Thoughts on US Monetary Policy

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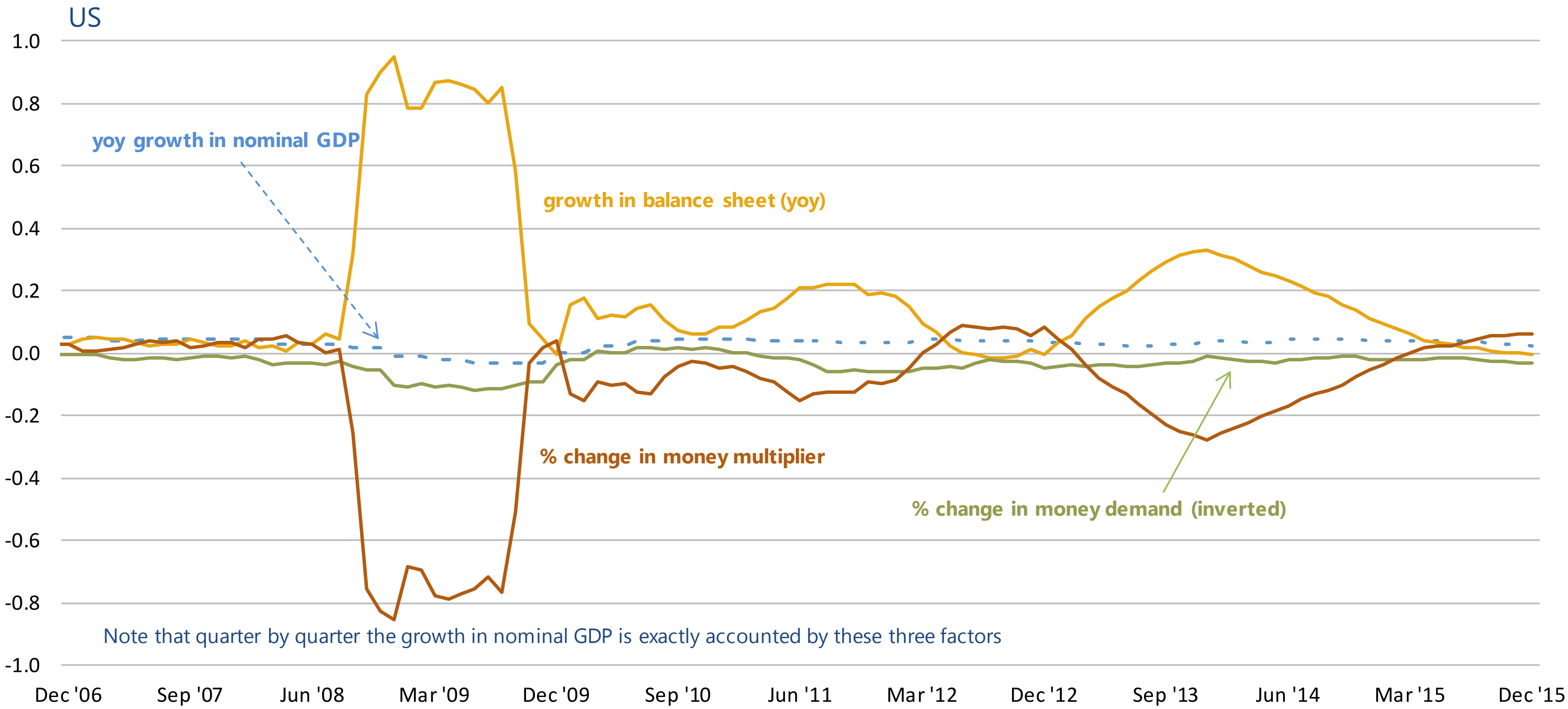
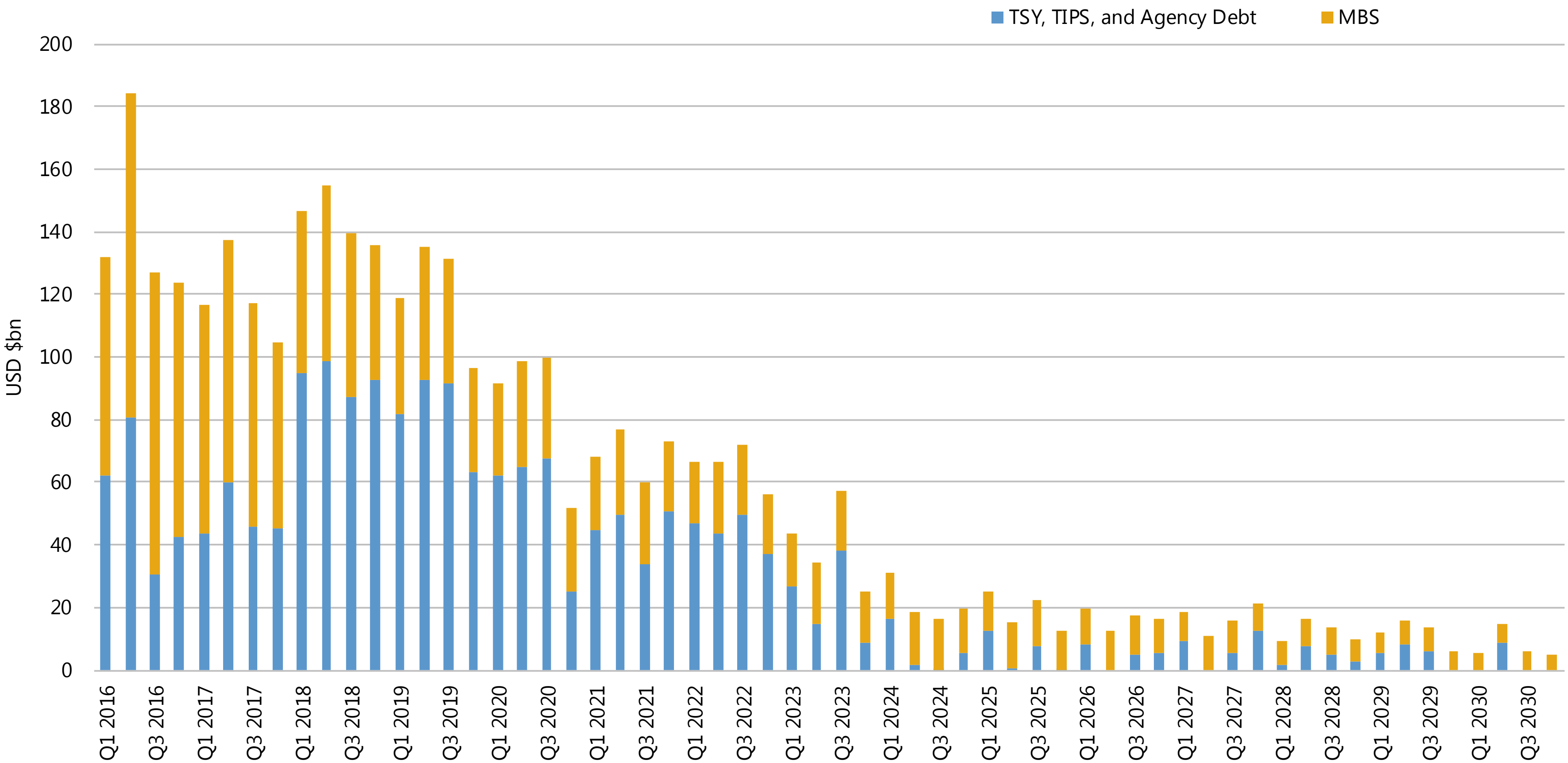
QE and Nominal GDP… the Collapse (and Rebound?) of the Money Multiplier



As of 31 December 2015
SOURCE: Haver Analytics

Maturity profile of the Fed's balance sheet through 2030



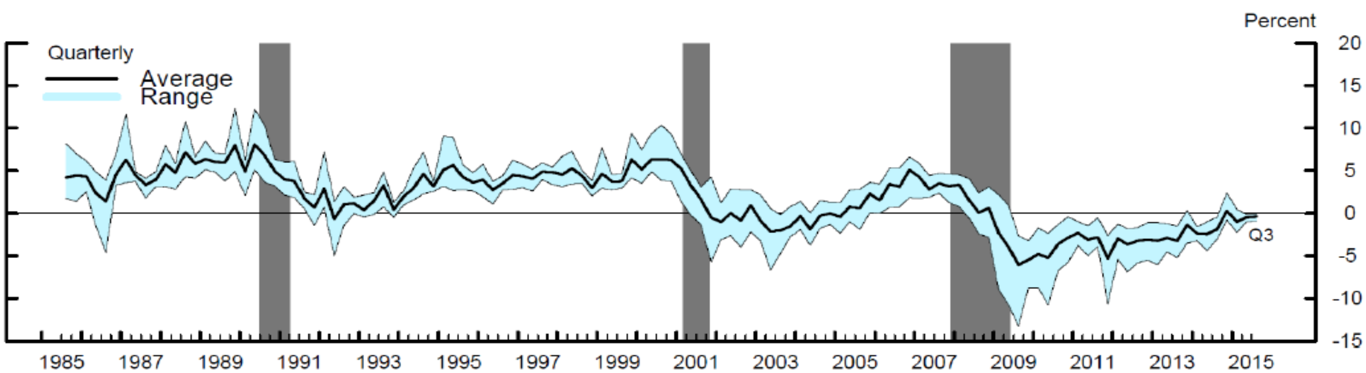
As of 1 January 2016
SOURCE: Federal Reserve Bank of New York, PIMCO
MBS "maturities" are estimated by modeling prepayments on MBS currently held on the Fed's balance sheet.

A ‘New Neutral’ Requires a Gradual Lift Off to a Lower Destination

> The equilibrium real federal funds rate is at present well below its historical average and is anticipated to rise only gradually over time as the various headwinds that have restrained the economic recovery continue to abate. If incoming data support such a forecast, the federal funds rate should be normalized, but at a gradual pace.

- Chairman **Janet Yellen** speaking at the "**The New Normal for Monetary Policy**" research conference at the Federal Reserve Bank of San Francisco, March 27, 2015

Estimates of the Real Natural Rate of Interest from Different Macroeconomic Models

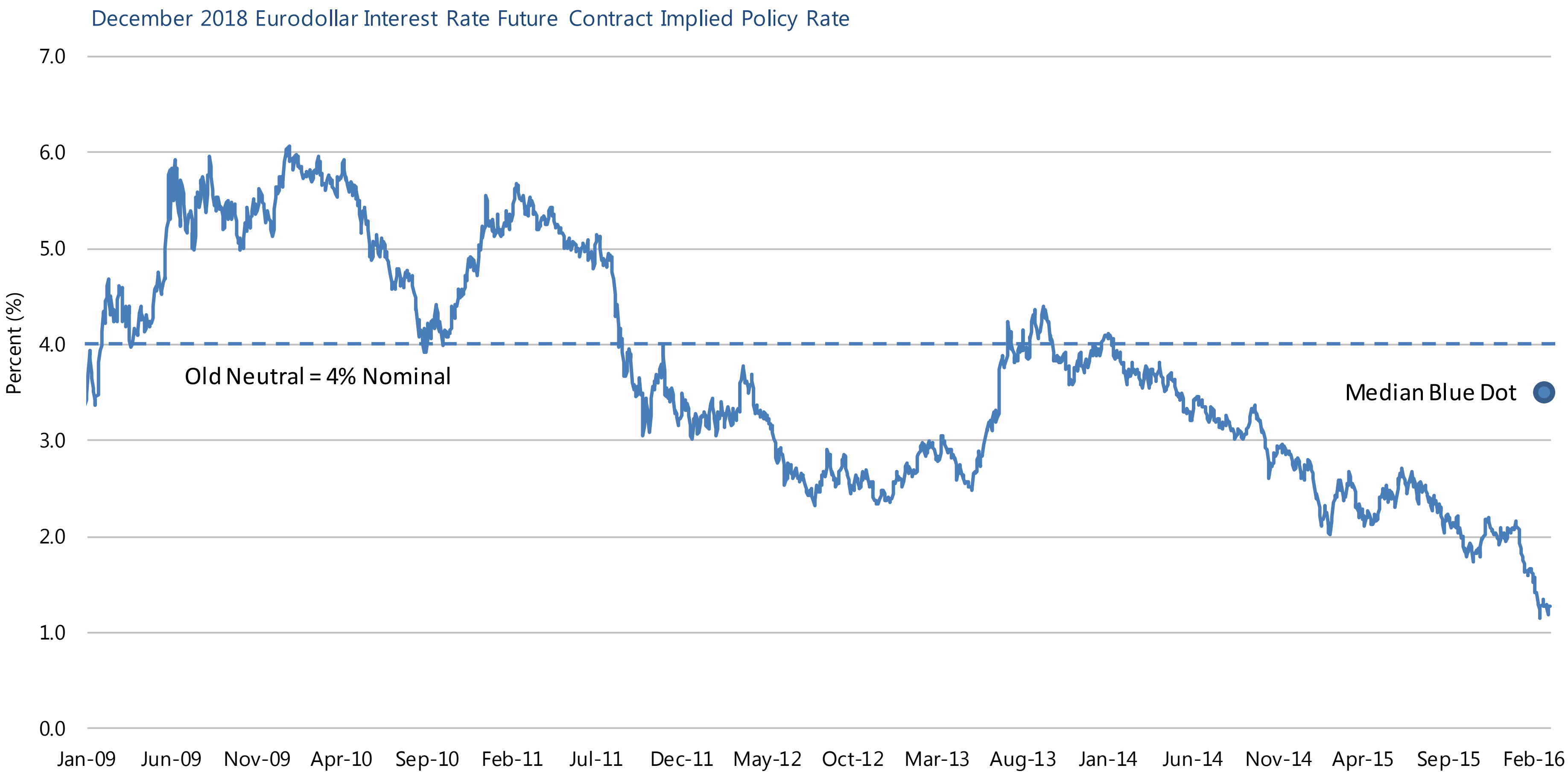


Note: The shaded bars indicate periods of business recession as defined by the National Bureau of Economic Research.

Source: The estimates are drawn from four models: (1) a dynamic stochastic general equilibrium (DSGE) model developed by the staff of the Federal Reserve Board and described in Kiley (2013); (2) a DSGE model developed by the staff of the Federal Reserve Bank of New York and described in Del Negro and others (2013); (3) a DSGE model developed by the staff of the Federal Reserve Board based on Christiano, Motto, and Rostagno (2014); and (4) a DSGE model developed by the staff of the Federal Reserve Board based on Guerrieri and Iacoviello (2013 [rev. 2014]).

SOURCE: Federal Reserve

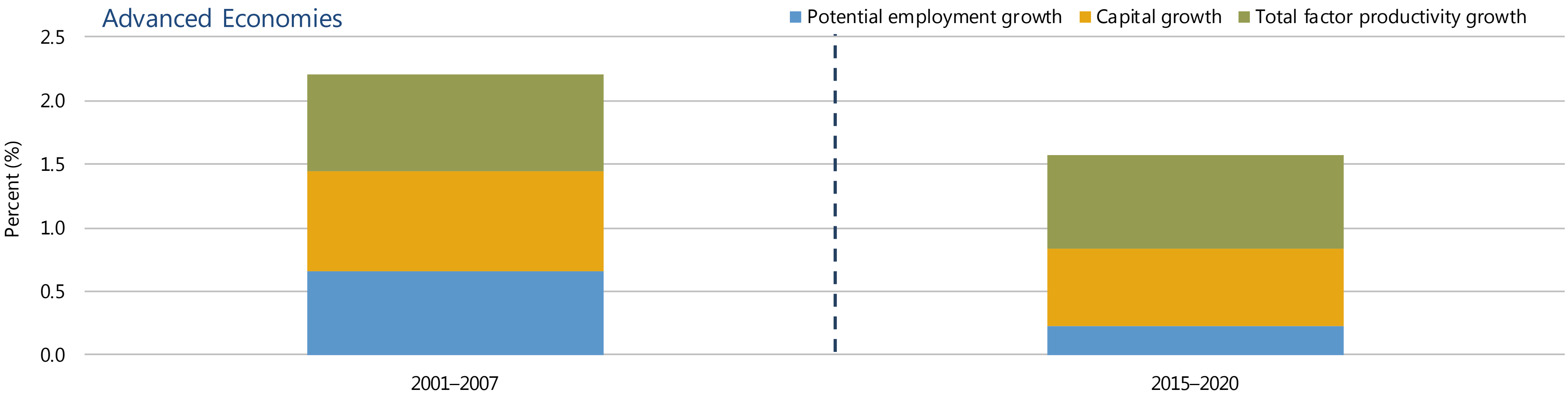
Evolution of Market Pricing of Short Term Interest Rates in December 2018

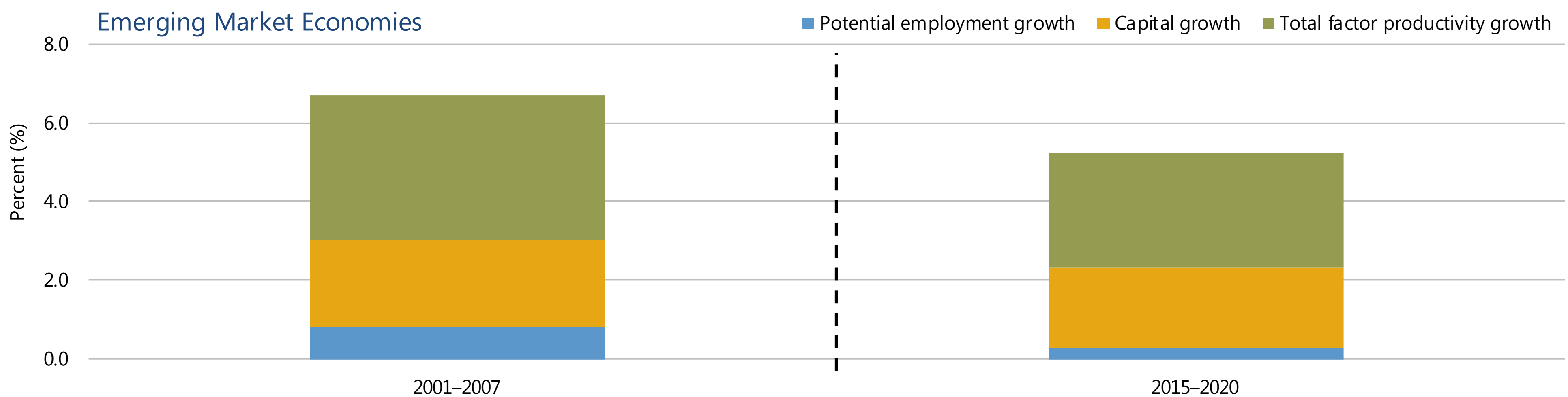


As of 29 February 2016
SOURCE: Bloomberg

Global growth converging to slowing trend trajectories

Potential output growth and its components





As of 15 April 2015
SOURCE: IMF World Economic Outlook

Neutral real interest rate, in theory, a weighted average of US and foreign potential output growth (Clarida, Gali, Gertler (2002))

Only in the special case of a closed economy is neutral real interest rate a function solely of home potential output growth. In general, CGG (2002) show that:

Potential Global GDP Growth

$$\overline{rr}_t = \rho + \beta_1 E_t\{\Delta \overline{y}_{t+1}\} + \beta_2 E_t\{\Delta y^*_{t+1}\}$$

Potential Home GDP growth

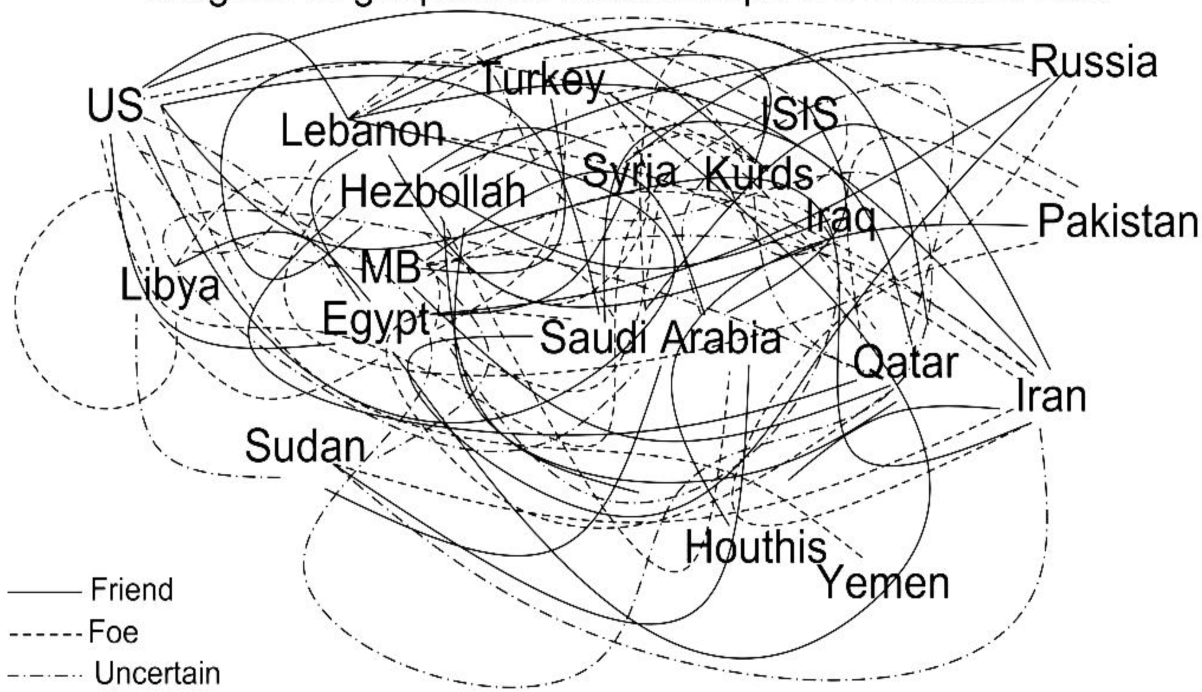
What happens in Beijing and Brasilia is (almost) as important as what happens in Washington to US bond yields - in the front end as well as the long end!

US Bond Yields Reflect in Part the Value of Insurance in an Uncertain World

“Curiously, heightened risk and fears of further disruptions – not just another financial crisis, but also geopolitical instability and pandemics – do not seem to carry much weight in current policy discussions… Though bonds are hardly a perfect hedge against such risks… even relatively minor shifts in disaster risk – say, a rise from a normal 2–3% to 3–4% – can lead to a massive decline in global real interest rates, even taking them well into negative territory. This can be the case even if expected growth is strong…”

Ken Rogoff, “The Stock Bond Disconnect,” Project Syndicate

Diagram of geopolitical relationships in the Middle East

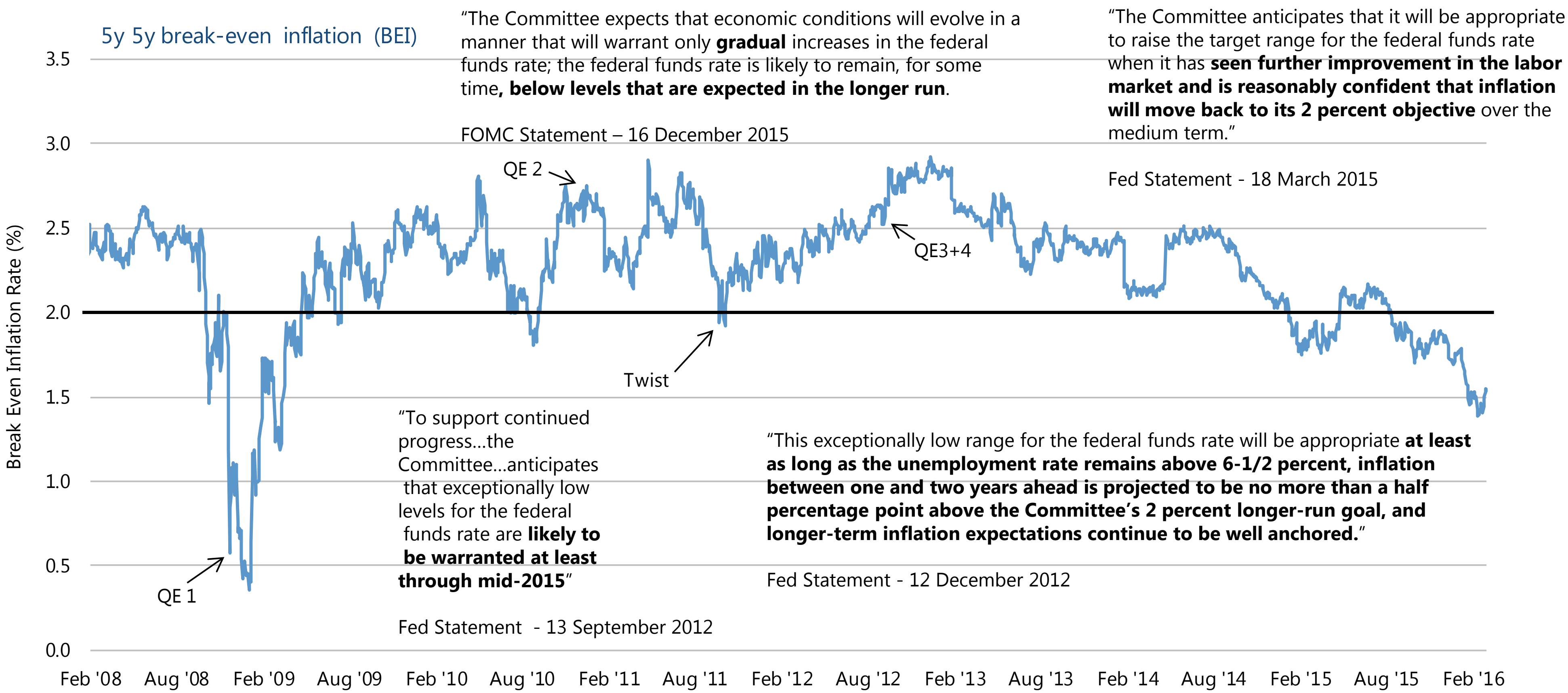


SOURCE: Atlantic Monthly

Total Return on a 30 Year US Treasury Bond in 2008…40%!

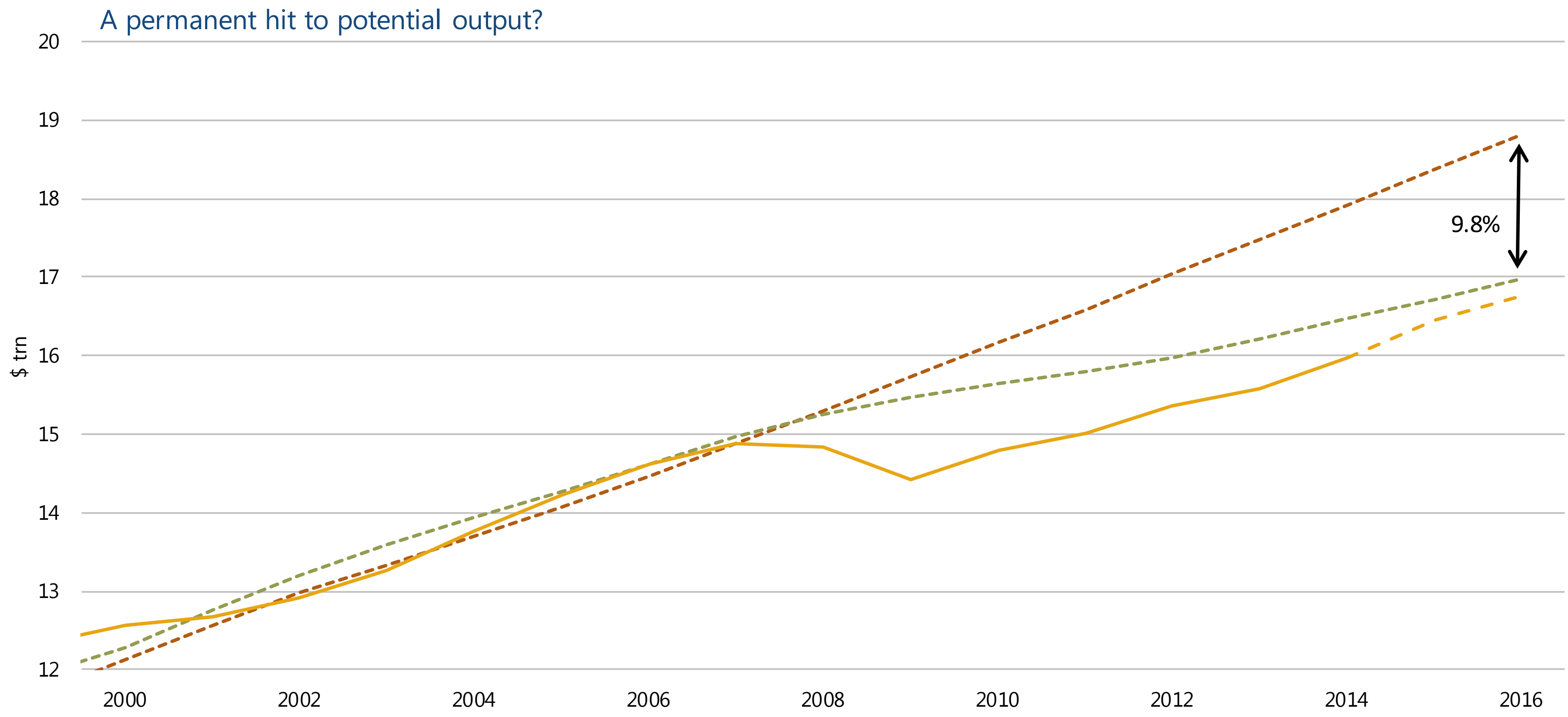
As of 1 January 2009
SOURCE: Bloomberg

Fed likely to continue to rely on communication to keep policy rate expectations anchored…



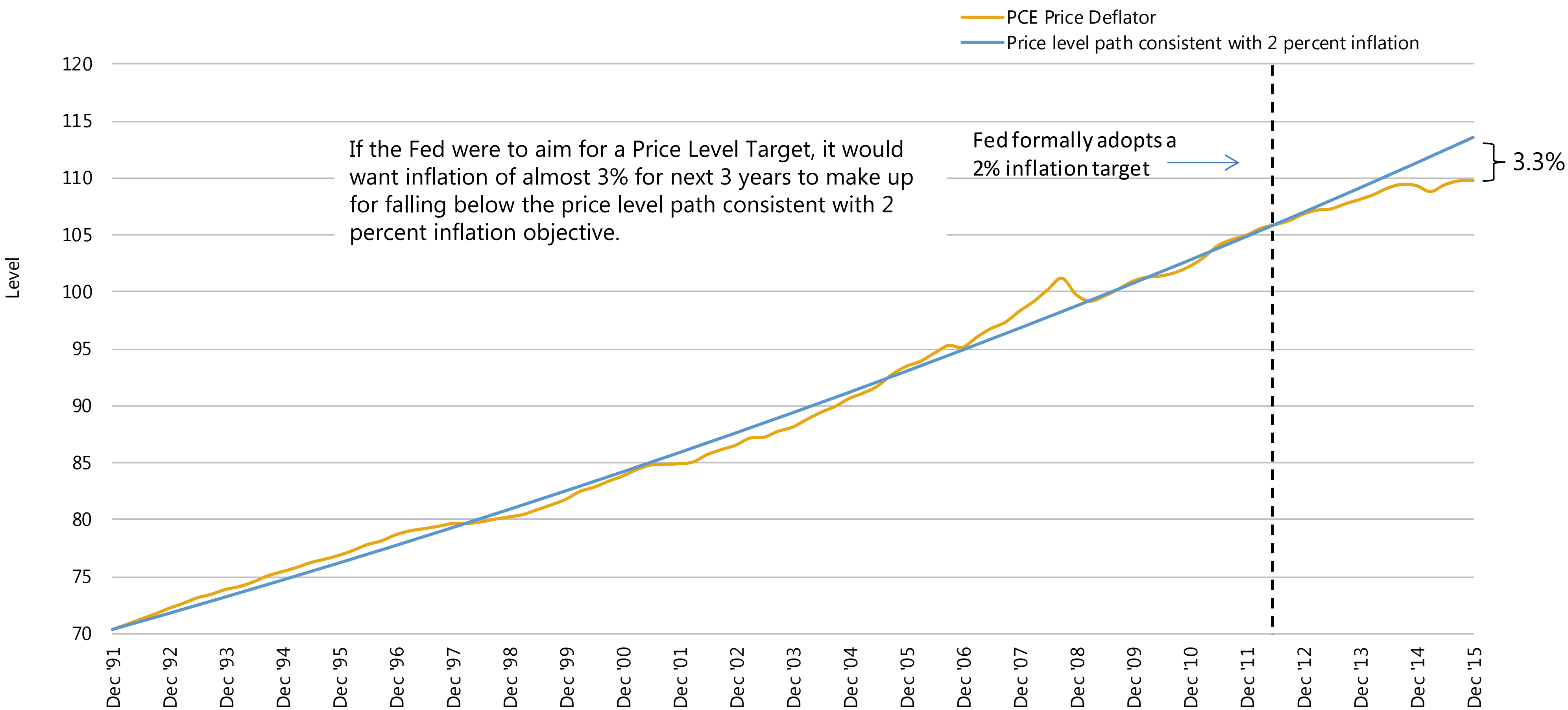
As of 29 February 2016
SOURCE: Bloomberg, Federal Reserve

As output gaps close in some major economies, and as central banks aim to run economies 'hot', is there upside risk to inflation that is not factored in to the consensus view?



As of 25 January 2016
SOURCE: CBO, "An Update to the Budget and Economic Outlook: 2015 to 2025"

US Price Level Since 1992…Time for a Price Level Target?



As of 31 December 2015
SOURCE: PIMCO, Haver Analytics