Appendix 1: Materials used by Mr. Davig, Ms. Ihrig, Mr. Martin, Mr. López-Salido, Ms. Leonard, and Mr. Laubach

Class III FOMC – Internal (FR)

Material for Briefing on

Long-Run Monetary Policy Implementation Framework

Troy Davig, Jane Ihrig, Thomas Laubach, Deborah Leonard, David Lopez-Salido, and Antoine Martin

November 1, 2016

INTRODUCTION

Framework objectives

Staff will evaluate options for a long-run monetary policy implementation framework that will best achieve a number of key goals:

1. Achieving an appropriate degree of control over short-term interest rates including during periods of financial distress and in a manner robust to structural changes in the financial system.
2. Enhancing the ability of the Federal Reserve to achieve macroeconomic and financial stability objectives at the zero bound.
3. Supporting the System's ability to address liquidity strains in money markets and support overall financial stability.

Framework objectives

In addition, alternative long-run operating frameworks will be evaluated on their ability to:

1. Reduce burdens and deadweight losses associated with reserve requirements.
2. Promote efficient, active, and resilient money markets and government securities markets.
3. Promote an efficient and resilient payment system.

Finally, criteria will be used in the evaluation following from the Committee's discussion of policy normalization principles and plans:

1. The framework should involve holding no more securities than necessary to implement monetary policy efficiently and effectively.
2. The assets held by the Federal Reserve will consist primarily of Treasury securities.

INTEREST RATE TARGETS & OPERATING REGIMES

Purpose

- Analyze interest rates that the Federal Reserve may wish to use as a **policy rate** and **operating regimes** to promote money market conditions consistent with the target policy rate

- Illustrate tradeoffs across policy implementation frameworks

Policy rates

- Serves function of communicating the stance of policy as well as supporting transmission
- Market rates
  - Unsecured: FFR and OBFR
  - Secured: GC Treasury repo rate
- Administered rates
  - Interest on reserves
  - ON RRP offering rate
- The choice of policy rate affects the selection of operating regime tools to achieve interest rate control

Case 1 - similar to current framework

Case 1 Unsecured or IOER rate / Flat portion of reserve demand curve	Case 2 Unsecured or IORR rate / Steep portion of reserve demand curve	Case 3 Repo Rate

- Floor tools are main mechanism
- Ceiling tools could be useful to contain rate volatility
- Reserve requirements and fine-tuning OMOs would be unnecessary
- What is the appropriate level of reserves?

Case 2 - similar to pre-crisis framework

Case 1 Unsecured or IOER rate / Flat portion of reserve demand curve	Case 2 Unsecured or IORR rate / Steep portion of reserve demand curve	Case 3 Repo Rate

- Key tool is reserve requirements, either mandatory or voluntary
- Discretionary OMOs would play an important role in offsetting volatile autonomous factors
- Ceiling and floor tools can limit the volatility of interest rates

Case 3 - repo framework

Case 1 Unsecured or IOER rate / Flat portion of reserve demand curve	Case 2 Unsecured or IORR rate / Steep portion of reserve demand curve	Case 3 Repo Rate

- ON RP and ON RRP facilities may be desirable
- Counterparties and parameter settings of the facilities could affect interest rate control
- Level of reserve balances may impact unsecured rate volatility
- Reserve requirements and discretionary OMOs may not be necessary

Interest rate control: normal times and zero bound

- In normal times, the FOMC can achieve interest rate control across wide range of potential policy rates through an appropriate choice of operating regime tools
  - These rates will likely effectively transmit the stance of policy to the real economy

- Interest rate control could be maintained at the effective lower bound, albeit with changes to the operating regime in some cases

Mitigate liquidity strains

- Regimes that operate on the flat portion of the reserve demand curve easily accommodate liquidity injections

- Regimes operating on the steep portion of the reserve demand curve
  - Can be maintained by using reserve sterilization tools
  - Alternatively, could transition to operating on the flat part of the demand curve

Other LRF objectives

- Burdens of reserve requirements could be reduced or eliminated
  - Reserve requirements could be set to zero in cases 1 and 3
  - VRTs could be considered in case 2
- All regimes support active money markets
- Promoting payment system efficiency is achieved in different ways across the operating regimes
  - Frameworks with high levels of reserve balances achieve this objective directly
  - Those with low level of reserves rely on existing Payment System Risk policies

A summary of considerations

	Case 1 Unsecured/Flat	Case 2 Unsecured/Steep	Case 3 Repo
1	Familiar interest rate	Familiar interest rate	Risk-free policy rate; less familiar
2	Robustness concerns with market rate	Few robustness concerns	Few robustness concerns
3	Simple to operate	Familiar but complicated	Less familiar but may work like current OR
4	Liquidity provision is not an issue	Need sterilization tools	Liquidity provision may not be an issue
5	No need to transition at ELB	Need to transition at ELB	No need to transition at ELB
6	Could set RRs to zero	Could consider VRTs	Could set RRs to zero
7	Some PE risk with large balance sheet	Least amount of PE risk	Some PE risk with large balance sheet

Ceiling & DW stigma

- The Discount Window is intended to
  - support interest rate control
  - provide liquidity to address broad-based funding pressures
  - provide liquidity to individual firms
- Stigma, perhaps most closely related to the third role, may limit discount window from performing all roles effectively
- Separate facilities for each type of liquidity provisioning may allow each tool to work more effectively
- Memo provides examples of facilities that may act as a more robust ceiling for rate control: DIRF and FIRF

Liquidity provision integration

- The degree to which liquidity backstop tools might be incorporated into the framework has implications for the design of the framework

- Options
  - Fully integrated into the operating framework
  - Available under certain pre-announced conditions
  - Inactive

Breadth of counterparties

- In normal times, a narrow set of counterparties may reduce the risk of distorting markets but could be seen as providing privileges to a few institutions
  - A broader set of counterparties for liquidity provision tools could also lead to moral hazard or political scrutiny

- In times of stress it might be advantageous to have broader reach in place in markets, both OMO and liquidity facilities, to help with interest rate control and transmission

BALANCE SHEET

Purpose

- Explore issues relevant to determining the appropriate size and composition of the balance sheet in the long-run
- What role can the balance sheet play in the long-run framework?
  - Support interest rate control
  - Support macroeconomic objectives
  - Support financial stability objectives
- How do balance sheet objectives affect SOMA portfolio design?
- What fiscal and political economy issues should be considered?

Support interest rate control

- Can be achieved with either a “small” or “large” balance sheet

- Operating regime choices may determine size of balance sheet
  - Driven in particular by level of reserve balances in operating regime

- Decisions to use the balance sheet as an active policy tool to support macroeconomic or financial stability objectives may have implications for the operating regime

Support macroeconomic objectives

- Macroeconomic benefits clear at the ELB, and likely also exist away from ELB
- Uncertainty about managing multiple tools and substitutability among them
- When should the balance sheet be used as an active tool?
  - Only at the ELB?
    - A low-duration balance sheet outside of ELB episodes may provide more room to conduct LSAPs as needed
  - Also away from the ELB?
    - A "new normal" may imply a greater role for balance sheet tools
    - A high-duration balance sheet may provide more room to lower short-term rates and alleviate risk of reaching the ELB
- Macro effectiveness depends on public's understanding of the use of balance sheet tools and the short-term interest rate

Support financial stability objectives

- Use in periods of market stress to improve liquidity and market functioning
- Use preemptively to reduce financial sector vulnerabilities
  - Provide safe, money-like assets to crowd out excessive private creation of runnable assets
  - Influence yield curve to reduce private sector maturity transformation
- Use to expand availability of HQLA and risk-bearing capacity for financial institutions
- Use to mitigate boom/bust cycles in housing sector

Implications of balance sheet role for portfolio design

Use balance sheet actively only at ELB or in a crisis

- In steady state, hold lean balance sheet with low duration
- At ELB or in a crisis, expand size, lengthen maturity, or change asset composition
- Revert to prior structure when conditions warrant
- However, starting point depends on economic variables (not a choice)
  - Risk of ever-growing balance sheet if normalization doesn't conclude between ELB visits

Use balance sheet actively in non-ELB/normal times

- In steady state, hold relatively large balance sheet
- Portfolio composition varies by desired objectives
- In some cases, steady-state portfolio structure meets desired objective
- In other cases, steady-state portfolio structure positions it to be used if needed
  - Requires shifts in composition to meet desired objective

Potential principles guiding portfolio design

- Central bank has some leeway in determining asset composition
  - Federal Reserve Act allows only a limited universe of safe assets
- Pre-crisis principles might hold different weights under some long-run balance sheet objectives
  - **Safety** (managing financial risk)
  - **Market neutrality** (avoiding price distortions and credit allocation)
  - **Liquidity** (providing balance sheet elasticity)
- **Operational readiness** might be considered a new principle
- **Return** and **transparency** might also be considerations

Fiscal and political economy considerations

- Monetary policy has broad fiscal implications regardless of size and composition of the central bank's balance sheet

- However, a large balance sheet accentuates important issues
  - Role of central bank in government debt management decisions
    - Federal Reserve and Treasury have different, at times inconsistent, goals
  - Costs of funding a permanently large balance sheet
    - Federal Reserve: Interest payments to counterparties vs. taxpayers
    - Consolidated federal government: What is cheapest source of financing?
  - Level and variability of remittances to the Treasury
  - Credibility or independence of central bank facing possible losses

DISCUSSION QUESTIONS

Three broad discussion questions

1. The memo titled "**Interest Rate Targets and Operating Regimes**" discussed three broad types of regimes—one focused on targeting an unsecured rate in a floor system with an ample supply of reserves, another focused on targeting an unsecured rate in a corridor system with a relatively scarce supply of reserves, and a third focused on targeting repo rates.

What are your views on the key design elements of these regimes, such as the choice of policy rate to be used as a focal point for setting and communicating the stance of policy (an unsecured or secured, or an administered or market rate), the choice among alternative forms of reserve requirements (required, voluntary, or none), and whether to operate on the flat or steep portion of the demand curve for reserves?

Three broad discussion questions

2. The memo also discussed possible alternative arrangements for liquidity provision that could help to mitigate stigma and create a more effective ceiling on short-term rates.

Do you have any views on changes in the discount window or on other vehicles for liquidity provision, such as the DIRF and FIRF standing facilities, discussed in the memo? What are your views about the appropriate level of readiness for the TAF as a tool to address broad-based funding pressures?

Three broad discussion questions

3. The memo titled "**Balance Sheet Considerations for the Federal Reserve's Long-run Framework**" discussed a range of issues associated with the long-run size and composition of the Federal Reserve's balance sheet.

What are your views on the appropriate future use of large-scale asset purchases to support macroeconomic objectives? Should such purchases be conducted only after rates have reached the effective lower bound (ELB), or do you see some role for purchases even when short-term rates are well above the ELB? What are your views on the use of the Federal Reserve's balance sheet to foster financial stability goals? What are your views on the appropriate long-run composition of the balance sheet?

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

Class II FOMC – Restricted (FR)

Material for the Briefing on

Financial Developments and Open Market Operations

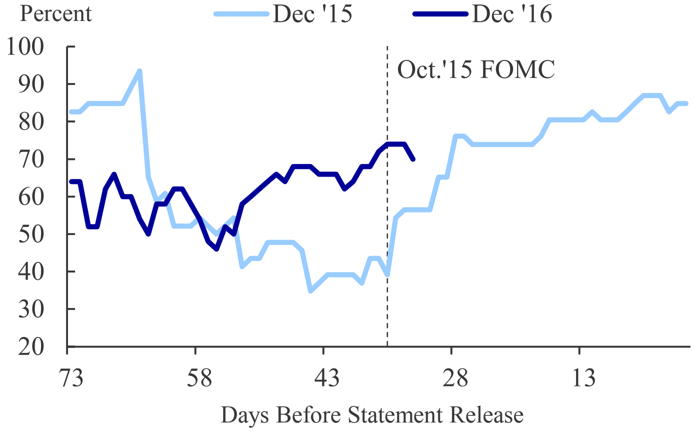
Simon Potter and Lorie Logan

November 1, 2016

Class II FOMC – Restricted (FR)

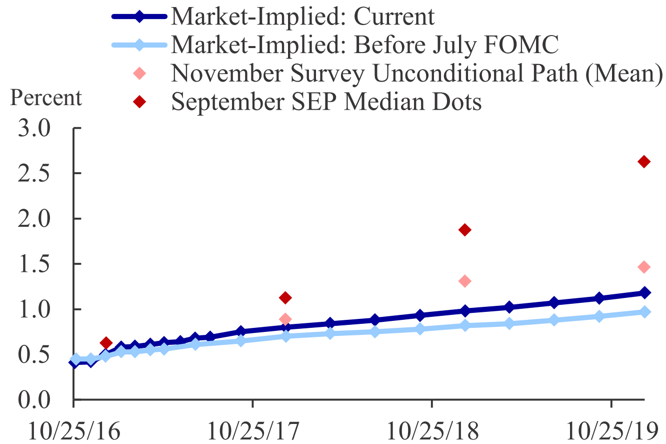
Exhibit 1

(1) Probability of a Rate Hike by December FOMC*



*Series start day of August Employment Situation release. Assumes a current effective rate of 12 bps increasing to 35 bps for the Dec. '15 meeting and a current effective rate of 40 bps increasing to 65 bps for the Dec. '16 meeting.
Source: Bloomberg, Desk Calculations

(2) Implied Federal Funds Rate Path*



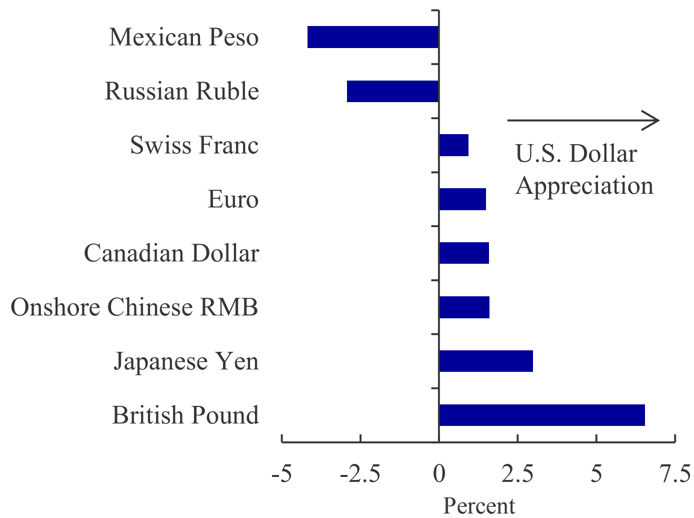
*Market-implied paths derived from federal funds and Eurodollar futures, survey path is the average PDF-implied mean from the November Survey of Primary Dealers and Market Participants.
Source: Bloomberg, Desk Calculations, Federal Reserve Board

(3) Changes in Financial Conditions Since Fed Policy Actions*

	From 10/31/14 to 12/15/15	From 12/15/15 to Current
Nominal 10-Year TSY Yield	-7 bps	-42 bps
U.S. Broad T.W. Dollar	+14.6 %	+1.2 %
S&P 500 Index	+1.3 %	+4.1 %
MSCI EM Equity Index	-23.3 %	+15.9 %
MBS OAS	-6 bps	+6 bps
High-Yield OAS	+252 bps	-200 bps

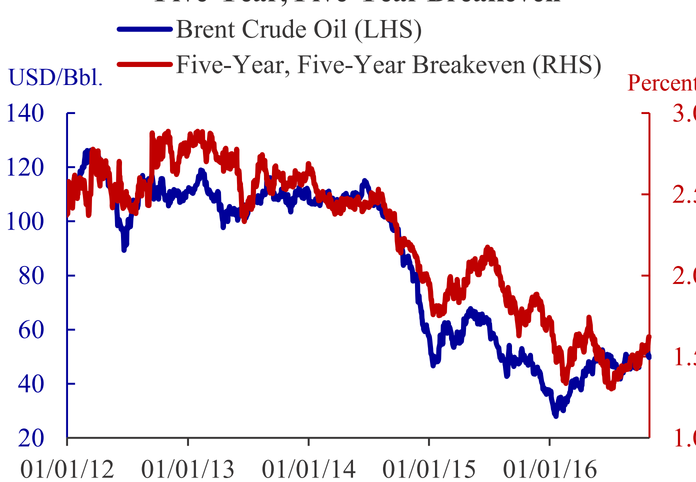
*Last month of balance sheet expansion was October 2014. Liftoff occurred on December 16, 2015.
Source: Barclays, Bloomberg, Federal Reserve Board

(4) U.S. Dollar Performance Since Sept. FOMC



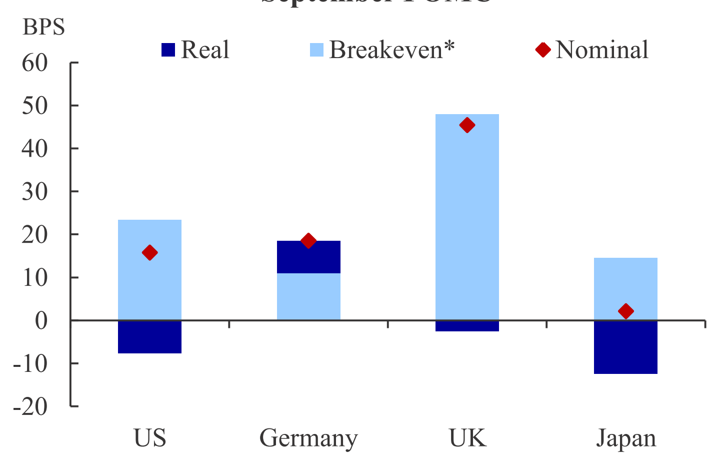
Source: Bloomberg

(5) Brent Crude Oil and Five-Year, Five-Year Breakeven



Source: Bloomberg, Federal Reserve Board

(6) Decomposed Change in 10-Year Yields Since September FOMC



*Computed as the residual of nominal less real yield.
Source: Bloomberg

Class II FOMC – Restricted (FR) Exhibit 2

(7) Central Bank Policy Action

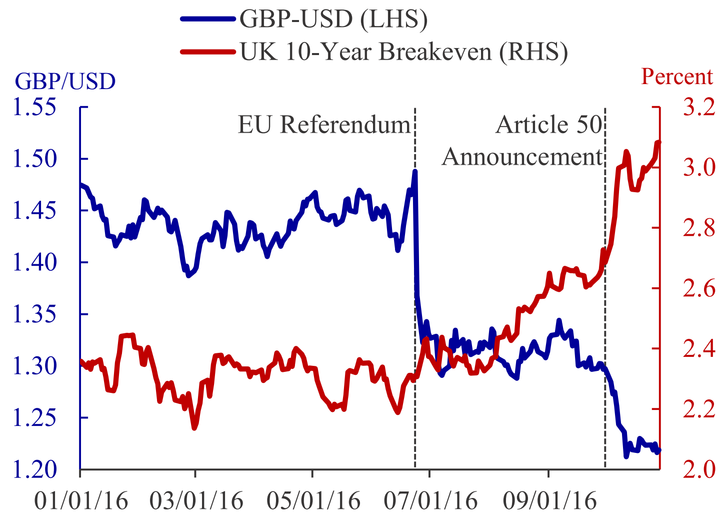
BoJ:

- Committed to overshoot its inflation target
- Introduced a nominal 10-year JGB yield target of around 0 percent
    - o Potential tension with both a price and quantity target for asset purchases
- Added a fixed-rate operation to purchase JGBs

ECB:

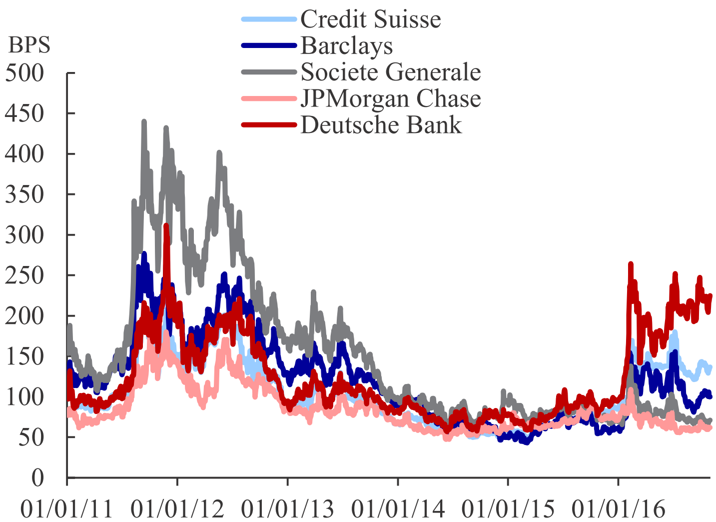
- No changes to its policy framework, but changes expected to be announced at December meeting

(8) Pound Sterling and 10-Year Inflation Breakeven



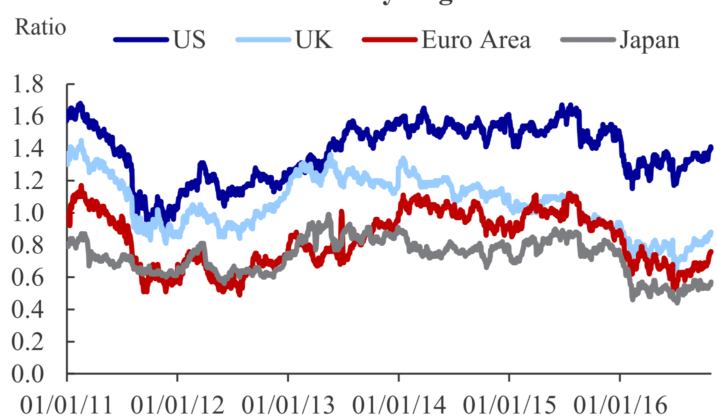
Source: Bloomberg

(9) Bank CDS



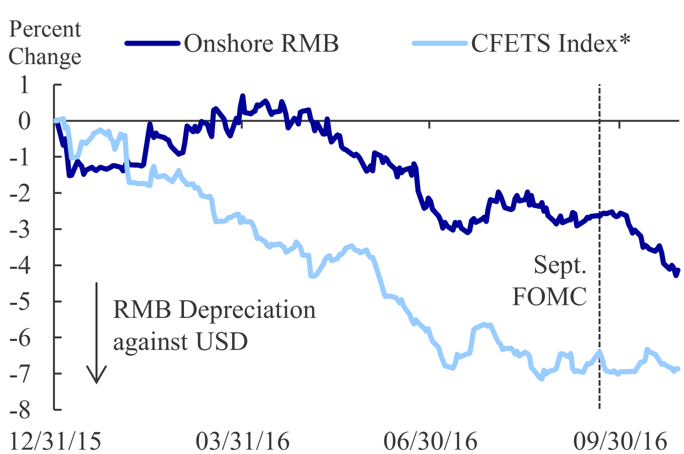
Source: Bloomberg

(10) Banking Sector Price-to-Tangible Book Ratio by Region*



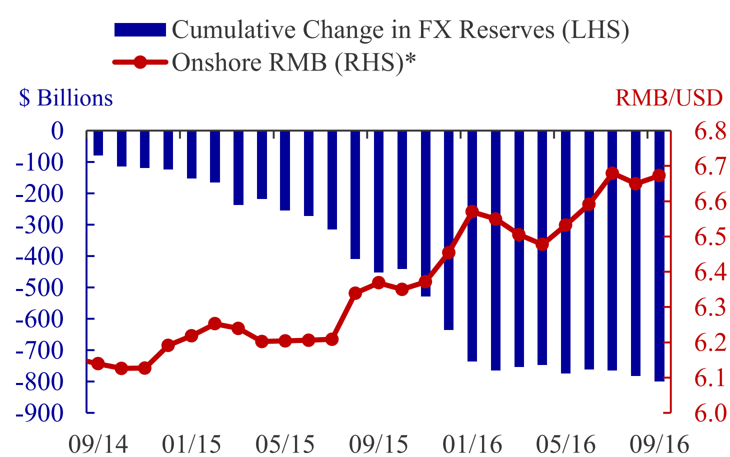
*Price-to-tangible book ratio is market cap divided by common shareholder equity less intangibles.
Source: Bloomberg

(11) Chinese Exchange Rate Since Start of Year



*Onshore RMB exchange rate against a basket of 13 currencies. Computed from central parity rates for all currencies traded on CFETS.
Source: Bloomberg, Desk Calculations

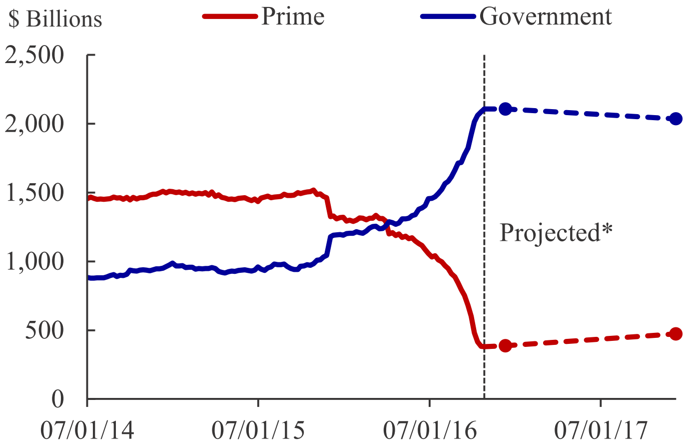
(12) Onshore RMB Level and Cumulative Change in China Foreign Exchange Reserves



*Average level over the month.
Source: Bloomberg

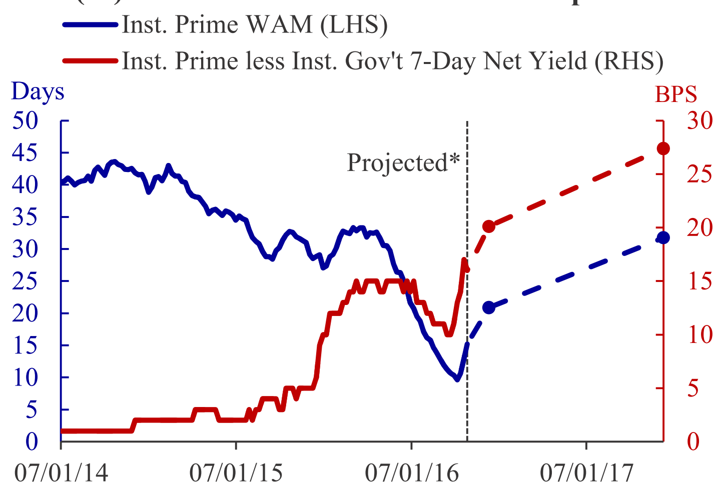
Class II FOMC – Restricted (FR) Exhibit 3

(13) MMF AUM



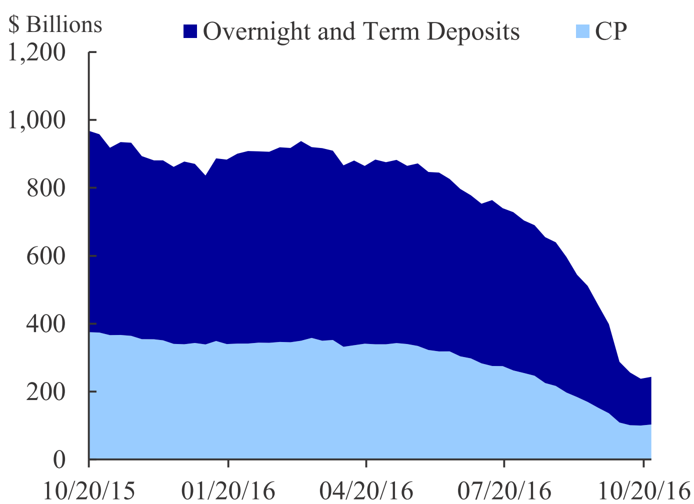
*Dashed lines show average projections from survey results.
Source: FRBNY Survey of Money Market Mutual Funds, iMoneyNet, November Surveys of Primary Dealers and Market Participants

(14) Prime Fund WAM and Net Yield Spread



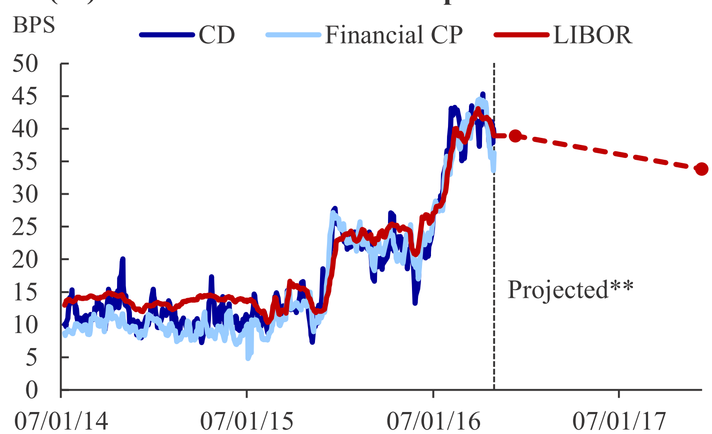
*Dashed lines show average projections from survey results.
Source: FRBNY Survey of Money Market Mutual Funds, iMoneyNet

(15) Select Prime MMF Holdings



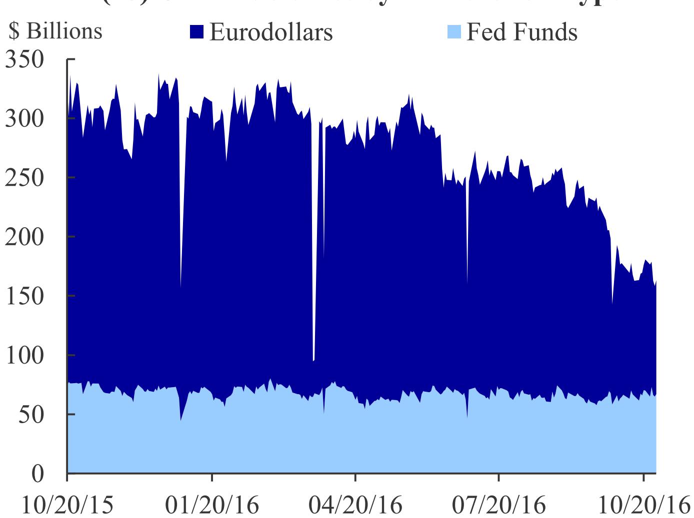
Source: iMoneyNet

(16) 3-Month Unsecured Rate Spreads to OIS*



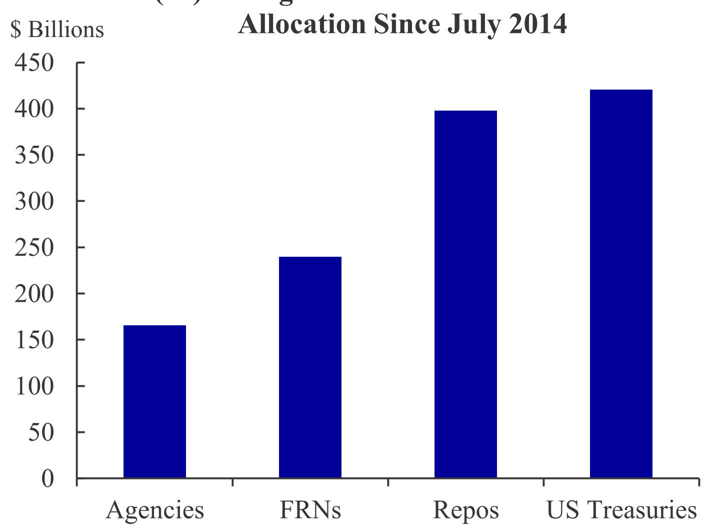
*Series reflect 5-day rolling average.
**Dashed lines show average projections from survey results.
Source: Desk Calculations, DTCC, FR2420, FRBNY Survey of Money Market Mutual Funds, November Surveys of Primary Dealers and Market Participants

(17) OBFR Volumes by Transaction Type



Source: FR2420

(18) Change in Government Fund Asset Allocation Since July 2014

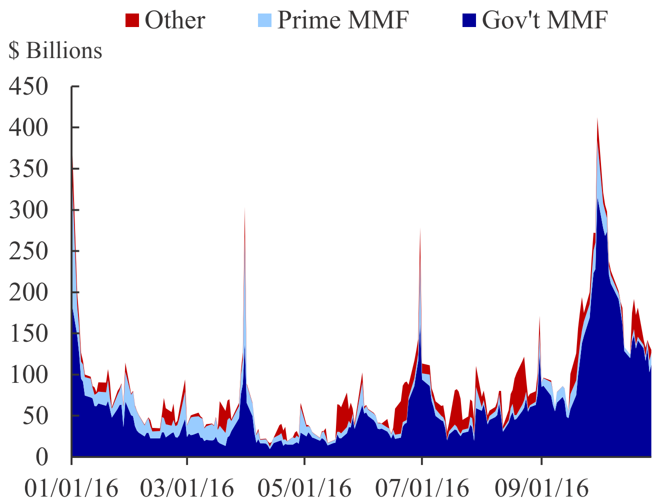


Source: iMoneyNet

Class II FOMC – Restricted (FR)

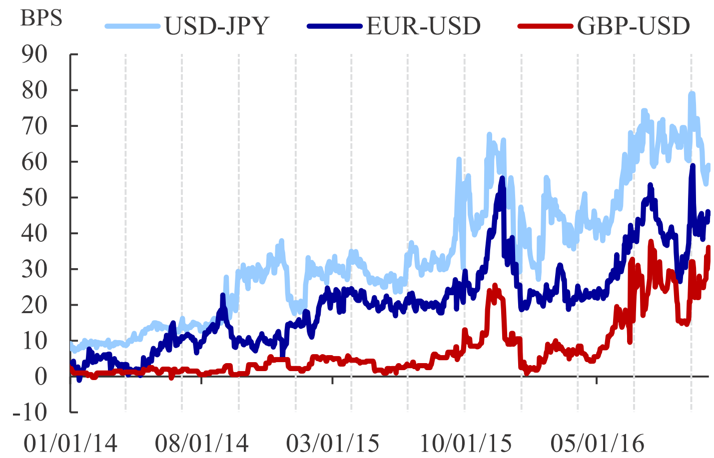
Exhibit 4

(19) ON RRP Take-Up by Counterparty Type



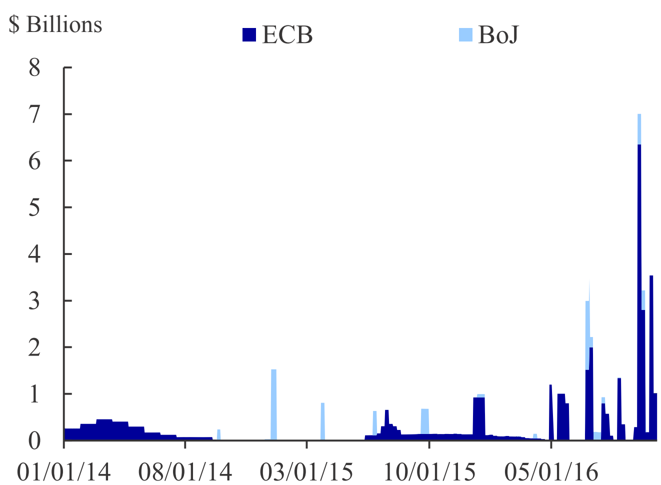
Source: FRBNY

(20) Three-Month Swap Basis*



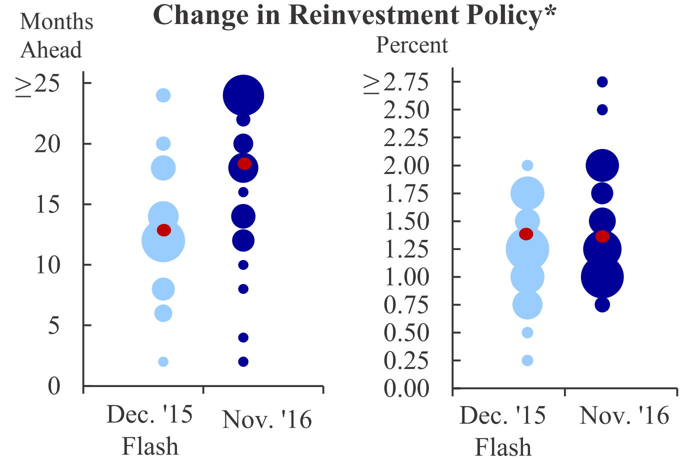
*Dashed lines indicate quarter end dates.
Source: Bloomberg

(21) Central Bank Liquidity Swaps Outstanding



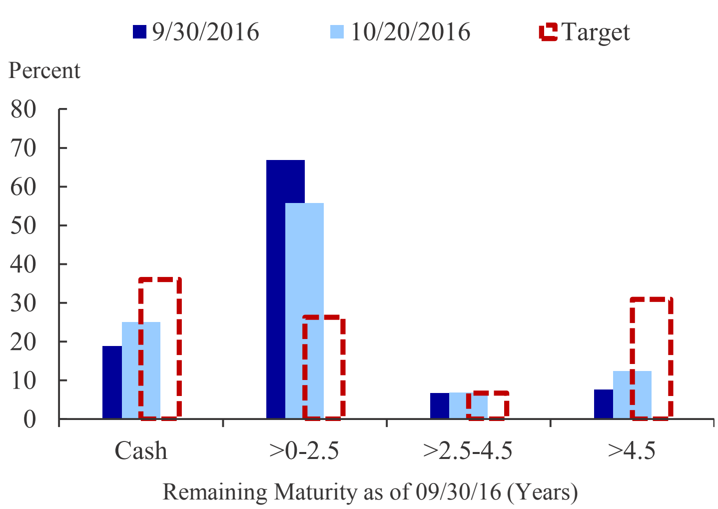
Source: FRBNY

(22) Expected Timing of and Fed Funds Rate at Change in Reinvestment Policy*



*Dots scaled by percent of respondents from the Dec. '15 Flash and Nov. '16 Surveys of Primary Dealers and Market Participants. Red dot is median. If expected time of policy change differs between Treasury and MBS, earlier is taken.
Source: FRBNY

(23) Euro Portfolio Allocations



Source: FRBNY

(24) Update on the Production of GC Repo Benchmark Rates

Main objectives:

- Improve amount and quality of information available to public
- Produce rate aligned with IOSCO principles
- Produce rate that is correlated with other money market rates, resilient to market evolution

Staff is proposing the publication of three daily secured benchmark rates:

- Tri-party transactions from BNYM
- Tri-party transactions, and GCF data from DTCC
- Tri-party transactions, GCF transactions, and Fed repo-based OMOs

Desk statement to be published this Friday (November 4)

Appendix: Summary of Operational Testing

Summary of Operational Tests in prior period:

- Domestic Authorization
    - October 5 and 6: Coupon swaps with unsettled agency MBS holdings for $20 million
- Foreign Authorization
    - October 6: Liquidity swap with BoC, BoE, ECB and SNB for USD51 thousand each; USD204 thousand total
    - October 12: Euro-denominated overnight repo for EUR1 million*
    - October 18 and 19: Liquidity swap with the Bank of Japan for JPY51 thousand
    - October 20: Liquidity swap with the Bank of England for GBP51 thousand
- TDF test operation
    - October 20: Conducted 7-day test with total take-up of $49 billion

Upcoming Operational Tests

- Tests scheduled under the Domestic Authorization
    - November 29: Outright MBS Sale (specified pool) for no more than $80 million
    - December 1: Outright MBS Sale (basket) for no more than $20 million
    - December 6: Treasury Outright Sale for no more than $400 million
    - December 7: Overnight repo for no more than $70 million

* The Desk did not include this test in the list of planned upcoming operational tests at the September FOMC meeting. However, it provided advance notice that this test would take place in Q4 of 2016 in the January memo from the Desk, titled: *Advance notice of 2016 small value exercises related to operational readiness testing dated January 21, 2016.*

Appendix 3: Materials used by Mr. Engen

Class II FOMC – Restricted (FR)

Material for Briefing on

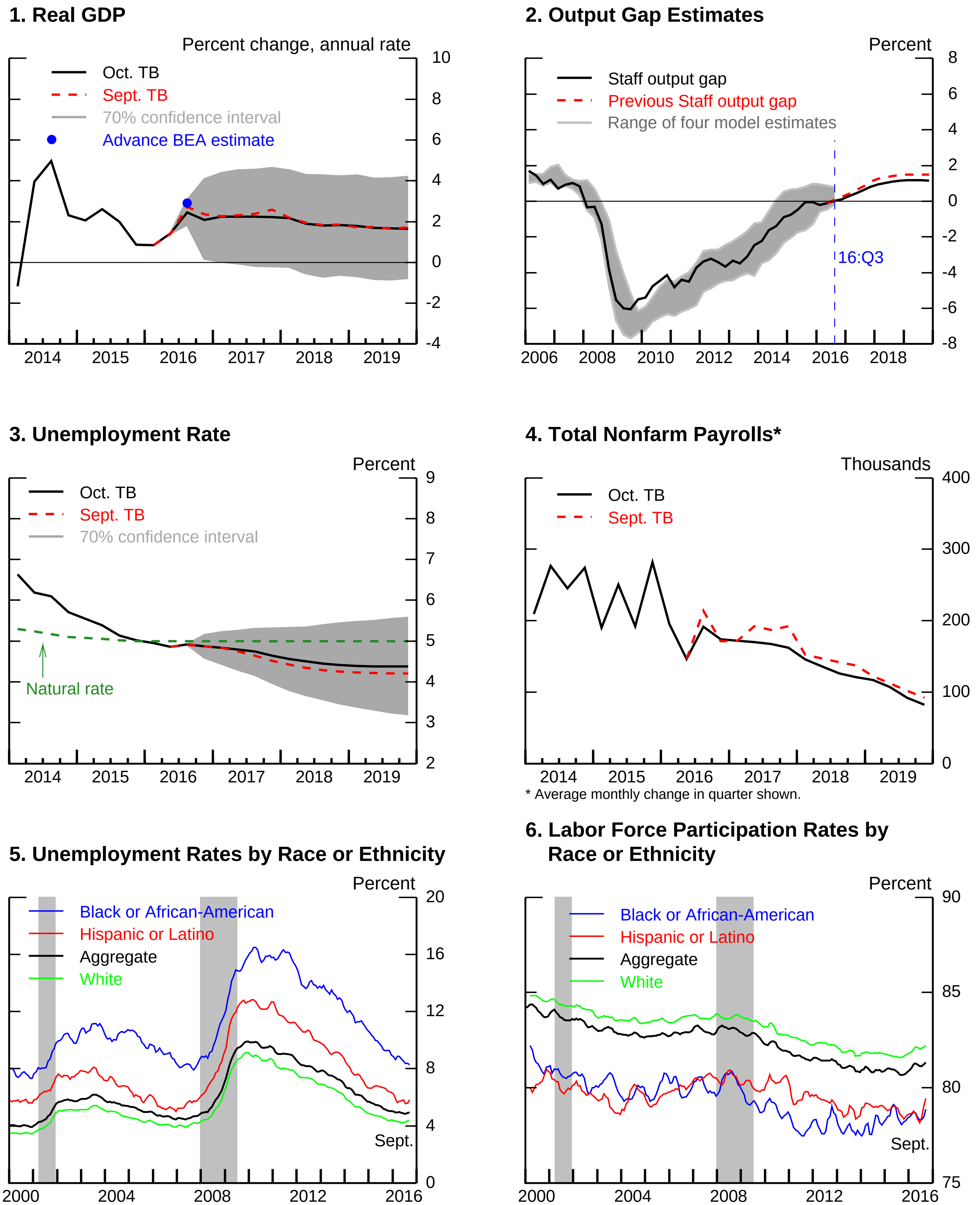
The U.S. Outlook

Eric M. Engen

November 1, 2016

Forecast Summary

Confidence Intervals for Panels 1, 3, 7, and 8 Based on FRB/US Stochastic Simulations

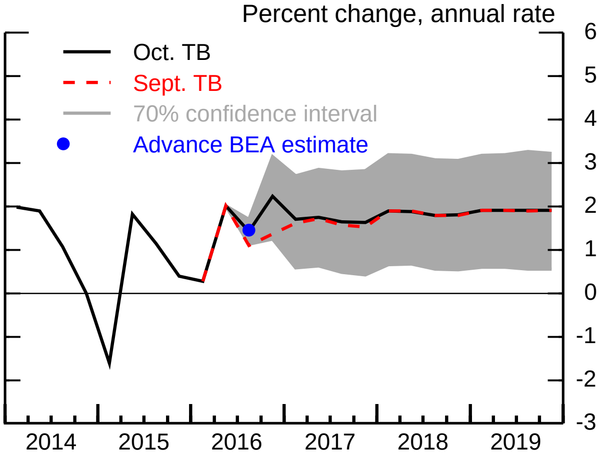


* Average monthly change in quarter shown.

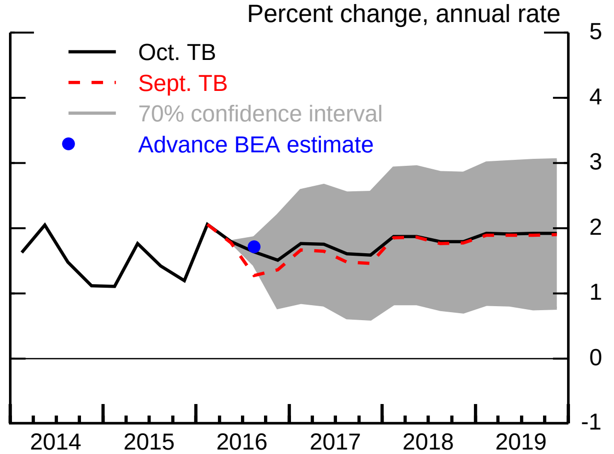
Note (Panel 5): Three-month moving averages. Shaded bars indicate a period of business recession as defined by the NBER.

Note (Panel 6): Three-month moving averages. Data cover persons between the ages of 25 and 54; data by race or ethnicity are seasonally adjusted by Board staff. Shaded bars indicate a period of business recession as defined by the NBER.

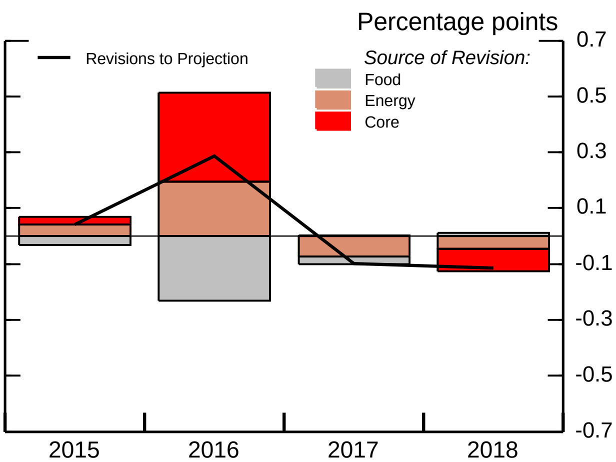
7. PCE Prices



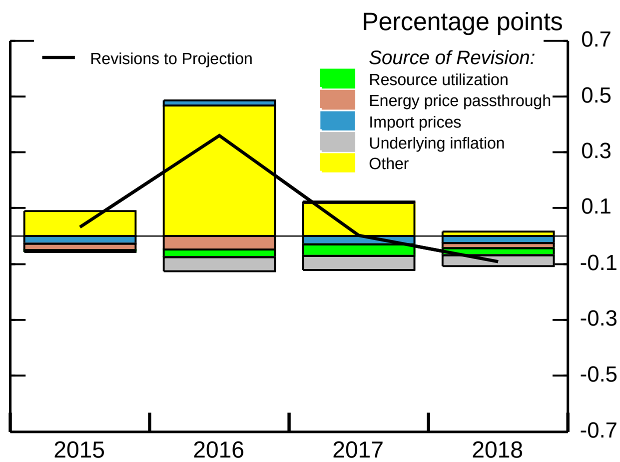
8. PCE Prices Excluding Food and Energy



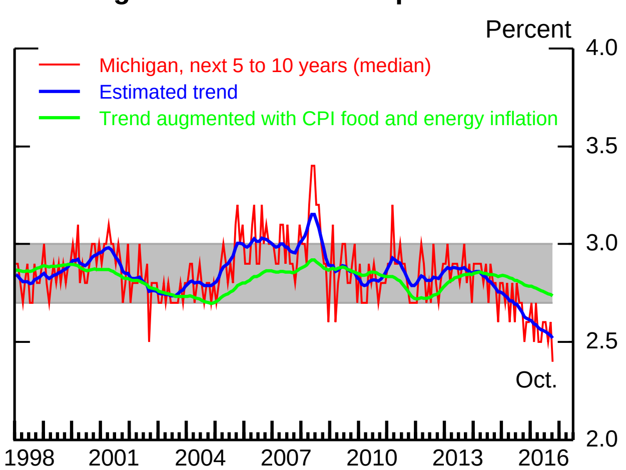
9. Inflation Revisions Since December: Total PCE



10. Inflation Revisions Since December: Core PCE

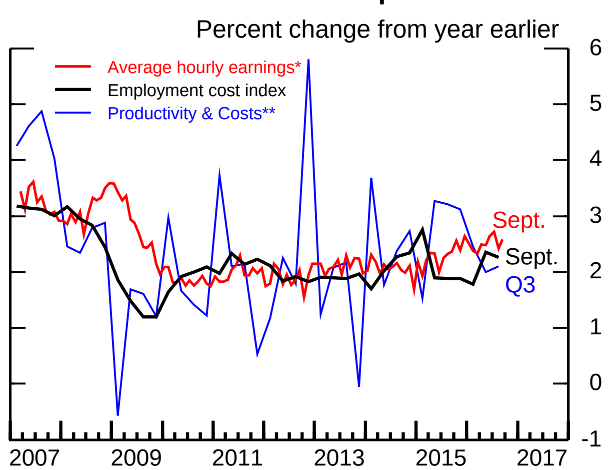


11. Longer-Term Inflation Expectations



Note: Shaded area denotes 70 percent of the observed historical range since 1998. Augmented trend uses staff forecasts for October CPIs.

12. Measures of Labor Compensation



*All employees. **2016:Q2 and Q3 based on staff translation.

Key Economic Indicators for the November, December, and January/February FOMC Meetings

(Percent change at annual rate, except as noted)

	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Total PCE price index							
3-month change	2.5	1.3	1.2	1.6	2.5	2.4	1.8
September Tealbook	*2.5*	*1.1*	*0.9*	*1.3*	*1.6*	*1.4*	*1.0*
12-month change	0.9	0.8	1.0	1.2	1.4	1.4	1.6
September Tealbook	*0.9*	*0.8*	*0.9*	*1.1*	*1.1*	*1.1*	*1.3*
Core PCE price index							
3-month change	1.8	1.6	1.6	1.8	1.7	1.4	1.4
September Tealbook	*1.8*	*1.4*	*1.2*	*1.3*	*1.4*	*1.4*	*1.3*
12-month change	1.6	1.6	1.7	1.7	1.7	1.7	1.8
September Tealbook	*1.6*	*1.6*	*1.6*	*1.6*	*1.6*	*1.6*	*1.6*
Unemployment rate (percent)	4.9	4.9	4.9	5.0	4.9	4.9	4.9
September Tealbook	*4.9*	*4.9*	*4.9*	*4.9*	*4.9*	*4.9*	*4.9*
Payroll employment (change in 000s)	271	252	167	156	164	184	174
September Tealbook	*271*	*275*	*151*	*215*	*171*	*171*	*171*
				1st Q3 est.		2nd Q3 est.	1st Q4 est.
Gross Domestic Product				2.5		2.5	2.1
September Tealbook				*2.7*		*2.7*	*2.4*

Key: Estimate first available at:

November meeting December meeting Jan./Feb. meeting

Notes: The September Tealbook projection for the September payroll employment change included an anticipated revision of 30,000 to the initially reported August figure. The January/February FOMC meeting runs from January 31, 2017 to February 1, 2017.

Appendix 4: Materials used by Mr. Kamin

Class II FOMC – Restricted (FR)

Material for Briefing on

The International Outlook

Steven B. Kamin
Exhibits by Meghan Letendre
November 1, 2016

Class II FOMC - Restricted (FR)

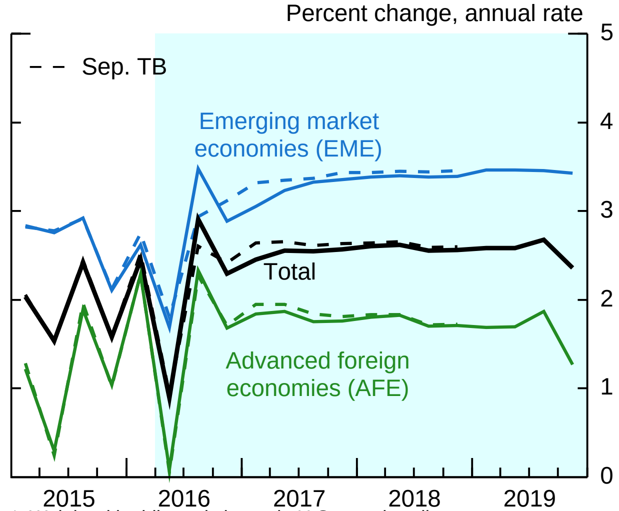
Exhibit 1

The International Outlook

1. Belgium

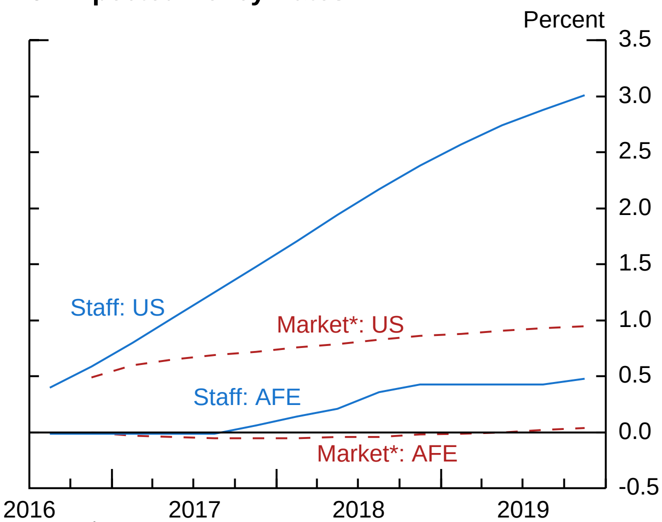
Source: Wall Street Journal

2. Foreign GDP*



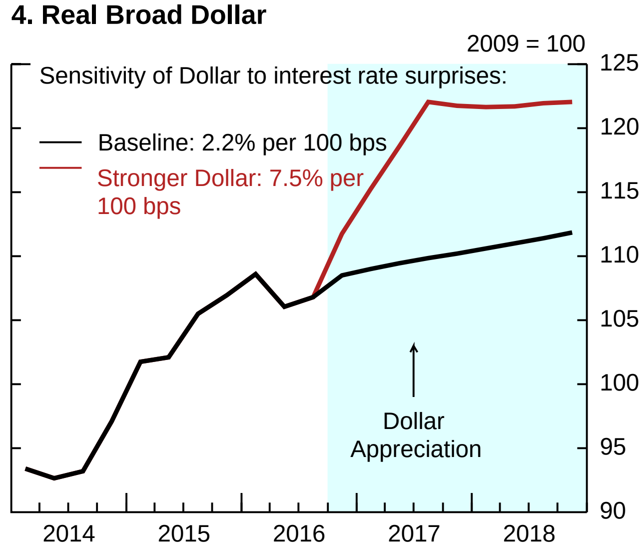
* Weighted by bilateral shares in U.S. merchandise exports.

3. Expected Policy Rates

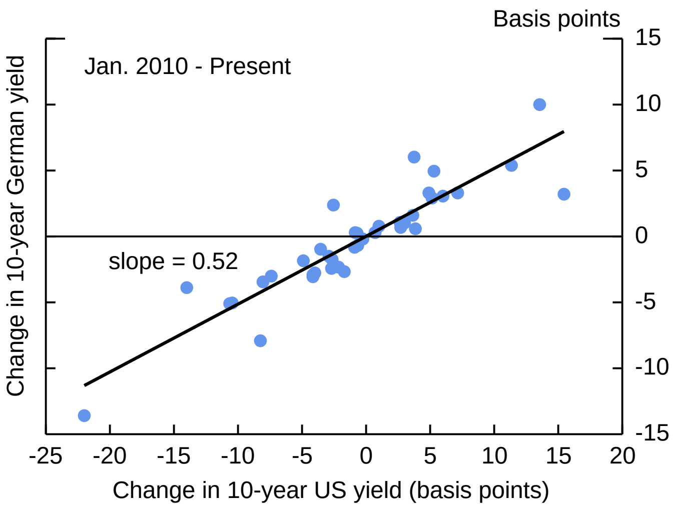


* Based on OIS swaps.

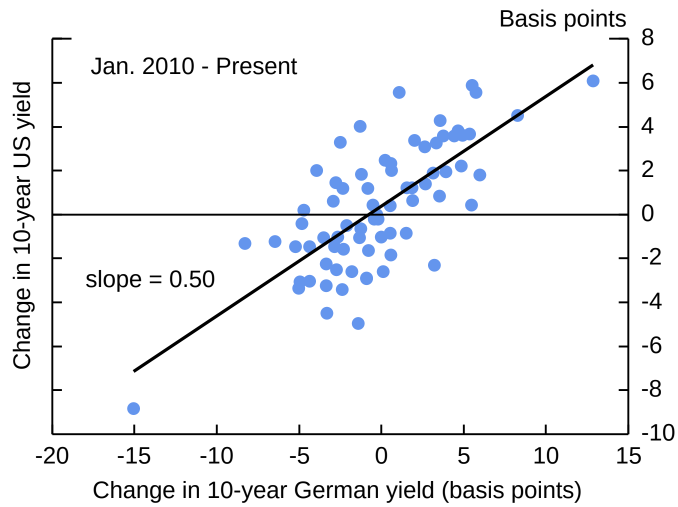
4. Real Broad Dollar



5. FOMC Announcement Dates



6. ECB Announcement Dates

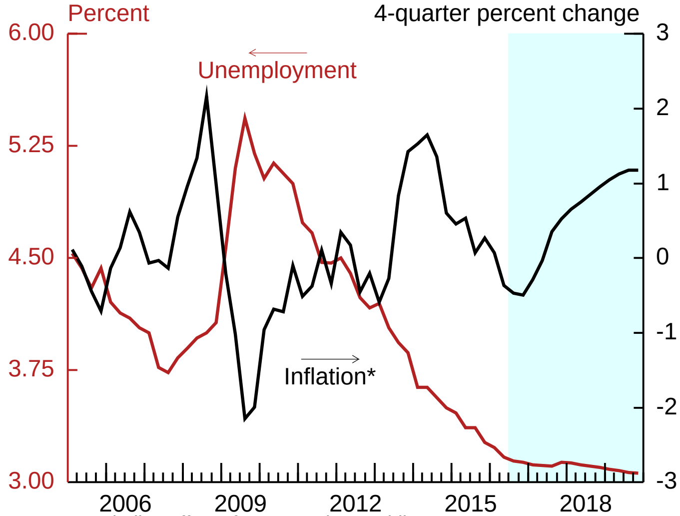


Class II FOMC - Restricted (FR)

Exhibit 2

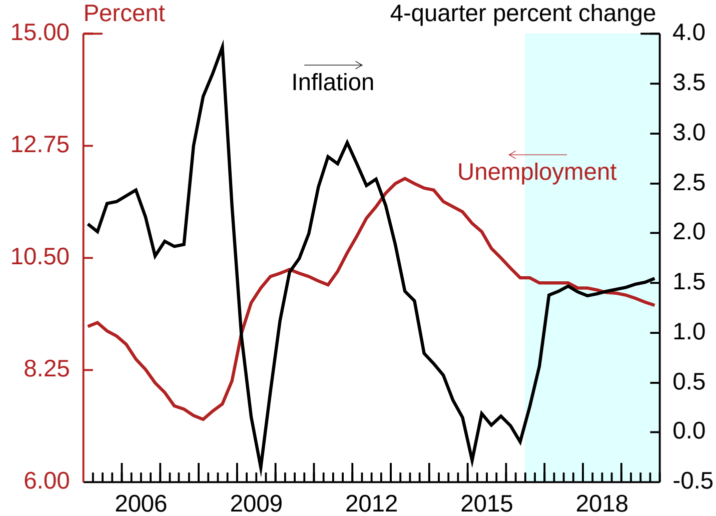
The International Outlook (2)

7. Japan



* Excluding effect of consumption tax hikes.

8. Euro Area



9. Net Interest Margins (NIMs) in Europe

- Regression equation:

$$\mathrm{NIM}_{ijt} = \alpha + \underset{(tstat\,=\,5.37)}{.377\, NIM_{ijt-1}} + \underset{(tstat\,=\,9.44)}{.065\ \text{3-Month Rate}} + \underset{(tstat\,=\,1.82)}{.023\ \text{Yield Spread}} + \mathrm{Controls}_{ijt} + \varepsilon_{ijt}$$

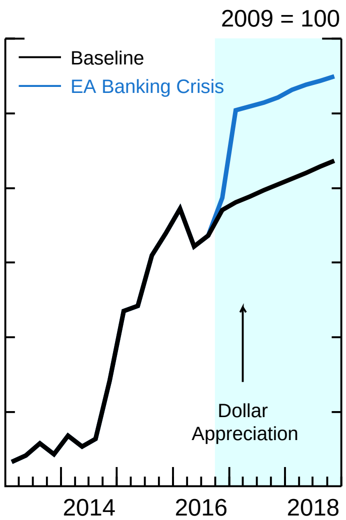
European NIM: 1.35%

European NIM assuming U.S. rates and yield spread: 1.40%

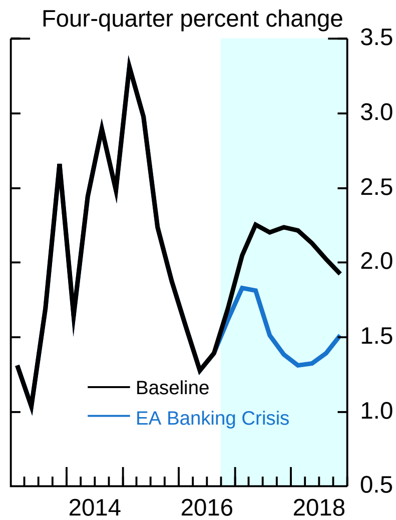
U.S. NIM: 2.45%

European Banking Crisis Scenario:

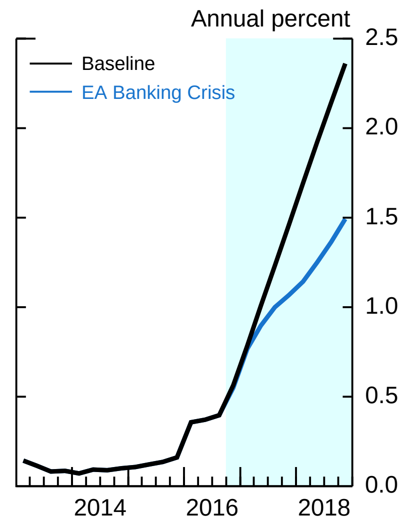
10. Real Broad Dollar



11. U.S. Real GDP



12. Federal Funds Rate



Class II FOMC - Restricted (FR)

Exhibit 3

The International Outlook (3)

International Financial Stability Matrix (IFSM)

	Advanced Foreign Economies						Emerging Market Economies					
	Canada	France	Italy	Japan	Switzerland	United Kingdom	Brazil	China	Hong Kong	Mexico	South Korea	Turkey
Net Overall Assessment*	M	M	N	M	M	M	E	N	M	M	L	N
Financial Sector**	M	N	E	N	N	N	N	E	M	L	M	N
Nonfinancial Sector**	N	M	M	ES	M	N	M	N	E	M	N	M
Sovereign Vulnerabilities**	L	N	E	N	ES	M	E	L	ES	N	L	M
External Vulnerabilities**	L	M	M	L	L	M	N	M	L	M	ES	E
Valuation Pressures**	N	M	L	ES	M	N	N	M	N	M	M	M
Impact of Institutions**	Positive	Neutral	Neutral	Neutral	Positive	Neutral	Negative	Neutral	Positive	Negative	Neutral	Negative

Extremely Subdued | Low | Moderate | Notable | Elevated

*Assessment with Support

**Standalone Assessment

Aggregate Matrix

Appendix 5: Materials used by Mr. Palumbo

Class II FOMC – Restricted (FR)

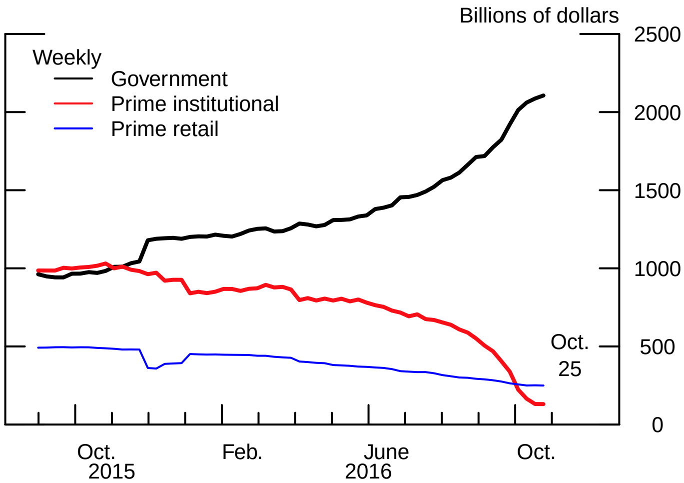
Material for Briefing on

Financial Stability

Michael G. Palumbo

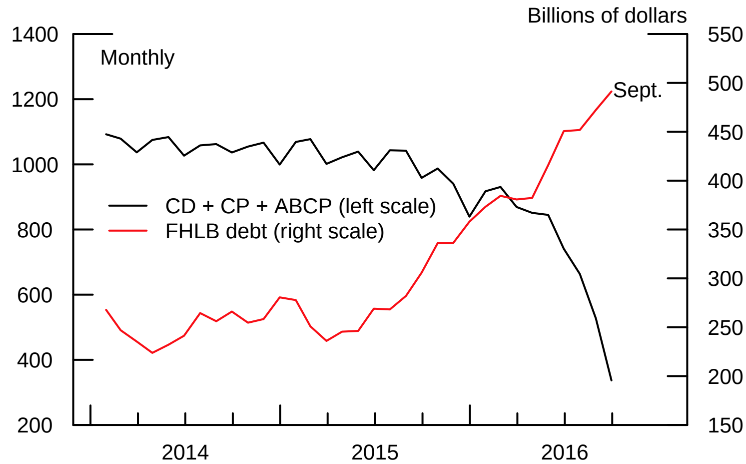
November 1, 2016

Money Market Funds, Assets Under Management



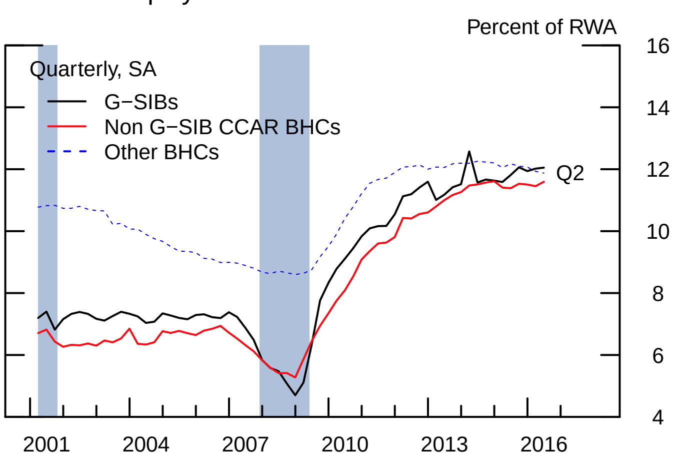
Source: iMoneyNet.

Money Market Fund Holdings



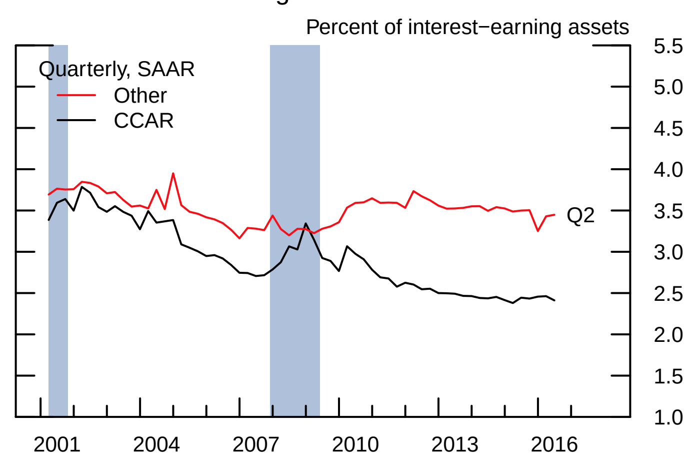
Source: SEC N−MFP Filings.

Common Equity Tier 1 Ratio



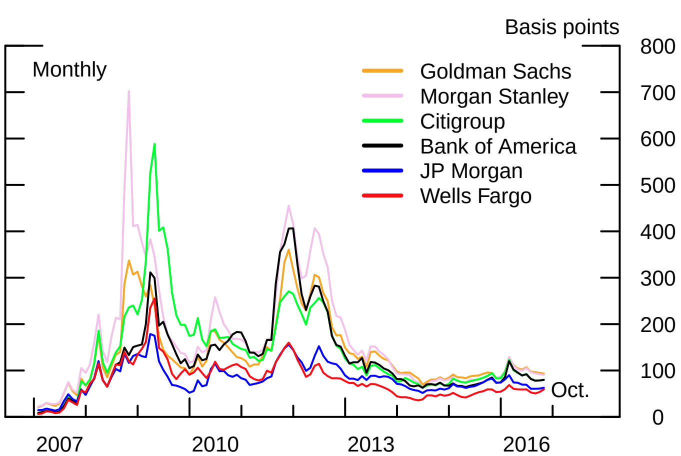
Source: FR Y−9C.

Bank Net Interest Margins



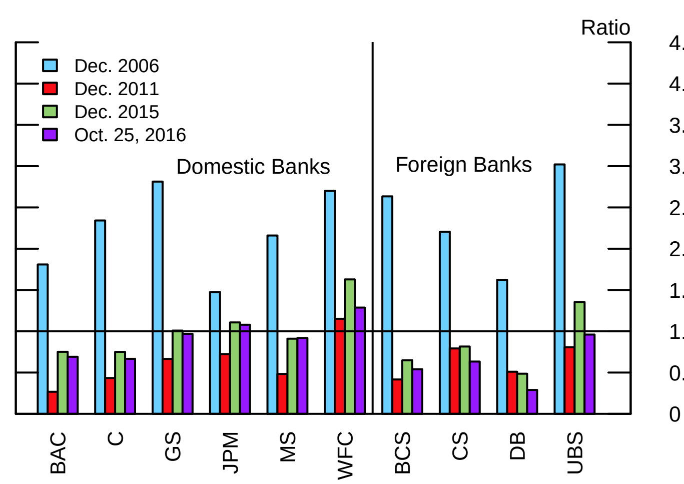
Source: FR Y−9C.

Domestic 5−Year CDS Premiums



Source: Markit.

Price−to−Book Ratios for Selected Firms



Source: FactSet.

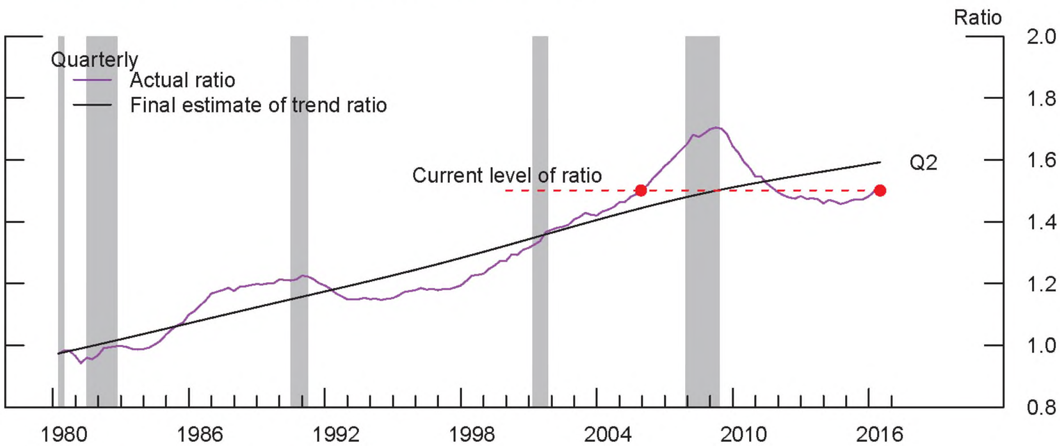
Indicators of Asset Valuation Pressures

Valuation ratio	Level	Adjusted for Treasuries
Equity P/E ratio		
Corporate bond prices		
CRE prices relative to rents		

Key: 0-20th percentile 20-40th percentile 40-60th percentile 60-80th percentile 80-100th percentile

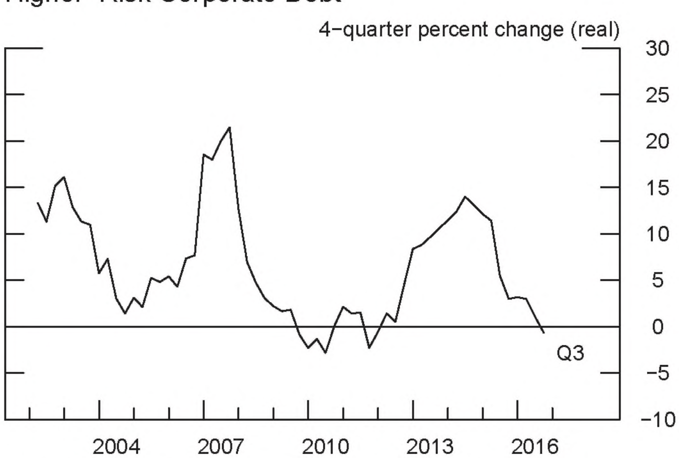
Notes: Color assignments were made based upon location of valuation metrics relative to their historical distributions.

Private Nonfinancial Sector Credit−to−GDP Ratio



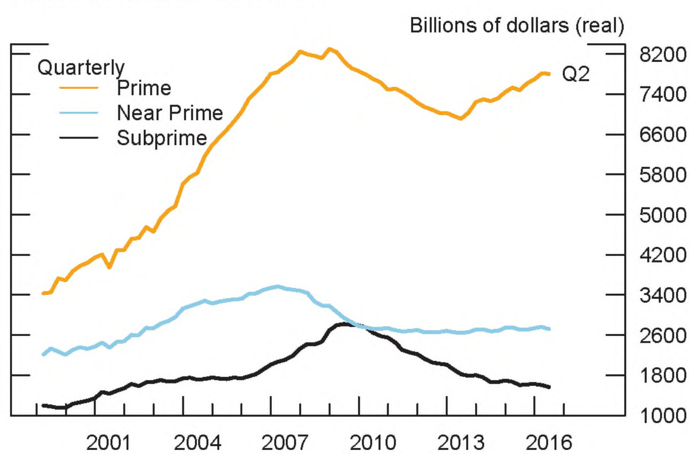
Source: Financial Accounts of the United States, NIPA, and staff calculations.

Higher−Risk Corporate Debt



Source: Mergent Fixed Investment Securities Database, Standard & Poor's.

Household Loan Balances



Source: FRBNY CCP/Equifax.

Staff Judgment on Levels of Vulnerabilities

Key: Extremely subdued Low Moderate Notable Elevated

Notes: Heat map color assignments were made by staff judgment. In the absence of significant structural changes, we would expect vulnerabilities to spend roughly equal proportions of time in each of the colored risk buckets.

	October 2015	July 2016	October 2016
Valuation Pressures	• The balance of indicators suggest moderate valuation pressures in equity and corporate debt markets, down from previous assessments • Term premiums remain very low • CRE valuation pressures increased further	• Treasury term premiums declined even further into negative territory • CRE valuation pressures remain appreciable, although lending standards have tightened • Equity prices have increased moderately despite weaker expected earnings • Corporate bond and equity risk premiums are, on net, unchanged	• Treasury term premiums remain well in negative territory • CRE valuations continue to rise as capitalization rates reached historical lows, but sales volumes declined and lending standards tightened • Corporate bond spreads and equity risk premiums are in line with historical norms
Private Nonfinancial Sector Leverage	• Aggregate measures of leverage for nonfinancial businesses are rising and are now slightly above their long-run averages • The rapid pace of debt growth for riskier firms is showing signs of cooling, but leverage remains historically high for these firms • The modest increases in household debt continues to be driven mostly by • prime borrowers	• Aggregate leverage for the nonfinancial corporate sector stayed elevated • Gross and net leverage of speculative-grade firms reached new highs even as growth of risky corporate debt continues to slow • The debt-to-income ratio of households continued to inch down	• Leverage for the nonfinancial corporate sector stayed elevated • Growth of risky corporate debt has been modest recently, but leverage of speculative-grade firms remained elevated • The debt-to-income ratio of households continued to inch down
Financial Sector Leverage	• Regulatory capital ratios remained close to recent highs • Available measures point to moderate leverage in the nonbank sector • Insurance industry is well capitalized and balance sheet risk appears manageable	• The results of the recent DFAST/CCAR exercise indicate sufficient capital for a severe macroeconomic shock • Available measures of leverage in the nonbank sector suggest little change • Following the Brexit vote, share prices and CDS spreads of large US banks were, on net, little changed	• Regulatory capital ratios for banks and insurance companies remain at high levels • Measures of leverage in the nonbank sector suggest little change • Spillovers related to developments at DB have been limited to equity prices of weakly capitalized European banks with similar business models
Maturity and Liquidity Trans-formation	• Large BHC liquidity buffers remain robust • Aggregate amount of runnable private money-like instruments remain stable relative to nominal GDP • Structural vulnerabilities in MMFs persist • Bond mutual funds' outflows could cause excess volatility in bond markets	• Large BHCs' holdings of liquid assets remain at high levels • Prime money market funds have considerably lower AUM due to conversions in anticipation of new regulation taking effect; reports indicate further outflows are likely • Large outflows from bond and loan mutual funds could exacerbate volatility in corporate debt markets	• Large BHCs' holdings of liquid assets remain at high levels • Prime institutional money market funds have considerably lower AUM, decreasing the risks associated with a run in this sector • First-mover advantage, and thus run-risk, remains at some open-end bond mutual funds
Overall Assessment			

Appendix 6: Materials used by Mr. Laubach

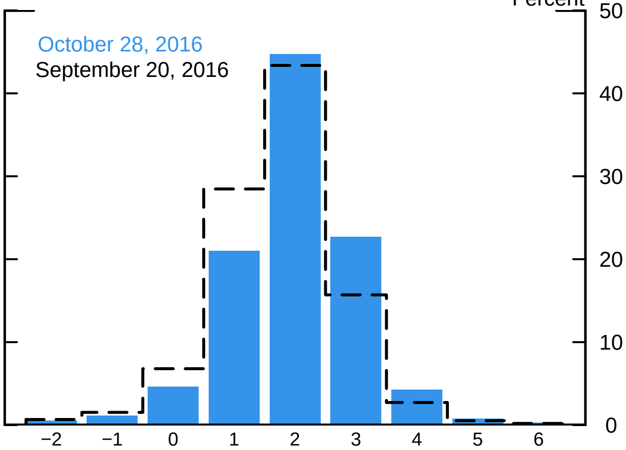
Material for the Briefing on

Monetary Policy Alternatives

Thomas Laubach
November 1–2, 2016

Potential Implications of a Higher Inflation Outlook

Probability Distribution of Average Headline CPI Inflation over the Next 10 Years

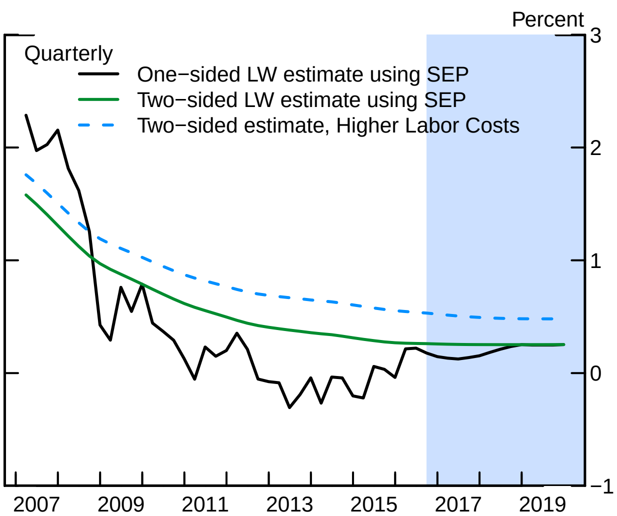


Note: Model−free probability distribution implied by inflation caps and floors.
Source: BGC Partners and Bloomberg.

Potential Implications of Higher Inflation

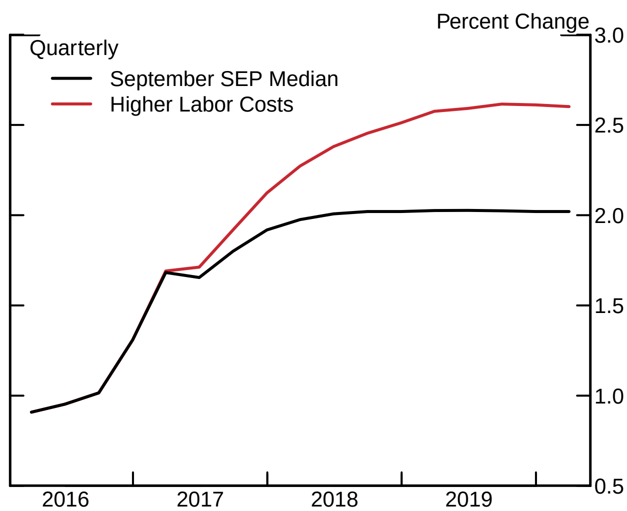
- "Higher Labor Costs" scenario features inflation that is persistently 1/2 pp above baseline
- How would this scenario affect
  - Assesment of current policy stance?
  - Federal funds rate path and financial conditions broadly?

r* Estimates



Note: Laubach−Williams estimates of r* treating real GDP, core inflation, and the federal funds rate through 2019 from either the September 2016 SEP medians or the "Higher Labor Costs" scenario as data.
Source: SEP, FRB/US, and staff calculations.

PCE Inflation Paths

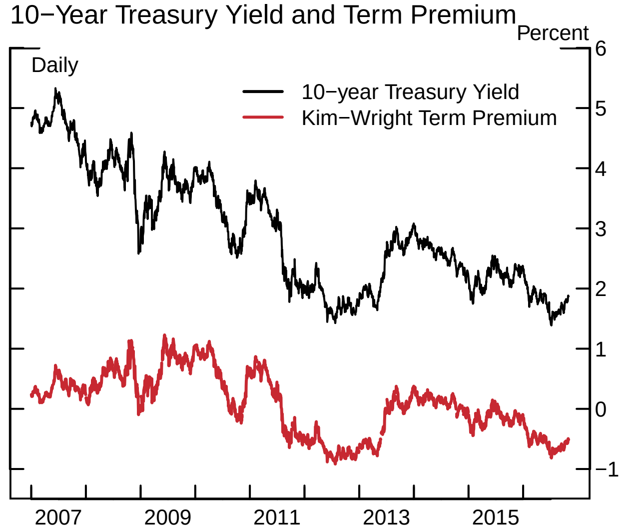


Note: The line "September SEP Median" shows PCE inflation from a baseline consistent with the September SEP medians. The line labeled "Higher Labor Costs" shows inflation in that scenario applied to the SEP−consistent baseline.
Source: SEP, FRB/US, and staff calculations.

Possible Responses of Financial Conditions

- Federal funds rate rises to 3 percent by 2019, 1/2 pp above baseline
- Assumes muted response of 10−year yield, term premium
- If investors expected higher inflation path, past term premium declines could unwind rapidly
- Rise in longer−term yields could be associated with dollar appreciation

10−Year Treasury Yield and Term Premium



Source: Bloomberg and staff calculations.

SEPTEMBER 2016 FOMC STATEMENT

1. Information received since the Federal Open Market Committee met in July indicates that the labor market has continued to strengthen and growth of economic activity has picked up from the modest pace seen in the first half of this year. Although the unemployment rate is little changed in recent months, job gains have been solid, on average. Household spending has been growing strongly but business fixed investment has remained soft. Inflation has continued to run below the Committee's 2 percent longer-run objective, partly reflecting earlier declines in energy prices and in prices of non-energy imports. Market-based measures of inflation compensation remain low; most survey-based measures of longer-term inflation expectations are little changed, on balance, in recent months.

2. Consistent with its statutory mandate, the Committee seeks to foster maximum employment and price stability. The Committee expects that, with gradual adjustments in the stance of monetary policy, economic activity will expand at a moderate pace and labor market conditions will strengthen somewhat further. Inflation is expected to remain low in the near term, in part because of earlier declines in energy prices, but to rise to 2 percent over the medium term as the transitory effects of past declines in energy and import prices dissipate and the labor market strengthens further. Near-term risks to the economic outlook appear roughly balanced. The Committee continues to closely monitor inflation indicators and global economic and financial developments.

3. Against this backdrop, the Committee decided to maintain the target range for the federal funds rate at ¼ to ½ percent. The Committee judges that the case for an increase in the federal funds rate has strengthened but decided, for the time being, to wait for further evidence of continued progress toward its objectives. The stance of monetary policy remains accommodative, thereby supporting further improvement in labor market conditions and a return to 2 percent inflation.

4. In determining the timing and size of future adjustments to the target range for the federal funds rate, the Committee will assess realized and expected economic conditions relative to its objectives of maximum employment and 2 percent inflation. 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. In light of the current shortfall of inflation from 2 percent, the Committee will carefully monitor actual and expected progress toward its inflation goal. The Committee expects that economic conditions will evolve in a manner that will warrant only gradual increases in the federal funds rate; the federal funds rate is likely to remain, for some time, below levels that are expected to prevail in the longer run. However, the actual path of the federal funds rate will depend on the economic outlook as informed by incoming data.

5. The Committee is maintaining its existing policy of reinvesting principal payments from its holdings of agency debt and agency mortgage-backed securities in agency mortgage-backed securities and of rolling over maturing Treasury securities at

auction, and it anticipates doing so until normalization of the level of the federal funds rate is well under way. This policy, by keeping the Committee's holdings of longer-term securities at sizable levels, should help maintain accommodative financial conditions.

NOVEMBER 2016 ALTERNATIVE A

1. Information received since the Federal Open Market Committee met in ~~July~~ **September** indicates that the labor market has continued to strengthen and growth of economic activity has picked up from the modest pace seen in the first half of this year. ~~Although the unemployment rate is little changed in recent months,~~ Job gains have been solid, on average**, in recent months, but the unemployment rate and other indicators of labor utilization have changed little, on balance. Growth of** household spending has ~~been growing strongly but~~ **slowed and** business fixed investment has remained soft. Inflation has continued to run below the Committee's 2 percent longer-run objective, **only** partly reflecting earlier declines in energy prices and in prices of non-energy imports. Market-based measures of inflation compensation remain low; most survey-based measures of longer-term inflation expectations are little changed, on balance, in recent months.

2. Consistent with its statutory mandate, the Committee seeks to foster maximum employment and price stability. The Committee expects that, with ~~gradual adjustments in the stance of~~ **appropriate** monetary policy, economic activity will expand at a moderate pace and labor market conditions will strengthen ~~somewhat~~ further. Inflation is expected to remain low in the near term, in part because of earlier declines in energy prices, but to rise **gradually** to 2 percent over the medium term as the transitory effects of past declines in energy and import prices dissipate and the labor market strengthens further. ~~Near-term risks to the economic outlook appear roughly balanced.~~ The Committee continues to closely monitor inflation indicators and global economic and financial developments.

3. Against this backdrop, the Committee decided to maintain the target range for the federal funds rate at ¼ to ½ percent. **In light of subdued pressures in the labor market and still-low levels of inflation,** the Committee judges that ~~the case for~~ an increase in the federal funds rate ~~has strengthened but decided, for the time being, to wait for further evidence of continued progress toward its objectives~~ **will not be warranted until evidence emerges that inflation is moving closer to 2 percent on a sustained basis**. The stance of monetary policy remains accommodative, thereby supporting further improvement in labor market conditions and a return to 2 percent inflation.

4. In determining ~~the timing and size of future~~ **when** adjustments to the target range for the federal funds rate **might become appropriate**, the Committee will assess realized and expected economic conditions relative to its objectives of maximum employment and 2 percent inflation**, along with risks to the economic outlook**. 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. ~~In light of the current shortfall of inflation from 2 percent, the Committee will carefully monitor actual and expected progress toward its inflation goal.~~ The Committee expects that economic conditions will evolve in a manner that will warrant ~~only gradual increases in the federal funds rate;~~ the federal funds rate ~~is likely to~~ remain**ing**, for some time, below levels that are

expected to prevail in the longer run. However, the actual path of the federal funds rate will depend on the economic outlook as informed by incoming data.

5. The Committee is maintaining its existing policy of reinvesting principal payments from its holdings of agency debt and agency mortgage-backed securities in agency mortgage-backed securities and of rolling over maturing Treasury securities at auction, and it anticipates doing so until normalization of the level of the federal funds rate is well under way. This policy, by keeping the Committee's holdings of longer-term securities at sizable levels, should help maintain accommodative financial conditions.

NOVEMBER 2016 ALTERNATIVE B

1. Information received since the Federal Open Market Committee met in ~~July~~ **September** indicates that the labor market has continued to strengthen and growth of economic activity has picked up from the modest pace seen in the first half of this year. Although the unemployment rate is little changed in recent months, job gains have been solid~~, on average~~. Household spending has been ~~growing strongly~~ **rising moderately** but business fixed investment has remained soft. Inflation ~~has continued to run~~ **has increased somewhat since earlier this year but is still** below the Committee's 2 percent longer-run objective, partly reflecting earlier declines in energy prices and in prices of non-energy imports. Market-based measures of inflation compensation **have moved up but** remain low; most survey-based measures of longer-term inflation expectations are little changed, on balance, in recent months.

2. Consistent with its statutory mandate, the Committee seeks to foster maximum employment and price stability. The Committee expects that, with gradual adjustments in the stance of monetary policy, economic activity will expand at a moderate pace and labor market conditions will strengthen somewhat further. Inflation is expected ~~to remain low in the near term, in part because of earlier declines in energy prices, but~~ to rise to 2 percent over the medium term as the transitory effects of past declines in energy and import prices dissipate and the labor market strengthens further. Near-term risks to the economic outlook appear roughly balanced. The Committee continues to closely monitor inflation indicators and global economic and financial developments.

3. Against this backdrop, the Committee decided to maintain the target range for the federal funds rate at ¼ to ½ percent. The Committee judges that the case for an increase in the federal funds rate has ~~strengthened~~ **continued to strengthen** but decided, for the time being, to wait for **some** further evidence of continued progress toward its objectives. The stance of monetary policy remains accommodative, thereby supporting further improvement in labor market conditions and a return to 2 percent inflation.

4. In determining the timing and size of future adjustments to the target range for the federal funds rate, the Committee will assess realized and expected economic conditions relative to its objectives of maximum employment and 2 percent inflation. 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. In light of the current shortfall of inflation from 2 percent, the Committee will carefully monitor actual and expected progress toward its inflation goal. The Committee expects that economic conditions will evolve in a manner that will warrant only gradual increases in the federal funds rate; the federal funds rate is likely to remain, for some time, below levels that are expected to prevail in the longer run. However, the actual path of the federal funds rate will depend on the economic outlook as informed by incoming data.

5. The Committee is maintaining its existing policy of reinvesting principal payments from its holdings of agency debt and agency mortgage-backed securities in agency mortgage-backed securities and of rolling over maturing Treasury securities at auction, and it anticipates doing so until normalization of the level of the federal funds rate is well under way. This policy, by keeping the Committee's holdings of longer-term securities at sizable levels, should help maintain accommodative financial conditions.

NOVEMBER 2016 ALTERNATIVE C

1. Information received since the Federal Open Market Committee met in ~~July~~ **September** indicates that the labor market has continued to strengthen and growth of economic activity has picked up from the modest pace seen in the first half of this year. Although the unemployment rate is little changed in recent months, job gains have been solid~~, on average~~ **and, along with other indicators, suggest that labor utilization has increased**. Household spending has been ~~growing strongly~~ **rising moderately** but business fixed investment has remained soft. Inflation ~~has continued to run~~ **has increased since earlier this year but is still** below the Committee's 2 percent longer-run objective ~~, partly reflecting earlier declines in energy prices and in prices of non-energy imports~~. Market-based measures of inflation compensation **have moved up but** remain low; most survey-based measures of longer-term inflation expectations are little changed, on balance, in recent months.

2. Consistent with its statutory mandate, the Committee seeks to foster maximum employment and price stability. The Committee expects that, with gradual adjustments in the stance of monetary policy, economic activity will expand at a moderate pace and labor market conditions will strengthen somewhat further. Inflation is expected ~~to remain low in the near term, in part because of earlier declines in energy prices, but~~ to rise to 2 percent over the medium term as the transitory effects of past declines in energy and import prices **continue to** dissipate and the labor market strengthens further. Near-term risks to the economic outlook appear ~~roughly~~ balanced. ~~The Committee continues to closely monitor inflation indicators and global economic and financial developments.~~

3. ~~Against this backdrop~~ **In view of realized and expected progress toward maximum employment and 2 percent inflation**, the Committee decided to ~~maintain~~ **raise** the target range for the federal funds rate ~~at ¼~~ to ½ **to ¾** percent. ~~The Committee judges that the case for an increase in the federal funds rate has strengthened but decided, for the time being, to wait for further evidence of continued progress toward its objectives.~~ The stance of monetary policy remains accommodative **after this increase**, thereby supporting **some** further ~~improvement~~ **strengthening** in labor market conditions and a return to 2 percent inflation.

4. In determining **[** the timing and size of **]** future adjustments to the target range for the federal funds rate, the Committee will assess realized and expected economic conditions relative to its objectives of maximum employment and 2 percent inflation**, along with risks to the economic outlook**. 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. In light of the current shortfall of inflation from 2 percent, the Committee will carefully monitor actual and expected progress toward its inflation goal. The Committee expects that economic conditions will evolve in a manner that will warrant only gradual increases in the federal funds rate; the federal funds rate is likely to remain, for some time, below levels that are expected to prevail in the longer run. However, the actual path of the federal funds rate will depend on the economic outlook as informed by incoming data.

5. The Committee is maintaining its existing policy of reinvesting principal payments from its holdings of agency debt and agency mortgage-backed securities in agency mortgage-backed securities and of rolling over maturing Treasury securities at auction, and it anticipates doing so until normalization of the level of the federal funds rate is well under way. This policy, by keeping the Committee's holdings of longer-term securities at sizable levels, should help maintain accommodative financial conditions.

Implementation Note if the Committee maintains the current target range

*Release Date: ~~September 21~~ **November 2**, 2016*

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 ~~September 21~~ **November 2**, 2016:

- The Board of Governors of the Federal Reserve System left unchanged the interest rate paid on required and excess reserve balances at 0.50 percent.

- 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 ~~September 22~~ **November 3**, 2016, 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 ¼ to ½ percent, including overnight reverse repurchase operations (and reverse repurchase operations with maturities of more than one day when necessary to accommodate weekend, holiday, or similar trading conventions) at an offering rate of 0.25 percent, in amounts limited only by the value of Treasury securities held outright in the System Open Market Account that are available for such operations and by a per-counterparty limit of $30 billion per day.
  >
  > The Committee directs the Desk to continue rolling over maturing Treasury securities at auction and to continue reinvesting principal payments on all agency debt and agency mortgage-backed securities in agency mortgage-backed securities. 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."

  More information regarding open market operations may be found on the Federal Reserve Bank of New York's website.

- The Board of Governors of the Federal Reserve System took no action to change the discount rate (the primary credit rate), which remains at 1.00 percent.

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

Implementation Note if the Committee raises the target range to ½ to ¾ percent

*Release Date: ~~September 21~~ **November 2**, 2016*

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 ~~September 21~~ **November 2**, 2016:

- The Board of Governors of the Federal Reserve System ~~left unchanged~~ **voted [unanimously] to raise** the interest rate paid on required and excess reserve balances ~~at 0.50~~ **to 0.75** percent**, effective November 3, 2016**.

- 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 ~~September 22~~ **November 3**, 2016, 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 ~~¼ to~~ ½ **to ¾** percent, including overnight reverse repurchase operations (and reverse repurchase operations with maturities of more than one day when necessary to accommodate weekend, holiday, or similar trading conventions) at an offering rate of ~~0.25~~ **0.50** 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 maturing Treasury securities at auction and to continue reinvesting principal payments on all agency debt and agency mortgage-backed securities in agency mortgage-backed securities. 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."

  More information regarding open market operations may be found on the Federal Reserve Bank of New York's website.

- **In a related action,** the Board of Governors of the Federal Reserve System ~~took no action to change~~ **voted [unanimously] to approve a ¼ percentage point increase in** the discount rate (the primary credit rate)~~, which remains at 1.00~~ **to 1.25** percent**, effective November 3, 2016**. **In taking this action, the Board approved requests submitted by the Boards of Directors of the Federal Reserve Banks of …**

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