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Fixed Income Research

Secular stagnation and US monetary policy

US Economics

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See Appendix A-1 for analyst certification, important disclosures and the status of non-US analysts.

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Interest rates and the trajectory of the economy

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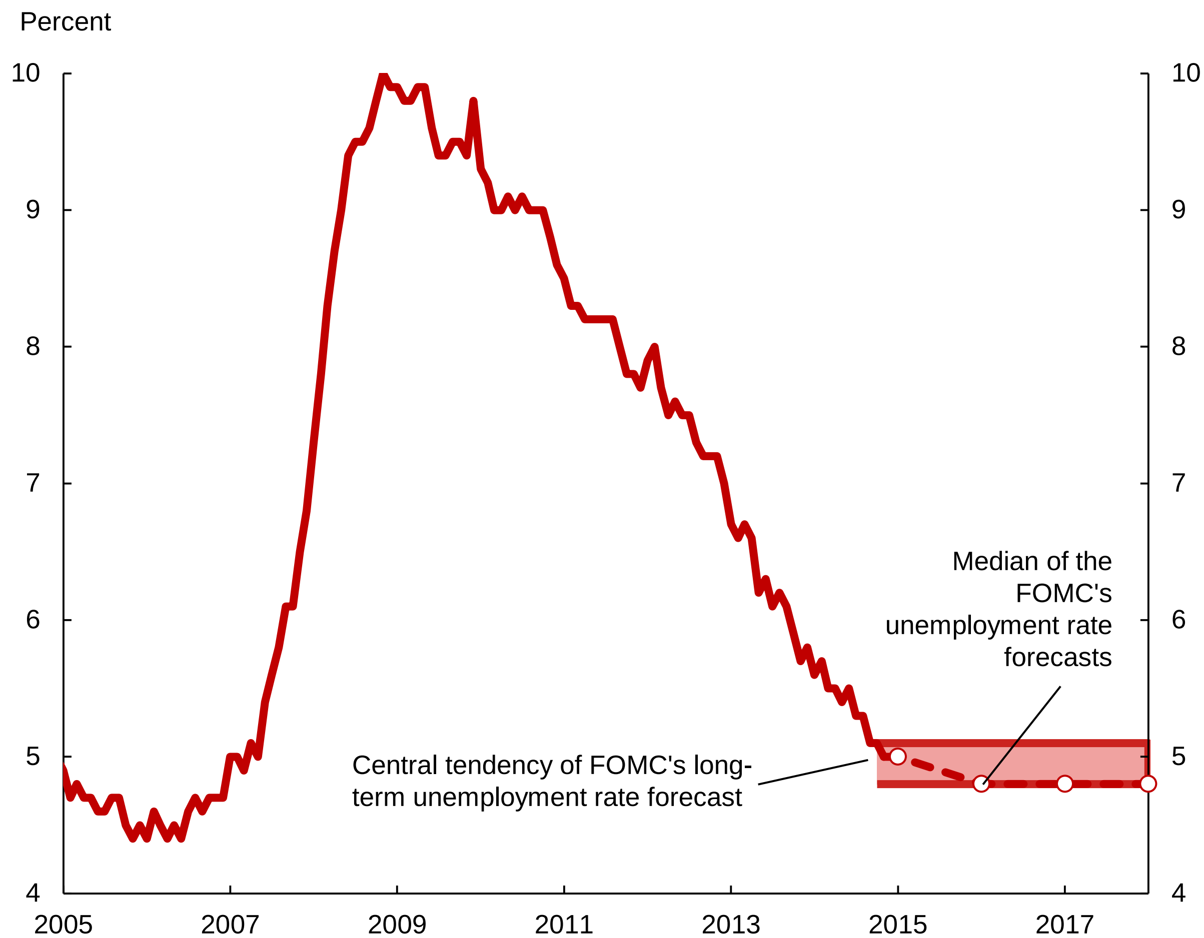
- After five years of steady declines the FOMC expects the unemployment rate to stabilize near its estimates of the “natural rate.”
- How far will rates have to increase to hit this forecast for the unemployment rate?
- What factors will determine how far rates have to rise?

Unemployment rate, actual and the FOMC forecasts

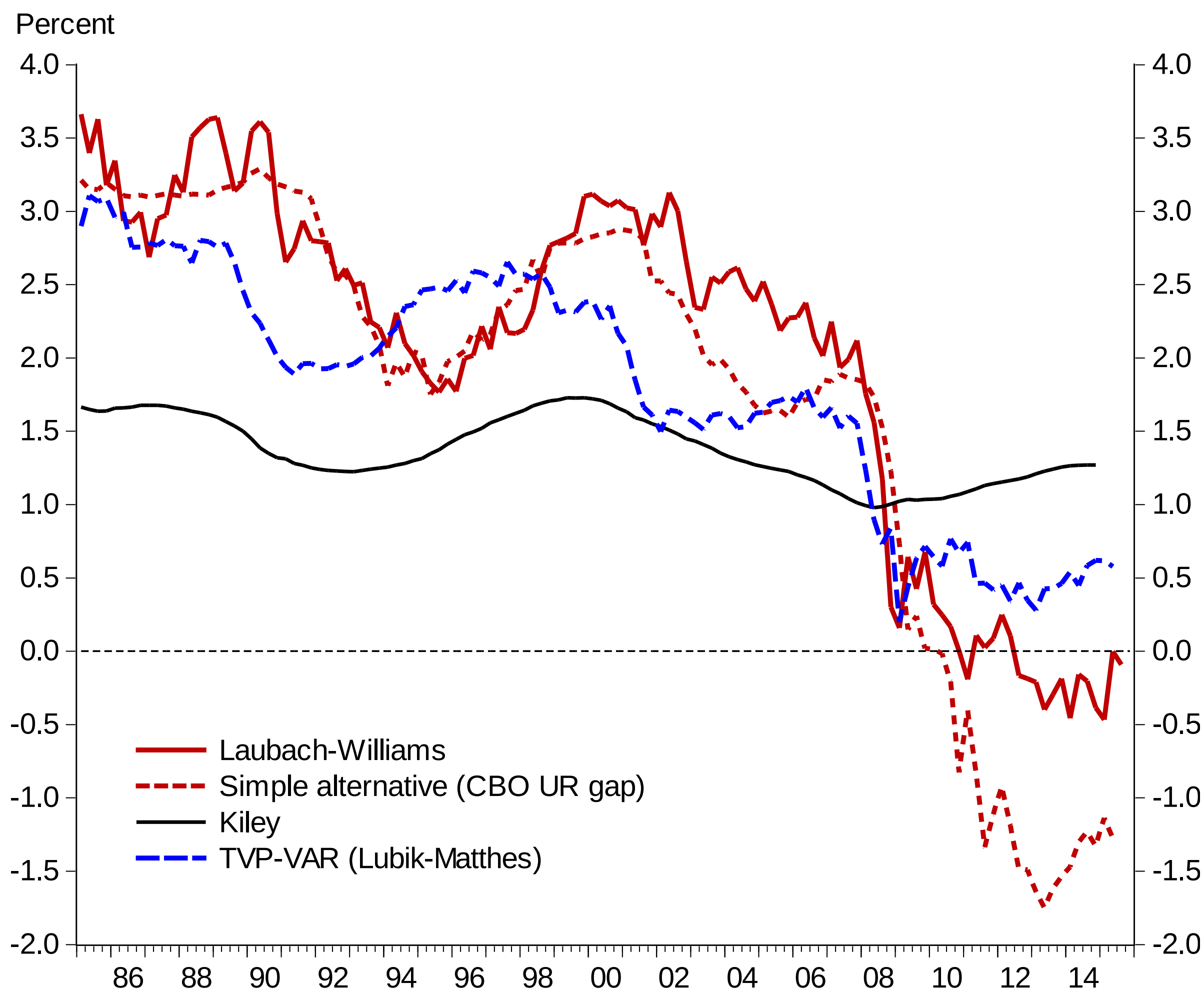


Source: BLS, Federal Reserve and Nomura Economics

A look at the data (#1)

- We can estimate the ERIR by asking what level of interest rates seems consistent with the economy growing at its potential.
- The most well-known model is Laubach and Williams (2003).
- Other approaches:
  - Use different measures of the output gap;
  - Take into account financial conditions (Kiley (2015))
  - Use time-varying parameters in a VAR (Lubik and Matthes (2015))
- Most of these approaches suggest that the ERIR:
  - Declined sharply during the "Great Recession."
  - Has increased little thereafter

Alternative estimates of the Equilibrium Real Interest Rate (ERIR, R*)



Source: Laubach and Williams (2003), Kiley (2015), Lubik and Matthes (2015), CBO and Nomura Economics.

Trends in "Equilibrium Real Interest Rates" (#2)

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Alternative estimates of the equilibrium real interest rate (R*) during economic recoveries

				Simple Alternatives				
				Output Gap		Unemployment Gap		
		LW	Kiley	LW	FRM	CBO	FRM	TVP-VAR
1983q1-1990q3	**R***	**3.2**	**1.6**	**2.9**	**3.7**	**3.1**	**3.9**	**2.8**
	s.e.		*0.7*	*0.4*	*0.4*	*0.4*	*0.4*	*1.0*
1991q2-2000q4	**R***	**2.4**	**1.5**	**2.7**	**2.0**	**2.4**	**2.3**	**2.3**
	s.e.		*0.8*	*0.3*	*0.6*	*0.4*	*0.6*	*0.9*
2002q1-2007q4	**R***	**2.4**	**1.3**	**2.4**	**2.1**	**1.9**	**2.1**	**1.6**
	s.e.		*0.7*	*0.3*	*0.5*	*0.4*	*0.6*	*1.0*
2009q3-2015q2	**R***	**0.0**	**1.2**	**-0.1**	**-1.5**	**-1.0**	**-0.8**	**0.5**
	s.e.		*0.8*	*1.0*	*1.3*	*1.1*	*1.2*	*1.3*
Last	**R***	**-0.1**	**1.3**	**-0.3**	**-1.2**	**-1.3**	**-1.0**	**0.6**
	s.e.		*0.8*	*1.0*	*1.2*	*1.2*	*1.2*	*1.4*

Notes: Simple alternatives are estimated using a simplified version of the Kalman filter techniques used by Laubach-Williams and alternative measures of "slack." See slide 15. The time-varying-parameter (TVP-VAR) is from Lubik and Matthes (2015). Source: Laubach and Williams (2003), Kiley (2015); Lubik and Matthes (2015), and Nomura Economics

Model-based estimates of the "natural" rate of interest

- The "natural rate" of interest is generally defined as the rate consistent with the economy operating in equilibrium (full employment) in the absence of price distortions.
- Note that the "natural rate" moves in response to the shocks that affect the economy.
- Since the "Great Recession" estimates of the natural rate have generally been negative and well below estimates of the ERIR.
- Estimates of the "natural rate" are sensitive to the specification of the model.

Alternative DSGE estimates of the "Natural" (Wicksellian) Real Interest Rate

		Justiniano and Primiceri (2010)	Barsky, Justiniano and Melosi (2014)	Del Negro, et al, (2015)	Curdia (2015)
1983q1-1990q3	**R***	**4.8**			
	s.e.	*0.5*			
1991q2-2000q4	**R***	**3.5**	**2.4**		
	s.e.	0.5			
2002q1-2007q4	**R***	**0.3**	**-2.6**		
	s.e.	0.5			
2009q3-2015q2	**R***		**-8.6**	**-4.7**	**-3.2**
	s.e.				*0.8*
Last	**R***			**-2.6**	**-2.7**
	s.e.				*0.7*

Source: Justiniano and Primiceri (2010); Barsky, Justiniano and Melosi (2014); Del Negro, et al, (2015); Curdia (2015); and Nomura Economics.

Are rates going to return to “normal”?

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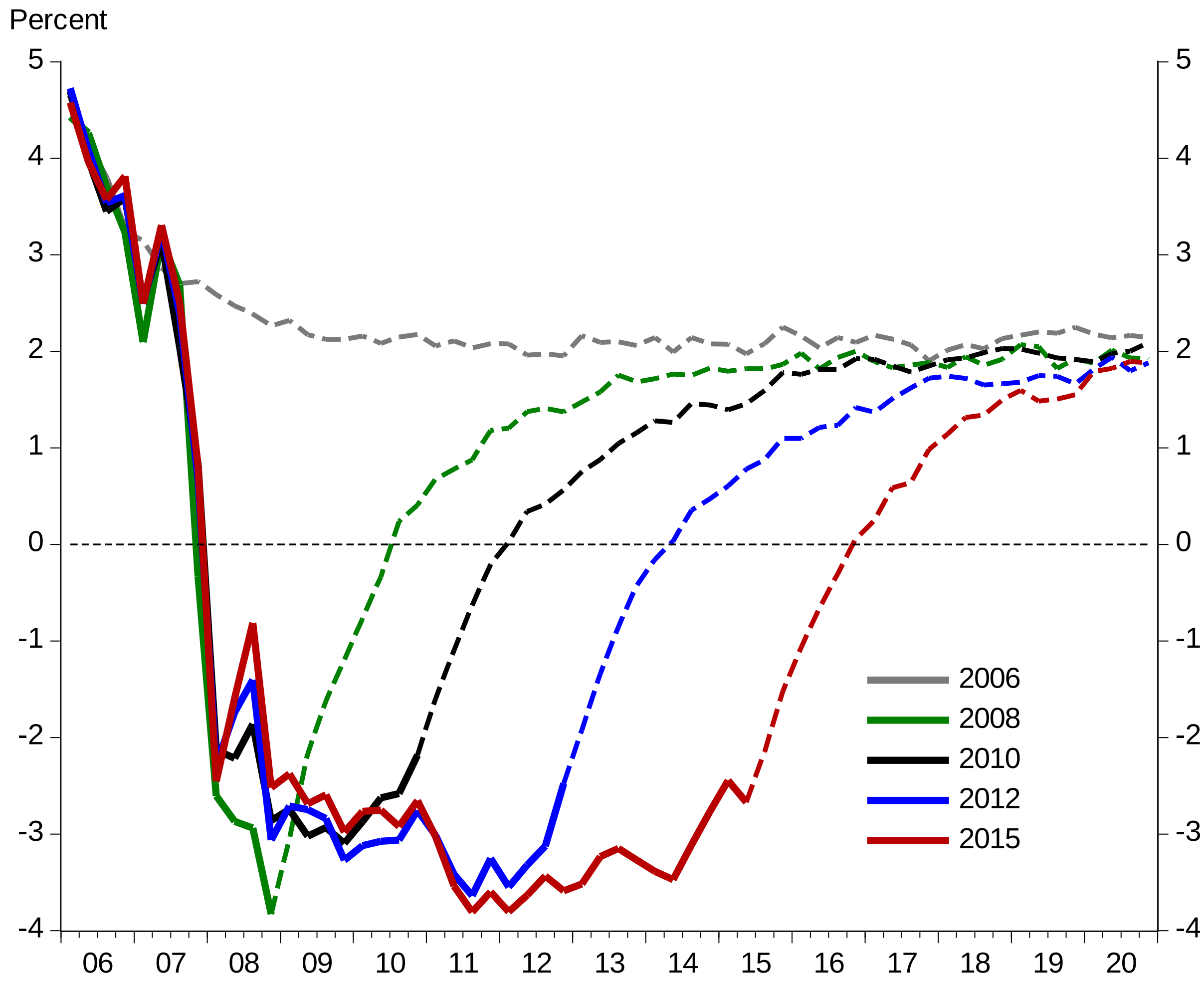
- Estimates of the ERIR and the “natural rate” of interest fell sharply during the “Great Recession.”
- They have not recovered.
- This raises the question of whether or not the shocks that have lowered interest rates are temporary or permanent.

Alternative estimates of, and forecasts for, the natural rate of interest based on data available through different periods



Note: The natural rate of interested is estimated forecasted going forward based on data available through the end of 2006, 2008, 2010 and 2012, and through 2015q2. Estimates and forecasts are based on the DSGE model presented Curdia, Ferrero, Ng, and Tambalotti (2015). Source: Curdia (2015) and Nomura Economics.

What does the data tell us?

- Equilibrium interest rate concepts – the ERIR and the "natural" rate of interest – are ***not*** stable
  - A variety of estimation techniques show considerable variation

- Equilibrium interest rates fell substantially at the time of the "Great Recession."

- But equilibrium interest rates were declining before the "Great Recession."
  - Weak recoveries following recessions in 1991 and 2001 may have been early consequences of some of the factors that are holding down interest rates now.

- Equilibrium interest rates have recovered little since the "Great Recession."

- Our quantitative estimates of equilibrium interest rates are very uncertain.
  - Kiley estimates that 80% of changes in priors about R* pass through to the posterior distribution.
  - "These results suggest that researchers with alternative prior views about the degree to which r* has shifted over time are unlikely to be swayed by the information in the relationship between output and short-term interest rates–there is simply too little information in such co-movement over the past 50 years to provide much guidance." Kiley (2015)

Source: Nomura Economics

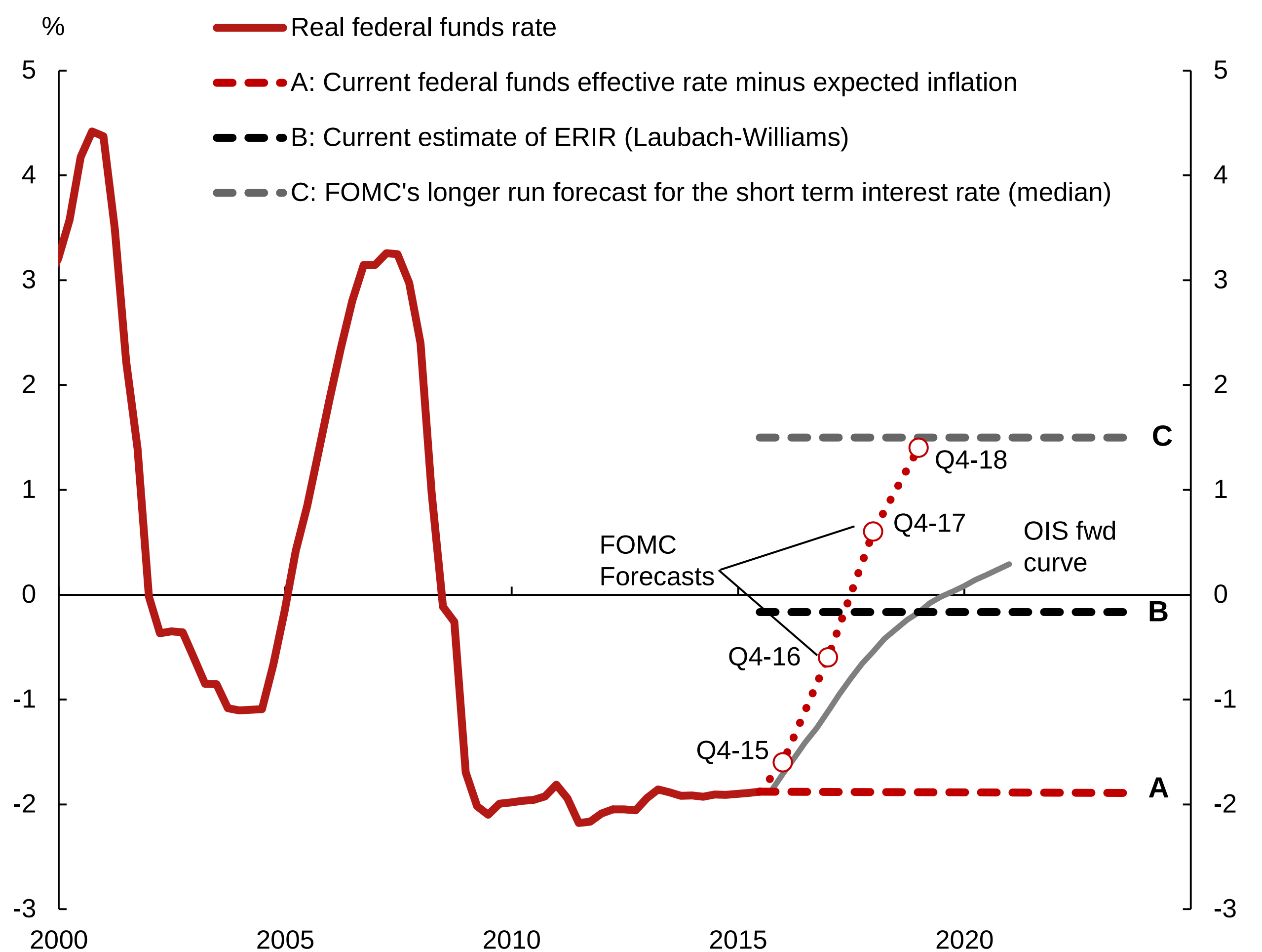
The FOMC’s interest rate forecast

■ The current FOMC forecast implies that they expect to close the gap with current estimates of the ERIR by early 2017.

■ Beyond that, additional hikes will depend on increases in the ERIR.

■ Ultimately, the FOMC will be constrained by what the economy can handle.

Real Federal Funds Rate, history and the FOMC’s forecast; estimate of the Equilibrium Real Interest Rate (ERIR); and the OIS forward curve



Note: Estimates of ERIR are from the latest estimates of Laubach and Williams (2003). Real federal funds rate is federal funds effective rate minus expected inflation from the FRB/US model (ex ante).
Source: Federal Reserve Board, Bloomberg and Nomura Economics

A non-exhaustive list of possible explanations

- Headwinds – an unfortunate sequence of shocks that will dissipate over time.
- Slowdown in potential growth
  - Slower growth in labor input
  - Slower growth in multifactor productivity
- Demographic effects on savings
  - Longer lifespans and earlier retirement increase the need for private savings
- Global savings glut
  - High rates of savings in fast-growing emerging economies
- "Shortage" of high-quality assets
- IT and investment
  - Falling relative price of capital goods
  - Changing nature of innovation

Source: Nomura Economics

Headwinds

- Recent declines in interest rates may reflect a series of shocks that have suppressed aggregate demand rather than some new persistent trend.
- In the wake of the “Great Recession” the US economy has had to deal with a number of shocks.
  - A correction in residential construction
  - Balance sheet repair for households and financial institutions
  - The European crisis
  - Fiscal consolidation
  - Weak foreign growth and the appreciation of the dollar
- This adjustment process may be typical – in its broad effects, rather than the details – of recoveries following deep financial crises.
- The apparent decline of equilibrium interest rates before the “Great Recession” undermines the strong form of the “headwinds” explanation.
  - It is noteworthy that the use of the word “headwinds” in this context was popularized by Alan Greenspan to described the weak recovery following the recession in 1991.

Source: Nomura Economics

Adverse supply trends

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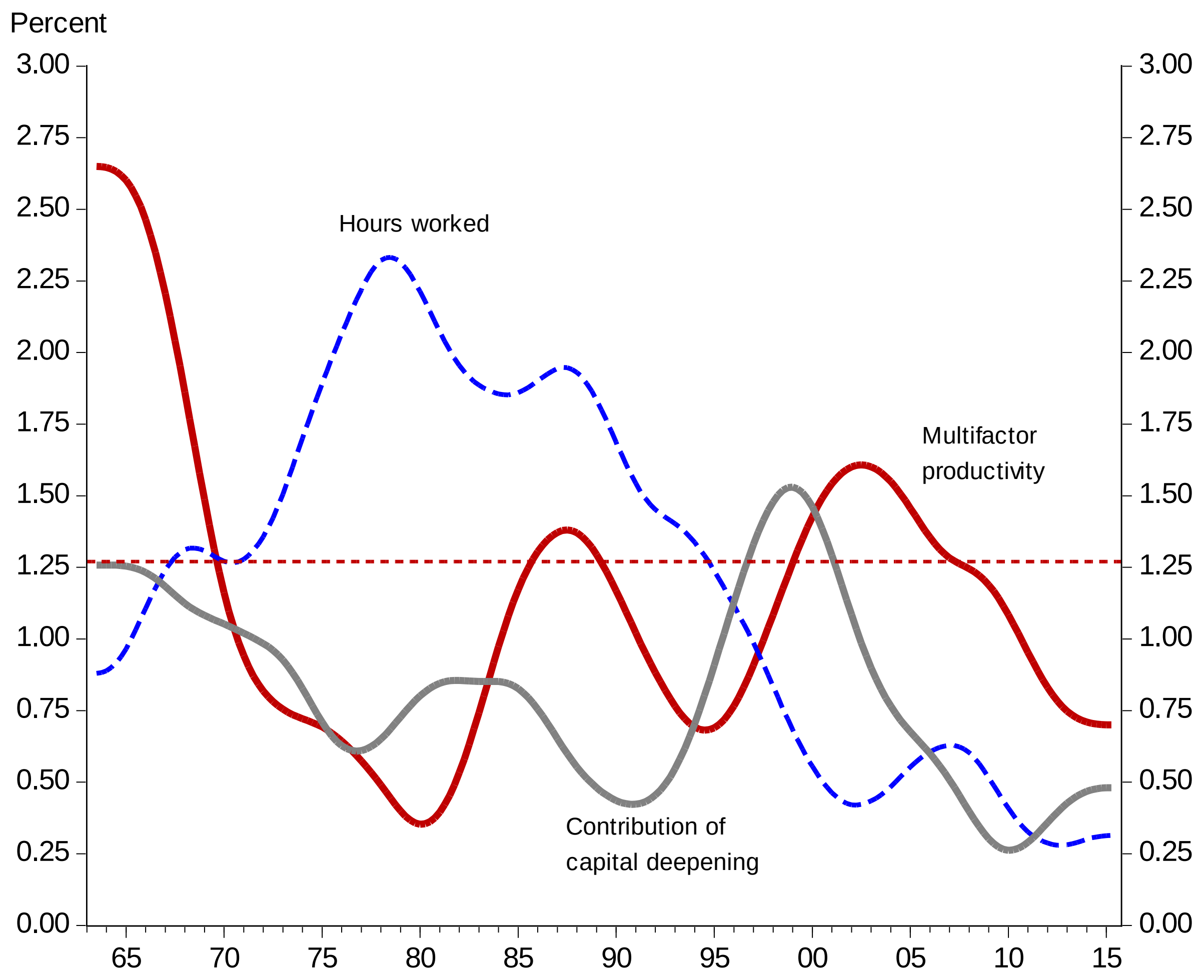
- The recent performance of interest rates comes at a time when aggregate supply is growing very slowly.
- The pace of growth has slowed for:
  - Hours worked
  - Multifactor productivity
  - The contribution of capital deepening to business sector productivity

Trend growth in: hours worked, multifactor productivity and the contribution of capital deepening to business sector productivity

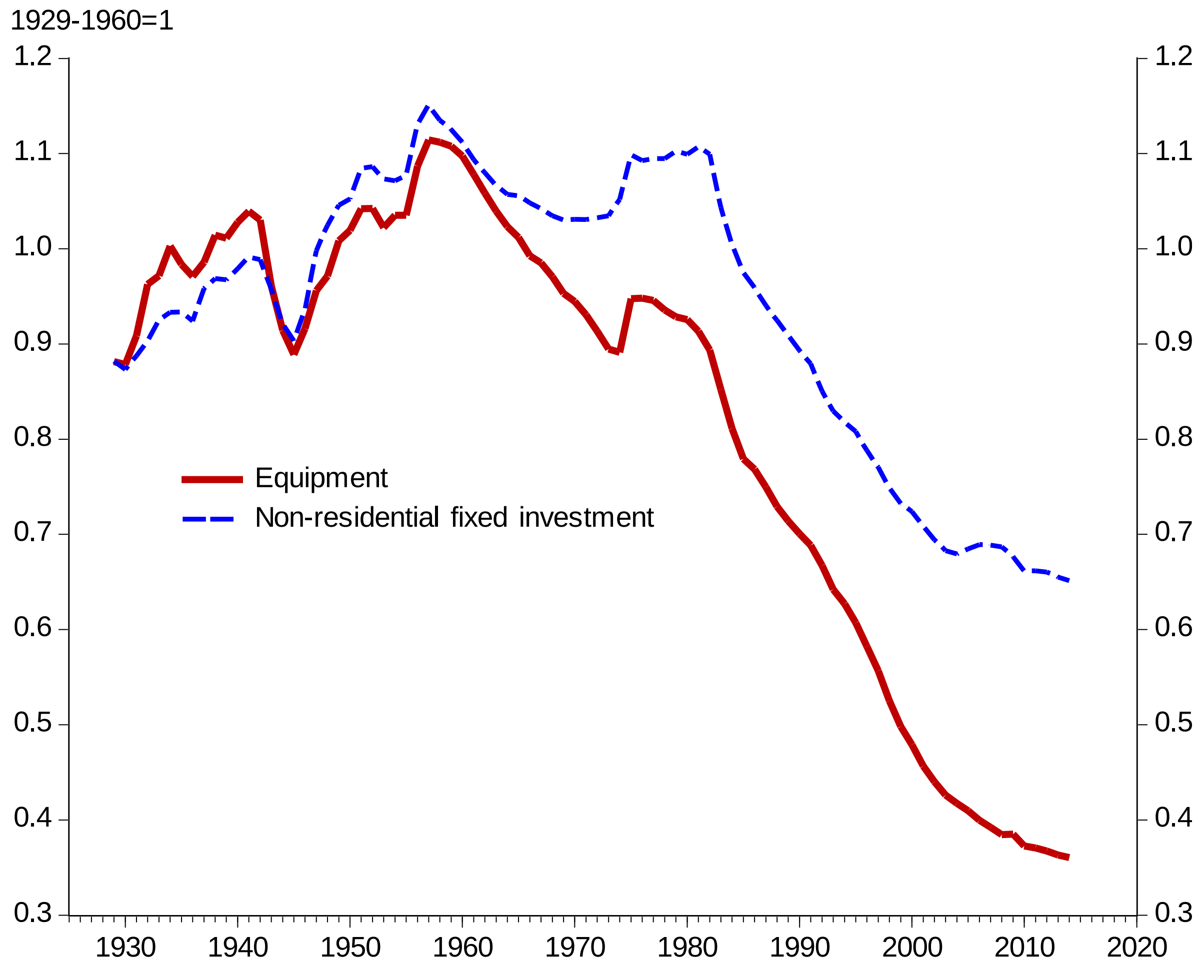


Note: Trends are estimated using the model presented in Fleischman and Roberts (2011). Red dashed line is the average rate of growth of multifactor productivity for 1947-2015 from Fernald (2014) .
Source: Fleishman and Roberts (2011), Fernald (2014) and Nomura Economics.

Falling price of capital

- In recent decades, prices for capital goods have fallen relative to prices for consumer goods.
- The biggest single explanation is the decline in the price of IT equipment.
- In recent years the pace of decline has seemed to slow.
  - But this probably reflects inadequacies in the way the BLS and BEA capture improvements in basic semi-conductors.

Ratio of prices for total non-residential fixed investment and equipment investment to core PCE prices

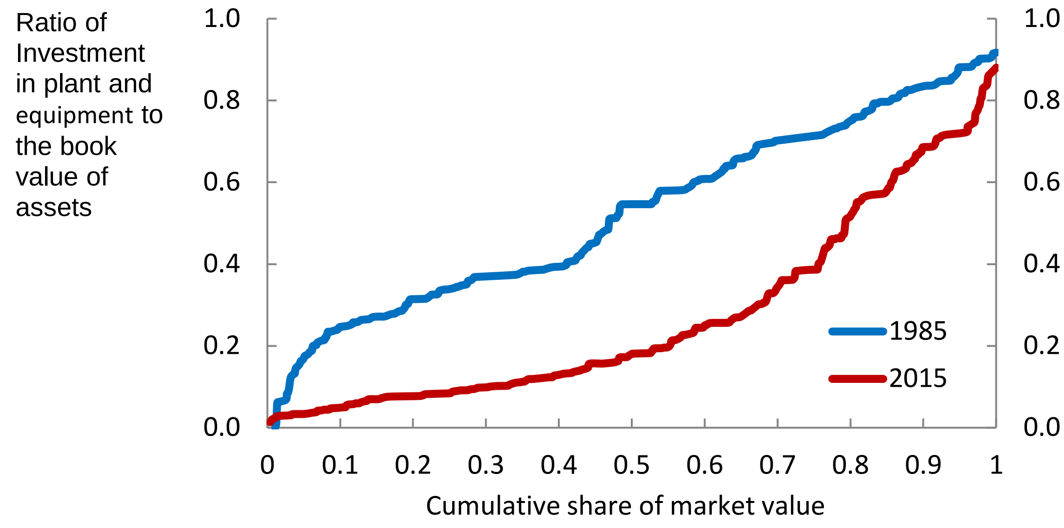


Source: BEA and Nomura Economics.

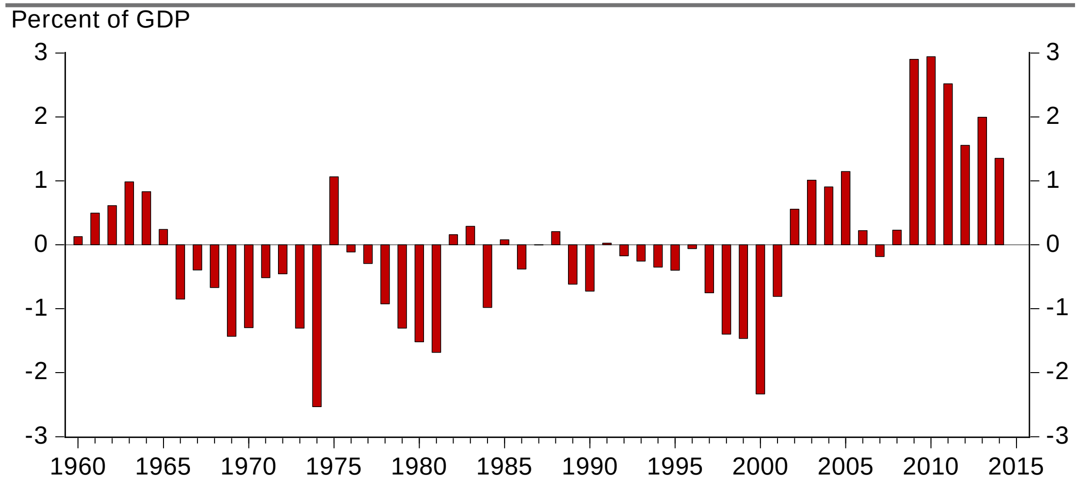
Shifting nature of innovation and corporate investment

- Investment in conventional plant and equipment has become less important for US companies.
- For the 250 largest non-financial companies, ratio of the value of plant and equipment to the book value of assets has fallen substantially.
- The median has fallen by more than two thirds over the last thirty years.
- Net lending by the non-financial corporate sector has turned positive since 2000.

Plant and equip. for the 250 largest non-financial US firms



Net lending by the Non-financial corporate sector



Source: BEA, Factset, and Nomura Economics

A few final thoughts (for me)

- Recent declines in interest rates probably reflect multiple factors
  - Alternative explanations are not, for the most part, mutually exclusive.

- What's going to change?
  - Will the slowdown in China and other emerging economies, and the associated declines in commodity prices, reduce the "global savings glut"?
  - Will a decline in the pace of reserve accumulation reverse, at least somewhat, the "shortage" of high quality assets?
  - Will new products emerge that boost investment by businesses and households (driverless cars, for example)?

- How should the uncertainty about the current level of the ERIR, and its likely evolution, affect FOMC decision making?

Source: Nomura Economics

Other material

Simple approach to estimating R*

Basic equation

$$GAP_t = \beta_1 GAP_{t-1} + \beta_2 GAP_{t-2} + \beta_3 (RR_{t-1} - R^*)$$

Where:

$GAP_t \equiv$ Output or unemployment rate gap

$RR_t \equiv$ Ex ante real interest rate

- This equation can be estimated using latent variable (Kalman filter) techniques.
- This simple approach tracks the Laubach-Williams estimates when their estimate of the output gap is used.
- Alternative measures of either the output gap (from the Fleischman-Roberts model) or unemployment rate gap (from either Fleischman-Roberts or CBO) yield lower estimates of R* in recent years.

Source: Laubach and Williams (2003), Fleischman and Roberts (2011), and Nomura Economics

Policy rules with uncertainty

- ***Taylor Rule***

$$R_t = r^* + \pi_t + \beta_\pi(\pi_t - \hat{\pi}) + \beta_y\left(U_t - \widehat{U}_t\right)$$

  - The Taylor rule depends on two constants that are hard to measure, i.e., the equilibrium real rate of interest and the natural rate of unemployment.

- ***Difference Rule***

$$R_t = R_{t-1} + \beta_\pi(\pi_t - \hat{\pi}) + \beta_y(U_t - U_{t-1})$$

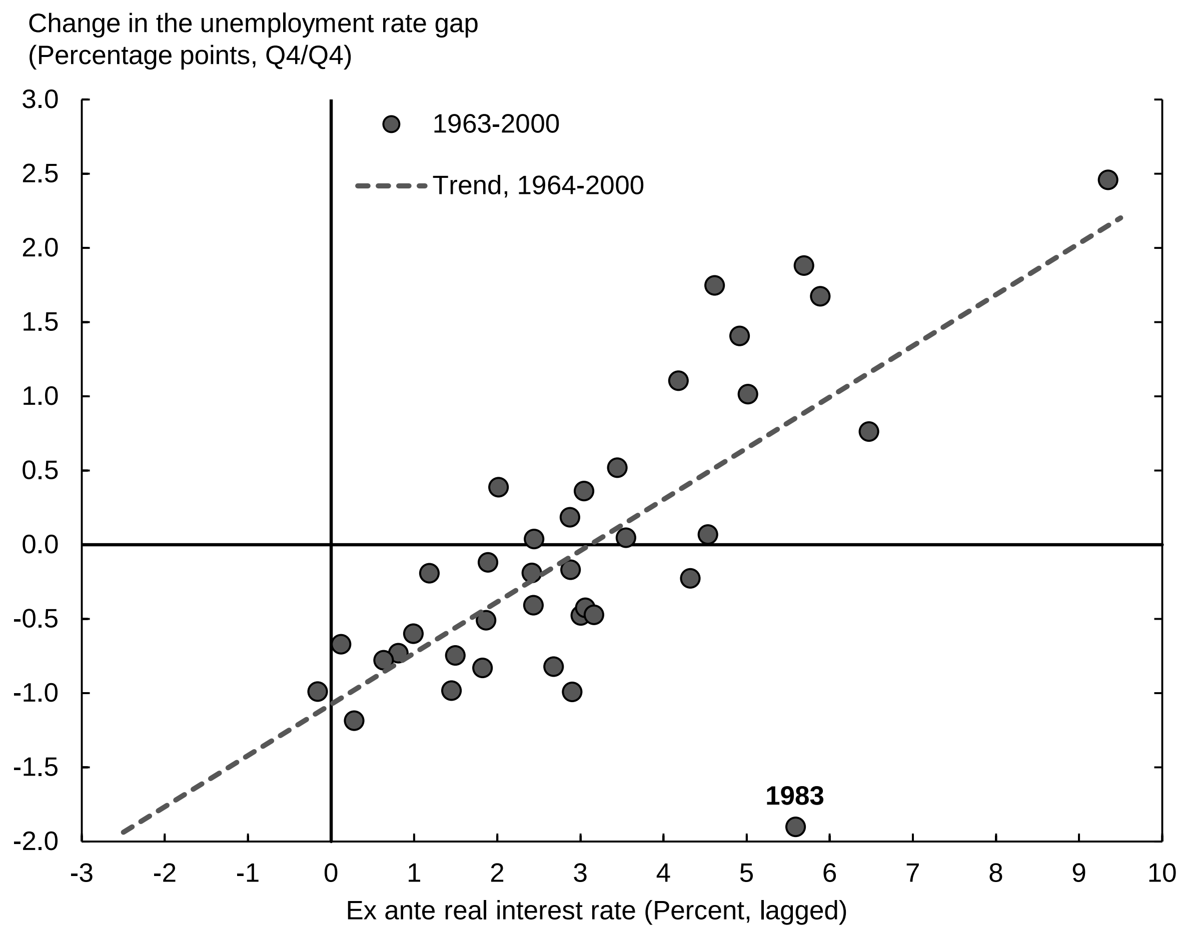
  - A “difference” rules depends only on observable variables.
  - “Difference” rules may be more robust in the face of uncertainty about R*

Source: Nomura Economics

A simple look at the data:
Real interest rate and changes in the unemployment rate gap

- Before 2001 there appeared to be a relatively stable relationship between the real interest rate and the unemployment rate gap.
  - The implied ERIR was about 2.9%.

Relationship between the real interest rate and changes in the unemployment rate gap



Source: Nomura Economics

A simple look at the data:
Real interest rate and changes in the unemployment rate gap

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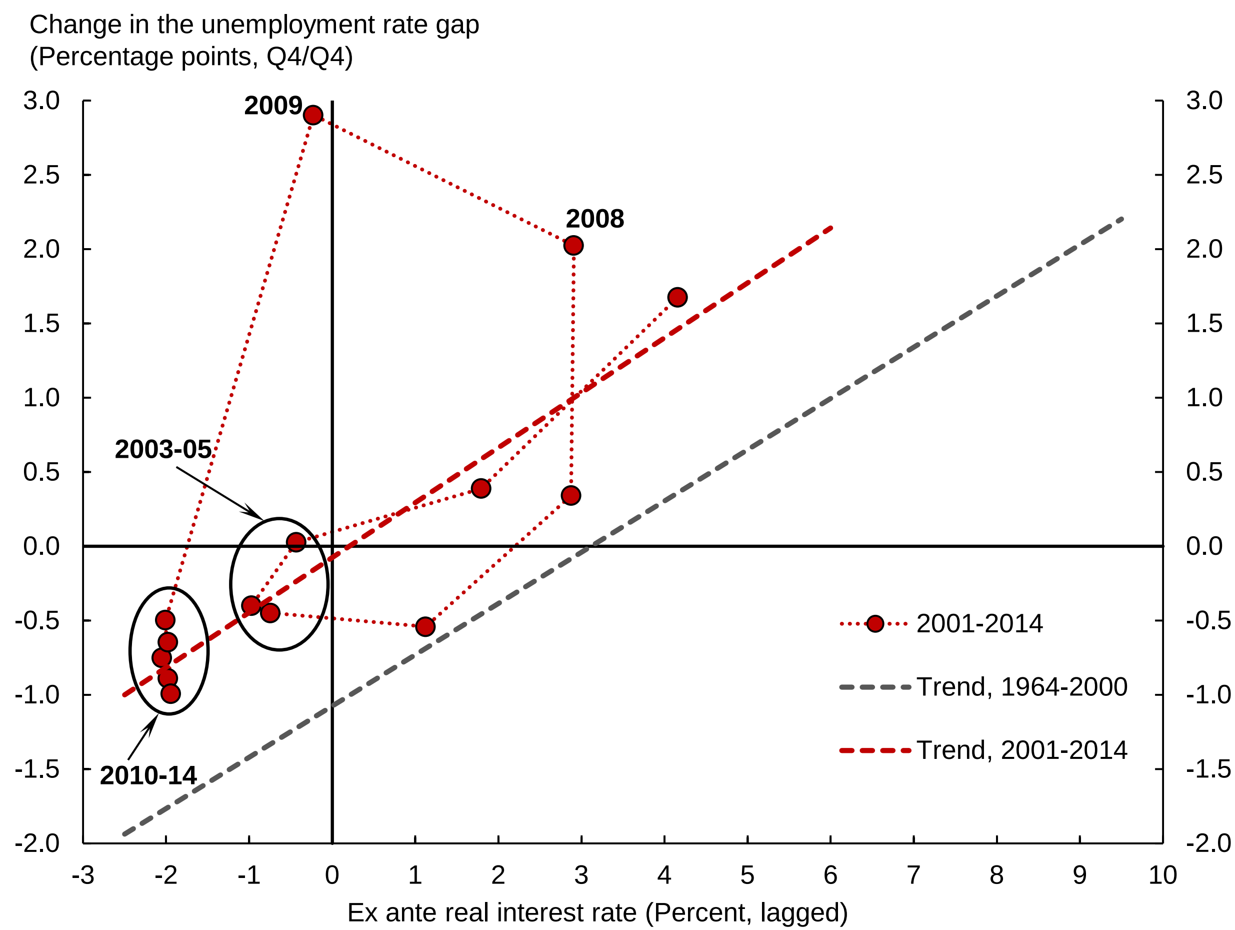
- Since 2001 it appears that ERIR has declined.
  - The implied ERIR was about 0.1%.

- Key question right now:
  - How stimulative, in a macroeconomic sense, is policy?

Relationship between the real interest rate and changes in the unemployment rate gap



Source: Nomura Economics

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Source: Nomura Economics

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