

Appendix 1: Materials used by Mr. Potter and Ms. Logan

Class II FOMC – Restricted (FR)

Material for Briefing on

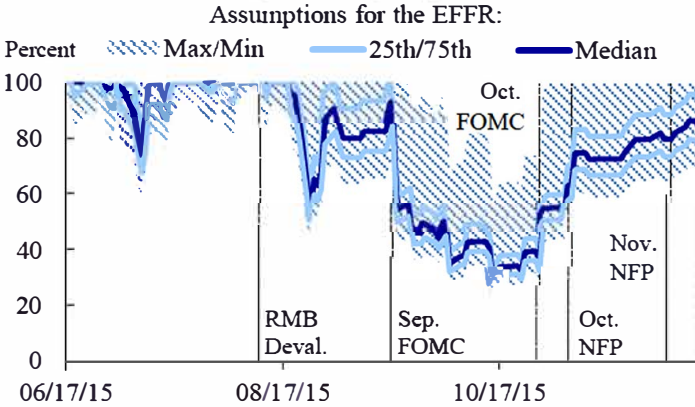
**Financial Developments and
Open Market Operations**

Simon Potter and Lorie Logan
December 15, 2015

Class II FOMC—Restricted (FR)

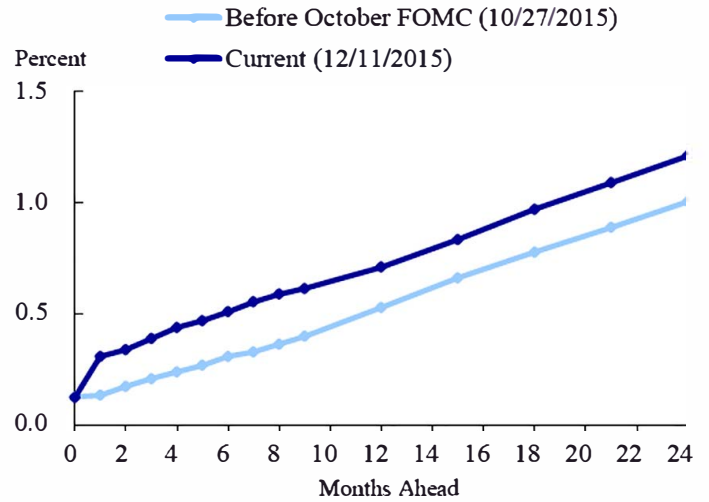
Exhibit 1

(1) Market-Implied Probability of a Rate Hike At or Before December FOMC*



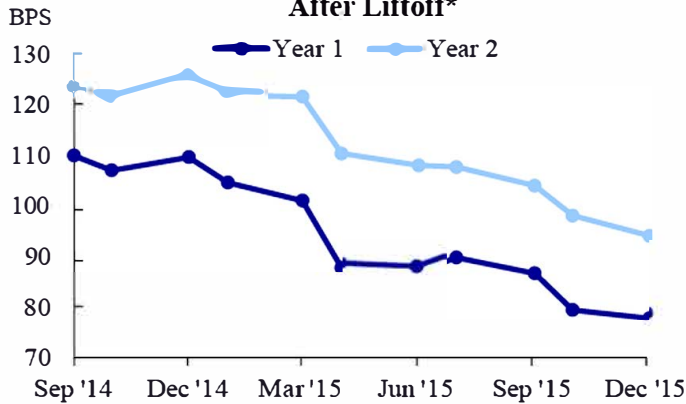
*Assumptions from the Surveys of Primary Dealers and Market Participants' PDF-implied means for the EFFR immediately after liftoff. Probabilities are derived from January fed funds futures contract and are capped at 100%.
 Source: Bloomberg, Federal Reserve Bank of New York Desk Calculations

(2) Comparison of Implied Fed Funds Rate Paths*



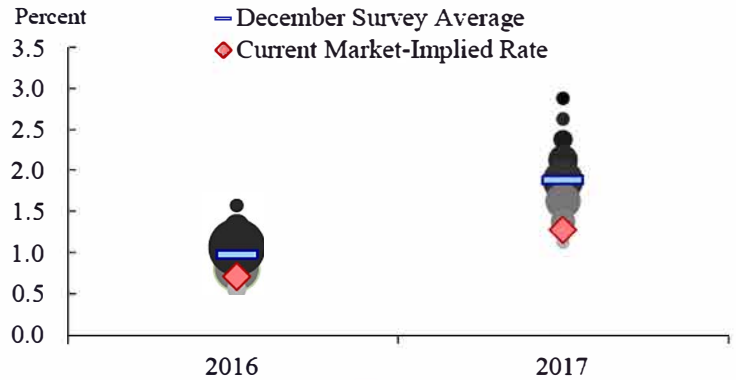
*Derived from federal funds futures and Eurodollar futures.
 Source: Bloomberg, Federal Reserve Bank of New York

(3) Average Expected Pace of Tightening After Liftoff*



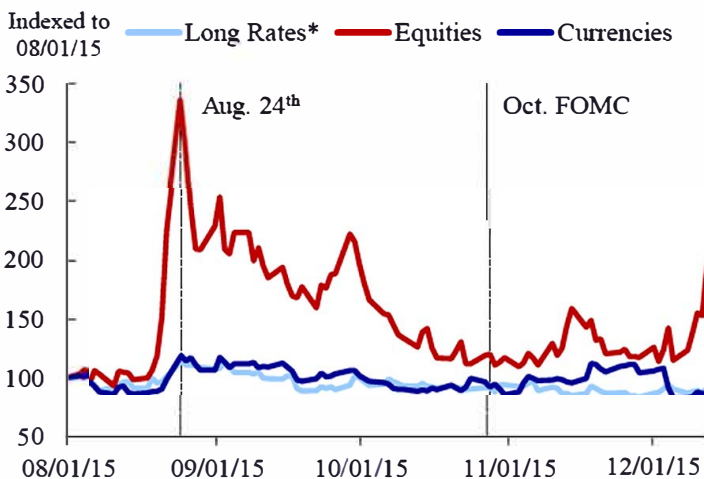
*Averages from the Surveys of Primary Dealers and Market Participants' PDF-implied means for the expected pace of tightening for the first and second years following liftoff. Responses are conditioned on not returning to the zero lower bound.
 Source: Federal Reserve Bank of New York

(4) Year-End Market-Implied and Survey-Implied Fed Funds Rate*



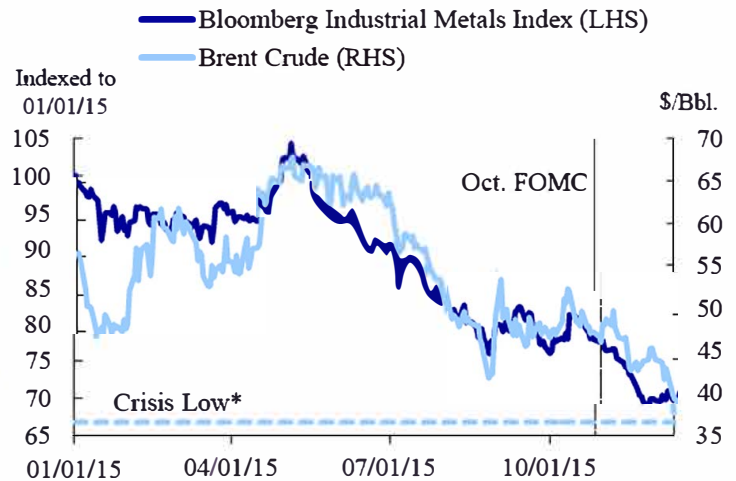
*Based on all responses from the Survey of Primary Dealers and Survey of Market Participants. Dots scaled by percent of December Survey respondents. Dots shaded so that the higher the probability respondents place on not returning to the zero lower bound, the darker the dot.
 Source: Federal Reserve Bank of New York Desk Calculations

(5) Implied Volatility Indices*



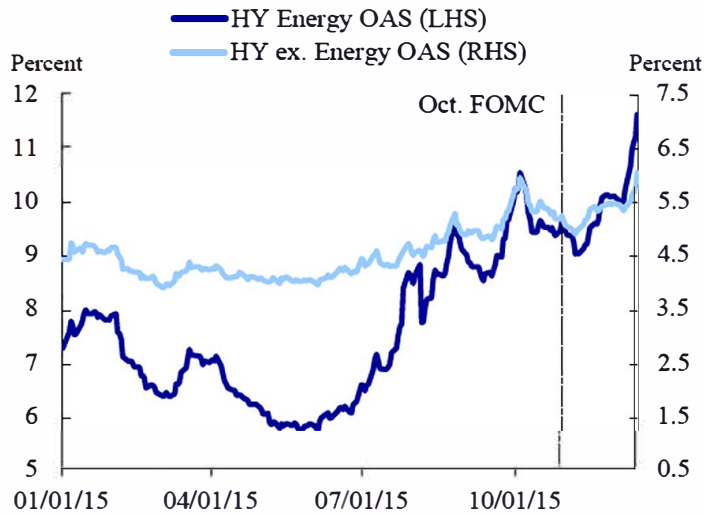
*1-month swaption with 10-year underlying.
 Source: Bloomberg, CBOE

(6) Commodity Prices



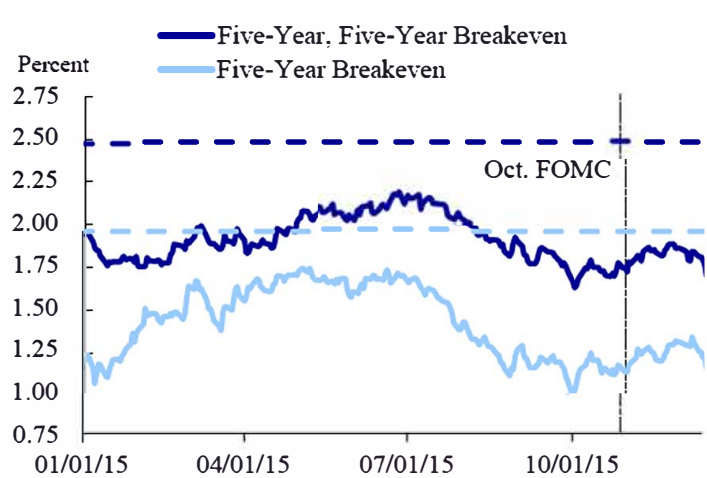
*Brent Crude oil closed on 12/24/08 at \$36.61/Bbl.
 Source: Bloomberg

(7) High-Yield Credit OAS



Source: Bloomberg, Barclays

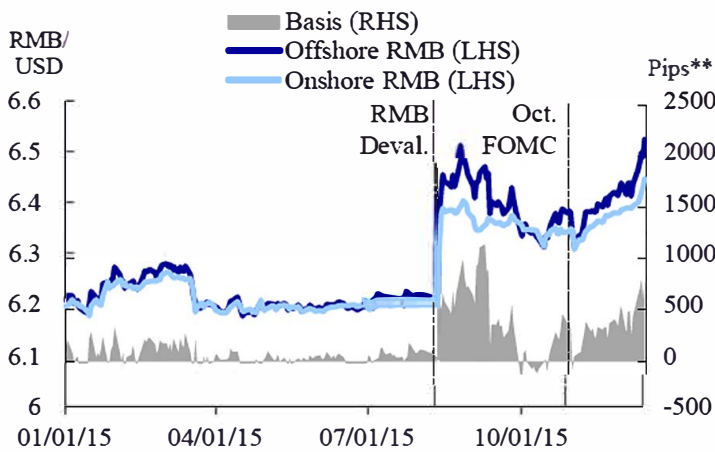
(8) Breakeven Inflation Measures*



*Dashed lines show 5-year averages.

Source: Bloomberg, Federal Reserve Board of Governors,

(9) Onshore and Offshore Renminbi*

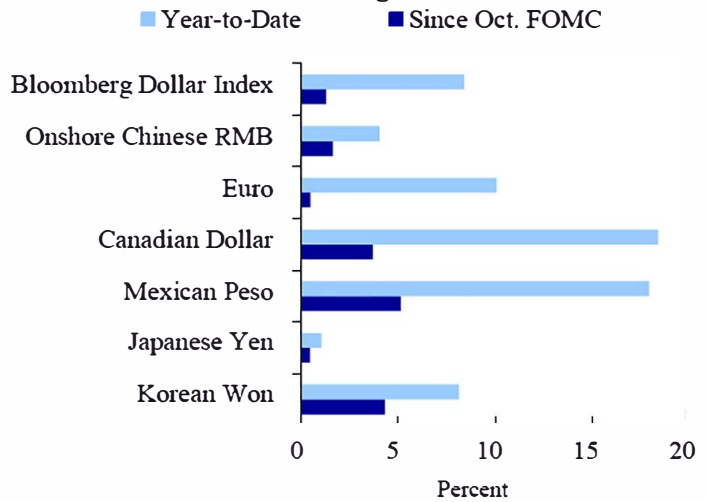


*Basis is calculated as the Offshore RMB less the Onshore RMB.

**A "pip" is 1/100th of a cent.

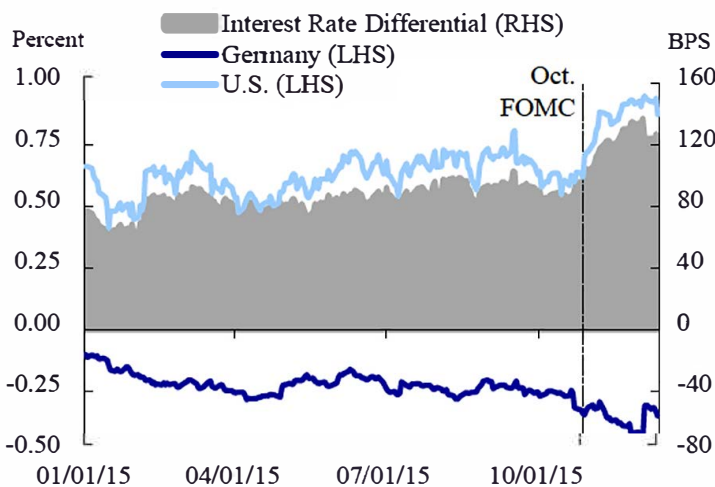
Source: Bloomberg

(10) U.S. Dollar Appreciation Against Major Trading Partners



Source: Bloomberg

(11) U.S. and German Two-Year Nominal Rates and Interest Rate Differential



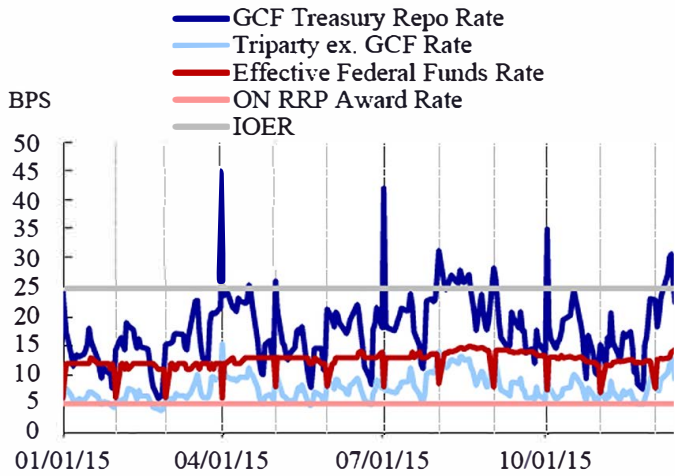
Source: Bloomberg

(12) Asset Price Changes Around ECB Meetings*

Asset	Daily Change on Dec. ECB Meeting	Change Since Oct. ECB Meeting
Sovereign Debt Yields		
10-Year Treasury	+13 BPS	+10 BPS
10-Year German	+20 BPS	-3 BPS
Equities		
S&P 500 Index	-1.4%	-0.3%
EuroStoxx50 Index	-3.6%	-2.1%
Foreign Exchange		
Euro-Dollar	+3.1%	-3.1%

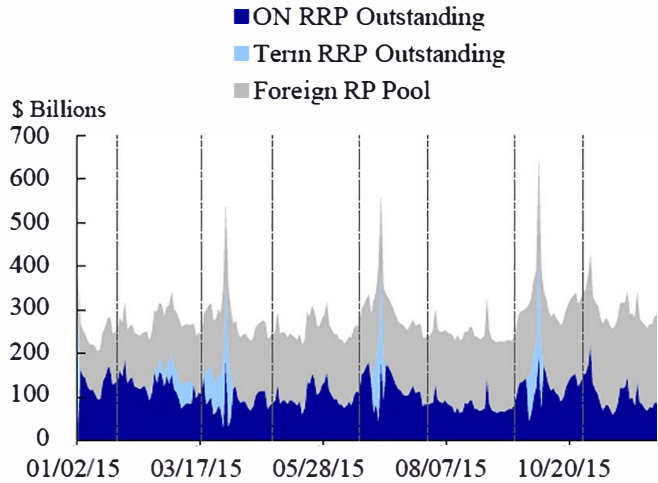
Source: Bloomberg

(13) Overnight Interest Rates*



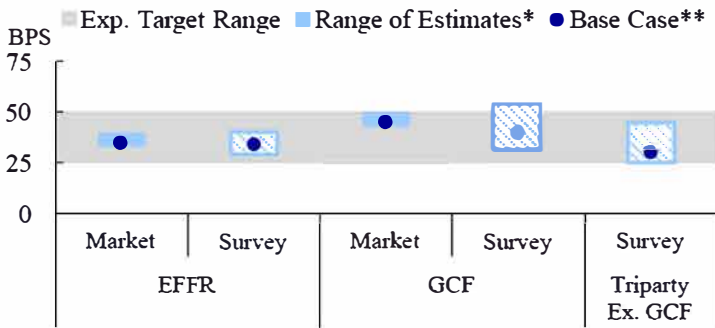
*Dark trip wires indicate quarter-ends, light trip wires indicate month-ends.
Source: Bloomberg, Federal Reserve Bank of New York

(14) RRP Outstanding and Foreign Repo Pool*



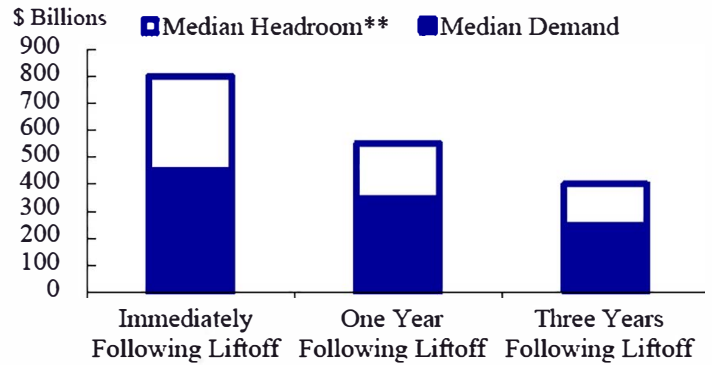
*Dashed lines indicate intermeeting periods.
Source: Federal Reserve Bank of New York

(15) Expected Level of Money Market Rates After Liftoff



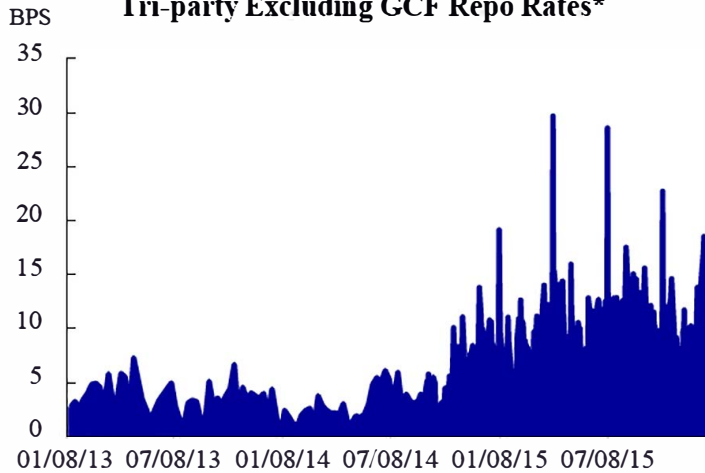
*Range: for market defined as the implied rate assuming 75% to 99% probability of liftoff, for survey defined as the 5th and 95th percentile from Desk Survey, ex. one dealer that does not expect Dec. liftoff.
**Base case: for market defined as the implied rate assuming a 90% probability of liftoff, for survey defined as the median response from Desk Survey, ex. one dealer that does not expect Dec. liftoff.
Source: Federal Reserve Bank of New York, Bloomberg

(16) ON RRP Expected Demand and Headroom*



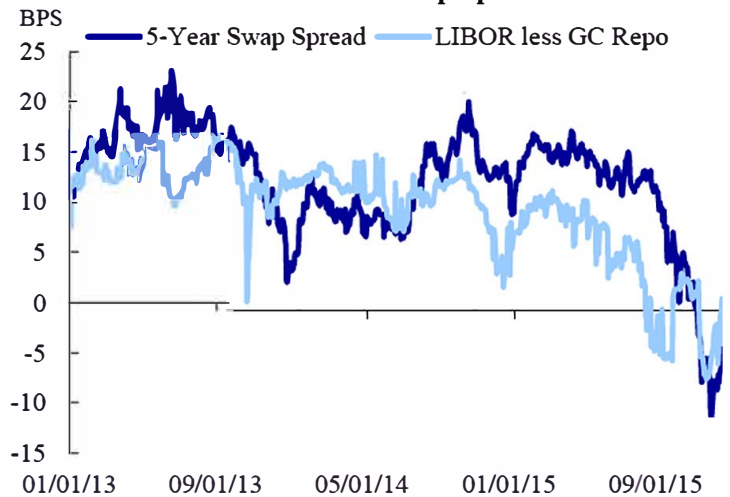
*Based on all responses from the December Survey of Primary Dealers and Survey of Market Participants
**Headroom is calculated as the RRP Cap less RRP Demand. When respondents indicate "no cap" the approximate size of the Treasury SOMA portfolio, \$2.2 trillion, is used as a proxy.
Source: Federal Reserve Bank of New York

(17) Spread Between GCF Repo and Tri-party Excluding GCF Repo Rates*



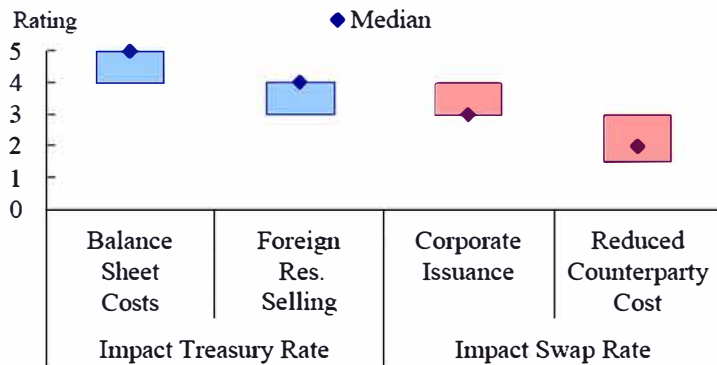
*Tri-party Ex. GCF Data series begins 01/08/13
Source: Federal Reserve Bank of New York, Bloomberg

(18) Three-Month LIBOR Less GC Repo and Five-Year Swap Spread



Source: Bloomberg

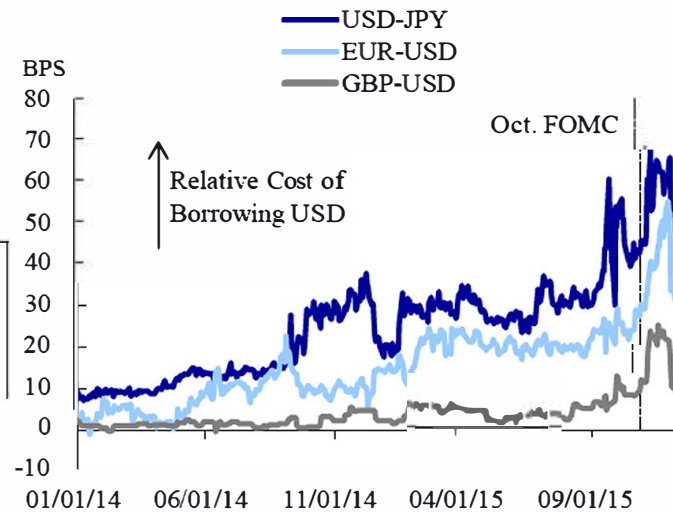
(19) Importance of Factors Explaining Recent Narrowing in Swap Spreads*



*Based on all responses from the December Survey of Primary Dealers and Survey of Market Participants. A rating of 1 implies that the factor is not important, while a rating of 5 implies the factor is very important. Boxes show interquartile ranges.

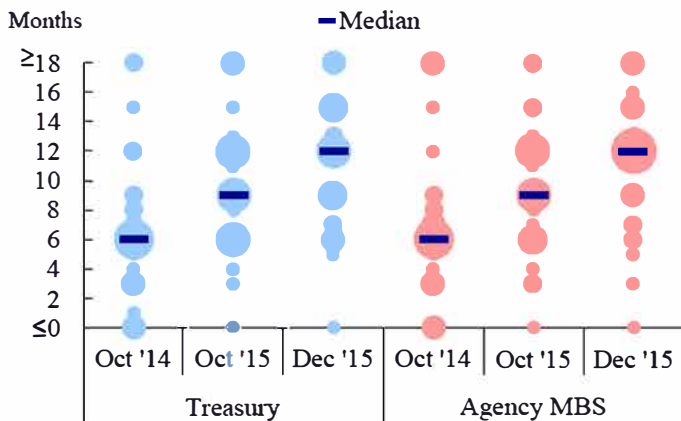
Source: Federal Reserve Bank of New York

(20) Three-Month FX Swap-Implied Basis



Source: Bloomberg

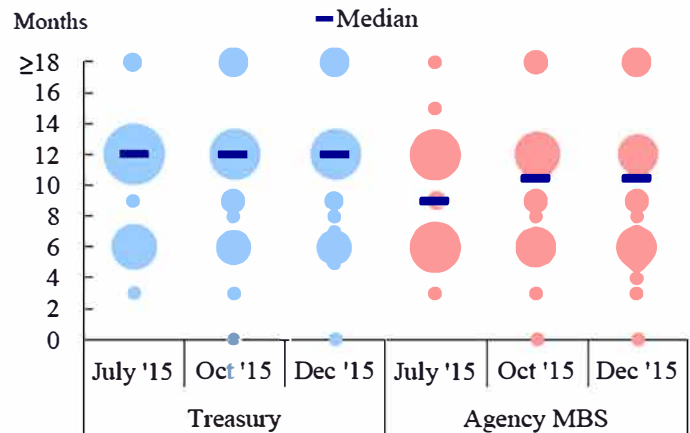
(21) Expected Timing of End to Some or All Reinvestments Relative to Liftoff*



*Dots scaled by percent of respondents from the Survey of Primary Dealers and Survey of Market Participants.

Source: Federal Reserve Bank of New York

(22) Expected Reinvestment Phase Out Period*



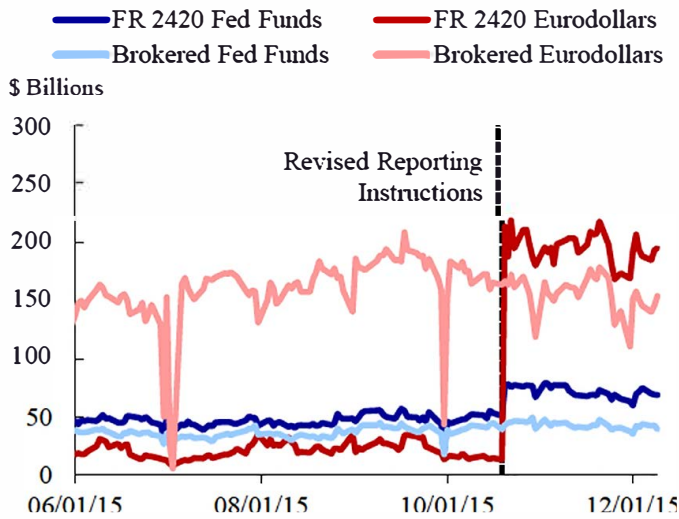
*Dots scaled by percent of respondents from the Survey of Primary Dealers and Survey of Market Participants.

Source: Federal Reserve Bank of New York

(23) Treasury Security Reinvestment Policy

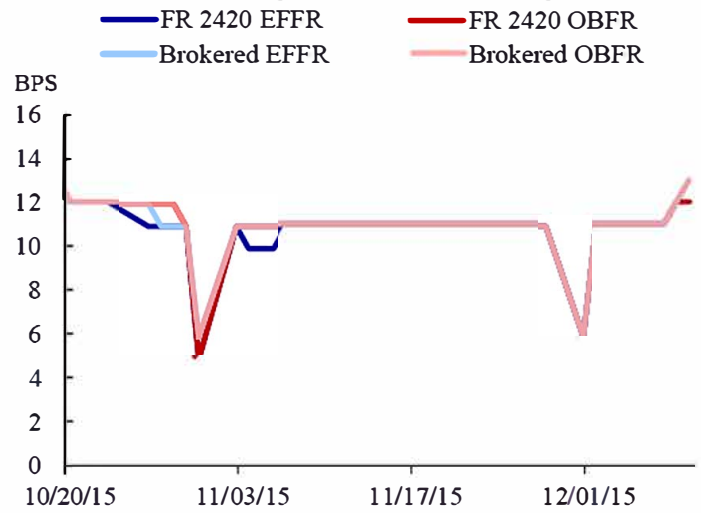
- Desk will continue to roll over maturing Treasury securities at auction
- Desk places bids for the SOMA at Treasury auctions equal in par amount to the value of holdings maturing on the issue date and allocated proportionally by offer size
 - Bids are place as noncompetitive tenders and are treated as add-ons to announced auction sizes
- SOMA holdings are currently limited to not more than 70 percent of total outstanding issuance amount of any one Treasury security
 - Desk observes this limit when rolling over maturing securities at auction
- Desk plans to publish a list of FAQs shortly after meeting outlining details of policy

(24) Fed Funds and Eurodollar Volumes



Source: Federal Reserve Bank of New York

(25) Volume-Weighted Median Overnight Rates



Source: Federal Reserve Bank of New York

(26) EFFR and OBFR Implementation

- Publish Desk statement on January 6th, just after the December meeting minutes release announcing:
 - Details about efforts to increase transparency
 - Policies intended to align the production of the EFFR and OBFR with international standards for financial benchmarks
- FR 2420 data allow us to publish more details about the unsecured overnight market compared to the data we receive from brokers
- Staff is examining whether additional data should be released with a lag

(27) Tri-party Treasury GC Repo Rate

- NY Fed collects and analyzes daily transaction data from the tri-party repo market
 - Useful for analysis of operations and market monitoring
- In 2014, the Federal Reserve convened the Alternative Reference Rates Committee or ARRC
 - A group of major U.S. dollar swap dealers tasked with identifying robust alternative reference rates
- Staff is examining the possibility of the NY Fed publicly producing an alternative reference rate based on Treasury GC Repo transactions

(28) Update on Counterparty Review

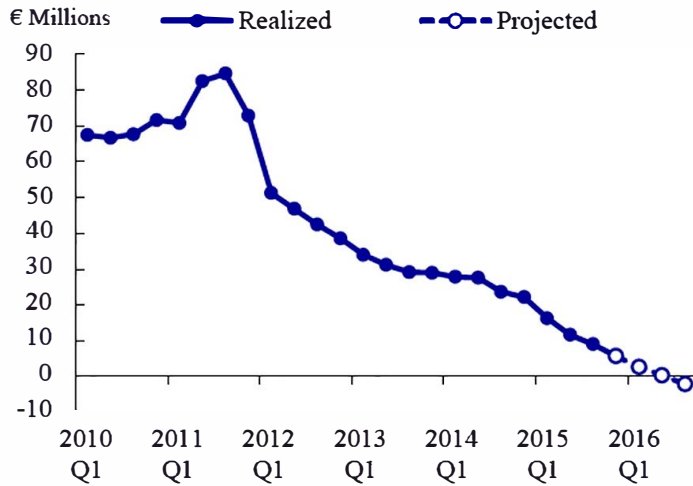
	Average MOC Firm		Average Small Primary Dealer*	
	Offers	Awards	Offers	Awards
Aggregate Trades (#)	65	7	1,136	126
Aggregate Trades (\$mm)	259	20	26,917	3,339
% of Total Purchases	0.02	0.01	1.96	0.99
Avg Trade Size (\$mm)	3		22	

*Average of the six smallest primary dealers - BNP, Cantor, Daiwa, Jefferies, Mizuho and SocGen. MOC firms are Brean Capital, Loop Capital and Mischler Financial.

Source: Federal Reserve Bank of New York

- Benefits associated with transacting with smaller broker dealers is greatly outweighed by the costs
- Unlikely to recommend that dealers with less than \$50 million in capital be eligible to be a primary dealer
- Staff continue to study potential adjustments to the counterparty framework
- Will present advised administrative policies to the Committee for approval

(29) Euro Portfolio Income



Source: Federal Reserve Bank of New York

(30) Operational Readiness Status of Operation or Facility

- In Production: Active – Operation currently in use. Staff are fully trained across locations, procedures are documented, business continuity plans are in place.
- In Production: Standby – Operation not currently active but ready to be implemented within two days’ notice; Desk conducts small-value exercises each year to ensure readiness. Otherwise complies with “In Production” guidelines.
- Rapid Deployment: (<2 weeks) – Operation not currently in use. High-level processes and procedures have been developed and a deployment plan is in place. Internal mock operations are conducted where feasible.
- Extended Deployment*: (<3 months) – Operation not currently in use. Several months would be needed for the operation to be deployed in scale so that technical infrastructure can be built and tested, legal agreements signed, etc.
- Significant Development Required*: (>3 months) – Operation still in formation phase. Significant resources would be needed to design, build and test the operation, as well as negotiate and sign legal agreements.

*Includes many operations that are not anticipated to move up in operational readiness level.

Appendix 2: Materials used by Messrs. Roberts and Gruber

Class II FOMC – Restricted (FR)

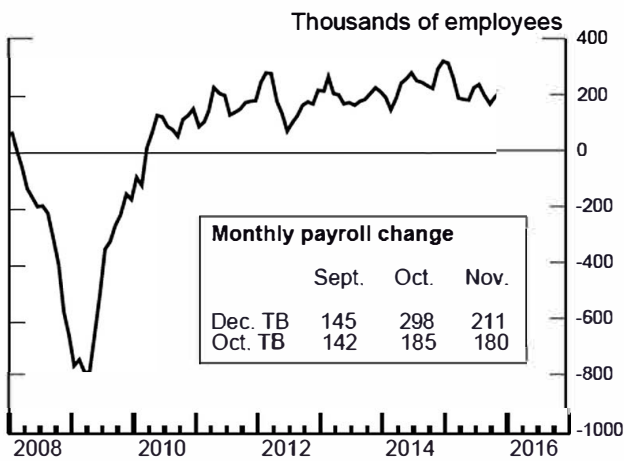
Material for

**Staff Presentation on the Economic and Financial
Situation**

John M. Roberts and Joseph W. Gruber
December 15, 2015

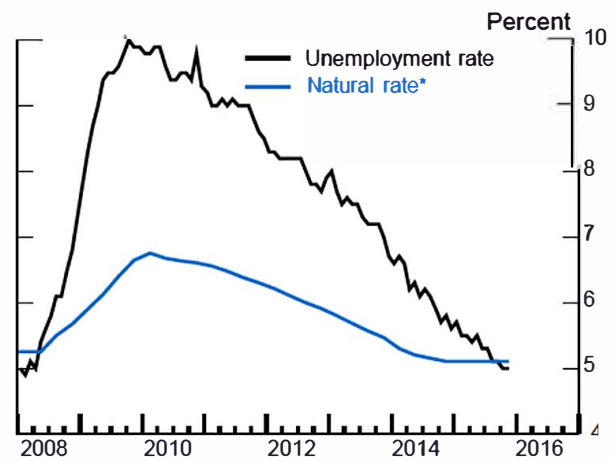
Recent Developments

1. Change in Total Payroll Employment*



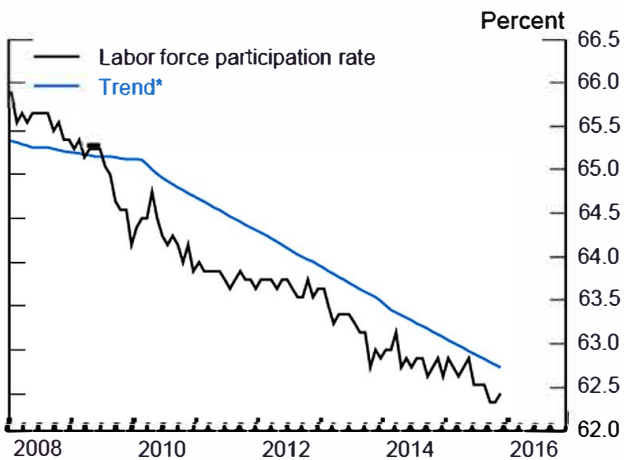
* Excluding decennial census hiring.
Note: Three-month moving average.

2. Unemployment Rate



* Staff estimate including the effect of extended unemployment benefits.

3. Labor Force Participation Rate



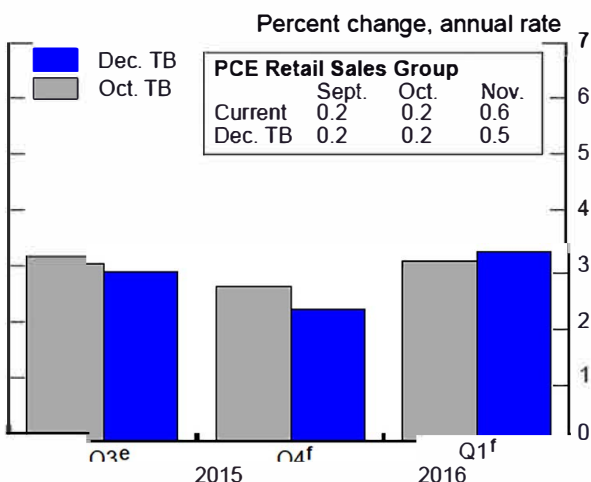
* Staff estimate including the effect of extended unemployment benefits.

4. Manufacturing IP (Percent change, annual rate)

	2015		
	H1 ^e	Q3 ^f	Q4 ^f
1. Manufacturing	0.4	3.4	1.5
2. Oct. TB	0.4	2.5	-1.4
3. Manufacturing ex. motor vehicles	-0.1	2.1	2.0
4. Oct. TB	-0.2	1.3	-0.5

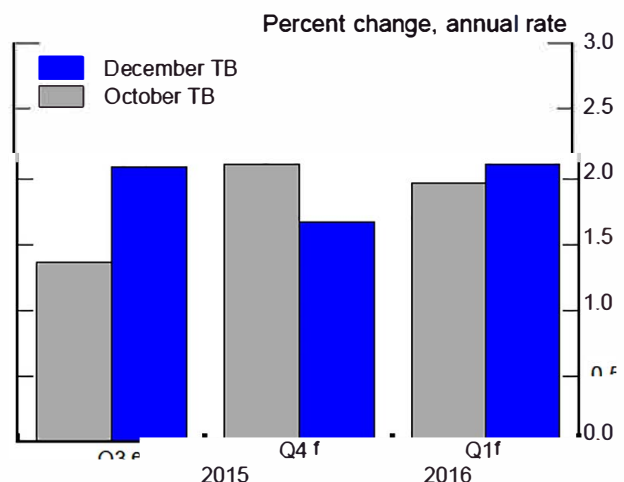
e: Staff estimate. f: Staff forecast

5. Real PCE



e: Staff estimate. f: Staff forecast.

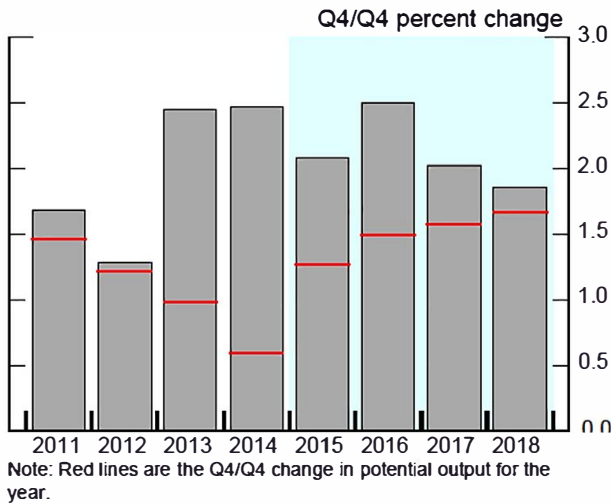
6. Real GDP



e: Staff estimate. f: Staff forecast.

Medium-Term Outlook

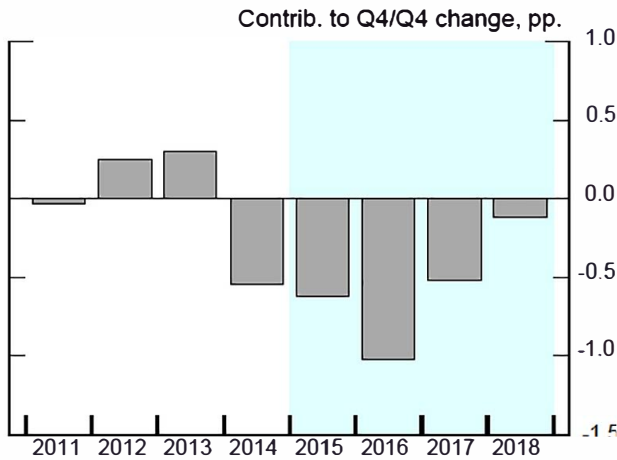
1. Real GDP



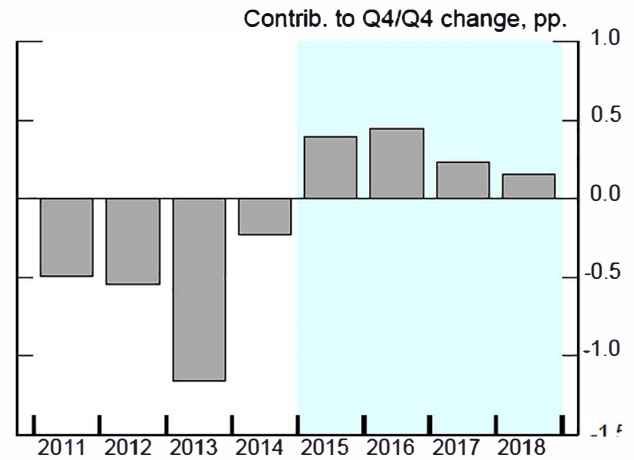
2. Key Determinants of the Contour

- Net exports expected to continue to be a substantial drag in 2016 and 2017.
- After several years in which fiscal policy restrained the recovery, it now provides a modest boost.
- The high level of wealth is expected to continue to boost consumer spending.

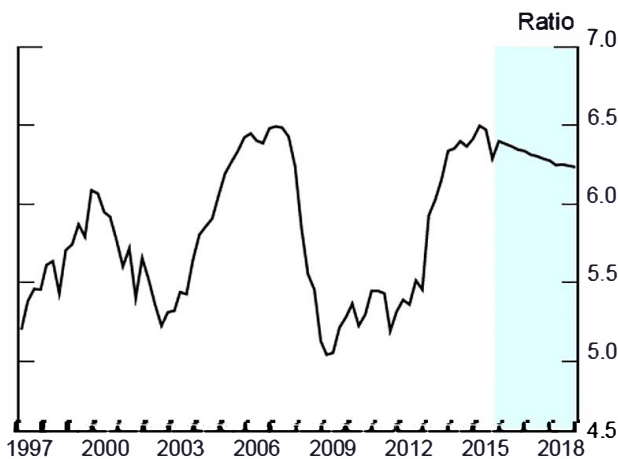
3. Contribution of Net Exports



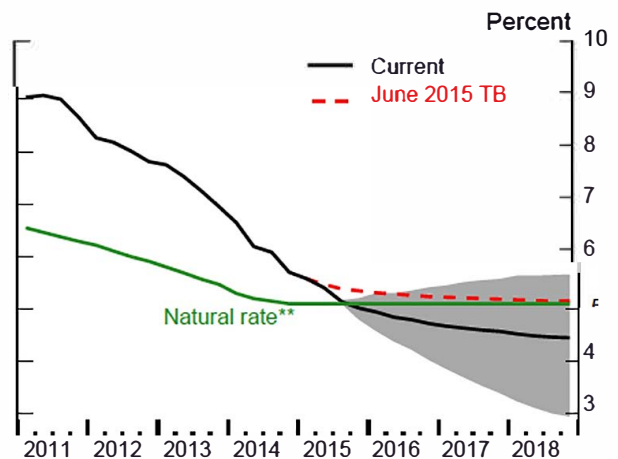
4. Fiscal Impetus



5. Wealth-to-Income Ratio



6. Unemployment Rate*



* Gray shaded area gives 70% confidence interval based on FRB/US stochastic simulations.

** Adjusted for effect of extended unemployment benefits.

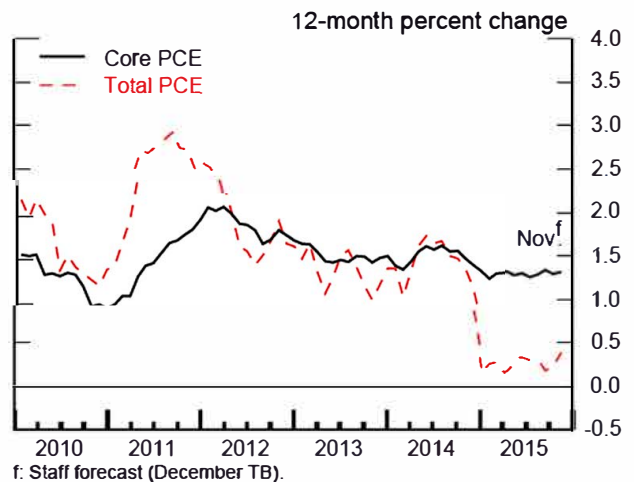
Inflation

1. Near-Term PCE Inflation (Percent change, annual rate)

	2015		2016
	Q3	Q4 ^f	Q1 ^f
1. Total PCE	1.3	0.0	0.0
2. Core PCE	1.3	1.2	1.4

f. Staff forecast (December TB).

2. Total and Core PCE Prices

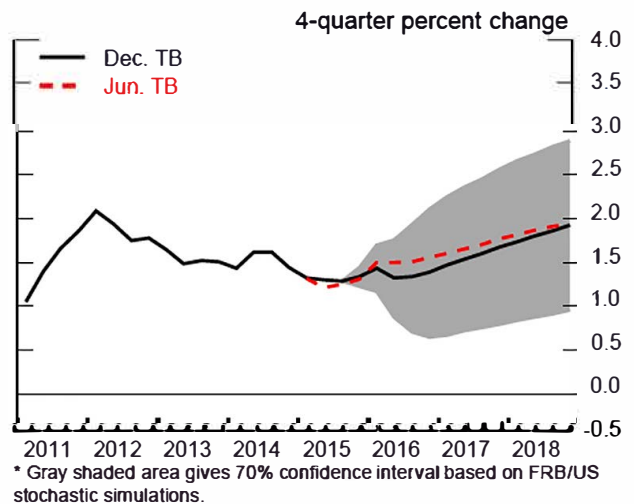


3. Decomposition of Core PCE Inflation Contrib. to Q4/Q4 change, pp.

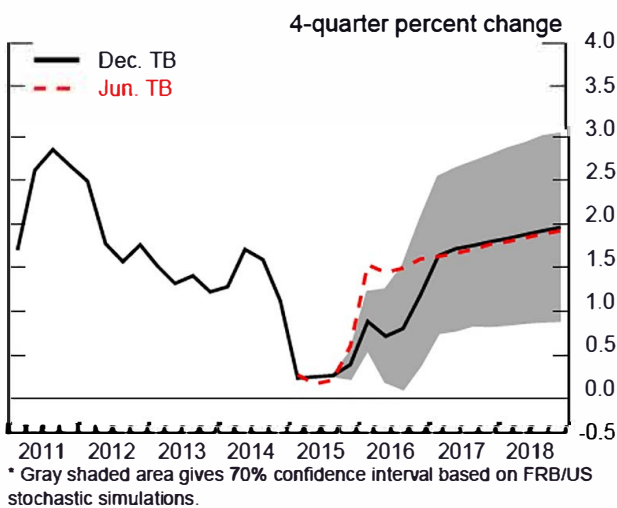
	2015	2016	2017	2018
1. Core PCE inflation	1.30	1.40	1.70	1.90
2. Energy and Import prices	-0.45	-0.40	-0.10	0.00
3. Resource utilization	-0.05	0.05	0.10	0.10
4. Other factors	0.00	-0.10	-0.10	0.00
5. Underlying inflation	1.80	1.80	1.80	1.85

Note: Rounded to the nearest 0.05.

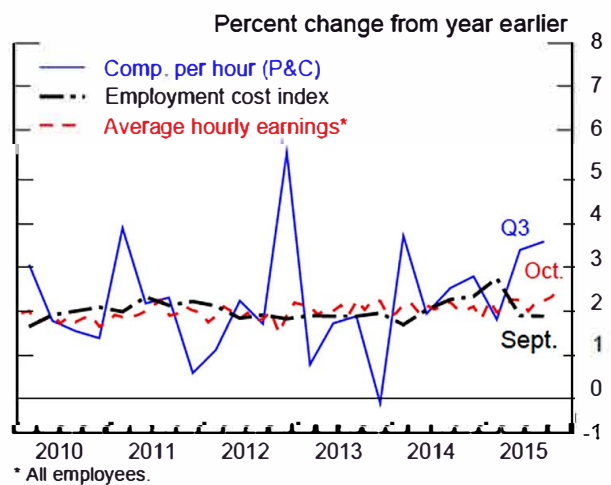
4. Core PCE Prices*



5. PCE Prices*



6. Labor Compensation



A Recession at the ZLB

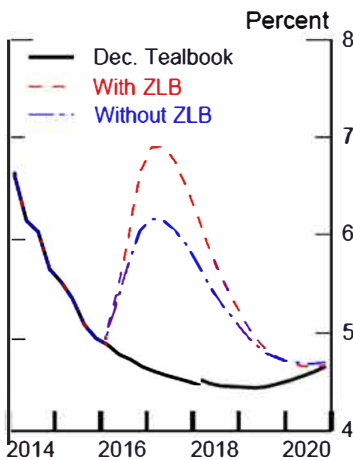
1. Recession Risk

- Recessions don't die of old age.
- Nonetheless, there is about a 15-to-20 percent chance that a recession will occur in any given year – and thus close to a 50 percent chance over medium term.
- We consider the implications of a recession that starts in 2016:Q2, when the federal funds rate is forecast to still be near the ZLB.

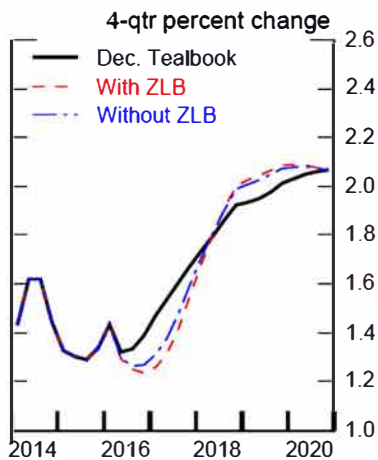
2. Calibration

- Based on the five more-moderate recessions since 1960.
- GDP falls 0.75 percent from peak to trough.
- The federal funds rate falls 275 basis points.
- Assumes no unconventional policy.

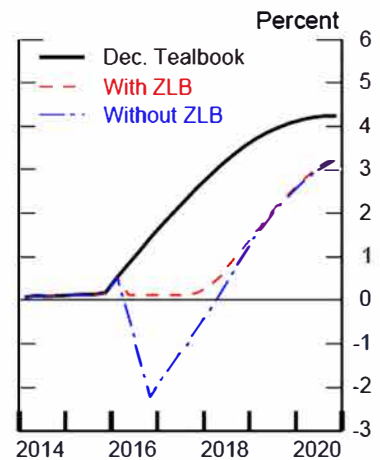
3. Unemployment



4. Core Inflation



5. Federal Funds Rate



6. Additional Considerations

- As the economy recovers and the funds rate rises, there will be more room to cut the funds rate.
- Starting in 2018, there would be room to accommodate a 275-basis-point funds rate cut.
- However, a recession may not be moderate; taking account the severe recessions as well, the average drop in the funds rate has been 400 basis points.
- Moreover, in our scenario, EDO's estimate of the equilibrium funds rate drops by 650 basis points.

The Foreign Outlook

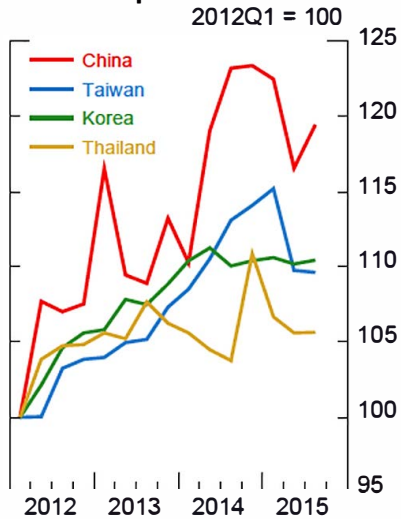
1. Real GDP*

Percent change, annual rate

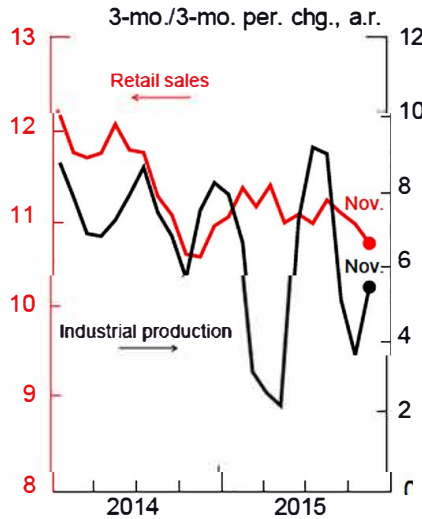
	2015				2016	2017	2018
	Q1	Q2	Q3	Q4			
1. Total Foreign	1.8	1.3	2.4	2.3	2.8	2.8	2.9
<i>October Tealbook</i>	1.7	1.1	2.3	2.4	2.8	2.8	2.9
2. Emerging Market Economies	2.5	2.0	3.0	2.8	3.5	3.8	3.9
<i>Of which:</i>							
3. Emerging Asia ex. China	3.4	1.9	3.6	3.6	4.2	4.1	4.1
4. China	5.7	7.2	7.2	6.5	6.3	6.1	6.0
5. Brazil	-3.3	-8.0	-6.7	-4.2	-0.7	1.6	2.1
6. Advanced Foreign Economies	1.0	0.6	1.8	1.7	2.0	1.8	1.9
<i>Of which:</i>							
7. Canada	-0.7	-0.3	2.3	2.0	2.1	1.9	1.8
8. Japan	4.4	-0.5	1.0	1.0	1.1	-0.3	1.0
9. Euro Area	2.2	1.6	1.2	1.4	2.0	2.1	2.1
10. UK	1.5	2.6	1.9	2.3	2.5	2.4	2.3

* GDP aggregates weighted by shares of U.S. merchandise exports.

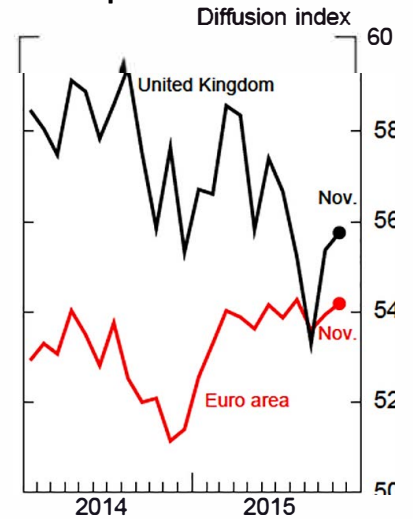
2. Real Exports



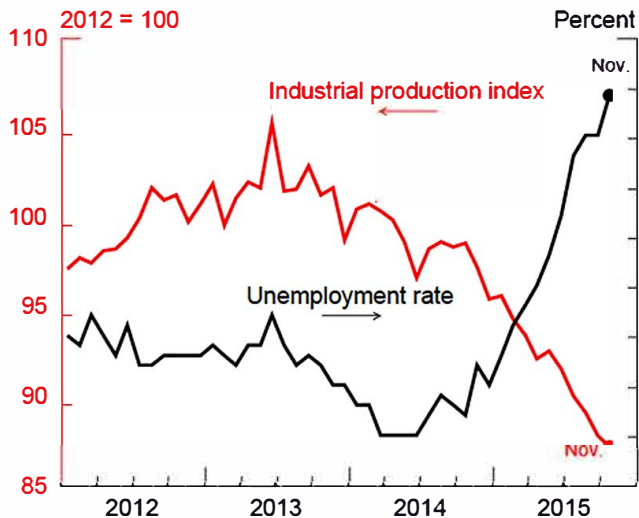
3. China



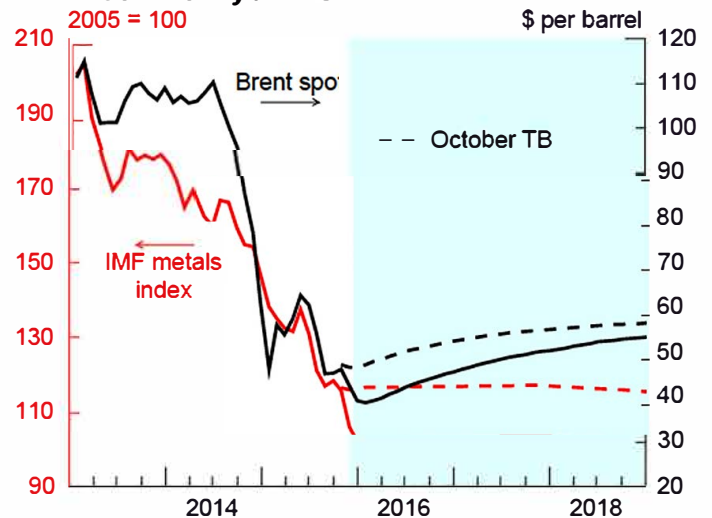
4. Composite PMI



5. Brazil



6. Commodity Prices

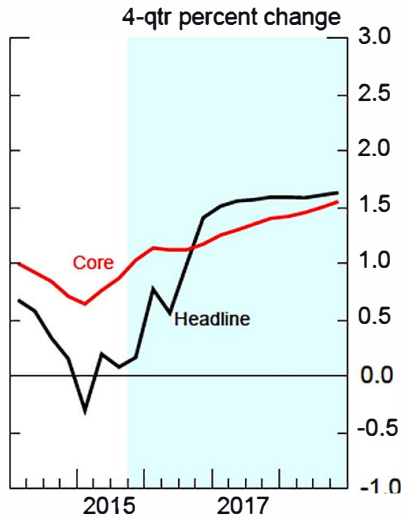


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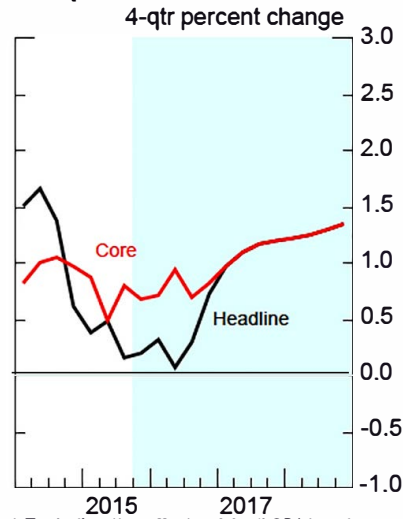
Exhibit 6

Monetary Policy

1. Euro Area Inflation

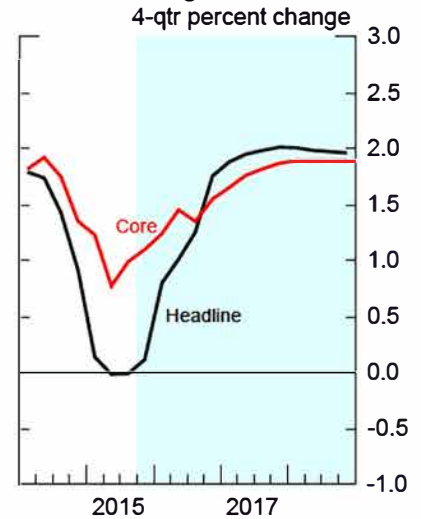


2. Japan Inflation*



* Excluding the effects of April 2014 and planned 2017 tax hikes.

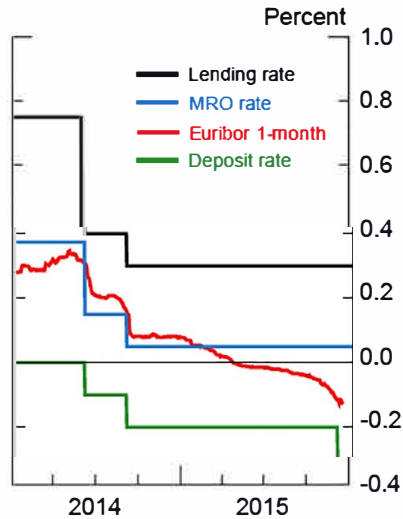
3. United Kingdom Inflation



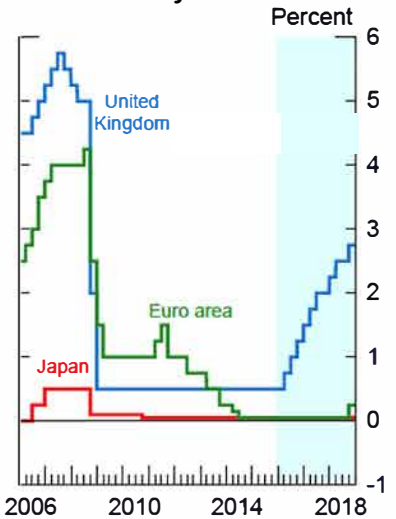
4. ECB Dec. 3 Policy Action

- Extended duration of current asset purchase program (APP) by six months to March 2017.
- Expanded assets available for purchase to include regional and local government debt.
- Reinvestment of APP holdings as they mature.
- Reduced the rate on deposit facility by 10 bp to minus 0.30 percent.

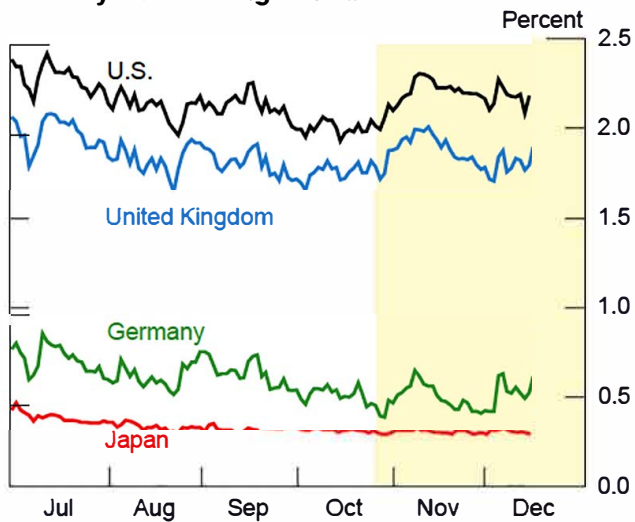
5. Euro Area Interest Rates



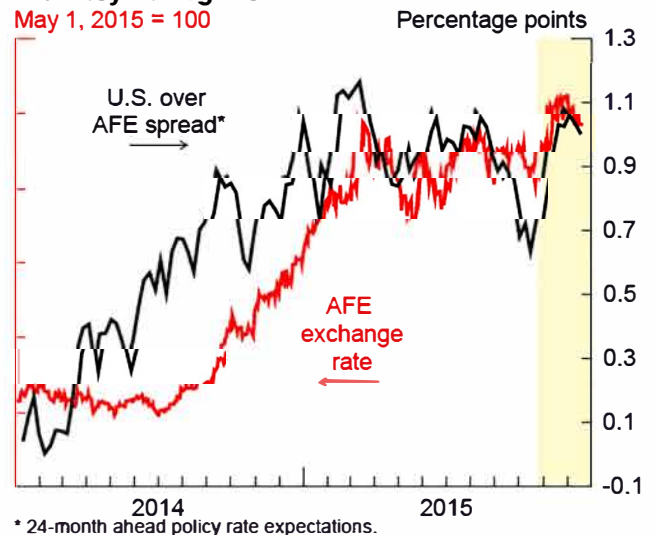
6. AFE Policy Rates



7. Ten-year Sovereign Yields



8. Policy Divergence

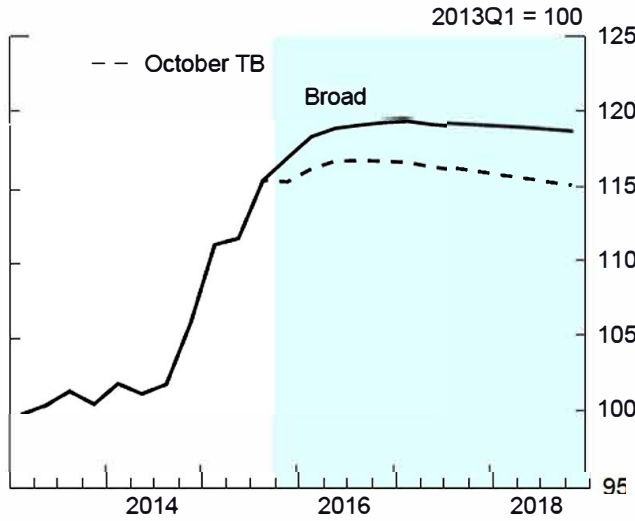


Class II FOMC - Restricted (FR)

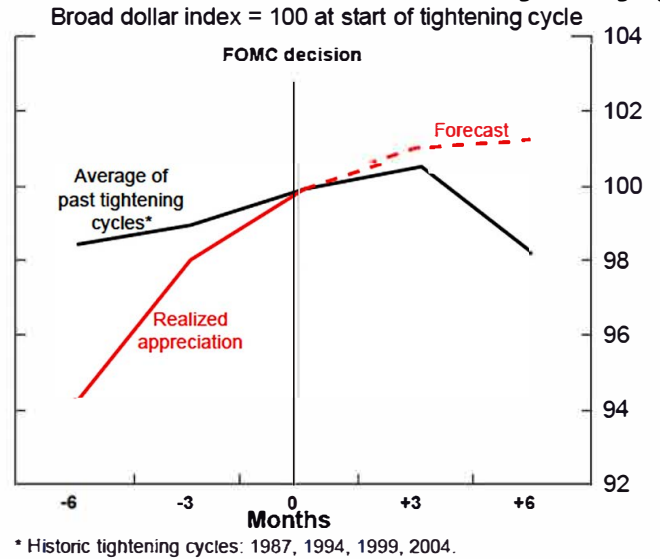
Exhibit 7

Liftoff

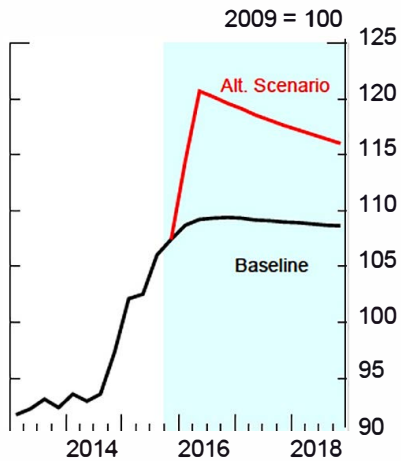
1. Real Dollar



2. Dollar Moves Around the Start of a Tightening Cycle

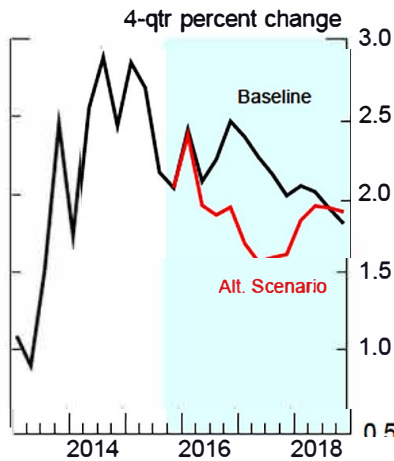


3. Real Dollar

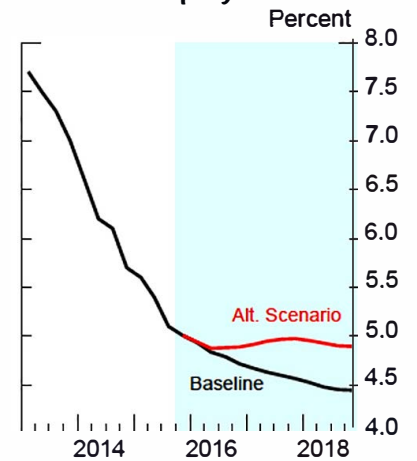


Alternative Scenario - Stronger Dollar

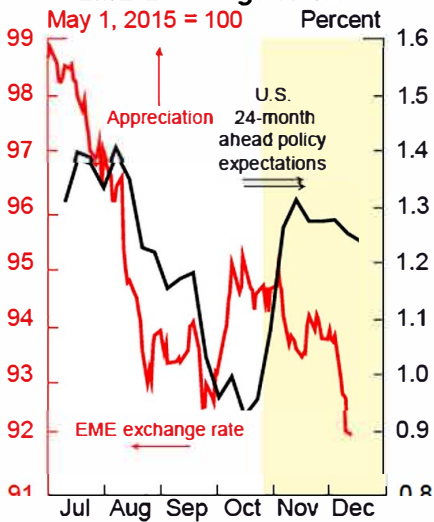
4. U.S. GDP



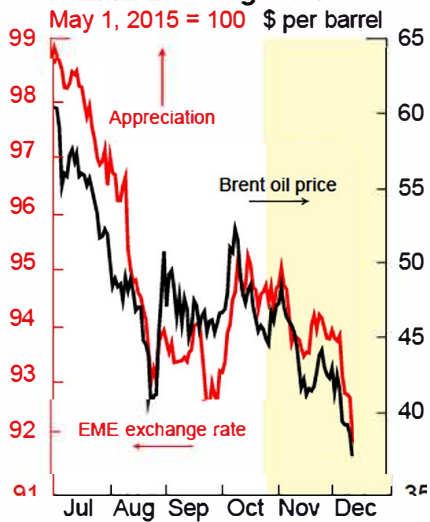
5. U.S. Unemployment Rate



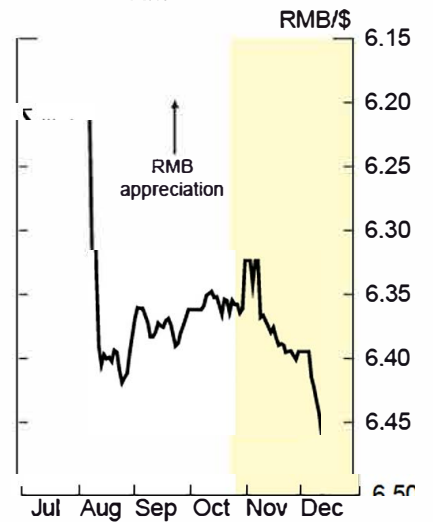
6. EME Exchange Rates



7. EME Exchange Rates

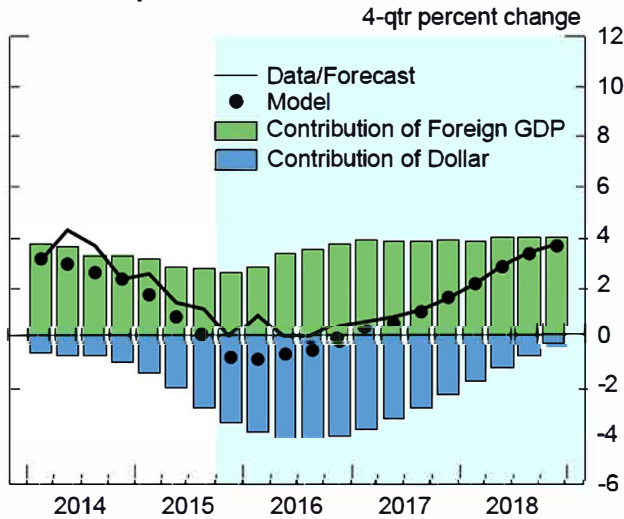


8. China RMB

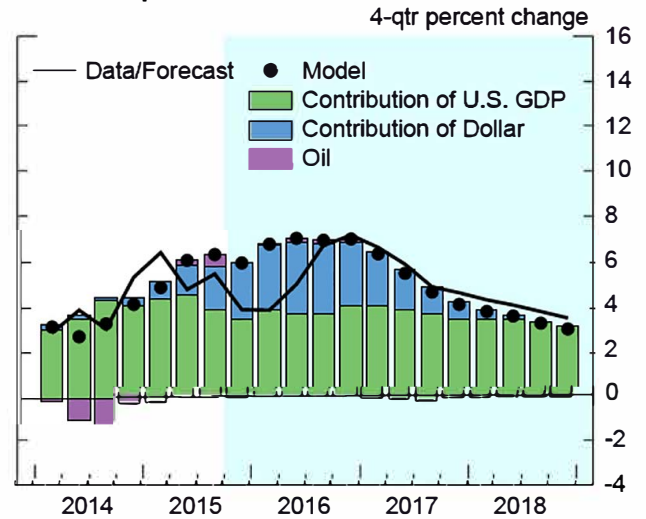


U.S. Trade

1. Real Exports of Goods and Services



2. Real Imports of Goods and Services

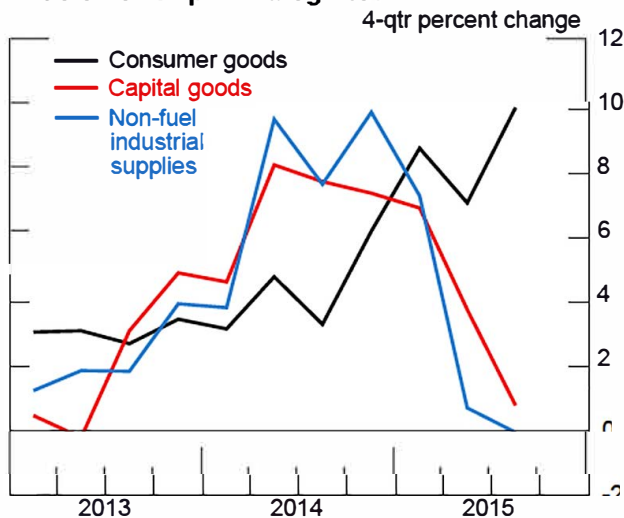


3. Trade in Real Goods and Services*

	2014	2015	2016	2017	2018
		H1	Q3	Q4	
Growth Rates (percent, annual rate)					
1. Exports	2.4	-0.6	0.7	0.5	0.5
October TB			0.8	1.8	1.1
2. Imports	5.4	5.1	1.9	3.8	7.2
October TB			4.4	6.4	6.7
Contribution to Real GDP Growth (percentage points, annual rate)					
3. Net Exports	-0.5	-0.9	-0.2	-0.5	-1.0
October TB			-0.6	-0.7	-0.9

* Updated from December Tealbook for recent data. Percent change from final quarter of preceding period to final quarter of period indicated.

4. Selected Import Categories



Appendix 3: Materials used by Mr. Wu

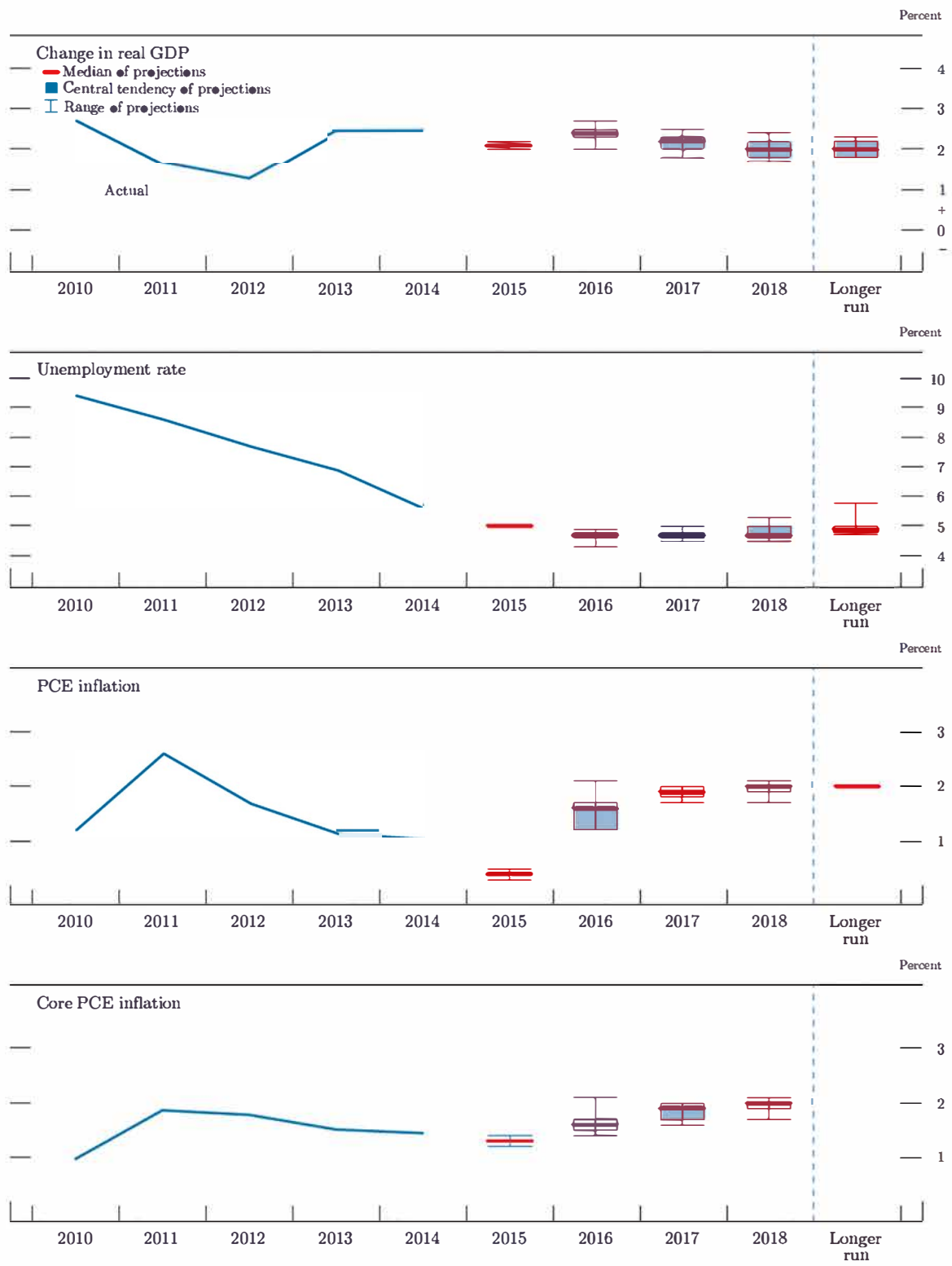
Class I FOMC – Restricted Controlled (FR)

Material for the Briefing on the

Summary of Economic Projections

Jason Wu
December 15, 2015

Exhibit 1. Medians, central tendencies, and ranges of economic projections, 2015–18 and over the longer run



NOTE: The data for the actual values of the variables are annual. 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.

Exhibit 2. Economic projections for 2015–18 and over the longer run (percent)

Change in real GDP

	2015	2016	2017	2018	Longer run
Median.....	2.1	2.4	2.2	2.0	2.0
September projection.....	2.1	2.3	2.2	2.0	2.0
Range.....	2.0 – 2.2	2.0 – 2.7	1.8 – 2.5	1.7 – 2.4	1.8 – 2.3
September projection.....	1.9 – 2.5	2.1 – 2.8	1.9 – 2.6	1.6 – 2.4	1.8 – 2.7
Memo: Tealbook.....	2.1	2.5	2.0	1.9	1.9
September projection.....	2.0	2.1	2.0	1.8	1.9

Unemployment rate

	2015	2016	2017	2018	Longer run
Median.....	5.0	4.7	4.7	4.7	4.9
September projection.....	5.0	4.8	4.8	4.8	4.9
Range.....	5.0	4.3 – 4.9	4.5 – 5.0	4.5 – 5.3	4.7 – 5.8
September projection.....	4.9 – 5.2	4.5 – 5.0	4.5 – 5.0	4.6 – 5.3	4.7 – 5.8
Memo: Tealbook.....	5.0	4.7	4.6	4.5	5.1
September projection.....	5.0	4.9	4.8	4.7	5.1

PCE inflation

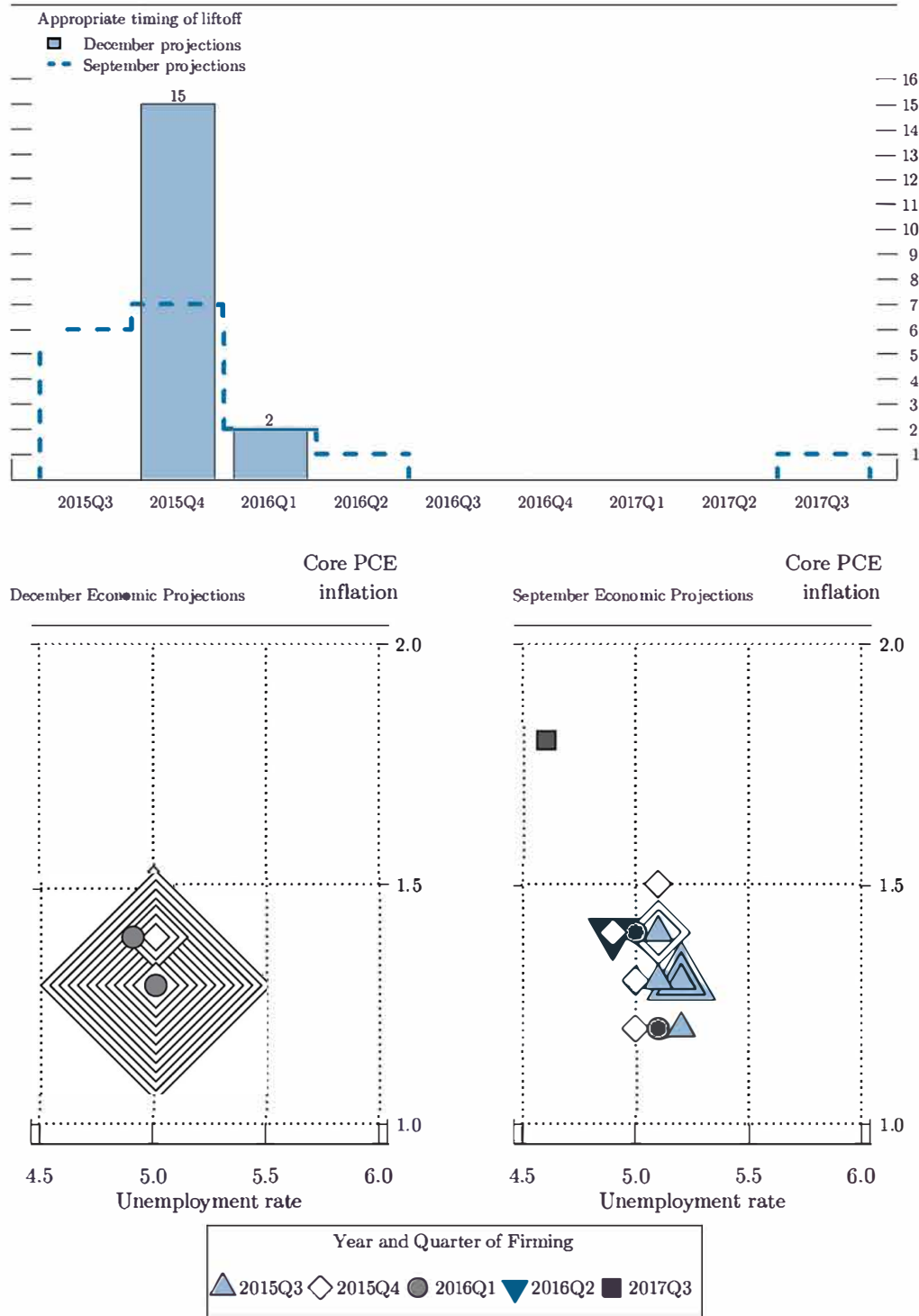
	2015	2016	2017	2018	Longer run
Median.....	0.4	1.6	1.9	2.0	2.0
September projection.....	0.4	1.7	1.9	2.0	2.0
Range.....	0.3 – 0.5	1.2 – 2.1	1.7 – 2.0	1.7 – 2.1	2.0
September projection.....	0.3 – 1.0	1.5 – 2.4	1.7 – 2.2	1.8 – 2.1	2.0
Memo: Tealbook.....	0.4	1.2	1.8	2.0	2.0
September projection.....	0.3	1.5	1.7	1.9	2.0

Core PCE inflation

	2015	2016	2017	2018
Median.....	1.3	1.6	1.9	2.0
September projection.....	1.4	1.7	1.9	2.0
Range.....	1.2 – 1.4	1.4 – 2.1	1.6 – 2.0	1.7 – 2.1
September projection.....	1.2 – 1.7	1.5 – 2.4	1.7 – 2.2	1.8 – 2.1
Memo: Tealbook.....	1.3	1.4	1.7	1.9
September projection.....	1.3	1.4	1.7	1.9

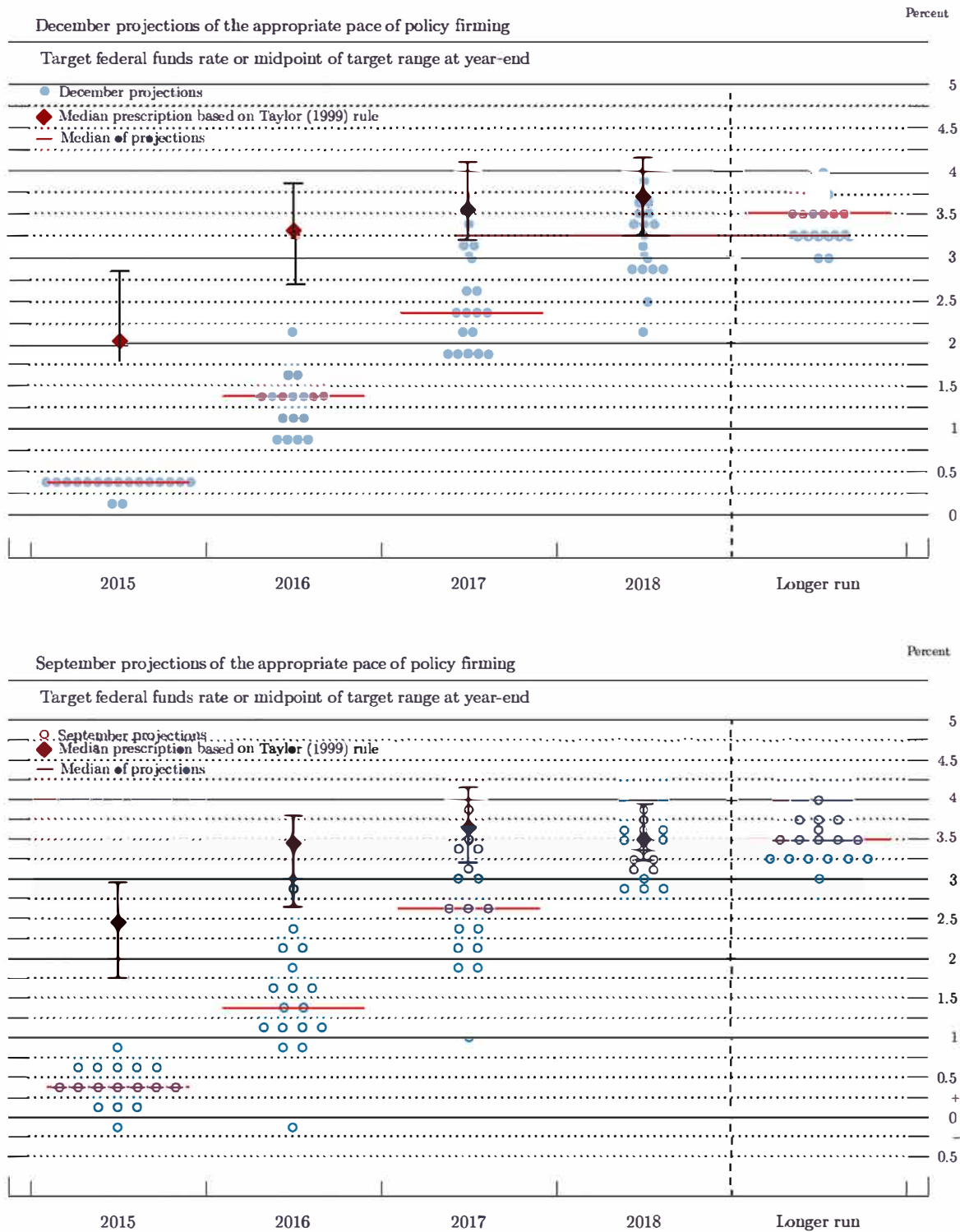
* The percent changes in real GDP and inflation are measured Q4/Q4. Projections for the unemployment rate are for the average civilian unemployment rate in the fourth quarter of the year indicated.

Exhibit 3. FOMC participants' assessments of the timing of and economic conditions at liftoff



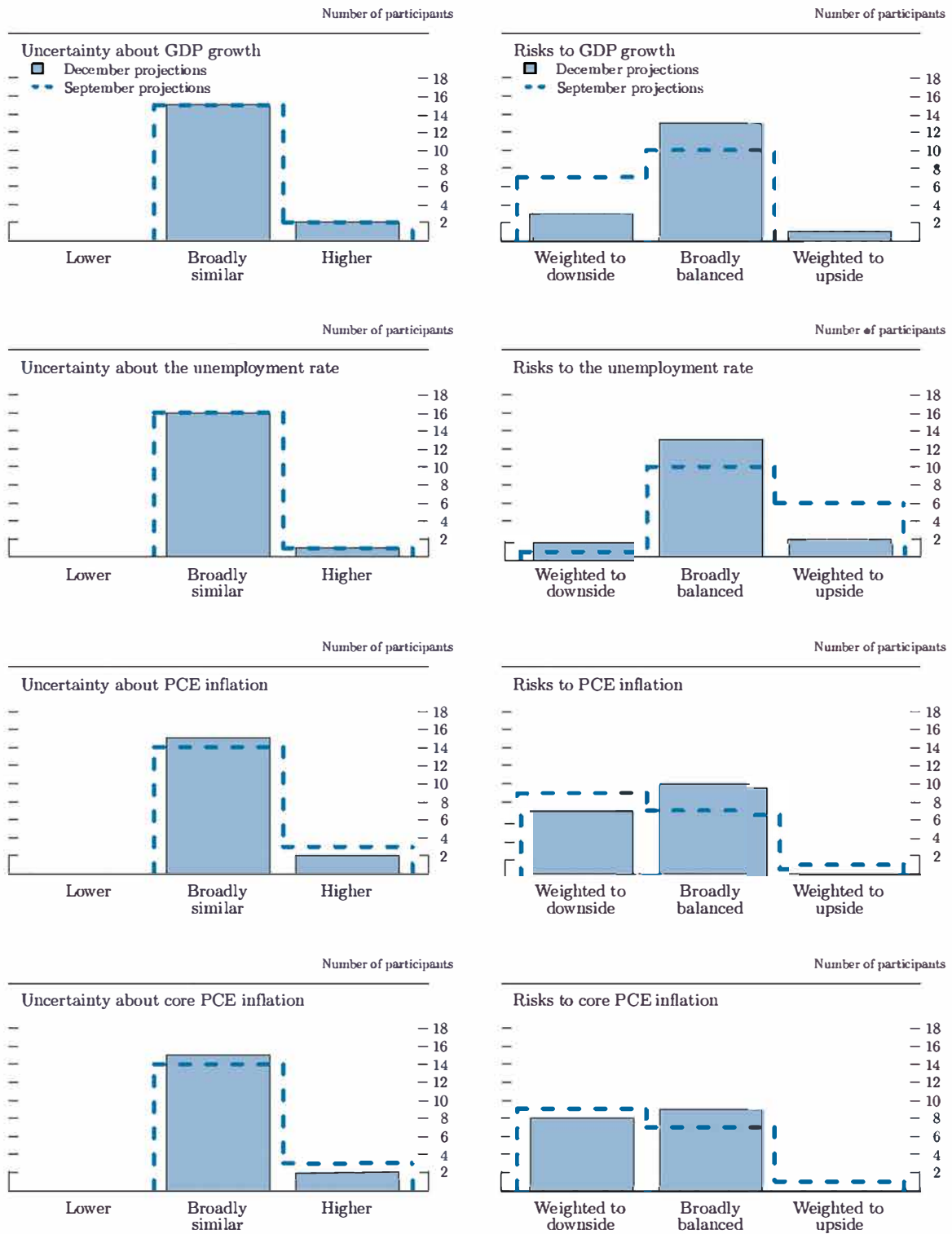
NOTE: In the upper panel, the height of each bar denotes the number of FOMC participants who judge that, under appropriate monetary policy, the first increase in the target range for the federal funds rate from its current range of 0 to 1/4 percent will occur in the specified calendar year and quarter. In the lower panels, percent change in core PCE is measured Q4/Q4 and when the projections of two or more participants are identical, larger markers, which represent one participant each, are used so that each projection can be seen.

Exhibit 4. Overview of FOMC participants' assessments of appropriate monetary policy



NOTE: In the two panels above, each circle indicates the value (rounded to the nearest 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 the federal funds rate at the end of the specified calendar year or over the longer run. The red diamonds for each year represent the median of the federal funds rate prescriptions that were derived by taking each participant's projections for the unemployment gap, core PCE inflation and longer-run nominal federal funds rate for that year and inserting them into the non-inertial Taylor (1999) rule. The whiskers represent the central tendency of the prescriptions of the non-inertial Taylor (1999) rule using participants' projections.

Exhibit 5. Uncertainty and risks in economic projections



Appendix 4: Materials used by Mr. Laubach

Class I FOMC – Restricted Controlled (FR)

Material for

Briefing on Monetary Policy Alternatives

Thomas Laubach
December 15–16, 2015

Exhibit 1: Policy Alternatives A, B, and C**Current and Expected Economic Developments***Labor Market*

- All alternatives report further improvement in the labor market

Inflation

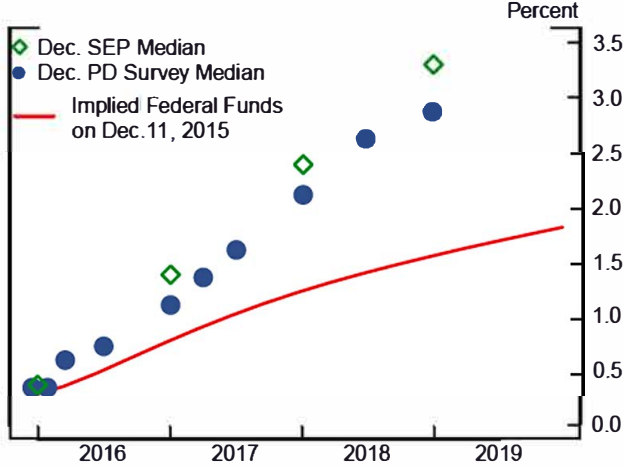
- Alternatives B and C
 - Both characterize inflation as continuing below the Committee's objective
 - Alternative B describes market and survey measures of inflation expectations, respectively, as low and having edged down while alternative C characterizes these measures as stable
 - Both B and C reaffirm the expectation that inflation will rise to 2 percent over the medium term and state reasonable confidence in that forecast
 - Alternative B retains the need to monitor inflation closely in paragraph 2 and emphasizes that intention in paragraph 4
- Alternative A
 - The Committee is not sufficiently confident in the outlook for inflation
 - Cites "subdued" inflation, core inflation, and gains in labor compensation; also cites "low" measures of inflation expectations
 - Current shortfall from 2 percent is "only partly" attributable to transitory factors that will "eventually" dissipate
 - Committee is prepared to add accommodation if information does not soon indicate inflation moving up toward 2 percent

Communicating the Expected Funds Rate Path

- *Adjustments will be gradual if the economy evolves as expected*
 - Alternative B: The Committee's economic outlook is consistent with "gradual adjustments" and economic conditions are likely to "evolve in a manner that will warrant only gradual increases"
 - Alternative C refers to "appropriate adjustments" in paragraph 2 and omits "only" in paragraph 4.
 - Both state that the funds rate is likely to remain, for some time, below levels expected to prevail in the longer run
- *Adjustments will be conditional on economic conditions*
 - Both state that "the timing and size of future adjustments" will depend on "realized and expected economic conditions" relative to objectives and
 - The actual path "will depend on the economic outlook as informed by the incoming data"

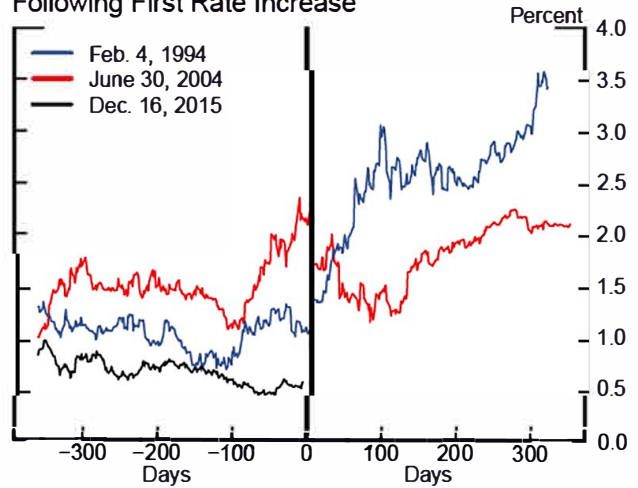
Exhibit 2: Monetary Policy Expectations

Federal Funds Rate Projections



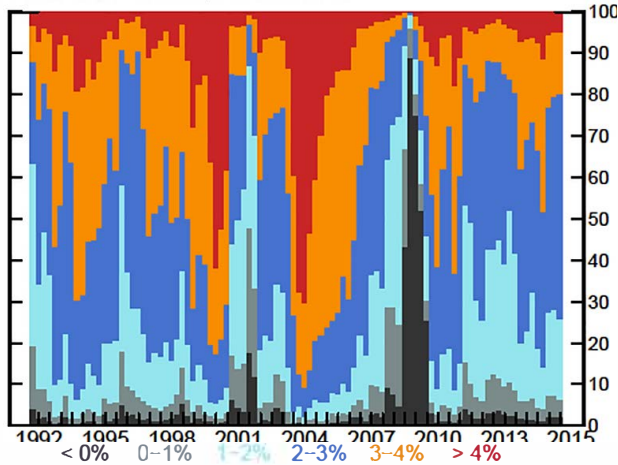
Note: The implied federal funds rate path is estimated using OIS quotes with a spline approach and a term premium of zero basis points.
 Source: Bloomberg, FRBNY Primary Dealer Survey sell-side results, December 2015 SEP, and staff calculations.

Expected Pace of Tightening during the Year Following First Rate Increase



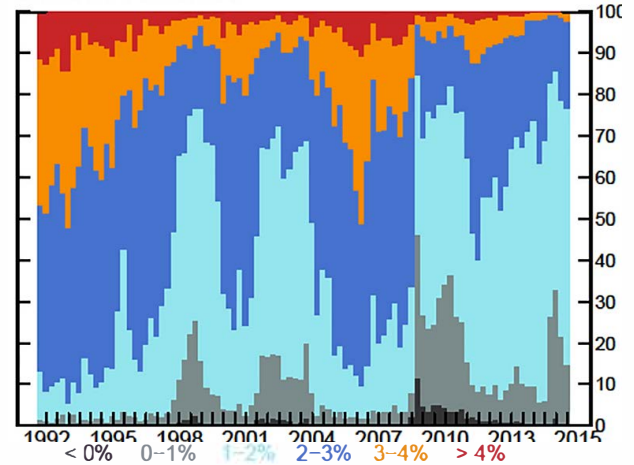
Note: Expected pace of tightening is the difference in the expected federal funds rate one year after first rate increase and federal funds rate upon first rate increase based on Eurodollar futures and basis swaps.
 Source: CME and Staff Calculations

Survey-based Probabilities of Year-Ahead Real GDP Growth Outcomes



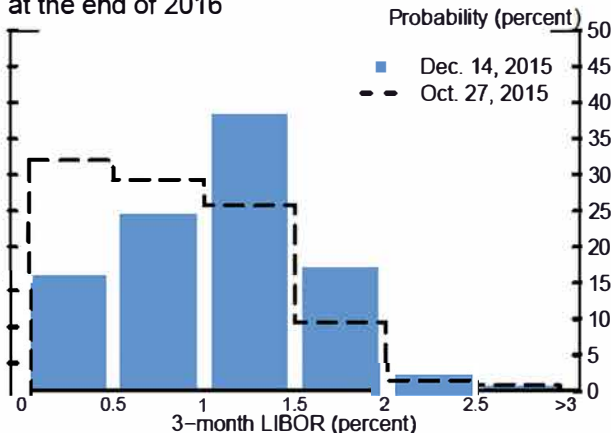
Note: Data represent averages across respondents' individual probability estimates. Year-ahead estimates are calculated as weighted averages of estimates for the current and next calendar years.
 Source: Survey of Professional Forecasters.

Survey-based Probabilities of Year-Ahead Inflation Outcomes



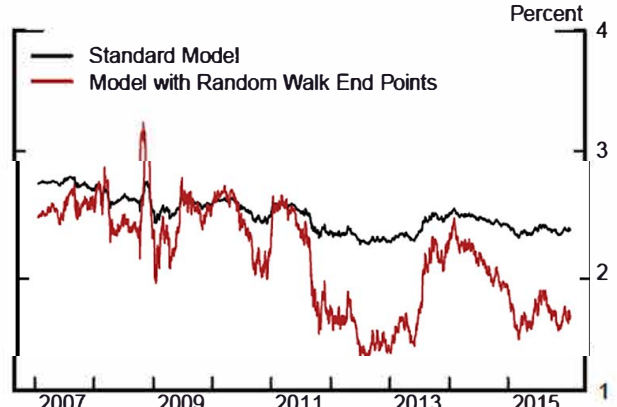
Note: Data represent averages across respondents' individual probability estimates. Year-ahead estimates are calculated as weighted averages of estimates for the current and next calendar years.
 Source: Survey of Professional Forecasters.

Implied Distribution of 3-month LIBOR at the end of 2016



Note: Risk-neutral probability density function obtained from Eurodollar futures options expiring in Dec. 2016. Based on lognormal-mixture parameterization.
 Source: CME and staff estimates.

5-to-10-Year Expected Inflation



Note: Based on latent factor term structure models fitted to nominal Treasury yields, TIPS yields, CPI inflation, and survey forecasts of inflation short rates. The standard model assumes stationary factors. The model with random walk end points assumes that the most persistent factor follows a random walk.
 Source: FRBNY, BLS, Blue Chip Forecasts, SPF, and staff calculations.

OCTOBER 2015 FOMC STATEMENT

1. Information received since the Federal Open Market Committee met in September suggests that economic activity has been expanding at a moderate pace. Household spending and business fixed investment have been increasing at solid rates in recent months, and the housing sector has improved further; however, net exports have been soft. The pace of job gains slowed and the unemployment rate held steady. Nonetheless, labor market indicators, on balance, show that underutilization of labor resources has diminished since early this year. Inflation has continued to run below the Committee's longer-run objective, partly reflecting declines in energy prices and in prices of non-energy imports. Market-based measures of inflation compensation moved slightly lower; survey-based measures of longer-term inflation expectations have remained stable.
2. Consistent with its statutory mandate, the Committee seeks to foster maximum employment and price stability. The Committee expects that, with appropriate policy accommodation, economic activity will expand at a moderate pace, with labor market indicators continuing to move toward levels the Committee judges consistent with its dual mandate. The Committee continues to see the risks to the outlook for economic activity and the labor market as nearly balanced but is monitoring global economic and financial developments. Inflation is anticipated to remain near its recent low level in the near term but the Committee expects inflation to rise gradually toward 2 percent over the medium term as the labor market improves further and the transitory effects of declines in energy and import prices dissipate. The Committee continues to monitor inflation developments closely.
3. To support continued progress toward maximum employment and price stability, the Committee today reaffirmed its view that the current 0 to $\frac{1}{4}$ percent target range for the federal funds rate remains appropriate. In determining whether it will be appropriate to raise the target range at its next meeting, the Committee will assess progress—both realized and expected—toward 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. The Committee anticipates that it will be appropriate to raise the target range for the federal funds rate when it has seen some further improvement in the labor market and is reasonably confident that inflation will move back to its 2 percent objective over the medium term.
4. 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. This policy, by keeping the Committee's holdings of longer-term securities at sizable levels, should help maintain accommodative financial conditions.
5. When the Committee decides to begin to remove policy accommodation, it will take a balanced approach consistent with its longer-run goals of maximum employment and inflation of 2 percent. The Committee currently anticipates that, even after employment and inflation are near mandate-consistent levels, economic conditions

may, for some time, warrant keeping the target federal funds rate below levels the Committee views as normal in the longer run.

ALTERNATIVE A FOR DECEMBER 2015

1. Information received since the Federal Open Market Committee met in ~~September~~ **October** suggests that economic activity has been expanding at a moderate pace. Household spending and business fixed investment have been increasing at solid rates in recent months, and the housing sector has improved further; however, net exports have been soft. ~~The pace of job gains slowed and the unemployment rate held steady.~~ Nonetheless, **A range of recent labor market indicators, on balance, including ongoing job gains and declining unemployment, show further improvement and confirms** that underutilization of labor resources has diminished **appreciably** since early this year. **In contrast, both overall and core inflation has have** continued to run below the Committee's longer-run objective, **only** partly reflecting declines in energy prices and in prices of non-energy imports. Market-based measures of inflation compensation ~~moved slightly lower~~ **remain low; some** survey-based measures of longer-term inflation expectations have ~~remained stable~~ **edged down**.
2. Consistent with its statutory mandate, the Committee seeks to foster maximum employment and price stability. The Committee expects that, with appropriate policy accommodation, economic activity will expand at a moderate pace, with labor market indicators continuing to move toward levels the Committee judges consistent with its dual mandate. The Committee continues to see the risks to the outlook for economic activity and the labor market as nearly balanced but is monitoring global economic and financial developments. Inflation is anticipated to remain near its recent low level in the near term but the Committee expects inflation to rise gradually toward 2 percent over the medium term as the labor market improves further and the transitory effects of declines in energy and import prices **eventually** dissipate. The Committee continues to **will closely** monitor **measures of actual and expected** inflation developments closely.
3. ~~To support continued progress toward maximum employment and price stability~~ **With inflation, core inflation, and gains in labor compensation all subdued, and with market-based measures of inflation compensation and survey-based measures of longer-term inflation expectations both low,** the Committee today reaffirmed its view that the current 0 to ¼ percent target range for the federal funds rate remains appropriate. In determining ~~whether it will be appropriate to raise the~~ **how long to maintain this** target range ~~at its next meeting,~~ the Committee will assess progress—both realized and expected—toward 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. ~~The Committee anticipates that it will be appropriate to raise the target range for the federal funds rate when it has seen some further improvement in the labor market and is reasonably confident that inflation will move back to its 2 percent objective over the medium term.~~ **The Committee is prepared to provide additional accommodation if incoming information does not soon indicate that inflation is moving up toward 2 percent.**
4. 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. This policy, by keeping the Committee's holdings of longer-term securities at sizable levels, should help maintain accommodative financial conditions.

5. ~~When the Committee decides to begin to remove policy accommodation, it will take a balanced approach consistent with its longer run goals of maximum employment and inflation of 2 percent. The Committee currently anticipates that, even after employment and inflation are near mandate consistent levels, economic conditions may, for some time, warrant keeping the target federal funds rate below levels the Committee views as normal in the longer run.~~

ALTERNATIVE B FOR DECEMBER 2015

1. Information received since the Federal Open Market Committee met in ~~September~~ **October** suggests that economic activity has been expanding at a moderate pace. Household spending and business fixed investment have been increasing at solid rates in recent months, and the housing sector has improved further; however, net exports have been soft. ~~The pace of job gains slowed and the unemployment rate held steady. Nonetheless,~~ **A range of recent labor market indicators, on balance, including ongoing job gains and declining unemployment, show further improvement and confirms** that underutilization of labor resources has diminished **appreciably** since early this year. Inflation has continued to run below the Committee's **2 percent** longer-run objective, partly reflecting declines in energy prices and in prices of non-energy imports. Market-based measures of inflation compensation ~~moved slightly lower~~ **remain low; some** survey-based measures of longer-term inflation expectations have ~~remained stable~~ **edged down**.
2. Consistent with its statutory mandate, the Committee seeks to foster maximum employment and price stability. The Committee **currently** expects that, with appropriate policy accommodation **gradual adjustments in the stance of monetary policy**, economic activity will **continue to** expand at a moderate pace, with **and** labor market indicators ~~continuing to move toward levels the Committee judges consistent with its dual mandate~~ **will continue to strengthen. Overall, taking into account domestic and international developments,** the Committee ~~continues to see~~ the risks to the outlook for **both** economic activity and the labor market as ~~nearly balanced but is monitoring global economic and financial developments. Inflation is anticipated to remain near its recent low level in the near term but the Committee expects inflation~~ **expected** to rise gradually toward **to** 2 percent over the medium term as the labor market improves further and the transitory effects of declines in energy and import prices dissipate **and the labor market strengthens further**. The Committee continues to monitor inflation developments closely.
3. ~~To support continued progress toward maximum employment and price stability, the Committee today reaffirmed its view that the current 0 to ¼ percent target range for the federal funds rate remains appropriate.~~ **The Committee judges that there has been considerable improvement in labor market conditions this year, and it is reasonably confident that inflation will rise, over the medium term, to its 2 percent objective. Given the economic outlook, and recognizing the time it takes for policy actions to affect future economic outcomes, the Committee decided to raise the target range for the federal funds rate to ¼ to ½ percent. The stance of monetary policy remains accommodative after this increase, thereby supporting further improvement in labor market conditions and a return to 2 percent inflation.**
4. In determining whether it will be appropriate to raise **the timing and size of future adjustments to** the target range **for the federal funds rate** at its next meeting, the Committee will assess ~~progress both realized and expected~~ **economic conditions** toward **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 anticipates **expects** that it will be appropriate to raise the target range for the federal funds rate when it has seen some further improvement in the labor market and is reasonably confident that inflation will move back to its 2 percent objective over the medium term **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.
6. ~~When the Committee decides to begin to remove policy accommodation, it will take a balanced approach consistent with its longer run goals of maximum employment and inflation of 2 percent. The Committee currently anticipates that, even after employment and inflation are near mandate consistent levels, economic conditions may, for some time, warrant keeping the target federal funds rate below levels the Committee views as normal in the longer run.~~

ALTERNATIVE C FOR DECEMBER 2015

1. Information received since the Federal Open Market Committee met in ~~September~~ **October** suggests that economic activity has been expanding at a moderate pace. Household spending and business fixed investment have been increasing at solid rates in recent months, and the housing sector has improved further; however, net exports have been soft. ~~The pace of job gains slowed and the unemployment rate held steady.~~ Nonetheless, **A range of recent labor market indicators, on balance, including ongoing job gains and declining unemployment, show further improvement and confirms** that underutilization of labor resources has diminished **appreciably** since early this year. Inflation has continued to run below the Committee's **2 percent** longer-run objective, partly reflecting declines in energy prices and in prices of non-energy imports. Market-based measures of inflation compensation ~~moved slightly lower~~ **stabilized**; survey-based measures of longer-term inflation expectations ~~have~~ **generally** remained stable.
2. Consistent with its statutory mandate, the Committee seeks to foster maximum employment and price stability. The Committee **currently** expects that, with appropriate policy accommodation **adjustments in the stance of monetary policy,** economic activity will **continue to** expand at a moderate pace, with **and** labor market indicators ~~continuing to move toward~~ **will continue to strengthen** levels the Committee judges consistent with its dual mandate. **Overall, taking into account domestic and international developments,** the Committee ~~continues to see~~ the risks to the outlook for **both** economic activity and the labor market as ~~nearly~~ balanced but is monitoring global economic and financial developments. Inflation is anticipated to remain near its recent low level in the near term but the Committee expects inflation **expected** to rise gradually toward **to** 2 percent over the medium term as the labor market improves further and the transitory effects of declines in energy and import prices dissipate **and the labor market strengthens further.** The Committee ~~continues to monitor inflation developments closely.~~
3. ~~To support continued progress toward maximum employment and price stability, the Committee today reaffirmed its view that the current 0 to ¼ percent target range for the federal funds rate remains appropriate.~~ **The Committee judges that there has been considerable improvement in labor market conditions this year, and is reasonably confident that inflation will rise, over the medium term, to its 2 percent objective. Given the economic outlook, and recognizing the time it takes for policy actions to affect future economic outcomes, the Committee decided to raise the target range for the federal funds rate to ¼ to ½ percent. Even after this increase, the stance of monetary policy remains accommodative.**
4. In determining whether it will be appropriate to raise **the timing and size of future adjustments to** the target range **for the federal funds rate** at its next meeting, the Committee will assess ~~progress both realized and expected~~ **economic conditions** toward **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. The Committee anticipates **expects** that it will be appropriate to raise the target range for

~~the federal funds rate when it has seen some further improvement in the labor market and is reasonably confident that inflation will move back to its 2 percent objective over the medium term~~ **economic conditions will evolve in a manner that will warrant gradual increases in the target for 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 anticipates doing so at least during the early stages of normalization of the federal funds rate.** This policy, by keeping the Committee's holdings of longer-term securities at sizable levels, should help maintain accommodative financial conditions.
6. ~~When the Committee decides to begin to remove policy accommodation, it will take a balanced approach consistent with its longer run goals of maximum employment and inflation of 2 percent. The Committee currently anticipates that, even after employment and inflation are near mandate consistent levels, economic conditions may, for some time, warrant keeping the target federal funds rate below levels the Committee views as normal in the longer run.~~

OCTOBER 2015 DIRECTIVE**(ALSO THE DIRECTIVE FOR DECEMBER 2015 ALTERNATIVE A)**

Consistent with its statutory mandate, the Federal Open Market Committee seeks monetary and financial conditions that will foster maximum employment and price stability. In particular, the Committee seeks conditions in reserve markets consistent with federal funds trading in a range from 0 to $\frac{1}{4}$ percent. The Committee directs the Desk to undertake open market operations as necessary to maintain such conditions. The Committee directs the Desk to maintain its policy of rolling over maturing Treasury securities into new issues and its policy of 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. The System Open Market Account manager and the secretary will keep the Committee informed of ongoing developments regarding the System's balance sheet that could affect the attainment over time of the Committee's objectives of maximum employment and price stability.

IMPLEMENTATION NOTE FOR DECEMBER 2015 ALTERNATIVES B AND C

Release Date: December 16, 2015

Decisions Regarding Monetary Policy Implementation

The Federal Reserve has made the following decisions to implement the monetary policy stance announced by the Federal Open Market Committee in its [statement](#) on December 16, 2015:

- The Board of Governors of the Federal Reserve System voted [unanimously] to raise the interest rate paid on required and excess reserve balances to 0.50 percent, effective December 17, 2015.
- 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:¹

~~“Consistent with its statutory mandate, the Federal Open Market Committee seeks monetary and financial conditions that will foster maximum employment and price stability. In particular, the Committee seeks conditions in reserve markets consistent with federal funds trading in a range from 0 to ¼ percent. **Effective December 17, 2015,** the [Federal Open Market](#) Committee directs the Desk to undertake open market operations as necessary to maintain such conditions **the federal funds rate in a target range of ¼ to ½ percent, including: (1) 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; and (2) term reverse repurchase operations to the extent approved in the resolution on term RRP operations approved by the Committee at its March 17–18, 2015, meeting.**~~

~~“The Committee directs the Desk to maintain its policy of **continue** rolling over maturing Treasury securities ~~into new issues at auction~~ and its policy of **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.”~~
~~The System Open Market Account manager and the secretary will keep the Committee informed of ongoing developments regarding the System’s balance sheet that could affect the attainment over time of the Committee’s objectives of maximum employment and price stability.~~

More information regarding open market operations may be found on the Federal Reserve Bank of New York’s [website](#).

¹ This directive supersedes the resolution on ON RRP test operations approved by the Committee at its December 16–17, 2014 meeting.

- In a related action, the Board of Governors of the Federal Reserve System voted [unanimously] to approve a $\frac{1}{4}$ percentage point increase in the primary credit rate to 1.00 percent, effective December 17, 2015. 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.

DESK STATEMENT FOR DECEMBER 2015 ALTERNATIVES B OR C

Release Date: December 16, 2015

Statement Regarding Overnight Reverse Repurchase Agreements

During its meeting on December 15-16, 2015, the Federal Open Market Committee (FOMC) directed the Open Market Trading Desk (the Desk) at the Federal Reserve Bank of New York (New York Fed), effective December 17, 2015, to undertake open market operations as necessary to maintain the federal funds rate in a target range of $\frac{1}{4}$ to $\frac{1}{2}$ percent, including overnight reverse repurchase operations (ON RRP) at an offering rate of 0.25 percent and in amounts limited only by the value of Treasury securities held outright in the System Open Market Account (SOMA) that are available for such operations and by a per-counterparty limit of \$30 billion per day.

To determine the value of Treasury securities available for ON RRP operations, several factors need to be taken into account, as not all Treasury securities held outright in the SOMA will be available for use in such operations. First, some of the Treasury securities held outright in the SOMA are needed to conduct reverse repurchase agreements with foreign official and international accounts.¹ Second, some Treasury securities are needed to support the [securities lending operations](#) conducted by the Desk. Additionally, buffers are needed to provide for possible changes in demand for these activities and for possible changes in the market value of the SOMA's holdings of Treasury securities.

Taking these factors into account, the Desk anticipates that around \$2 trillion of Treasury securities will be available for ON RRP operations to fulfill the FOMC's domestic policy directive.² In the highly unlikely event that the value of bids received in an ON RRP operation exceeds the amount of available securities, the Desk will allocate awards using a single-price auction based on the stop-out rate at which the overall size limit is reached, with all bids below this rate awarded in full at the stop-out rate and all bids at this rate awarded on a pro rata basis at the stop-out rate.

These ON RRP operations will be open to all eligible RRP counterparties, will settle same-day, and will have an overnight tenor unless a longer term is warranted to accommodate weekend, holiday, and other similar trading conventions. Each eligible counterparty is permitted to submit one proposition for each ON RRP operation, in a size not to exceed \$30 billion and at a rate not to exceed the specified offering rate. The operations will take place from 12:45 p.m. to 1:15 p.m. (Eastern Time). Any changes to these terms will be announced with at least one business day's prior notice on the New York Fed's website.

The results of these operations will be posted on the New York Fed's website. The outstanding amounts of RRP are reported on the Federal Reserve's H.4.1 statistical release as a factor absorbing reserves in Table 1 and as a liability item in Tables 5 and 6.

¹ The outstanding amounts of RRP with foreign official and international accounts are reported on the Federal Reserve's H.4.1 statistical release as a factor absorbing reserves in Table 1 and as a liability item in Tables 5 and 6.

² This amount will be reduced by any term RRP operations outstanding on the day of each ON RRP operation.

Appendix 5: Materials used by Mr. Madigan

Class I FOMC – Restricted Controlled (FR)

Updated Implementation Note

December 16, 2015

December 16, 2015

Decisions Regarding Monetary Policy Implementation

The Federal Reserve has made the following decisions to implement the monetary policy stance announced by the Federal Open Market Committee in its [statement](#) on December 16, 2015:

- The Board of Governors of the Federal Reserve System voted [unanimously] to raise the interest rate paid on required and excess reserve balances to 0.50 percent, effective December 17, 2015.
- 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:¹

~~“Consistent with its statutory mandate, the Federal Open Market Committee seeks monetary and financial conditions that will foster maximum employment and price stability. In particular, the Committee seeks conditions in reserve markets consistent with federal funds trading in a range from 0 to 1/4 percent. Effective December 17, 2015, the Federal Open Market Committee directs the Desk to undertake open market operations as necessary to maintain such conditions~~ **the federal funds rate in a target range of 1/4 to 1/2 percent, including: (1) 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; and (2) term reverse repurchase operations to the extent approved in the resolution on term RRP operations approved by the Committee at its March 17–18, 2015, meeting.**

~~“The Committee directs the Desk to maintain its policy of **continue** rolling over maturing Treasury securities ~~into new issues~~ **at auction** and its policy of **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.”~~ ~~The System Open Market Account manager and the secretary will keep the Committee informed of ongoing developments regarding the System’s balance sheet that could affect the attainment over time of the Committee’s objectives of maximum employment and price stability.~~

More information regarding open market operations may be found on the Federal Reserve Bank of New York’s [website](#).

¹ This directive supersedes the resolution on ON RRP test operations approved by the Committee at its December 16–17, 2014 meeting.

- In a related action, the Board of Governors of the Federal Reserve System voted [unanimously] to approve a 1/4 percentage point increase in [the discount rate](#) (the primary credit rate) to 1.00 percent, effective December 17, 2015. In taking this action, the Board approved requests submitted by the Boards of Directors of the Federal Reserve Banks of Boston, Philadelphia, Cleveland, Richmond, Atlanta, Chicago, St. Louis, Kansas City, Dallas, 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.

Appendix 6: Materials used by Ms. Logan

Class II FOMC – Restricted (FR)

Material for Briefing on

Term RRP Operations Over Year End

Simon Potter and Lorie Logan

December 16, 2015

December 2015 Term RRP

Operation Date	Maturity Date	Term	Amount Offered	Max. Rate (BPS)
Dec 18	Jan 04	17 Days	50	ON RRP + 0
Dec 23	Jan 04	12 Days	100	ON RRP + 0
Dec 30	Jan 05	6 Days	150*	ON RRP + 0

*Any undersubscribed capacity from either of the December 18 and December 23 term RRP operations will be added to the offering size of the December 30 term RRP operation.