Appendix 1: Materials used by Mr. Mertens and Ms. Meade

Class II FOMC – Restricted (FR)

Material for Briefing on

Review of Monetary Policy Framework

Karel Mertens and Ellen Meade

December 10, 2019

Supporting memos and contributors listed on final page of packet.

Distributional Considerations

Rising inequality may contribute to challenges posed by ELB:

- Lower r* though increased net supply of savings
- Worse economic downturns once ELB is reached if more households live paycheck-to-paycheck

Model simulations of two versions of a New Keynesian model:

- RANK: perfect insurance against individual earnings risk
  - Inequality plays no role in macroeconomic dynamics
- HANK: imperfect insurance, liquidity constraints
  - Larger share of liquidity-constrained households makes economy more sensitive to shocks
  - Stronger multiplier effects exacerbate recessions once policy rate hits ELB
  - Average unemployment is 0.6 percentage points higher in HANK compared to RANK, and the standard deviation of unemployment is almost twice as large

Distributional Effects of Monetary Policy

Cost of business cycles are not borne equally

- Those hit the hardest in a downturn also benefit more in a strong economy, but historically not enough to offset negative effects of recessions
- Monetary policy strategies that reduce frequency/severity of recessions likely to decrease inequality in the long run

Monetary policy also has short-run distributive effects

Looser monetary policy, in the short run:

- Benefits most working age households, in particular borrowers and the working poor
- May be less popular among many (upper-) middle class retirees because of losses in interest income

Performance of Alternative Strategies in RANK and HANK models

We evaluate strategies in which policy rate depends on current output gap and average inflation over some horizon:

- After a severe demand shock, inflation make-up strategies remain effective even in the economy with liquidity-constrained households
- Stabilization gains are larger in the model with liquidity constraints (HANK) compared to the model without these constraints (RANK)
- Inflation make-up strategies reduce average unemployment rate by 0.4 to 0.5 pp in the model with liquidity constraints
- In practice, such a reduction in unemployment would almost certainly be larger for particularly vulnerable subgroups

Takeaways from *Fed Listens* Initiative

Fourteen public events

- Outward-facing piece of your review
- Engaged the public directly on issues pertaining to dual mandate
- Different in focus from System's usual community engagement activities

Representatives of underserved communities generally saw the current strong labor market conditions as providing significant benefits

- Primarily employment opportunities
- Concern about ramifications of the next downturn for newly hired workers

Perspectives from Business

Business representatives saw current labor market conditions as presenting challenges

- Partnering with workforce development agencies or community colleges to devise training programs or specialized curriculums
- Greater willingness of firms to employ individuals who would not have been considered in less favorable labor market conditions

Business representatives generally did not report increasing wages as a means of attracting and retaining workers

- Offering new training or education programs; adding or augmenting health care, other benefits
- Possibly reflects growing emphasis on “workplace culture”

Perspectives on Interest Rates, Inflation, and Communications

Low interest rate environment
- Businesses and CDFIs saw as beneficial
- LMI communities generally have little or no access to conventional credit
- Wealthier retirees have seen decline in interest income

Little discussion of inflation relative to discussion of labor market
- Acknowledgement that inflation is low
- Businesses emphasized importance of stable and predictable inflation
- Retirees, LMI communities voiced specific concerns

Communications
- Fed could better tailor its messages to different audiences
- Little or no understanding of policymakers' concerns about too-low inflation

Supporting Memos and Contributors

Feiveson, Laura, Nils Goernemann, Julie Hotchkiss, Karel Mertens, and Jae Sim (2019). "Distributional Considerations for Monetary Policy Strategy," memorandum to the Federal Open Market Committee, Board of Governors of the Federal Reserve System, November 22.

Dunn, Wendy, Jeff Fuhrer, Ellen Meade, and John Roberts (2019). "*Fed Listens* Events: Summary and Key Takeaways," memorandum to the Federal Open Market Committee, Board of Governors of the Federal Reserve System, December 4.

Appendix 2: Materials used by Ms. Logan

Class II FOMC - Restricted (FR)

Material for Briefing on

Financial Developments and Open Market Operations

Lorie Logan
Exhibits by Ashley Rhodes
December 10, 2019

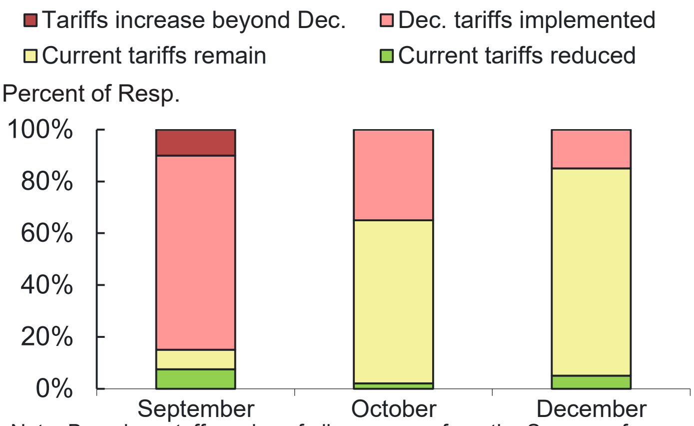
Class II FOMC – Restricted (FR) Exhibit 1

(1) Asset Price Changes Over Intermeeting Period

	Since October FOMC	Current Level
U.S. Rates		
2Y Treasury	+1 bps	1.61%
10Y Treasury	+4 bps	1.84%
Fed 5Y5Y Breakeven Inflation	+11 bps	1.76%
Risk Assets & Currencies		
S&P 500 Index	+3.8%	3,146
IG Credit Spreads	-5 bps	102 bps
HY Credit Spreads	-3 bps	360 bps
U.S. TW Broad Dollar	+1.0%	117

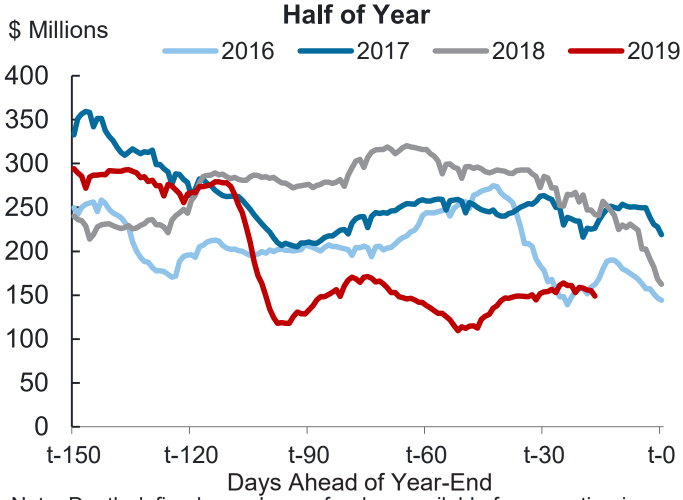
Note: Current Level pricing as of 12/06/19.
Source: Bloomberg, Federal Reserve Board of Governors

(2) Expectations for Tariffs on Imports from China



Note: Based on staff scoring of all responses from the Surveys of Primary Dealers and Market Participants. As of the December survey, current tariffs include tariffs on $360 billion of goods that have been implemented.
Source: FRBNY

(3) Market Depth of 10-Year Treasury during Second Half of Year



Note: Depth defined as volume of orders available for execution in central limit order books.
Source: BrokerTec

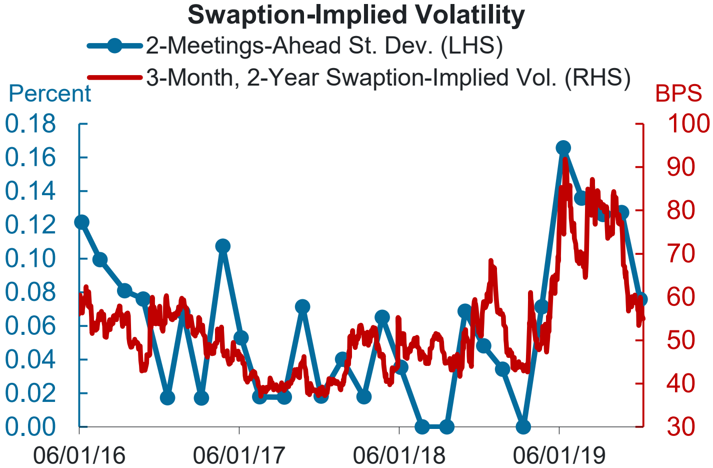
(4) Expectations for December FOMC Meeting

Target Rate:
- Market pricing and Desk surveys point to expectations for no change to the target range

Statement:
- Respondents expect little significant change to the FOMC statement

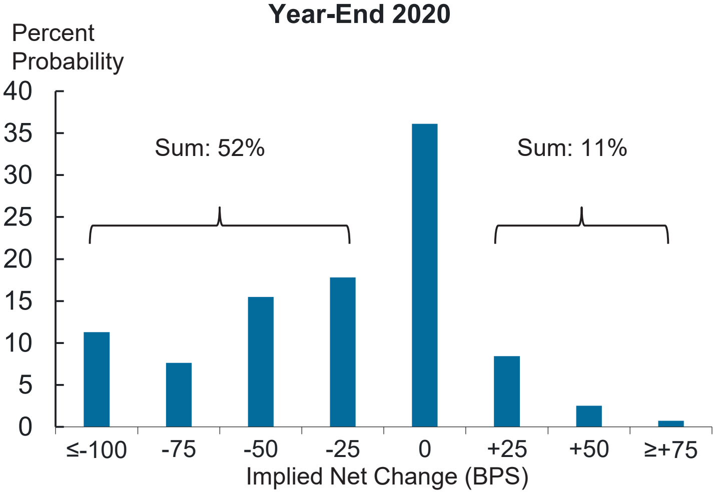
SEP:
- Expectations for median rate dots for 2019 to 2022 to shift lower by 25 basis points
  - Median respondent expects longer-run dot to remain unchanged

(5) Disagreement in Modal Target Rate Forecast and Swaption-Implied Volatility



Note: Disagreement is the standard deviation of modal target rate forecasts 2 FOMC meetings ahead, based on all responses to the Surveys of Primary Dealers and Market Participants.
Source: Bloomberg, FRBNY

(6) Average PDF for Implied Target Rate Changes by Year-End 2020



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

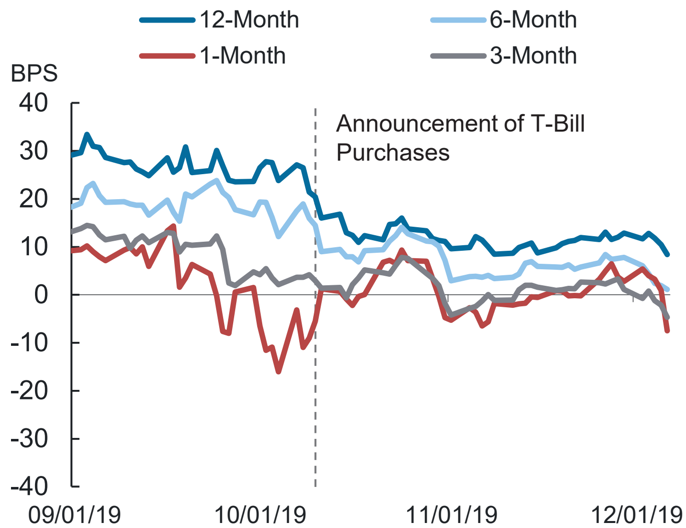
Class II FOMC – Restricted (FR)

Exhibit 2

(7) Overview of Key Topics

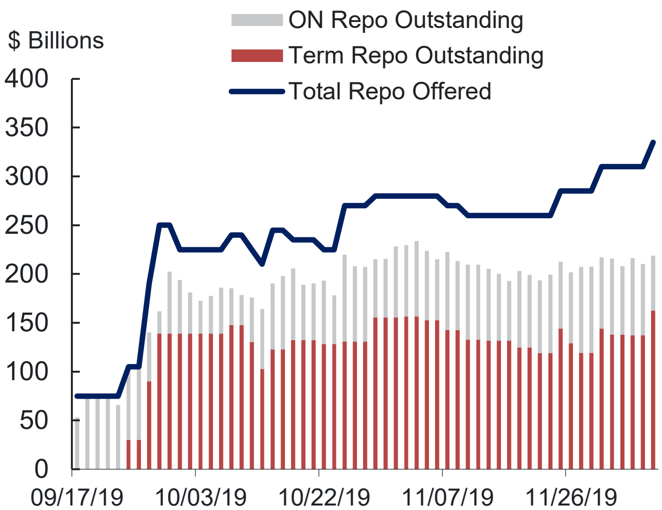
1. Update on implementation of FOMC’s strategy to ensure ample reserves
2. Approach to managing risks to policy implementation around year-end
3. Considerations for implementation in 2020

(8) Treasury Bill-OIS Spreads



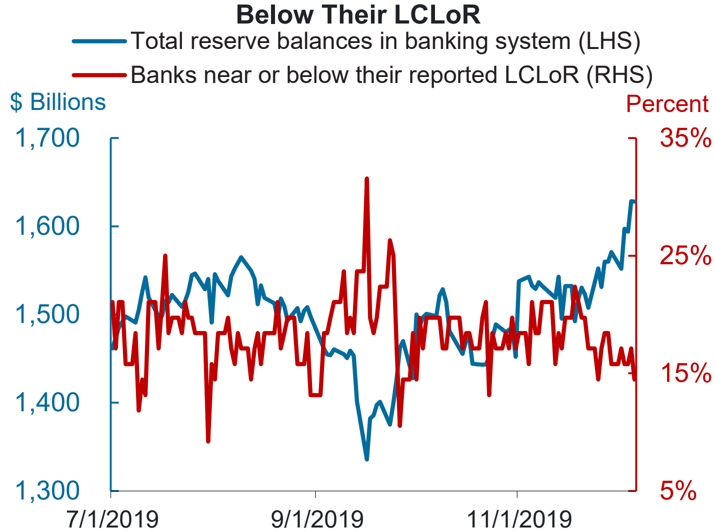
Source: Bloomberg

(9) Desk Temporary Open Market Operations



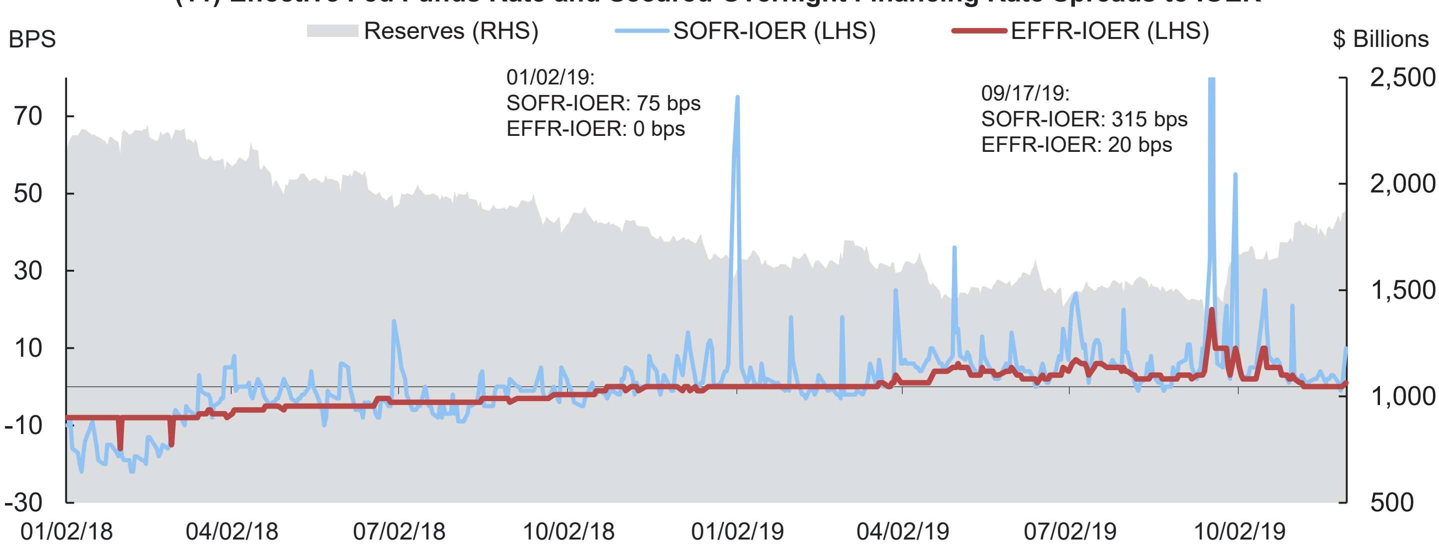
Source: FRBNY

(10) Reserve Balances Held By SFOS Banks Near or Below Their LCLoR



Source: Board of Governors, NRBL, SFOS 3

(11) Effective Fed Funds Rate and Secured Overnight Financing Rate Spreads to IOER

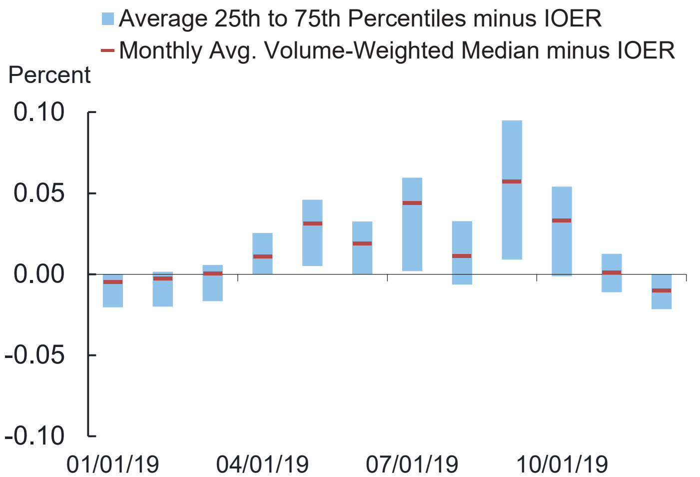


Source: FRBNY

Class II FOMC – Restricted (FR)

Exhibit 3

(12) Monthly Average Intraday Dispersion of Fed Funds and Eurodollar Trades



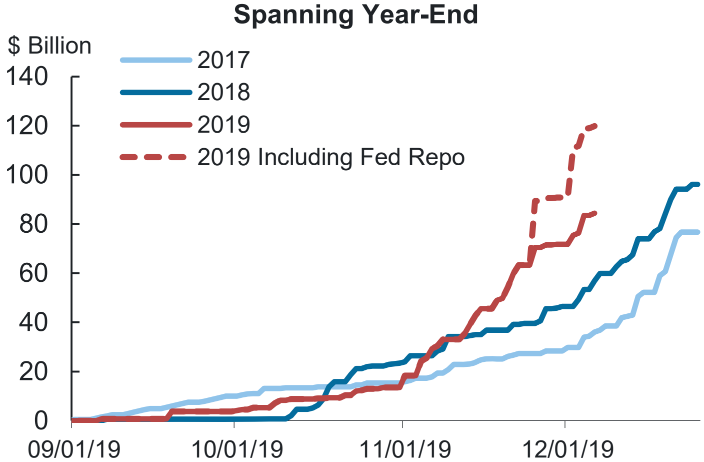
Note: December data as of 12/06/19.
Source: FRBNY, Staff Calculations

(13) Overnight and Term Rates around Year-End

Implied Year-End Overnight Rates	Current Level (%)	Spread to IOER	YE 2018 Level (%)	Spread to IOER
Interdealer GC repo*	3.90	**2.35**	2.95	**0.55**
Implied EFFR**	1.62	**0.07**	2.43	**0.03**
Term Rates				
1m Dec. SOFR-FF futures	0.07		0.09	
3m FX swap EURUSD	-0.13		-0.15	
3m FX swap USDJPY	-0.32		-0.39	

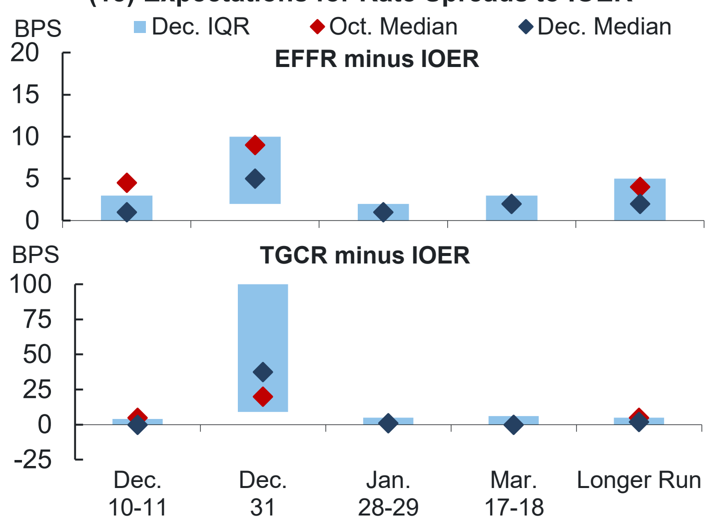
Note: *Based on quoted rates in interdealer Treasury GC markets. **Based on forward OIS. Green indicates easier funding conditions compared to this time last year, red indicates the opposite.
Source: Bloomberg

(14) Cumulative BNYM Treasury Triparty Repo Spanning Year-End



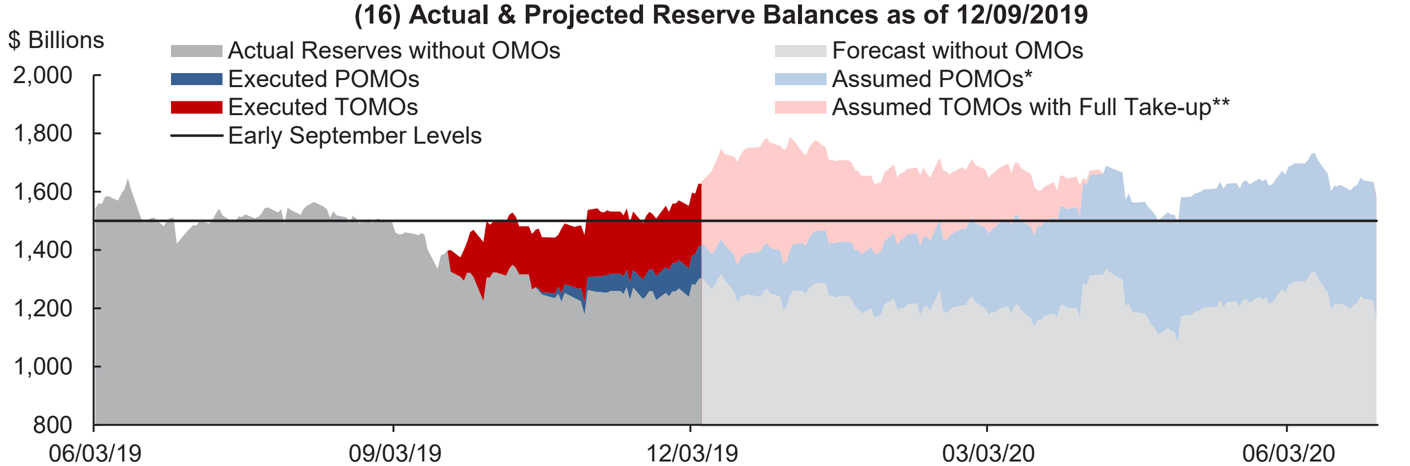
Note: Trades maturing in January of the subsequent year. 2017 and 2018 series shown to 12/25 of each year. On 12/09/19 an additional $25 billion in Fed term repo was taken up.
Source: BNYM, FRBNY

(15) Expectations for Rate Spreads to IOER



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

(16) Actual & Projected Reserve Balances as of 12/09/2019



*Assumes $60B per period through April 30.
**Take-up amount is often lower than offered amount. Assumes $120 billion ON offered through mid-March, after which ON RPs are tapered to $75 billion through the end of March ($150 billion on 12/31 & 1/2); four $35 billion two-week term repo tranches that begin to taper in mid-January (and completely roll-off by the beginning of April); and four $25 billion longer-term repo tranches that mature in January
Source: Board of Governors, FRBNY, Staff Calculations

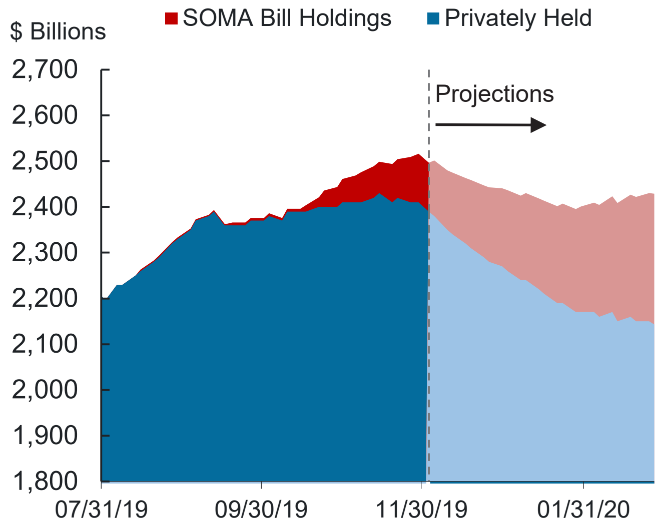
Class II FOMC – Restricted (FR)

Exhibit 4

(17) Operational Considerations After Year-End

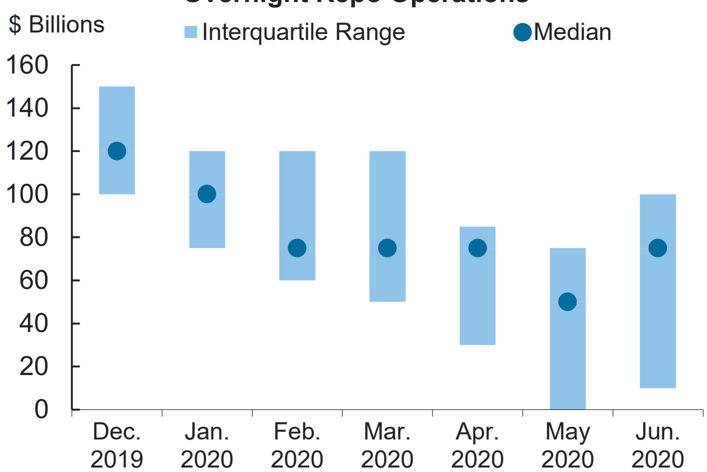
- If bill purchases start to impact bill market liquidity, could add short coupon securities.
- Transition away from active repo operations as bill purchases build reserves.

(18) Bill Universe by Ownership



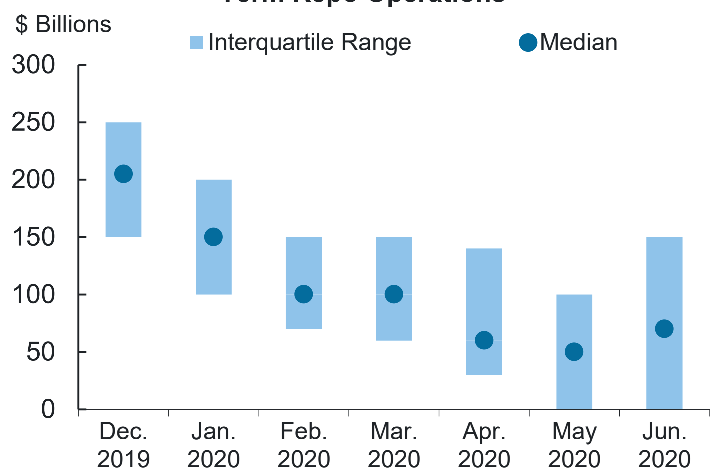
Source: FRBNY, Wrightson

(19) Expectations for Maximum Daily Repo Offered in Overnight Repo Operations



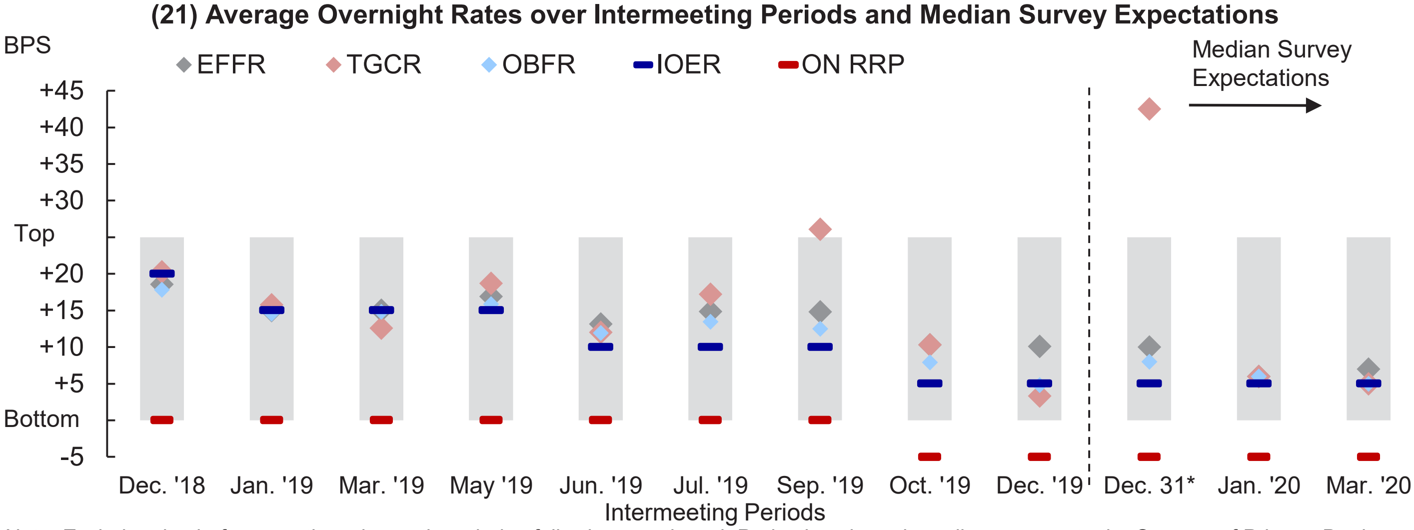
Note: Based on all responses to the Surveys of Primary Dealers and Market Participants.
Source: FRBNY

(20) Expectations for Maximum Daily Repo Offered in Term Repo Operations



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

(21) Average Overnight Rates over Intermeeting Periods and Median Survey Expectations



Note: Excludes day before month-end, month-end, day following month-end. Projections based on all responses to the Surveys of Primary Dealers and Market Participants. *Dec. 31 represents expectations for year-end.
Source: Board of Governors, FRBNY

Appendix 1

(1) Summary of Operational Testing

Summary of Operational Tests in prior period:

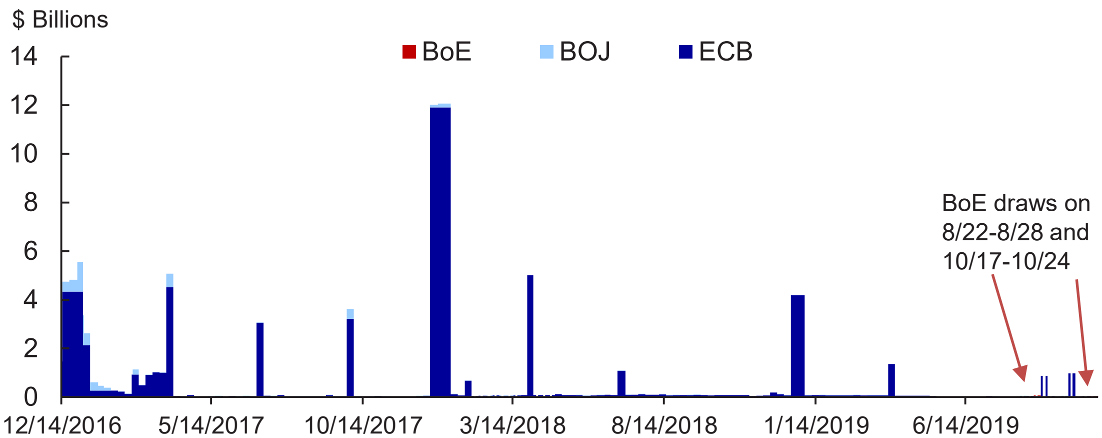
- Domestic Authorization
  - November 5: Term repo for $68 million*
  - November 7: Securities lending (using backup tool) for $75 million
  - November 19: Term reverse repo with MBS collateral for $71 million
  - November 19 and 21: Coupon swap with unsettled MBS holdings for $20 million, total
  - December 3 and 5: MBS specified pool sale for $167 million, total
  - December 5: Outright FRN sale for $50 million
- Foreign Authorization
  - November 5: Pound sterling liquidity swap for GBP 51,000
  - November 8: Early partial liquidation of a euro-denominated callable term deposit with an official institution for €1 million
  - November 18: Yen liquidity swap for JPY 51,000
  - November 19: Yen-denominated sovereign debt purchase for ¥100 million

Upcoming Operational Tests:

- One test scheduled under the Domestic Authorization.
  - December 18: Overnight repo (using the backup tool) for up to $75 million
- No tests scheduled under the Foreign Authorization

*This repo operation had T+1 settlement.

(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 11/14/19 ($ 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

Note: From Oct. '17 to Jun. '19 the cumulative net deviation w as $62 million. November purchase period not yet completed.

(2) Treasury Purchase Summary through 11/14/19 ($ 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	75,016	-4,984	-4,945

Note: Purchase period reflects mid-month to mid-month period beginning in specified calendar month. November purchase period not yet completed.

Appendix 3: Materials used by Mr. Follette

Class II FOMC - Restricted (FR)

Material for Briefing on

The Domestic Economic Situation

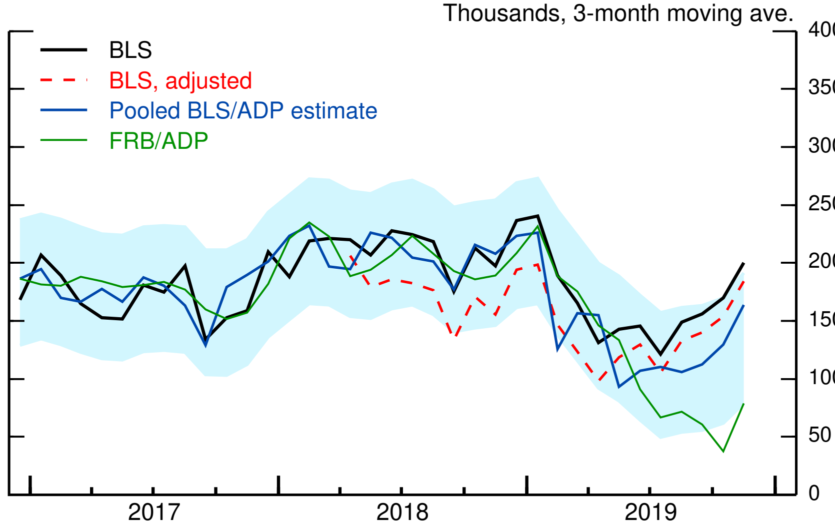
Glenn R. Follette
Exhibits by Rosemary Rhodes and Ashley Sexton
December 10, 2019

1. Recent Data and Near-term Outlook

1. 2019 Outlook

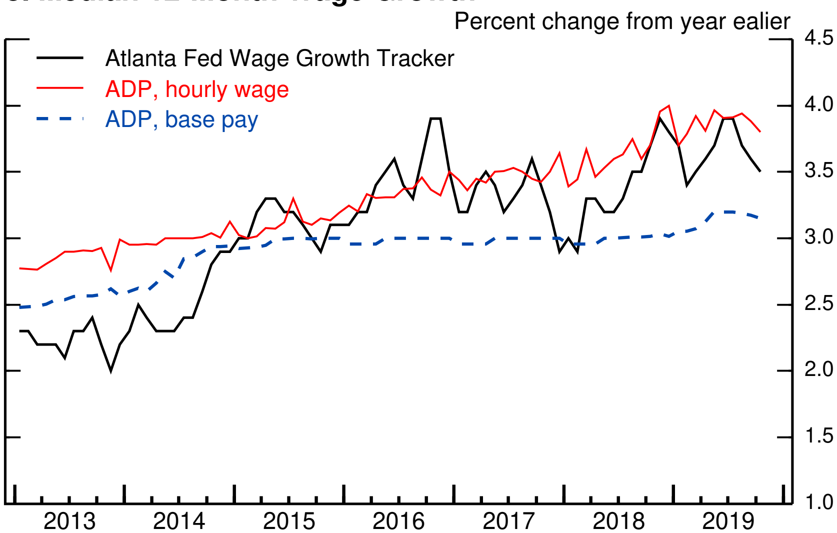
	H1	H2	Q3	Q4
1. GDP (% change)	2.6	1.9	2.2	1.6
2. November TB	2.6	1.7	2.1	1.3
3. October TB	*2.6*	*1.6*	*1.7*	*1.6*
Contribution from:				
4. PDFP (p.p.)	2.1	1.8	1.9	1.8
5. October TB	*2.1*	*1.8*	*1.8*	*1.8*
Memo:				
6. Unemployment rate (%)	3.8	3.6	3.6	3.5
7. October TB	*3.8*	*3.6*	*3.6*	*3.6*

2. Private Payroll Gains



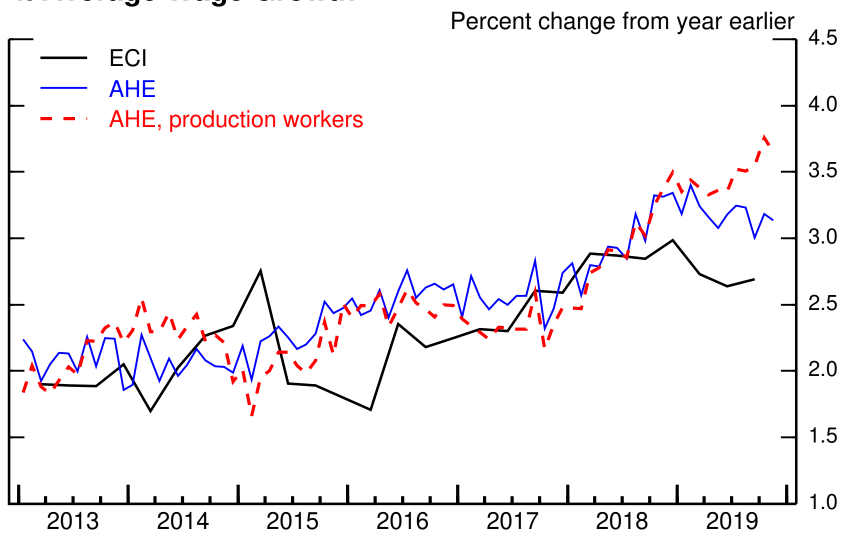
Note: Shaded region denotes 90 percent confidence interval for pooled estimate. Pooled estimate is not smoothed.

3. Median 12-Month Wage Growth



Note: Change in wages for same worker over 12 months.

4. Average Wage Growth



2. Evolution of the Outlook

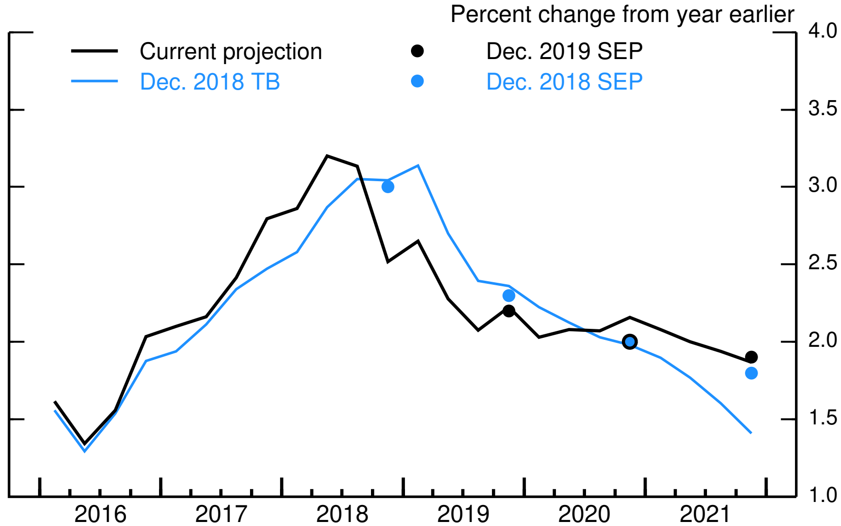
5. Forecast Haiku

Economy slowed

But unemployment still fell

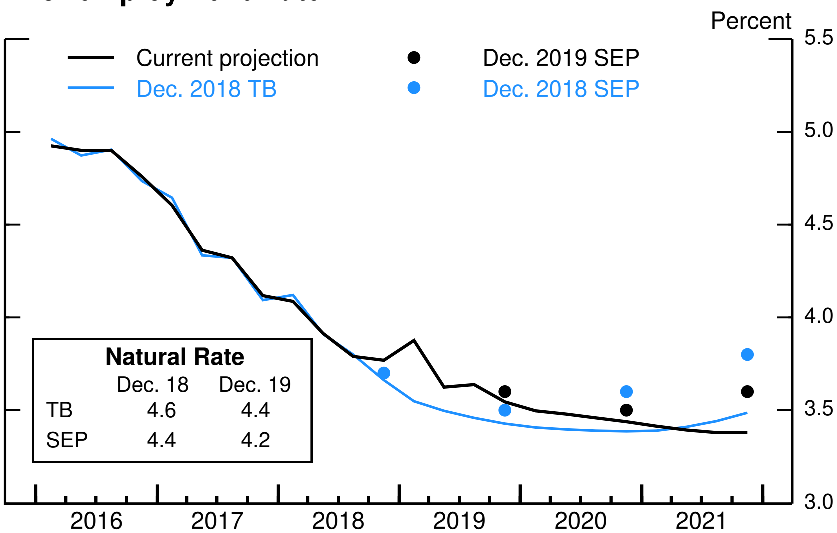
Inflation faltered

6. GDP

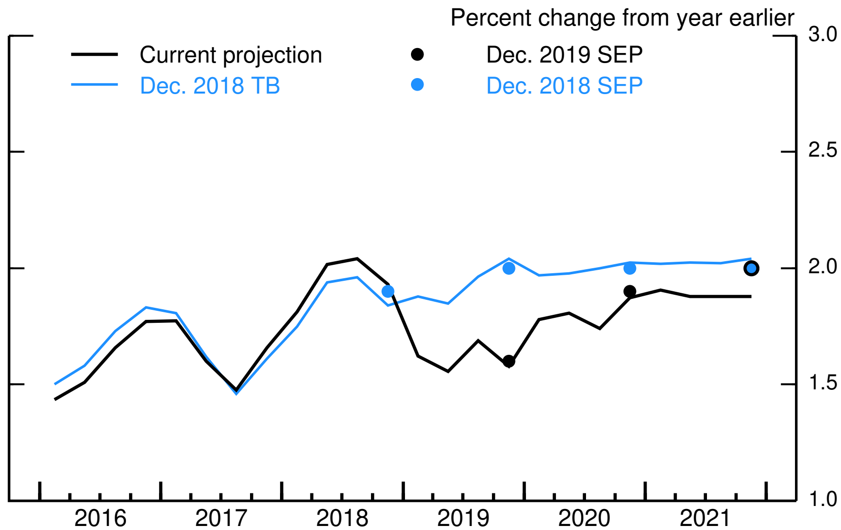


Note: Forecasted value for 2020:Q4 corresponds to both Dec. 2018 SEP and Dec. 2019 SEP.

7. Unemployment Rate



8. Core PCE Inflation



Note: Forecasted value for 2021:Q4 corresponds to both Dec. 2018 SEP and Dec. 2019 SEP.

3. Labor Market Developments

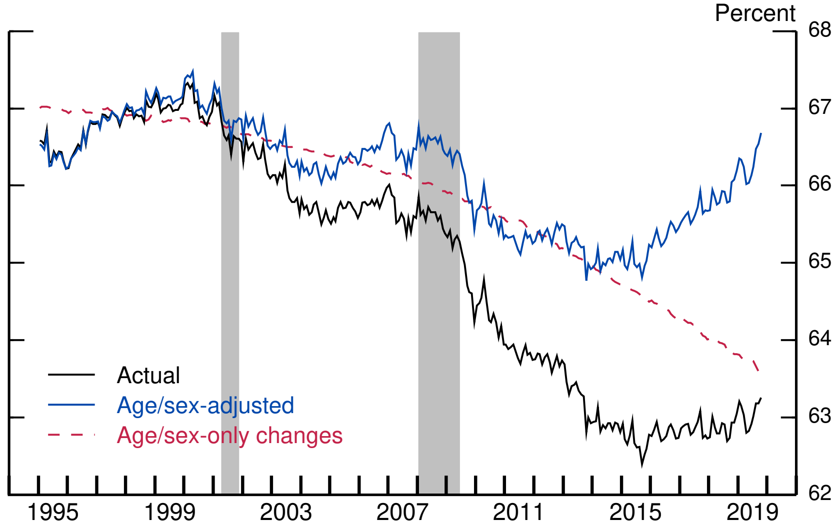
9. Labor Force Participation Has Surprised

(Percent)

	2019 Q4 Forecast		Revision
	Dec. 18	Dec. 19	
1. Unemployment rate	3.4	3.5	0.1
2. Payroll employment*	156	158	2.0
3. LFPR	62.9	63.2	0.3
4. Trend LFPR	62.5	62.9	0.4

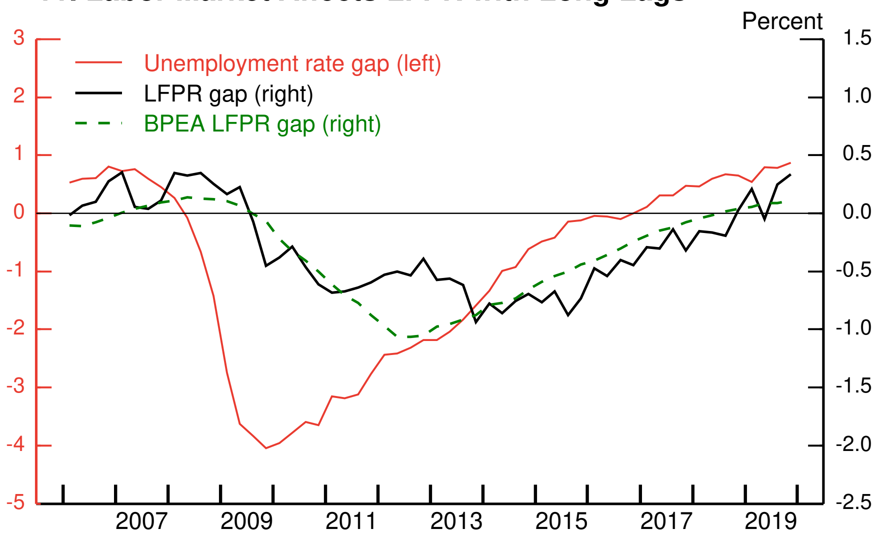
*Average monthly change over the year. Includes expected -23,000 adjustment from benchmark revision.

10. Aging Has Held Down LFPR



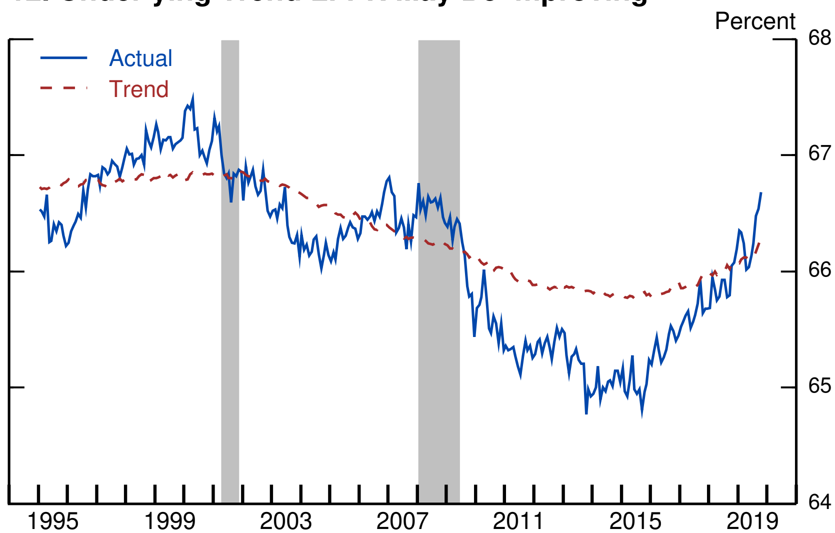
Note: Age/sex distribution normalized to 1997 for age/sex-adjusted and age/sex-only series.

11. Labor Market Affects LFPR with Long Lags



Note: BPEA is an estimate derived from state-level regressions found in Aaronson and others (2014).

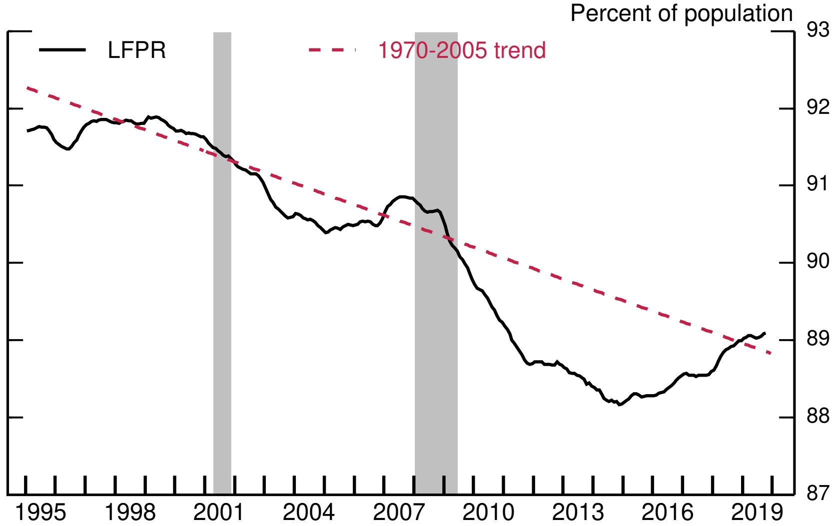
12. Underlying Trend LFPR May Be Improving



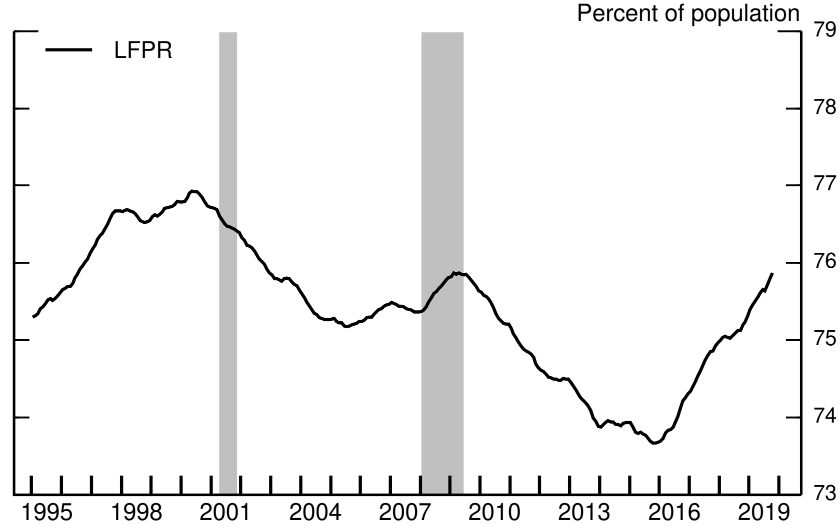
Note: Age/sex distribution normalized to 1997.

4. Labor Force Participation

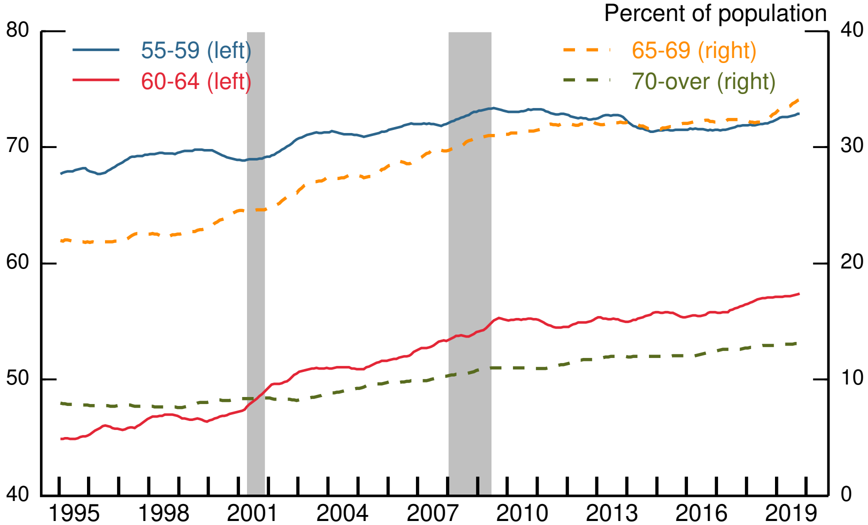
13. Prime-Age Men



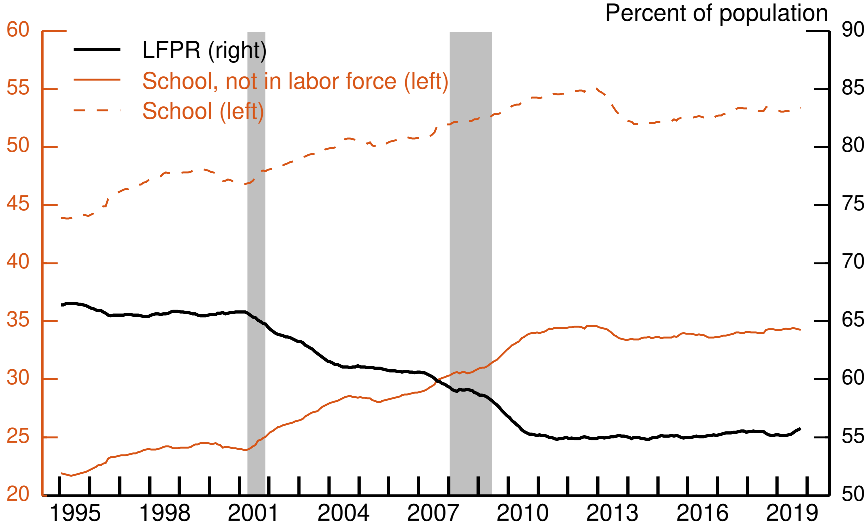
14. Prime-Age Women



15. Ages 55 and Over

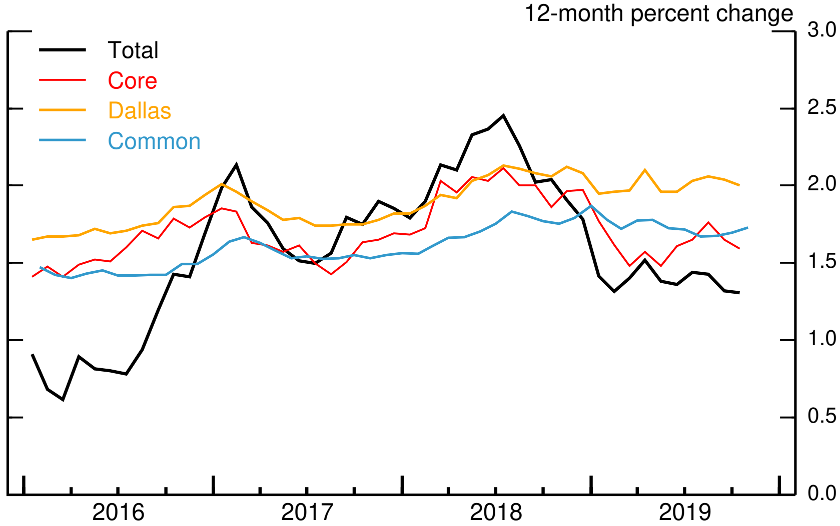


16. Ages 16 to 24



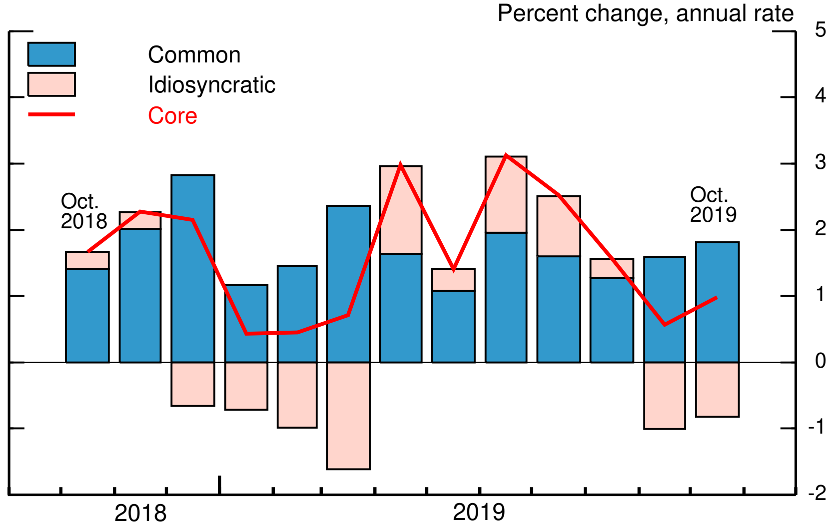
5. Filtering Inflation Data

17. PCE Inflation



Note: Common is common component of core inflation estimated by a dynamic factor model.

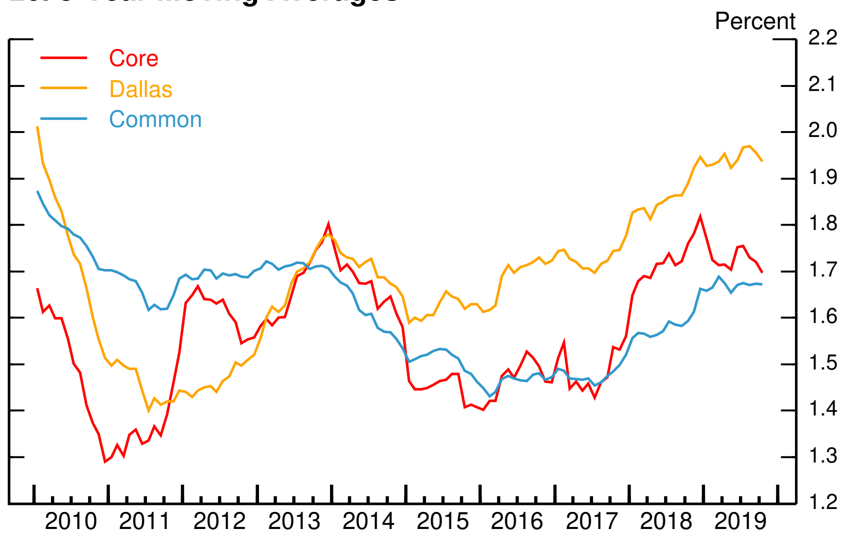
18. Monthly Core PCE Inflation



19. Average Inflation Rates Vary Across Measures

	Mean inflation rate		Standard deviation	
	Last 10 years	Last 20 years	Last 10 years	Last 20 years
Total PCE	1.5	1.8	1.7	2.4
Core	1.6	1.7	0.8	1.2
Dallas	1.7	2.0	0.6	0.7
Common	1.6	1.8	0.3	0.4

20. 3-Year Moving Averages



Appendix 4: Materials used by Mr. Kamin

Class II FOMC - Restricted (FR)

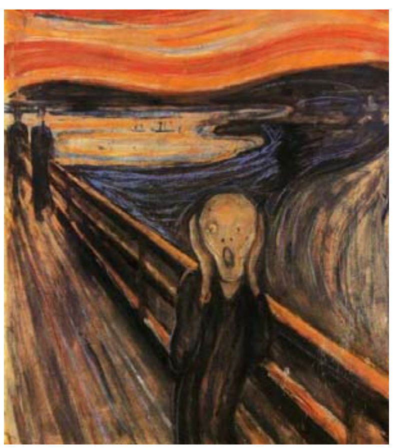
Material for Briefing on

The International Outlook

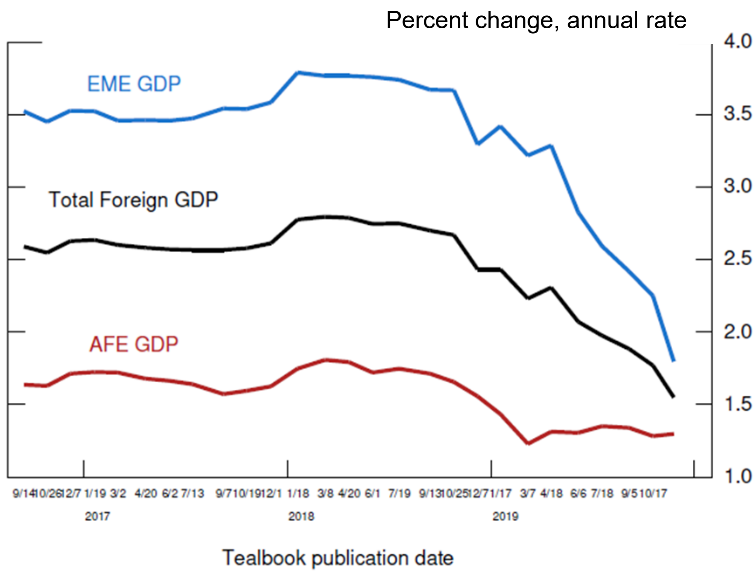
Steven B. Kamin
Exhibits by Theresa Dinh
December 10, 2019

What, me worry?

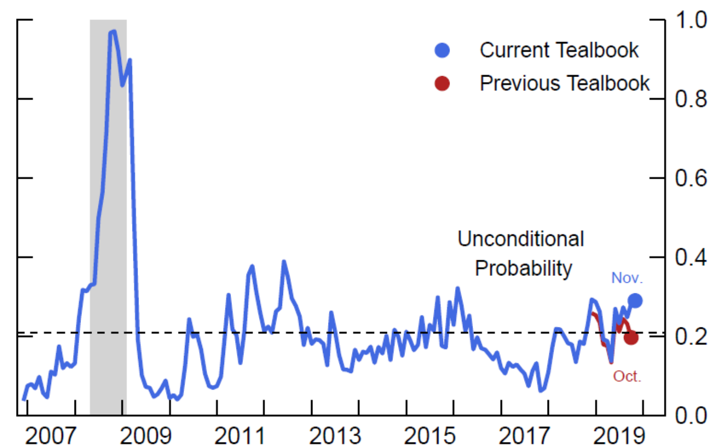
- Haunted by prospect of failing to predict next global recession.
- We have marked down our forecast for this year repeatedly.
- But little evidence that global recession is imminent, and probability of recession is still moderately low.



Evolution of the Staff Forecast for 2019



Estimated Probability of Recession in the Foreign Economy within 12 Months (ADS+FSI)

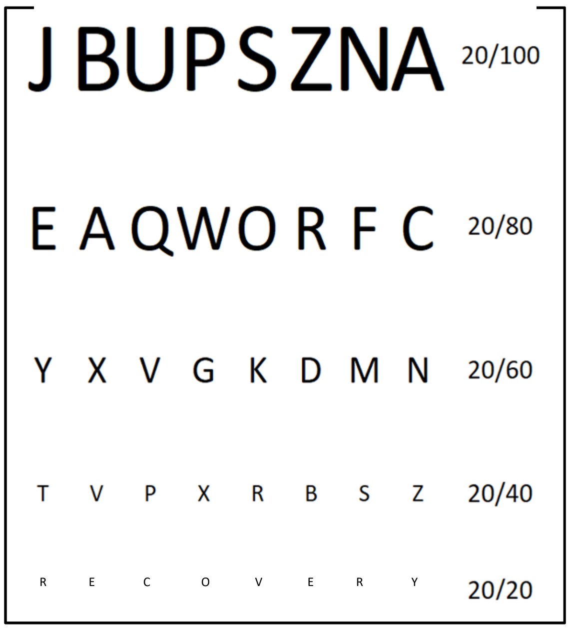


Shading indicates that countries representing 55% of foreign GDP classified as in recession. Source: Staff calculations.

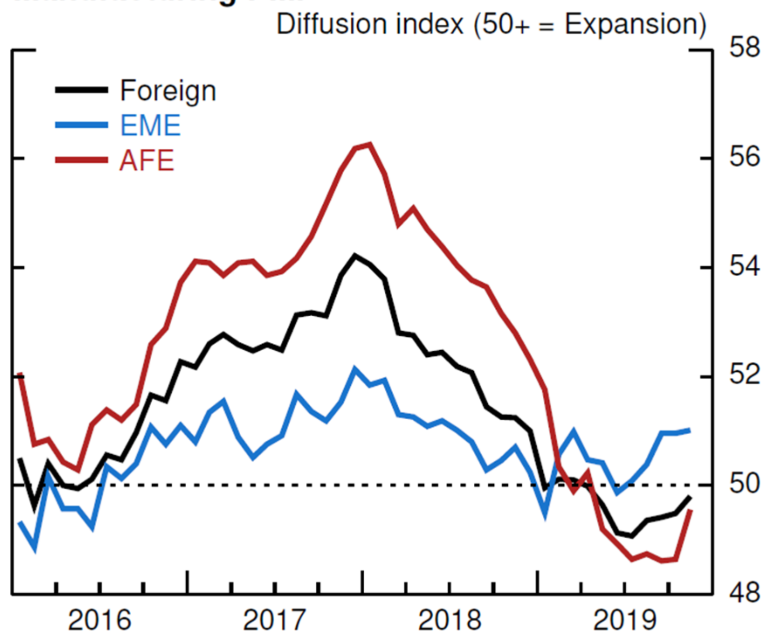
Green shoots?

- Tentative signs of recovery, but one needs 20/20 vision to see.
- Manufacturing PMIs turning up, albeit still at a depressed level.

Eye Chart



Manufacturing PMI

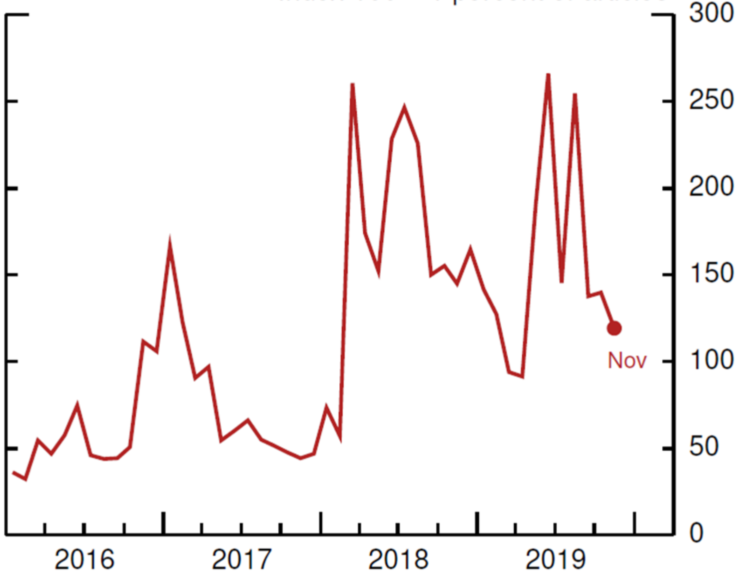


Source: IHS Markit.

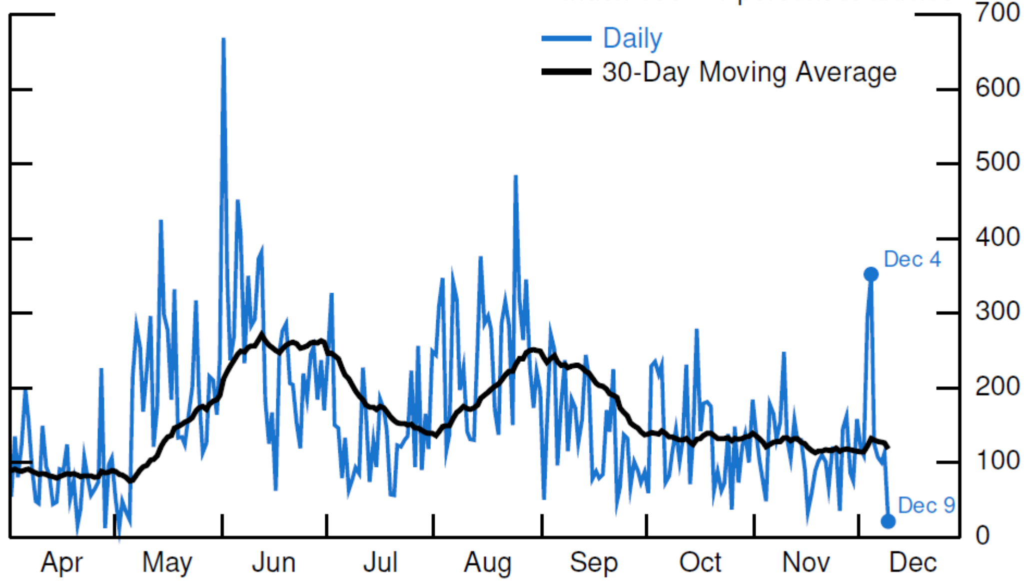
Trade tensions have lessened – we hope.

- Trade policy uncertainty (TPU) eased since summer, largely on increased hope of successful "phase one" trade talks with China.
- Our daily measure of TPU spiked up in early December, but has since subsided.

Monthly Trade Policy Uncertainty Index



Daily Trade Policy Uncertainty Index

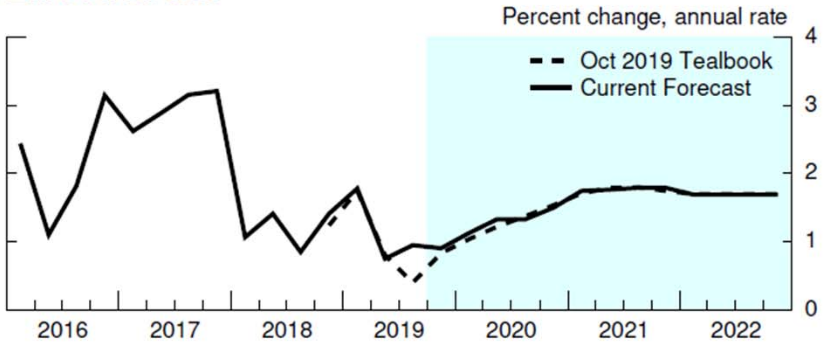


Note: Share of articles in major newspapers that mention uncertainty and an additional trade-policy-related word.
Source: Caldara, Dario, et al. "The economic effects of trade policy uncertainty." *Journal of Monetary Economics* (2019).

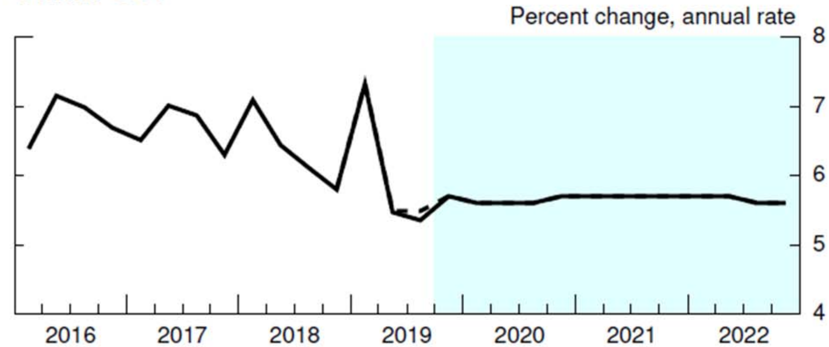
Growth appears to have bottomed out in some key economies.

- Euro area and Chinese growth in Q3 stayed at Q2 pace.
- Emerging Asia ex. China solid except for Hong Kong.
- Latin America still struggles.

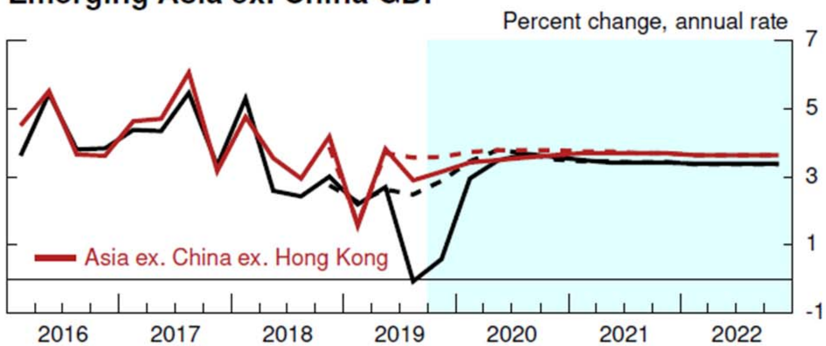
Euro Area GDP



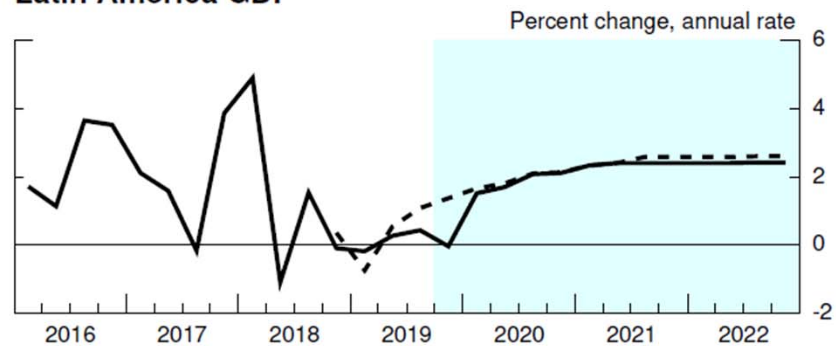
China GDP



Emerging Asia ex. China GDP

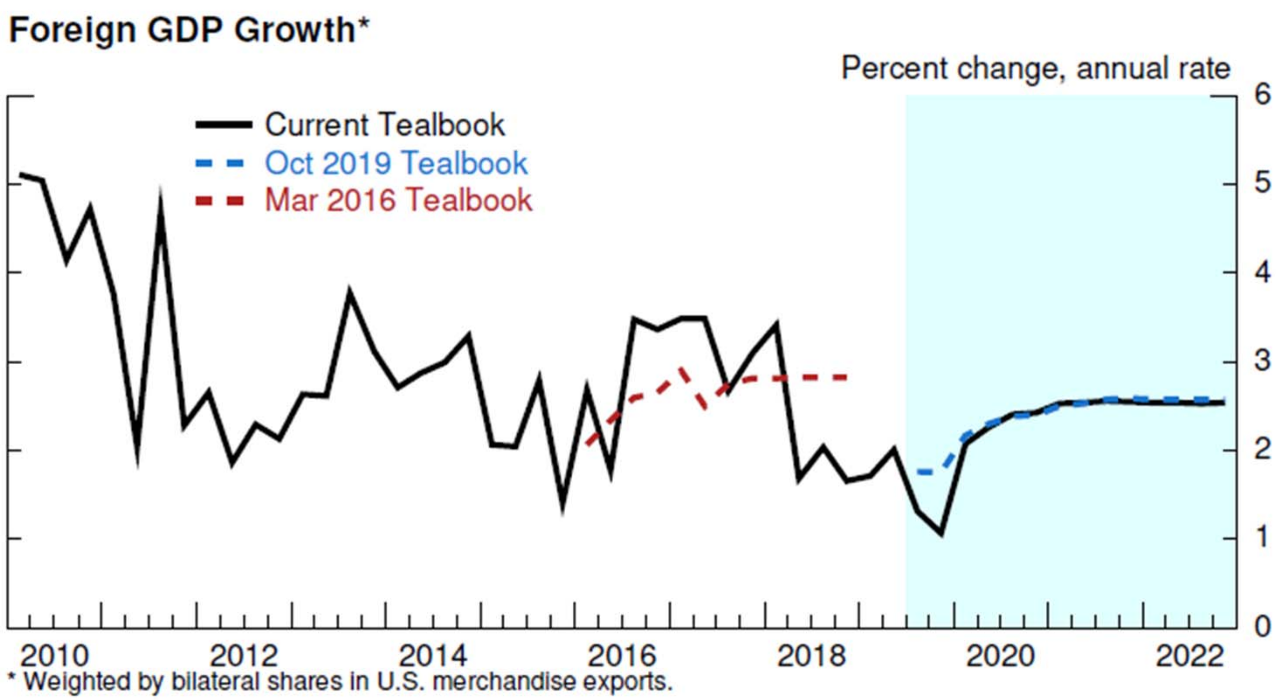


Latin America GDP



Current Outlook

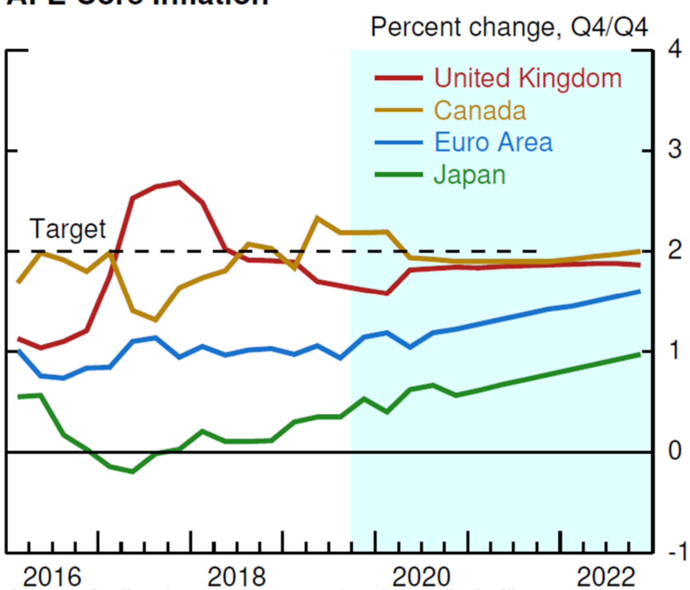
- Foreign growth bottoms out in current quarter and moves up next year.
- Pick up reflects expected strengthening in manufacturing, reduced trade uncertainty, rebound in Hong Kong, and accommodative policies.
- 2016 also looked bleak, but turned out better than expected.



Policy rates to stay low.

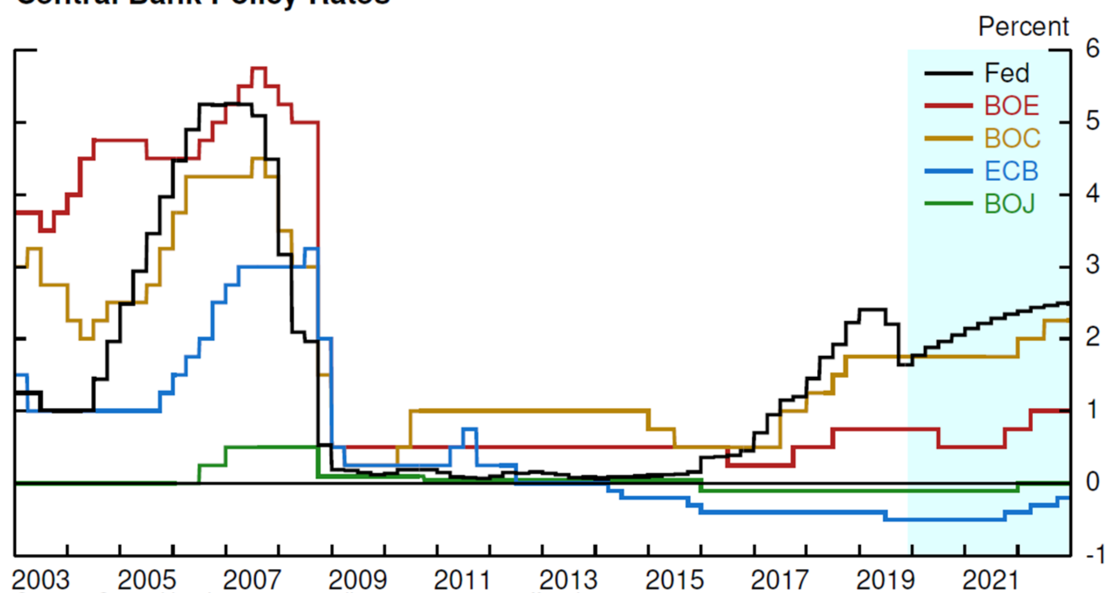
- Canadian and U.K. inflation near 2 percent targets.
- Inflation far from targets in euro area and Japan, and hence policy rates expected to stay very low.
- Policy rates don't rise much in the U.K. and Canada, either.

AFE Core Inflation



Source: Staff estimates, Haver, national statistical offices.

Central Bank Policy Rates



Source: Central bank monetary policy statements, staff estimates.

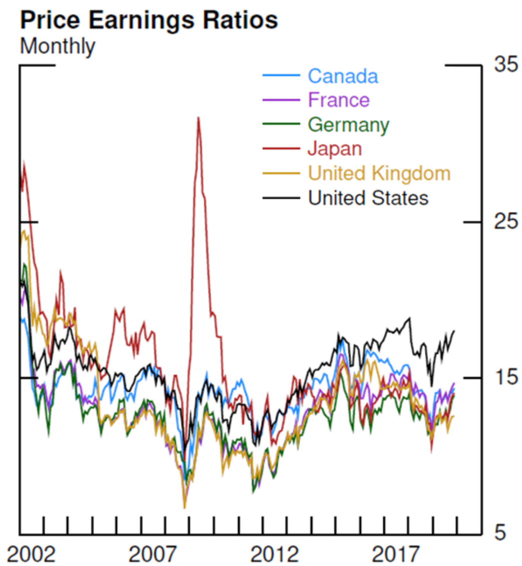
Why won’t ECB and BoJ ease further?

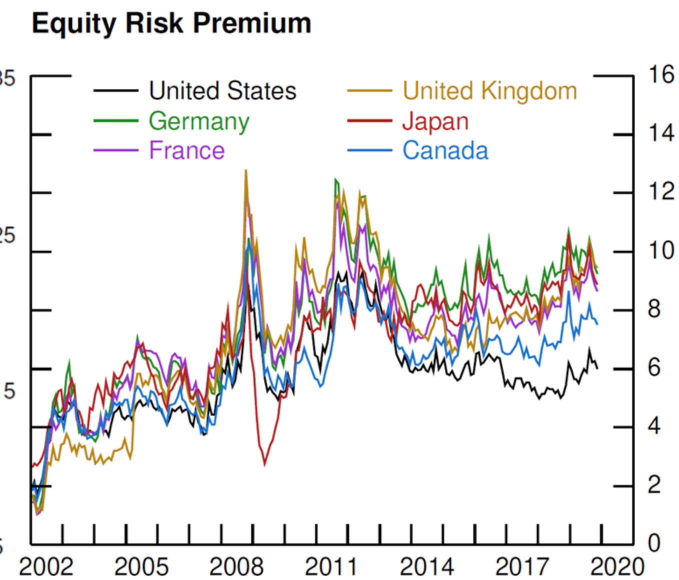
- Worries about effect of low rates on banks, insurance companies, and pension funds.
- Concerns low rates and low profitability might encourage reach for yield and financial excesses.
- Concerns of depressive effect on households’ interest income and sentiment.
- Outlook is for steady growth.

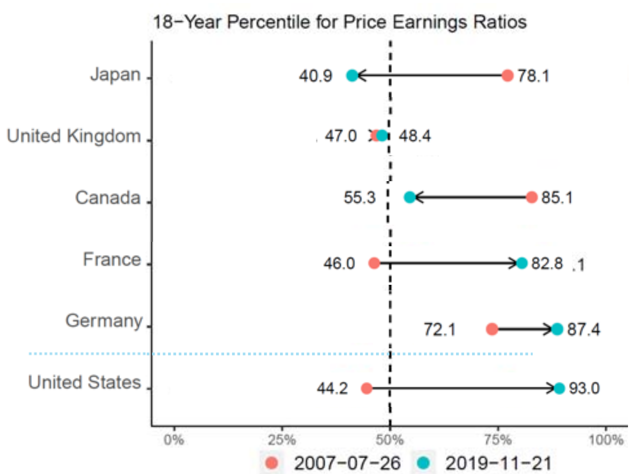
Impact of low-for-long interest rates on financial stability in AFEs?

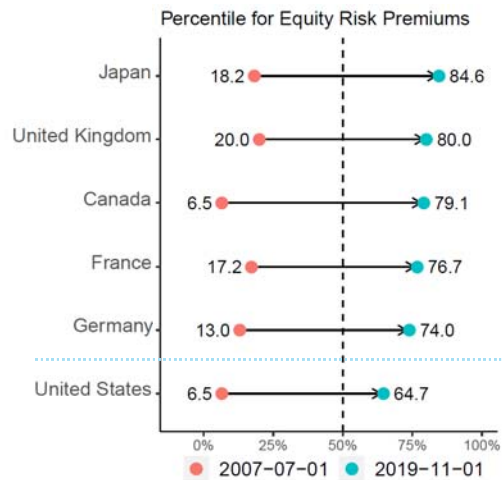
- Review experience over past decade, when interest rates near zero.
- Focus on two important dimensions of risk-taking and financial stability:
  - Asset valuations.
  - Non-financial sector leverage.

Equity prices abroad too high? Generally, no.



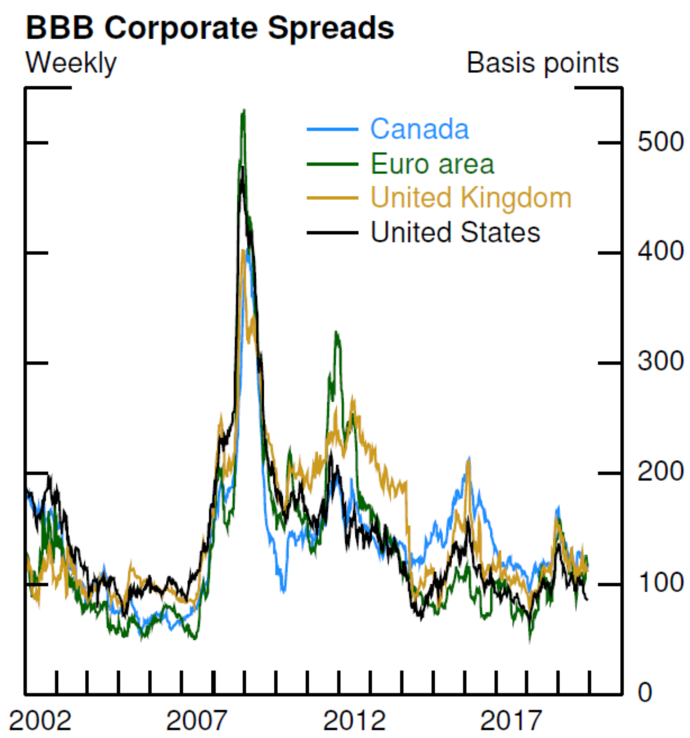


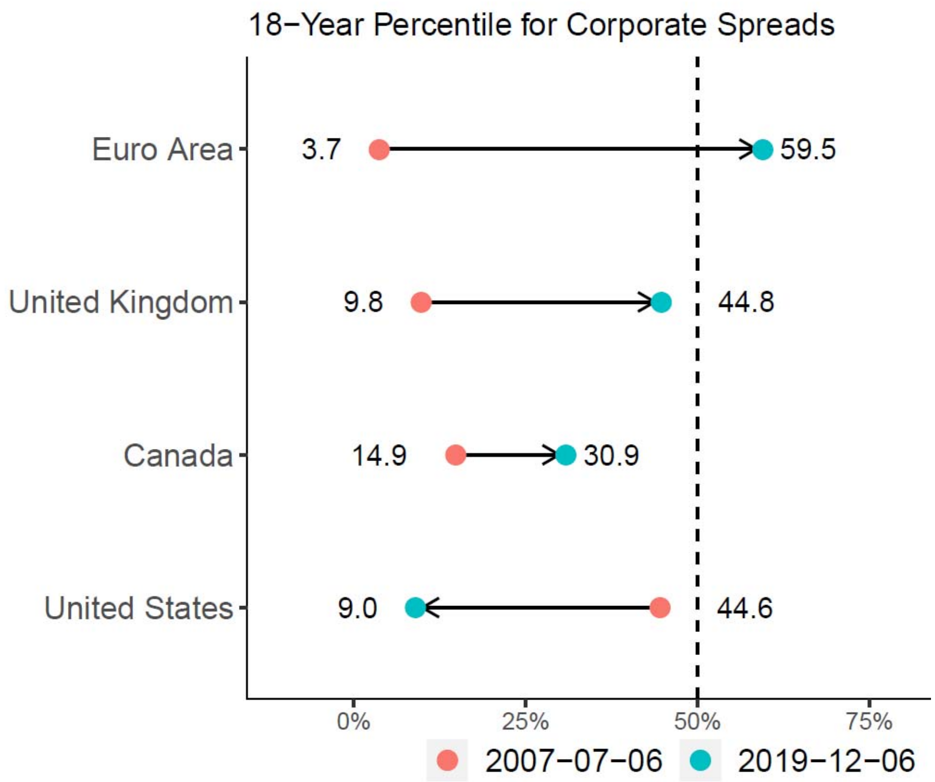




- Mixed outcomes for PE ratios.
- Equity risk premium: measure of compensation for risk of holding equities.
  =earnings/price ratio minus 10-year real interest rate.
- Equity risk premiums have risen since Global Financial Crisis.

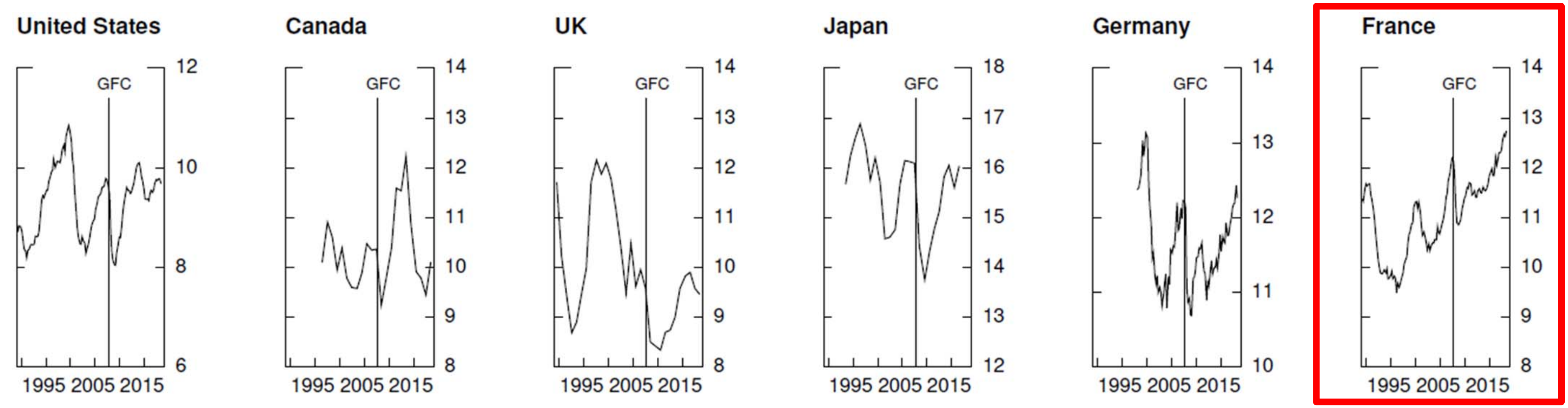
Corporate bond spreads abroad too low? Generally, no.





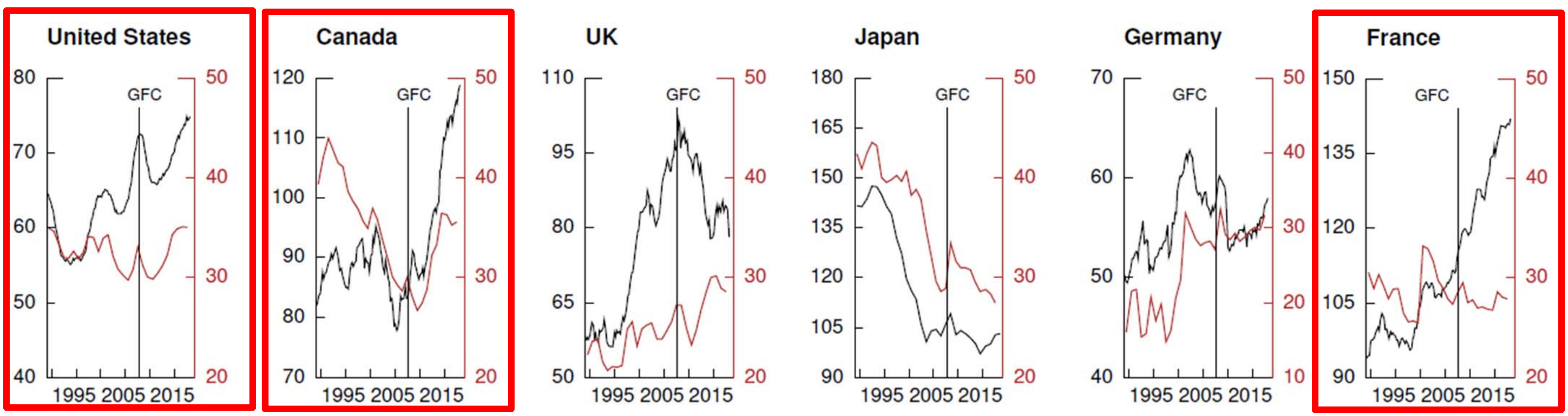
Non-Financial Corporate Investment-to-GDP

Percent

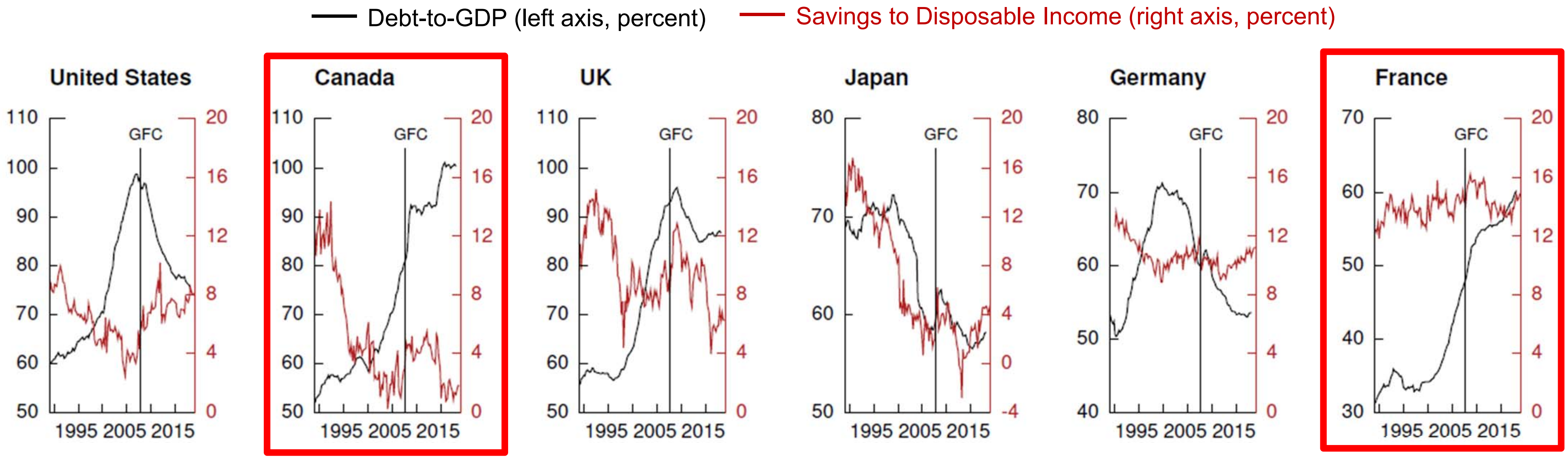


Non-Financial Corporate Credit-to-GDP and Leverage

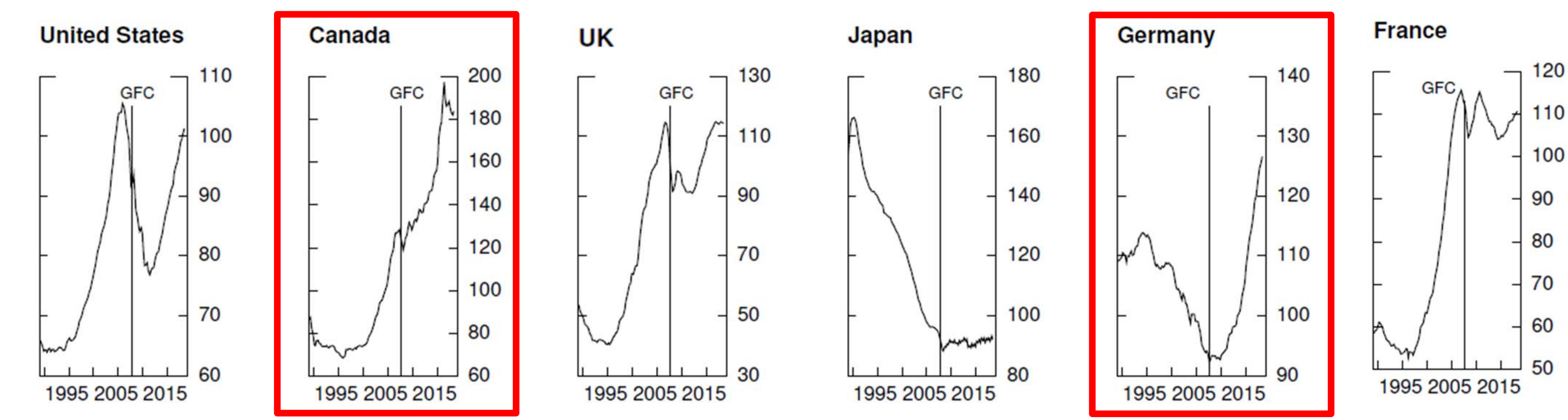
Credit-to-GDP (left axis, percent) Leverage (right axis, percent)



Household Savings Rate and Debt-to-GDP



Real Housing Prices



Conclusions

- Low rates motivated some, not great deal, of spending borrowing, and valuation excesses in AFEs.
- Doesn’t mean further low rates pose no financial stability risk.
  - Aggregate data may obscure risk-taking at micro level.
  - Hangover from GFC may have restrained credit.
  - Causality may run from low risk-taking to low interest rates.

Appendix

Panels from Page 9

- *Price earnings ratios:* price/earnings ratio based on 12-month forward earnings (Source: IBES).

- *Equity risk premium:* difference between expected return on equities, as defined by forward earnings over price, and risk free interest rate (Source: Staff calculations, expected return on equities from IBES, 10-year sovereign yield from Bloomberg, 10-year ahead inflation expectation from Consensus).

- *18-year percentile for Price earnings ratios*: price earnings percentiles for July 2007 and Nov 2019 in a sample from 2002 to 2019 (Source: Staff calculations, IBES).

- *Percentile for equity risk premium ratios*: equity risk premium percentiles for July 2007 and Nov 2019 in a sample from 2002 to 2019 (Source: Staff calculations, expected return on equities from IBES, 10-year sovereign yield from Bloomberg, 10-year ahead inflation expectation from Consensus).

Panels from Page 10

- *BBB Corporate Spreads:* difference in 5-year BBB corporate bond yields and 5-year sovereign bonds yields (Source: Bloomberg).

- *18-year percentile for Corporate Spreads:* BBB corporate spread percentiles for July 2007 and Nov 2019 in a sample from 2002 to 2019 (Source: Staff calculations, Bloomberg).

Panels from Page 11

- *Investment-to-GDP:* nonfinancial corporate gross fixed capital formation (except for the UK, where it is defined as total business gross fixed capital formation) (Source: national accounts, Haver Analytics).

- *Credit-to-GDP:* credit to non-financial corporations from all sectors at market value (Source: BIS).

- *Non-financial corporate leverage:* aggregate leverage ratio across a country as defined by sum of total debt across all firms divided by sum of total assets across all firms (Source: Worldscope).

Appendix

Panels from Page 12

- *Household Debt-to-GDP:* total credit extended to households and non-profit institutions serving households at market value (Source: BIS).

- *Household savings to disposable income:* net savings rate used for United States, Canada, Japan, and Germany. Gross savings rate used for United Kingdom and France. (Source: Haver Analytics).

- *Real housing prices:* real house price index seasonally adjusted, indexed to 2005, and deflated using personal consumption expenditure (Source: Dallas Fed).

Panels from Appendix

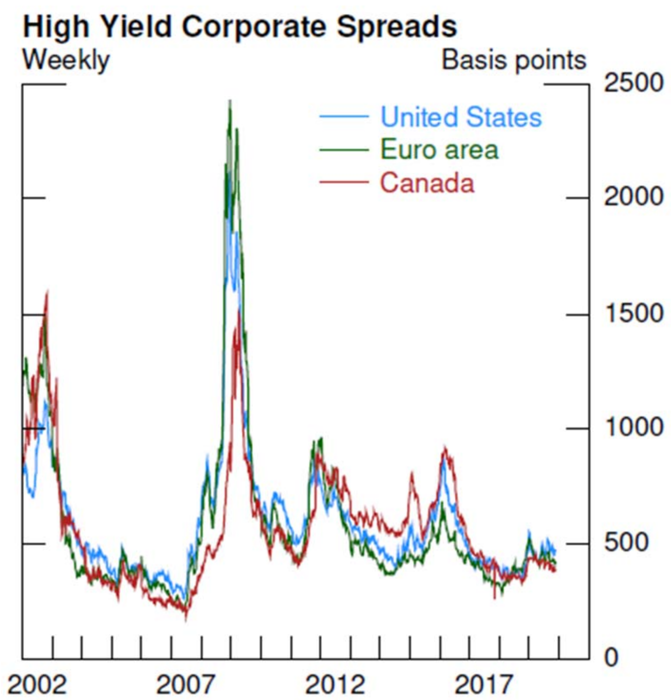
- *High yield corporate spreads:* difference in 5-year high yield bond yields and 5-year sovereign bond yields (Source: BAML)

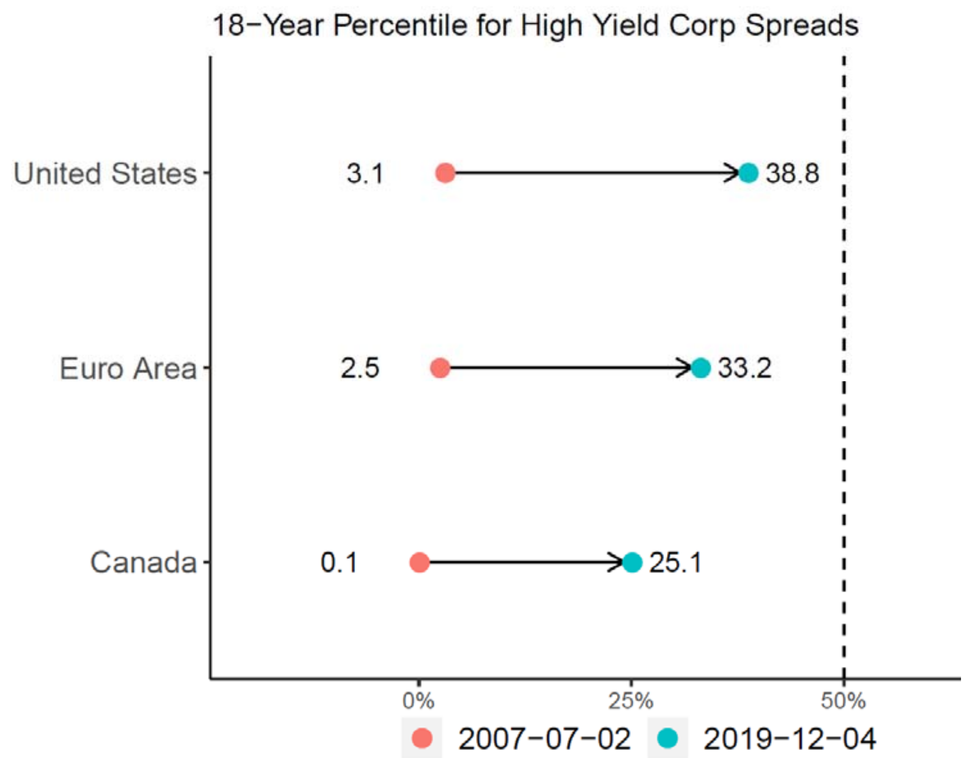
- *18-year percentile for high yield corporate spreads:* high yield corporate spread percentiles for July 2007 and Nov 2019 in a sample from 2002 to 2019 (Source: Staff calculations, BAML).

- *10-year yields:* 10-year sovereign bond yields (Source: Bloomberg).

- *10-year term premium:* 10-year nominal term premiums calculated from 3-factor ACM model for foreign countries, and 3-factor KW model for the US (Source: Staff calculations, U.S. yield data from the Board, U.K. yield data from BOE, other countries' yield data from Bloomberg, and Blue Chip and Consensus Economics survey data).

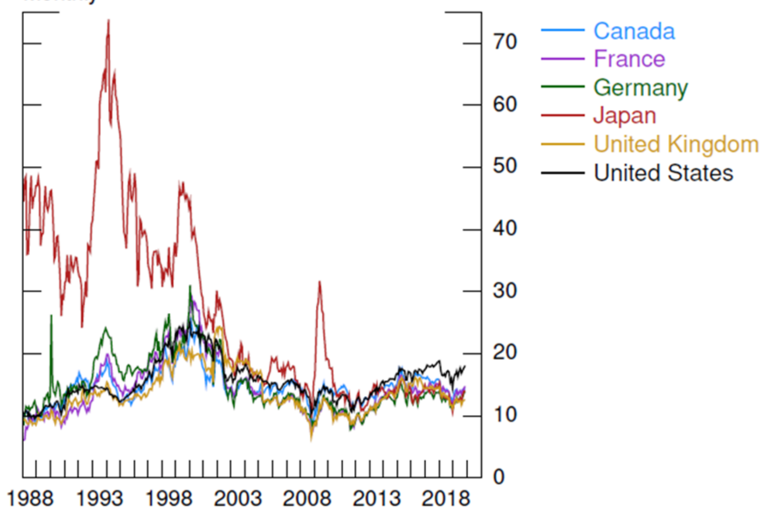
High Yield Corporate Spreads



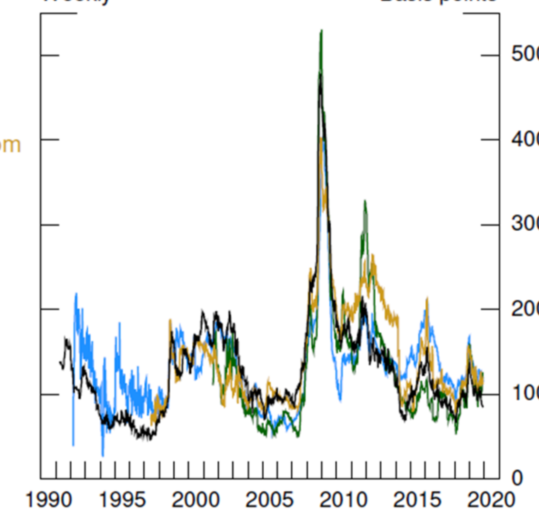


Asset Valuations over Longer Time Periods

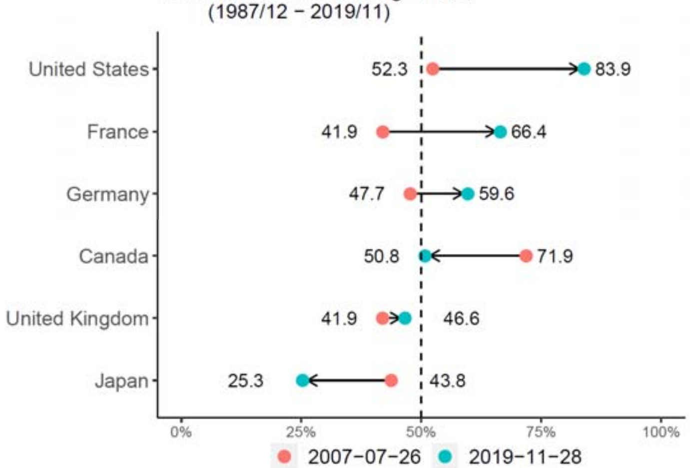
Price Earnings Ratios
Monthly



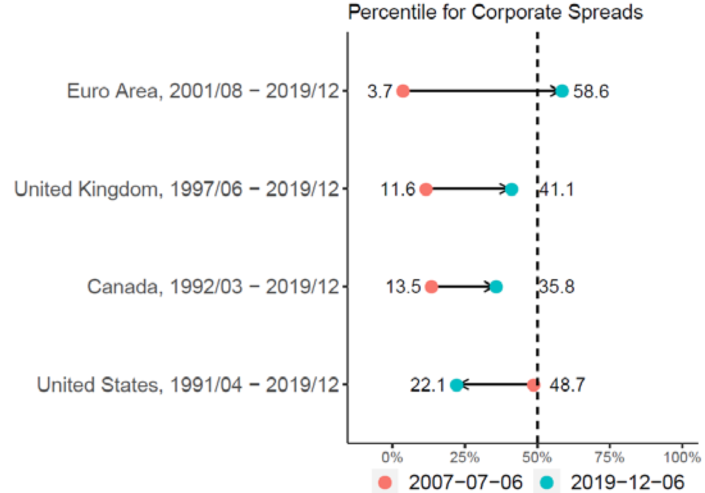
BBB Corporate Spreads
Weekly
Basis points



Percentile for Price Earnings Ratios
(1987/12 – 2019/11)



Percentile for Corporate Spreads

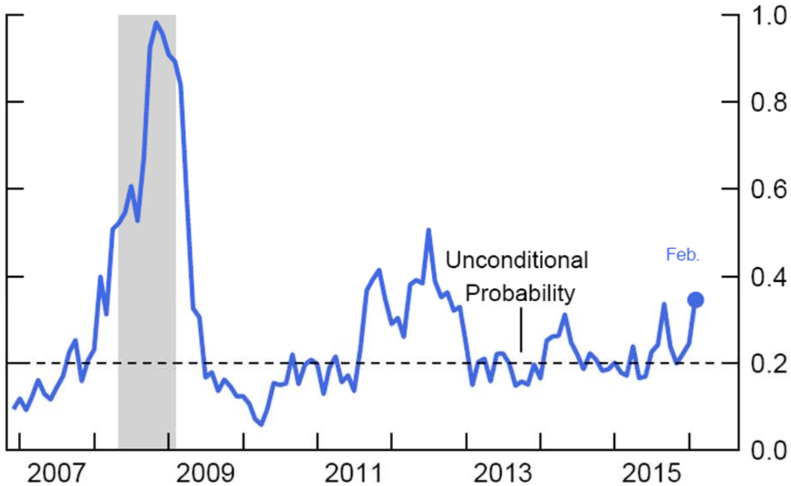


Recession Probabilities as They Looked in Past

- At time of previous foreign slowdowns, recession probability models were approaching 40 percent.

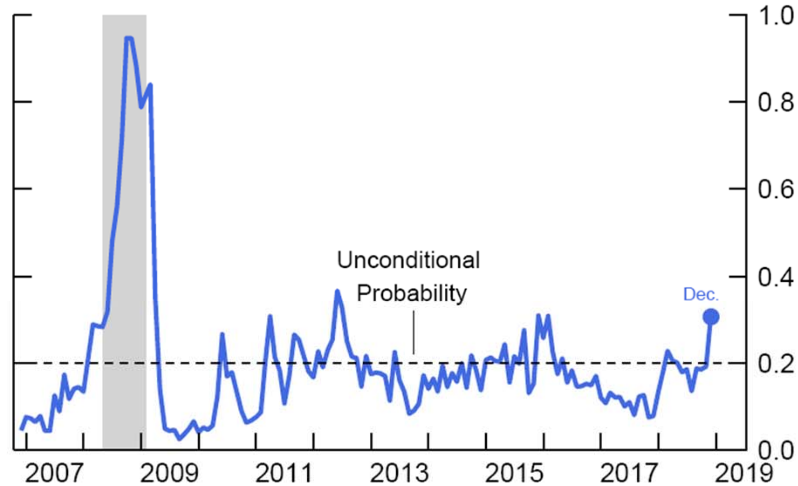
Estimated Probability of Recession in the Foreign Economy within 12 Months

March 2016 Tealbook



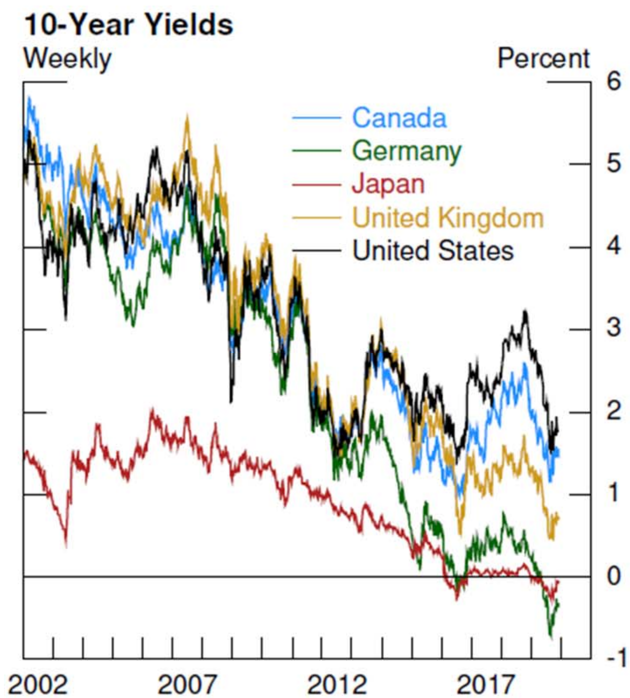
Estimates are based on a monthly probit model that includes a real time index of macro indicators (industrial production, retail sales, new export orders, and GDP) and an index of financial stress (FSI). Shading indicates that countries representing 55% of foreign GDP are classified as in recession. Source: Staff calculations.

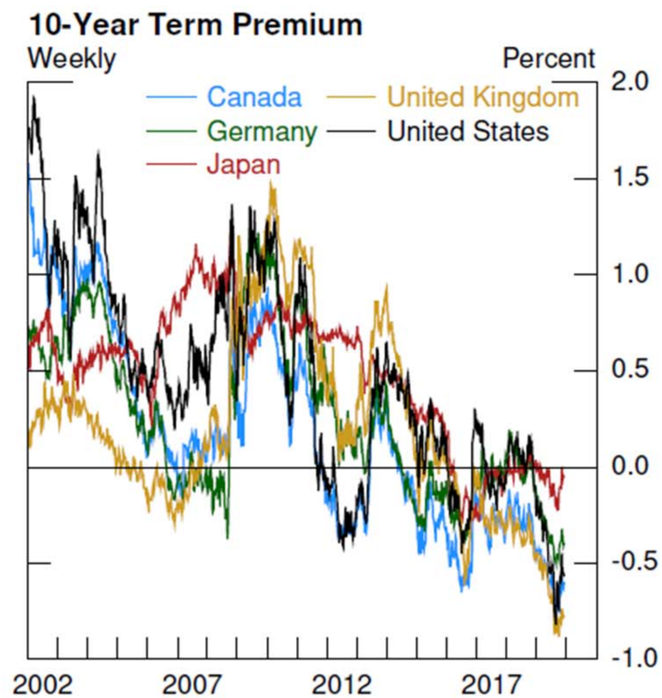
December 2018 Tealbook



Estimates are based on a monthly probit model that includes a real time index of macro indicators (industrial production, retail sales, new export orders, and GDP) and an index of financial stress (FSI). Shading indicates that countries representing 55% of foreign GDP are classified as in recession. Source: Staff calculations.

Yields and Term Premiums





Appendix 5: Materials used by Mr. Lewis

Class I FOMC - Restricted Controlled (FR)

Material for Briefing on

Summary of Economic Projections

Kurt Lewis

Exhibits and support by Erik Larsson and Max Gross

December 10, 2019

Exhibit 1. Economic projections for 2019-22 and over the longer run (percent)

Change in real GDP

	2019	2020	2021	2022	Longer run
Median	2.2	2.0	1.9	1.8	1.9
September projection	2.2	2.0	1.9	1.8	1.9
Range	2.1–2.3	1.8–2.3	1.7–2.2	1.5–2.2	1.7–2.2
September projection	2.1–2.4	1.7–2.3	1.7–2.1	1.6–2.1	1.7–2.1
Memo: Tealbook	2.2	2.2	1.9	1.7	1.7
September projection	2.1	2.0	1.8	1.7	1.7

Unemployment rate

	2019	2020	2021	2022	Longer run
Median	3.6	3.5	3.6	3.7	4.1
September projection	3.7	3.7	3.8	3.9	4.2
Range	3.5–3.6	3.3–3.8	3.3–4.0	3.3–4.1	3.5–4.5
September projection	3.5–3.8	3.3–4.0	3.3–4.1	3.3–4.2	3.6–4.5
Memo: Tealbook	3.5	3.4	3.4	3.4	4.4
September projection	3.7	3.6	3.6	3.6	4.4

PCE inflation

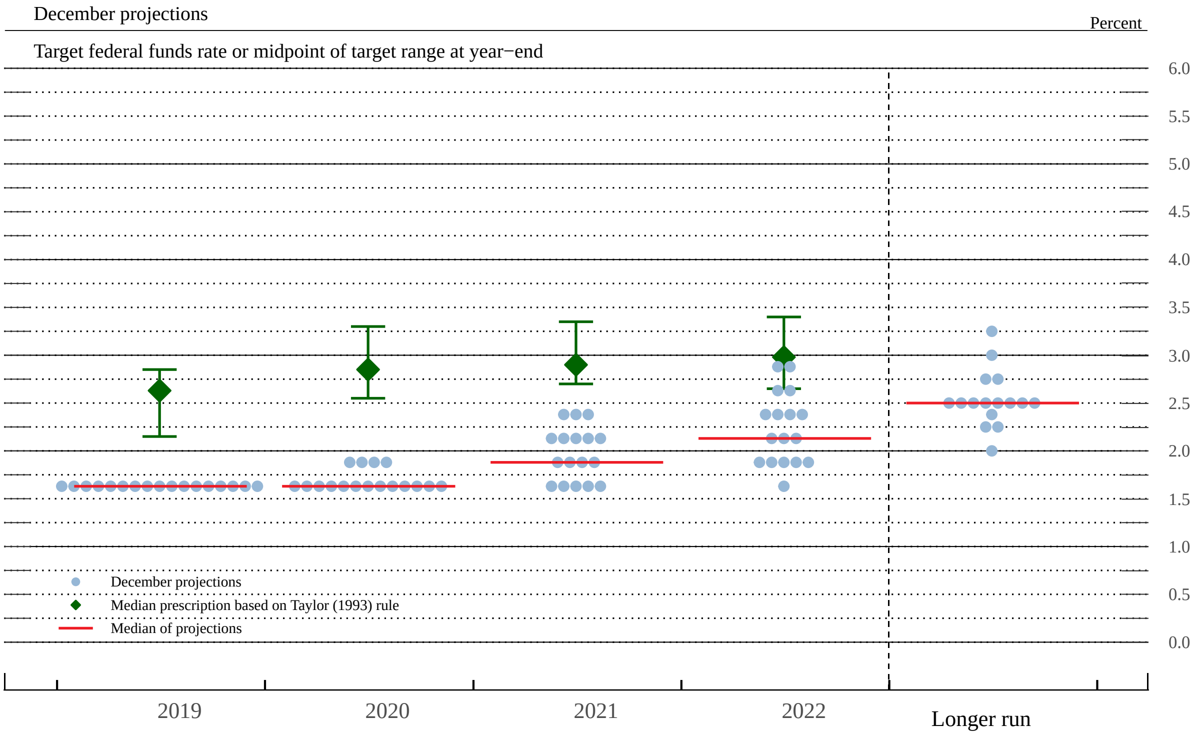
	2019	2020	2021	2022	Longer run
Median	1.5	1.9	2.0	2.0	2.0
September projection	1.5	1.9	2.0	2.0	2.0
Range	1.4–1.7	1.7–2.1	1.8–2.3	1.8–2.2	2.0
September projection	1.4–1.7	1.7–2.1	1.8–2.3	1.8–2.2	2.0
Memo: Tealbook	1.4	1.7	1.9	1.9	2.0
September projection	1.5	1.8	1.8	1.8	2.0

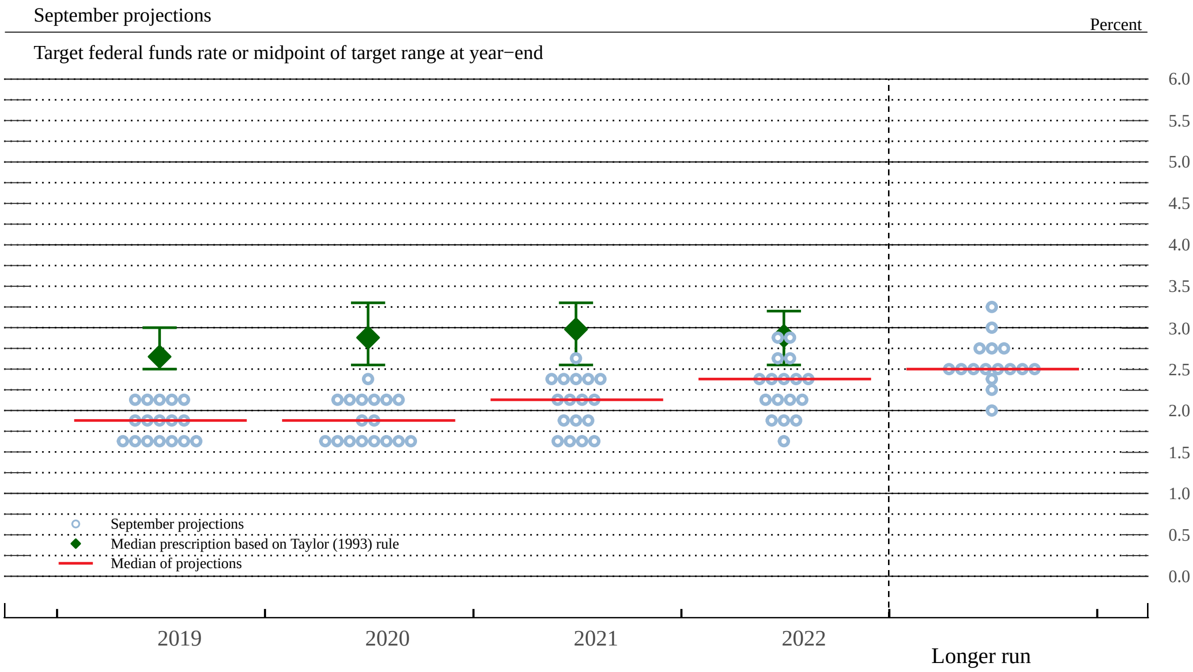
Core PCE inflation

	2019	2020	2021	2022
Median	1.6	1.9	2.0	2.0
September projection	1.8	1.9	2.0	2.0
Range	1.6–1.8	1.7–2.1	1.8–2.3	1.8–2.2
September projection	1.6–1.8	1.7–2.1	1.8–2.3	1.8–2.2
Memo: Tealbook	1.6	1.9	1.9	1.9
September projection	1.8	1.8	1.8	1.8

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 17-18, 2019, meeting, and one participant did not submit such projections in conjunction with the December 10-11, 2019, meeting.

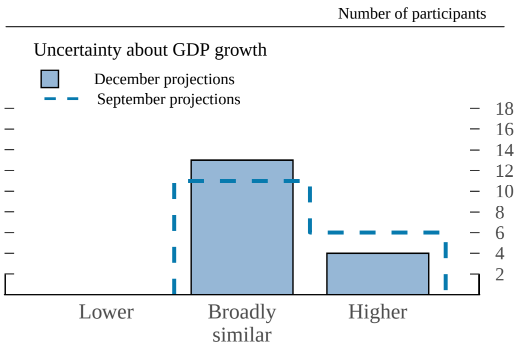
Exhibit 2. Overview of FOMC participants' assessments of appropriate monetary policy

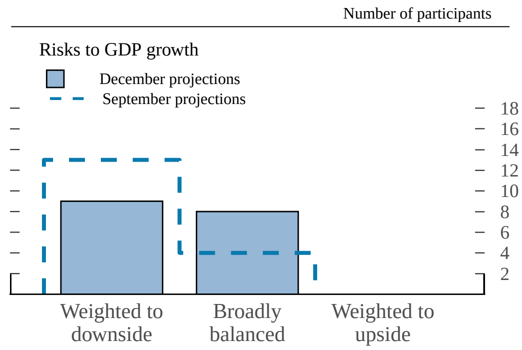


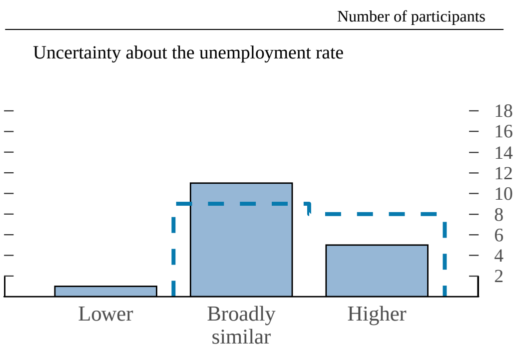


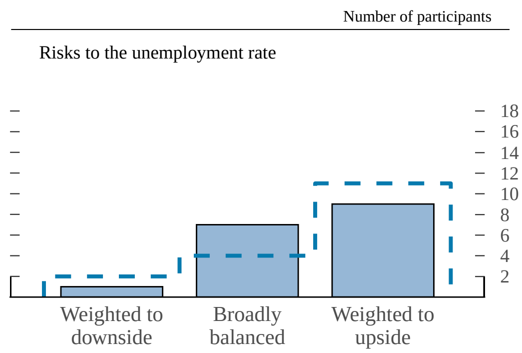
Note: In these two panels, each blue dot indicates the value (rounded to 1/8 percentage point) of an individual participant's judgment of the midpoint of the appropriate target range for the federal funds rate, or the appropriate target level for that rate, at the end of the specified year or over the longer run. Each green 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 Taylor (1993) 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 whiskers show the central tendency, for each year, of the prescriptions that result from using the Taylor (1993) rule. One participant did not submit longer-run projections for the federal funds rate or unemployment rate.

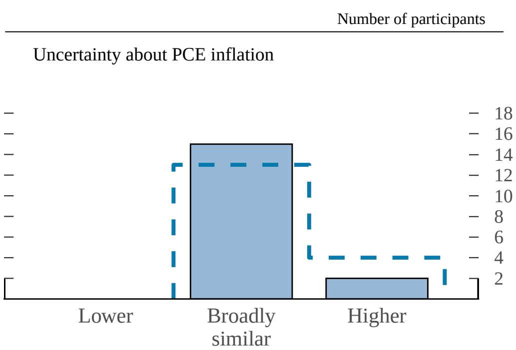
Exhibit 3. Uncertainty and risks in economic projections

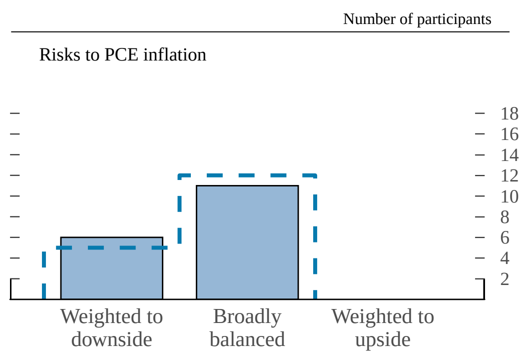


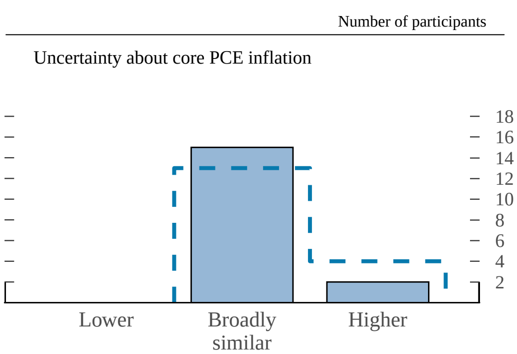


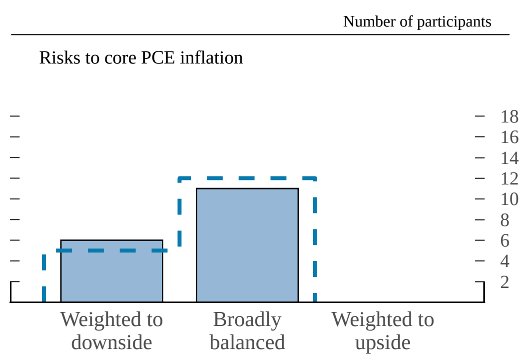












Appendix 6: Materials used by Mr. Laubach

Class I FOMC – Restricted Controlled (FR)

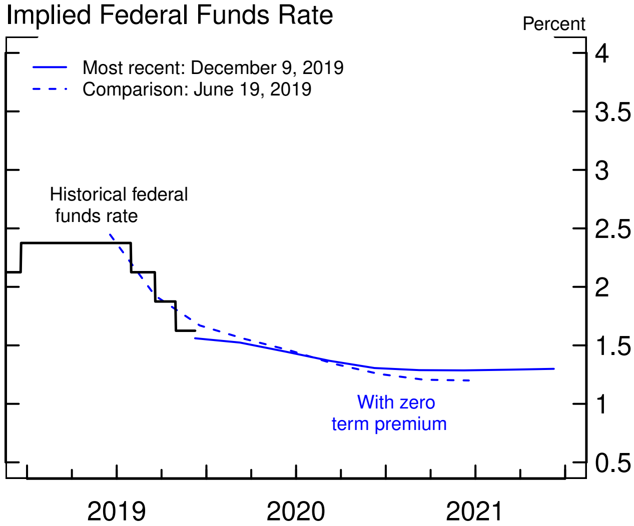
Material for the Briefing on

Monetary Policy Alternatives

Thomas Laubach
Exhibits by Stephen Azzolino
December 10-11, 2019

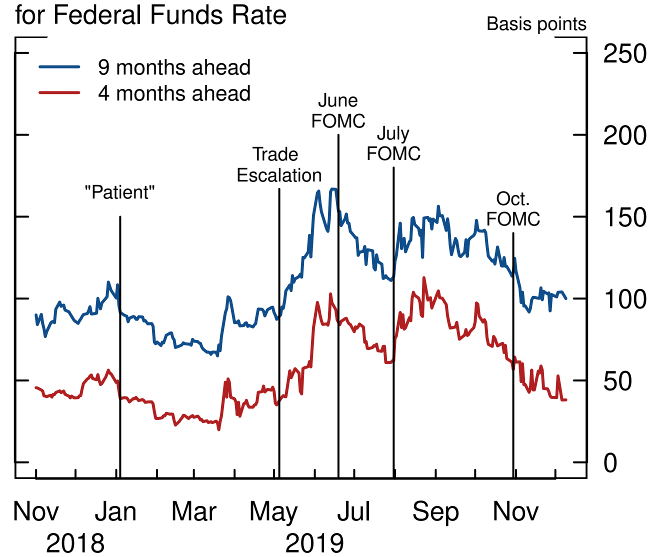
Monetary Policy Considerations

Implied Federal Funds Rate



Note: Zero term premium path is estimated using OIS quotes with a spline approach, and a term premium of zero basis points.
Source: Bloomberg, Board staff calculations.

Width of 90% Confidence Interval for Federal Funds Rate

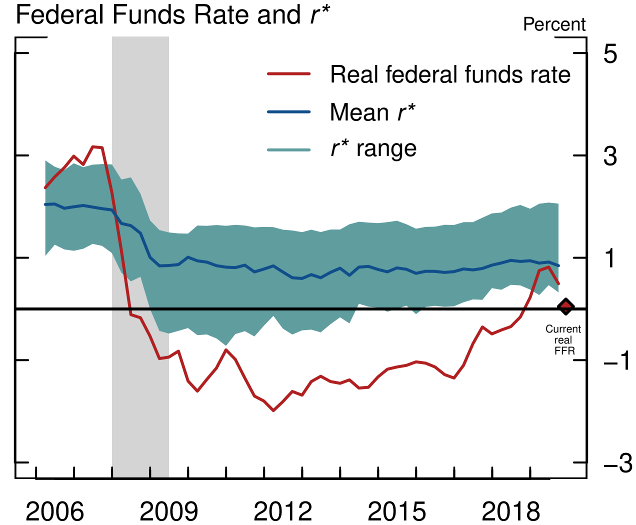


Source: CME Group and Board staff calculations.

Scenarios Expected to Call for a Rate Change

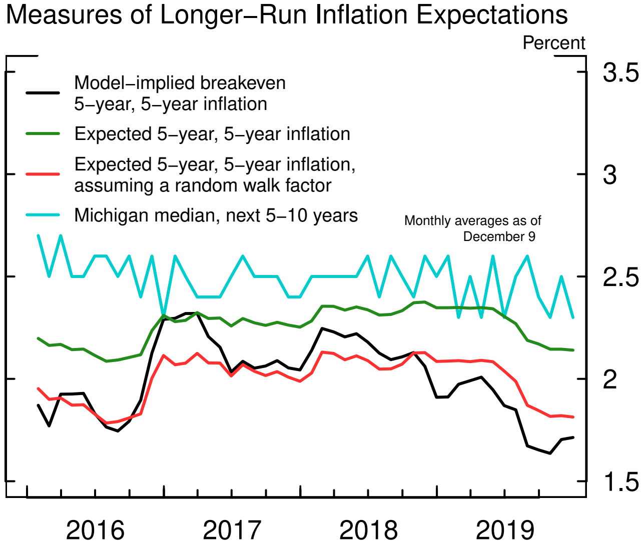
- Desk surveys asked for scenarios leading to rate change by the end of 2020.
- Scenarios likely to lead to easing:
  - Tepid or slowing growth.
  - Low inflation.
  - Slower hiring.
  - Trade−related developments.
- Scenarios likely to lead to tightening:
  - Favorable trade developments.
  - Inflation moving above 2 percent objective.

Federal Funds Rate and *r**



Note: The real federal funds rate is the quarterly average of the federal funds rate less 4−quarter core PCE inflation. Various papers on *r** referenced in the November 2019 Tealbook's Monetary Policy Strategies. Gray shading uses the NBER's dating of the recession.

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.

Policy Alternatives

- Alternative B
  - Current policy stance is appropriate to support a favorable economic outlook.
  - Need to monitor global developments and muted inflation pressures.
- Alternative A highlights inflation remaining below 2 percent as a risk.
- Alternative C presents contingency language for a scenario in which a rate hike is likely imminent.

OCTOBER 2019 FOMC STATEMENT

1. Information received since the Federal Open Market Committee met in September 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. In light of the implications of global developments for the economic outlook as well as muted inflation pressures, the Committee decided to lower the target range for the federal funds rate to 1-1/2 to 1-3/4 percent. This action supports the Committee's view that sustained expansion of economic activity, strong labor market conditions, and inflation near the Committee's symmetric 2 percent objective are the most likely outcomes, but uncertainties about this outlook remain. The Committee will continue to monitor the implications of incoming information for the economic outlook 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 DECEMBER 2019

1. Information received since the Federal Open Market Committee met in ~~September~~ **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~~ **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. In ~~light of the implications of global developments for the economic outlook as well as muted inflation pressures~~ **support of these goals**, the Committee decided to ~~lower~~ **maintain** the target range for the federal funds rate ~~to~~ **at** 1-1/2 to 1-3/4 percent. ~~This action supports~~ The Committee~~'s~~ **continues to** view ~~that~~ sustained expansion of economic activity, strong labor market conditions, and inflation near the Committee's symmetric 2 percent objective ~~are~~ **as** the most likely outcomes~~, but~~**. However,** uncertainties about this outlook remain**, including whether inflation will remain below 2 percent longer than expected**. The Committee will continue to monitor the implications of incoming information for the economic outlook 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 December 2019

1. Information received since the Federal Open Market Committee met in ~~September~~ **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. ~~In light of the implications of global developments for the economic outlook as well as muted inflation pressures,~~ The Committee decided to ~~lower~~ **maintain** the target range for the federal funds rate ~~to~~ **at** 1-1/2 to 1-3/4 percent. ~~This action supports~~ The Committee~~'s view~~ **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 ~~are the most likely outcomes, but uncertainties about this outlook remain~~. 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 DECEMBER 2019

1. Information received since the Federal Open Market Committee met in…

2. Consistent with its statutory mandate, the Committee seeks to foster maximum employment and price stability. In ~~light of the implications of global developments for the economic outlook as well as muted inflation pressures~~ **support of these goals**, the Committee decided to ~~lower~~ **maintain** the target range for the federal funds rate ~~to~~ **at** 1-1/2 to 1-3/4 percent. ~~This action supports~~ The Committee~~'s view~~ **judges** that **some reduction in the degree of monetary accommodation may soon become appropriate to** sustain~~ed~~ **the** expansion of economic activity, strong labor market conditions, and inflation near the Committee's symmetric 2 percent objective ~~are the most likely outcomes, but uncertainties about this outlook remain~~. The Committee will continue to monitor the implications of incoming information for the economic outlook 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 December 2019, All Alternatives

Release Date: December 11, 2019

Decisions Regarding Monetary Policy Implementation

The Federal Reserve has made the following decisions to implement the monetary policy stance announced by the Federal Open Market Committee in its statement on ~~October 30, 2019~~ **December 11, 2019**:

- The Board of Governors of the Federal Reserve System voted **[** unanimously **]** to ~~lower~~ **maintain** the interest rate paid on required and excess reserve balances ~~to~~ **at** 1.55 percent, effective ~~October 31, 2019~~ **December 12, 2019**.
- As part of its policy decision, the Federal Open Market Committee voted to authorize and direct the Open Market Desk at the Federal Reserve Bank of New York, until instructed otherwise, to execute transactions in the System Open Market Account in accordance with the following domestic policy directive:

  "Effective ~~October 31, 2019~~ **December 12, 2019**, the Federal Open Market Committee directs the Desk to undertake open market operations as necessary to maintain the federal funds rate in a target range of 1-1/2 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 ~~purchase~~ **continue purchasing** Treasury bills at least into the second quarter of ~~next year~~ **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 ~~conduct~~ **continue conducting** term and overnight repurchase agreement operations at least through January ~~of next year~~ **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 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 ~~a 1/4 percentage point decrease in~~ **the establishment of** the primary credit rate ~~to~~ **at the existing level of** 2.25 percent~~, effective October 31, 2019~~. ~~In taking this action, the Board approved requests to establish that rate submitted by the Boards of Directors of the Federal Reserve Banks of Minneapolis and San Francisco.~~

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

> Leave the interest rates paid on required and excess reserve balances unchanged at 1.55 percent.

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 December 6, 2019, memo to the Board.

Appendix 7: Materials used by Ms. Tevlin

Class II FOMC – Restricted (FR)

Material for

Consumer Price Index Update

Stacey Tevlin

December 11, 2019

Recent Changes in Consumer Price Indexes
(Percent changes)

	Monthly change			Nov./Nov. change	
	Sept.	Oct.	Nov.	2018	2019
Total CPI	**0.0**	**0.4**	**0.3**	**2.2**	**2.1**
November TB			*0.2*		*2.0*
Food	0.1	0.2	0.1		
November TB			*0.2*		
Energy	−1.4	2.7	0.8		
November TB			*0.2*		
Core CPI	**0.1**	**0.2**	**0.2**	**2.2**	**2.3**
November TB			*0.2*		*2.3*

Note: November 2019 CPI data released at 8:30 a.m. on December 11, 2019.