Monetary Policy Determination

Driehaus College of Business; DePaul University
Finance 513 – Money and Capital Markets Lecture
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Overview

- **The Federal Reserve has multiple responsibilities**
  - Monetary policy
  - Financial stability
  - Supervision and regulation
  - Financial services

- **Focus on monetary policy today**

- **Offer an institutional, conceptual, and empirical tour**
  - Goals
  - Tools
  - Setting optimal interest rate policy
  - Transmission mechanisms
  - Current outlook and implications for policy

Goals – The Dual Mandate

- **The Federal Reserve Act states the goals of monetary policy**

    – Price Stability

    – Maximum Employment

    – Stable Long-term Interest Rates

Goals – The Dual Mandate

- **How is it different from inflation targeting?**
  - Primary versus secondary objective
  - ECB: "To maintain price stability is the primary objective of the Eurosystem …"
  - "Without prejudice to the objective of 'price stability', the Eurosystem shall also support the general economic policies …" including " 'full employment' and 'balanced economic growth' "
  - Mandate versus practice

- **What about other goals?**
  - Value of the dollar
  - Financial stability

What Monetary Policy Can And Cannot Affect

Aggregate Supply: Mostly Immune to Monetary Policy

- **Available labor**
  - Labor force adjusted for the natural rate of unemployment

- **Effective capital stock**
  - Plant, equipment, software, housing stock, etc.

- **Productivity**
  - Technological capabilities
  - Institutions and regulations

Aggregate Demand: Sensitive to Monetary Policy

- **Household spending**
  - Incentive to save
  - Wealth effects

- **Business investment**
  - Cost of capital
  - Prospective product demand

- **Net exports**
  - Effects on dollar

- **Government purchases**

Balancing Aggregate Demand And Supply

- **Aggregate demand brought into alignment with aggregate supply by adjustments in interest rates**

- **Aggregate demand increases by lower interest rates**
  – Relevant rates: Long-run, real interest rates facing households and businesses

- **Long-run private-sector real interest rates**

  =

  expected average short-term nominal rate

  minus

  expected average inflation rate

  plus

  risk premia (duration, credit, inflation uncertainty)

Optimal Fed Funds Rate (FFR)

- **How do you translate the dual mandate to an operational target?**

- **FOMC statement on "Longer-Run Goals and Policy Strategy"**

- **How about meeting-to-meeting decisions?**

- **Policymakers' Loss Function**
  - One approach to quantifying and assessing policy goals and performance

Loss Function – Inflation Communication

- **January 30, 2019 document – "Longer-Run Goals and Policy Strategy"**
  - Sets 2% objective for PCE inflation
  - Target is for an average over medium term
  - Symmetric target, not a ceiling
  - Explicit statement should help anchor expectations
  - Renewed annually since 2012

- $\pi^* = 2\%$

- $\pi_t = 1.9\%$
 (but had been below 2% during most of the current recovery)

What is so special about 2%?

- **ECB: "below, but close to, 2 percent over the medium term"**

- **BoE: 2 percent**

- **BoC: "the target range is 1 to 3 per cent, with the Bank's monetary policy aimed at keeping inflation at the 2 percent target midpoint"**

- **BoJ: 2% since January 2013**

- **Central Bank of Turkey: no fixed target; 5% in recent years**

- **Why not 0%? 3%? 10%?**
  - Costs of high inflation vs deflation or low inflation
  - Limits of traditional monetary policy tools – the zero lower bound

Policymakers' Loss Function: Inflation Targeter with Symmetric Losses

- **Minimize** $L = (\pi - \pi^*)^2$
  - L – size of policy loss
  - π – actual inflation rate
  - π^* – target inflation rate

- **Assume** $\pi^* = 2\%$
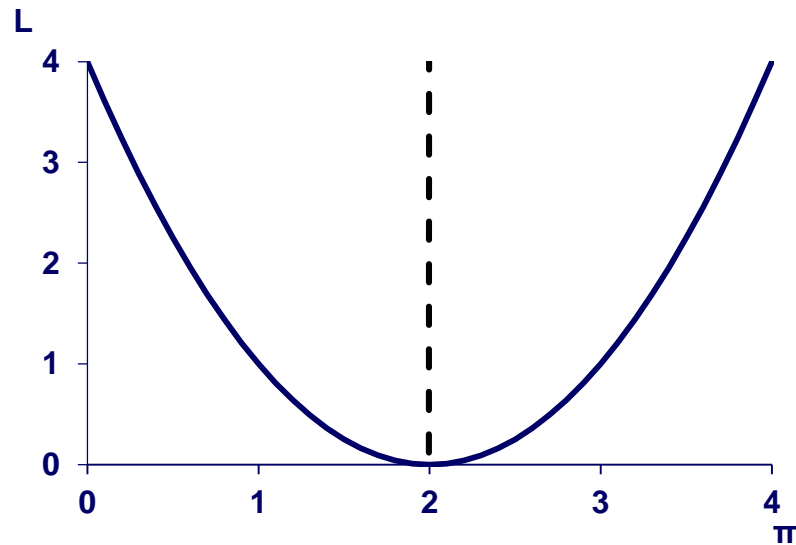
# Policymakers' Loss Function – Dual Mandate

- $L = \omega(\pi - \pi^*)^2 + (1 - \omega)(u - u^*)^2$

  - L – size of policy loss

  - π – actual inflation rate

  - π^* – target inflation rate

  - u – actual unemployment rate

  - u^* – equilibrium natural rate of unemployment (NAIRU)

  - ω – weight placed on inflation gap $(\pi - \pi^*)$

Loss Function – Unemployment "Target"

- **Conceptually, somewhat different than inflation target**
  - u^* largely not determined by the central bank

  - "Natural rate of unemployment"

  - Changes over time as the structure of the economy and demographics change

Natural Rate of Unemployment
(percent)
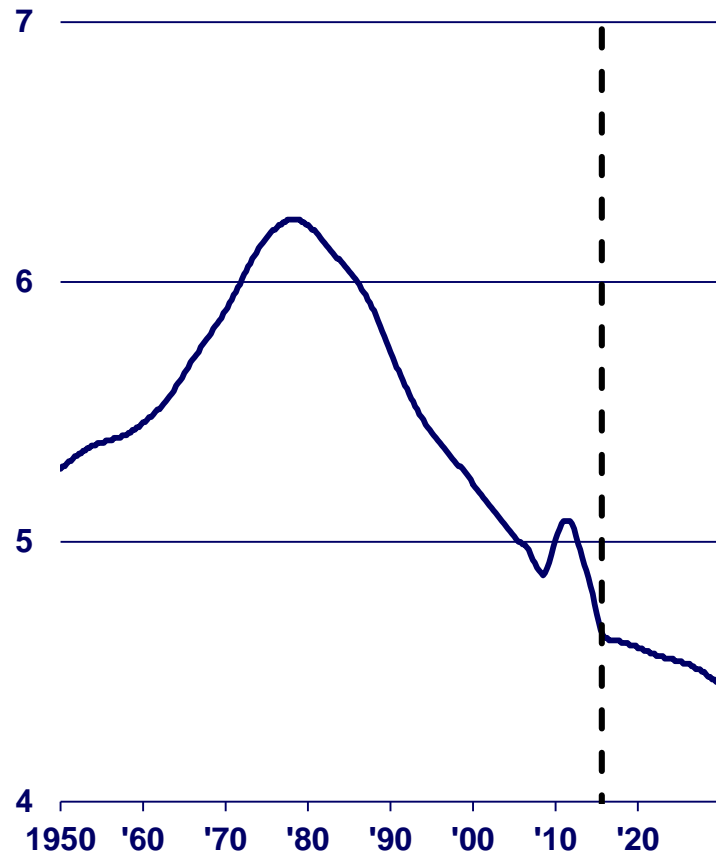
Source: Congressional Budget Office.

Loss Function – Unemployment Communication

- **January 30, 2019 document – "Longer-Run Goals and Policy Strategy""**
  - The appropriate employment goal may change over time for nonmonetary reasons
  - Seek an economy operating at its level of potential output

- **Based on median December 2018 Projections**:

$$u^* = 4.4\%$$

  - Had been as high as 5% - 6% in 2011

- $u_t = 4.0\%$

Loss Function – Weight on Inflation vs Unemployment

- **January 30, 2019 document – "Longer-Run Goals and Policy Strategy"**

- **Balanced approach**
  - Take balanced approach when shocks push the economy away from objectives
  - Takes account of lags in effects of monetary policy and other limits

- **Does this imply $\omega = 0.5$?   Maybe for some, but not necessarily for all FOMC participants.**

Bull's-Eye Accountability for Fed's Dual Mandate
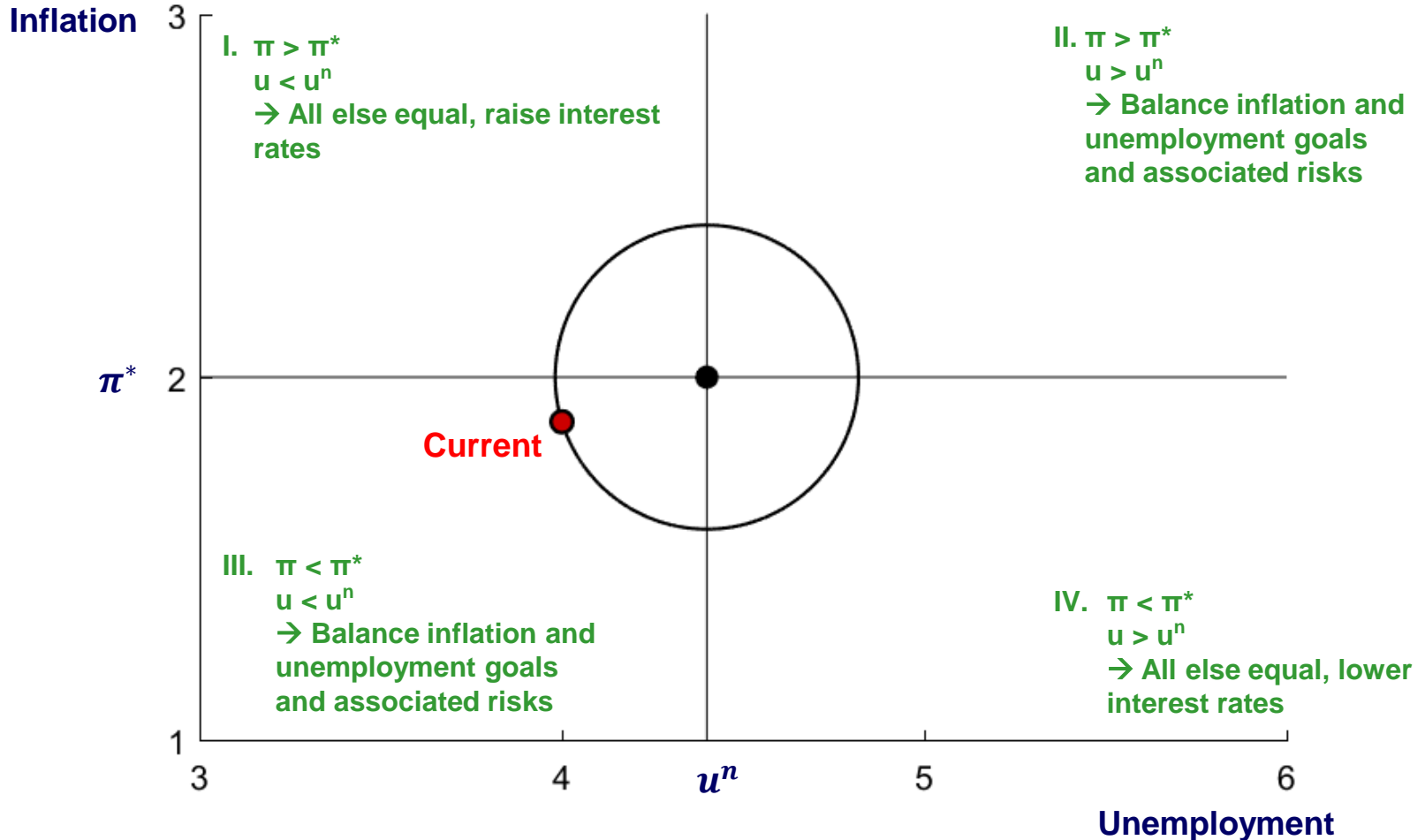
Loss Function
(percent)

$$L = 0.5(\pi - 2)^2 + 0.5(u - u^n)^2$$

Inflation

I. $\pi > \pi^*$
$u < u^n$
→ All else equal, raise interest rates

II. $\pi > \pi^*$
$u > u^n$
→ Balance inflation and unemployment goals and associated risks

Current

III. $\pi < \pi^*$
$u < u^n$
→ Balance inflation and unemployment goals and associated risks

IV. $\pi < \pi^*$
$u > u^n$
→ All else equal, lower interest rates

π^* 2

3

1

3   4 u^n 5   6

Unemployment

Bull's-Eye Accountability for Fed's Dual Mandate

Loss Function
(percent)

$$L = 0.5(\pi - 2)^2 + 0.5(u - u^n)^2$$

Inflation

3

$(\pi = 2.4, u = 4.4)$

$(\pi = 2, u \approx 4.0)$

π^* 2

$(\pi = 2, u = 4.8)$

Current
$(\pi = 1.9, u = 4.0)$

$(\pi = 1.6, u = 4.4)$

1

3   4 u^n 5   6

Unemployment
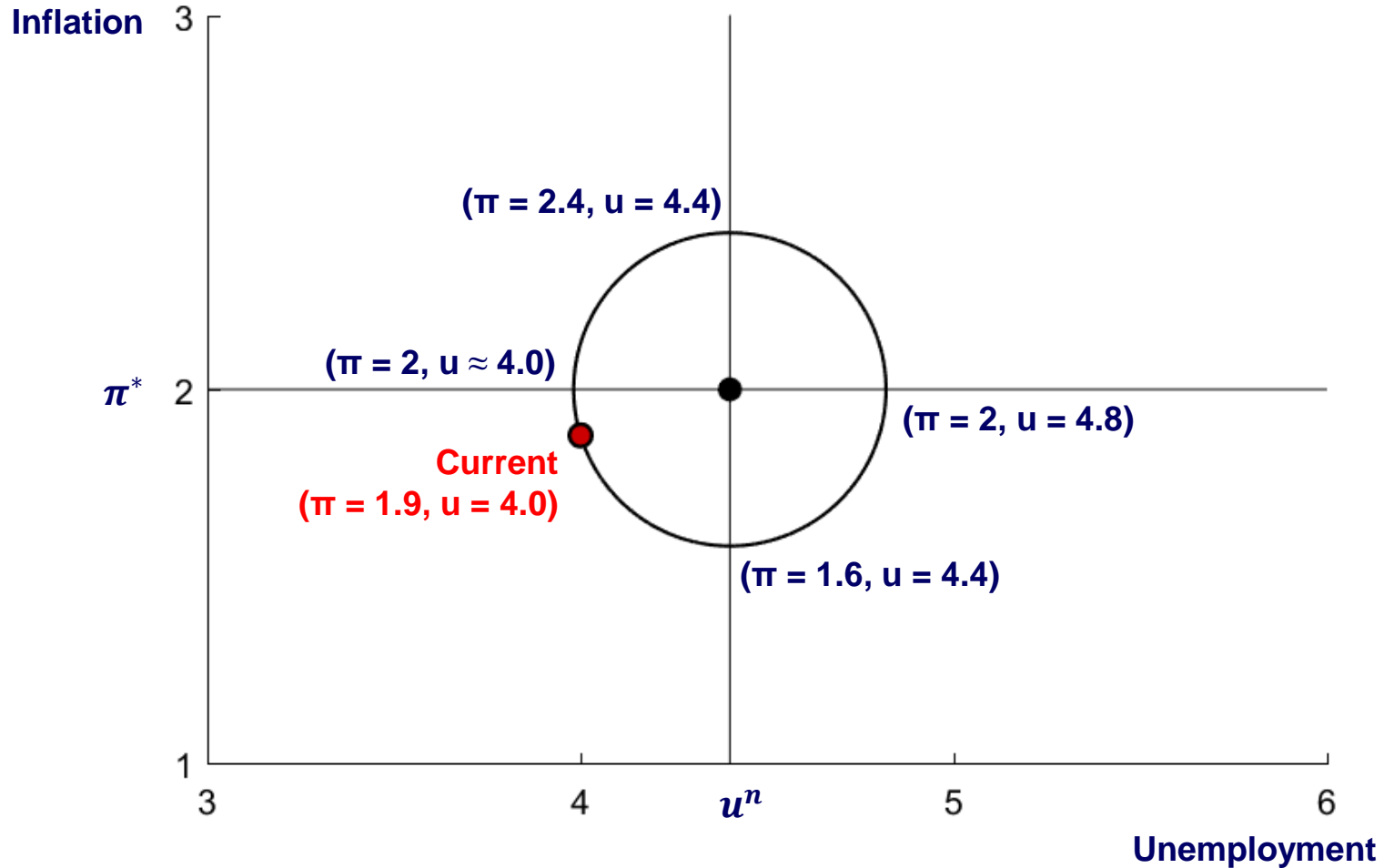
Tools

- **Traditional**
  - Reserve requirements ($ banks hold at the Fed against certain deposits)
  - Discount rate (the rate the Fed charges banks when they borrow overnight from the discount window)
  - Federal funds rate (the rate banks charge each other for overnight unsecured loans)
  - New "traditional": interest on reserves, term deposit facility; reverse repos with additional counterparties

- **Non-traditional**
  - Communications policies (Forward Guidance)
  - Credit and liquidity facilities during the crisis
  - QE I-III; Operation Twist; QT

Traditional Policy Implementation

- **The FOMC decides to change the target for the fed funds rate.**

- **What happens next?**

Monetary Policy Operating Regime (2006)

The Market for Reserves
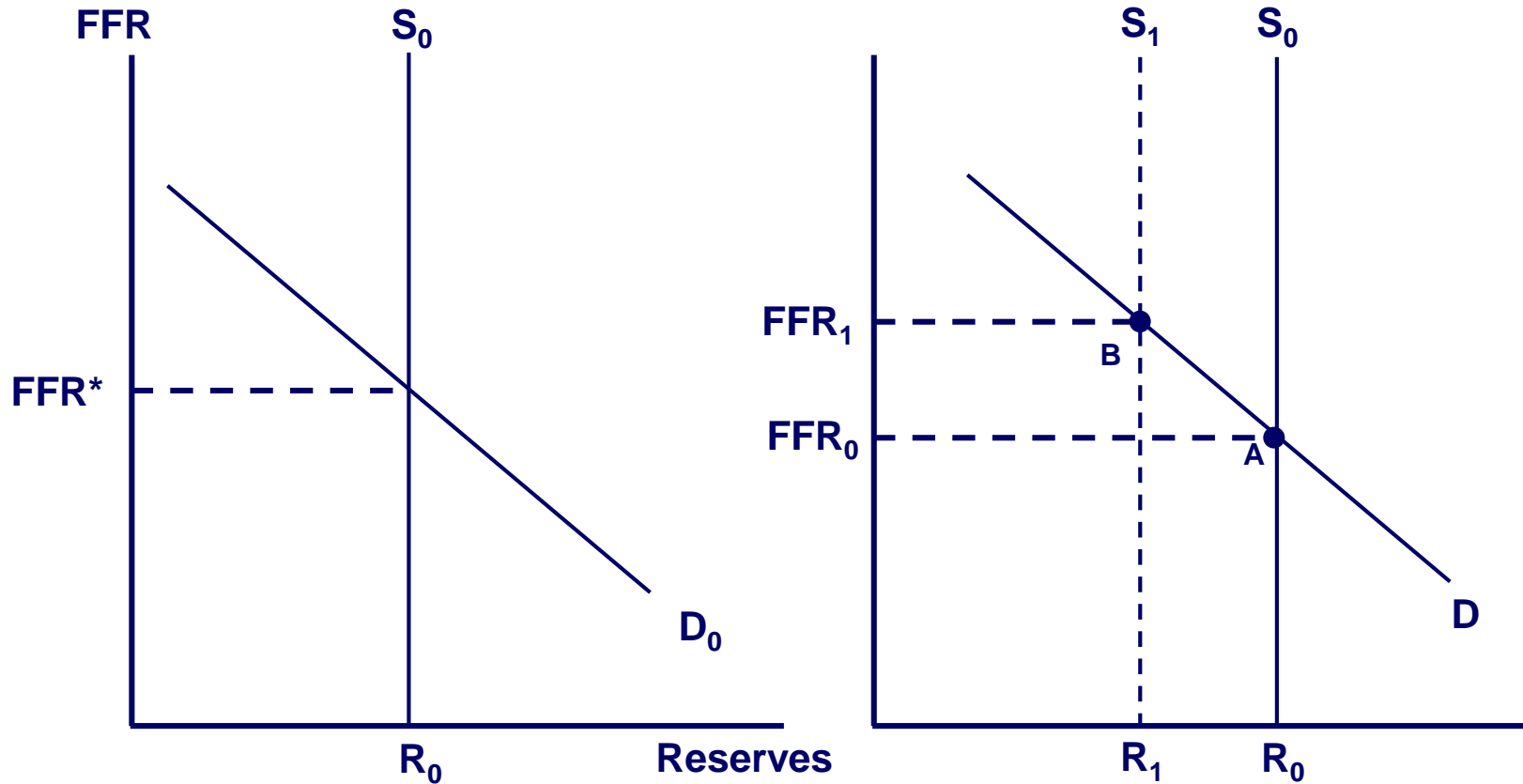
Monetary Policy Operating Regime (2006)

The Market for Reserves
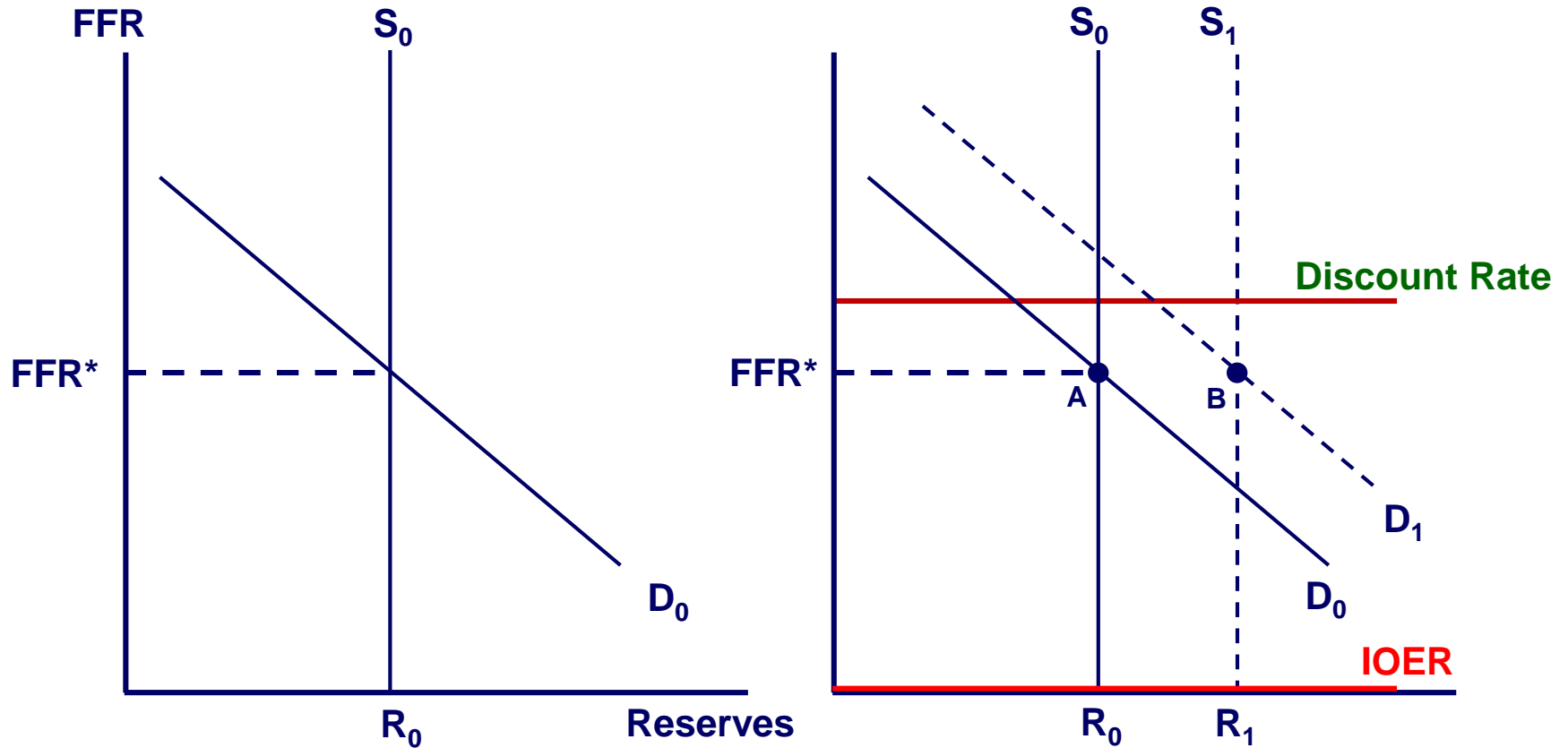
Evolution of the Fed Balance Sheet

2006
(billions)
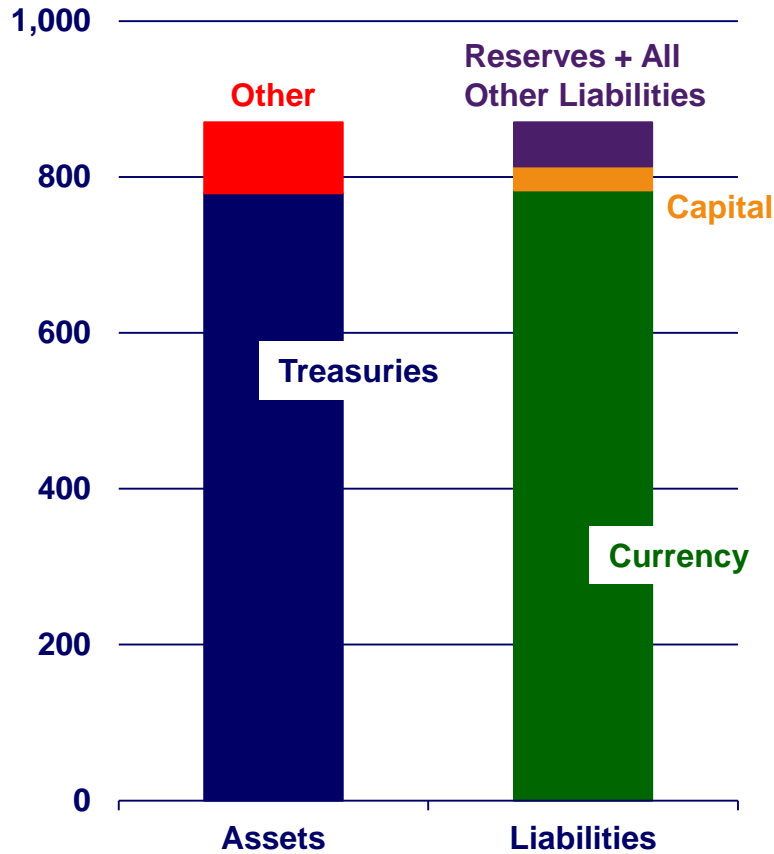
Present (Week of 1/2)
(billions)
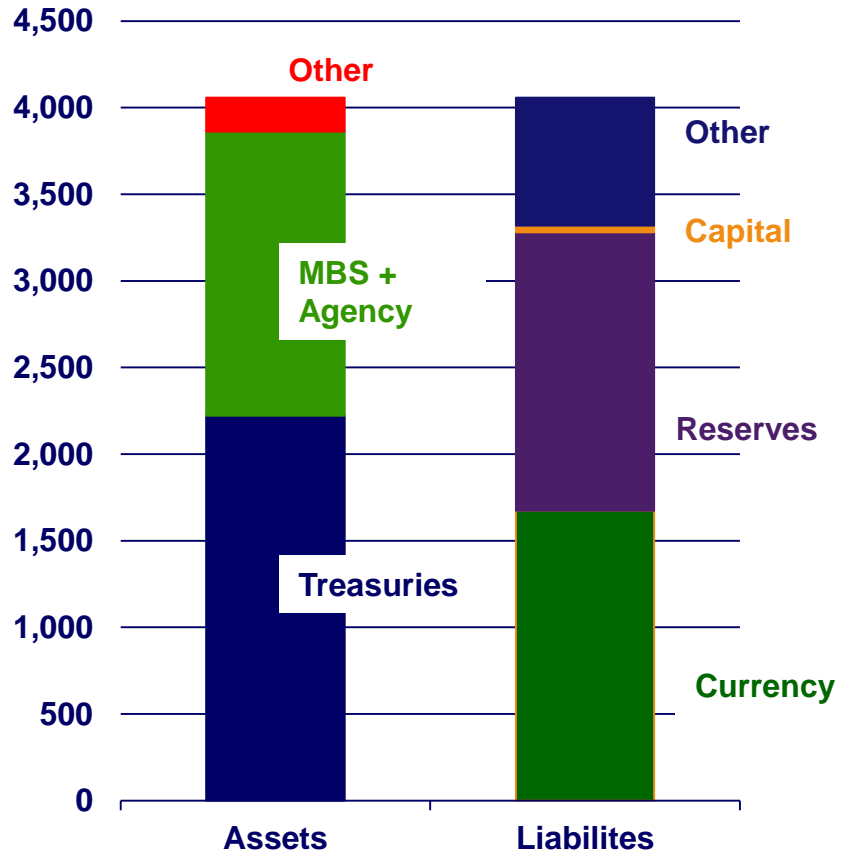
Monetary Policy Operating Regime Today

The Market for Reserves
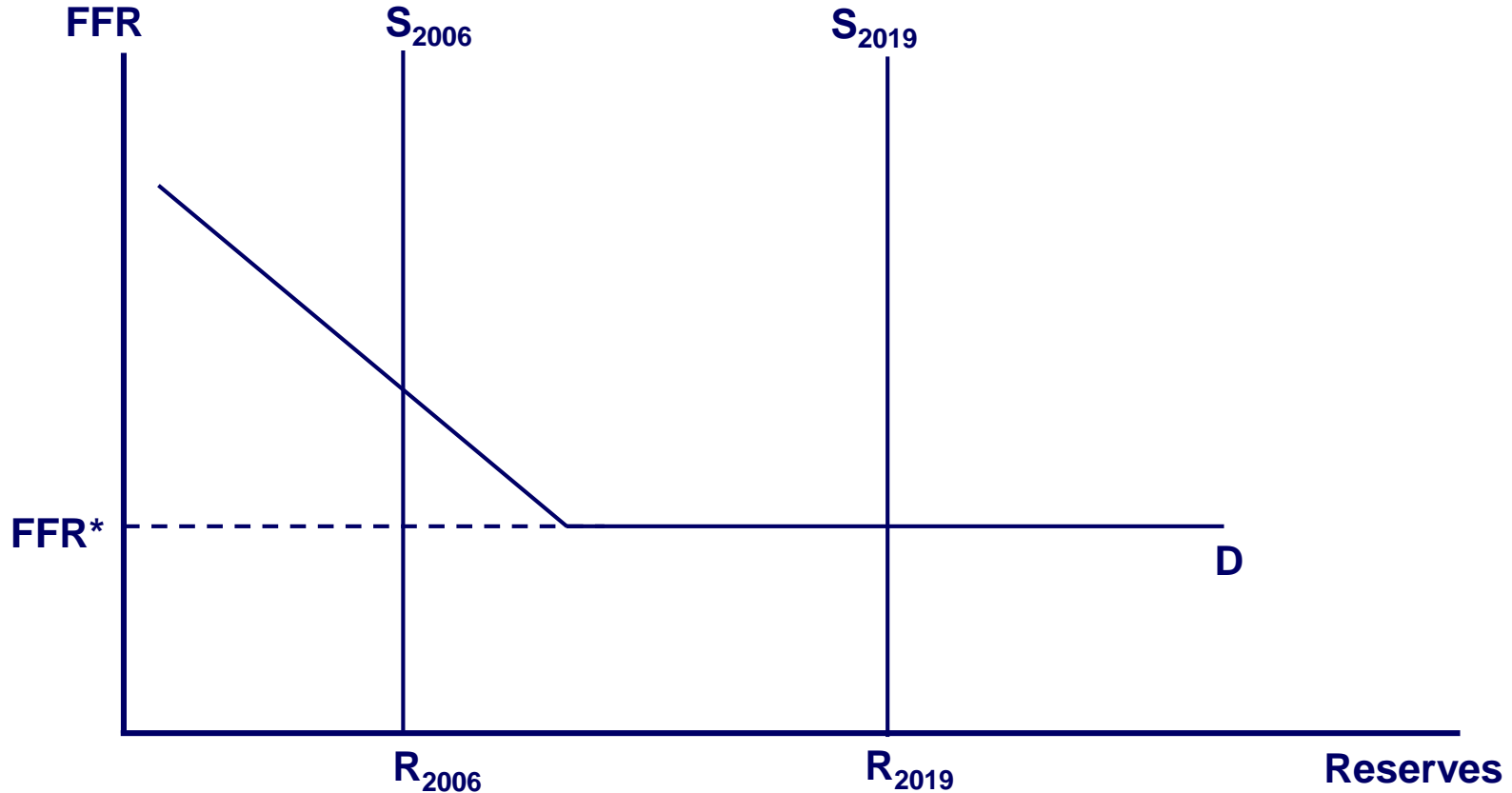
Monetary Policy Operating Regime Today

The Market for Reserves
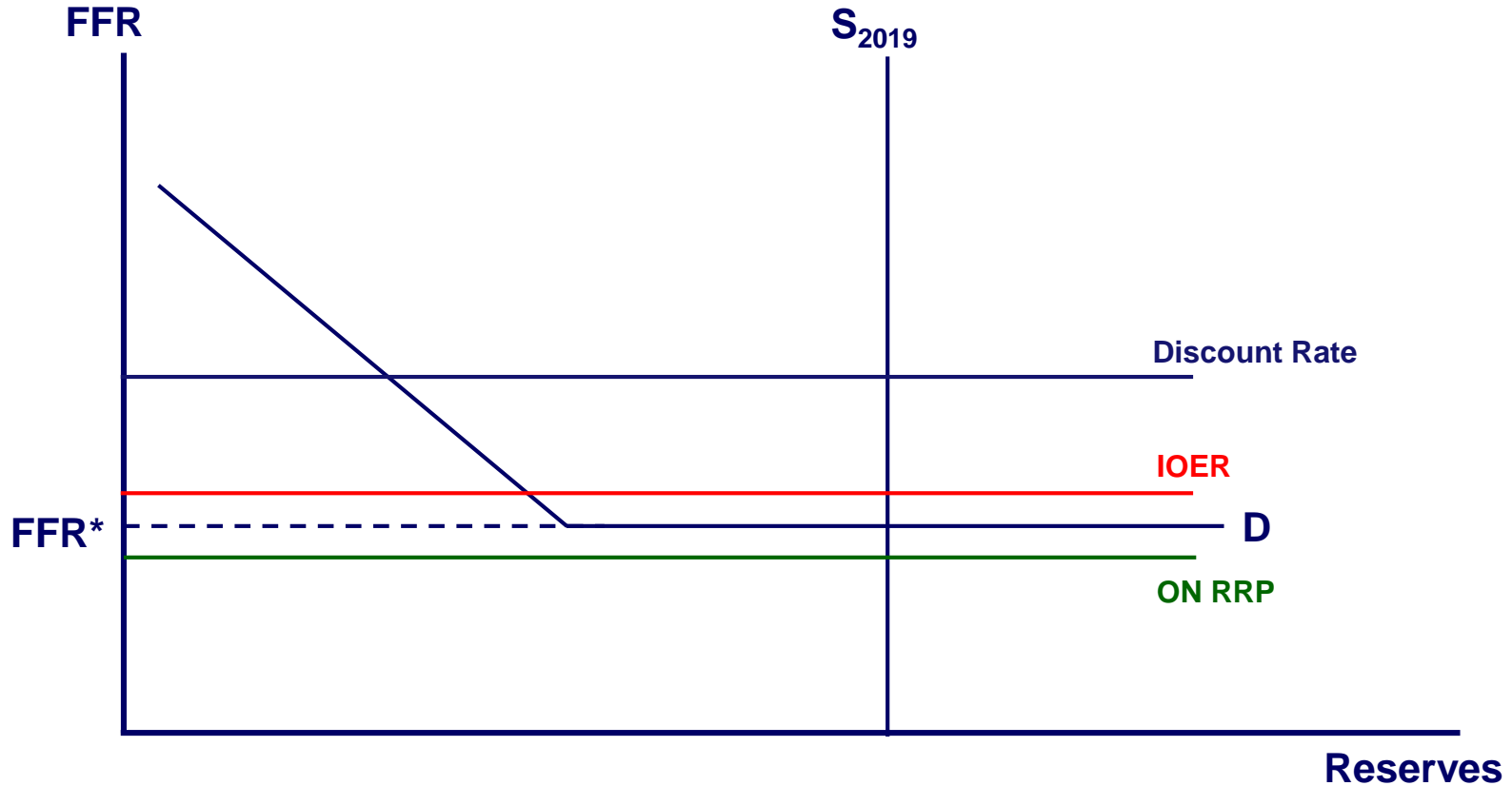
New Tools

- **Traditional tools:**
  - Add liquidity by purchasing/borrowing securities (lending to counterparties)
  - Natural Counterparties: sellers/borrowers in money markets (e.g. broker dealers)

- **New tools:**
  - Address the increase in the size of the balance sheet and the amount of reserves
    - Pre-crisis: ~$10 billion;   Today: ~$1.6 trillion
    - Drain liquidity by selling/lending securities (borrowing from counterparties)
  - Natural Counterparties: purchasers/lenders in money markets (MMMs, FHLBs, etc.)

Policy Normalization

- **Target a range for the federal funds rate – at least initially**
  - Implement primarily by raising the Interest on Excess Reserves (IOER)
  - Coordinated decisions between the FOMC and the Board of Governors
  - Use ON Reverse Repurchase Facility (ON RRP), Term RRPs, and Term Deposits as supplementary tools

- **Balance sheet policies**
  - Currently redeeming maturing Treasury securities, MBS, and agency debt
  - Subject to caps: Treasuries $30B/month; MBS and agency $20B/month
- **Longer-term, normalize the size of the balance sheet for efficient and effective conduct of policy**

New Monetary Policy Framework

- **June 2017 Statement: Adjust balance sheet size to implement monetary policy effectively and efficiently**

- **January 30, 2019 statement:**

  - "Ample" reserves";

  - FFR the primary tool; controlled through administered rates (i.e. IOER, ON RRP, primary credit rate) without active management of reserves;

  - Adjust balance sheet normalization if needed;

  - Use all policy tools if reductions in FFR are not sufficient

Transmission to Other Interest Rates

$$i = r + \pi$$

$\longrightarrow$

$$r_t^h = \sum_{i=t}^{t+h} E[FFR_i] - \sum_{i=t}^{t+h} E[\pi_i]$$

+   *term premium*
+   *default risk premium*
+   *liquidity premium*
+   *other risk premia*

Overview of 'Standard' Transmission Channels
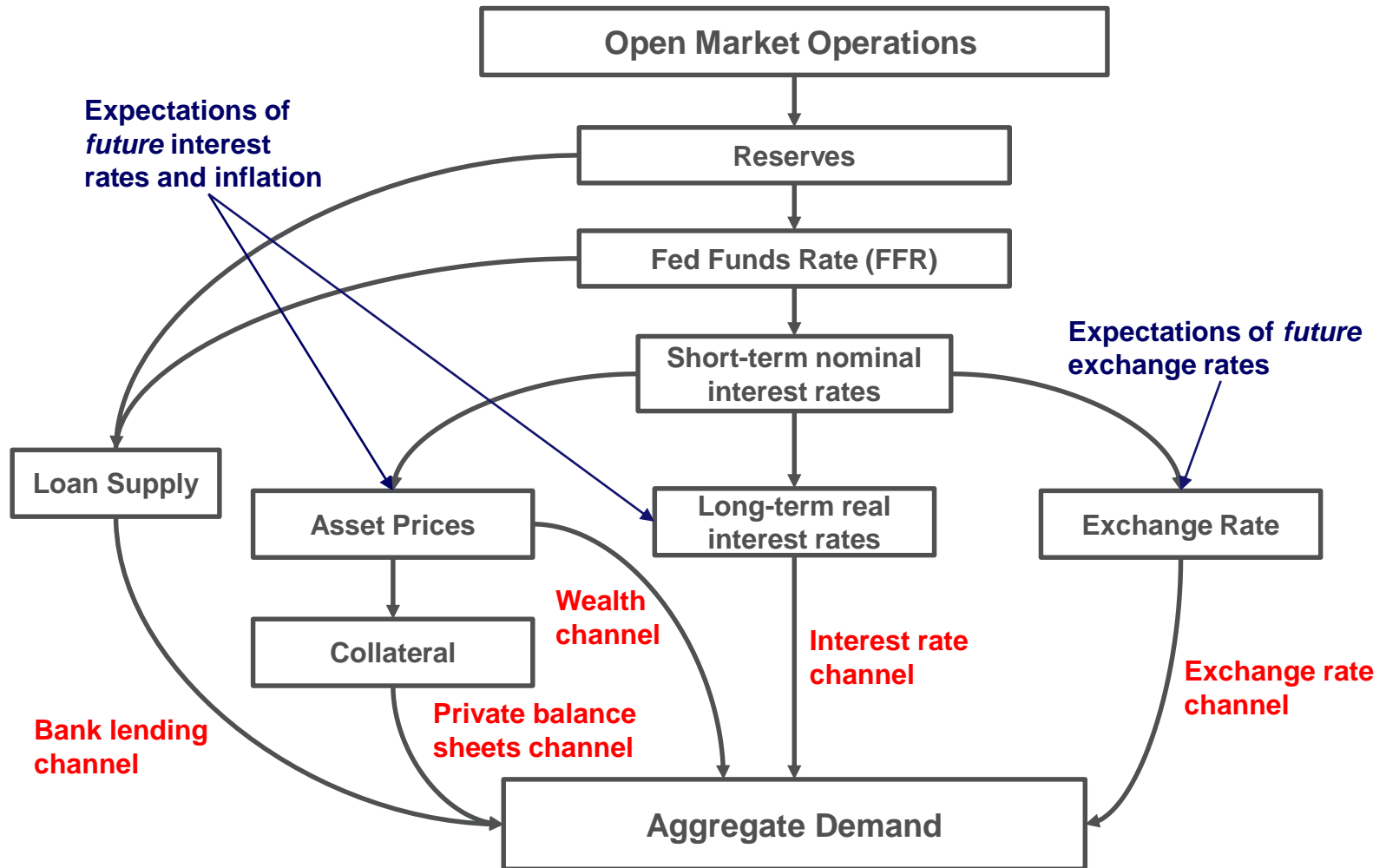
$\pi = 1.9\%$ and $u = 4.0\%$. Now what?

- **Raise rates?**

- **Depends on economic outlook and developments**

- **Lots of cross-currents; heightened uncertainty**

- **Glass half-full/half-empty**

Glass Half-Empty

The New York Times *Jan. 25, 2019*
Shutdown Sets Off Airport Delays as F.A.A. Announces Staffing Shortages

FINANCIAL TIMES
Theresa May's Brexit suffers historic defeat *JANUARY 16, 2019*

Bloomberg *January 14, 2019*
The World's Biggest Economies Are Moving Deeper Into a Slowdown

npr *December 6, 2018*
Huawei Finance Chief's Arrest Threatens To Inflame U.S.-China Tensions

THE WALL STREET JOURNAL. *Jan. 1, 2019*
U.S. Indexes Close With Worst Yearly Losses Since 2008

Glass Half-Full

The Washington Post

January 25

Trump signs bill to open the government, ending the longest shutdown in history

FINANCIAL TIMES

JANUARY 4, 2019

Wall Street notches one of the biggest rallies since 2011 as bulls regain footing

USA TODAY Feb. 1, 2019

Employers add booming 304,000 jobs in January, marking 100th straight month of employment gains

Recent Developments: Glass Half-Full or Half-Empty?

- **Solid Fundamentals on Real Activity and Inflation**

- **Juxtaposed with Financial Market turbulence**

Strong Labor Markets

Monthly Payroll Employment Change
(thousands)
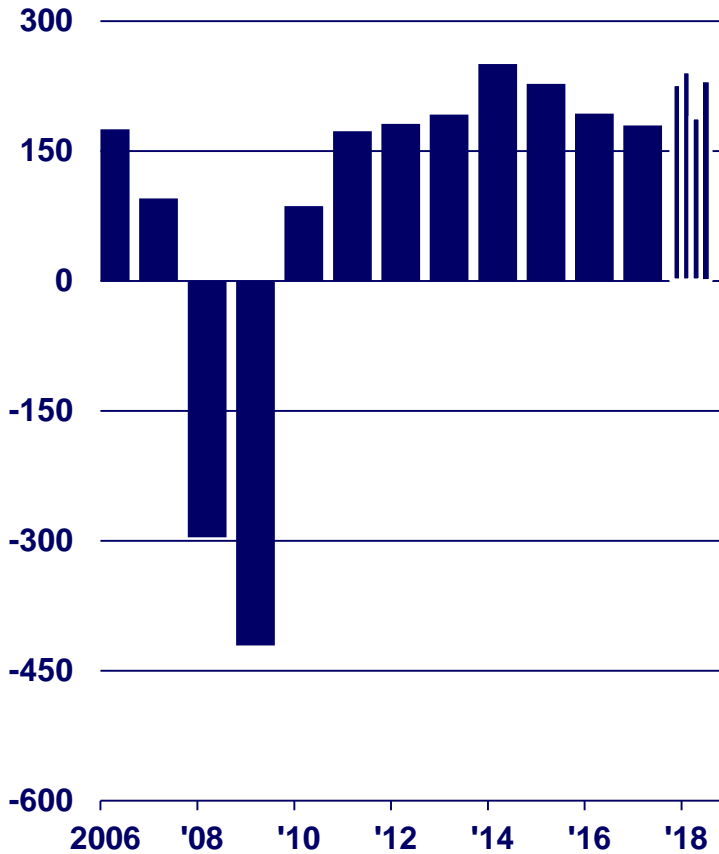
Unemployment Rate
(percent)

Long-Run Central Tendency

FOMC Projections
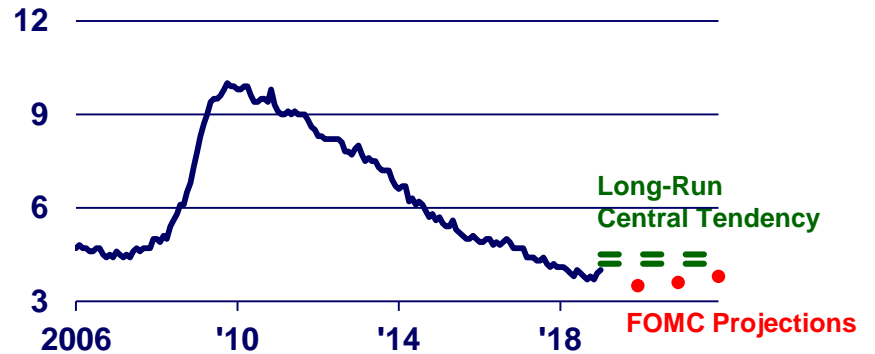
Labor Force Participation Rate
(percent)

Trend

- - Predicted using unemp. gap

Jan-2019
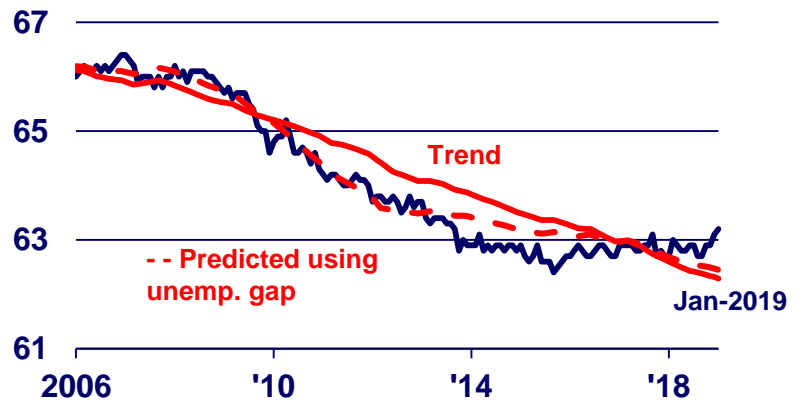
Trend estimates for LFPR calculated by Chicago Fed staff
Source: Bureau of Labor Statistics from Haver Analytics

Strong Consumption, Solid Business Investment

Real PCE
(quarterly annualized percentage change)
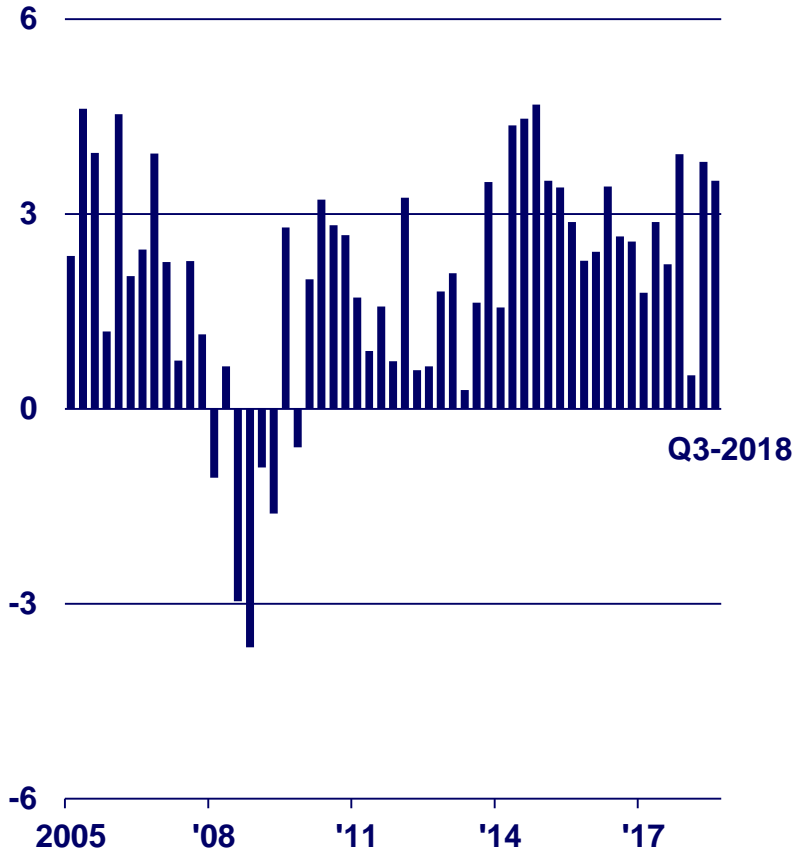
Core Capital Goods Orders and Shipments
($ bil.)

Q3-2018

Nov-2018

Orders
Shipments

Source: Bureau of Economic Analysis and Census Bureau from Haver Analytics

Softness in Housing Markets Continues

Housing Starts
(millions)
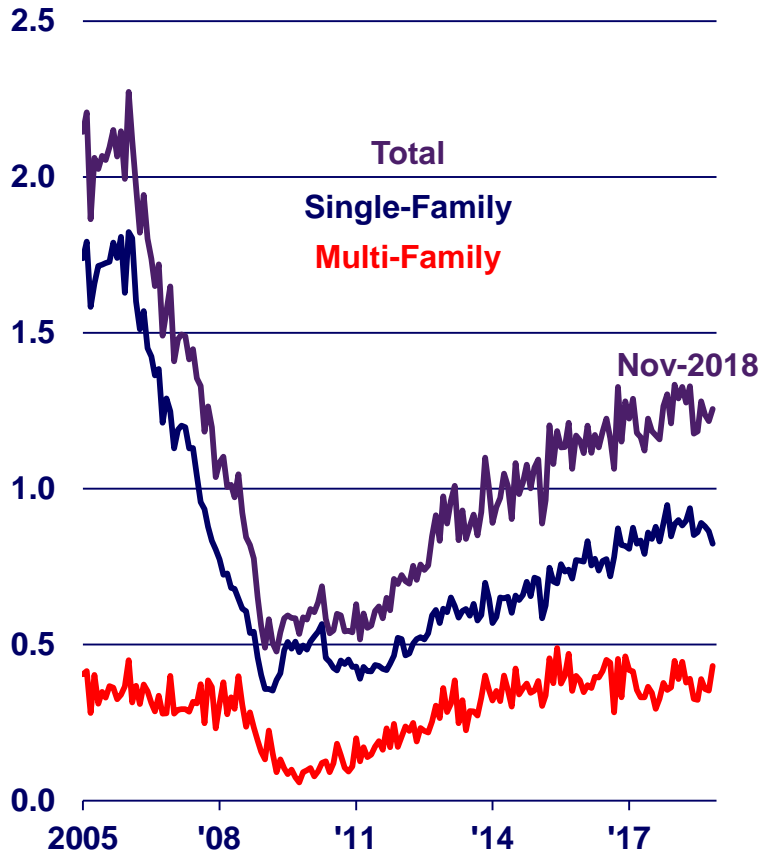
New and Existing Home Sales
(millions)

Housing Starts chart labels: Total, Single-Family, Multi-Family, Nov-2018

New and Existing Home Sales chart labels: Existing, New, Dec-2018
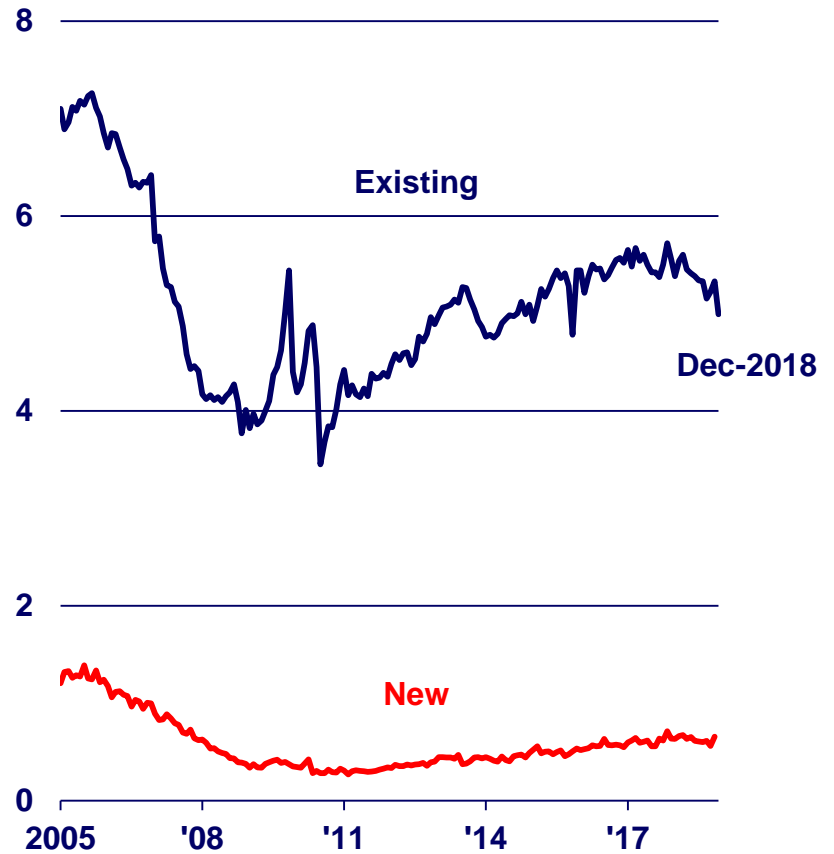
Source: Census Bureau and National Association of Realtors from Haver Analytics

Banner 2018, Still Solid Near Term Growth Ahead

	Q4	2018	2019
Macroadvisers (Feb 4)	2.4	3.0	2.1
Blue Chip (Jan 9 & Feb 1)	2.6	3.1	2.2
GDPNow (FRB Atl) (Feb 1)	2.5	3.1	
FRBC Nowcast (Feb 5)	2.4	3.0	
Dec FOMC SEP (Dec 19)		3.0	2.3

Longer Term GDP Outlook Also Still Solid

Real GDP Growth
(Q4/Q4 percentage change)
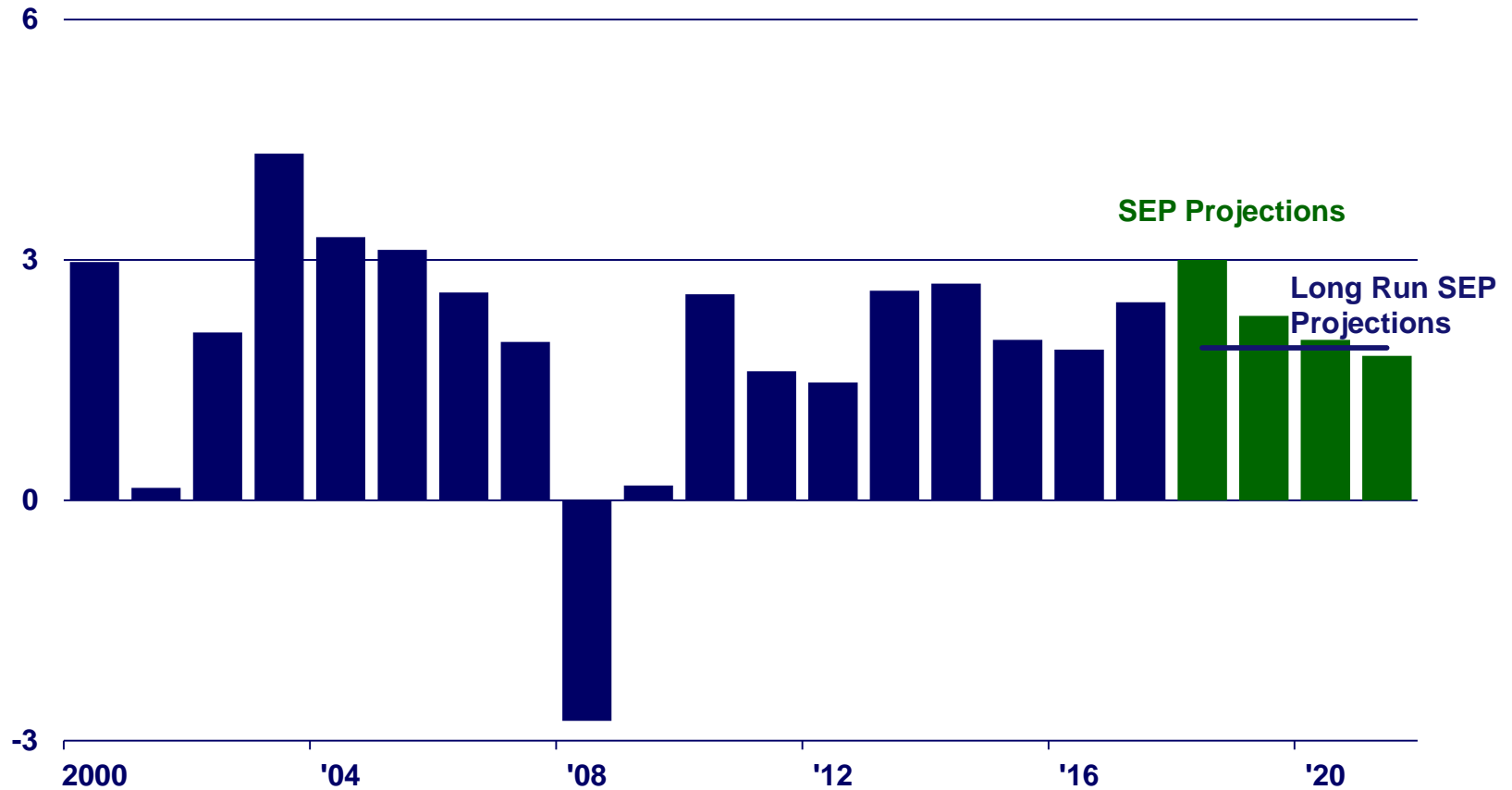
Source: Bureau of Economic Analysis and FOMC's December 2018 Summary of Economic Projections from Haver Analytics

Inflation Near Target

PCE Inflation
(year-over-year percentage change)

Core CPI	Oct	Nov	Dec
Monthly	0.2	0.2	0.2
Yr/Yr	2.1	2.2	2.2
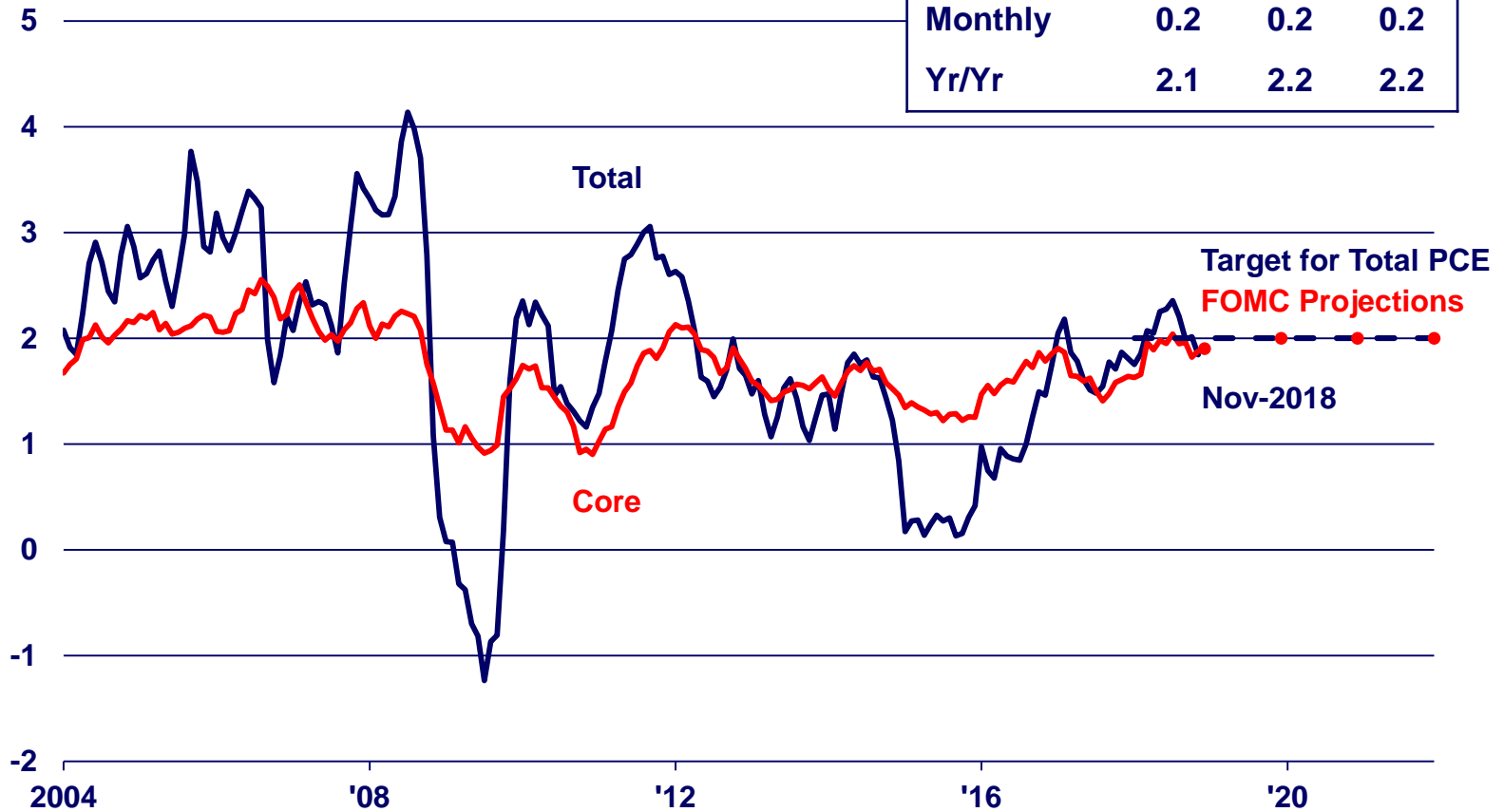
Source: Bureau of Economic Analysis and FOMC's December 2018 Summary of Economic Projections from Haver Analytics

Mixed Inflation Factors

Wage Growth
(year-over-year percentage change)
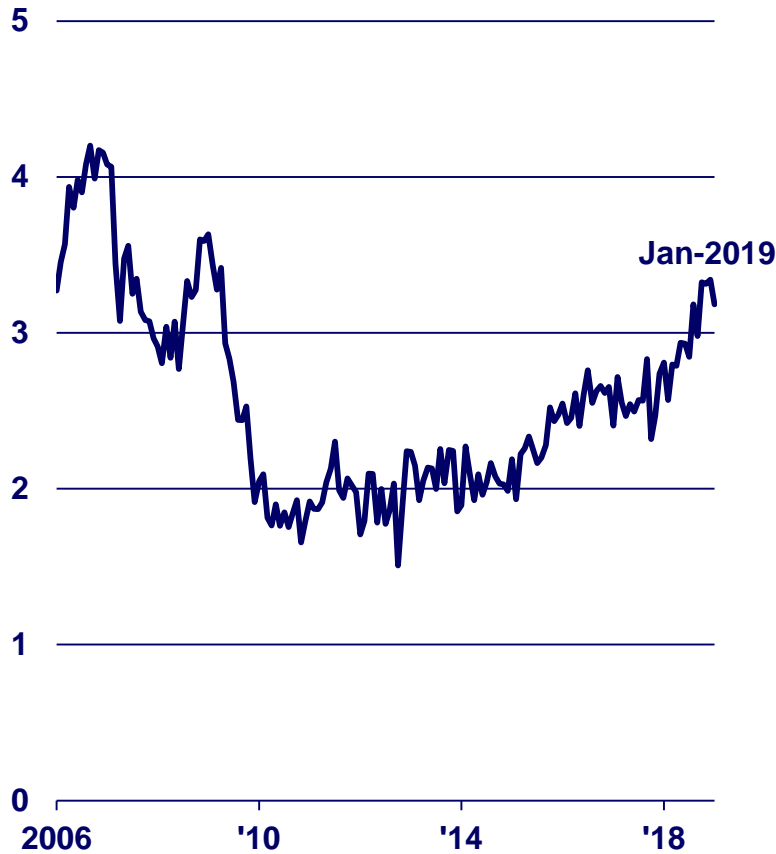
TIPS 5/5F Inflation Compensation
(percent)

Jan-2019

04-Feb-2019
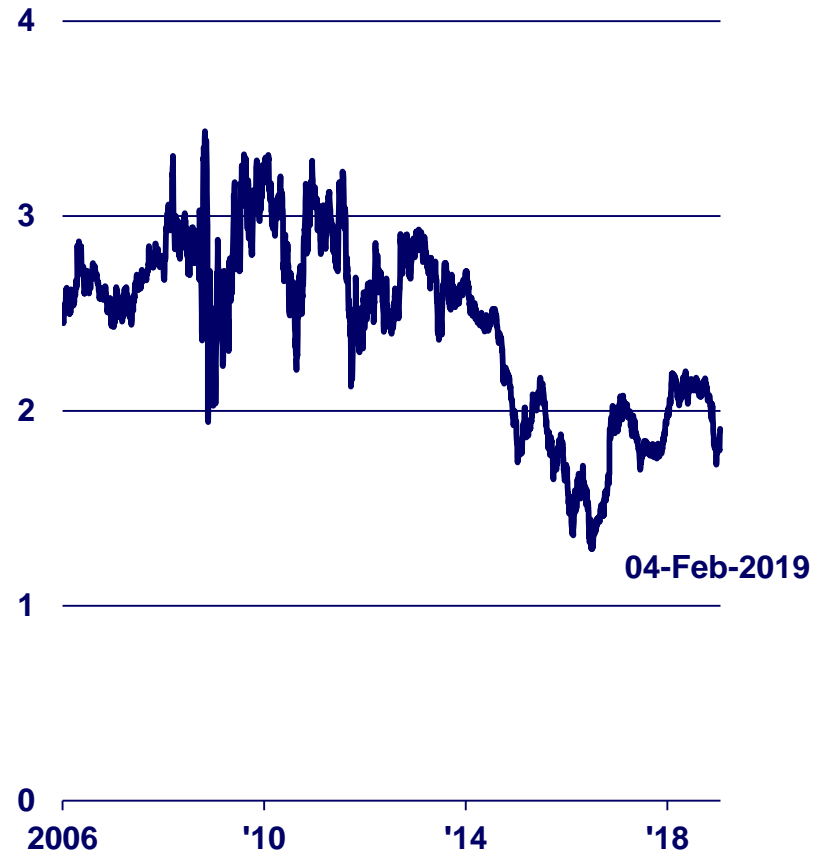
Source: Board of Governors of the Federal Reserve System and Bureau of Labor Statistics from Haver Analytics

Many Sources of Investor Anxiety

- **Concerns over a slow-down in growth abroad**

- **Disorderly Brexit with significant spill-overs**

- **Other geopolitical risks**

- **Concerns over a slow-down in the U.S.**

- **Uncertainty over trade and other government policies**

  - The effects of the prolonged government shutdown

- **Concerns that the FOMC will tighten too much**

Re-assessment of Risks

S&P 500 Index

Corporate Bond Spreads
(spread over 10yr treasury, percent)

VIX

04-Feb-2019

High Yield

04-Feb-2019

Investment Grade

Re-assessment of Risks

10 Year Treasury Rate
(percent)
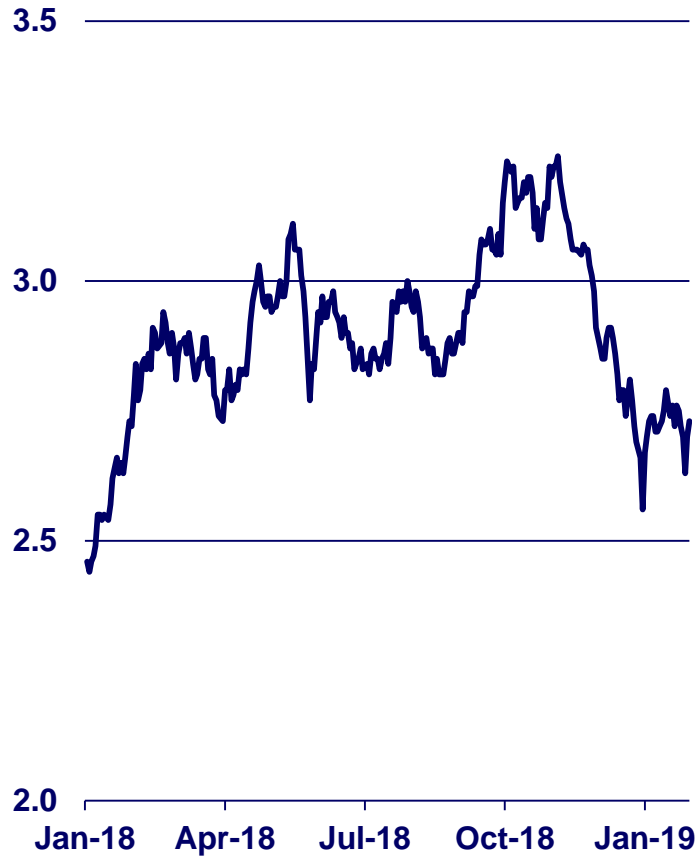
Foreign Exchange Rates
(index, Jan-2018 = 100)
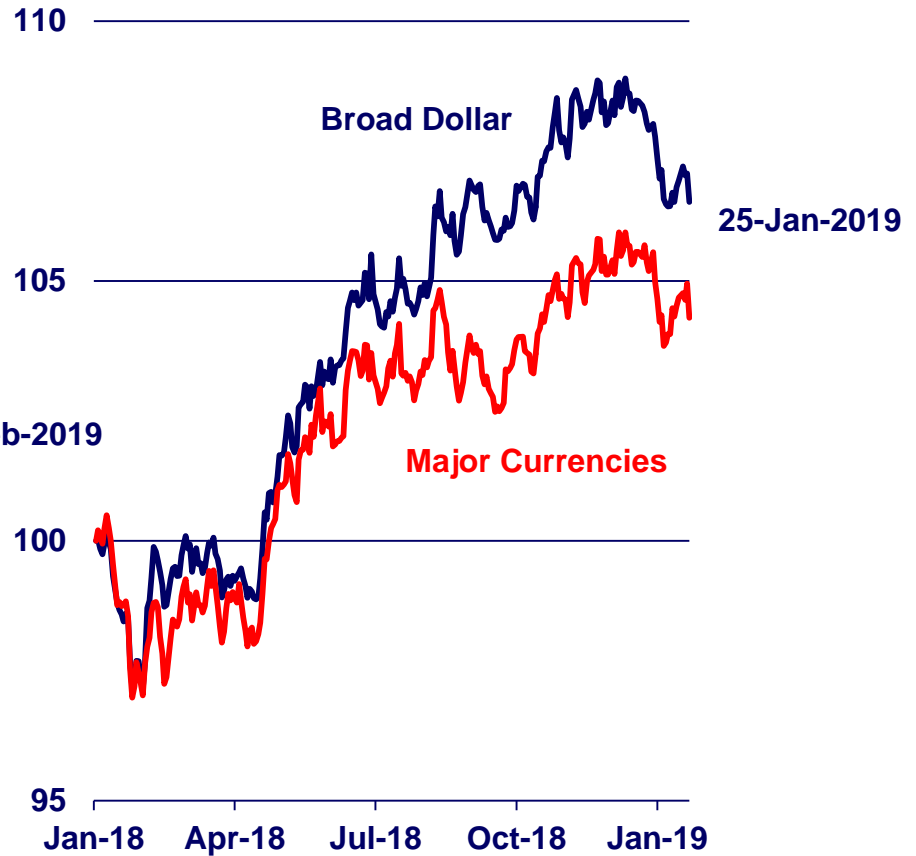
Source: Board of Governors of the Federal Reserve System from Haver Analytics
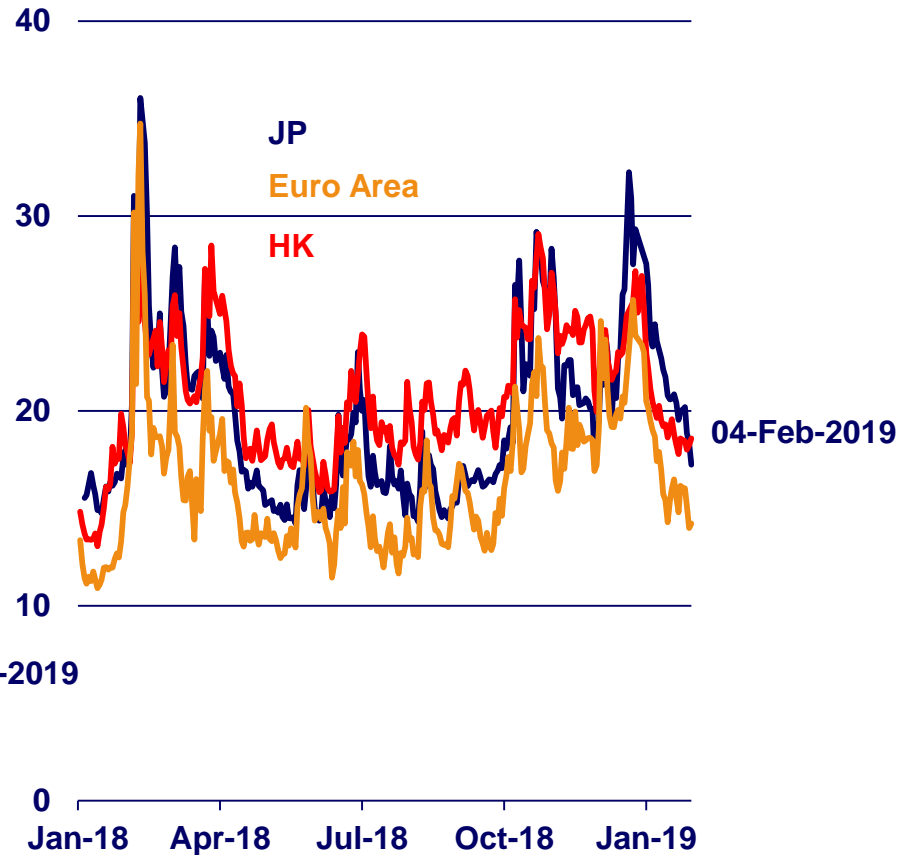
Similar Movements in Asset Markets Abroad
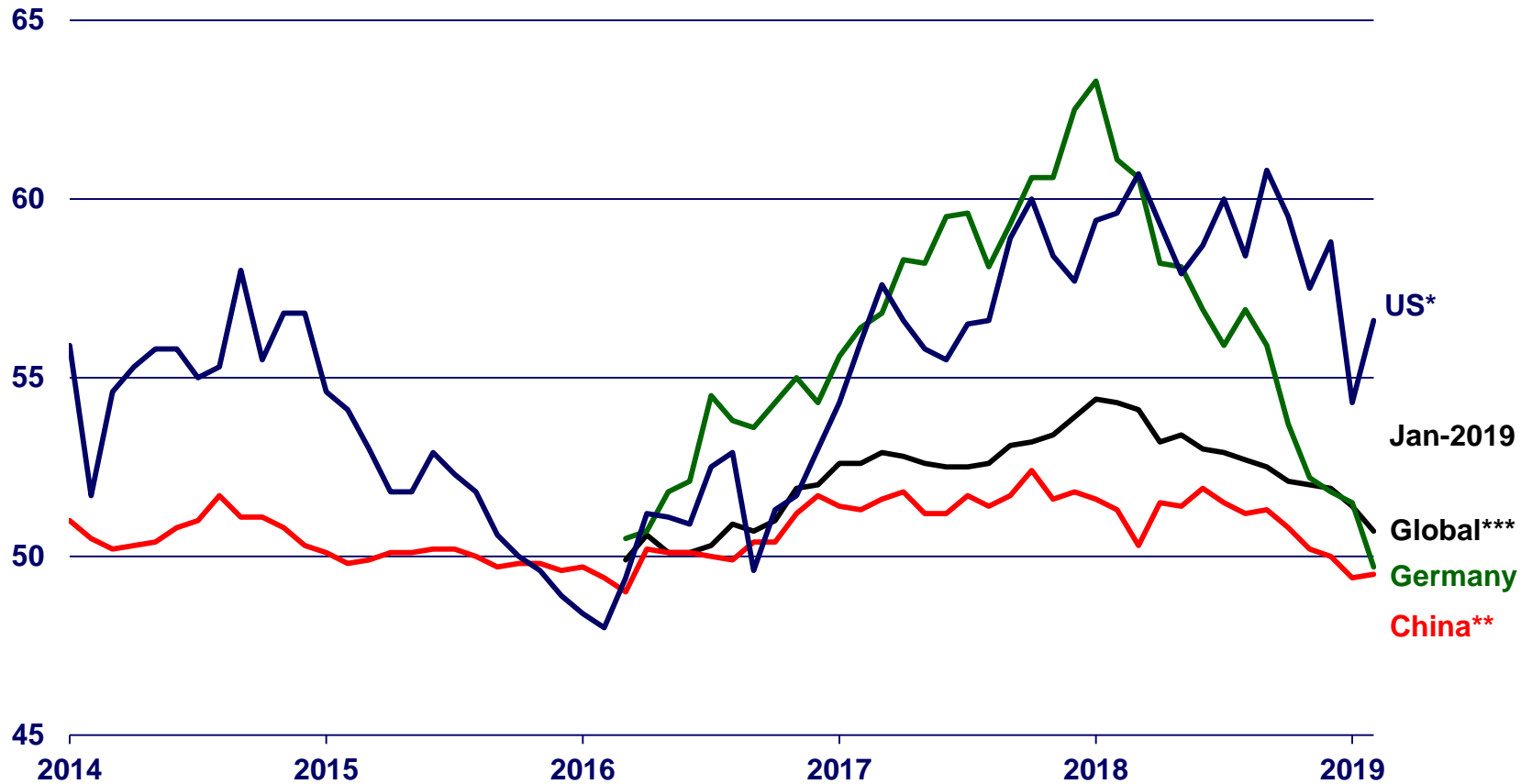
Stock Price Indices
(index, Dec-31 = 100)
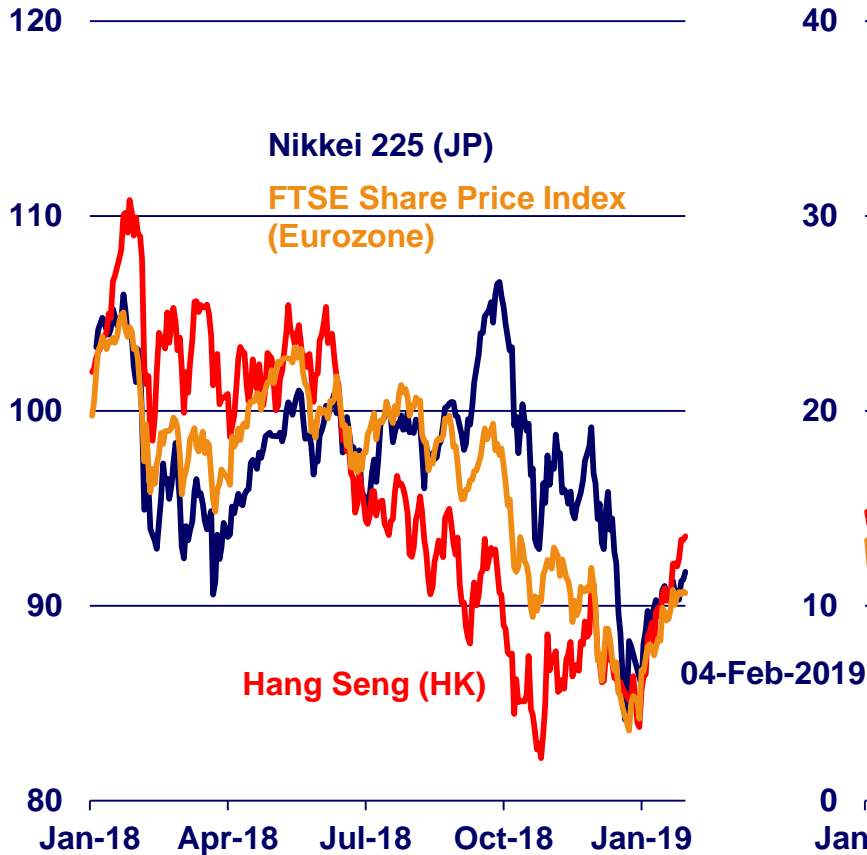
Volatility Indices
(index)

Nikkei 225 (JP)

FTSE Share Price Index
(Eurozone)

Hang Seng (HK)

04-Feb-2019

JP

Euro Area

HK

04-Feb-2019

Source: Financial Times and Hang Seng Co. from Haver Analytics

42

Signs of a Global Slowdown I
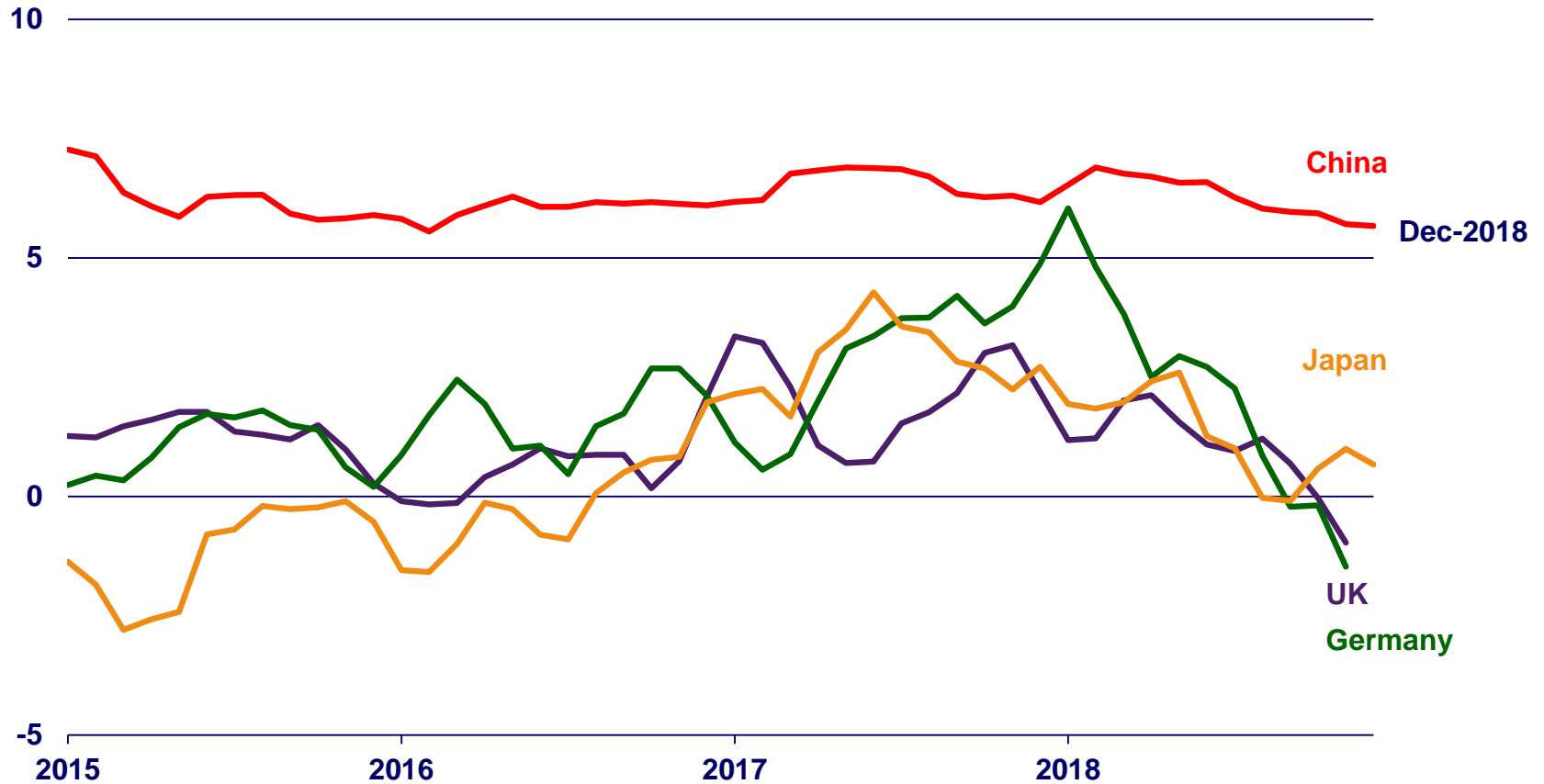
Global PMI Manufacturing Indicators
(index)

43

Signs of a Global Slowdown II

Industrial Production Indices
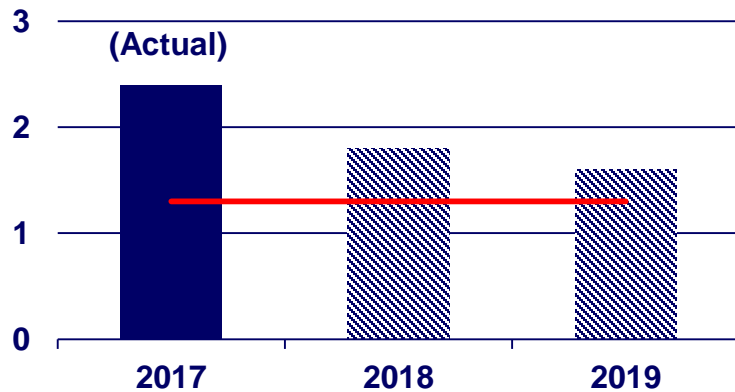(3-month moving average, year-over-year percentage change)

Source: Various government statistical agencies from Haver Analytics

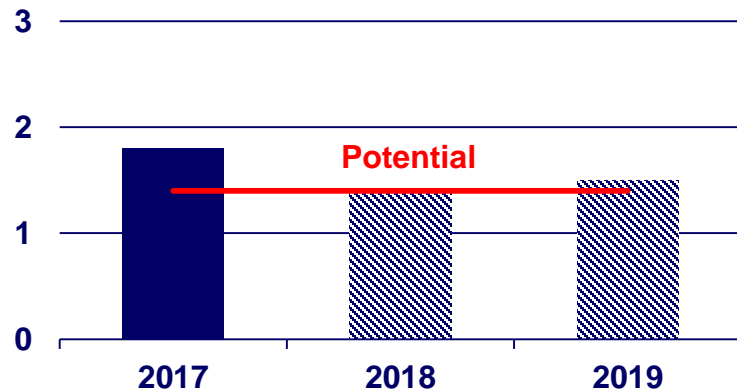# International Growth Forecasts Still Solid
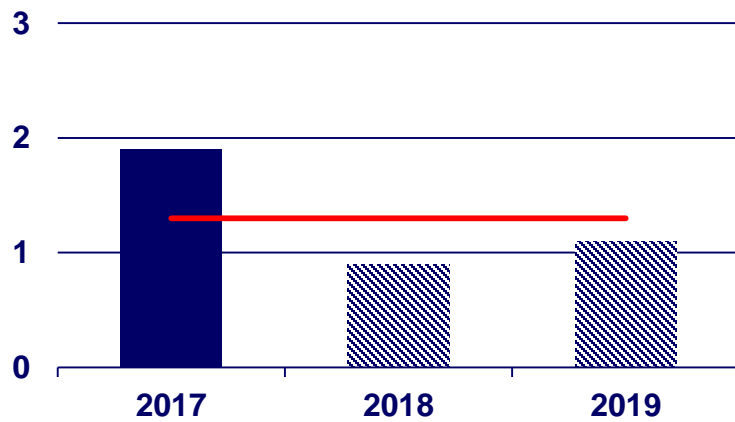
Euro Area
(annual, %)

UK
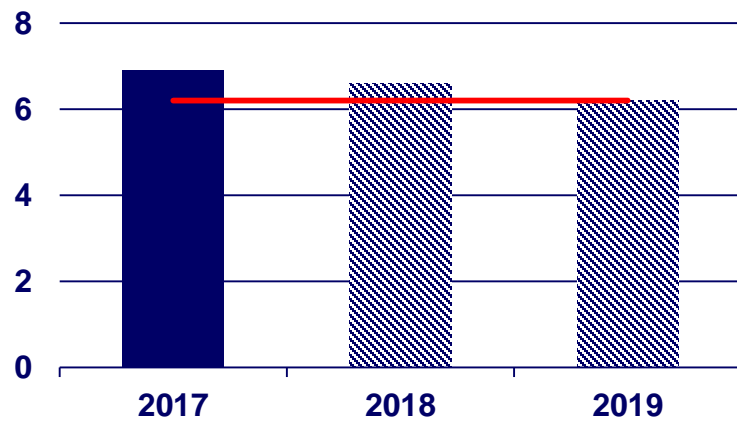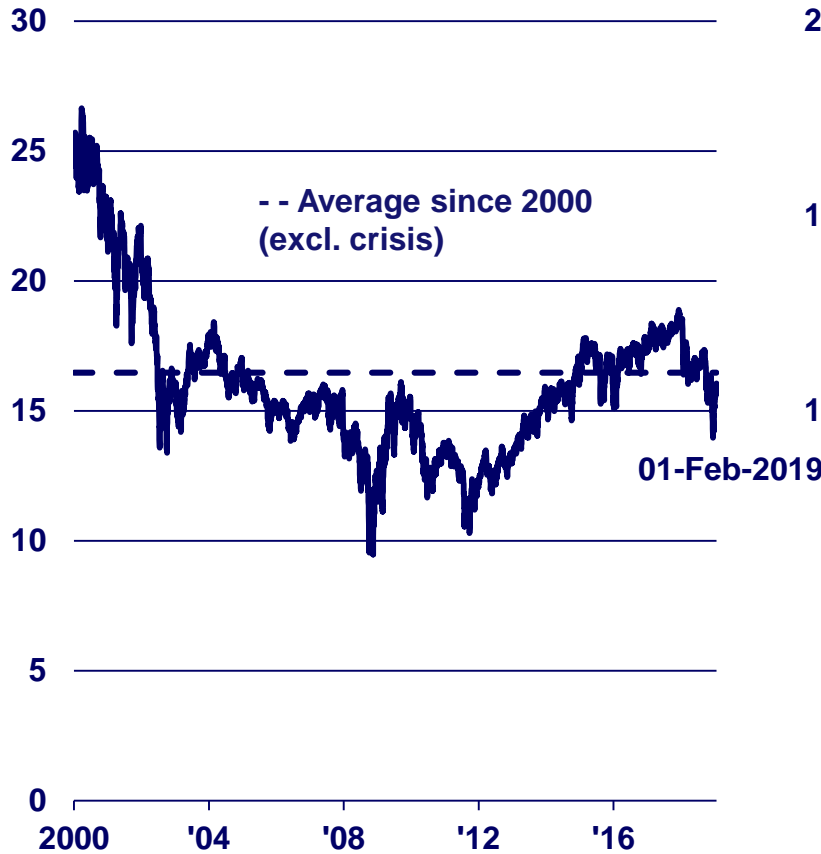(annual, %)
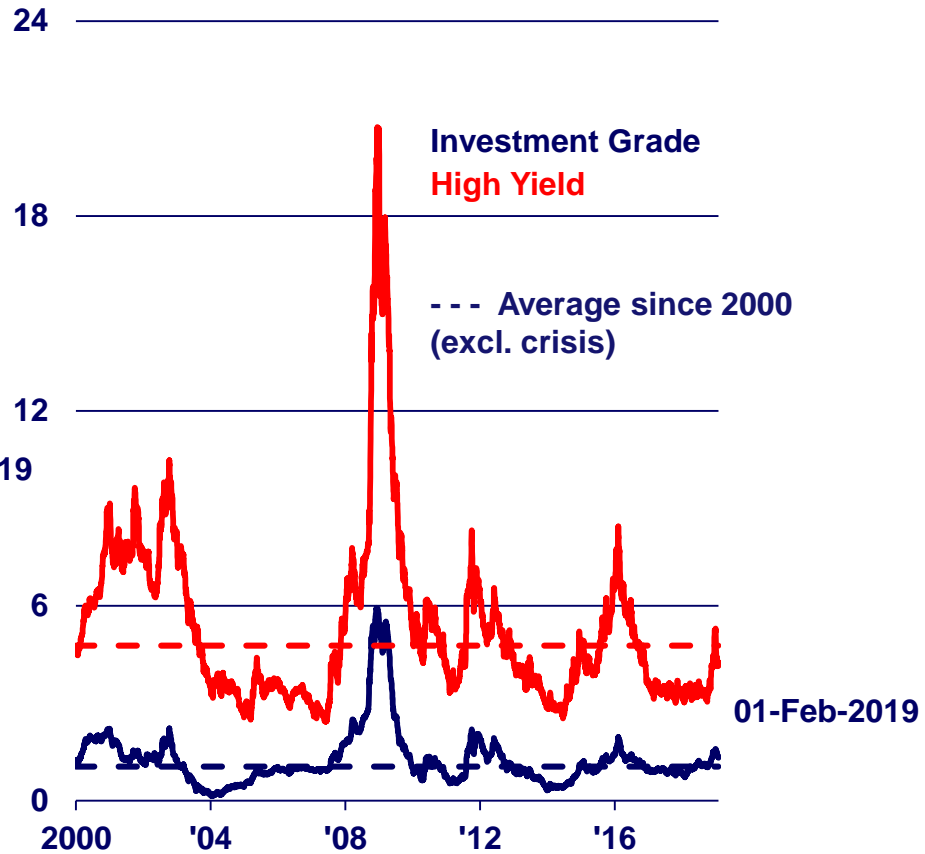

Japan
(annual, %)

China
(annual, %)

Source: IMF Interim World Economic Outlook (Jan 2019) and OECD

Historical Perspective

One-Year-Forward Price/Earnings Ratio, S&P 500 Composite
(Ratio)

- - Average since 2000 (excl. crisis)

01-Feb-2019

Corporate Bond Spreads
(spread over 10-year Treasury rate)

Investment Grade
High Yield

- - - Average since 2000 (excl. crisis)
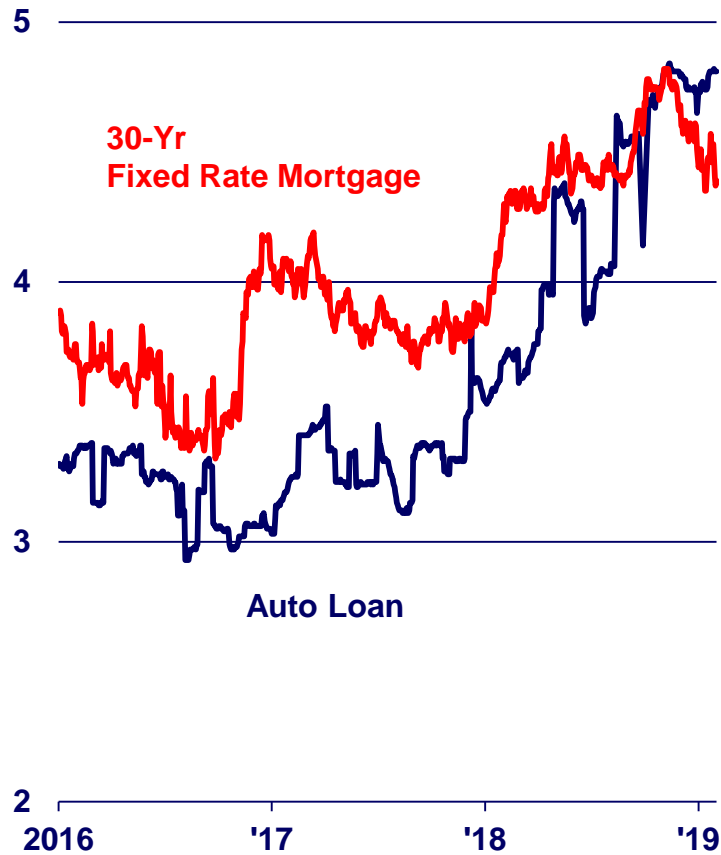
01-Feb-2019

Source: ICE/Merrill-Lynch from Haver Analytics and Bloomberg

46

Impact on Households

Consumer Loan Rates
(percent)

Household Net Worth
(as a percentage of disposable personal income)

Source: New York Times and Board of Governors of the Federal Reserve System from Haver Analytics
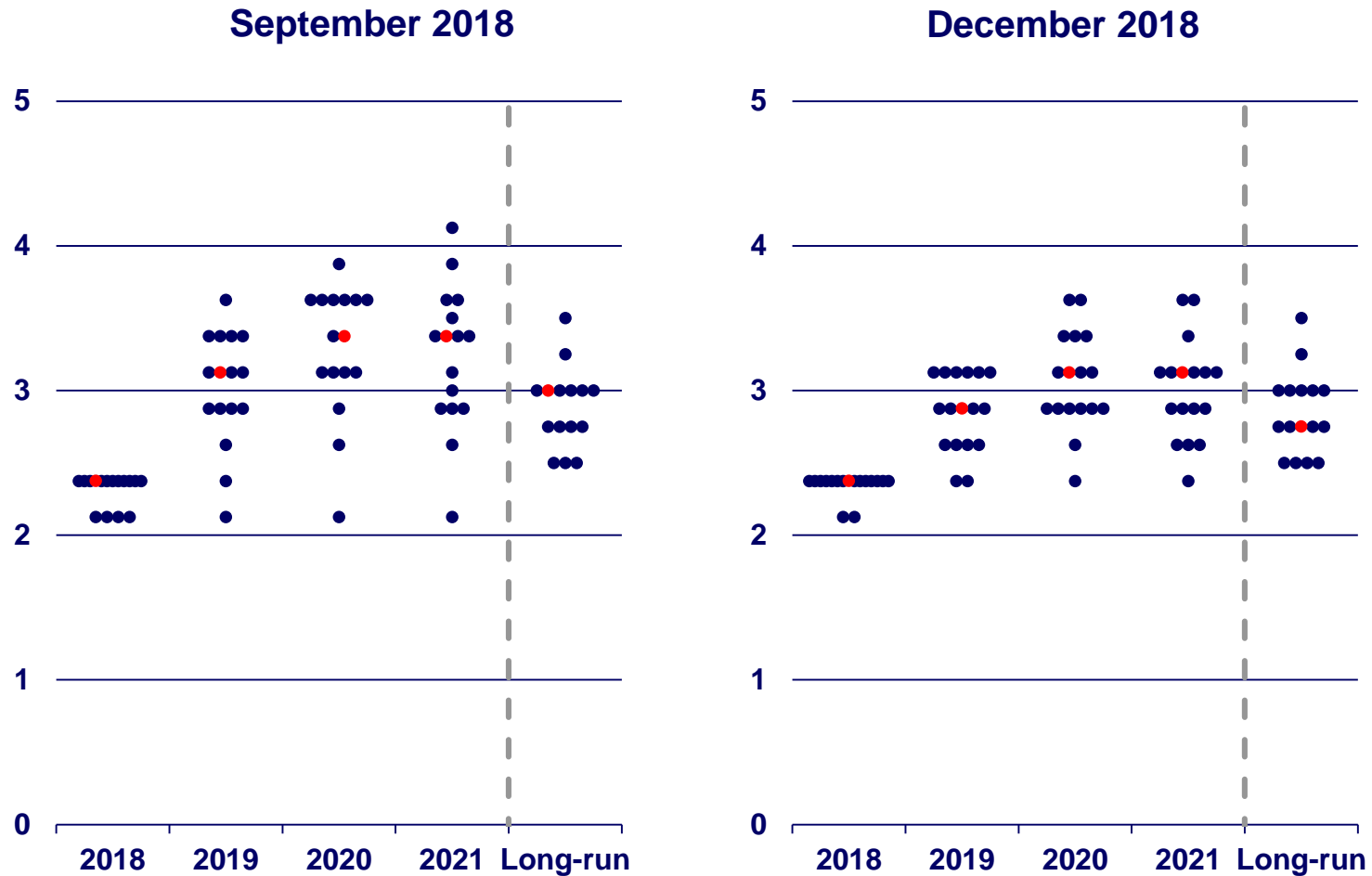
Overall Financial Conditions Still Accommodative

Chicago Fed National Financial Conditions Index
(relative to average)

Period	Change in the NFCI
1997 Asian Crisis	0.18
1998 Russian Crisis	0.56
2010 Greek Crisis	0.19
2011 Euro Fiscal Concerns	0.46
2013 Taper Tantrum	0.06
Nov. 2015-Feb.2016 Episode	0.17
Current Episode	0.03

25-Jan-2019

*Source: Federal Reserve Bank of Chicago*

FOMC's Expected Monetary Policy Path

Each shaded circle indicates the value (rounded to the nearest 1/8 percentage point) of an individual participant's judgment of the appropriate level of the target federal funds rate at the end of the specified calendar year or over the longer run. Red dots indicate the median projection. Inertial Taylor rule uses data from the FOMC's SEPs.

Investors' Policy Expectations

Distribution of Federal Funds Rate Target at 2019 Year End
(percent)

50
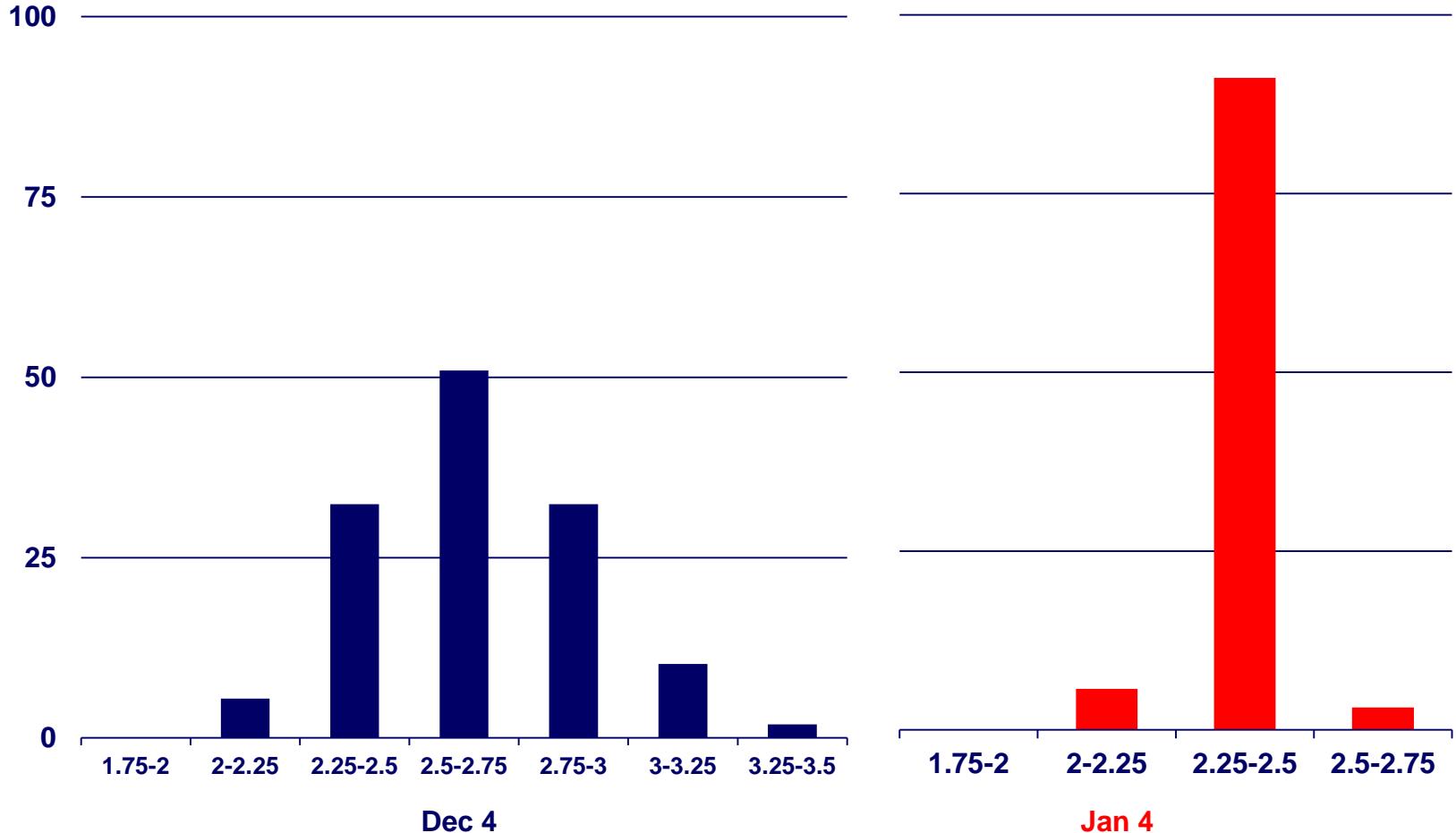
January 30, 2019 FOMC Statement

- **"Patient" with future adjustments to policy**

- **Wait-and-see how the cross-currents resolve**

- **Usual approach during periods of heightened uncertainty**