



JSPS Grants-in-Aid for Creative Scientific Research

Understanding Inflation Dynamics of the Japanese Economy

超低金利の長期化：その原因と含意

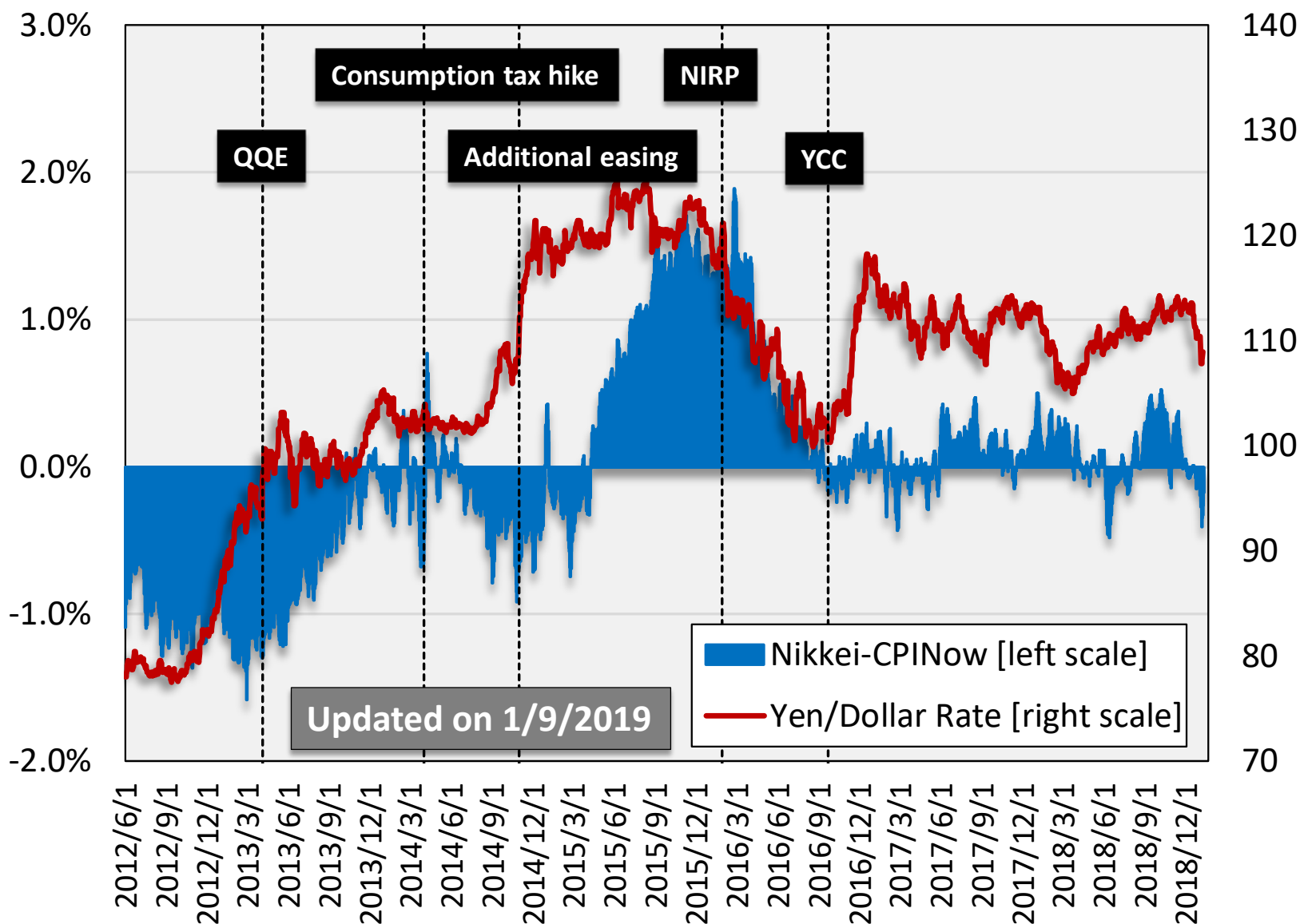
渡辺 努

東京大学大学院経済学研究科経済理論専攻
株式会社ナウキャスト 創業者・技術顧問

<https://sites.google.com/site/twatanabelab/>

2019年1月24日

Consumer price inflation and the Yen/Dollar rate at the daily frequency





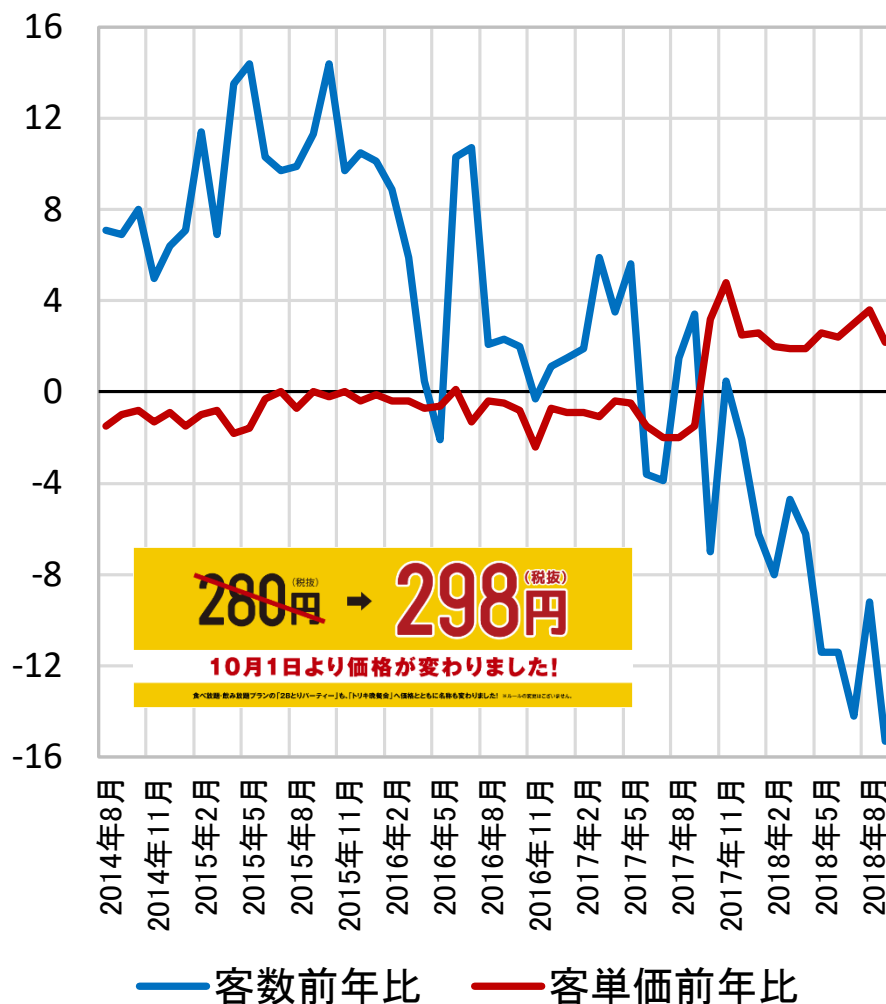
値上げはいつから検討されていましたか。

正直言うとですね、アベノミクスが出始めた頃から意識はしていました。結構早い段階です。政策として物価を上げていくというのですから、流れは変わると思いました。後に東京オリンピックの開催も決まり、地価も家賃もじわじわ上がって、これはもう、上げざるを得ないタイミングが来ると考えていました。

値上げが成功する企業とそうでない企業の差はなんでしょう。

思うに、「共感」が重要なんでしょうね。例えばヤマト運輸は、お客さまのために利便性をどんどん高めていきましたが、半面、スタッフの負担が増えていきました。そうした構造が世間にも理解され、現場の負担を改善するため値上げをお願いしますというのに、共鳴してもらえたんでしょうね。

鳥貴族の客数と客単価



International Monetary Fund, "What Explains Low Inflation Expectations in Japan?", Box 1 of 2018 Japan Article IV Consultation -- Staff Report, IMF Country Report No. 18/333, November 2018.

Box 1. What Explains Low Inflation Expectations in Japan?¹

Despite a recent gradual upward trend of consumer price index (CPI) inflation, a prolonged period of deflation from the mid-1990s has led to stubbornly-low inflation expectations in Japan. Younger cohorts have lower inflation expectations than older Japanese, due to their limited exposure to inflation. Business competition in some areas and low inflation expectations put pressure on Japanese firms to find ways to maintain current prices despite rising costs.

Inflation expectations across age cohorts.

Using micro-level datasets and a University of Tokyo consumer survey, a positive correlation between age and inflation expectations is derived, with younger Japanese having lower inflation expectations than older cohorts (text figure).² This shows that historical experience of inflation, or the lack thereof, plays a role in how individuals form expectations about future price increases.

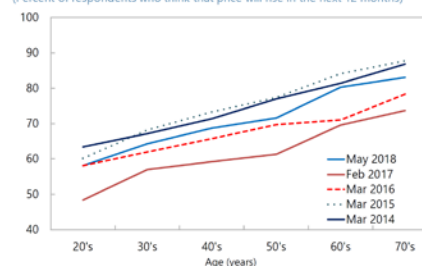
Product downsizing.

With intense business competition in some areas (i.e. mobile-phone related prices and supermarket prices) and low inflation expectations by consumers, Japanese firms search for ways to respond to rising costs by not raising prices. Product downsizing, the practice of substituting identical products with a reduction in size and/or weight, is one solution adopted by some Japanese firms. In particular, product downsizing accounts for about one third of product substitutes within the studied dataset over the last 10 years.³

Stubbornly low inflation. Firms' reluctance to raise prices further reinforces low inflation and low inflation expectations. According to research from the University of Tokyo, nearly half of the goods items in the CPI basket exhibit an annual rate of price change of near zero (text figure). A large share of near-zero inflation items was observed not only during the period of deflation, but also in recent months, following six-years of monetary easing by the Bank of Japan and a return to positive CPI inflation.⁴ Concentration of zero-price inflation in the distribution of item-level inflation in Japan is significantly different from that observed in other advanced economies, including the United States, where the mode of item-level inflation is centered around three and a half percent (text figure).

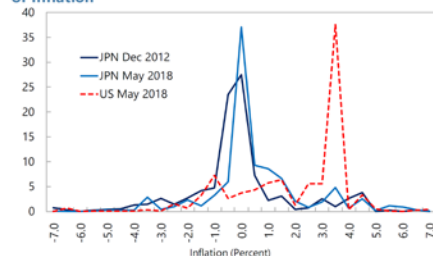
Japan: Age Profile of Inflation Expectations

(Percent of respondents who think that price will rise in the next 12 months)



Sources: Diamond, Watanabe and Watanabe (2018); University of Tokyo.

Japan vs. United States: Distribution of Item-by-Item Rates of Inflation



Sources: Watanabe and Watanabe (2018).

¹ Prepared by Gee Hee Hong (APD).

² See Diamond, Watanabe and Watanabe (2018), "The Formation of Consumer Inflation Expectations: New Evidence from Japan's Deflation Experience," Working Paper CARF-F-422, Center for Advanced Research in Finance.

³ See Imai and Watanabe (2018), "Product Downsizing and Hidden Price Increases: Evidence from Japan's Deflationary Period," *Asian Economic Policy Review*.

⁴ See Watanabe and Watanabe (2018), "Why Has Japan Failed to Escape from Deflation?" *Asian Economic Policy Review*.

Why are Interest Rates So Low?

Secular Stagnation

vs.

Secular Innovation

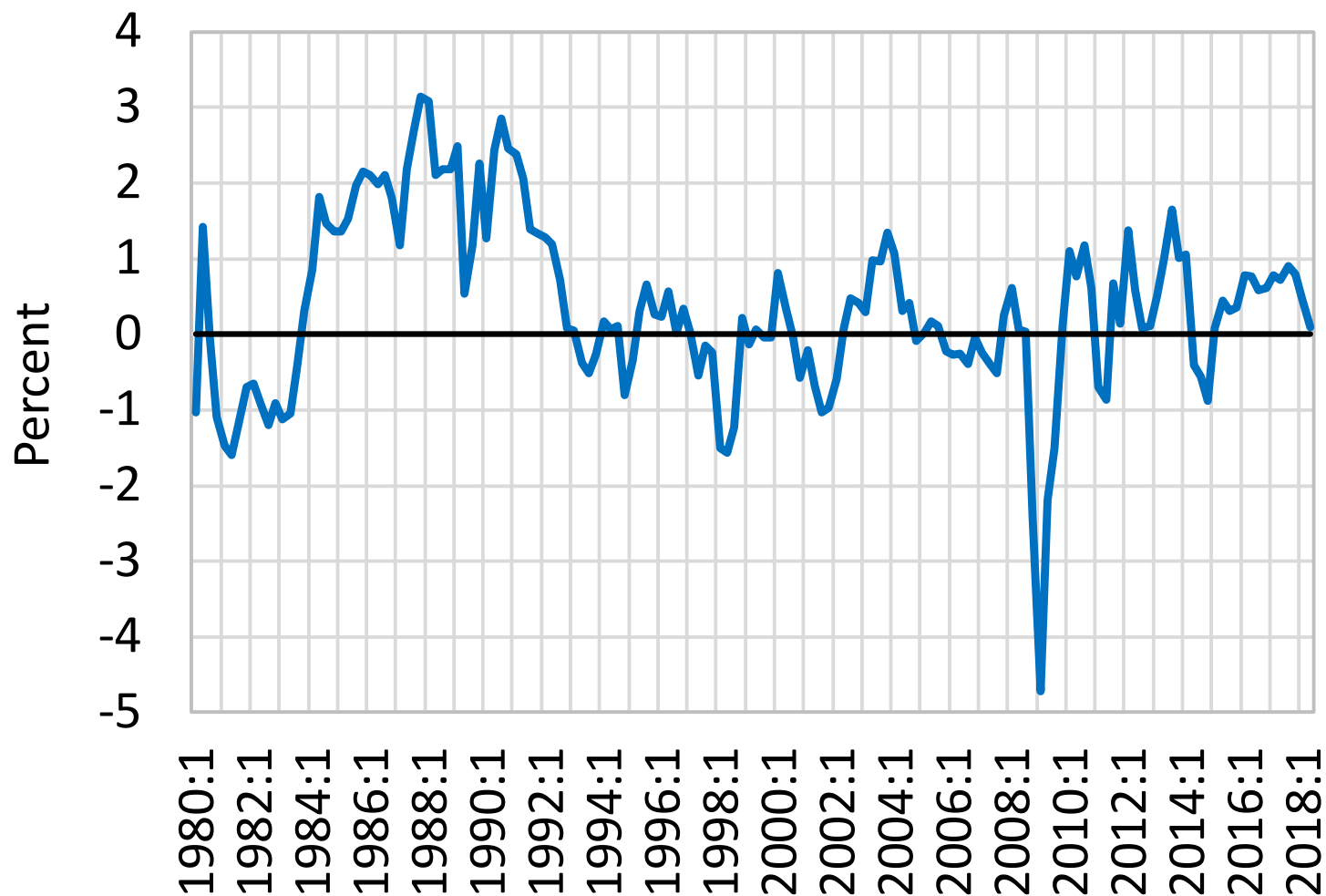
Secular Stagnation Camp

Gloomy view

- Low nominal interest rates stem from **low equilibrium real interest rate (or natural rate of interest)**
- Secular stagnation (Hansen 1939; Summers 2014)
 - low productivity growth (Gordon 2016)
 - savings glut (Bernanke 2005)
 - growing preference for safe assets (Caballero 2008)
 - demographic changes

$$\text{Nominal interest rate} = \text{Equilibrium real rate} + \text{Inflation expectations}$$

The equilibrium real rate of interest (or the natural rate of interest) in Japan



Secular Stagnation Camp

Gloomy view

- Low interest rates stem from **low equilibrium real interest rate**
- Secular stagnation (Hansen 1939; Summers 2014)
 - low productivity growth (Gordon 2016)
 - savings glut (Bernanke 2005)
 - growing preference for safe assets (Caballero 2008)
 - demographic changes

Secular Innovation Camp

Rosy view

- Low interest rates stem from **low inflation expectations**
- Secular innovation: ICT, AI, Biotech, FinTech etc
- **Innovation lowers true inflation.** However, measured inflation deviate from true inflation as national statistical agencies fail to catch true inflation (Goolsbee and Klenow 2018). But other people, including markets, can catch true inflation.
- Innovation raises equilibrium real rates, but not that much. Recent innovation does not require large investment (Summers 2014)

$$\text{Nominal interest rate} = \text{Equilibrium real rate} + \text{Inflation expectations}$$

Four Reasons Why I Support Secular Innovation Hypothesis

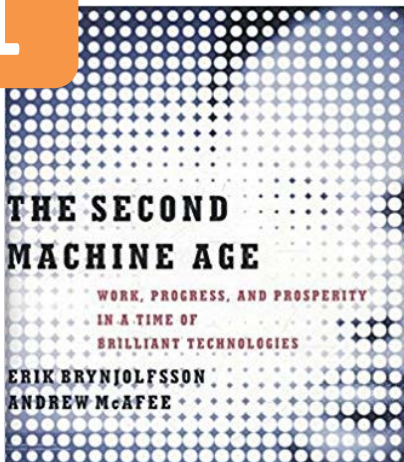
Fact #1: The bible for secular innovation camp sells much more than the bible for the other camp

Amazon Best Sellers

Our most popular products based on sales. Updated hourly.

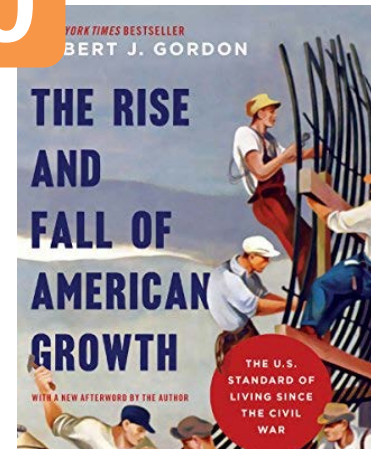
Best Sellers in Development & Growth Economics

#1



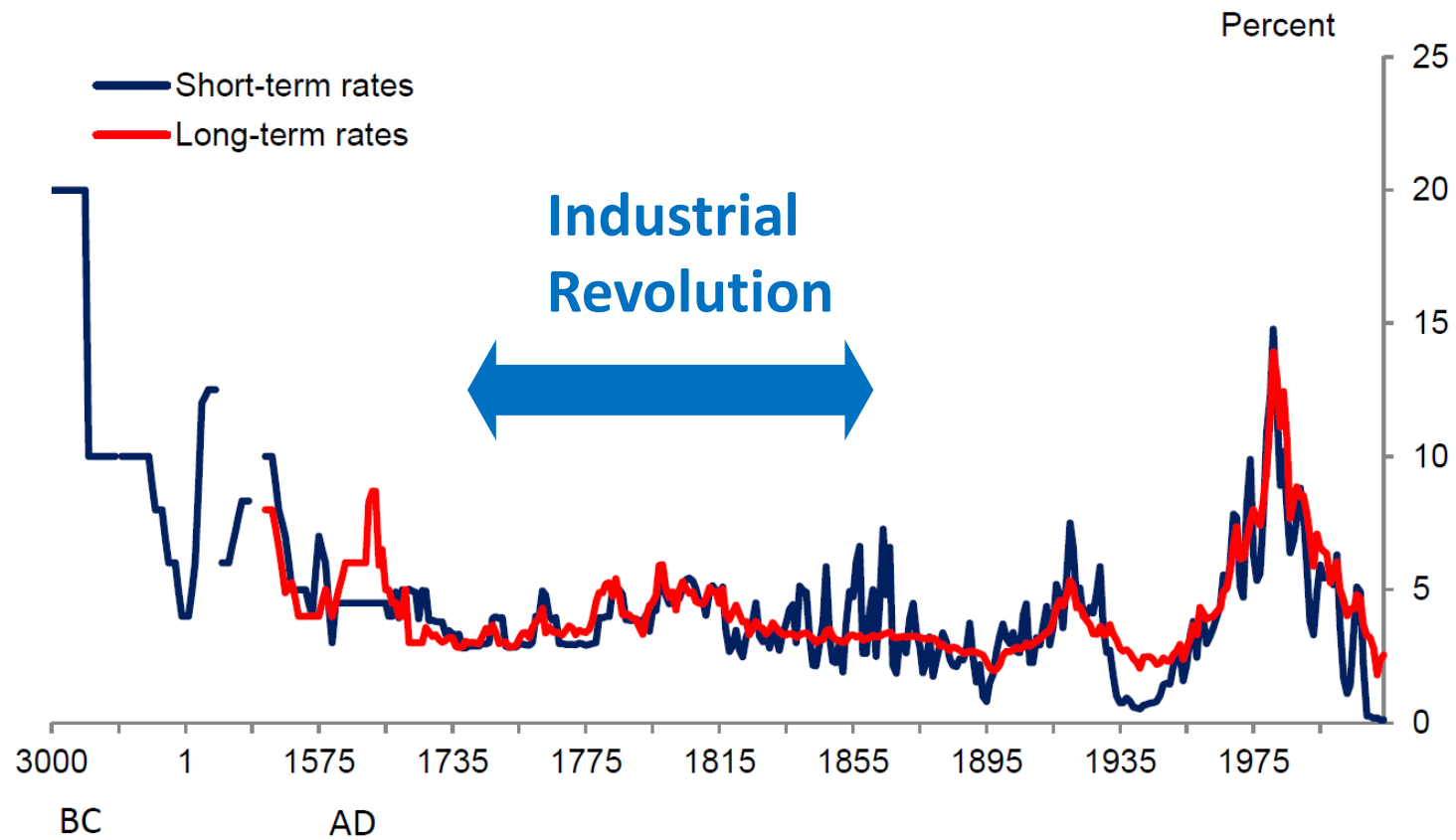
Secular Innovation Camp
The Second Machine Age
Erik Brynjolfsson, MIT

#40



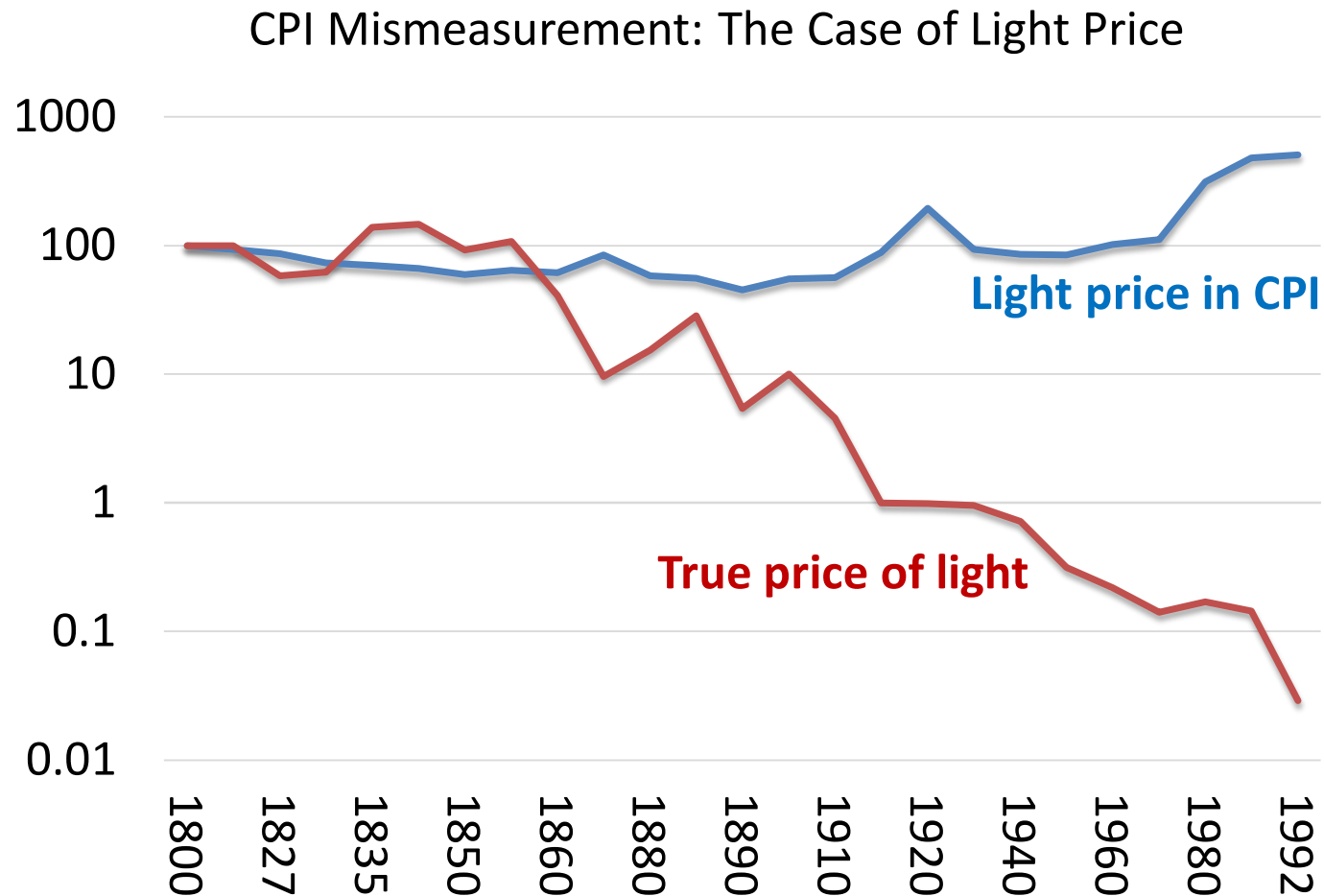
Secular Stagnation Camp
The Rise and Fall of American Growth
Robert Gordon, Northwestern

Fact #2: The historical evidence suggest that fluctuations in long-term nominal rates come dominantly from fluctuations in inflation expectations rather than fluctuations in equilibrium real rates



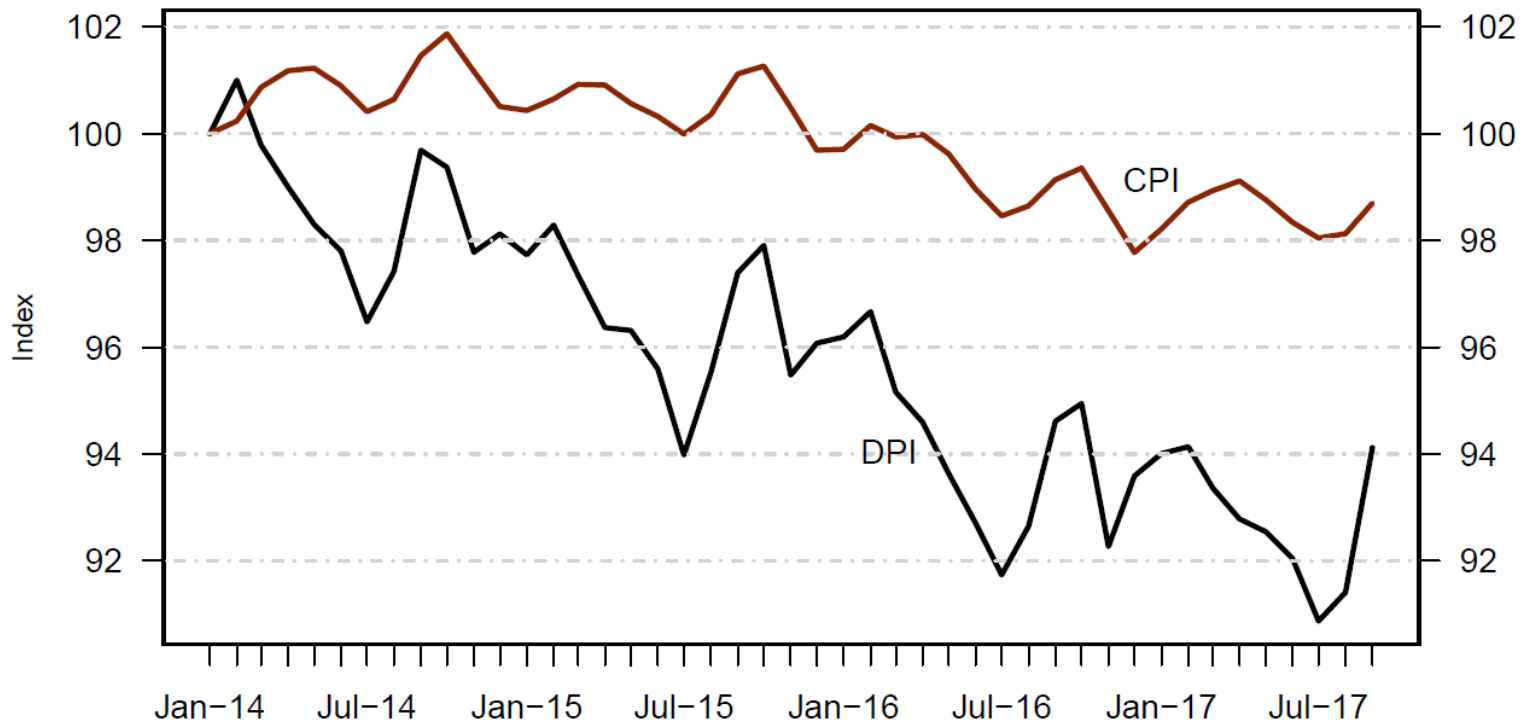
Source: Andrew Haldane, "Growing, fast and slow," Feb 2015.

Fact #3: The existing research suggests that official CPI substantially overestimated the prices of new products



Source: W. D. Nordhaus, "Do Real-Output and Real-Wage Measures Capture Reality? The History of Lighting Suggests Not." Jan 1996.

Figure 2: Cumulative Inflation, DPI vs. CPI.



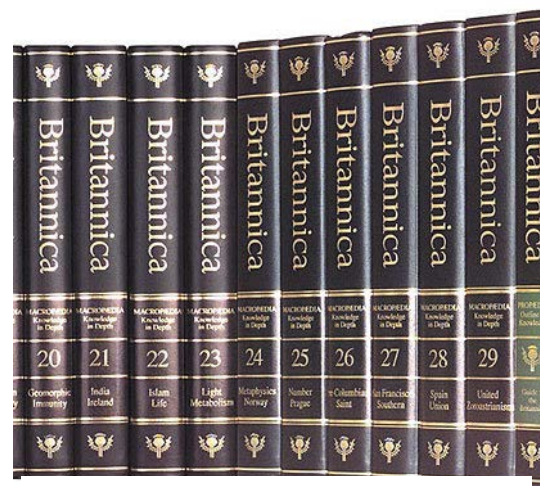
Source: A. D. Goolsbee, P. J. Klenow, "Internet Rising, Prices Falling," NBER Working Paper No. 24649, May 2018

Fact #4: Digital goods are almost FREE!

However, the price decline due to this is NOT incorporated into official CPI.



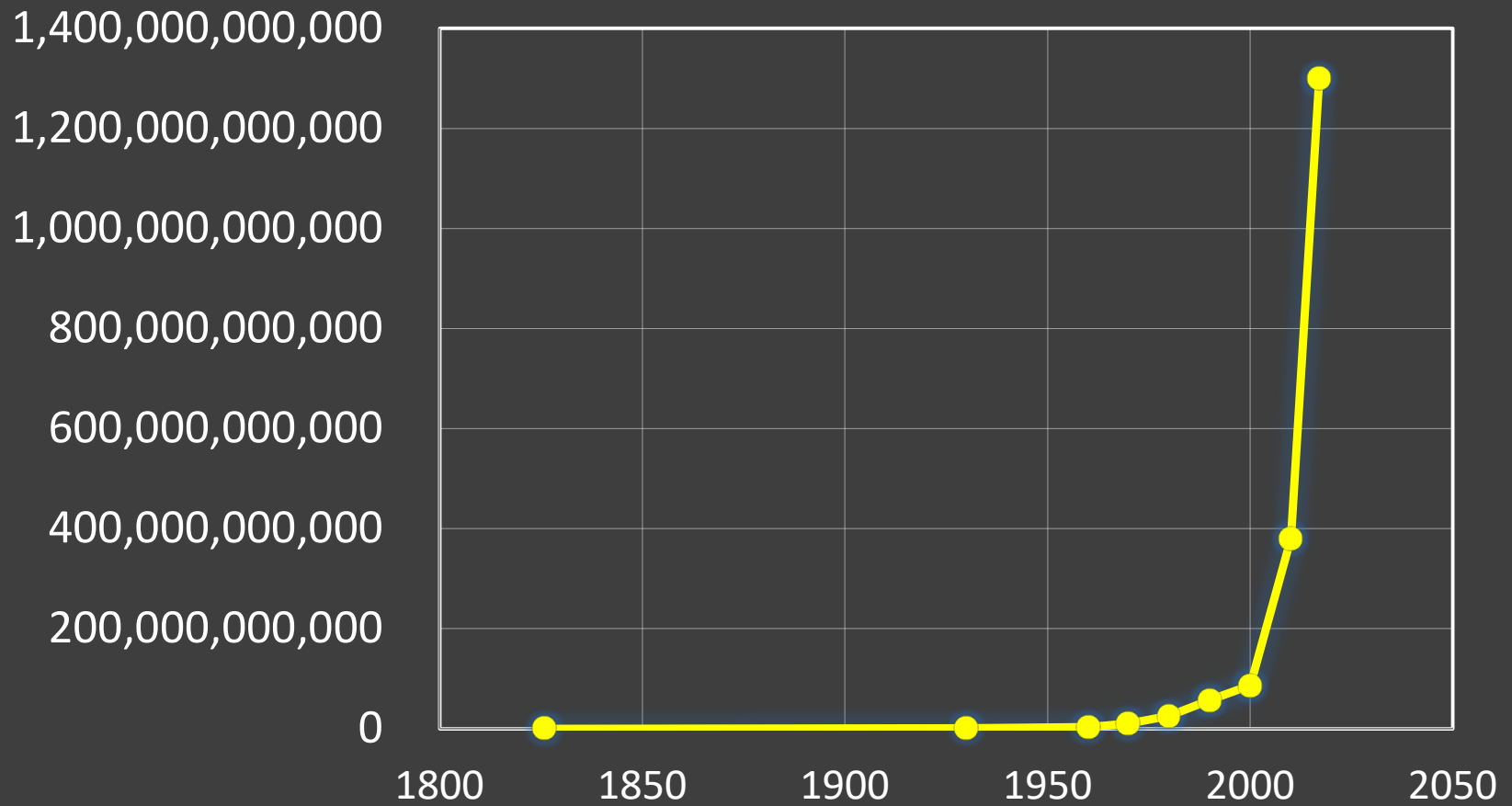
WIKIPEDIA
The Free Encyclopedia



Utility > 0 = Production = Expenditure = Income

Utility $\hat{=}$ Production = Expenditure = Income > 0

Number of Photos Taken Each Year



Secular Stagnation Camp

Gloomy view

- Low interest rates stem from **low equilibrium real interest rate**
- Secular stagnation: low productivity growth; savings glut; growing preference for safe assets; demographic changes

- CB and Govt will have a hard time.
- The ZLB will be binding more often in the future. CBs will be forced to adopt again FG, QE, NIRP, or something else.
- **CBs may need to raise the target rate of inflation**
- Interest margins will be smaller so that banks are less profitable. Financial system may be unstable (Fischer 2016)

Secular Innovation Camp

Rosy view

- Low interest rates stem from **low inflation expectations**
- Secular innovation: ICT, AI, Biotech, FinTech etc
- Innovation lowers true inflation.

- No worry about future!
- No reason for govt and CB to change macro policy. The most urgent thing is to improve methodology adopted by statistical agencies.
- **CBs may need to lower the target rate of inflation**
- More new technologies and more entrants into financial industry
- More focus on micro policies like consumer protection, privacy etc