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1. Introduction

Seven years have passed since the Global Financial Crisis and massive monetary easing programs are still ongoing in many places. However, the developed economies have not recovered to resume pre-crisis growth rates as most policy makers had hoped for. A significant decline of the average per-capita real GDP growth rate is found in most developed economies from the pre-Crisis period to the post-Crisis period. Moreover, although emerging economies were relatively resilient during the Global Financial Crisis, they also have recently begun to show signs of a significant slowdown. Growth is disappointing across the board, not only in the developed economies which are the epicenter of the Crisis, but meanwhile also in many emerging economies, not the least China.

What is behind this disappointing growth? It is the composite effect of three “seismic” shifts in the global economy.

Firstly, there is a persistent dampening fallout from the property bubbles, busts, and the ensuing financial crises in developed economies. Secondly, information communication technology becomes ubiquitous and unfortunately employment-unfriendly. This impact is most severely felt in developed economies, but it will eventually impact on emerging economies as well. Thirdly, many economies have shifted or are close to shift from the demographic bonus phase of young and growing population to the demographic onus phase of aging population. Most developed economies have turned this corner, and many emerging economies are about to follow suit. These shifts are occurring under unabated globalization in finance and production both in developed and emerging economies.

These seismic shifts have both short-run and long-run effects, with strong policy implications. Firstly, aggregate demand is generally weaker. Moreover, aggregate demand becomes less responsive to traditional macroeconomic stimulus, having substantial short-run implications. Secondly, many economies are losing

flexibility and thus efficiency (i.e. the capacity to adjust) is declining, with negative long-run implications. Thirdly, since conventional monetary policy (i.e. setting a policy rate) turns out to be less effective, developed economies' central banks are increasingly reliant on using central bank balance-sheets (unconventional policies) as a stabilization device (in particular for banking and financial markets). Lastly, and most importantly, uncertainty is particularly heightened. This is not only because newness of phenomena implies uncertain quantitative effects, but also there may be unexpected interactive effects of these three factors. In fact, these interactive effects seem significant in various sectors and areas. This heightened uncertainty (of a quasi-Knightian dimension) poses a serious challenge to policy makers.

In Section 2, these three seismic shifts facing the global economy are explained by taking Japan and the United States as examples. Section 3 discusses policy implications of these seismic shifts, with special emphasis on the heightened uncertainty.

2. Three “Seismic Shifts” in the Global Economy

2.1. Bubbles, Busts and Financial Crises

The property bubble, bust, and financial crisis in developed economies resulted in huge capital losses and severe balance-sheet adjustment needs (‘deleveraging’), which led to persistently weaker demand (firms and households paying down debt), less responsive to conventional stimulative aggregate demand management policies. It should be noted that demand recovery was asymmetric due to the uneven distribution of capital losses (whether loss is incurred by households [United States] or mainly in business sectors [Japan]) as well as characteristics of overinvestment (whether or not overinvestment is in houses, buildings or structures in which investment is irreversible).

Sectoral differences are stark: for example, automobile (relatively reversible investment) is recovering fast but housing (typically protractedly reversible investment, with strong hysteresis effects) is only recovering very slowly in the United States. Concurrently, interest-sensitive demand components are severely affected, such as US housing (heavy capital losses in US household sectors), and Japanese capital-intensive industries (heavy capital losses in Japanese corporate sectors especially small to medium-size enterprises (SME)). As a result, with interest-rate-sensitive sectors as housing and SME investment severely affected, policy rate cuts have lost their pre-crisis effectiveness as tools of short-term aggregate demand management.

Moreover, the damage is far deeper and more persistent than most economists expected. Efficiency of financial intermediation was badly damaged, possibly for an extended period. Not only bank lending is weak after the financial crisis, but also bank's ability to select the fittest, most promising prospects has been diminished.

The role of financial institutions to channel funds to productive enterprises is obstructed when those institutions have significant amounts of impaired assets. Suffering from severe balance-sheet problems, institutions may find themselves with no other choice but to keep borrowers on life support (and loans from turning to non-performing), which prevents them from extending new loans to more auspicious businesses. So-called zombie firms were supported by zombie banks. In fact, during the period of the Japanese financial crisis of 1997, the total factor productivity of surviving firms was actually *lower* than that of exiting firms in a large panel analysis of Japanese firms (Nishimura et.al. 2005).

Severe balance-sheet adjustment of banks may also hamper US financial intermediation. The rate of births of new business establishments exhibited a marked decline after the financial crisis of 2008, which coincides with tightening of the standards for commercial and industrial loans to small firms (whose perspectives are more difficult to assess). Since the higher this rate is, the more flexible the economy, this decline also is indicative of a problem in financial intermediation.

An additional factor we should take into consideration is the significant interaction between property-bubble-induced crises and demographic factors. In fact, the comparison between Japan and the United States suggests that if a property bubble induces a crisis, the crisis is deeper when the pace of population aging is faster. In other words, the burst of the bubble has more depressive effects in a rapidly aging society than otherwise. The real house price decline of the United States from peak to bottom is about two thirds of that of Japan, while the decline in working-age population ratio (United Nations estimates) of the United States from the peak year to thirty years later is also roughly two thirds of Japan.

The reason rests on people's long-run expectations (expectations about distance future, say, thirty years from now). Economic agents are more pessimistic about future returns on property in a rapidly aging society than otherwise. They may be even overly pessimistic. The importance of demographic factors on people's long-run expectations is discussed in Section 2.3.

2.2. The “Employment-Unfriendly” Impact of Information and Communication Technology

Labor markets are increasingly polarized because of the ubiquitous use of information and communication technology (ICT), a general purpose technology. To put it succinctly, if a job, however complicated, is ultimately programmable – can be captured in an algorithm –, that job is likely to vanish in due course, replaced by computer chips.

Traditional medium-skilled jobs (such as technical support staff) are vanishing, especially in the United States. This means that more workers end up with low-paid, non-career jobs, particularly in services. Moreover, high-paid jobs become more technology-oriented, requiring specific, highly demanding skills. Thus, “career-oriented jobs” are becoming even scarcer than before for ordinary, technologically less-skilled people.

This change induces generally weaker demand, but with substantial sectoral variation. It translates into weaker demand of the “losing majority” of workers with low-paid temporary or insecure jobs and commensurately low expectations about future income. For the losing majority this implies a higher propensity to save out of additional temporary income, in order to prepare for contingencies, rather than spend now and counting on a future increase in permanent income. This suggests the traditional monetary policy transmission mechanism through labor income is less effective. Although the demand for luxuries of the “winning few” is strong, it is not likely to compensate for the overall negative effect of the change.

The employment-unfriendly characteristics of ICT also affect the efficiency of the labor market. On the supply side, a large number of once medium-skilled workers lose their traditional jobs and are forced to join the rank of unskilled workers, while others, including even some prime-age workers, choose to drop out of labor force permanently. On the demand side, technologically-demanding job vacancies increase since eligible workers are chronically of short supply. Two consequences follow from here. Firstly, the mismatch between the growing demand for high-skilled, technologically-oriented workers and increased supply of low-skilled workers (of whom some were once medium-skilled) is amplified. Secondly, since low-skilled, low-wage jobs are generally more sensitive to business cycles, an upturn of economic activities brings faster improvement in the overall unemployment rate with less pressure on the average wage inflation than before. (The Philipps curve flattens.)

The employment-unfriendly effect of ubiquitous ICT has a large effect when

combined with financial-crisis-induced recessions and aging population. Firstly, prolonged, protracted recessions and declining product-price inflation push firms to cut costs relentlessly, making this trend more pronouncing. Costly, that is, well-paid white-collar medium-skilled jobs can be replaced by computer programs. U.S. firms are known to be particularly aggressive in this replacement, especially in the wake of recessions. In fact, the job losses between 2007 and 2011 are mostly concentrated in medium skilled jobs (Faberman and Mazumder 2012, Figure 4).

Secondly, there are additional effects emanating from an aging workforce as well as institutional factors, particularly in Japan. Old workers in long-term employment (so-called regular employment) are relatively hard to fire, especially in Japan. Thus, the jobs of young long-term (regular) employment workers are now replaced by those of ICT-empowered young temporary (non-regular) employment workers, through reduced hiring of young long-term employment workers. In the 2000s, many medium-to-high wage long-term employment jobs disappeared and were replaced by low-paid, ICT-empowered temporary employment jobs. A ‘new normal’ with regard to regular jobs is developing.

Macroeconomic impacts of this change are found in the wage Phillips curve, the classical relationship between nominal wage inflation and the unemployment rate. More workers end up with low-paid non-career jobs, especially in services. Or some workers completely dropout of the labor force. In fact, there is an alarming decline of prime-age labor force participation in the United States. Consequently, wages are not as responsive to changes in unemployment rates as they used to be historically. The wage Phillips curve is seemingly shifting downward. This downward shift is found both in the United States and Japan.

2.3. Shift from Demographic Bonus to Onus

Demographic changes are slow-moving generational changes, far longer than economic fluctuations that policy makers are mostly concerned. The effects of demographic changes *per se* are small in a particular year and considered mostly negligible. Thus, demographic factors are usually taken as constant in macroeconomic discussion. However, when demographic factors are coupled with other factors, especially with financial innovation and resulting loose credit, they have significant effects in the economy.

In developed economies, post-war baby booms and substantial medical advances created a substantial demographic bonus, in which the ratio of working-age

(15-64) to non-working-age (0-15, 65+) population has increased significantly. The economy had more prime-age, output-producing people than before relative to dependent children and elderly people. Thus, the economy as a whole produces more output to consume or invest than just supporting children and elderly people. This was tantamount to a lasting “bonus” in paychecks, creating and fostering a vibrant economy for a substantial period of time. If people extrapolate past experience of say, thirty years (one generation) into the future, a demographic bonus can nurture optimism, possibly excessive optimism, about the economy’s perspectives.

When such excessive optimism is coupled with financial innovation, enabling easy credit, a vast expansion of credit occurs. Excessive optimism leads to excessive leveraging and temporarily high growth; in turn, feeding on each other, excessive leveraging and high growth reinforce excessive optimism. However, the demographic bonus can eventually shift to an onus of aged population, as the market and the public realize that past high growth cannot be sustained. Then, a feedback process begins, reversing course: excessive pessimism leads to excessive deleveraging and persistently low growth; in turn, excessive deleveraging and low growth reinforce excessive pessimism. This leveraging and subsequent deleveraging process, the alteration between bubbles and busts, is a key trait of credit cycles (Reinhart and Rogoff 2009 and Buttiglione et al. 2014). Thus, if a demographic bonus is coupled with financial innovation, then excessive optimism, caused by a demographic bonus, is likely to trigger the leveraging process, while a shift from demographic bonus to onus eventually starts the deleveraging process.

In fact, many developed economies, including Japan and the United States, exhibit this demography-induced process of credit cycles. In the following three figures, the demographic composition (thick line), credit expansion (thin line), and real property prices (double line) are juxtaposed. The demographic composition is represented by the inverse dependency ratio or the working-age (15-64) to non-working-age (0-14, 65+) population ratio.

Figure 1 shows the Japanese case. We have two peaks in the working-age ratio (thick line), accompanied by two peaks in the real property price (double line). However, of these two peaks, the second peak around 1991 happens to be a malign bubble that triggered a financial crisis and a sustained period of quasi-deflation and economic stagnation, practically ever since. What is the difference between the first peak and second one? The credit expansion (thin line) is the answer. Credit was expanding at the time of the first peak, but the level was not as high as during the second peak. The credit factor confounds the bubble to make it a malign one.

The vast credit expansion ahead of the second peak was the result of “financial innovation” at that time. Several years before the peak of the working age population ratio, financial liberalization and deregulation sparked the arrival of new products at that time such as CPs and large time deposits with unregulated rates (Nishimura 2011). This innovation nourished the atmosphere of search for yield and excessive risk taking, which resulted in a substantial loosening of banks’ lending standards.

A remarkably similar picture is found in the United States, depicted by Figure 2. Again there were two peaks in the working-age population ratio. The first peak roughly coincided with a peak in real property prices, and their subsequent decline had relatively small impacts on the economy. With the deregulation of deposit rates (Regulation Q) and the approval of money market funds, the S&L crisis occurred but the overall economic conditions remained resilient. It was the second peak that triggered the global financial crisis. Like in Japan, a vast expansion of credit was recorded several years prior to the second peak which caused a severe financial crisis. Financial innovation, this time securitization of doubtful loans and mortgages, played a significant role in this unprecedented increase of credit.

In contrast, in Germany (Figure 3), there was a surge in credit in the late 2000s, but the working-age population ratio had already peaked long before – a full 20 years before. So it is not surprising that Germany did not experience property bubbles and busts in the 2000s of the same scale as Japan and the United States.

The experience of these developed economies is relevant for some emerging economies which are about to turn the corner from the population bonus to onus phase, especially in Asia. In particular, China, Republic of Korea, and Hong Kong SAR have peaked with respect to working-age ratio around 2009-2013. And their real property prices also seem to peak out, although it is not certain at this moment. However, credit expansion shows no significant downturn and keeps going up. The developed economies’ experience suggests that these economies might be vulnerable to their own version of credit cycles.

Moreover, the size of population bonus is much larger and the effect of population onus is likely to be much stronger in many Asian economies. Their peak of the working-age population ratio is generally much higher (for example, Korea 2.7, Thailand 2.6, and China 2.8) than that of developed economies (Japan 2.3, Germany 2.3 and US 2.0), which implies that the effect of the population bonus should have been larger than in the developed economies. In addition, their speed of aging is close to the fastest aging economy, which is Japan, or even faster than Japan in the case of Korea. If the experience of developed countries is applicable to these emerging economies, it

suggests that the peak of credit cycles might be steeper and the bottom deeper.

Aside from the effect on very long run expectations and property prices, a shift from demographic bonus to onus is likely to have a lasting impact on long-run (per capita) growth.

Firstly, the demographic onus of aging population reduces the economy's flexibility and mobility, especially when the effect of aging population is combined with the need for severe balance-sheet adjustments. In the United States, the mobility rate among prime-age and older home owners declined substantially, by about 35% (35-64) and almost 40% (65+) respectively, as compared with 30% for young home owners under 35, between 2005 (before the crisis) and 2009 (after the crisis) (Joint Center for Housing Studies 2010, Figure 13). The mobility rate between young and older renters did not change during that period. This suggests that it was the combined effect of demography and property price declines that decreased mobility.

Secondly, when the effect of aging population is combined with "employment-unfriendly" ICT, old workers compete with young ones to crowd the latter out, hampering sufficient human capital investment in young workers. This also has a large negative effect on long-run efficiency.

3. Ineffective Conventional Policies and Heightened Uncertainty

The discussion in the previous section about three seismic shifts in the global economy can be summarized and paraphrased in four points – point which policy makers will have to account for, going forward.

Firstly, the collapse of a property bubble has a long-lasting effect, hampering financial intermediation and leading to a structurally weaker aggregate demand, also less responsive to traditional monetary policy, as amply demonstrated in developed economies. Here property bubbles should be interpreted as a over-valuation in very long-term, close to irreversible investment in structures, including housing and infrastructure. It is thus of utmost importance to avoid a property bubble in the first place, especially for emerging economies, but also in developed economies to stay away from a replay of past devastating bubbles.

Secondly, information and communication technology has employment-unfriendly (biased against labor) impacts and reduces medium-skilled jobs substantially in developed economies. This structurally dampens labor income growth as well as, as a consequence, aggregate demand's sensitivity to income growth, through which traditional monetary policy works. It also reduces labor market flexibility and

efficiency, lowering potential output. Since information and communication technology is now increasingly easy to access, resulting scarcity of high-paid career-oriented jobs will become an important issue not only for developed but also emerging economies. The issue is likely to become a global concern soon.

Thirdly, in an initial phase, a demographic bonus often causes excessive ('exuberant') optimism. If this excessive optimism is combined with financial innovation and easy credit, a credit cycle of booms and busts is likely to start. Subsequently, an eventual and inevitable shift from the demographic bonus to an onus phase induces a shift from excessive optimism to excessive pessimism. Developed economies have suffered from this demography-induced credit cycles, and some emerging economies seem to have brought themselves to the verge of their version of credit cycles.

Lastly, and most importantly, against this context, uncertainty is particularly heightened. This is partly because the newness of phenomena implies uncertain quantitative effects. Moreover, as suggested in the previous section, the three seismic shifts interact, amplifying each other. Thus, there may be unexpected combined effects in various sectors and areas, and policy makers should be alert about these possibilities.

So what is an appropriate policy prescription? Firstly, it becomes very important to distinguish between "growing out of the crisis" versus "bubbling out of the crisis". The latter is quite problematic, since a bubble collapses eventually and inevitably, with all the side-effects previously mentioned. Thus, we should avoid "bubbling out of the crisis" and pursue "growing out of the crisis."

Secondly, policy makers, especially central bankers, must adjust themselves to the decreasing effectiveness of conventional policy tools. Since people's very long run expectations revealed in property markets and asset markets in general are an important determinant of aggregate demand, and that other policy tools become ineffective, property and asset markets become a major policy target. This policy concern about expectations in property and asset markets goes well beyond the traditional concern about inflationary expectations. In this way, policy makers of developed economies are increasingly reliant on unconventional, central banking balance-sheet policies of asset purchases.

In particular, policies aimed at changing people's expectations are found to be more effective. Direct, targeted market intervention can be effective when excessive pessimism prevails and markets are dysfunctional. Quantitative Easing can explicitly aim to change people's expectations and increase the market value of financial assets and properties that are depressed by pessimism. In addition, since foreign exchange

markets are a part of integrated global financial markets, the overvaluation of currencies can be rectified through asset purchases.

Large-scale asset purchases, however, have side effects of incentivizing a search for yields which comes with and excessive risk-taking of investors, who are counting on central banks to keep high asset prices (the various puts market participants have been talking of). This poses a serious challenge to policy makers who should avoid the recurrence of financial excesses or bubbles and at the same time should influence people's long run expectations.

Thirdly, we should prepare for the "new normal" of demographic onus and fallouts of past financial excesses. Developed economies are in a very slow recovery stage, or more precisely speaking, a rebuilding stage from the "systemic damage" of the past malign property bubbles, so that it is not likely to have a quick return to fully-functioning financial intermediation. Moreover, many economies are a transition phase to restore efficiency in labor markets after a strong impact of ubiquitous, employment-unfriendly information and communication technology. Thus, although it may be premature to say that we are now in a permanently low, near-zero or even negative equilibrium interest rate regime, it may also be misleading to claim that the worst is over and we are returning to an old normal. With respect to hampered financial intermediation after financial crisis, the current "rebuilding" of the social network of trust is still fragile.

In this context, policy aimed at structural change is important, though it seems a very round-about one and beyond conventional policy. One example is to enhance efficiency of financial intermediation by "Funding for Financing Economic Growth." Bank of Japan, Bank of England, and European Central Bank all adopted a similar policy of enhancing SME lending which has suffered severely from the banking crisis (Nishimura 2012).

Finally, it is of utmost importance to respond to heightened uncertainty about complex effects of past and possibly future property bubbles, employment-unfriendly technological change, and most of all, demographic shifts to population onus. In particular, we must respond to heightened uncertainty with regard to the side effects of unconventional monetary policy. Direct intervention like Quantitative Easing is reducing markets' "price-discovery" capacity, which is crucial when there is substantial uncertainty in the market.

In this new world, the central bank becomes all the more important as information provider. It should draw attention back to the importance of fundamentals and the level of outstanding risks, even when some of the policy prescriptions are not

purely central bank-related. Its policy should be examined from this perspective especially in the framework of financial stability policy.

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Figure 1

Japan

(Inverse Dependency Ratio) (Land Price, Loans, Real, Peak=100)

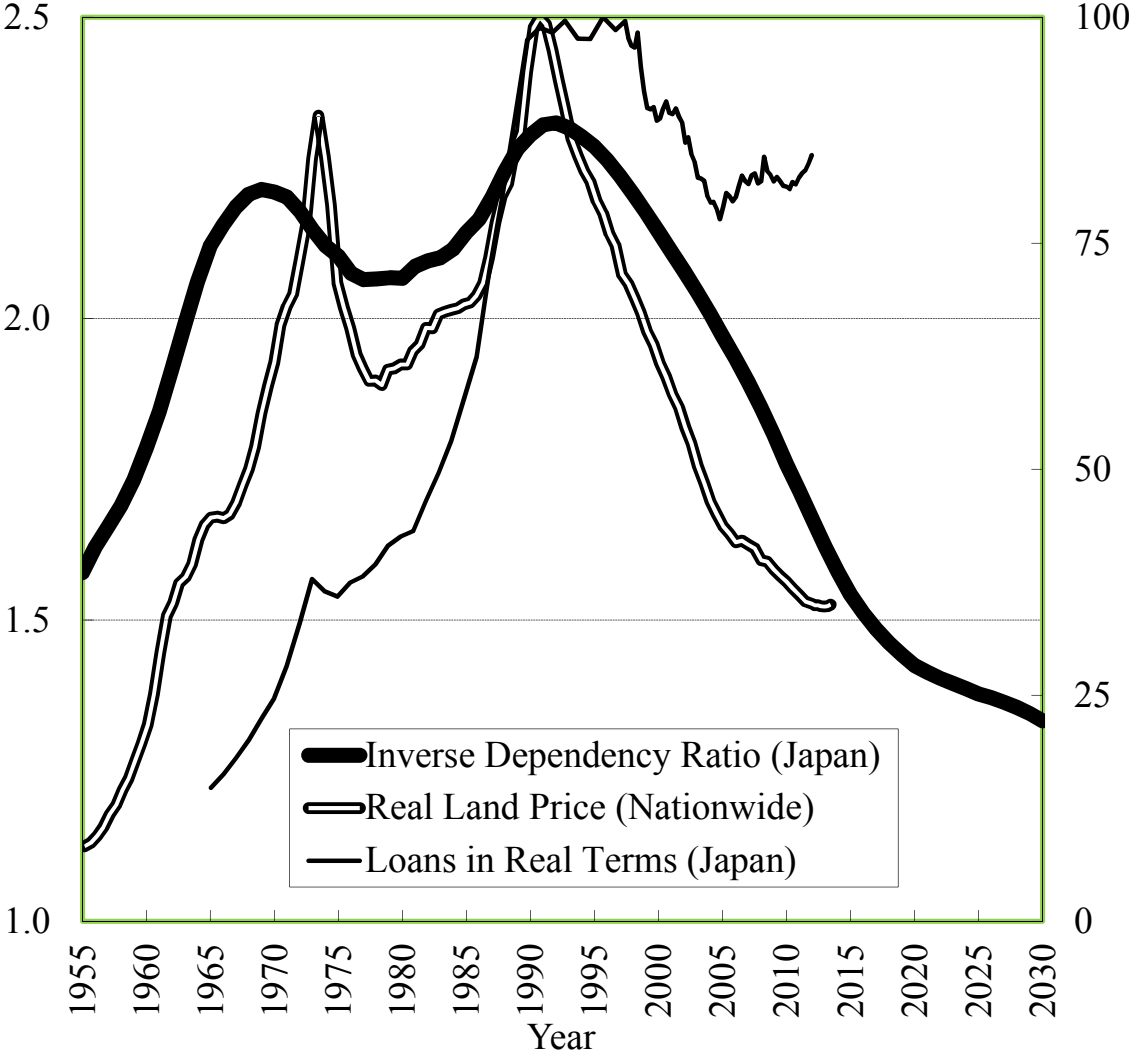


Figure 2

US

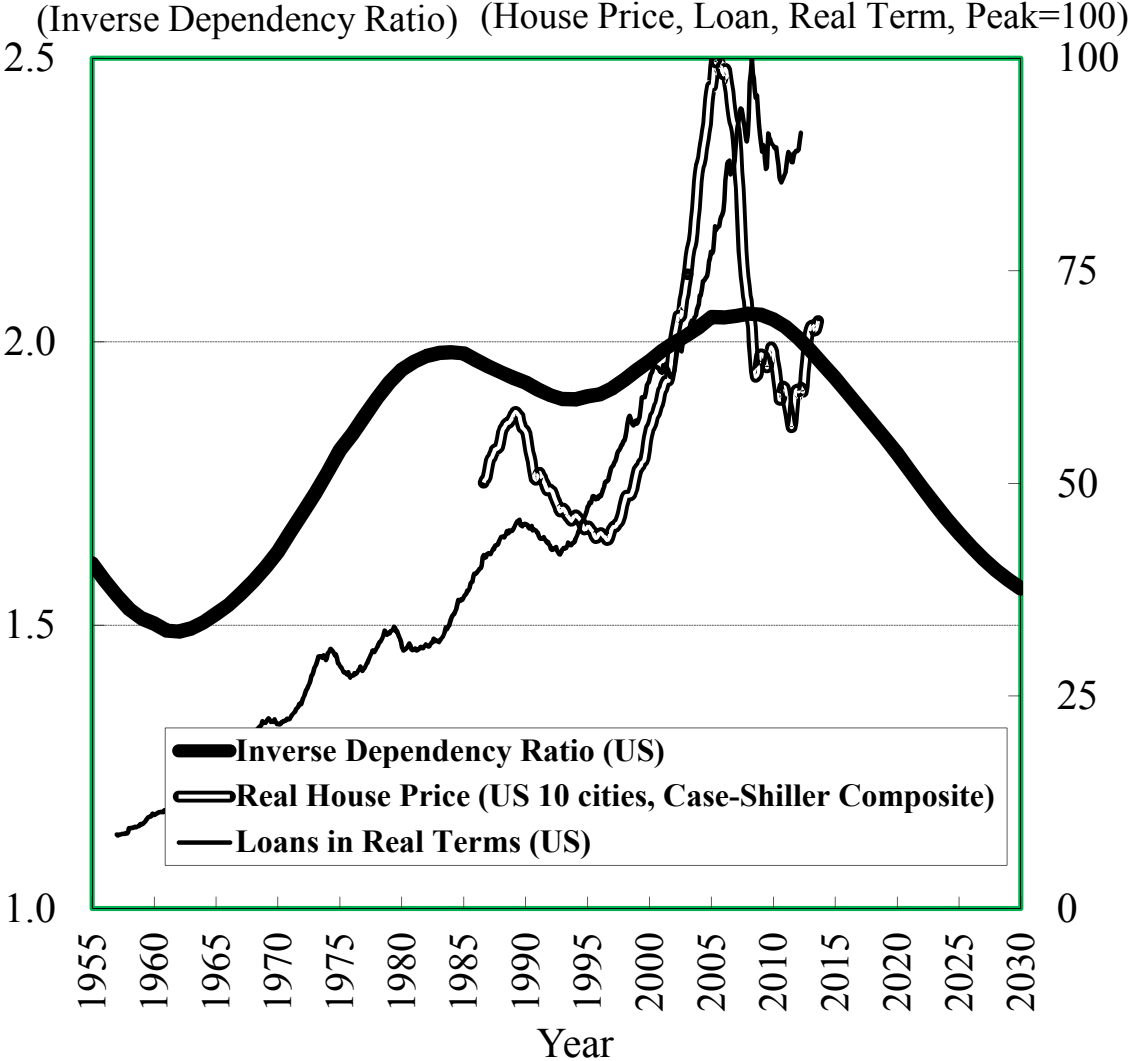


Figure 3

Germany

