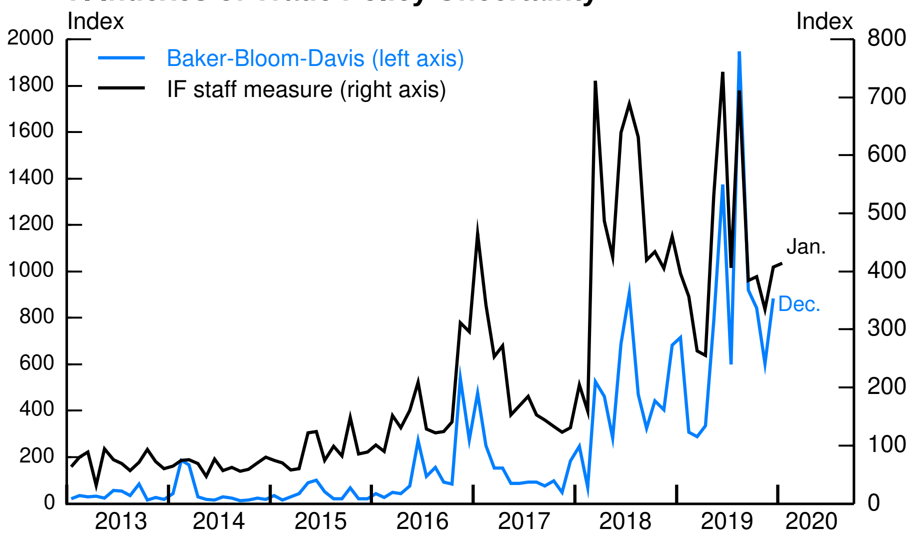
Note: Solid line is January Tealbook projection; dashed line is November Tealbook projection.

6. Expected Earnings Growth for S&P 500 Firms



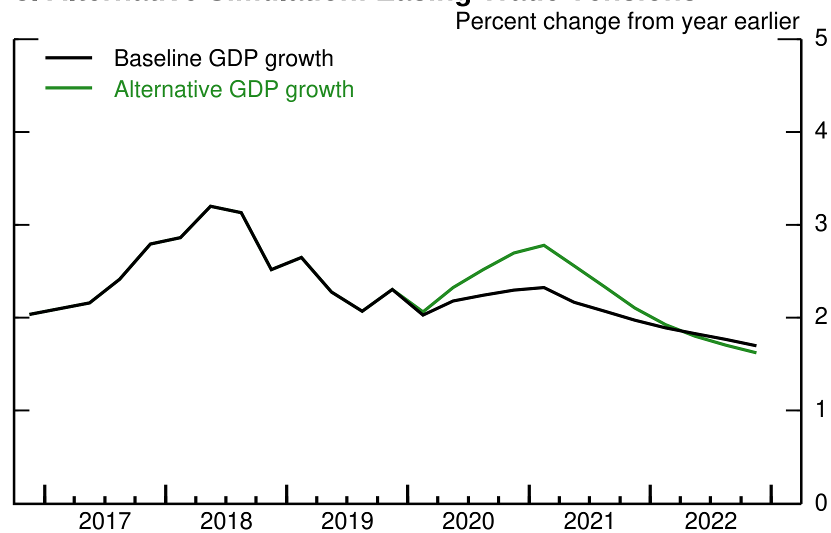
Note: Analysts' expectations for earnings growth over the next three to five years. January values based on data through January 23. Shaded bars indicate NBER recession periods.

7. Indexes of Trade Policy Uncertainty



Note: Indexes normalized to have a mean of 100 over the period 1985-2010.

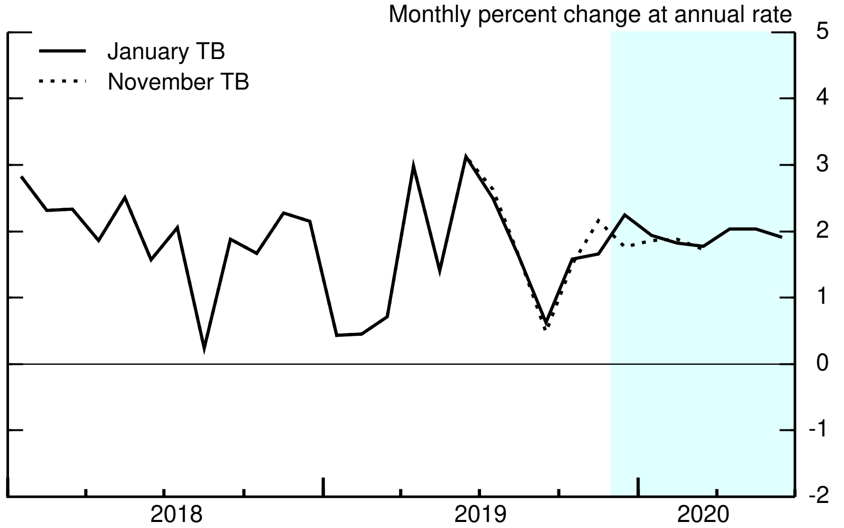
8. Alternative Simulation: Easing Trade Tensions



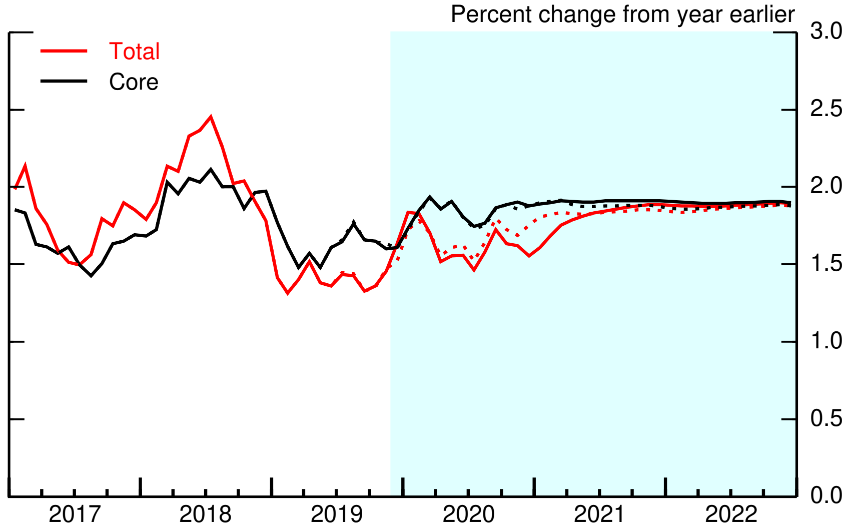
Note: Baseline is January Tealbook projection.

Outlook for Inflation

9. Monthly Core PCE Price Inflation

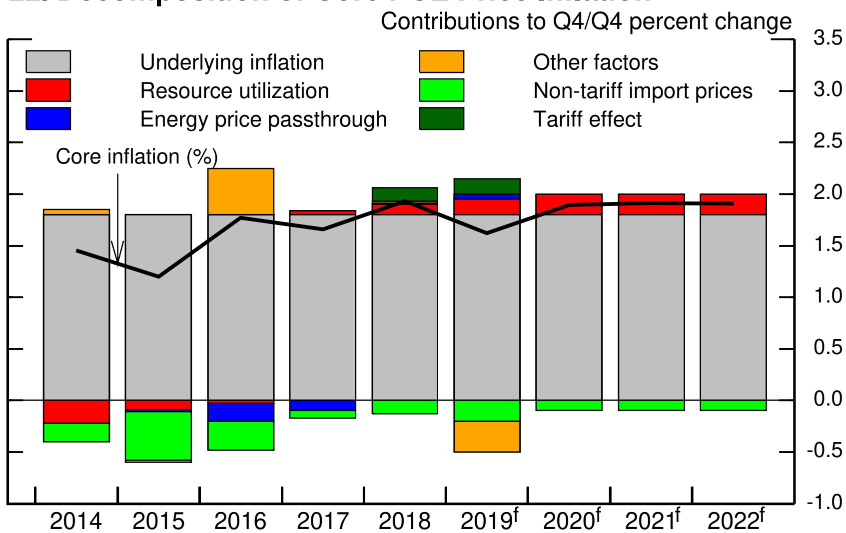


10. Medium-Term PCE Price Inflation



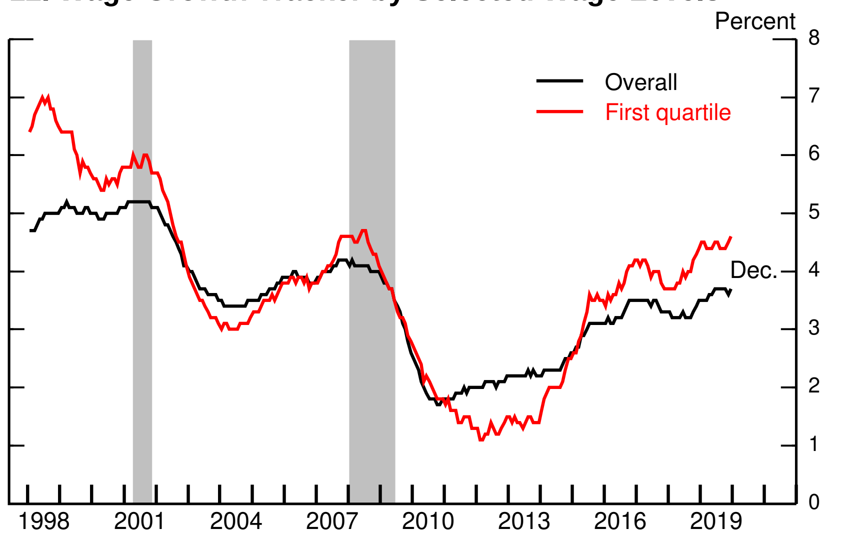
Note: Solid lines are current projections; dotted lines are November Tealbook projections.

11. Decomposition of Core PCE Price Inflation



f. Staff forecast.

12. Wage Growth Tracker by Selected Wage Levels

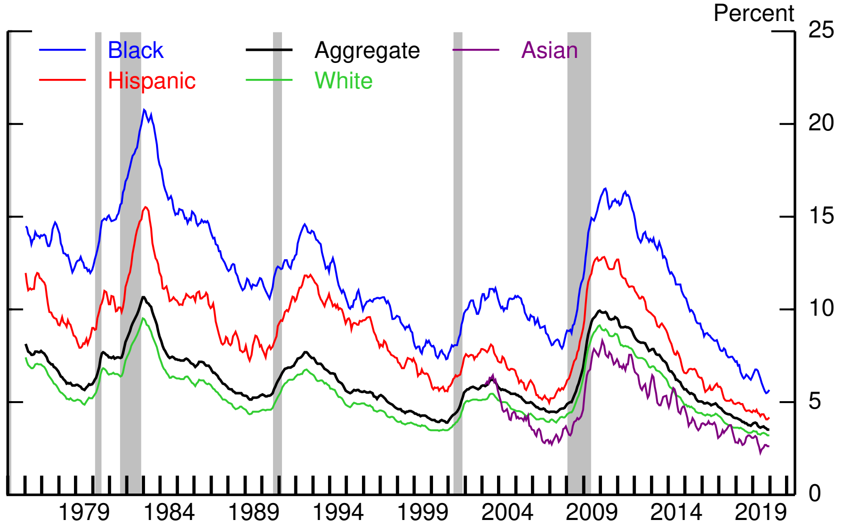


Note: 12-month moving average of monthly median wage growth for wage level category shown. Shaded bars indicate NBER recession periods.
Source: Federal Reserve Bank of Atlanta.

Labor Market Statistics by Race or Ethnicity

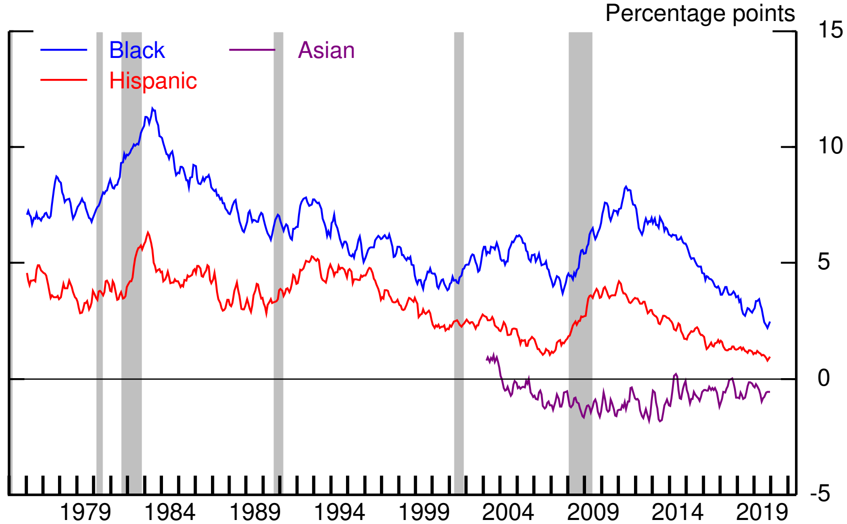
Three-month moving averages. Shaded bars indicate NBER recession periods.

13. Unemployment Rate



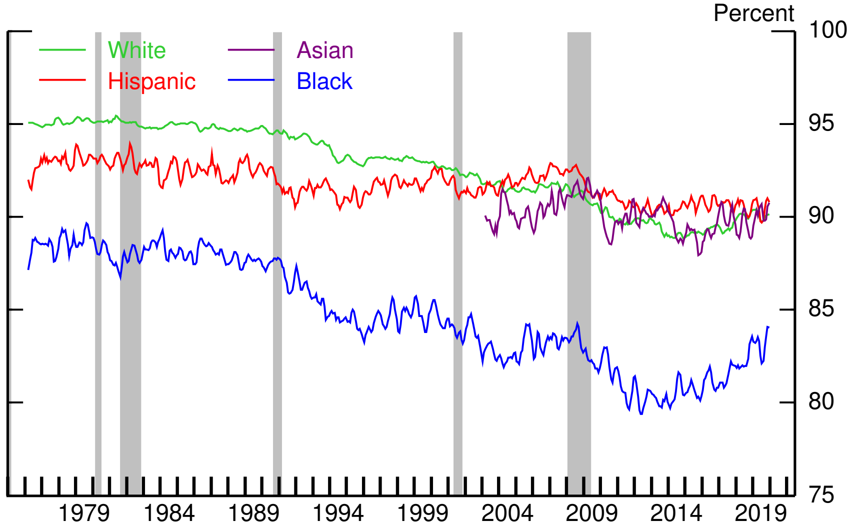
Note: Categories are not mutually exclusive, as "Hispanic" may include people of any race.

14. Relative Unemployment Rate



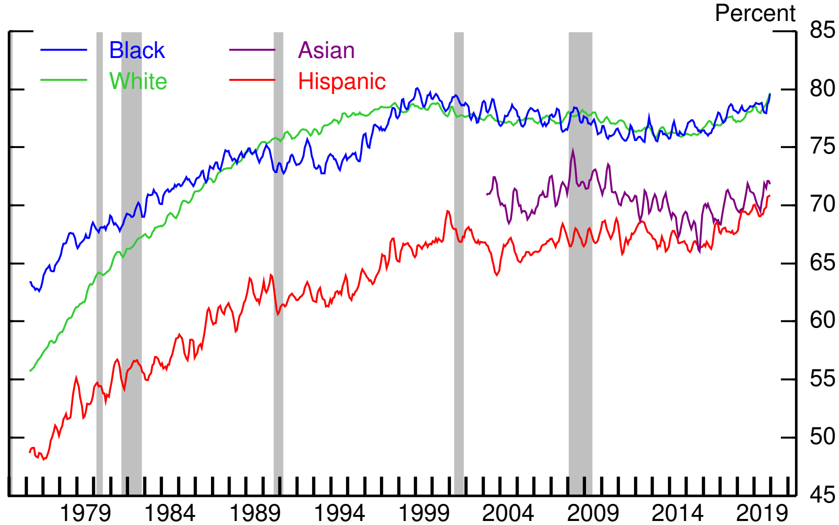
Note: Gap between unemployment rate for specified group and white unemployment rate. Categories are not mutually exclusive, as "Hispanic" may include people of any race.

15. Participation Rate (Men, 25-54 years)



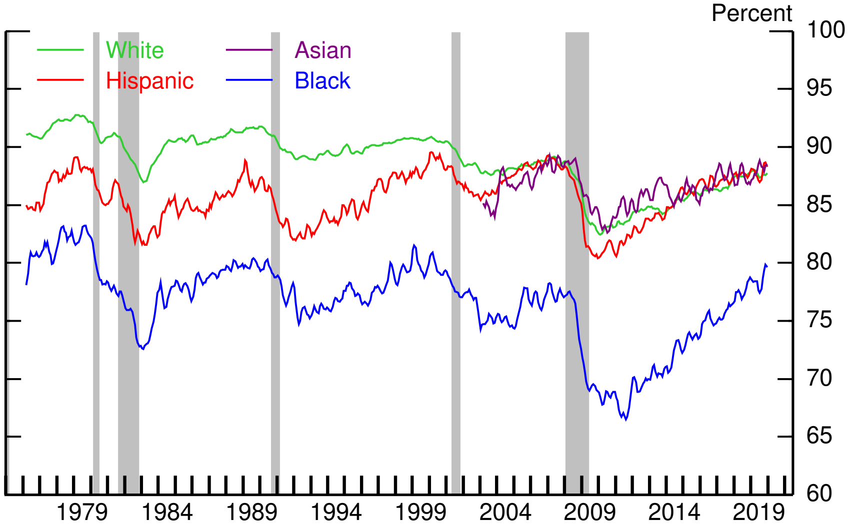
Note: Categories are mutually exclusive.

16. Participation Rate (Women, 25-54 years)



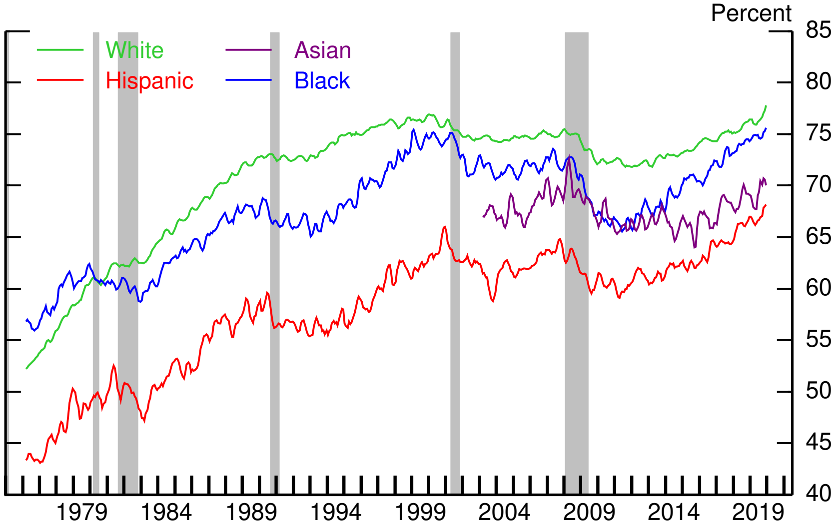
Note: Categories are mutually exclusive.

17. Employment-to-Population Ratio (Men, 25-54 years)



Note: Categories are mutually exclusive.

18. Employment-to-Population Ratio (Women, 25-54 years)



Note: Categories are mutually exclusive.

Appendix 5: Materials used by Mr. Gruber

Class II FOMC - Restricted (FR)

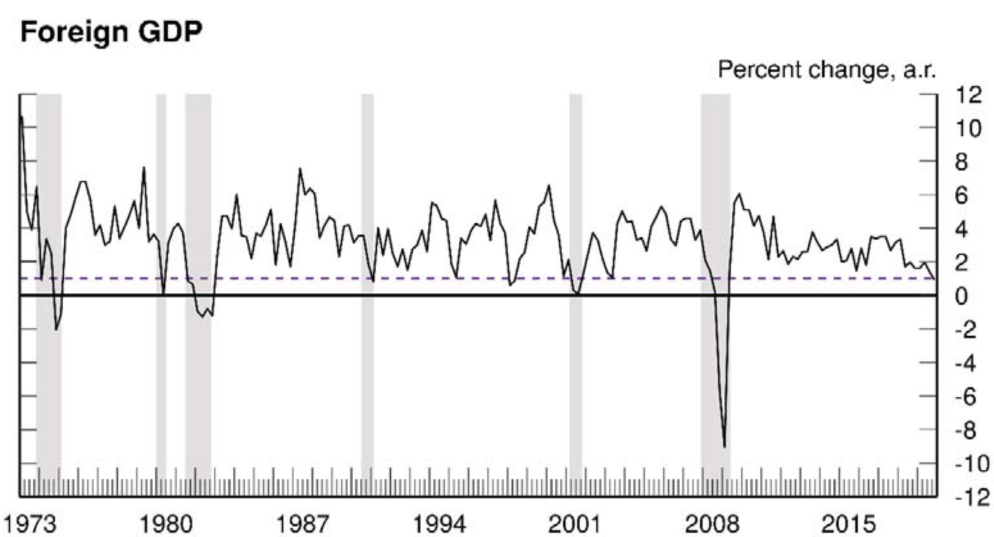
Material for Briefing on

The International Outlook

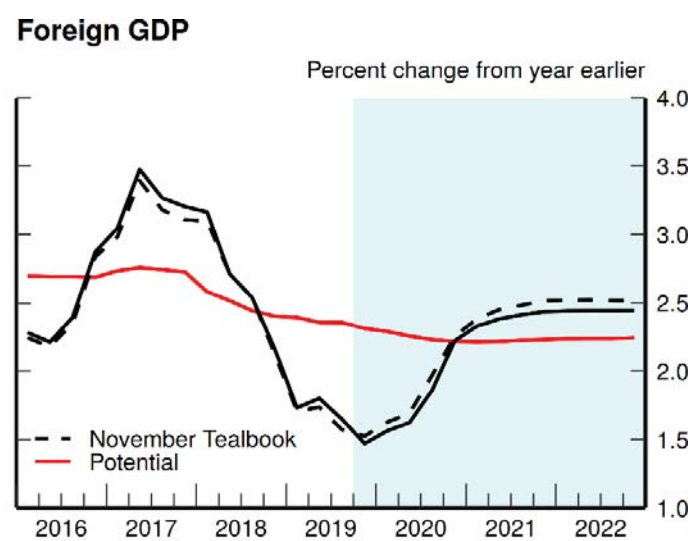
Joseph Gruber
Exhibits by Andrea M. Garcia and Chazz Edington
January 28, 2020

2019 a terrible year for foreign growth

- Foreign growth below 1 percent in Q4. Doesn't happen very often.
- Continuation of factors that have depressed growth throughout 2019.
  - Manufacturing, investment, and trade slump.
  - In part due to trade tensions (about -0.3 ppt. on foreign growth)
  - Social unrest in a number of economies.



Note: Weighted by bilateral shares in U.S. merchandise exports. Purple dashed line indicates 1 percent threshold. Shading indicates U.S. recessions.
Source: Staff calculations.

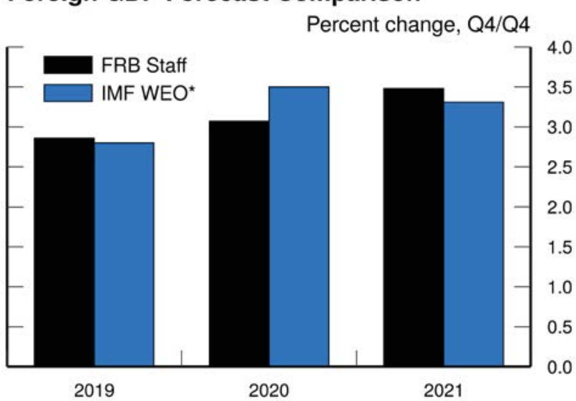


Note: Weighted by bilateral shares in U.S. merchandise exports.
Source: Staff forecast.

Growth expected to pick up in 2020 (and not just us)

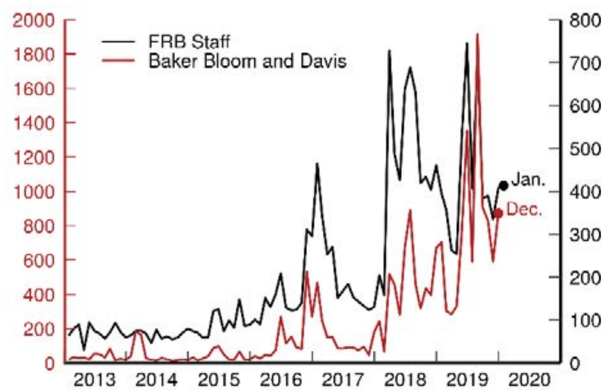
- Factors holding down growth in 2019 dissipate. Including reduced drag from unrest in HK and Chile and recovery in Mexico.
- Importantly trade tensions ease (phase-one, USMCA, Franco-U.S. détente.)
- Easing trade tensions boost foreign growth in 2020 and 2021.

Foreign GDP Forecast Comparison



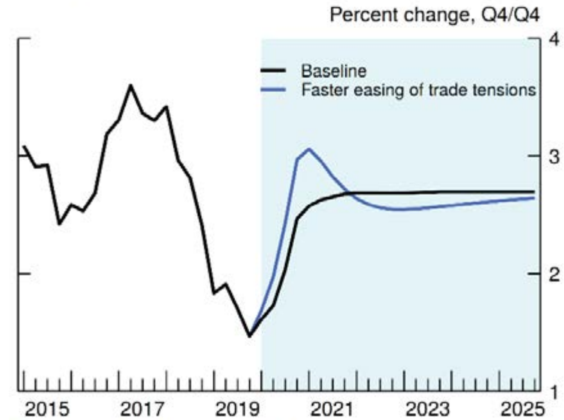
* IMF WEO forecasts are from the January 2020 release.
Note: Countries weighted by PPP GDP.
Source: Board staff forecast; International Monetary Fund World Economic Outlook.

Trade Policy Uncertainty Indexes



Note: 1985-2010 = 100 for both indexes.
Source: Baker et al., 2016; Caldara et al., 2019.

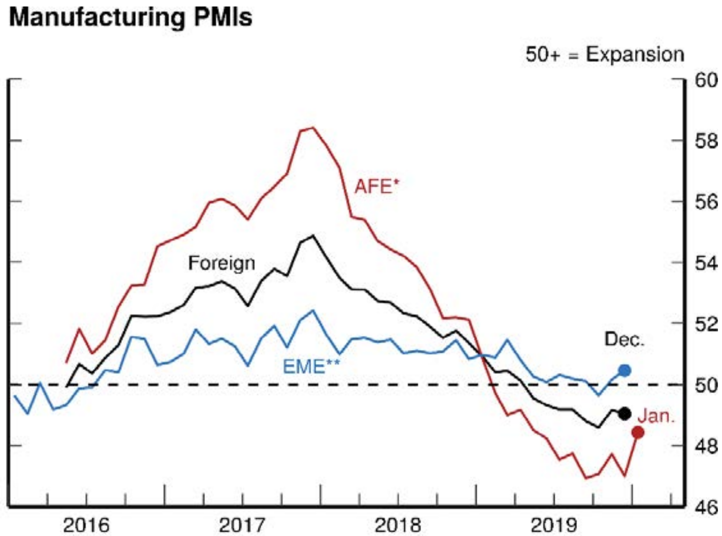
Foreign GDP: Alt. Scenario with Faster Easing of Trade Tensions



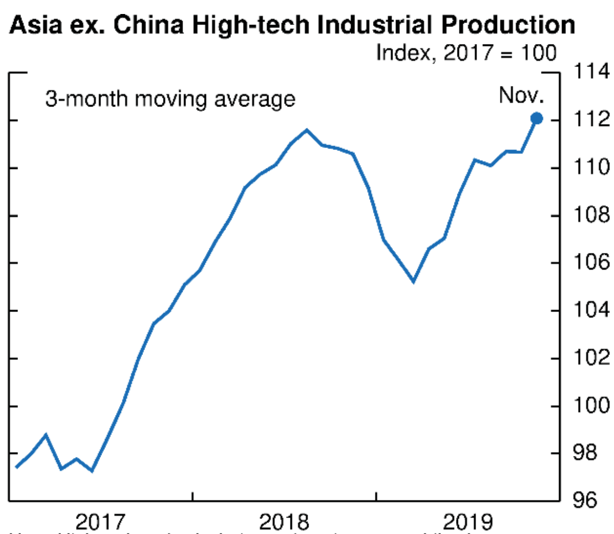
Note: Weighted by bilateral shares in U.S. merchandise exports.
Source: Staff forecast.

Manufacturing Slump Easing

- Increased speculation that manufacturing slump is coming to an end.
- But only tentative signs in the data.



* Includes Australia, Euro area, Japan, and the United Kingdom.
** Includes Brazil, China, India, Indonesia, Israel, Korea, Mexico, Russia, Singapore, and Taiwan.
Note: Aggregates weighted by PPP GDP.
Source: Staff calculations; Haver Analytics; IHS Markit; China Federation of Logistics and Purchasing; Singapore Institute of Purchasing and Materials Management.

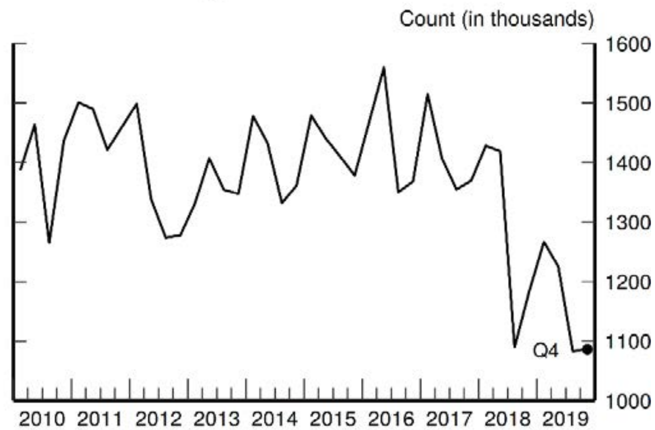


Note: High-tech series include semiconductors, mobile phones, computers, and components thereof. IP aggregate weighted by shares in U.S. merchandise exports. The aggregate includes Korea, Malaysia, Singapore, and Taiwan.
Source: Haver Analytics.

Stabilization in Europe

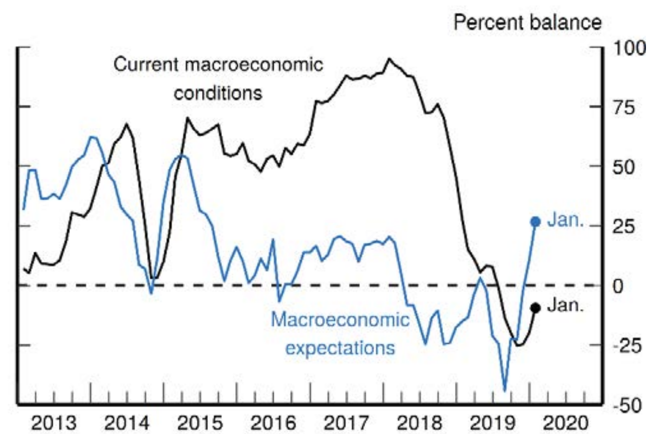
- Manufacturing still weak, in part reflecting autos.
- Recession probabilities remain high.
- But economic sentiment moving up.

German Passenger Car Production



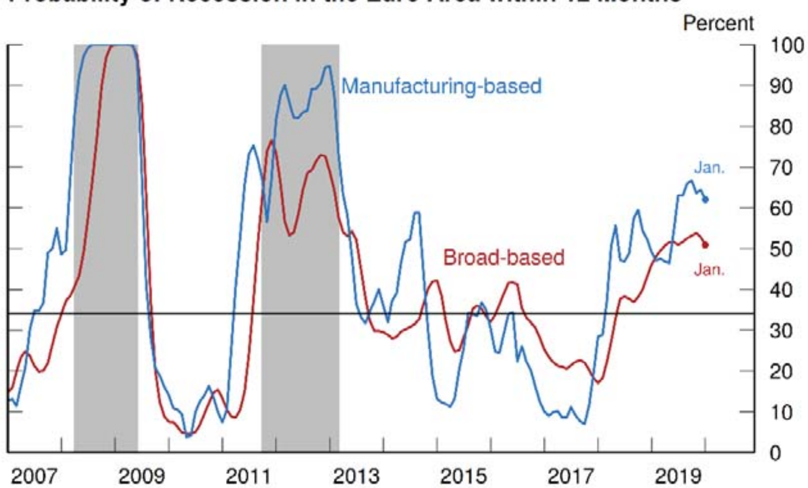
Source: Verband der Automobilindustrie.

German ZEW Economic Sentiment



Source: Zentrum fur Europaische Wirschaftsforschung.

Probability of Recession in the Euro Area within 12 Months

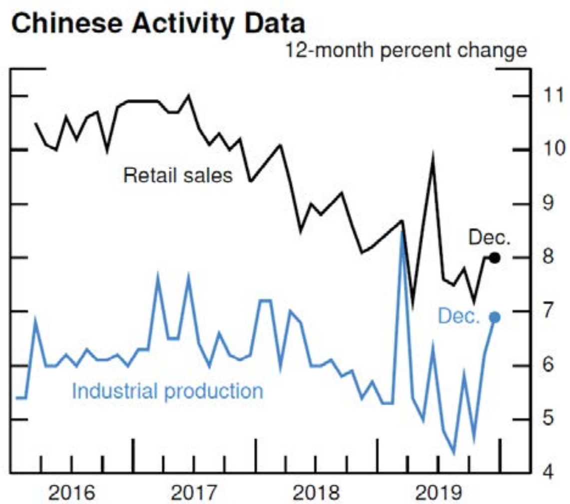


Note: CEPR recessions and periods of "very slow growth" shaded in grey.
Black line: Unconditional probability = 34%
Source: Staff estimates.

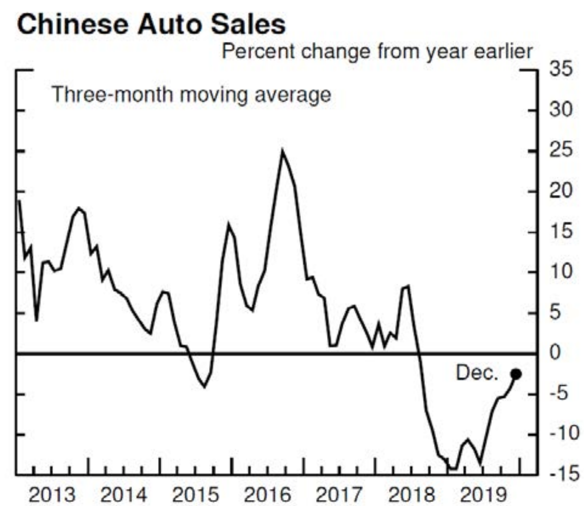
China was looking better

- Indicators have been improving.
- Spilling over to the region (strong growth in Korea and Taiwan.)

Source: Haver Analytics; China Customs.



Source: China National Bureau of Statistics.

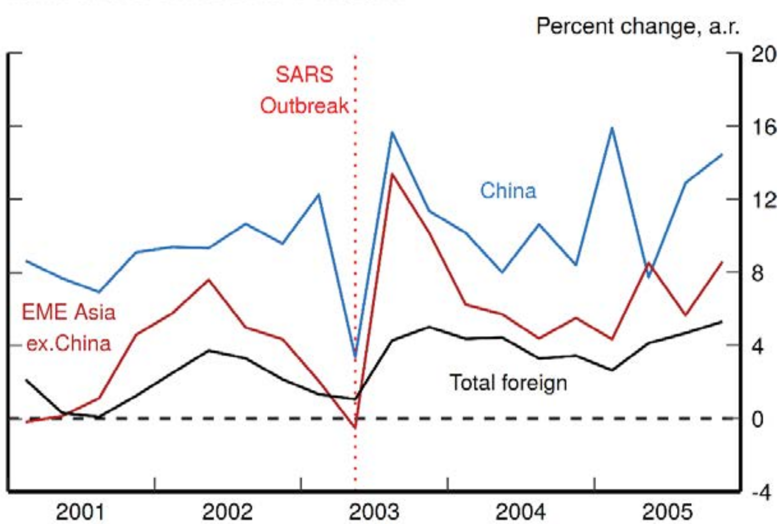


Source: Haver Analytics; China Association of Automobile Manufacturers.

Coronavirus likely to affect outlook

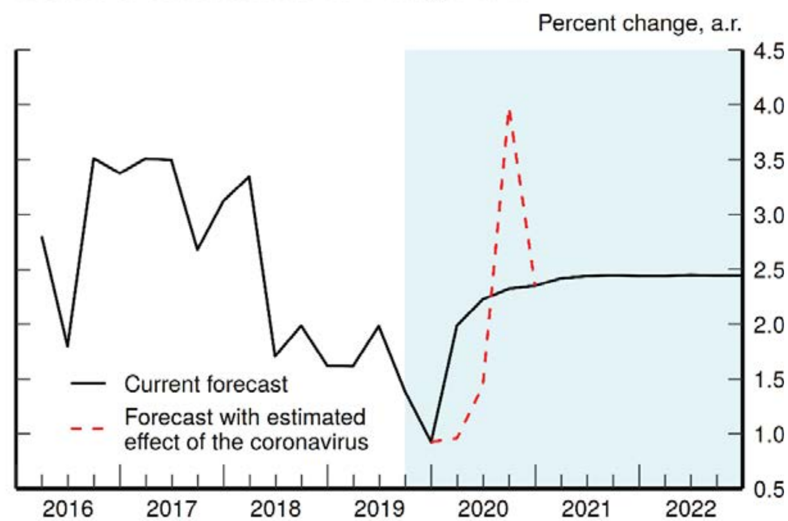
- Spread of Coronavirus has disrupted travel and activity in China.
- SARS outbreak led to sizable short term dip in China's growth.
- Situation continues to develop, but could delay pick up in foreign growth.

Real Gross Domestic Product



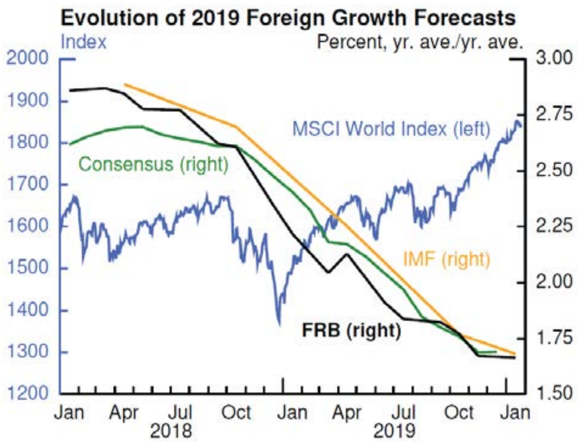
Source: China National Bureau of Statistics; staff calculations.

Impact of Coronavrius on Foreign GDP

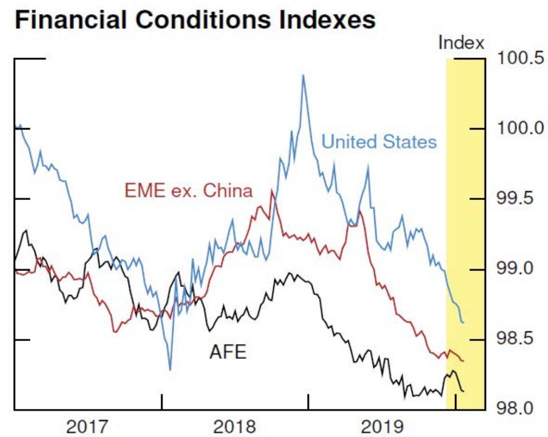


Note: Weighted by bilateral shares in U.S. merchandise exports.
Source: Staff forecast.

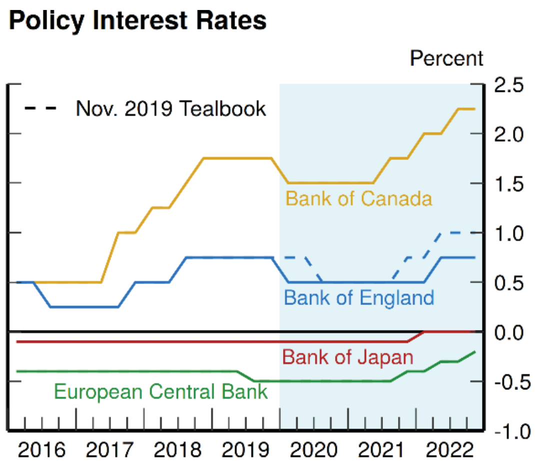
Pick up supported by favorable financial conditions



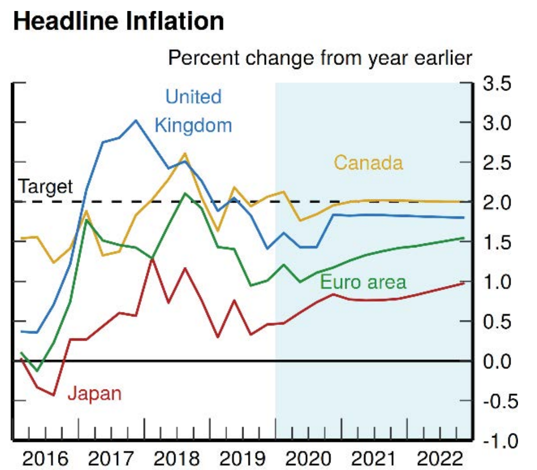
Note: MSCI World Index data goes through January 24, 2020.
Sources: Board staff forecast; International Monetary Fund World Economic Outlook databases; Consensus Economics; MSCI.



Note: Data through January 24, 2020.
Source: Goldman Sachs and staff calculations. FCIs are weighted averages of short-term interest rates, long-term interest rates, corporate bond and CDS spreads, equity valutaion ratios, and foreign exchange rates. Normalized such that long term means are equal to 100.

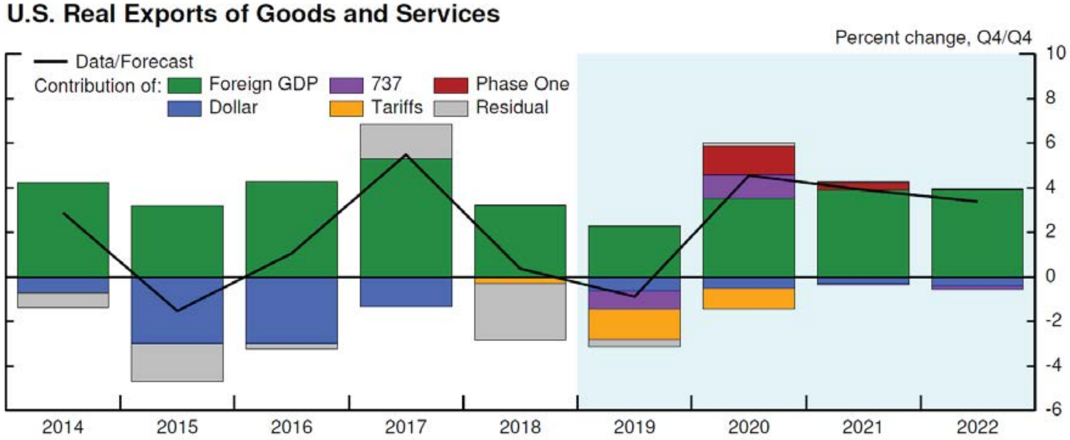


Source: Staff forecast.

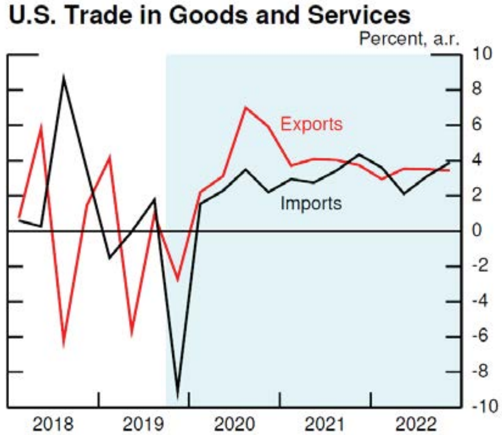


Source: Staff forecast.

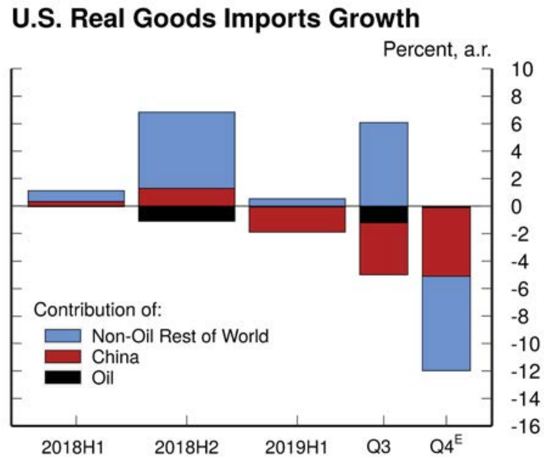
Both exports and imports have been weak



Source: Staff calculations.



Note: Shading indicates forecast period.
Source: Staff forecast.



Note: Q4 estimate is based on the first two months of data.
Source: Staff calculations.

International Financial Stability Assessment

		Vulnerability Assessment	Prominence of Risks
	Summary Assessment	Moderate	
Advanced Foreign Economies	Canada	Moderate	Low
	France	Moderate	Medium
	Germany	Low	Medium
	Italy	Notable	High
	Japan	Moderate	Low
	Switzerland	Moderate	Low
	United Kingdom	Moderate	High
Emerging Market Economies	Brazil	Notable	Medium
	China	Notable	High
	Hong Kong	Moderate	High
	Mexico	Notable	Medium
	South Korea	Low	Medium
	Turkey	Elevated	High

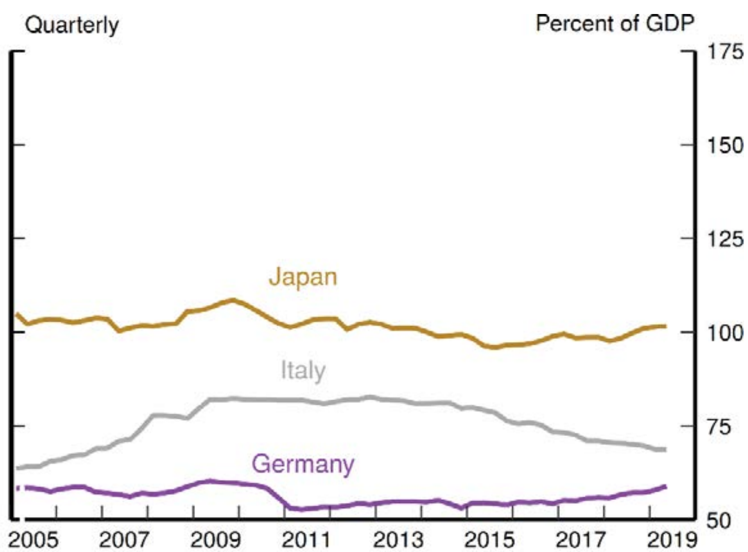
Summary and country assessments remain unchanged

Changes in prominent near-term risks

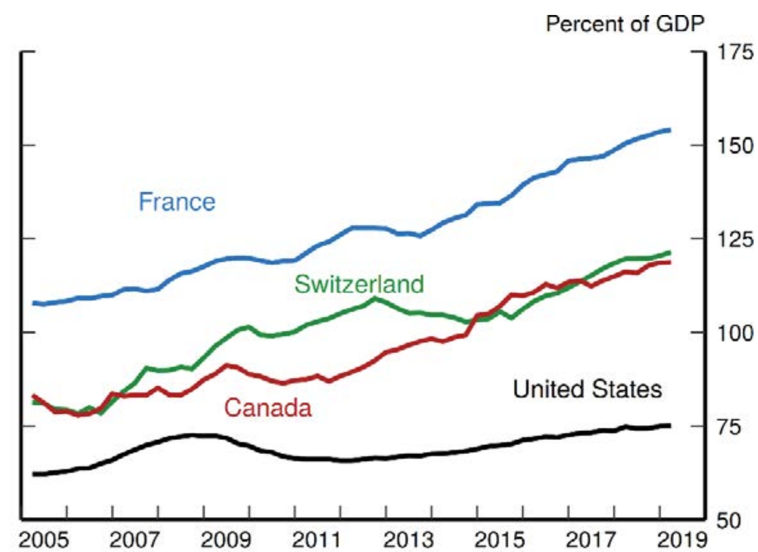
- Trade tensions (Mexico↓, Japan↓)
- Political uncertainty (Brazil ↓)
- Geopolitical risks (Hong Kong↑)

Nonfinancial Corporate (NFC) Debt has been rising

- NFC debt has increased in some but not all advanced foreign economies.



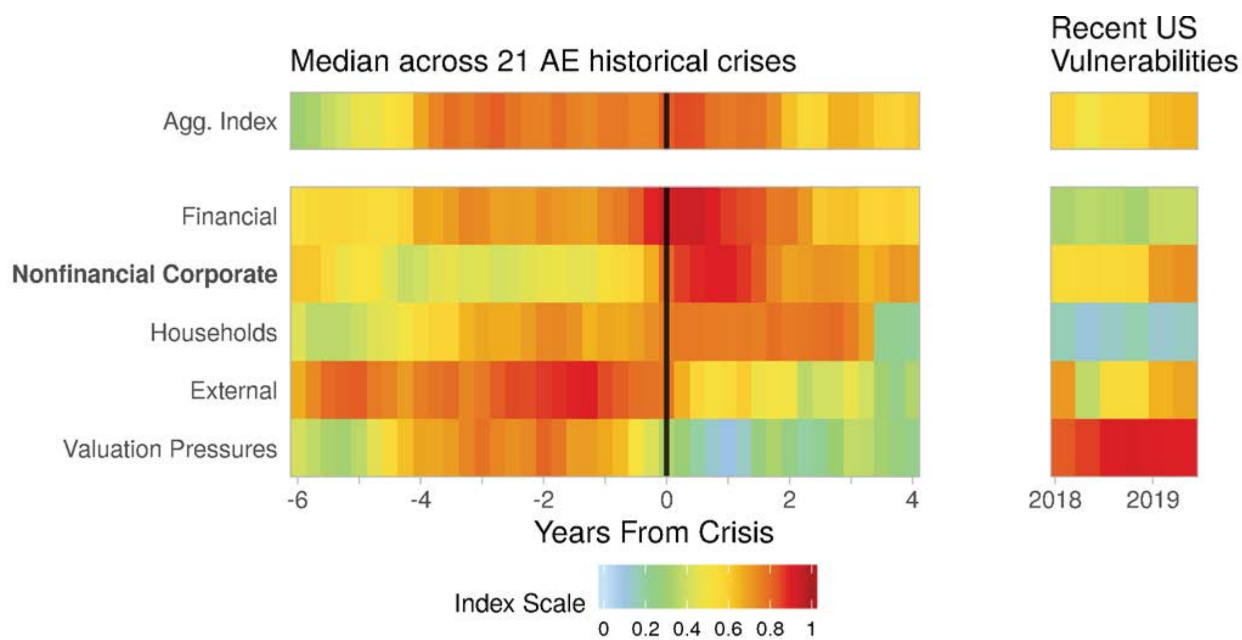
Source: Bank for International Settlements.



Source: Bank for International Settlements.

But NFC vulnerability historically not elevated before crisis

- Data on financial crises in 19 AFE countries since 1985.
- Country-specific vulnerability indexes for 5 sectors
- Median vulnerability around crises typically not high for NFC sector.
- Current configuration of U.S. vulnerabilities not typically associated with crises.



Note: The vulnerability indexes range from 0 (low vulnerabilities) to 1 (high vulnerabilities) based on estimates of the historical distribution of relevant underlying data following the method in Lee, Posenau, and Stebunovs (forthcoming).

NFC debt has not led to more severe recessions

- Look at 51 recessions in AFEs and differentiate those preceded by NFC debt expansion (measured by gap between NFC debt/GDP and its trend.)
- Length and severity of recessions preceded by NFC credit buildup similar to average recession.

	N	Mean Length* (Q)	Mean Depth** (%)
All Recessions	51	6.9	-1.7
of which preceded by NFC expansion	27	6.4	-1.8

*Number of quarters from start to end of recession.

**Depth is the percent decline in real GDP from the quarter before the start of the recession to the minimum value achieved during the recession.

Appendix 6: Materials used by Mr. Schindler

Class II FOMC - Restricted (FR)

Material for Briefing on

Financial Stability Developments

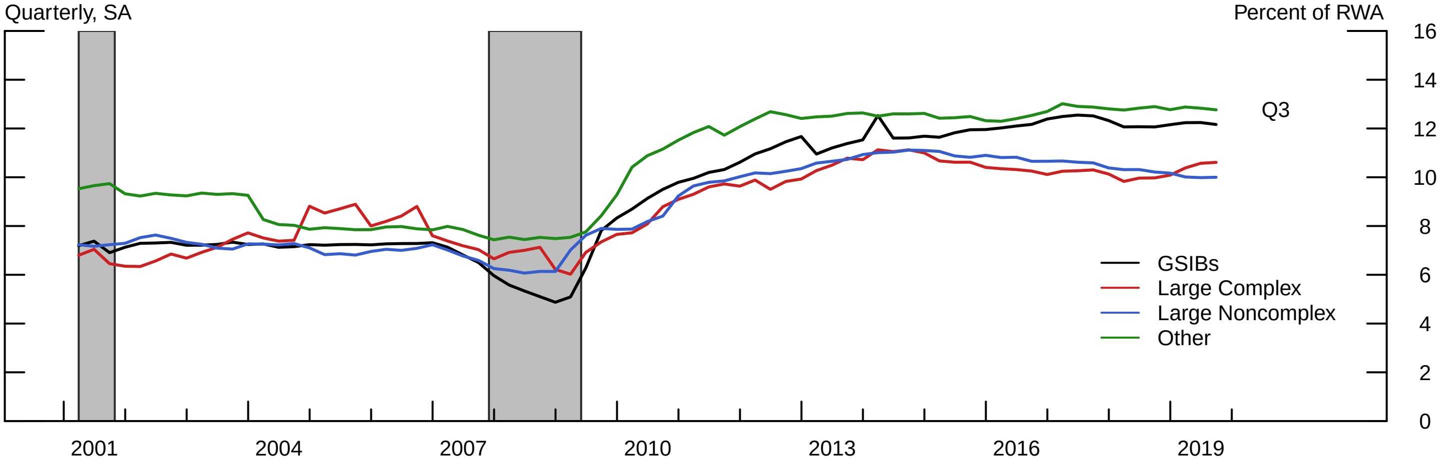
John Schindler
Exhibits by Morgan Elliott
January 28, 2020

Class II FOMC - Restricted FR

Exhibit 1

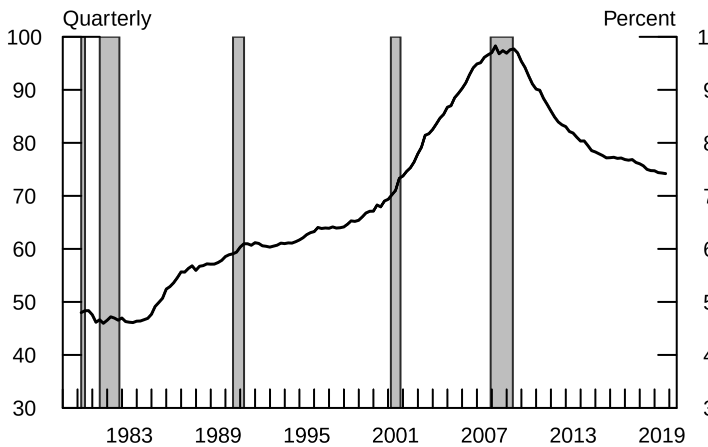
January 28, 2020

Chart 1−1
Common Equity Tier 1 Ratio, by BHC Type



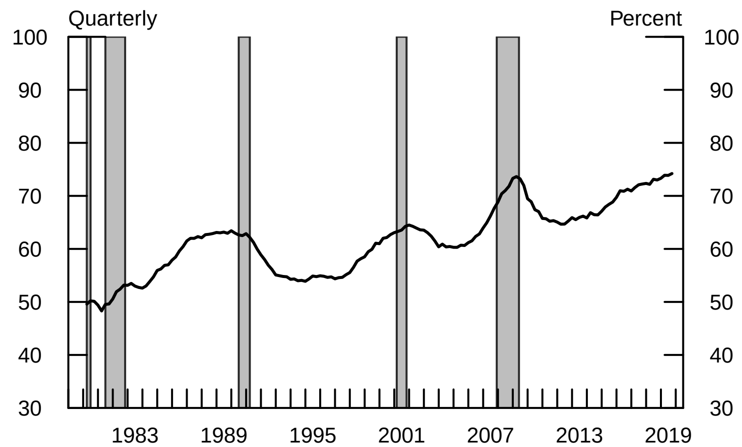
Source: FR Y−9C.

Chart 1-2
Household Sector Credit−to− GDP Ratio



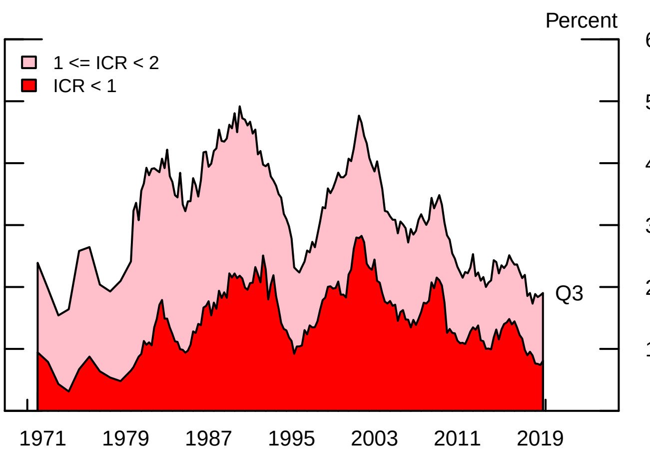
Source: Staff calculations based on Bureau of Economic Analysis, national income and product accounts, and Federal Reserve Board, Statistical Release Z.1, "Financial Accounts of the United States."

Chart 1−3
Nonfinancial Business Sector Credit to GDP Ratio



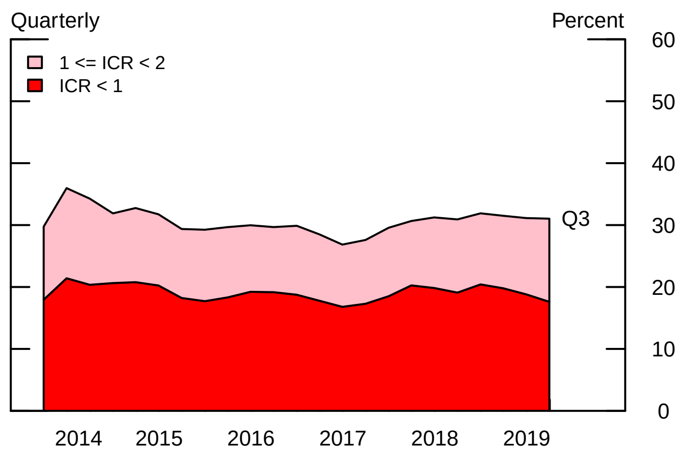
Source: Staff calculations based on Bureau of Economic Analysis, national income and product accounts, and Federal Reserve Board, Statistical Release Z.1, "Financial Accounts of the United States."

Chart 1−4
Debt Balances below Threshold Interest Coverage Ratio: Public Firms



Source: Compustat.

Chart 1−5
Debt Balances below Threshold Interest Coverage Ratio: Private Firms



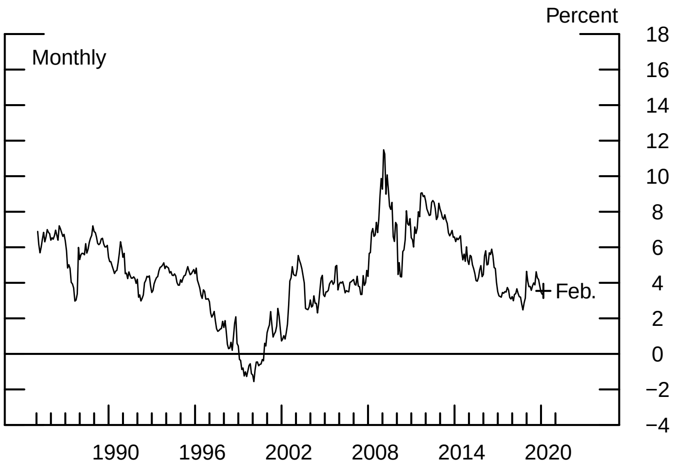
Source: FR Y−14Q H.1.

Class II FOMC - Restricted FR

Exhibit 2

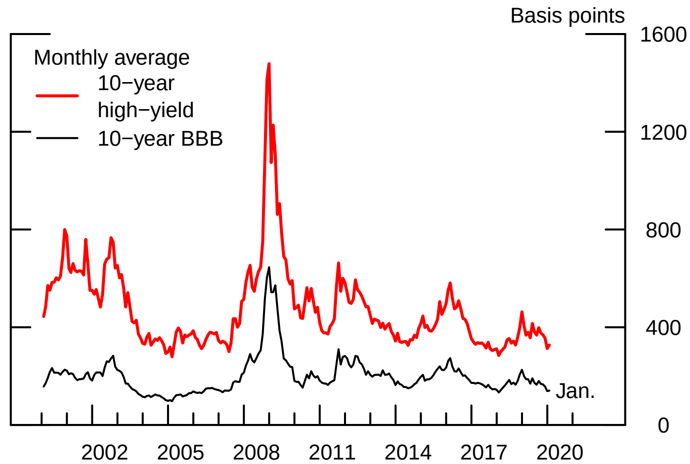
January 28, 2020

Chart 2−1
Equity Risk Premium



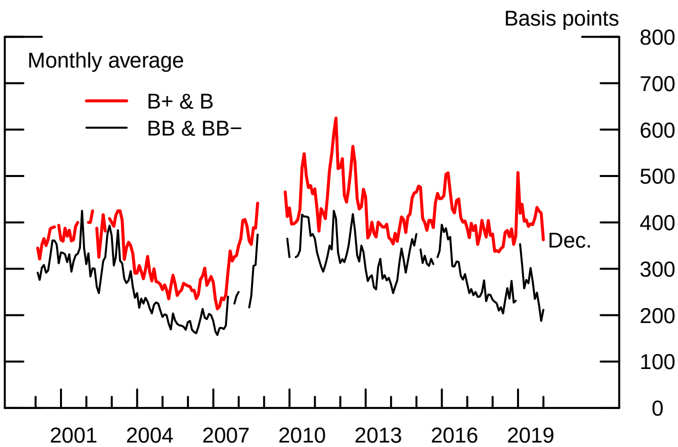
Source: Staff projection.

Chart 2−2
Corporate Bond Spreads



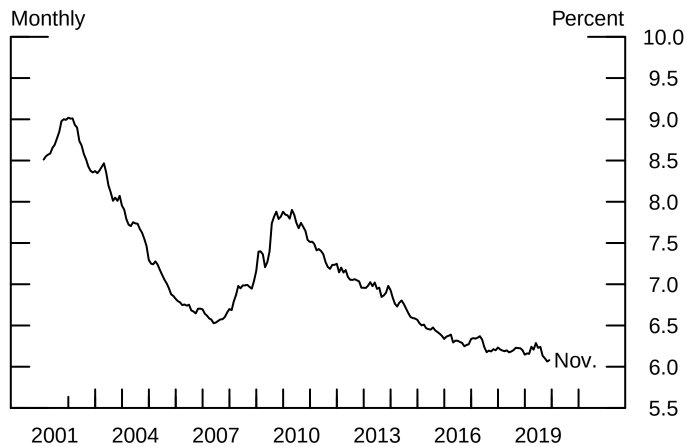
Source: Staff estimates of smoothed corporate yield curves based on Merrill Lynch data and smoothed Treasury yield curve.

Chart 2−3
Average Spread of New−Issue Institutional Leveraged Loans



Source: S&P LCD.

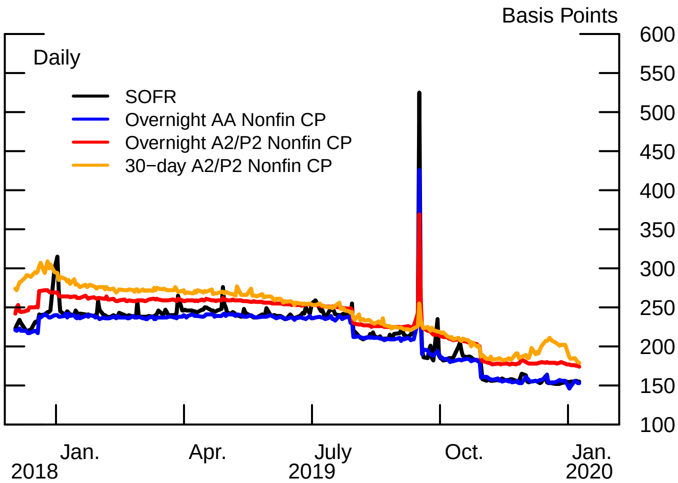
Chart 2−4
CRE Capitalization Rate at Origination



Source: Real Capital Analytics; CoStarReal Capital Analytics; CoStar

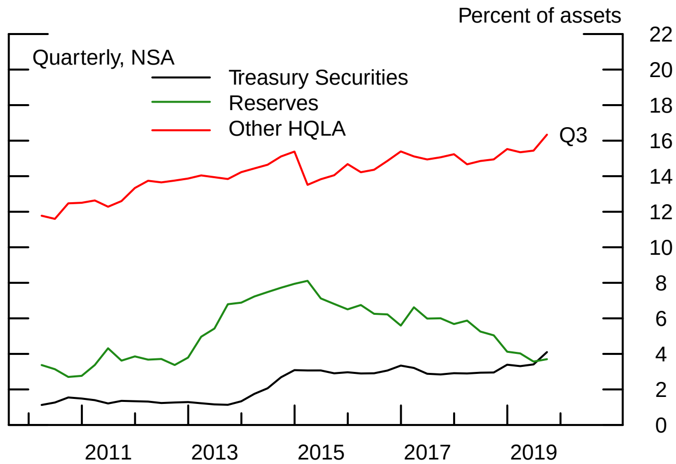
Exhibit 3

Chart 3−1
SOFR and Commercial Paper (CP) Rates



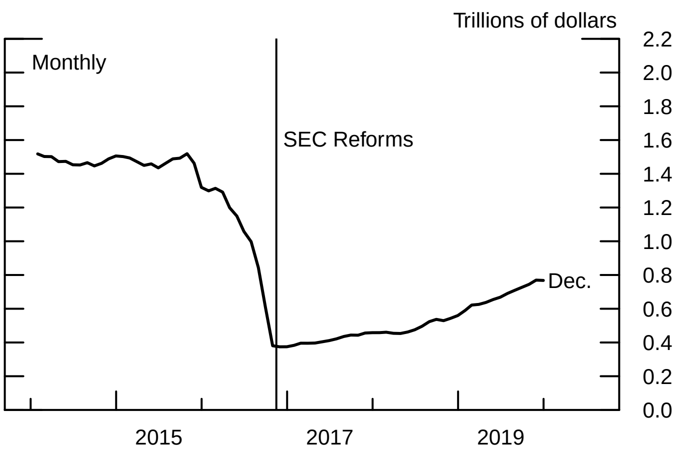
Source: Federal Reserve, The Depository Trust and Clearing Corporation.

Chart 3−2
Liquid Assets at all BHCs



Source: FR Y−9, Call Report.

Chart 3-3
Assets in Prime MMFs

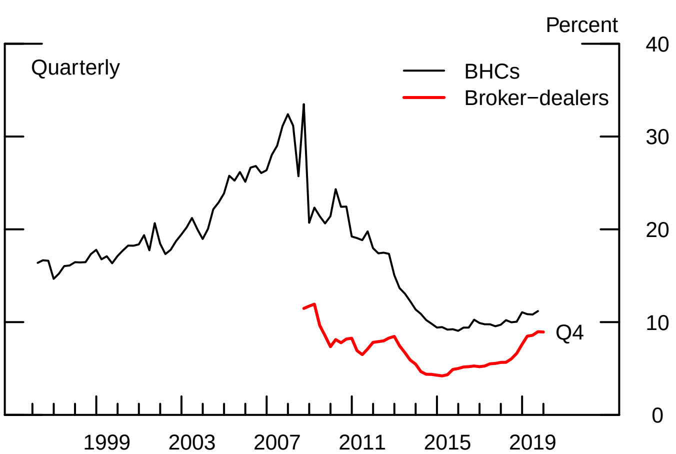


Source: iMoneyNet.

Table 3-4
Framework

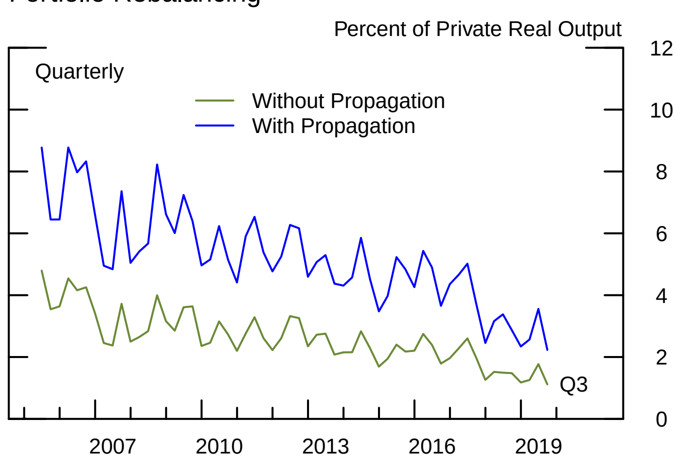
		Shocks to: Institutions	Shocks to: Markets
Shocks From	Institutions	Institutions View	Institutions x Markets View
Shocks From	Markets	Institutions x Markets View	Markets View

Chart 3−5
Fire−sale Vulnerabilities for BHCs and Broker−Dealers



Source: FR Y−9C, FRBNY.

Chart 3−6
Expected Output Loss Due to Insurer Bond Portfolio Rebalancing



Source: Staff estimates using data from the BEA, Mergent FISD, and NAIC Quarterly & Annual Statutory Filings.

Chart 1-1

Sample includes banks as of 2019:Q3. Prior to 2014:Q1, the numerator of the CET1 ratio is Tier 1 common capital for adv. approaches BHCs (prior to 2015:Q1, for non-adv. approaches BHCs). Afterwards, the numerator is CET1 capital. The denominator is risk-weighted assets (RWA). Shaded areas are NBER Recessions.

Chart 1-2

The shaded bars indicate periods of business recession as defined by the National Bureau of Economic Research: January 1980–July 1980, July 1981–November 1982, July 1990–March 1991, March 2001 November 2001, and December 2007–June 2009. GDP is gross domestic product.

Chart 1-3

The shaded bars indicate periods of business recession as defined by the National Bureau of Economic Research: January 1980–July 1980, July 1981–November 1982, July 1990–March 1991, March 2001 November 2001, and December 2007–June 2009. GDP is gross domestic product.

Chart 1-4

Total debt of public firms as of 2019Q3 is $6,975.5 billion.

Chart 1-5

Total debt of nonpublic firms as of 2019Q3 is $7,554 billion.

Chart 2-1

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

Chart 2-2

Spreads over 10-year Treasury yield.

Chart 2-3

Breaks in the series represent periods with no issuance. Straight spreads do not include upfront fees.

Chart 3-2

“Other liquid assets” includes estimates of non-Treasury securities that qualify for HQLA, including MBS and other securities issued or guaranteed by government agencies and government-sponsored agencies.

Chart 4-2

System capital lost due to fire−sale spillovers if all asset prices decline by 1%.

Appendix 7: Materials used by Mr. Laubach

Class I FOMC – Restricted Controlled (FR)

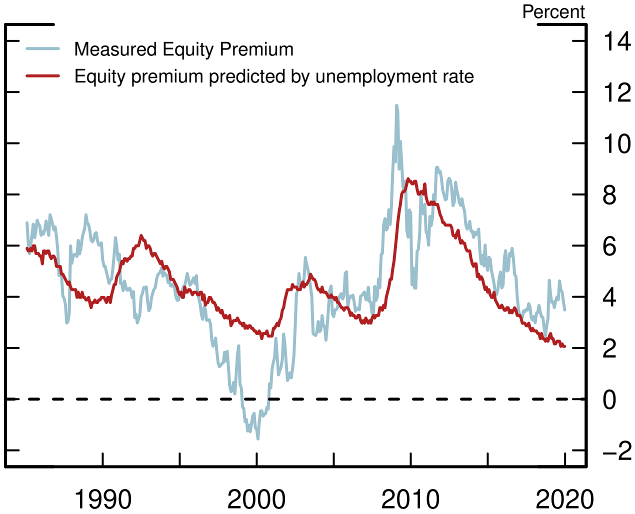
Material for the Briefing on

Monetary Policy Alternatives

Thomas Laubach
Exhibits by Stephen Azzolino
January 28-29, 2020

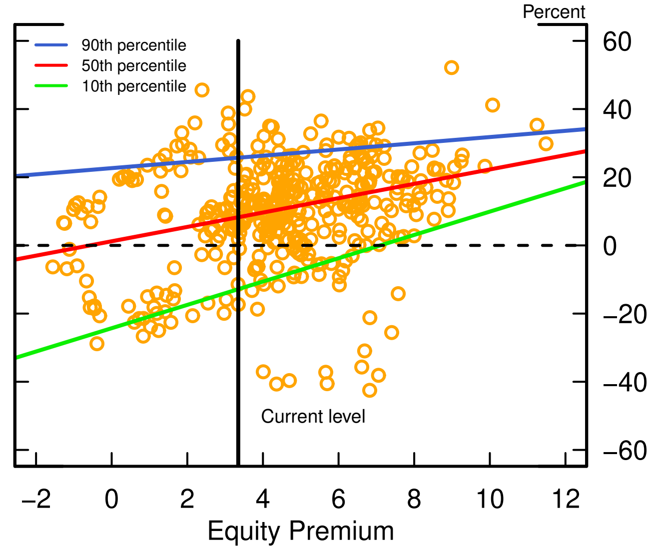
Monetary Policy Considerations

Equity Premium and the Business Cycle



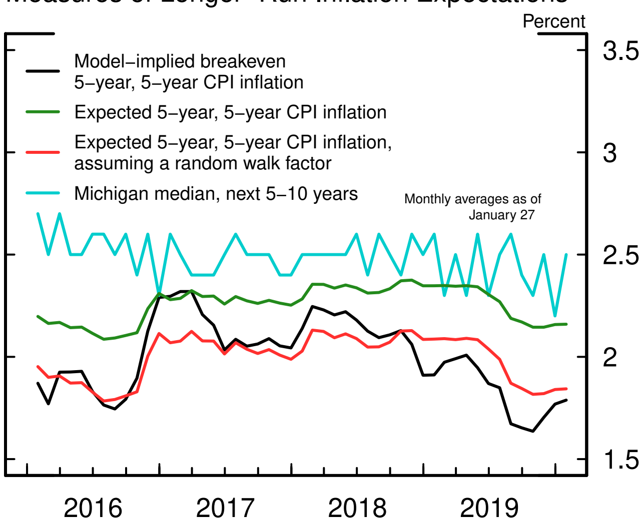
Source: Board staff calculations.

Equity Premium and Year−Ahead S&P 500 Returns



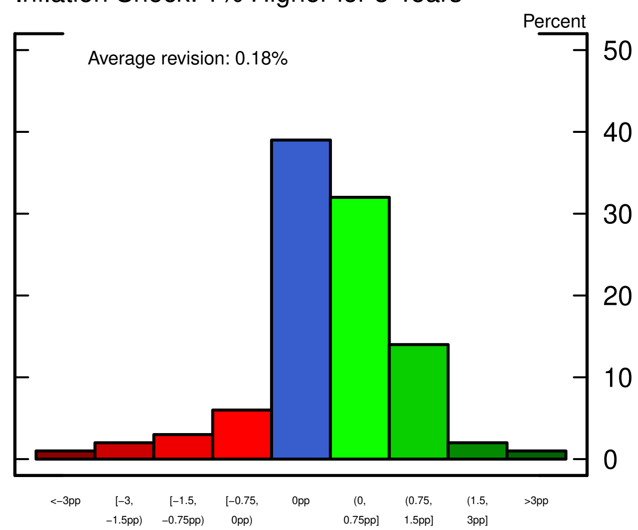
Source: Board staff calculations.

Measures of Longer−Run Inflation Expectations



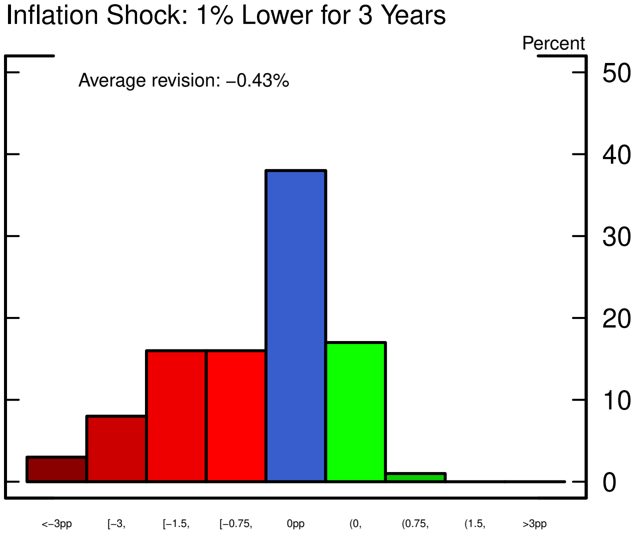
Note: The black, green, and red series are monthly averages.
Source: Board staff estimates, University of Michigan Survey of Consumers.

Inflation Shock: 1% Higher for 3 Years



Source: Federal Reserve Bank of New York Survey of Consumer Expectations July 2019 Special Module.

Inflation Shock: 1% Lower for 3 Years



Source: Federal Reserve Bank of New York Survey of Consumer Expectations July 2019 Special Module.

Policy Alternatives

- Alternative B affirms current policy stance is appropriate
  - Underlines Committee's resolve to bring inflation to 2 percent
- Alternative A provides threshold−based forward guidance
  - Would strengthen communications, sacrifices flexibility
- Alternative C presents contingency language when the case for some reduction in accommodation has materially strengthened

DECEMBER 2019 FOMC STATEMENT

1. Information received since the Federal Open Market Committee met in October indicates that the labor market remains strong and that economic activity has been rising at a moderate rate. Job gains have been solid, on average, in recent months, and the unemployment rate has remained low. Although household spending has been rising at a strong pace, business fixed investment and exports remain weak. On a 12-month basis, overall inflation and inflation for items other than food and energy are running below 2 percent. Market-based measures of inflation compensation remain low; survey-based measures of longer-term inflation expectations are little changed.

2. Consistent with its statutory mandate, the Committee seeks to foster maximum employment and price stability. The Committee decided to maintain the target range for the federal funds rate at 1-1/2 to 1-3/4 percent. The Committee judges that the current stance of monetary policy is appropriate to support sustained expansion of economic activity, strong labor market conditions, and inflation near the Committee's symmetric 2 percent objective. The Committee will continue to monitor the implications of incoming information for the economic outlook, including global developments and muted inflation pressures, as it assesses the appropriate path of the target range for the federal funds rate.

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 JANUARY 2020

1. Information received since the Federal Open Market Committee met in ~~October~~ **December** indicates that the labor market remains strong and that economic activity has been rising at a moderate rate. Job gains have been solid, on average, in recent months, and the unemployment rate has remained low. Although household spending has been rising at a ~~strong~~ **moderate** pace, business fixed investment and exports remain weak. On a 12-month basis, overall inflation and inflation for items other than food and energy ~~are running~~ **continue to run** below 2 percent. ~~Market-based measures of inflation compensation remain low; survey-based measures of longer-term inflation expectations are little changed.~~ **Indicators of longer-term inflation expectations remain low.**

2. Consistent with its statutory mandate, the Committee seeks to foster maximum employment and price stability. The Committee decided to maintain the target range for the federal funds rate at 1-1/2 to 1-3/4 percent. The Committee judges that the current stance of monetary policy is appropriate to support sustained expansion of economic activity, strong labor market conditions, and inflation ~~near~~ **returning to** the Committee's symmetric 2 percent objective. **The Committee expects to keep the target range for the federal funds rate no higher than its current setting at least until inflation has returned to 2 percent on a sustained basis. However,** the Committee will continue to monitor the implications of incoming information for the economic outlook, including global developments and muted inflation pressures, as it assesses the appropriate path of the target range for the federal funds rate.

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 January 2020

1. Information received since the Federal Open Market Committee met in ~~October~~ **December** indicates that the labor market remains strong and that economic activity has been rising at a moderate rate. Job gains have been solid, on average, in recent months, and the unemployment rate has remained low. Although household spending has been rising at a ~~strong~~ **moderate** pace, business fixed investment and exports remain weak. On a 12-month basis, overall inflation and inflation for items other than food and energy are running below 2 percent. Market-based measures of inflation compensation remain low; survey-based measures of longer-term inflation expectations are little changed.

2. Consistent with its statutory mandate, the Committee seeks to foster maximum employment and price stability. The Committee decided to maintain the target range for the federal funds rate at 1-1/2 to 1-3/4 percent. The Committee judges that the current stance of monetary policy is appropriate to support sustained expansion of economic activity, strong labor market conditions, and inflation ~~near~~ **returning to** the Committee's symmetric 2 percent objective. The Committee will continue to monitor the implications of incoming information for the economic outlook, including global developments and muted inflation pressures, as it assesses the appropriate path of the target range for the federal funds rate.

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 JANUARY 2020

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. The Committee decided to maintain the target range for the federal funds rate at 1-1/2 to 1-3/4 percent. The Committee judges that ~~the current stance~~ **some reduction in the degree** of monetary ~~policy is~~ **accommodation may soon become** appropriate to ~~support~~ sustain~~ed~~ **the** expansion of economic activity, strong labor market conditions, and inflation near the Committee's symmetric 2 percent objective. The Committee will continue to monitor the implications of incoming information for the economic outlook~~,~~ ~~including global developments and muted inflation pressures,~~ as it assesses the appropriate path of the target range for the federal funds rate.

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 January 2020, All Alternatives

Release Date: January 29, 2020

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 ~~December 11, 2019~~ **January 29, 2020**:

- 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 ~~1.55~~ **1.60** percent, effective ~~December 12, 2019~~ **January 30, 2020**. **Setting the interest rate paid on required and excess reserve balances 10 basis points above the bottom 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 ~~December 12, 2019~~ **January 30, 2020**, the Federal Open Market Committee directs the Desk to undertake open market operations as necessary to maintain the federal funds rate in a target range of 1-1/2 to 1-3/4 percent. In light of recent and expected increases in the Federal Reserve's non-reserve liabilities, the Committee directs the Desk to continue purchasing Treasury bills at least into the second quarter of 2020 to maintain over time ample reserve balances at or above the level that prevailed in early September 2019. The Committee also directs the Desk to continue conducting term and overnight repurchase agreement operations at least through ~~January~~ **April** 2020 to ensure that the supply of reserves remains ample even during periods of sharp increases in non-reserve liabilities, and to mitigate the risk of money market pressures that could adversely affect policy implementation. In addition, the Committee directs the Desk to conduct 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 ~~1.45~~ **1.50** 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 all principal payments from the Federal Reserve's holdings of Treasury securities and to continue reinvesting all principal payments from the Federal Reserve's holdings of agency debt and agency mortgage-backed securities received during each calendar month. Principal payments from agency debt and agency mortgage-backed securities up to $20 billion per month will continue to be reinvested in Treasury securities to roughly match the maturity composition of Treasury securities outstanding; principal payments in excess of $20 billion per month will continue to be reinvested in agency mortgage-backed securities. Small deviations from these amounts for operational reasons are acceptable.

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

- In a related action, the Board of Governors of the Federal Reserve System voted [unanimously] to approve the establishment of the primary credit rate at the existing level of 2.25 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

Interest on required and excess reserve balances

> Raise the interest rates paid on required and excess reserve balances to 1.60 percent, effective January 30, 2020.

Establishment of the primary, secondary, and seasonal credit rates

> Approve establishment of the primary credit rate at the existing rate of 2.25 percent and establishment of the rates for secondary and seasonal credit under the existing formulas specified in the staff's January 24, 2020, memo to the Board.