NBER WORKING PAPER SERIES

JAPANIZATION: IS IT ENDEMIC OR EPIDEMIC?

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Working Paper 21954
http://www.nber.org/papers/w21954

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
February 2016

The earlier draft of this paper was written for 2015 KDI/EWC Conference on "JAPANIZATION: Causes and Remedies" organized by the East-West Center, Honolulu, Hawaii, 10–11 August 2015. Comments by Professor Barry Eichengreen, Dongchul Cho, Andrew Mason and other participants of the conference are highly appreciated. The views expressed herein are those of the author and do not necessarily reflect the views of the National Bureau of Economic Research.

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NBER Working Paper No. 21954
February 2016
JEL No. E43,E44,E52,E58,E61,E62,F31

ABSTRACT

Japanization is defined as a combinations of the following economic conditions: (1) the actual growth rate is lower than the potential growth rate for an extended period; (2) the natural real interest rate is below zero and also below the actual real interest rate; (3) the nominal (policy) interest rate is zero; (4) deflation, i.e., negative inflation rate. As a summary measure for these conditions, the Japanization index, the sum of proxy for GDP gap, inflation rate and the nominal interest rate, is proposed. The growth rate, the inflation rate and the nominal and real interest rate has been declining since 1990. Since 2009, major advanced countries have shared conditions (1)-(3). Only Japan has experienced a prolonged period of (4) deflation. A closer examination of how Japan got into the Japanization state reveals that it is a combination of (a) a hard-landing of the 1990-92 bubble; (b) not dealing with non-performing loans problem promptly and decisively, resulting in a major banking crisis; (c) the absence of a soft landing after the banking crisis; (d) the lack of quantitative easing policies when deflation first occurred; (e) the absence of an inflation target; and (f) the absence of timely, large scale fiscal stimulus. The fact that Abenomics—a mix of aggressive monetary policy, combined with a 2% inflation target and fiscal stimulus—in lifting the economy out of deflation shows it is possible to prevent or cure Japanization.

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Japanization: Is it Endemic or Epidemic?

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"Turning Japanese; I think I'm turning Japanese; I really think so"

From "Turning Japanese" by The Vapors, 1980.

"[Japan] was suffering from seemingly endless stagnation and deflation. And Western economists were scathing in their criticisms of Japanese policy. …And these days, I often find myself thinking that we ought to apologize. …the West has, in fact, fallen into a slump similar to Japan's — but worse." – From "Apologizing to Japan," Krugman (2014)

1. Introduction

The Japanese experience of the "lost two decades" (1992-2012), accompanied by deflation (1998-2012), showed that an advanced country could fall into a prolonged period of stagnation and deflation. Japan's nominal GDP peaked at 523 trillion yen in 1997 and then declined to 471 trillion yen in 2009, before recovering to 488 trillion yen in 2014, which is still the level in 1992. The absolute stagnation in nominal GDP, a combination of slow growth (in real GDP) and a sustained deflation (in GDP deflator) is unprecedented among advanced countries in the post-WW II history.

It is said that Japanese deflation was the first since the Great Depression of the 1930s. During the Great Depression, the growth rate became negative and a sharp drop in prices were observed in the United States, but the sharp decline in activities and prices lasted only a few years. In Japan, the stagnation and deflation has continued for more than a decade, although their magnitudes have been less than those in the Great Depression.

The main tool of the conventional monetary, the interest rate, was used to combat declining activities and inflation in the early to mid-1990s. With an eruption of a banking crisis of 1997-98, economic activities shrank significantly. The policy interest rate in Japan became zero in 1999. This was beginning of the zero interest rate policy (ZIRP), which has continued until now except several months in 1990-91 and 2006-08. Since the nominal interest rate has a floor (the nominal zero bound), the Bank of Japan has argued that monetary policy cannot help the economy, once the policy rate is

lowered to zero. The Bank of Japan's quantitative easing was first introduced in 2001 and maintained until 2006. Fiscal stimulus has been repeatedly applied. Yet, the economy fell into and remained in stagnation and deflation.

Before the global financial crisis of 2008-09, the Japanese experience of stagnation and deflation was viewed as unique to Japan. Several hypotheses were put forward why Japan fell into a deflationary state. Popular explanations include an asset price bubble, the second half of the 1980s, and its burst in the 1990s. Procrastination in dealing with non-performing loans made the problem much bigger and imposed stress on the Japanese banking system. Loans to problematic, insolvent companies (zombies) were extended, which was called "evergreening," without clear corporate rehabilitation plans. The evergreening crowded out possible new loans to healthy companies, thus delaying recovery. (See Caballero, Hoshi and Kashyap (2008).) Much of stagnation in the 1990s can be explained by the bubble burst and a series of policies that prolonged nonperforming loans problem.

Other factors that are regarded relevant to stagnation include monetary policy, not bringing the interest rate down to zero early in the near deflation stage and raising the interest rate (ending ZIRP) while the inflation rate was still negative; and fiscal policy contraction, including hiking the consumption tax rate in April 1997. However, the view that Japanese deflation and stagnation was a unique endemic case, whatever reasons were, came to be questioned later.

During the Global Financial Crisis (GFC) of 2008-09, the United States came close to a meltdown of the financial system. It could have severe stagnation and deflation. A decisive action by the Federal Reserve, led by Chair Bernanke, is often credited to have prevented the US economy from falling into deflation. However, growth remained stagnant and the inflation rate remained below the target for several years. The policy rate became virtually zero in the fourth quarter of 2008 and so remained until the end of 2015.

In the wake of GFC, the European economies, plagued with a twin crises of a banking crisis and a sovereign debt crisis, experienced weak activities and declining prices (in some of the Euro zone countries). Several banks were closed in a few months following the collapse of Lehman Brothers. The Greek sovereign debt crisis erupted in 2010, and it affected other Euro zone countries, such as Italy, Spain, Portugal, and Ireland.

Economic activities remained weak and possible deflation became a concern. In response, both the FRB and ECB lowered the interest rate to near zero, and expanded their balance sheets. Quantitative easing was adopted in the US and Euro zone. By early 2013, many policy makers and economists in the US and Europe started to express concerns about possible deflation, as their economic performances started to look like Japan of a decade earlier.[2] The Japanese-style stagnation became a case of epidemic, that is, economies with similar symptoms became widespread in the US and Europe.

Then, signs of Japanization also started to show among some of the emerging market (EM) economies. Traditionally emerging market economies enjoy high growth rate, accompanied by high inflation rate and high nominal interest rates. The EM growth rate higher than advanced countries are explained by growth convergence from a low-income high-growth state to a high-income, low-growth state. The EM inflation rate higher than advanced countries can be explained by the productivity increase differential between tradable manufacturing sectors and non-tradable sectors. With a relatively stable exchange rate, the inflation rate differential amounts to the real exchange rate appreciation.[3] However, as the advanced countries struggled to recover from the GFC, the slow growth and low inflation rate hit EM economies. Although deflation has not happened and the policy interest rate is still considerably above zero, the directions of the change is downward. Further negative shocks like slowdown of the Chinese economy, if sustained, may drive the inflation rate of some of its trading partners into the negative territory.

The rest of the paper is organized as follows: Section 2 defines Japanization. Section 3 presents data that compare the growth rate, the inflation rate, and the interest rates of Japan, US and Europe. Section 4 reviews what really caused Japan's stagnation and deflation by explaining events and policy actions chronologically. Section 5 reviews economic policies taken by Prime Minister Abe in 2012-2015 in an attempt to lift the economy out of deflation. Section 6 discusses what we can learn from the Japan's experiences. Section 7 discusses the role of demography in Japanization. Section 8 concludes.

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[2] Kawai and Morgan (2013) is one of the early papers that have "Japanization" in paper title.

[3] The real exchange rate appreciation of EM economies is often called the Balassa-Samuelson effect.

2. Japanization

2.1. Definition

The economic conditions that are referred to as "Japanization" have several aspects. No consensus has emerged on a precise definition.[4] The following list of stylized facts constitute a phenomenon that is called "Japanization."

(1) Stagnant growth: $g < g^*$

The first characteristic is a sustained period of stagnation, that is, the actual growth rate, g, being below the potential growth rate, g*. Since this condition amounts to a lack of aggregate demand, there can be explained by familiar stories along the line of Keynesian economics. Private sectors suffer some negative shocks, external or internal, and policy responses were either too little or too late. Monetary and fiscal policies being too tight certainly contribute to the lack of aggregate demand. However, this condition itself is indistinguishable from a cyclical recession.

(2) Secular stagnation: $r^n<0$ and $r^n < r$

The third characteristic is to explain a prolonged period of stagnant growth, namely "secular stagnation." The phrase was first coined by Hansen (1939) and reinvented by Summers (2013, 2014). See also Bernanke (2015) and Eichengreen (2015) for the possible cause of secular stagnation. The "secular" happens because aggregate demand is always below aggregate supply, due to too high real interest rate. When the actual real interest remains higher than the natural real rate of interest, stagnation cannot be overcome easily. Secular stagnation can be defined as the natural real rate of interest becomes negative, while the actual rate stays above the natural rate. (See Eggertsson and Mehrotra (2014) for a formal modeling.).

(3) Nominal Zero bound: $i=0$

The fourth characteristic is that the policy rate, i, is lowered to and stuck at (near) zero. When stagnation continues, the central bank lower the interest rate. Since the nominal interest rate cannot be (significantly) below zero, this is the maximum easing the central bank can do with the conventional monetary policy tool. The zero interest rate policy (ZIRP) was introduced in Japan first in 1999. After the global financial crisis began to deepen, in the wake of the collapse of the Lehman Brothers in 2008, ZIRP

[4] See a monograph by Pesek (2014) and a chapter by Kawai and Morgan (2013) for earlier contributions to analyze "Japanization," in Rhee and Posen (2013).

spread to the rest of G7 countries. As of end-2015, the ZIRP still is in place in Japan, the US, and most European countries. The fact that monetary policy of the advanced world has been stuck at around the ZIRP seems to show that the conventional tool alone cannot lift the economy out of secular stagnation.

The interest rates of EM countries have a downward trend, but they have not reached zero yet. The global environment of the low interest rate and low growth rate affects monetary policy of the EM. In order keep growth to recover, the EM countries have been lowering the policy interest rate since mid-2013, the interest rate is still well above zero.

(4) **Deflation ($\pi < 0 < \pi^*$)**.

The last piece of Japanization is deflation. Japanese price levels (measured by CPI, CPI without food and energy, or GDP deflator) have been declining since 1998. The magnitude of deflation has been rather small, at least compared to those in the Great Depression in the 1930s.

Combining characteristics (4) and (5), the real interest rate, that is the nominal interest rate minus the inflation rate, has to be positive. If the natural rate is the negative, as described in characteristic (2), the actual real interest rate is indefinitely above the natural rate. Thus this creates and secular stagnation. Table 1 shows the taxonomy around the secular stagnation and Japanization.

<Table 1> about here

Japanization is a state of the economy that satisfies all of the above, (1)-(4). It is a chronic state of underperforming, deflationary economy, and there is no conventional monetary policy to stimulate the demand. The economy can be caught in a deflationary trap.

When the economy is falling into a long stagnation, the inflation rate falls. In response to widening GDP gap and the inflation rate being less than the target rate, the nominal policy rate is likely to be cut at the speed faster than that of the inflation rate. Thus the real interest rate tends to decline as the inflation rate declines. However, the positive correlation between the inflation rate and the real interest rate is reversed once the nominal interest rate hit the zero bound. The nominal rate is stuck at zero, while the inflation rate may continue to fall and there is no lower bound for the inflation rate.

When the inflation rate becomes negative and continues to fall, the real interest rate becomes positive and rising. It is important to understand that the correlation between the inflation rate and the real interest rate will be reversed when the nominal interest rate is stuck at zero, and there is no conventional monetary policy can do to help the economy to escape the deflation trap. This relationship between the inflation rate and the real interest rate before and after the nominal interest rate becoming zero is illustrated in Figure 1. The state of Japanization is in the region where the nominal interest rate hit zero and the inflation rate is negative.

<Figure 1 about here>

2.2. Turning Japanese

As mentioned in Introduction, Japanization first occurred in Japan but its characteristics are more often observed now in the rest of the world. In fact, with closer examinations in the next section, economies around the world have started to move toward the state of Japanization well before the global financial crisis of 2008-09 (GFC).

For example, the low interest rate can be viewed as a reaction to deflation and stagnation. But, a trend of declining interest rates started well before the GFC. This point was forcibly made in Bean, Broda, Ito and Kroszner (2015), hereafter BBIK. There must be a reason for the interest rate to decline since 1990, not only in Japan, but globally. A hypothesis that is consistent with this observation is the so-called "global saving glut" (Bernanke, 2015, a, b). An increase in global saving has exceeded an increase in global investment. Capital movement has become freer over the time. An increase in savings among emerging market economies, combined with a decline in highly productive investment opportunities, may explain the declining interest rate in advanced countries.

The combination of stagnation and deflation implied that aggregate demand was chronically lower than the aggregate supply. This aspect is sometimes described as "secular stagnation" (Summers, 2013, 2014, 2015a, b). Eichengreen (2015) also argued that a decline in the relative price of investment goods is associated with secular stagnation when a long economic history is considered. Buiter (2015) and Teulings, Coen and Richard Baldwin (2014) provide extensive examinations of various arguments.

So the "Japanization" is an extreme state of the long run trend of declining growth, inflation rate and the interest rate. The extreme state means its accompaniment with deflation. The distinctive feature is "deflation" and its associated difficulty of getting out of there. In order to avoid Japanization, it is important to adopt some strong policies, which may be unconventional, before the economy is fully caught in a deflationary trap. In a later section, it will be discussed how to get out of the deflationary trap, but it seems harder to get out of it than to avoid it.

In addition, a movement toward Japanization state, namely disinflation and declining interest rate, combined with lower than potential growth can be loosely said to be a process of turning Japanese. With these definition and taxonomy in mind, let us first observe the facts.

3. Facts

3.1. Inflation Rate

Figure 2, panel A, shows the time series of the (headline) inflation rate for the four countries, US, UK, Japan and Germany from 1985 to 2015.[5] It is remarkable that the inflation rates of these four advanced countries have moved in the same directions most of the time since the mid-1980s. In addition to the co-movement, it is also remarkable that Japanese inflation rate is much lower than the other three countries since 1985, and below zero most of the time since 1998. The four countries had a peak of the inflation rates in 1990-91, followed by gradual decline until the mid-2000s. From 2004 to 2007, the four countries experienced increasing inflation rates, due to rising oil prices and economic booms (driven by the subprime loans encouraging housing booms in the US). With the GFC, the inflation rates became below (or very close to) zero. The three countries, except Japan until 2013, was able to stimulate the economy to raise the inflation rate. But, again, sharp declines in the inflation rates of the four countries took place from 2013 to 2015 took place. This is partly due to the sharp decline in oil prices, and partly due to sovereign debt crisis in southern European countries.

Figure 2, panel B, shows the period average of the inflation rates in the four sub-periods: 1985-1990 (pre-1990 peak); 1991-2000 (moderate declines in the inflation rate); 2001-2007 (boom before the GFC); and 2008-current (post-GFC). The Euro zone

[5] The Japanese inflation rate is adjusted for the value-added tax rate hikes in April 1997 and in April 2014. For the twelve-month period following the tax rate hike, the inflation rate is adjusted to show the underlying inflation rate, by taking out the estimated pass-through of the VAT rate hike to CPI.

average is also added to the sample for the period after 1991. It shows the trend decline in all countries over 30 years. It also show that Japan is an outlier that its inflation rate has been about 2 percentage point lower than other countries, while other three countries (and Euro zone) have almost same average inflation rates for each period since 1991.

<Figure 2, panels A and B about here>

Deflation may be attributable to a particular set of monetary policy actions. Having a low but positive inflation rate (say, 2%) in the inflation target framework tends to anchor inflation expectation at the target rate. An application of nonconventional policy, once the policy interest rate hit zero, would also contribute to converging and anchoring inflation expactation. These points will be discussed further in Section 4. So far, only Japan has experienced the prolonged period of negative inflation rate, which is a hallmark of Japanization. But other countries are close to turning Japanese in the last three years.

3.2. Growth Rate

Figure 3, panel A, shows a time-series of the growth rate (of real GDP) for 1985-2015, for US, UK, Japan, Germany and the Euro Zone. Again, it is remarkable that growth rates of these four countries (and Euro zone) exhibit co-movement. The second half of the 1980s was a boom for all regions. From the late-1990s to 2007, all regions had a stable growth rates. The global financial crisis of 2008-09 hit all regions with a huge negative shock to growth. It is rather remarkable that Japan suffered most in terms of growth in the GFC despite its relative strength among their financial institutions. Japan was hard hit through the trade channel in the GFC, in addition to its low potential growth rate.

Figure 3, panel B, shows the period averages of the growth rates. (The four sub-periods are the same with Figure 2.) It clearly shows the declining trend for all regions. The growth rates in the second half of the 1980s was above 3%. The average growth rates became in the range between 1% (Japan) and 3% (US) in the 1990s and pre-GFC 2000s. In the post-GFC period, the growth rates of all the regions came down to between 0 and 1. For the 30 years, the growth deceleration is remarkable.

<Figure 3, panels A and B about here>

A period from 1992 to 2012 is known as the "lost two decade" in Japan. It is believed that the growth rate continued to underperform. Figure 4, panel A, shows the levels of nominal and real GDP for Japan and the USA. Note that the levels are measured in the yen for Japan (right scale) and in US dollars for the US (the right scale), so the magnitudes are not comparable between Japan and US. The Japanese nominal GDP basically stopped its increase at around 1992, while the US nominal GDP shows a consistent growth, except the period of GFC, 2008-09. Since nominal GDP measures the combination of growth and inflation, the stagnant GDP of Japan shows that Japan is really in the static state in both fronts.

Figure 4, panel B, shows movements of real GDP. In both countries, real GDP is expressed in GDP in constant prices at 2005 prices. However, they are in the different currency units so that the levels of two lines are not comparable. Again, the Japanese growth shows a distinct kink at around 1990. In the 1980s, the Japanese growth rate was higher than the US. In the 1990s, the growth trend in Japan has slowed down with a huge drop in 2008-09, while growth in US does not have a visible kink in its growth trend.

<Figure 4 Panels A and B about here>

3.3. Interest Rates

Figure 5, panel A, shows the time-series of the nominal policy rates for US, UK, Japan and the Euro Zone. For Japan, the call rate is used; for US the federal funds rate; for UK, Sonia, and for the Euro zone, Eonia. The Japanese policy rate was lowered to 0.5% in 1995, and then guided down to zero in 1999. The spring of 1999 marked the beginning of the zero interest rate policy (ZIRP). Except for brief periods in 2000-01 and 2006-2008, when the rate was lifted from zero, the policy rate has stayed zero until now. In other countries, the interest rate became near zero only after the global financial crisis (GFC) of 2008-09, in response to the financial turmoil in the wake of a collapse of the Lehman Brothers.

Figure 5, panel B, shows the period averages of the interest rate for the 4 sub-periods. It shows the dramatic decline and convergence toward zero in all regions. Japan was the front-runner, followed by the US, UK, and the Euro zone. This may be the best picture for the advanced economies all turning Japanese.

<Figure 5, panels A and B about here>

Again, the declining trend started in the early 1990s or even earlier. So, the global ZIRP is post-GFC, but the declining interest rate has a much longer history. GFC itself cannot be a whole explanation of Japanization. Of course, the nominal interest rate tends to go down when the inflation rate goes down. For the economic activity, the real interest rate is the relevant rate.

Figure 6 shows the nominal long-term (10 year bond) interest rates for US, UK, Japan and Germany. Panel A shows the time series and Panel B shows the period averages. The time series shows a remarkable co-movement, and at similar rates, among US, UK and Germany. The Japanese bond rate stayed much lower than the other three countries for the entire sample period, but with a similar speed of decline. The nominal long interest rate of Japan has become almost zero by 2015 and so has Germany. In this sense, Germany (or the Euro Zone in general).

<Figure 6 panels A and B about here>

The declining trend is confirmed in the panel B, period averages. To repeat an earlier observation, the declining interest rate well precedes the GFC. It started in the early 1990s or even earlier.

For the criteria of secular stagnation, it is the real interest rate, not the nominal interest rate that matters. By subtracting the inflation rate, the real interest rates are constructed for the short-term one and the long-term one. However, one point in the examination of the real interest rate that needs a caution. In the Japanization state, the rising real rate, if due to the declining inflation rate, that signals worsening situation (recall Figure 1). As mentioned above, the distinctive feature of Japanization is the positive real interest rate despite the zero nominal interest rate and the below-potential growth.

Figure 7, panel A, shows the time-series of the real policy interest rate, which is defined to be the difference between the nominal short rate (Figure 5) minus the inflation rate (Figure 2). Figure 7, panel B, shows the real interest rate of all countries having a declining trend. Japanese real interest rate stayed near zero between 1998 and 2008, because both the interest rate and the inflation rate were near zero. The US real short

interest rate fluctuated between +4% and -4% between 1985 and 2008 with a declining trend.

<Figure 7, panels A and B about here>

In the wake of GFC, the real exchange rate showed a contrasting movement between Japan and the rest. In Japan, the real rate stayed positive from 2009 to 2012. This is the result of the nominal short interest rate being zero, while the inflation rate become negative. This shows the heart of the problem—it is a deflationary trap. The real interest rate in 2009 rose when the economy, with a sharp drop in real GDP, very much needs monetary stimulus. The real interest rate in Japan remained positive until 2013. Japan during the period between 2008 and 2012 shows a typical Japanization state.

The real short interest rate for US, UK, and the Euro Zone became negative in 2009 and stayed negative until 2014, helping the economic recovery from the depth of GFC. This is a result of ZIRP, quantitative easing and other measures that the governments and central banks adopted in this period. It was fortunate for countries other than Japan to have had positive inflation rates. The contrast between Japan and the rest is remarkable between 2009 and 2012.

Figure 8 shows the real long-term interest rates for the same four countries and the Euro Area. Comparing Figure 8 panel A together with Figure 6 panel A, it is immediately clear that the nominal interest rates of the three west countries, US, UK and Germany, move closely together than real interest rates. The real long rates of Japan is closer to the three west countries than that of the nominal long rates.

Between 2009 and 2012, the real long rates of the four countries show the similar behaviors of the real short rates. Namely, the Japanese real long rates were positive and real long rates of the three western countries were negative. Again, this confirms that only Japan suffered from true Japanization, or the deflationary trap.

Figure 8, panel B, shows the period averages. The real long rates of the four countries show declining trend. Japanese real long rate behaved similarly to the other three countries. In the post-GFC period, the UK real long rate is close to zero, while other three countries had 1 percent.

<Figure 8, panels A and B about here>

3.4. Japanization Index

It may be easier to understand those macroeconomic trends regarding stagnation and Japanization in one summary variable. One variable that capture Japanization can be the sum of growth (or under-performance of it, namely GDP gap), inflation rate, and the nominal policy rate:

Japanization index (J) = GDP gap (g-g*) + inflation rate (π) + nominal policy rate (i)

The lower the number, closer the country is to the Japanization state. If the J-index is negative, the country is in the Japanization state, or be in the deflationary trap. It captures the essential part of the stagnant, deflationary problem. The ballpark figure for a normal state in the US used to be a combination of zero GDP gap, 2% inflation rate, and the 4% policy rate. Thus, the number 6 may be a healthy state. When an economy is caught in stagnation and deflation, combined with zero interest rate, the J index becomes negative. The negative number is the state of the Japanization.

One may wonder whether the natural real interest rate should be added to the components of Japanization index, or alternatively be used instead of the nominal policy rate. This is a valid proposal. However, the natural real interest rate should be calculated independent of inflation rate or GDP gap. The usual definition of the real interest rate, if added to the definition, will cancel out the inflation rate from the index.

Figure 9, panel A, shows the time-series of the Japanization index (J-index) for Japan, Germany, UK, US and the Euro Area. The time series is shown from 1991 to 2014, except for Euro Area that lacks for 1991-93. In this Figure, the GDP gap is estimated as the difference between the current growth rate and the potential growth rate, where the latter is the average of the growth rate from 1985 to the current.

The J-index for these countries were all above 5 in 1991. The J-index for Japan quickly descended toward zero in a few years and stayed below zero most of the time since 1992. All other countries and Euro Area experienced a mild downward trend. The sharp downturn in 2009 is a result of large GDP gap due to the Global Financial Crisis (GFC). After a brief recovery from the GFC, the J-index for all countries have stayed below 3 for 2012-2014. The J-index of Euro Area is almost the same as that of Japan, for these three

years. The Euro Area is on the verge of Japanization, if not already in it.

Figure 9, panel B, shows the period average of the Japanization index. This clearly shows the advanced economies have come from a normal economy (J-index above 6) to a state of Japanization in the last 20 some years. Looking at Figure 9, Japanization certainly looks like an epidemic rather than endemic.

<Figure 9 panels A and B about here>

The J-index, defined and shown here, is admittedly a crude index. Any improvement to the definition and construction of the variable is left for future research. The purpose of proposing this index is to stimulate the research toward a good summary statistics that would warn the danger of falling into a deflationary trap.

4. Chronology[6]

4.1. Bubble and Burst

The preceding section described the time series of macroeconomic variables that are relevant to how Japan fell into lost two decades, which is now known as Japanization. Here, building on the facts we reviewed, a succinct chronological description is presented. Major debating points will be analyzed in the subsequent subsections. References are made to the inflation rates from 1985 to 2015 as shown in Figure 10. In addition to headline inflation rate, two other inflation rates are shown: Core inflation rate that excludes fresh food only (including energy price) and Core-Core inflation rate that excludes food (but not alcohol beverages) and energy. In order to assess the underlying inflation trend, it is better to use either Core (when energy prices are stable) or Core-Core (when energy price movements are volatile).

<Figure 10 about here>

The **second half of the 1980s** is known as the period of a bubble economy, as stock prices and real estate prices tripled and quadrupled in four years. The Nikkei stock price index recorded the peak on the last business day of 1989 at 38915.87 yen. But, ten months later, the Nikkei would become drop to below 20,000 yen. Urban land prices, both residential and commercial, rose three-fold in the second half of the 1980s and then lost

[6] Descriptions and explanations of the Japanese experience in this section parallel with Bean, Broda, Ito and Kroszner (2015, ch. 3).

half of the gain in four years and all the gains in "lost two decades." Figure 11 shows movements of these asset prices. The asset price bubble and its burst in the 1990s is often identified as a major cause of the economic malaise that Japan experienced in the subsequent twenty years.

<Figure 11 about here>

During the boom years, banks lent close to a full value of collateralized assets—land, housing structures, office buildings—to developers, construction companies and retail customers, assuming that the value of collaterals would continue to rise. Traditionally in Japan, land values were considered to move only upward, as the supply of land, especially in the urban area, is limited and preference for owning houses is strong. The real estate boom was supported by banks' credit.

The period of **1990-92** was the initial phase of bursting bubble. Monetary policy and financial policies were still on the side of tightening in 1990-91. The economy was still buoyant while asset prices started to decline.

The headline inflation rate reached 4.0% (the core inflation rate being 3.2%) in January 1991, significantly higher than the level of two years earlier, which was 1%. When asset prices started to rise in 1985-87, the CPI inflation rate was subdued. Hence lowering the interest rate to fight deflationary pressure from a record yen appreciation was understandable. However, the sign of the overheating from the traditional measure of CPI inflation was evident by the early 1989. The headline inflation rate was in the range of 1.5% to 1.7% in 1989, rising above 2% in January 1990 and hit 4% in January 1991. The Bank of Japan raised the policy rate from the spring of 1989 but it was too late and too slow to react (see Ito (2013)).

Policy measures were applied to accelerate the declines of asset prices. Little consideration was given to possible adverse effects on the financial system at this point. The inflation rate was still higher than 2% in 1990-1992.

A further decline in the stock prices and slumping real estate markets in 1992 caused the growth rate to come down sharply. By 1992, the stock prices were down by 60% of the peak, and the weight of non-performing loans was growing. This was the beginning of the lost two decades. In 1992, the growth rate became significantly lower, around 1%.

The period of **1992-95** was increasingly shadowed of nonperforming problems among financial institutions. Capital bases of banks were gradually but substantially eroded. Smaller institutions with undiversified assets started to fail. Even among large institutions, possible losses from nonperforming loans grew to the level that seriously affected their capital positions. The fragility of the financial system and evergreening nonperforming loans adversely affected lending to healthier firms. The economic growth slowed down substantially and remained low. The inflation rate in December 1992 was 2.0%, but disinflation continued, and it reached 0% (even negative for a few months) in 1995. Some part of the disinflation of the year can be attributed to a sharp yen appreciation in the spring of 1995.

The policy makers grossly underestimated the increasing weight of non-performing loans to the entire banking system. As early as 1992, many developers suspended interest payments to banks. However, banks were willing to lend more to NPL companies in order to hide nonperforming loans. The forbearance was also found among the regulator. There were not alarmed by declines of stock and land prices until very late. A few real estate firms going bankrupt may not be a big problem. But when all real estate companies stop payments, it becomes the problem of banks. In fact, a systemic crisis was in the making. Taking out excesses in the bubble—or "cleansing" of excesses—seemed to be given a higher policy priority than financial stability.

The inflation rate would decline to below 1% by April 1994. The inflation rate would stay below 1% for the following two decades (except for several months in 2007-08 due to oil price increases.

In **1995-96**, strong policies were taken to stimulate growth. A large fiscal stimulus, with a relatively large additional tax cut and expenditure increase was applied in 1995 (see Kuttner and Posen (2002)).The policy rate was lowered from 2 percent in January 1995 to 0.5 percent in September. The economy was recovering in 1996. The growth rate exceeded 2% in 1996, and the inflation rate stay above zero, but just barely.

In **April 1997**, the consumption tax (VAT) rate was hiked from 3% to 5%. This was combined with expiration of income tax credit and an increase in social security contribution rates. A fiscal drag of 2% of GDP was applied. The second quarter, April-June, of 1997 recorded a negative rate of growth, but the growth rate recovered to

a positive territory in the third quarter. Then came a huge shock that is probably a single most important event in Japanization.

4.2. Banking Crisis, deflation, ZIRP and QE

In **1997-98**, the banking crisis hit Japan. In November 1997, Hokkaido Takushoku Bank (one of top 20 banks at the time), Yamaichi Securities (one of the big four securities firms at the time) and Sanyo Securities (a medium-sized securities firm) all failed. In many ways, the failure of these firms was comparable the US and European experiences with Lehman Brothers in 2008. The Japanese Finance Minister two years earlier said "None of 20 large banks would fail." Moreover, there was no plan on how to deal with other fragile large banks. Japanese financial institutions were de facto shut out from international markets, and they even could not trust each other. Two other large banks failed in 1998, despite capital injection of March 1998, and it took another capital injection of much larger amounts in March 1999 to stabilize the financial system.

With near meltdown of the banking and financial systems, the growth rate became negative and the inflation rate become negative in 1998. This was the beginning of deflation that would persist for the following 15 years. The Bank of Japan would attempt a series of policies in response to stagnation and deflation. 1998 was also a watershed in terms of wage flexibility. Until 1997, total compensations to labor tended to downward in a prolonged recession, but a decrease was in terms of cut in overtime work and twice-a-year bonus payments, which is applicable to almost all full time workers in Japan.

In **1999**, the zero interest rate policy 1999-2001, ZIRP. The Bank of Japan lowered the policy interest rate to zero in the spring of 1999. This was the beginning of the zero interest rate policy (ZIRP). The Bank of Japan communicated that ZIRP will be maintained until "deflationary concerns are dispelled". However, the exit condition was not defined numerically (see Ito (2004)). The policy rate was raised in August 2000. The first episode of ZIRP was short-lived, and the exit was made when the inflation rate was still negative.

Once the inflation rate fell into the negative territory, the real interest rate becomes positive, even with the zero nominal interest rate. The deeper the economy sinks into deflation, the higher becomes the real interest rate, which reduces the aggregate demand reinforcing the recession. Japan got into this trap in 1999.

In March **2001,** the Bank of Japan adopted the quantitative easing (QE), for the first time among G7 countries, in light of weakening the economy. With non-remunerated excess reserves, providing an ample liquidity via QE meant the interest rate became zero again. The QE would continue with expanding the balance sheet. On the asset side, the Bank of Japan bought short-term government bonds (maturities less than three years) and on the liability side, the balance of zero-interest excess reserves at the Bank of Japan increased. The policy rate became zero. The Bank did not communicate clearly what the expected transmission channels are, what if the inflation rate it was targeting, and the exit condition of QE. The Bank of Japan opposed to the idea of adopting the inflation targeting framework (see Ito (2004)). According to Ito and Mishkin (2006), a lack of inflation target and miscommunication reduced the power of QE.

In **2003**, another bank failure took place. A large bank, Resona Bank, was de facto nationalized with capital injection and one small bank failed in 2003. However, the financial sector remained calm, as the failures were dealt with an established orderly resolution mechanism, which was legislated in the wake of 1997-98 banking crisis.

In **2004-06**, an economic recovery took place. The growth rate started to pick up, with strengthened financial sector, the dollar strength (i.e., yen depreciation), and political stability under popular Prime Minister Koizumi. The inflation rate continued to be negative despite the recovering output activities.

In **2006-2008**, the second exit from ZIRP was made. The headline inflation rate finally rose to the positive territory in the spring of 2006 and the Bank of Japan raised the interest rate (the 2nd exit from ZIRP) in August 2006. However, the headline inflation rate turned negative again in 2007, but started to rise in the second 2008, and reached 2% in July 2008. Almost all of the increase in headline inflation rate was due to oil and commodity price increases and imported inflation due to yen depreciation. This is evident from the Core-Core inflation rate remained at around 0% when the headline CPI rose to 2%, as shown in Figure 10. The impression was given that the Bank of Japan was targeting the zero (or just above zero) inflation rate, and the communication from the Bank of Japan did not contradict the view.

In **2008-2012**, the global financial crisis of 2008-09 affected Japan in several ways. The failure of the Lehman Brothers triggered a severe fragility in the financial systems in

the United States and Europe. The Japanese financial institutions were not affected by the financial crisis in the west, since they did not invest in securities that lost values quickly in the crisis.

However, Japan was affected in several ways. First, as the world demand shrank rapidly, Japanese exports declined substantially, and the GDP growth rate recorded the worst performance in the post-WW II period. Second, the inflation rate plunged to the negative territory partly because domestic and external weak demands but also a sharp decline in commodity and oil prices. The headline inflation rate plunged from plus 2% in July 2008 to minus 2% in July 2009. The Core-Core inflation rate, which was hovering in the range of minus 0.1% to 0.2% in 2008 sank to minus 1 percent in September 2009. Both the headline and Core-Core inflation rate would stay negative until the spring of August 2013. Third, the yen appreciated sharply from about 120 yen per dollar to 80 yen per dollar in the wake of the GFC. This put downward pressure on prices and output activities, aggravating the degree of deflation.

When the Lehman Brothers failed in September 2009, the global financial markets suddenly fell into a liquidity shortage and many financial markets became dysfunctional (See Ito (2010)). Prices of Collateralized Debt Obligations (CDOs) backed by subprime mortgages became practically worthless. Several US and European financial institutions failed due to insolvency, or came close to failing due to lack of liquidity. Federal Reserve bought various assets in dysfunctional markets, injected capital in some of large financial institutions (de facto nationalization) and arranged mergers. The large scale asset purchases by the Federal Reserves and the Bank of England expanded their respective balance sheets. In many European countries, similar failures, mergers, and rescues occurred. ECB also expanded the balance sheets by purchasing covered bonds.

The most striking effects of those expansion of the balance sheet was on the exchange rates. The dollar appreciated against the euro and emerging market currencies, and the yen appreciated against the dollar. The yen and the Swiss franc were considered to be "safe haven" and the two currencies became the strongest.

Japanese financial institutions remained relatively healthy as they had not invested in subprime-related securities. So, the Bank of Japan probably found little reason to introduce asset purchases for the financial stability purpose. However, the drop of GDP

in 2009 was biggest in Japan. The crisis in the US and Europe came to Japan through the trade channel. When output activities slow down and the inflation rate became negative, a possibility of adopting unconventional policies, such as quantitative easing, similar to US and Europe, could have been adopted. However, at this point, no strong action was taken, and the yen appreciated against the US dollar and the euro.

The Democratic Party of Japan (DPJ) took the majority in the Lower House in the election of August 2009, and formed the government in September 2009. This was the first time that the DPJ, or any party other than Liberal Democratic Party (LDP), had a majority in the Lower House. Economic policy was geared toward income transfer to the lower income families, children and farmers. Fiscal stimulus did not occur and sharp downturn of activities were not corrected by fiscal policy either.

The Bank of Japan also lowered the policy rate to near zero (0.1 percent), but did not embark on QE. The balance sheet of the Bank of Japan remained flat, while the balance sheets of the western banks expanded rapidly, as shown in Figure 12. The difference between the Bank of Japan and the western central banks was believed to be a major factor behind the sudden yen appreciation.

<Figure 12 about here>

The conventional monetary policy relying on adjusting the policy rate had become powerless since 1999. The repeated negative shocks causing prices to decline made the real interest rate higher, so that investment and consumption demands declined, reinforcing a recession. An economy caught in a deflationary trap with persistent stagnation, i.e., below potential growth, despite stimulative efforts of ZIRP and a flat yield curve, is a Japanized economy. The case of Japanization is found in Japan between 1999 and 2012, but an undisputable way between 2009 and 2012.

5. Great Escape from deflation

The period of **2013-2015** is a period that all policies were aimed at escaping the deflationary trap that Japan had been caught in the preceding 15 years. The economic policy package became known as Abenomics. The general election of December 2012 made a sea change in Japanese politics. The Democratic Party of Japan (DPJ) that had been in power for three years was replaced by the Liberal Democratic Party (LDP) led by Prime Minister Abe as a ruling party. The Abe cabinet was formed at the end of

December 2012 and pushed the Bank of Japan to adopt the 2% inflation target, selected Governor Kuroda, who is an inflation target believer. Governor Kuroda introduced Quantitative and Qualitative Easing (QQE) on April 4, 2013.

Between mid-November 2012, when the House of Representatives was dissolved and April 4, 2013, the yen depreciated from about 80 yen/dollar to 95 yen/dollar; and the Nikkei 225 stock index rose from 8,500 yen to 12,000 yen. These changes in asset prices were based on purely expectation of drastic policy changes, which Mr Abe had advocated. After the QQE announcement, whose contents exceeded market expectation, the yen depreciated to the 100 yen/mark and the Nikkei rose to 15,000 level, in the subsequent weeks. The yen depreciation—or to be precise, a correction of overvalued yen—from mid-November to the summer was a result of the public expecting and the Bank implementing QQE. The channel of aggressive monetary policy turned out to be asset price changes, prompted by portfolio rebalancing.

In the general election of December 2012, Shinzo Abe ran on a platform prioritizing an escape from the deflationary trap. The program subsequently implemented comprised "three arrows": aggressive monetary expansion (so-called quantitative and qualitative easing, or QQE) together with an explicit inflation target of 2%; initial fiscal stimulus that would turn to consolidation once growth resumed; and structural reforms to boost potential output growth. All three arrows combined are expected to lift the Japanese economy out of a deflationary bad equilibrium to a normal good equilibrium with higher growth and 2% inflation. The inflation rate is Core CPI, which excludes fresh food but includes energy.

As Prime Minister Abe urged the Bank of Japan to agree to a document to set the target of inflation rate at 2%, and the document was signed in January 2013. Mr. Haruhiko Kuroda, then President of Asian Development Bank, became a new Governor in March 2013. The Quantitative and Qualitative Easing (QQE) was launched in April 2013.

The QQE policy comprised of two parts, quantitative and qualitative: (1) Expanding monetary base at an annual pace of about 60-70 trillion yen by asset purchases; and (2) lengthening the average maturity of the Japanese Government Bonds (JGB) from 3 years to 7 years with purchase of about 50 trillion yen; and purchasing ETFs (an annual pace of 1 trillion yen) and J-REITs (an annual pace of 30 billion yen). Belatedly, the balance sheet size (change from January 2007) of the Bank of Japan started to increase

sharply in April 2003, as seen in Figure 12.

Prime Minister Abe also applied the second arrow, the flexible fiscal policy. Immediately after he took office. He ordered to form a large supplementary budget in February (just two months remaining in the fiscal year) in order to kick start the economy.

With the yen depreciation and stock price increases due to the first and second arrows, exporters started to report profits and investors in the stock market started to feel wealth effects. The inflation rate started to get out of the negative territory and continued to rise and the growth rate started to rise. This paved way to give a go to raise the tax rate, which was legislated in 2012, to be implemented in April 2013. There was a group of people who doubted the wisdom of fiscal consolidation when getting out of deflation was not certain. However, those who thought fiscal deficits were too large to sustain prevailed to persuade Prime Minister. By April 2014, all indicators were showing good signs. The inflation rate rose to 1.5% (yoy, excluding effects of consumption tax rate hike.)

The direction of the inflation rate, the growth rate, and overall business sentiments, all look fine at the first year anniversary of QQE, in April 2014. However, effects of the rate hike of consumption tax in April 2014 sent the economy into a negative growth territory, again. The growth rate remained low for the rest of the year, in spite of prior expectation of V-shape recovery after an expected negative growth for one quarter immediately after the tax hike.

As growth continued to be sluggish, the inflation rates started to decline. The inflation rate of Core CPI, adjusted for contribution of consumption tax rate hike, started to decline in May 2014, and would reach to 0.0%--back to square one—in March 2015. The Bank of Japan was concerned whether the expected rate of inflation would start decline, although the inflation rate was declining mostly because oil prices were declining. The Bank of Japan revised the QQE by accelerating the pace of asset purchase.

In the October 2014 meeting of monetary policy Board meeting, the Bank of Japan narrowly (5 to 4) decided to increase the size of asset purchases (QQE2). The pace of asset purchase was increased to 80 trillion annually. In November, Prime Minister Abe announced that the second scheduled rate hike of the consumption tax would be delayed form October 2015 to April 2017.

One of the stated goal of Abenomics is the inflation targeting. Although deflation seems to be defeated, the inflation rate is slow to move up. During the first year of implementation, Abenomics produced intended results. It rose from -0.5% in April 2013 to +1.5% in April 2014. However, the inflation rate fell back to 0.0% in April 2015. About a half of the decline can be explained by oil price decrease, while the other half is due to diminished activities in the wake of the consumption tax, effective in April 2014.

The economy finally started to grow in the first quarter of 2015. The inflation rate started to increase during the summer, and when the oil price effects are eliminated, the Core-Core inflation rate has been increasing, and reached hovering at around 0.9% in September 2015. Hence, as the oil price decline effects will dissipate by end-2015, the inflation rate will go up above 1 % by the spring of 2016 and toward 2% by end-2016, as the Bank of Japan now forecast. The inflation targeting framework is still maintained.

In summary, what is the consequences of policies by Abenomics with Kuroda's QQEs? The inflation rate was raised out of the negative territory; the stock prices rose from 8,500 to 20,000; the exchange rate depreciated from 80 yen/dollar to the 120-125 yen/dollar range by July 2015. At least the deflationary equilibrium is far behind, but the economy has not reached a new normal equilibrium. In order to increase a potential growth rate for Japan despite the demographic onus (disadvantage), structural reform to change environment for investments, the so-call third arrow of Abenomics, is essential; not the first and second arrow. The growth strategy based on deregulation and liberalization of the unnecessarily regulated industries, such as agriculture, health care and education is the most important step of Abenomics. We have yet to see a significant progress on that front.

6. Lessons

6.1. Bubble

From the above mentioned chronology, several lessons can be drawn in order to avoid Japanization. First, if at all possible, it is better to avoid a bubble. However, it is well known that it is difficult to tell the difference between a fundamentals-supported boom and a financial bubble. To prevent creating a bubble is important because financial instability needs to be avoided in the event of a bubble burst. If financial institutions are robust to asset price declines, asset price booms can be tolerated. It may be equally wasteful to squash a good boom prematurely in a fear of a bubble.

What will turn out to be a dangerous asset price increases is the one financed by a huge leverage. Hence, it is important to avoid concentration of lending to real estate sectors among the financial institutions. What is called macro-prudential measures is important in this respect. The Japanese experiences of the second half of 1980s show that weak supervision on banks allowed banks to extend too much leverage.

With benefits of hindsight, the peak levels of stock prices or real estate prices could not be justified by discount sum of future rents or dividends. The declines of the asset prices in the subsequent 20 years all but erased those gains in the second half of the 1980s. It is often argued that monetary policy was too loose in the second half of the 1980s despite the rising asset prices. It can be also argued that the factors that contributed to deflation was not monetary policy but prudential policy to make sure that risk of possible asset price declines are not concentrated among financial institutions. One solution is to set the maximum loan-to-value ratio so that banks would be resilient to a possible price fall in the future. Even more crude regulation, such as a cap on the total amount of lending to real estate sectors from the banking sector, which was introduced in March 1990, can be introduced much earlier.

Too conservative an attitude toward price increases may result in premature tightening. Too low an inflation target increase a risk that a negative shock easily push the economy in to a deflation.

6.2. Burst

When the eventual burst came in 1990-91, it was first welcomed by the public and policy makers as the asset prices will decline to affordable levels. In a sense, the bursting bubble was viewed as a process toward normalization. The fiscal and monetary authorities were belatedly tightening in 1990-91, accelerating the decline in asset prices, rather than relaxing to moderate the decline. The policy interest rate was raised from 1989 to 1991. The total lending amount from banks to the estate sector was capped in March 1990. Moreover, the national land holding tax was introduced in 1991 and the short-term capital gains tax was raised in 1991.

Even with careful monetary policy and prudential policy, a bubble may happen and a burst may occur. Then it is difficult to manage the situation. The Japanese experience of the early 1990s show that bringing down the asset prices quickly may have unintended

consequences, including deflation. When a burst comes, the financial stability is equally important as finding a new equilibrium. Sometimes soft-landing of the economy and the soundness of financial institutions may outweigh the timeliness of finding a new equilibrium. Here, a judgement is required.

As described above, in 1990-91, policies were introduced when asset prices were already declining. Tight monetary and credit policies (raising the interest rate and capping credit to the real estate sectors) and fiscal and tax policies (introducing land tax and hiking real estate capital gains tax), after the peak had passed, were considered necessary to make sure that the bubble would not come back. The prospects for returning to robust output growth are higher if the excess is cleaned up once and for all, quickly. This may be labeled as the cleansing view.

One of the reasons to support the cleansing view is that it would make a recovery faster. Theoretically, the cleansing view advocate believe that the price level goes down to the fundamentals-consistent level faster and then, economic growth would resume faster. It was politically good that ordinary citizens may afford housing, as prices came down. Greedy developer may suffer but it can be also politically good.

With benefit of hindsight, there were three problems with the then-popular cleansing view. First, the market had already turned the corner from buying assets based on expected appreciation to selling assets based on expected price declines. The rapid decline of asset prices pushed down the fundamentals, because the acceleration of price decline made the economy to sink further, resulting in fundamentals to deteriorate further. Instead, asset prices went into a "reverse bubble," namely, expectation of price decline would cause further price decline. Second, therefore a new equilibrium may not be well defined or known. This may be parallel to a proposition that we may not know whether price increase is a bubble or not. Third, when the price decline is not stopped, damages to the financial system may outweigh losses from a slow adjustment toward a new equilibrium.

Another observation is that when hard-landing may cause wide-spread defaults among real estate and construction sectors and banks had already lent with high loan-to-value ratios, the hard-landing has more negative impacts to the economy than otherwise. In order to avoid that kind of negative impacts, efforts to moderate a sharp decline in real estate prices after a bubble burst can be applied. For example lowering the interest

rates and purchase of mortgage backed securities or REITs would contribute to making landing softer. This may be a revisionist view in Japan, but the importance of preventing too quick a decline was recognized by FRB Chairman Ben Bernanke in 2008-09. The credit easing (later dubbed as quantitative easing (QE-1) was precisely to support housing prices and to prevent further banking failure. Thanks to the support by the Federal Reserve QE, the US real estate prices in the wake of GFC did not decline as much as the Japanese counterpart. Figure 13 shows the representative real estate prices in Japan and in US, lining up timing of the peak of the prices at the same time. The US real estate price decline stopped after a decline by one-third, while Japanese real estate price decline continued until almost all the gains made in the second half of the 1980s was lost. The burden on the financial system and the economy at large was much bigger in Japan.

<Figure 13>

6.3. Downward flexibility of wages

The banking crisis of 1997-98, with four large financial institutions failure, and resulting recession in 1998 caused a structural changes in the labor market. Large financial institutions (are forced) to let go employees, which was unprecedented, labor unions and workers put job security first in the negotiation. Accordingly, it became prevalent that payments to workers were reduced. Downward nominal wage rigidity was broken in the recession of 1998. Earlier Japanese companies had dealt with a recession by lowering "bonuses" (paid to all workers). After 1998, nominal wages started to go down. This set up the deflationary wage-price spiral. So, since 1998, the downward spiral of wages and prices continued until 2012. Wages went down because of deflationary expectations; lower wages resulted in lower consumption; and lower consumption widened the GDP gap. As deflationary expectation had sunk in, it became difficult to lift the economy. The Japanese economy seemed to have fallen into a state where demand is permanently lower than potential output. The recessionary state can be viewed as a deflationary trap or secular stagnation. However, the mechanism may be different from Alvin Hansen or Lawrence Summers. It is more similar to, but a milder version of, Irving Fischer's Debt Deflation.

It shows that it is important to apply strong policies to avoid a price-wage downward spiral. It would be easier to stimulate with conventional tools when wages and prices are still increasing than to stimulate with unconventional tools to break a wage-price

deflationary cycle.

6.4. Disinflation, deflation and Japanization

It is important to distinguish between the period of disinflation and that of deflation. The disinflation regime is when the inflation rate was positive and declining (1992-1998) and the deflationary regime is when the inflation rate was negative (1998-2012, except 2006-08).

Disinflation has been considered to be a good thing, when the central banks were fighting too high an inflation rate. However, lowering the inflation rate too low is as dangerous as hyper-inflation. This was learned in Japan's deflation. The inflation target of 2% is a good policy to avoid deflation but risk is symmetric between upside and downside. Since Japan did not adopt the inflation targeting framework during the disinflation and deflation periods, the warning of peril of deflation was not conveyed to the public.

The United States came close to deflation in late 2008, but a strong credit easing (QE1) in 2009 prevented deflation. Some of the Euro zone countries are still on the verge of deflation. Since monetary policy is controlled for the average of Euro zone countries, deflation in one country may not be dealt with properly. That is a risk.

6.5.Big push, or "Abenomics"

Even the nominal interest rate is lowered to zero—and it is not possible to set the nominal interest rate at the negative rate without causing de-intermediation—the real interest rate becomes positive since nominal inflation rate is negative. Monetary policy's main tool is ineffective. Many favor fiscal policy at the liquidity trap, or in this case deflationary trap. But, sooner or later, mounting debts become a concern.

If the goal is to avoid a protracted period of deflation, it is important to act quickly as soon as the inflation rate becomes negative. Once deflation is sustained and inflation expectation turns negative, it would become harder to get out of deflation. In case of Japan, deflation had continued since 1998. After the GFC, a situation got worse, as the yen appreciated vis-à-vis the US dollar by about 30%, and deflation got worsened. Mr. Abe won the general election on the platform of defeating deflation by installing someone who can implement inflation targeting of 2% and aggressive monetary policy. In addition, Prime Minister Abe ordered fiscal stimulus by formulating a

supplementary budget. With expectation of quantitative easing and more-than-expected quantitative and qualitative easing that Governor Kuroda announced in April 2013 corrected overvaluation of the yen, which caused a sharp increase in stock prices and the inflation rate to rise.

7. Demography

Japan is experiencing a demographic transition from a stage with large skilled work force to that with large retired people who are "aging." This is a result of birth rate declining for decades. The working age (ages 20-65) population has turned to decline in 1998, and total population in 2007. Japan is the first country to experience the aging with shrinking population, although several countries are expected to experience the same phenomenon in the near future.

Japan's demographic transition has several economic implications. First, aging is expected to lower the household saving rate. The lifecycle theory predicts that higher the population growth, the higher the household saving rate. When baby boomers are making life's transition from middle-aged to just near retirement, that economy produces large saving. Japan in the 1970s to 1990s and many emerging market economies at present belong to this category. However, Japan is already in the next stage of baby boomers to retire and start dis-saving.

Second, fiscal deficits tend to worsen in an aging society. On the expenditure side, aging will require higher expenditures on social security, including pension and health care. Aging will also reduce income tax revenues. Third, the potential growth rate will become lower, as the labor supply will be lower. With smaller labor supply may motive labor-saving technological progress, thus investment may rise. However, if labor-saving technology is not available, like in many service industries, the capital expenditures will become lower with population. Fourth, aging and shrinking population may result in a rising real interest rate, when the declining saving outweighs the declining investment demand. Although Japan has enjoyed low nominal and real interest rates, this may turn out to be temporary, cyclical phenomenon of being in the deflationary bad equilibrium.

With these observations, a demographic transition to an aging society predicts a lower growth from the supply side, but not a lower interest rate.

In explaining stagnation, demographic transition to "aging" (an increasing proportion of the retired to the workers) and "decreasing population" is straightforward and important. Consumption of wide ranging goods will shrink, although demand for medical care is expected to increase. As the domestic market for consumptions goods is expected to continue shrinking, companies are reluctant to invest, except for medical facilities and health care related investment.

It is quite certain that Japanese growth rate is pushed down, by 1.0 - 1.5%, due to a decline in (working age) population. The per-working age output growth (hereafter, per capita growth) in lost decades were not bad. In fact, per capita growth in Japan during for the best part of the last two decades (2004-2007) are comparable to the United States, or to the 1970s and 1980s. Those who emphasize that per capita growth was respectable even in the lost decades do not think Japan was achieving potential growth during the lost decades and deflation was not problem. (BIS study). We agree that the stagnation looks less problematic if we take the per capita growth,

Whether demographic transition to aging also explains Japan's deflation and/or declining, low real interest rate is not straight forward. Some argues that demographic changes put downward pressure on the inflation rate and the real interest rate. The aggregate demand decline that causes stagnation would also explains deflation. If this is true, deflation does not have a quick cure by fiscal or monetary policy. However, demand decline is only a half story. The same demographic transition will have supply side effects too. The lack of workers constrains production, so the aggregate supply also drops. If the aggregate supply comes down faster than aggregate demand, then the inflation rate will rise instead of decline. So, a theoretically expected result will be "stagflation" rather than "deflationary stagnation." The real interest rate may also increase if the inflation rate tends to increase due to supply constraint. Whether aging causes deflation or not thus depends relative magnitude of demand declines and supply declines.

Whether monetary and fiscal policy can compensate for demographic weights on demand and supply declines can be debatable. Changed in long-run real output and growth, due to demographic transition, cannot be controlled by policy. The long-run Phillips curve is vertical and aging tends to move it to left. Monetary and fiscal polies can influence on the short-run Phillips curve but not the permanent one. However on the inflation/deflation effect of demography is most likely offset by proper monetary

policy. Monetary policy with good communication is essential in maintaining expectation close to the targeted inflation rate.

8. Concluding Remarks

Japanization is defined as the prolonged state of deflation, combined with secular stagnation and zero nominal interest rate. The short-term nominal interest rate is zero, but deflation makes the real interest rate positive. The yield curve is almost flat, making the long interest rate is also very low. The paper first reviewed the general trends of the inflation rates, the growth rates and the interest rates of US, UK, Japan and Euro zone (or Germany). All four advanced countries share the same declining trends in these variables with varying degree of starting point and speed. Then the paper reviewed the experiences of Japan, in an attempt to answer why only Japan suffered from the state that is now known as Japanization. It was shown that Japanization occurred as a result of large financial shocks combined with a particular set of policies. If it is important to avoid Japanization, there are set of policies toward the objective. So far, the US and the UK seemed to have escaped Japanization. As of this writing, the Euro Zone economy seems to be still at risk.

Many emerging market economies have experienced disinflation and growth slowdown. However, Japanization is a result of negative shocks and a particular set of policies. If correct roles and consequences of policy actions are learned, Japanization is avoidable. Abenomics is succeeding in getting the economy out of deflation.

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Table 1. Taxonomy

	Taxonomy		Possible reasons
<1>	Stagnation	$g < g^*$	Too tight monetary policy (if not ZLB), timid QE(if ZLB); too tight fiscal policy
<2>	Secular Stagnation	$r^n < 0$ and $r^n < r$	Multiple equilibria; Too low rate of inflation (expectation); Saving Glut
<3>	ZLB	$i = 0$	monetary policy response to stagnation
<4>	Deflation	$\pi < 0 < \pi^*$	Too tight monetary policy
	Japanization	All of the above	

Figure 1: The relationship among the inflation rate, the nominal interest rate and the real interest rate and

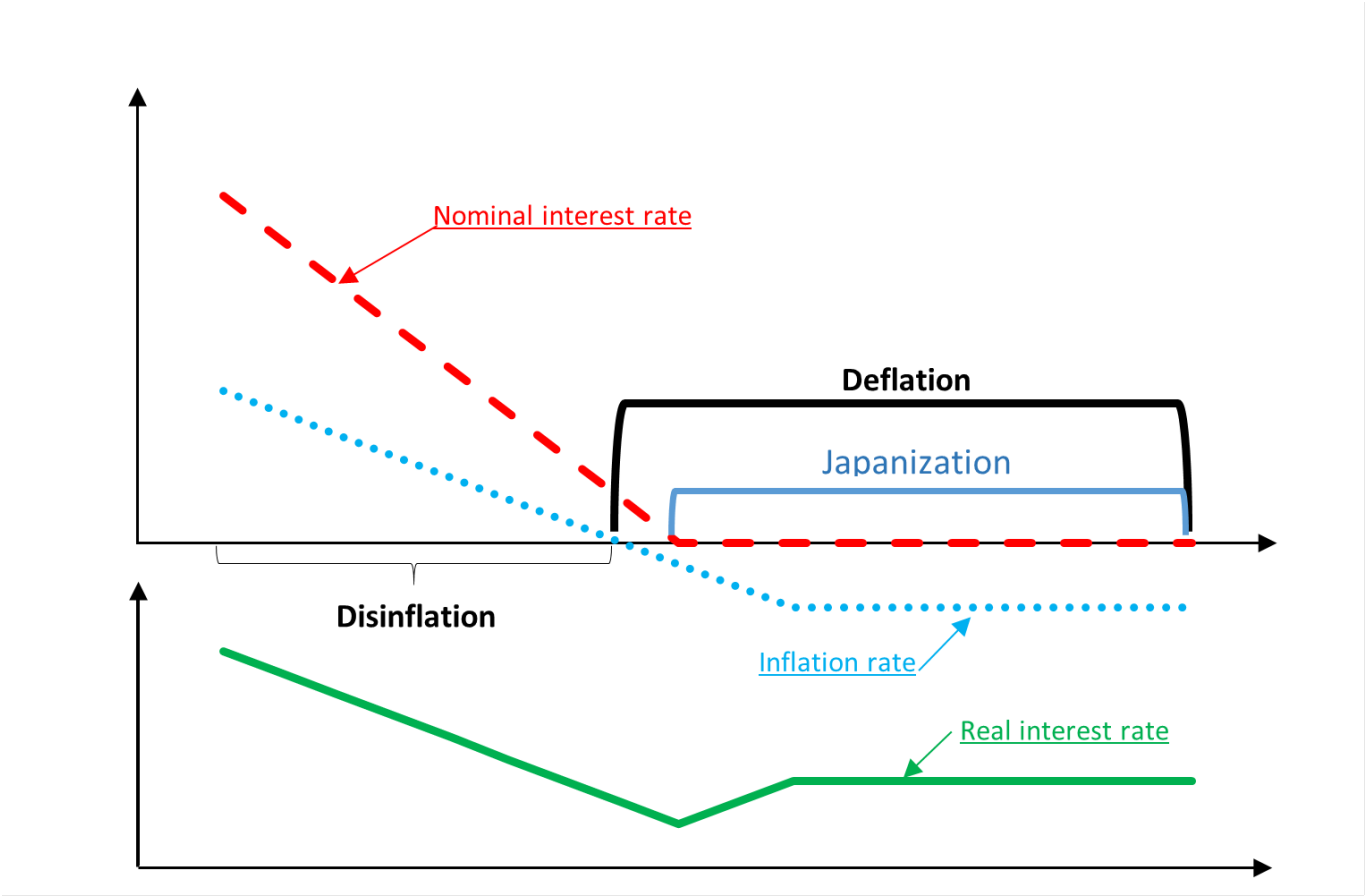
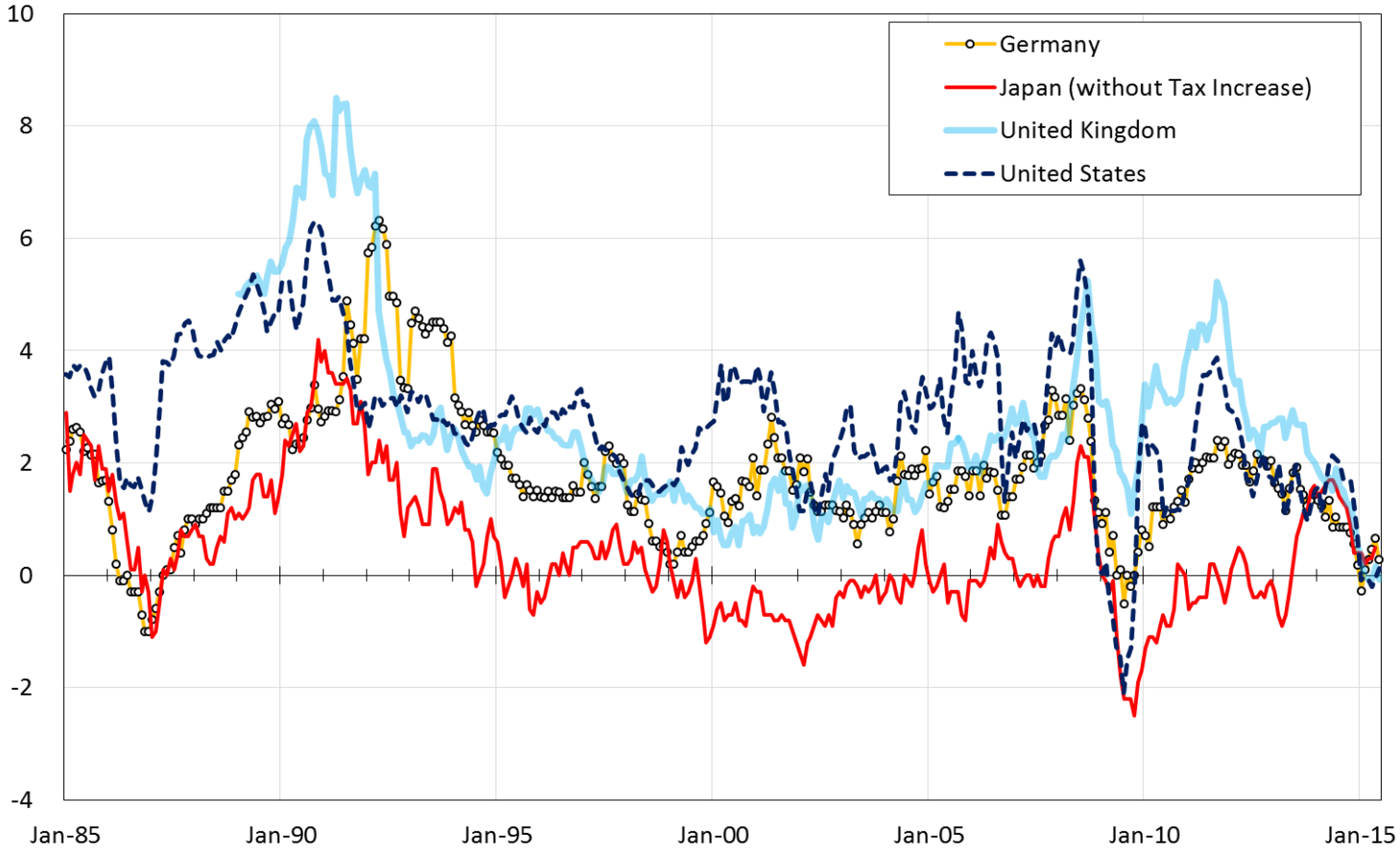


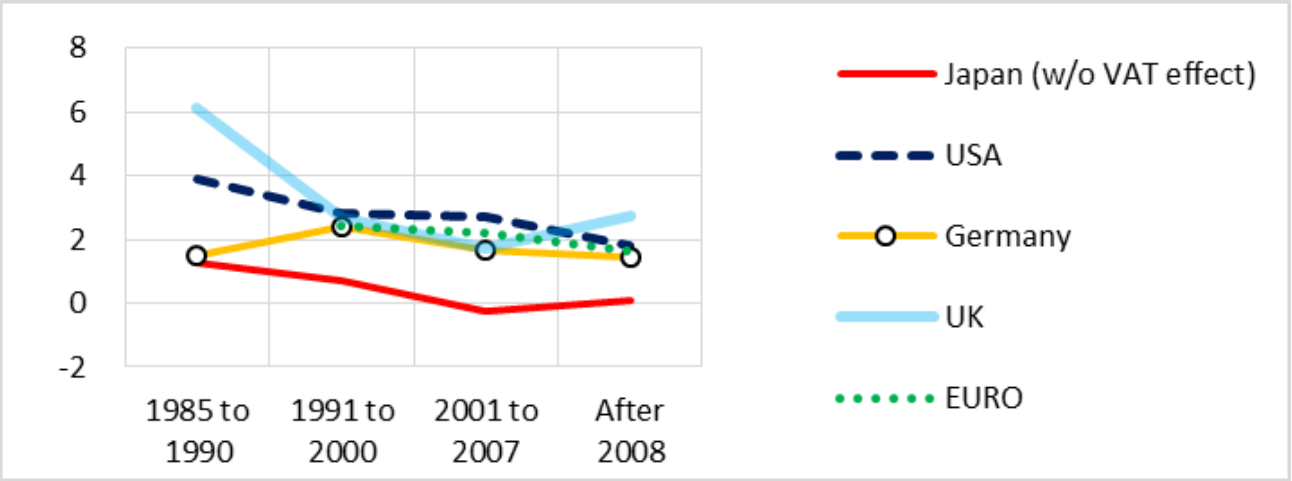
Figure 2. Inflation Rates (headline) (Japan, US, UK, Germany)

Panel A. Time-series



Source: IMF and MIC(Japan).

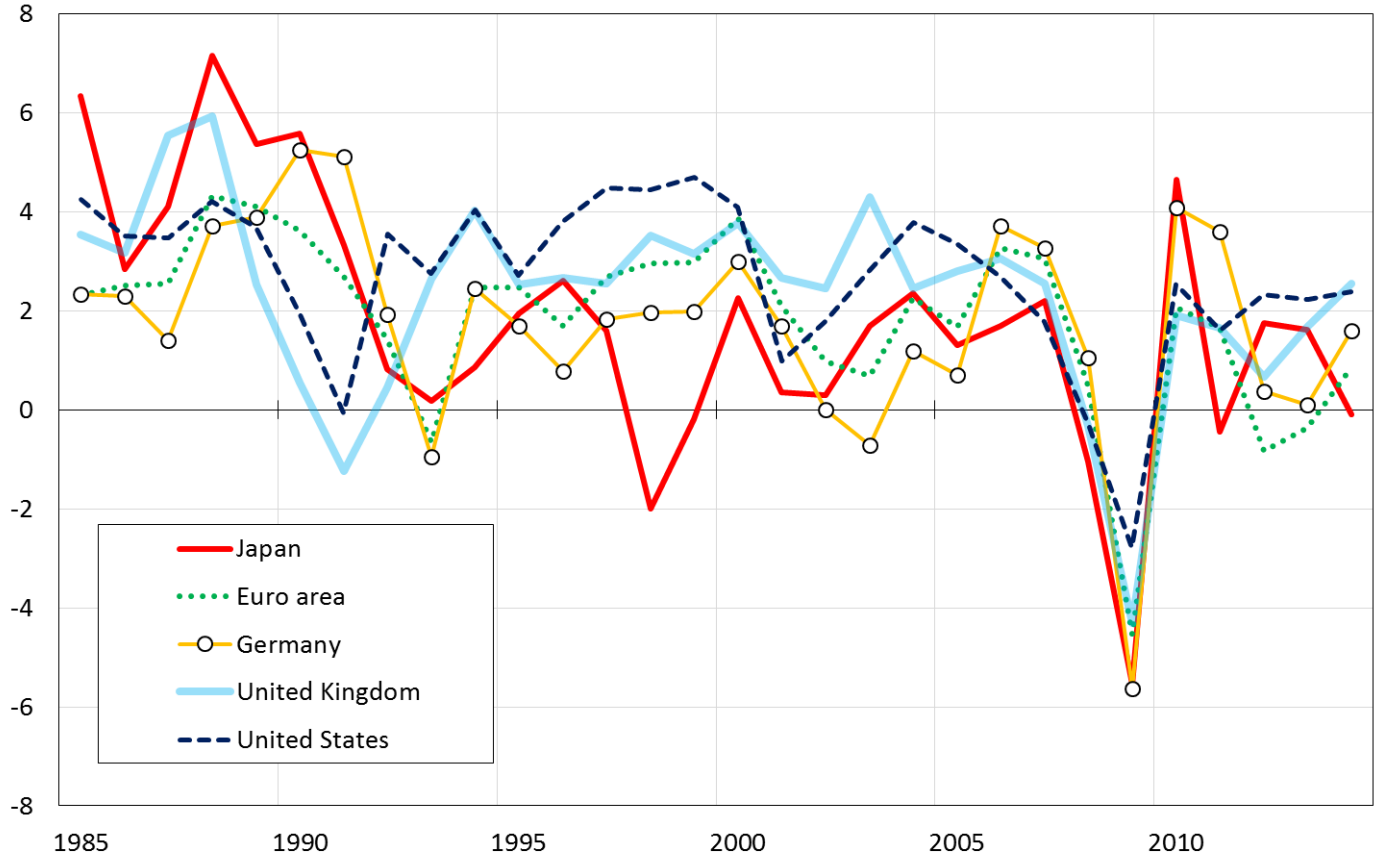
Panel B. Period Averages



Inflation rate (headlline CPI)				
	1985 to 1990	**1991 to 2000**	**2001 to 2007**	**After 2008**
Japan (w/o VAT effect)	1.279	0.678	-0.269	0.104
USA	3.904	2.803	2.692	1.792
Germany	1.509	2.394	1.647	1.423
UK	6.098	2.695	1.701	2.722
EURO		2.423	2.187	1.621

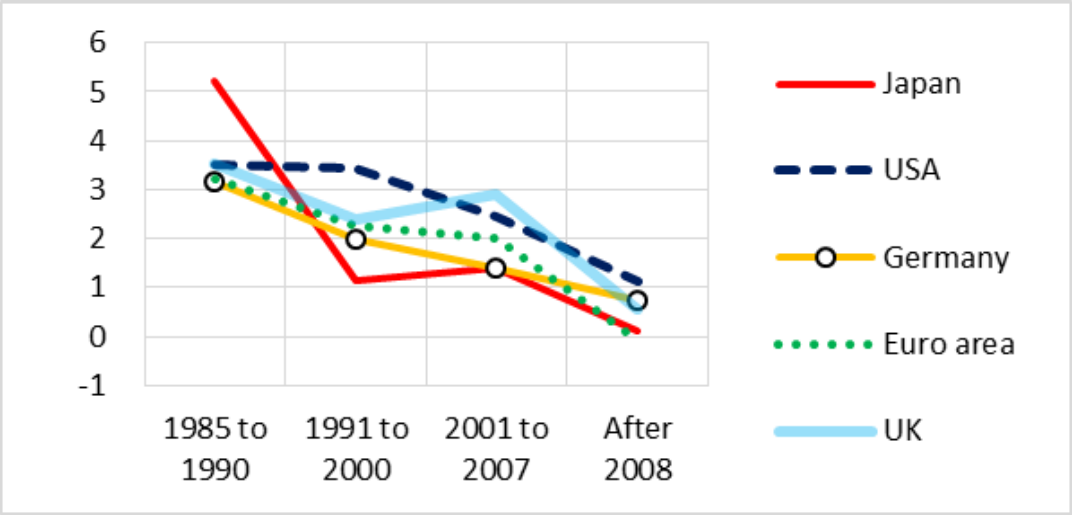
Figure 3. Growth Rates (1985-2015, US, UK, Japan, Germany, Euro Zone)

Panel A. Time-series



Source: World Bank, World Development Indicators.

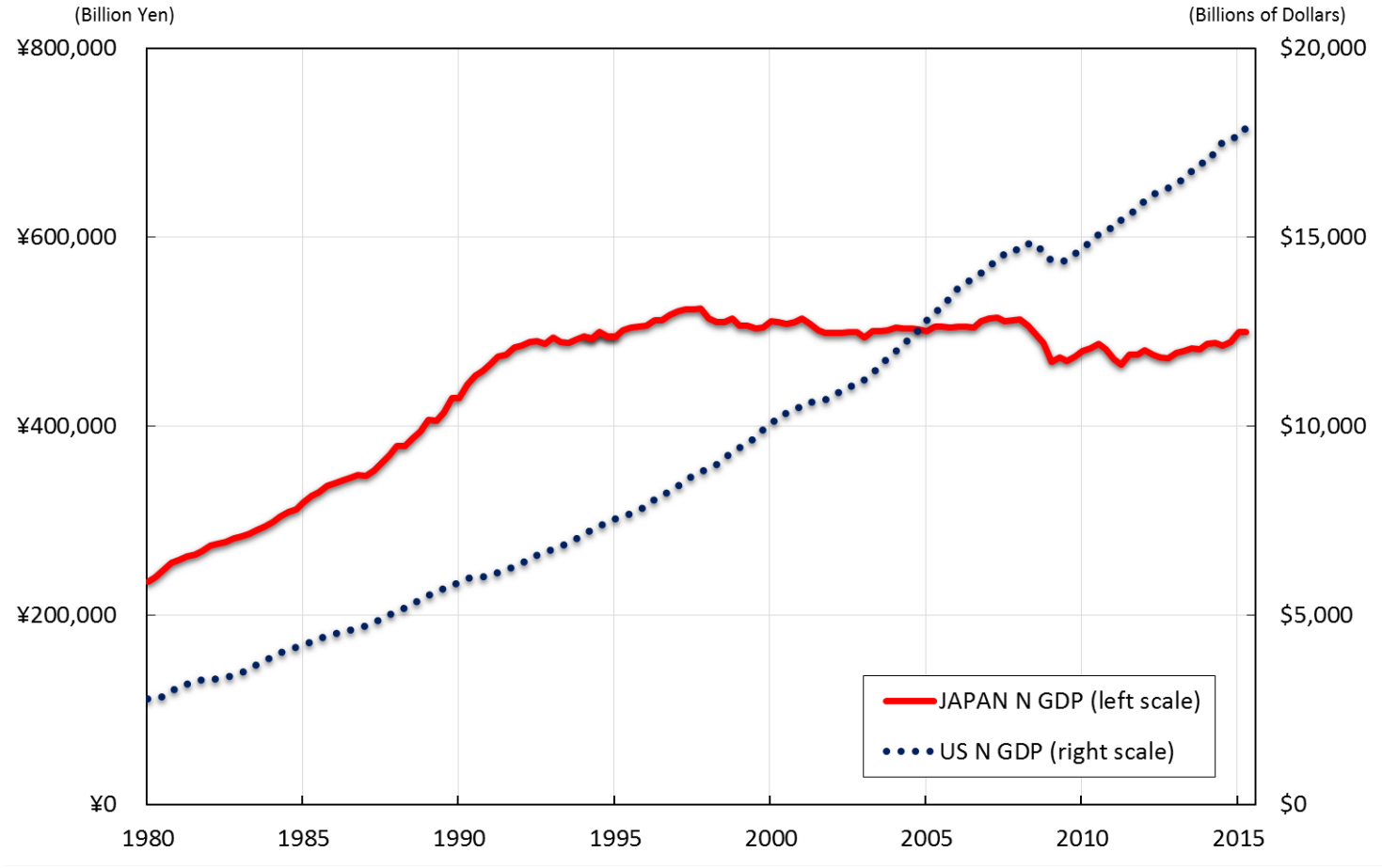
Panel B. Period Averages



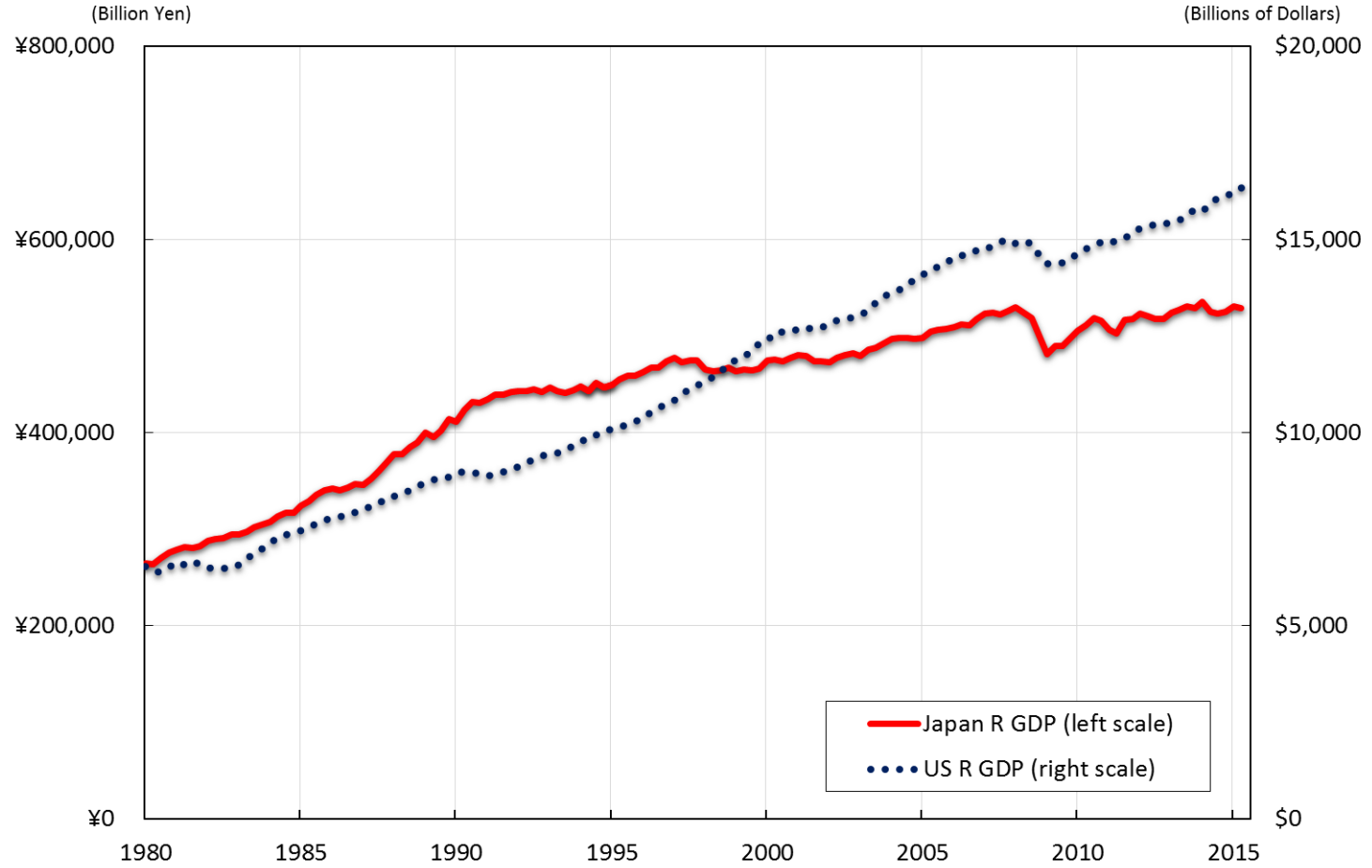
GDP growth (annual %)				
	1985 to 1990	**1991 to 2000**	**2001 to 2007**	**After 2008**
Japan	5.227	1.138	1.411	0.128
USA	3.503	3.449	2.449	1.142
Germany	3.146	1.978	1.408	0.740
Euro area	3.228	2.255	2.001	-0.097
UK	3.540	2.406	2.896	0.542

Figure 4. GDP (Japan and US)

Panel A. Nominal GDP



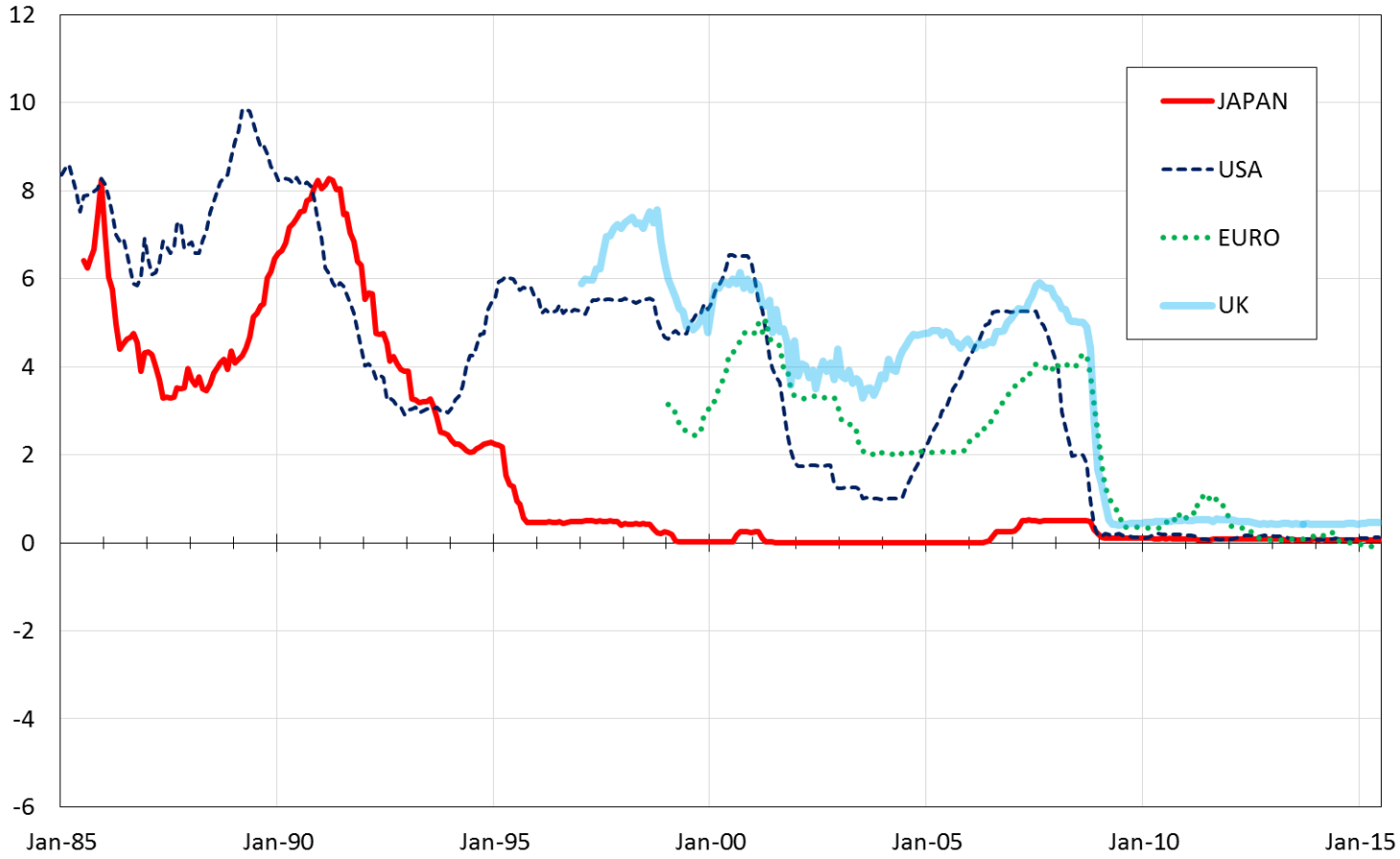
Panel B. Real GDP



Notes: Real GDP in each country is at the 2005 prices.

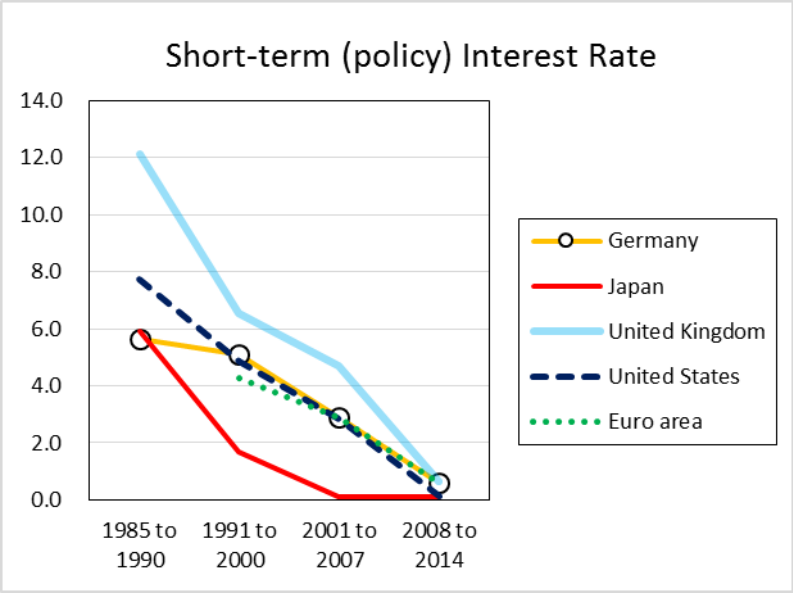
Figure 5. Nominal Short-term Interest rate (1985-2015. US, UK, Japan Euro Zone)

Panel A. Time-series



Source: BOJ, FRB, ECB and BOE.

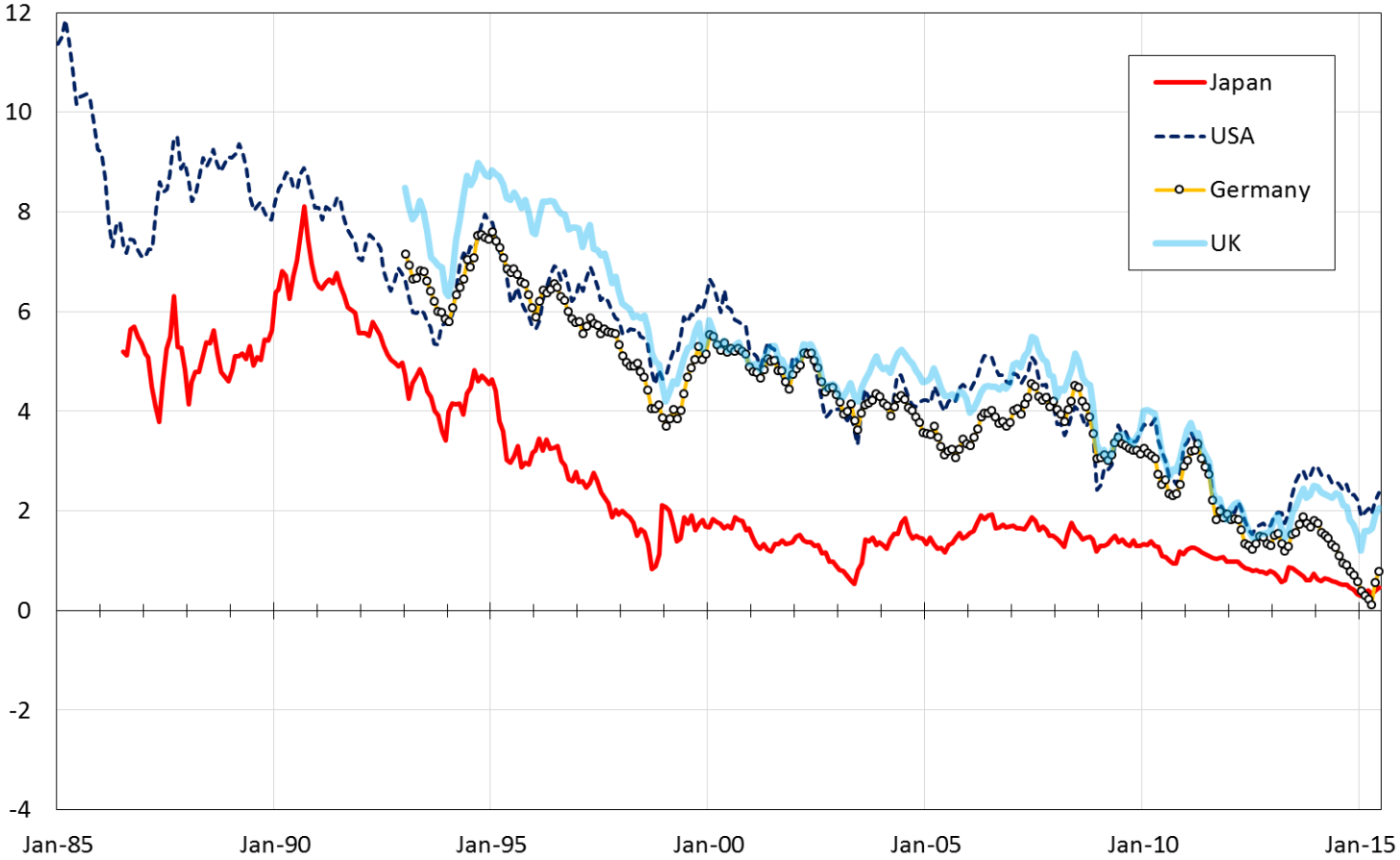
Panel B. Period Averages



	Germany	Japan	United Kingdom	United States	Euro area
1985 to 1990	5.64	5.93	12.12	7.75	
1991 to 2000	5.09	1.68	6.54	4.85	4.26
2001 to 2007	2.89	0.11	4.70	2.83	2.89
2008 to 2014	0.60	0.10	0.63	0.13	0.60

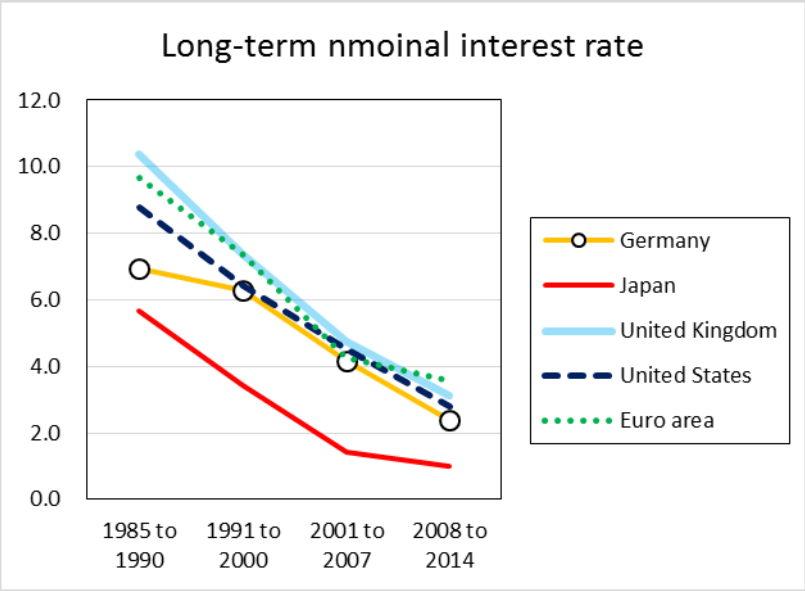
Figure 6. Nominal long interest rate

Panel A. Time-series



Source: MOF, FRB and ECB.

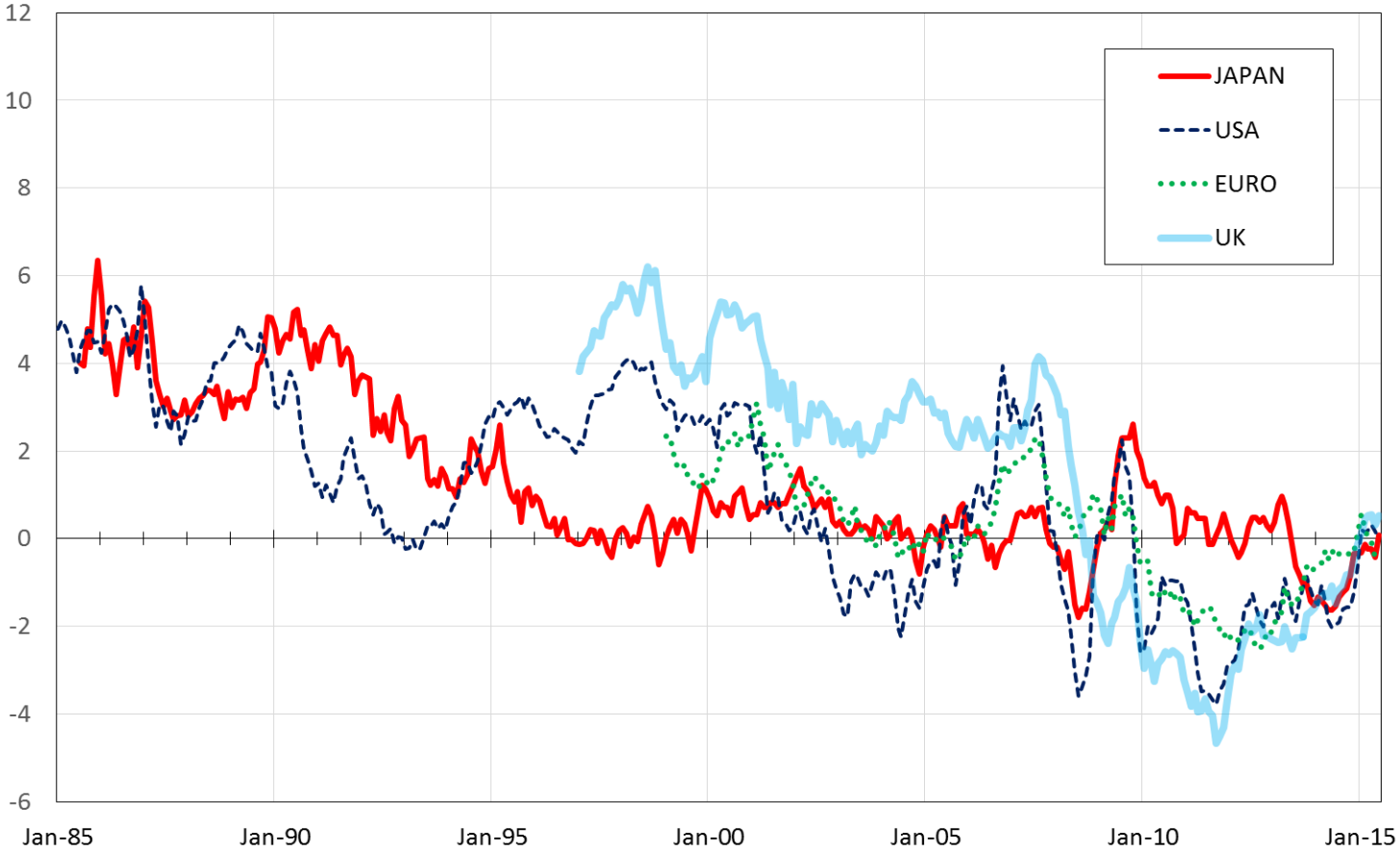
Panel B. Long-term nominal interest rate, Period Averages



	Germany	Japan	United Kingdom	United States	Euro area
1985 to 1990	6.95	5.67	10.39	8.76	9.68
1991 to 2000	6.28	3.43	7.38	6.41	7.33
2001 to 2007	4.15	1.40	4.74	4.52	4.27
2008 to 2014	2.40	1.01	3.13	2.80	3.55

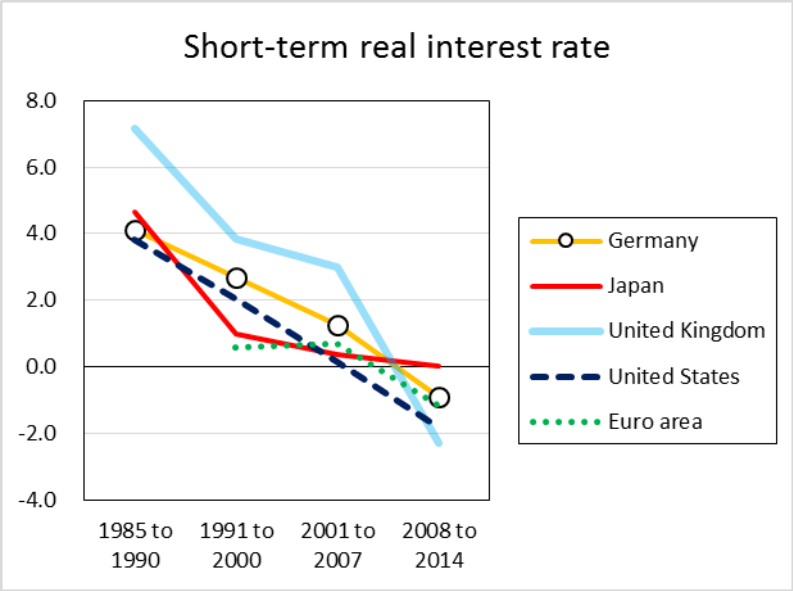
Figure 7. Real Short Interest rate

Panel A. Time-series



Source: IMF, MIC(Japan), BOJ, FRB, ECB and BOE.

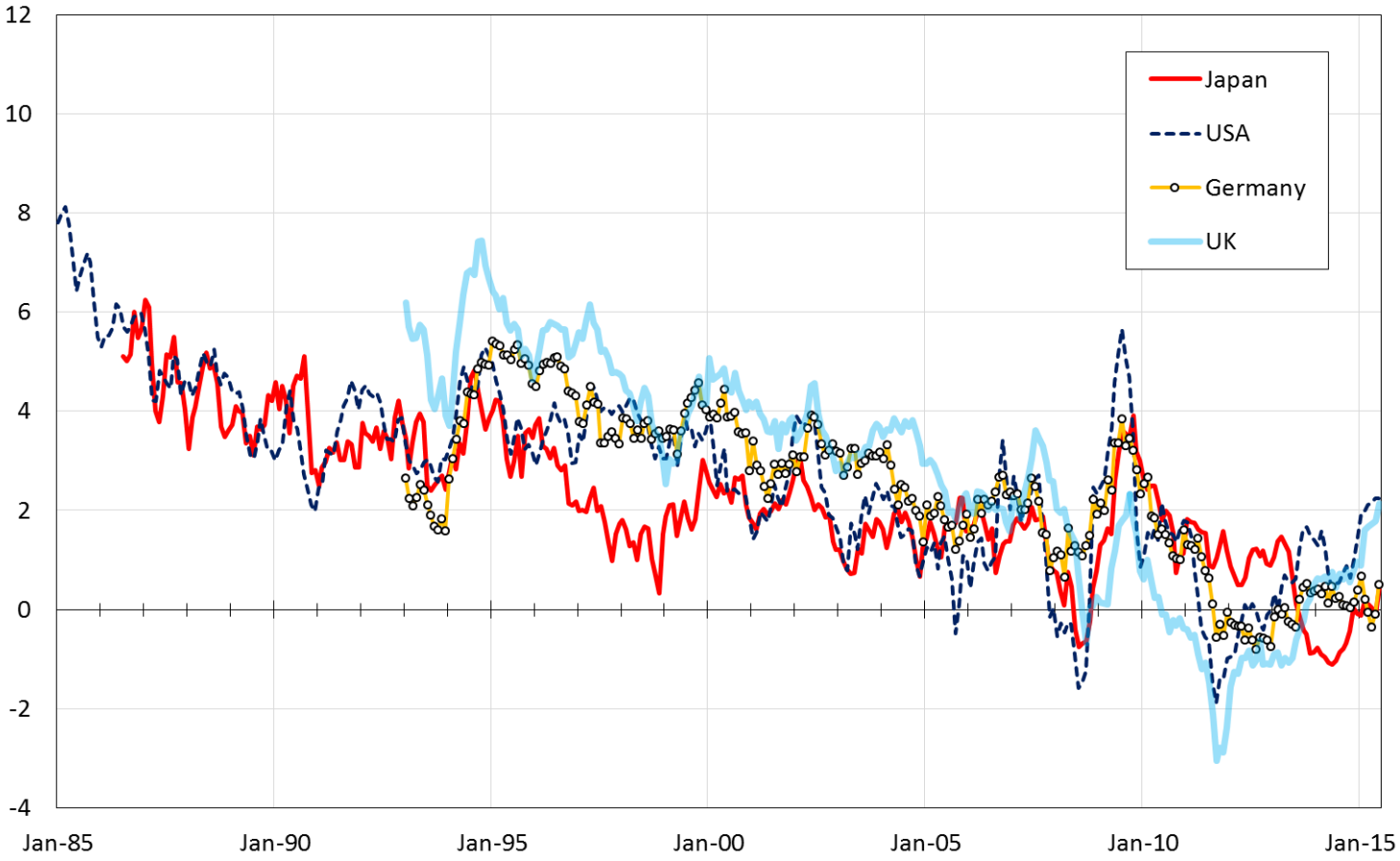
Panel B. Period averages.



	short real interest rate					
	Germany	Japan	United Kingdom	United States	Euro area	
1985 to 1990	4.13	4.65	7.18	3.84		
1991 to 2000	2.69	1.00	3.85	2.05	0.56	
2001 to 2007	1.24	0.38	2.99	0.14	0.70	
2008 to 2014	-0.91	0.01	-2.28	-1.80	-1.14	

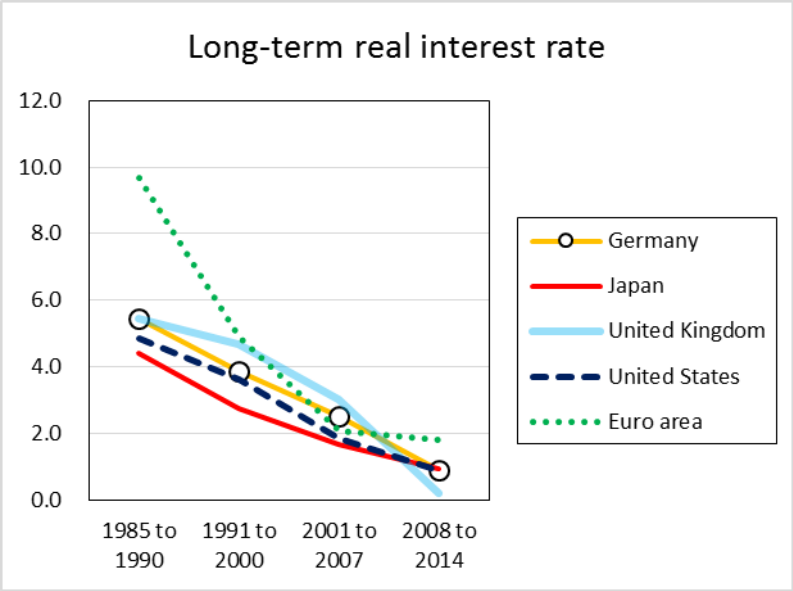
Figure 8. Real Long interest rates

Panel A. Time-series



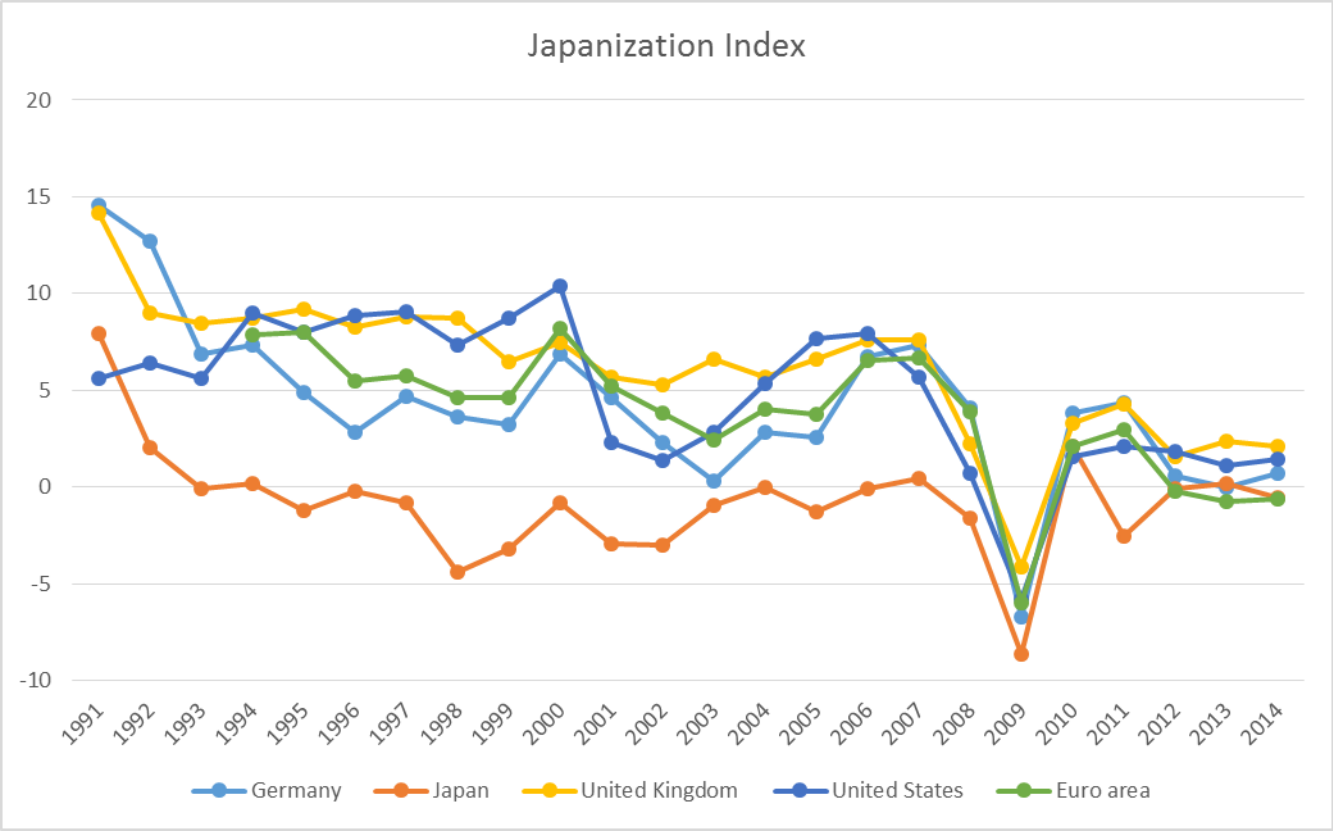
Source: IMF, MIC(Japan), MOF(Japan), FRB and ECB.

Panel B. Period Averages



	Long real interest rate					
	Germany	Japan	United Kingdom	United States	Euro area	
1985 to 1990	5.44	4.39	5.45	4.86	9.68	
1991 to 2000	3.89	2.75	4.69	3.61	4.91	
2001 to 2007	2.50	1.67	3.03	1.83	2.08	
2008 to 2014	0.89	0.92	0.21	0.88	1.80	

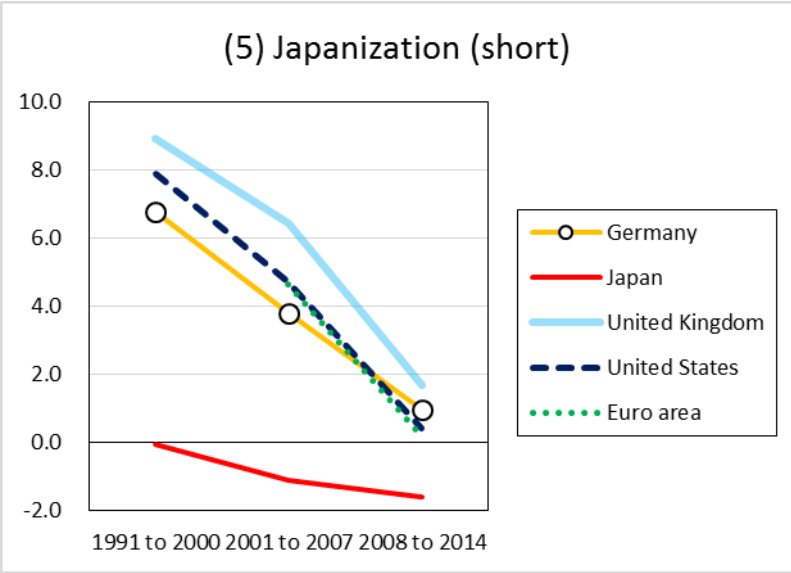
Figure 9 panel A. Japanization Index



Note: The Japanization index is the sum of GDP gap, inflation rate, and the nominal short-term interest rate.

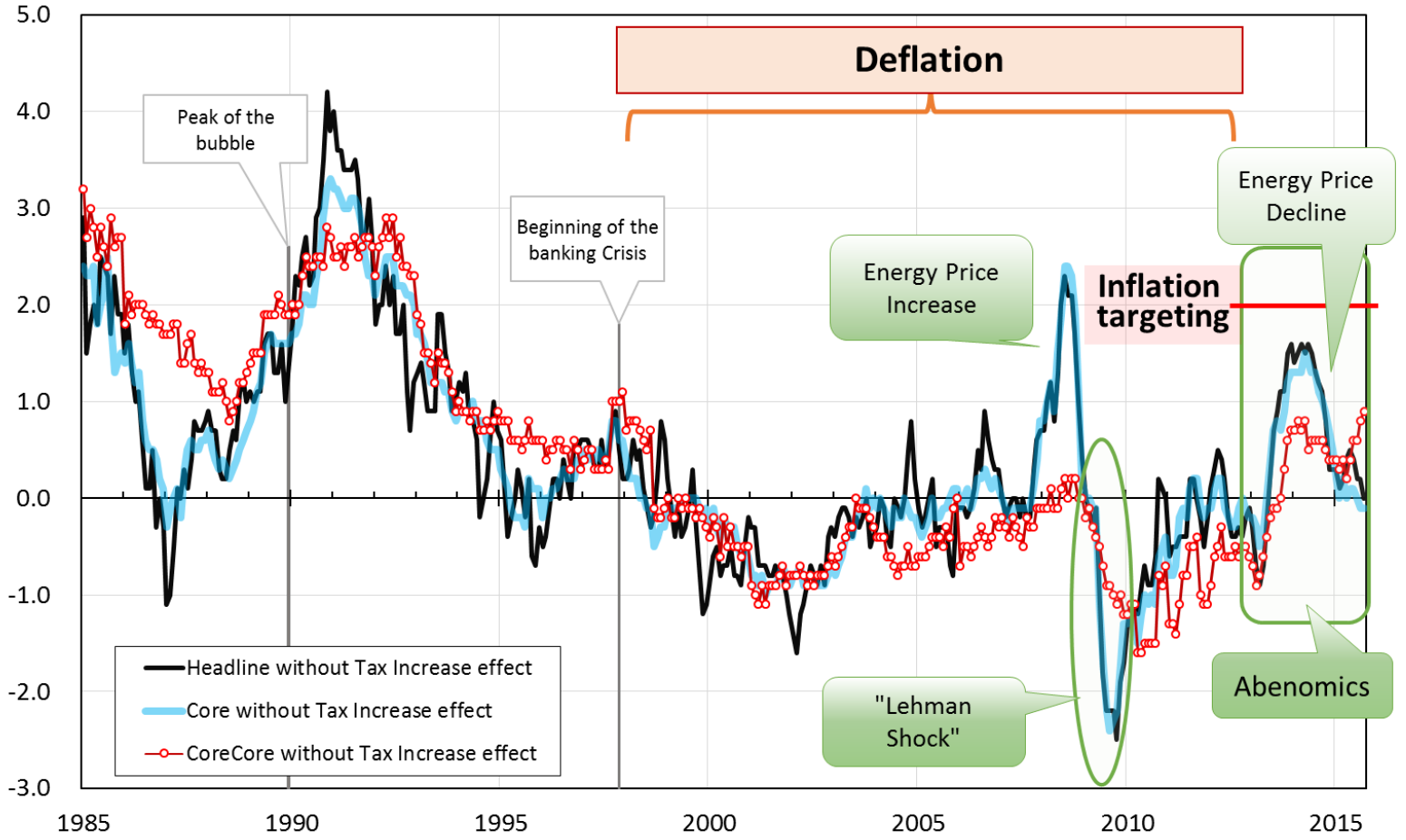
Source: Author' calculation

Figure 9 panel B.



	Germany	Japan	United Kingdom	United States	Euro area	
1991 to 2000	6.76	-0.05	8.93	7.91		
2001 to 2007	3.81	-1.12	6.45	4.74	4.63	
2008 to 2014	0.98	-1.58	1.67	0.42	0.21	

Figure 10. Inflation rates in Japan



Note: The inflation rates from 2014:4 to 2015:04 are adjusted for the pass-through from consumption tax rate hike, according to the estimates by the Bank of Japan. Inflation rates from 1989:04-1990:03 and from 1997:4-1998:3 are adjusted for the pass-through from consumption tax rate hikes, based on author's calculation.

Source: Statistics Bureau, Ministry of Internal Affairs and Communications.

Panel 11. Nikkei225, so residential and commercial indexes

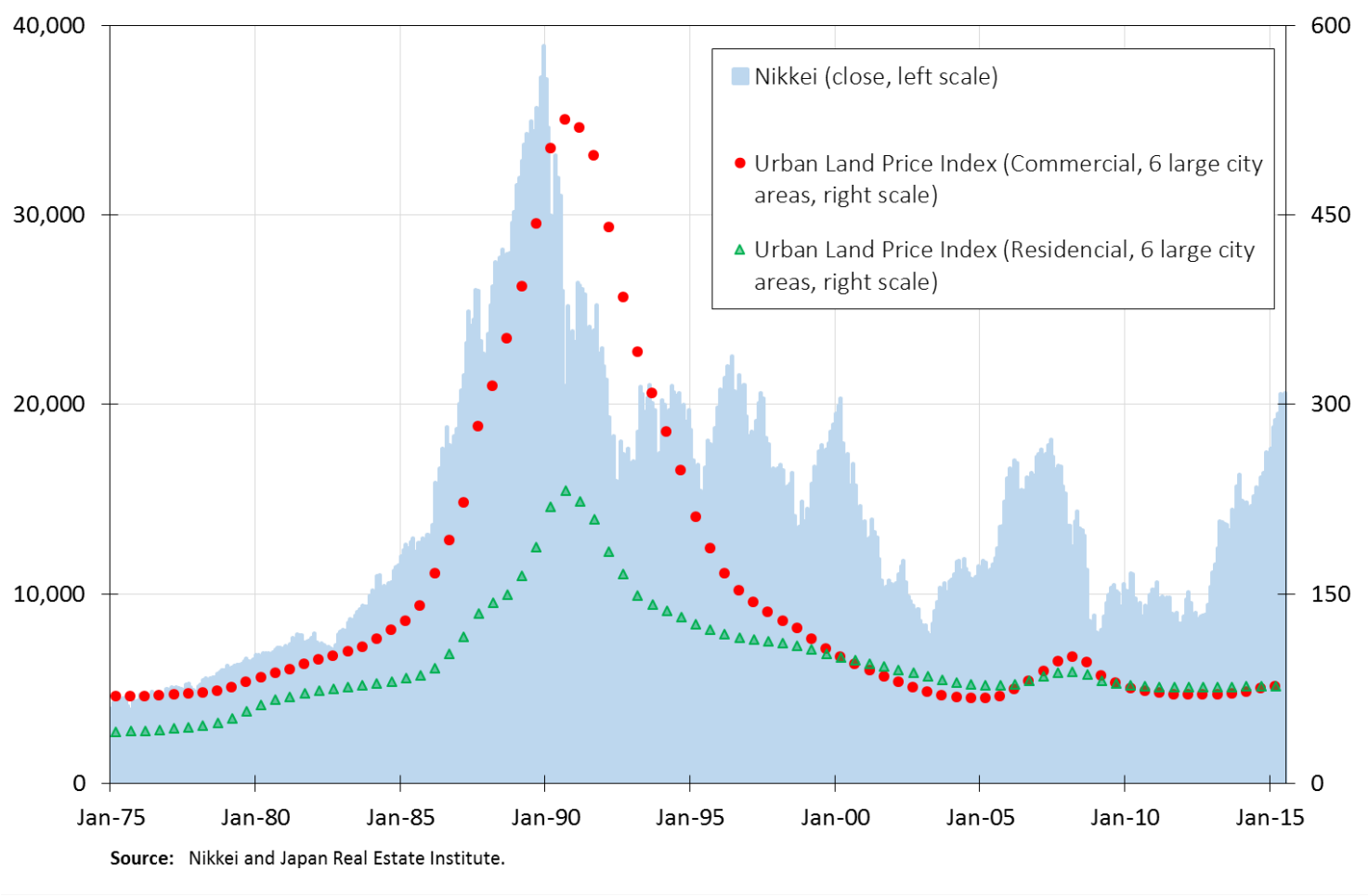


Figure 12. Central Bank balance sheets

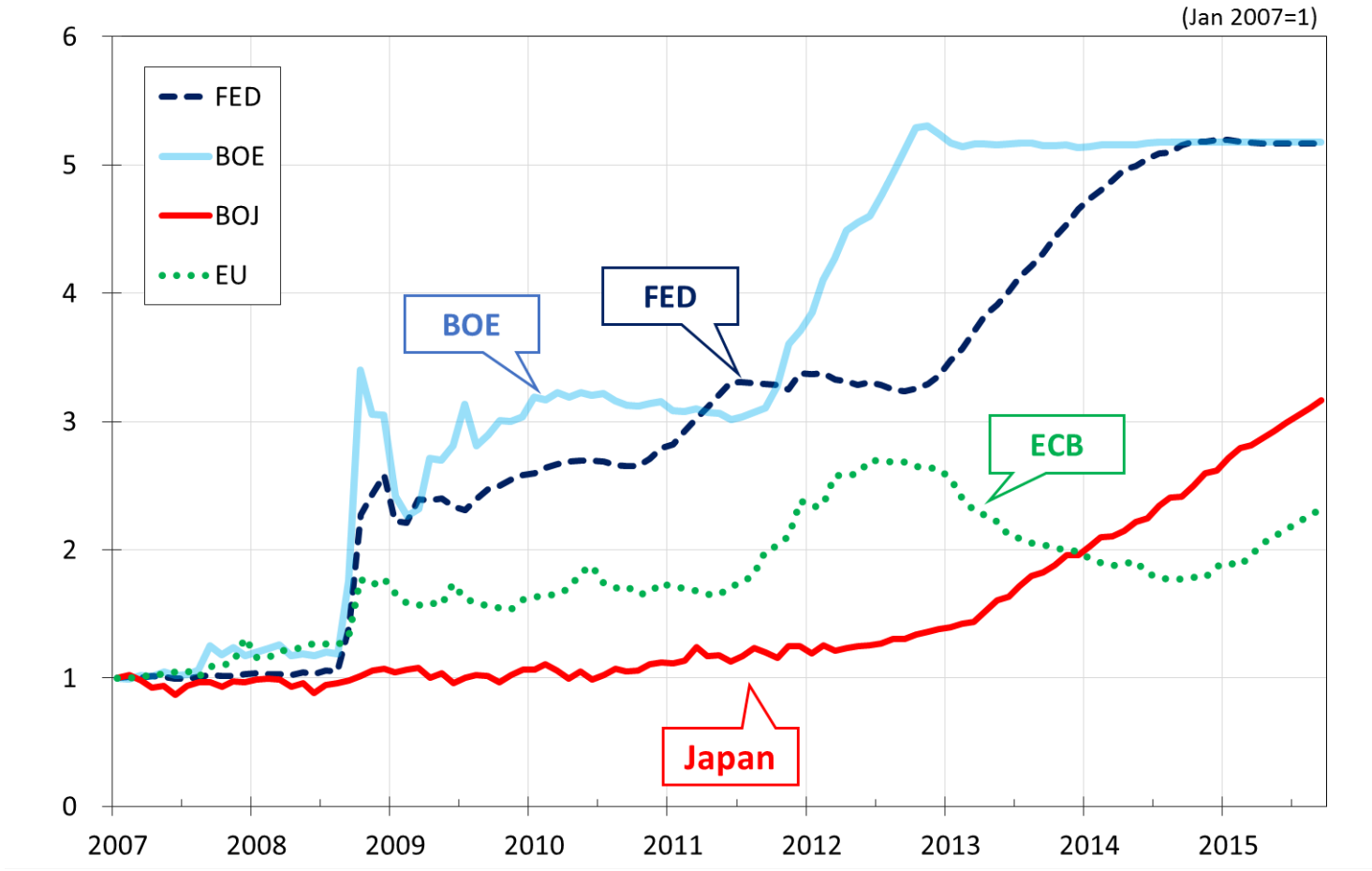


Figure 13. The land prices bubble: Japan – US comparison