Kiyohiko G Nishimura: This time may truly be different – balance sheet adjustment under population ageing

Speech by Mr Kiyohiko G Nishimura, Deputy Governor of the Bank of Japan, prepared for the panel "The Future of Monetary Policy" at the 2011 American Economic Association Annual Meeting, Denver, Colorado, 7 January 2011.

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1. Introduction: population ageing

This panel's topic "The Future of Monetary Policy" is doubly opportune. Firstly, more than two years have past since the immediate fallout of the Lehman Brothers' collapse, giving us time both to look back and to look forward. Secondly, we are not yet out of the woods and are still in the process of soul-searching; pursuing a better understanding of our economic environment and the appropriate monetary policy responses.

In this presentation, I will give a perspective that may be different from other panelists: longer-run, more qualitative than quantitative. Specifically, to contemplate the future, I start from the fact that we are in the midst of a balance sheet adjustment process after the financial bubble burst, *at a time when the population is ageing*. This is not the simple balance sheet adjustment of the past, which took place with a growing young population. This is an acute balance sheet adjustment when the composition of the nation's population is rapidly tilting toward the old. This is unprecedented in our modern history of economic growth. This ageing population is the result of people's choices made many years ago when, after the Second World War, birth control became possible and substantial medical improvements were reducing child mortality and increasing longevity. These medical advances and the baby boom after the war, together with longer life expectancy, are true blessings for economic growth, bringing what are often called population dividends, with many young workers producing and few old people being supported. However, at some point in time, the trend had to be reversed. The significant point for us here is that the bubble we have experienced has coincided closely with the turning point in these demographic dynamics.

Population ageing: inverse dependency ratio

Let me show you some telling figures on the inverse dependency ratio, which indicates how many people of working age it takes to provide for one dependent person. The Japanese ratio peaked around 1990, and it was in the very next year, 1991, that the Japanese Bubble peaked. The peak of the US ratio was between 2005 and 2010, and the peak of the US Subprime Bubble was 2007 (Fig. 1.1). The economically troubled countries of the eurozone have a similar pattern to Japan and the United States. The ratios for Greece, Portugal and Spain have almost the same time profile, and all of them peaked around 2000–2005. The peak of the Spanish property boom was just after the ratio's peak, and the financial problems of Greece also started at the same time. A particularly interesting case is Ireland, which showed a sharp rise in the ratio until around 2005. The bust of the country's property market bubble was just a few years around the corner (Fig. 1.2). Incidentally, for the sake of completeness, I have included the figures for China (Fig. 1.3), whose ratio seems still to be rising rapidly, but will peak a bit later than in Euro-American countries. The peak will be around 2010–15, after which it will go down as rapidly as it is now going up. The inverse dependency ratios of many other Asian countries have a quite similar time profile to that of China.

I am not suggesting any causality here, but simply pointing out the balance sheet adjustments after the bubble burst in Japan, United States and the eurozone, whether private or public, must be carried out as the population is ageing. I believe this fact has an important bearing on the future of monetary policy, especially unconventional monetary policy.

In Section 2, I first examine the process of balance sheet adjustment after the bursting of a bubble and when the population is ageing, juxtaposing Japan in the 1990s and the United States in the 2000s. Then, in Section 3, I summarize the consequences of severe, prolonged balance sheet adjustment, as seen in Japan in the 2000s. Finally in Section 4, I identify the multi-faceted challenges central banks may face as a consequence of carrying out balance sheet adjustments under population ageing, and I explain the Bank of Japan's policies to tackle these problems.

2. Balance sheet adjustment and the breakdown of the transmission mechanism

Who leveraged during the bubble period? Japan and the United Sates

In order to find out the effect of balance sheet adjustments after the bursting of a bubble, let me first clarify who leveraged during the bubble periods. In Japan, it was the corporate sector, especially small to medium-sized firms, which for the first time gained access to large banks after the so-called financial liberalization (Fig. 2.1). The corporate sector's loan-to-GDP ratio increased by 29 percentage points in the ten years before the bubble burst in 1991. In the United States, it was the household sector that leveraged, especially in housing. The household sector's housing loans-to-disposable income ratio jumped by 39 percentage points in the ten years before the bubble burst in 2007.

Breakdown of the monetary transmission mechanism

These sectors were interest-sensitive and thus constituted the "transmission gears" of the ordinary monetary transmission mechanism in the periods before the bubbles burst. That is, these leveraged sectors had been sensitive to policy rate reduction in business cycles. However, after the bubbles burst, these leveraged sectors became insensitive to policy rate reduction, because of the acute balance sheet adjustments. Large legacy shortfalls must be compensated for by current profit or income, period by period, and this process is slow and painful. This leads to a breakdown in the ordinary monetary transmission mechanism of policy rate change.

To see this, let me first consider corporate investment in Japan. Figure 3.1 depicts manufacturing investment by the corporate sector. The shaded areas indicate recession, the black line is manufacturing investment in real terms, and the blue line shows the time profile of the policy rate. This figure shows that the policy rate cut prevented investment from falling sizably in the three business cycles before the bubble. In contrast, after the bubble burst, a sharp decline in the policy rate clearly failed to prevent a sharp decline in investment. Basically, the same picture is found in the corporate sector's non-manufacturing investment (Fig. 3.2).

In the United States, the household sector is the leveraged sector. Its most interest-sensitive demand components are demand for new homes and new automobiles. In Figure 3.3, again, the shaded areas depict recession, the black line is new home sales, and the blue line is the federal fund target rate. This figure shows that policy rate cuts at least prevented new home sales from falling further, and that they helped sales to pick up in the three business cycles before the bubble. However, a sharp decline in the policy rate after the bubble burst failed to prevent a sharp decline in new home sales. Qualitatively quite similar observations apply to new automotive sales (Fig. 3.4).

Ageing population and property prices

As suggested in the Introduction, Japan was faced with a rapidly ageing population after the bubble burst of 1991, while the United States is about to face its own version with a somewhat milder population ageing. There are many consequences of population ageing, such as differences in consumer preferences and technological adaptability between the

young and the old, but I will concentrate on one particular issue that is pertinent to balance sheet adjustments, namely, the possible effects of population ageing on property prices.

In Figure 4.1, the real land price (national average, for all purposes) is juxtaposed with the inverse dependency ratio from 1955 to date. This figure shows, firstly, that the relative abundance of young people coincided with sharply higher property prices. Secondly, in contrast, the relative abundance of old people seems to be leading to lower property prices. It should be noted here that declining property prices greatly aggravated the balance sheet adjustments of Japanese corporations. The US case is illustrated in Figure 4.2. In the United States also, an increasing reverse dependency ratio seemed to coincide with the property bubble. After the bubble burst of 2007, property prices seem to have followed the long run movement of the inverse dependency ratio, although it would be premature to draw any conclusions from this at the moment.

3.   Prolonged balance sheet adjustment under population ageing: consequences

What then are the consequences of severe and prolonged balance sheet adjustment under population ageing? Three adverse consequences can be identified.

Declining mobility

First, mobility declines, or in other words, the economy becomes "inflexible". Since de-leveraging firms or households have to pay back all their debts before "moving" from their current position, they are often stuck with an "underwater" property. Population ageing strengthens this tendency. In the case of Japan, de-leveraging took place in the corporate sector, and thus firms became less mobile between industries and regions. In the United States, the household sector is de-leveraging, and thus household mobility has been reduced.

Figure 5.1 depicts declining entrepreneurial mobility in Japan. This figure shows the creation and destruction of enterprises between pre-bubble (1981–1986), bubble (1987–1991), and post-bubble (1992–1996). It can be seen in this figure that, after the bubble burst of 1991, creation of enterprises was sharply reduced. In contrast, the increase in the rate of destruction was relatively mild. These two imply a "sticky industry structure," a tendency to hang on to the past.

Declining mobility is found in the household sector in the United States. Figure 5.2 shows changes in the householder mobility rate between 2005 and 2009. A sharp decline is found across all age groups. Since there is no such change in renters, this sharp decline suggests that the housing crash reduced householder mobility rates.

Loss of non-tangible/human capital

The second consequence of severe and prolonged balance sheet adjustment is the loss of non-tangible or human capital. De-leveraging firms and households suffering long under-utilization or under-employment tend to lose their non-tangible or human capital. In Japan, this has been observed especially in small to medium-sized enterprises: loss of entrepreneurship, loss of human networks in skilled manufacturing, and loss of access to technological advances. In the United States, the long-term unemployed or underemployed risk losing their human capital.

Problems in financial intermediation

The third consequence of severe and prolonged balance sheet adjustment is the deterioration in financial institutions' efficient functioning as financial intermediaries. This was most acutely observed in Japan during the several years after the bubble burst: a pile-up of

non-performing loans seemed to lead to a breakdown in the "market selection mechanism" around 1997.

Figure 6 shows the result of a large-scale panel analysis of Japanese firms, in which the total factor productivity of exiting and surviving firms is compared. Survival of the fittest is a basic premise of the natural selection mechanism. Thus, if the market mechanism works well, the productivity of successful and surviving firms should be higher than that of failing and hence exiting firms, at least on the average.

In this figure, the shaded areas show cases where the productivity of failing and thus exiting firms is higher than that of surviving firms, which is an anomaly. In fact, the shaded areas are rather exceptional most of the time. However, if we look at the period 1996–97, the period of the financial crisis, we see many shaded areas indicating that more productive firms were exiting in many industries. This strongly suggests a breakdown in the natural selection mechanism.

Results of acute B/S adjustment under population ageing: Japan in the 2000s

So, what are the end results of acute balance sheet adjustment under population ageing? Some of these consequences can be seen in the Japanese situation in the 2000s.

First, growth prospects declined. The average real GDP growth fell from 5% to 4 % in the 70s and 80s to around 1% in the 90s and 2000s. This implies the expected rate of return on investment in the 2000s is low, especially for small to medium-sized firms depending on domestic demand. In contrast, money (bank deposits) becomes relatively attractive as a store of value, given the price-stability pledge of the central bank. Ironically, this leads to an apparent breakdown of the historically-proven quantity-theoretic relationship between real activity and money stock. Moreover, not only is the policy rate very low, but so too are longer risk-free rates, judged by historical standards. Conventional monetary policy through the overnight policy rate is not as effective as before, and this means the economy is more vulnerable to a downside shock.

Second, there are signs of coordination failure. Banks' lending is sluggish, partly because of their inadequate functioning as an expert relationship banker. Here a vicious circle seems to be working. To begin with, banks lack expertise to assess investment in new fields, suffering as they are from problems with non-performing loans and under-investment in their loan officers' human capital. Consequently banks do not lend. This means that new investments and new enterprises cannot get funding, and thus new markets falter. Then, banks miss the opportunities to accumulate new expertise, bringing them right back to the starting point of this vicious circle.

Another coordination failure is found in capital markets, in the form of "excessive" risk aversion. Fearing unknown unknowns, investors shun investing in riskier securities. Their market then becomes thin and vulnerable to non-fundamental shocks. This means they themselves become prone to turning into unknown unknowns, thus the original fear is self-fulfilling. These two types of coordination failure in financial markets result in an apparent lack of "animal spirits".

Third, we see a piling-up of government debt. This is partly the result of the substitution of public debt for private debt in the process of balance sheet adjustment, and partly due to the substitution of public demand for private demand during this period of declining growth. According to the OECD's Economic Outlook, Japan's General Government Gross Financial Liability-to-GDP Ratio in 2010 was 198%, compared with 93% in the United States. However, it should also be noted that, because of low long-term rates, the Government Net Debt Interest Payments-to-GDP is 1.2% in Japan, compared with 1.7% in the United States.

4. Multi-faceted challenges and unconventional monetary policy

The consequences of Japan's prolonged balance sheet adjustment under population ageing described so far lead us to a number of multi-faceted challenges.

The first challenge is that of cyclical-stabilization: ensuring a return to sustainable growth with price stability, when the policy rate is near zero and longer-term risk-free rates are also very low. In Japan's case, this also means overcoming deflationary pressures.

The second challenge is to enhance the growth trend, or strengthen the foundations for growth. In other words, the challenge is to raise long-term growth prospects, especially in domestically-oriented growth. This should be done by solving the coordination failure in banking and capital markets described above.

The third challenge is to avoid causing problems in national debt management. We should design and execute carefully measures to cope with the first and the second challenge, taking appropriate account of the current national debt situation as explained before, as well as general economic conditions.

To tackle the first and the second challenges, the Bank of Japan instituted its Growth Foundation Strengthening Facility (GFSF) in June of last year and adopted Comprehensive Monetary Easing (CME) in October.

To meet the challenge of "cyclical-stabilization", the first part of the CME changed the guidance for the policy rate from 0.1% to the range between 0 and 0.1%, making clear the Bank's Virtually Zero-Interest Rate Policy (VZIRP). For the second part of the CME, the Bank clarified its policy duration commitment: the Bank will continue its VZIRP until it judges price stability to be in sight on the basis of the Policy Board members' understanding of price stability. With Policy Board members' announced forecasts for two years ahead, this is similar to "forecast targeting" though not specific in numbers. The third part of the CME is the Asset Purchase Program, which is also designed to meet the cyclical-stabilization challenge. Its aim is to influence downward longer-term rates. The outright purchase of JGBs with remaining maturity of 1–2 years and T-bills is to reduce the term-premiums of risk-free rates, and the purchase of CPs and Corporate Bonds is to reduce both term-premiums and risk-premiums. The scheme to provide 3-month funds at the overnight rate already instituted was aimed at lowering rates longer than the overnight rate, and has been continued and included in this program.

Moreover, the Asset Purchase Program is aimed at breaking another vicious circle in capital markets, that caused by "excessive" risk aversion. In this Asset Purchase Program, the Bank purchases riskier assets than it bought before: BBB-rated corporate bonds, and a-2 CPs. It also purchases ETFs and J-REITs directly from the market. The purchase is designed to act as a catalyst to induce investment in riskier assets, and thus help solving the coordination failure.

To tackle the second, "trend-enhancement" challenge, or strengthening growth potential, the Bank instituted its Growth Foundation Strengthening Facility (GFSF) in the form of preferential fund-provisioning to support financial institutions' own initiatives in lending and investing in new growth areas. It should be made clear here that it is not the Bank of Japan but participating financial institutions that determine which investment projects should be funded using this GFSF. Thus, the GFSF is designed to be a catalyst to induce banks to find new firms or new investment projects in their perceived growth areas. In this way, the GFSF is targeted at breaking the vicious circle of no lending resulting in no new markets and thus no demand for lending to start with.
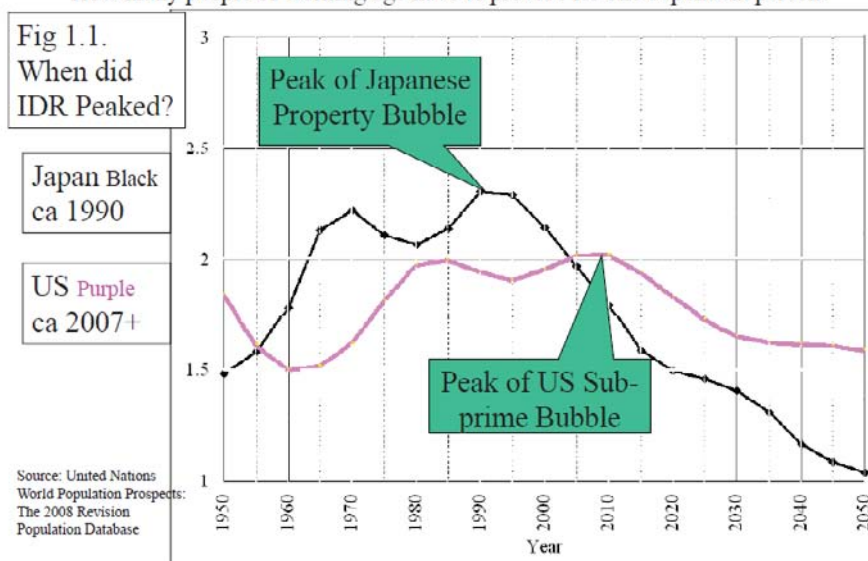
When implementing these measures to cope with cyclical-stability and trend-enhancing challenges, it is very important to take appropriate account of the third challenge, that of avoiding causing problems in national debt management. Specifically, it is crucial to avoid creating an impression of the "monetization" of government debts. Otherwise, the large scale purchase of JGBs may lead to a substantial and lasting ratcheting up of long-term rates,

which would pose a serious problem for economic recovery and the financial position of the government. Taking this point into consideration, the Bank of Japan has already purchased about 22 trillion yen in JGBs annually, beside the Asset Purchase Program. By the same token, we should be very careful about the possibility that asset purchases may lead to capital losses, which could tarnish the credibility of the central bank.

In the bubble years, we often heard talk of this being the beginning of a new age of prosperity and that, as the title of the popular book says, "this time is different". Since the bubble burst, people have tended to think the collapse was simply a fleeting nightmare and that we will eventually be back to the old normal, just as before. That may be true. However, if we recognize the problems arising from acute balance sheet adjustments when the population is ageing, there is the distinct possibility that this time may truly be different.
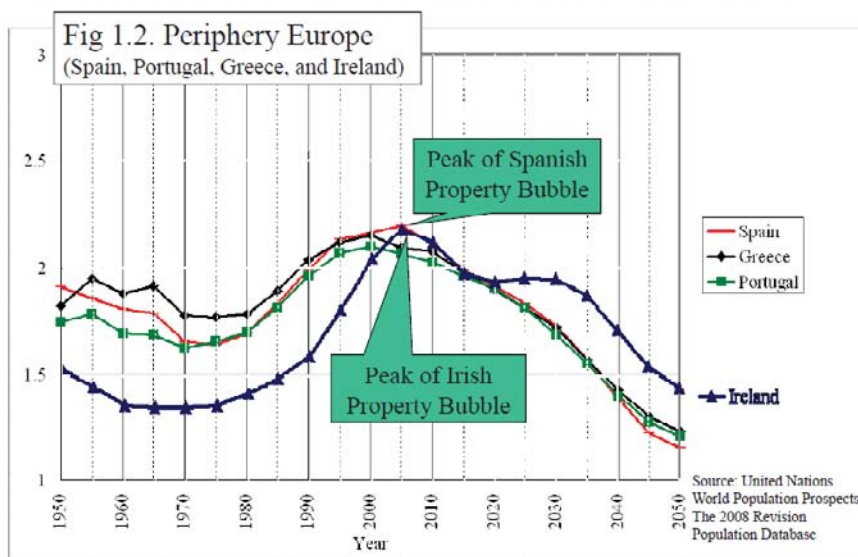

Population Ageing: Inverse Dependency Ratio
How many people of working age have to provide for one dependent person?

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Population Ageing: Inverse Dependency Ratio

How many people of working age have to provide for one dependent person?

Fig 1.3. China

Japan Black ca 1990

US Purple ca 2007+

China Blue ca 2010-15

Chinese Peak?

Who Leveraged during the Bubble?

Fig 2.1. Japan➔ Corporate Sector

Corp. Loan/GDP: Increased by 29 % points
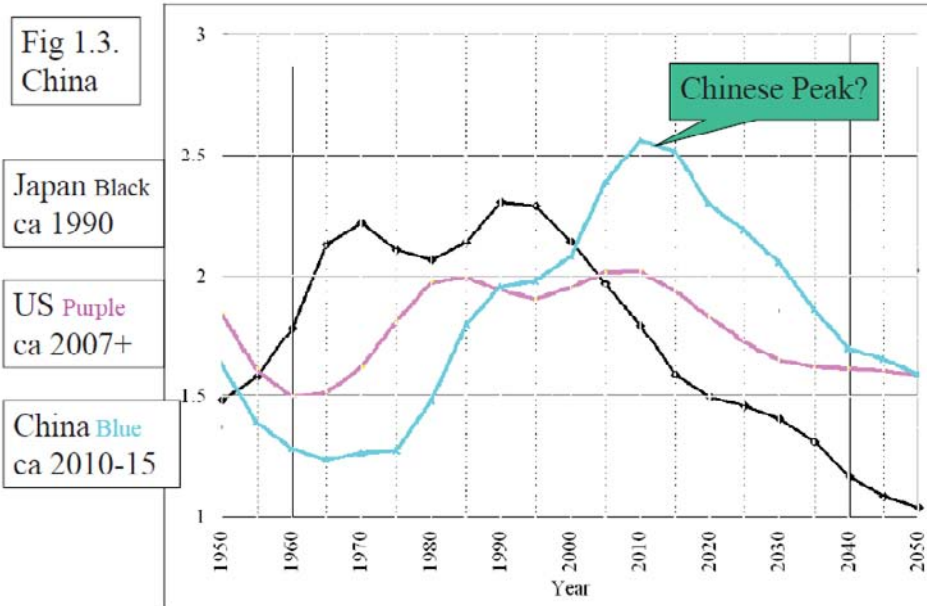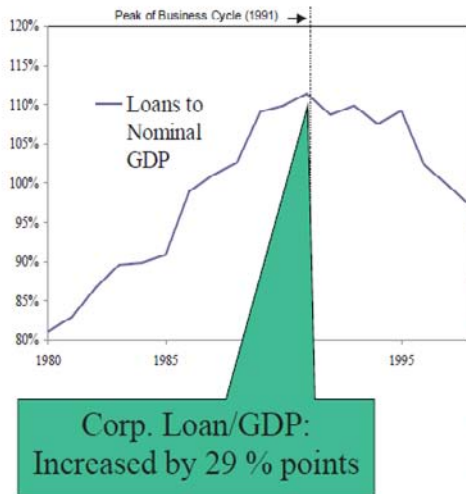
Fig 2.2. US➔ Household Sector

Housing Loan/Income Increased by 39 % points
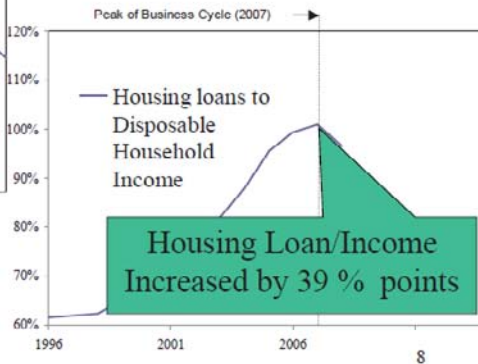
Japan: Corporate Sector
1. Manufacturing Investment (Fig 3.1)

Policy rate cut prevented investment from falling sizably in the three business cycles before the bubble

Sharp decline in policy rate failed to prevent sharp decline in investment after the bubble
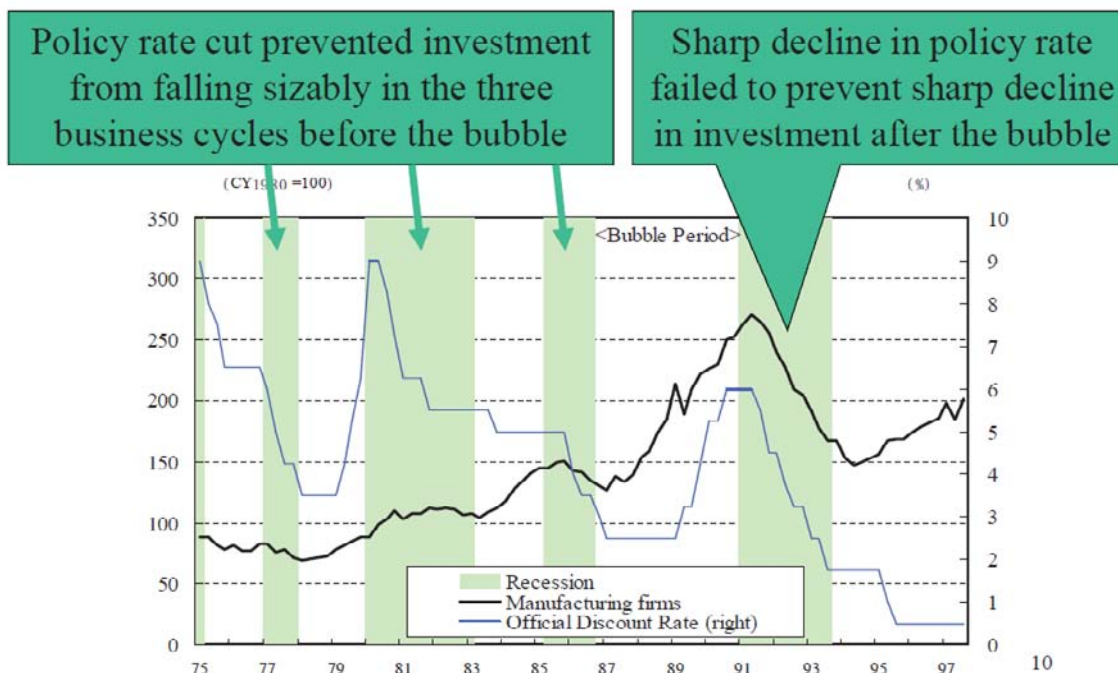
Japan: Corporate Sector
2. Non-Manufacturing Investment (Fig 3.2)

- The same picture as for manufacturing

Policy rate cut seems more effective here than in manufacturing in the three business cycles before the bubble

Sharp decline in policy rate failed to prevent sharp decline in investment after the bubble
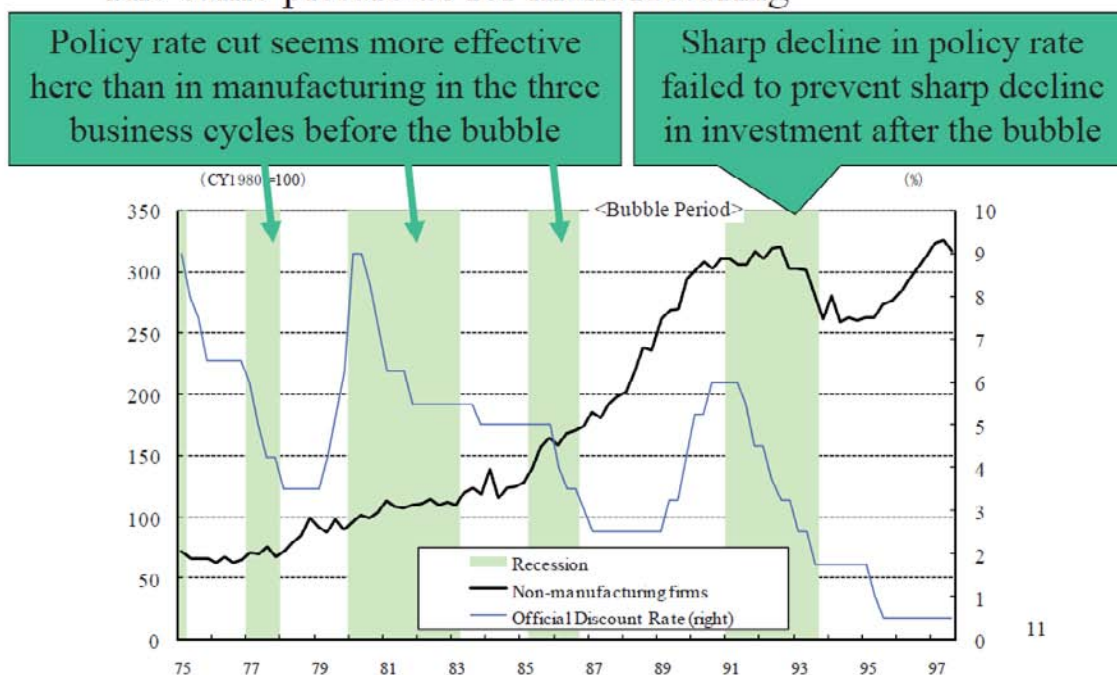
US: Household
1. New Home Sales (Fig 3.3)

Policy rate cut at least prevented new home sales from falling further, and helped them pick up in the three business cycles before the bubble

Sharp decline in policy rate failed to prevent sharp decline in new home sales after the bubble

Recession
US New Home Sales
FF Target Rate (right)
Bubble Period
(th. annualised)
(%)
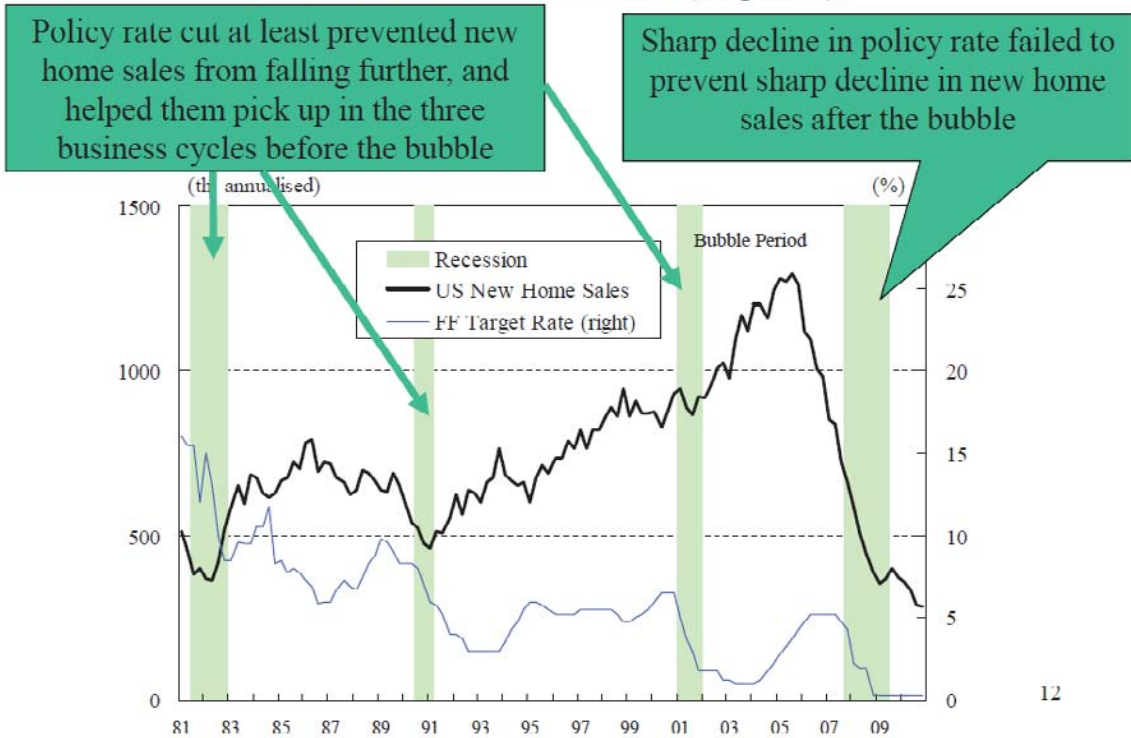
US: Household
2. Automotive Sales (Fig 3.4)

Policy rate cut at least prevented automotive sales from falling further, and/or helped them pick up quickly in the three business cycles before the bubble

Sharp decline in policy rate failed to prevent sharp decline in automotive sales after the bubble

Recession
US Auto Sales Vehicles
FF Target Rate (right)
Bubble Period
(mil. annualised)
(%)
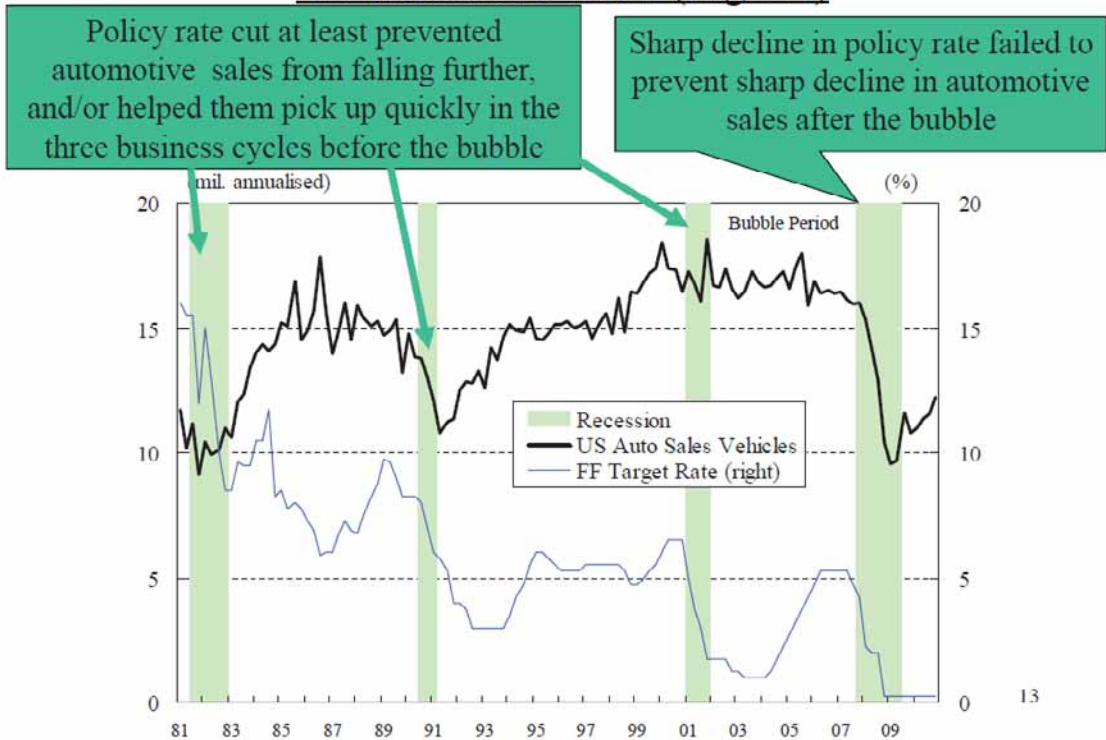
Ageing Population and Property Prices: Japan (Fig 4.1)

Relative abundance of young coincided with higher property prices

(Inverse Dependency Ratio)

(Real Land Price, Peak<Mar.1991>=100)

Relative abundance of old leads to lower property price

Declining property prices aggravated B/S adjustment

- Inverse Dependency Ratio (Japan)
- Real Land Price (Peak=100)
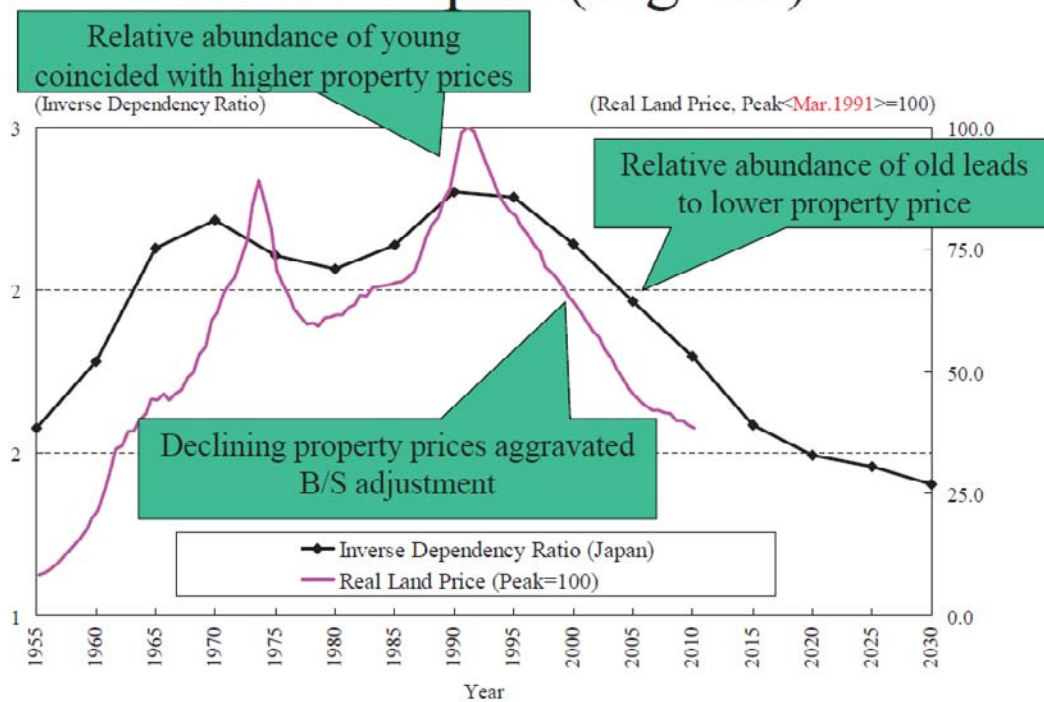
Year

Ageing Population and Property Prices: US (Fig 4.2)

(Inverse Dependency Ratio)

(Real House Price, Peak<Dec.2005>=100)

In US also, increasing IDR coincided with the property bubble

Declining IDR may also coincide with decline in property prices

- Inverse Dependency Ratio (US)
- Real House Price (US 10 cities, Case-Shiller Composite)
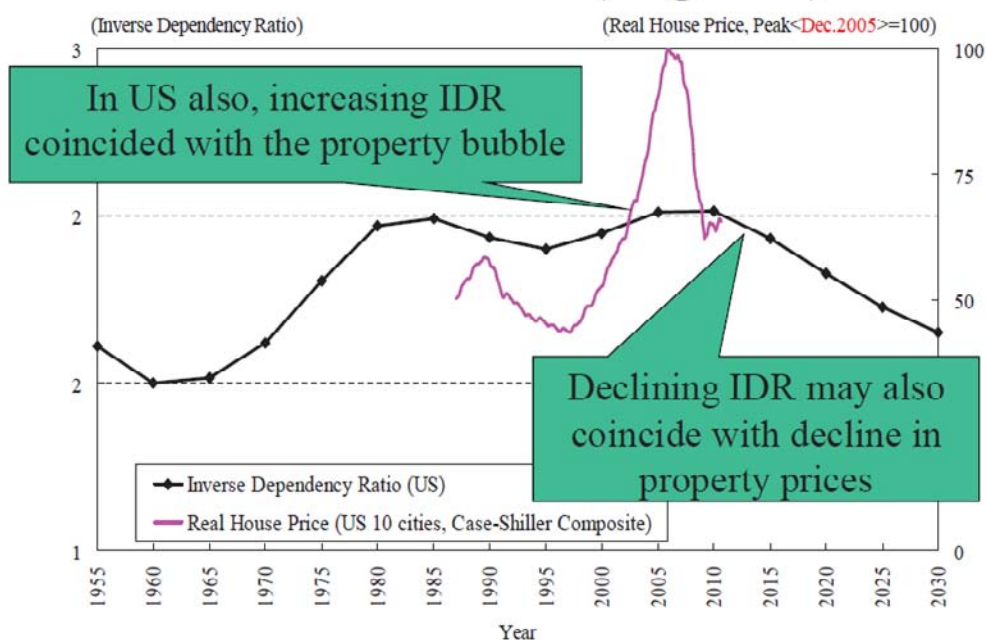
Year

Declining Mobility: Japan

- "Sticky industry structure," hanging on to the past

Fig. 5.1 Enterprise Creation and Destruction

Year	All industries (%)			tail de	Eating and drinking places	Services	Miscellaneous
Post-World War II Era[b]							
Rate of net increase							
1981–1986	2.31	3.	1.18	1.97	1.49	1.23	5.31	3.08
1987–1991	3.25					6.04	4.72
1992–1996	1.41					2.87	1.42
Rate of creation (estimated)							
1981–1986	3.52	5.46				6.10	4.11
1987–1991	3.76	5.98				6.39	5.28
1992–1996	2.12	4.90				3.40	2.19
Rate of destruction (bankruptcy rate)							
1981–1986	1.33	2.58	1.12	1.72	0.82	0.70	0.97	1.16
1987–1991	0.57	0.88	0.48	0.88	0.33	0.33	0.44	0.68
1992–1996	0.75	1.14	0.73	1.07	0.38	0.35	0.59	0.82

- After the bubble burst, creation of enterprises is sharply reduced.

In contrast, relatively mild increase in destruction.

Source: Nishimura and Kawamoto (2003). "Why Does the Problem Persist? "Rational Rigidity" and the Plight of Japanese Banks," *The World Economy*, 26 (2003), 301-324

Declining Mobility: US

- The housing crash reduced mobility rates.

Fig 5.2 Changes in Householder Mobility Rate, 2005–9
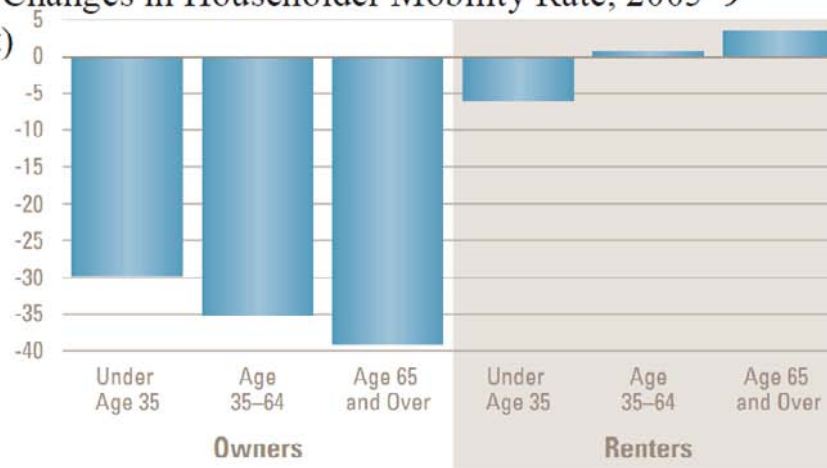
Note: Mobility rate is defined as the share of householders who reported having moved in the previous 12 months.

Source: JCHS tabulations of US Census Bureau, 2005 and 2009 Current Population Surveys.

Figure 13, *The State of the Nation's Housing* 2010, Joint Center of Housing Studies of Harvard University

Fig 6. Breakdown of Natural Selection Mechanism in the Financial Crisis of 1997

TFP of surviving and exiting firms	1994–95		1995–96		1996–97		1997–98	
	Survive	Exit	Survive	Exit	Survive	Exit	Survive	Exit
Food products and beverages								
Livestock products	1.71	1.00	1.67	1.05	1.68	1.94	2.18	1.28
Seafood products	1.42	0.86	1.58	1.06	1.66	0.94	1.28	1.11
Flour and grain mill products	2.35	0.69	3.83	1.05	4.00	1.21	4.27	2.33
Miscellaneous foods and related products	1.43	3.15	1.52	1.26	1.49	1.61	1.60	0.98
Soft drinks, carbonated water, alcoholic, tea and tobacco	4.12	1.49	4.59	1.63	4.56	1.60	4.53	5.26
P						2.96	3.89	3.64	1.24
Che								
C						1.84	3.69	3.36	2.22
I						2.84	3.21	2.91	7.49
C						2.38	0.95	2.06	n.a.
Oil and fat products, soaps, synthetic detergents, surface-active agents and paints	1.72			1.16	2.18	1.98	2.50	1.69
Drugs and medicines	2.10	1.60	2.26	1.76	2.49	2.43	2.63	1.67
Miscellaneous chemical and allied products	2.55	1.59	2.15	3.94	2.73	1.87	2.97	1.18
Retail trade								
Retail trade, general merchandise								
Retail trade (dry goods, apparel and apparel accessories)	1.15	1.07	1.25	1.14	1.36	1.18	1.28	1.10
Retail trade (food and beverage)	0.84	0.71	0.98	0.71	0.93	1.01	0.99	1.78
Retail trade (motor vehicles and bicycles)	0.84	0.74	0.92	0.92	0.96	0.89	0.88	
Retail trade (furniture, household utensil and household appliance)	1.05	1.04	1.04	1.13	1.18	0.92	1.30	
Household appliance stores	1.00	0.92	1.27	1.03	1.20	1.42	0.93	
Drug and toiletry stores	4.16	0.78	2.33	0.84	2.54	0.87	0.87	
Fuel stores	0.94	0.86	0.88	1.04	0.87	0.94	0.92	
Miscellaneous retail trade	1.12	1.51	1.15	1.12	1.18	1.31	1.06	

1997: many industries saw more productive firms exiting. → Breakdown of natural selection

Shaded: exiting firms are more productive than surviving firms

Notes: (1) Shaded areas indicate weighted mean of TFP of exiting firms is greater than that of surviving firms. (2) "Survive" include "switch" firms. Nishimura, Nakajima, Kiyota (2005) "Does Natural Selection Mechanism Still Work in Severe Recessions? –Examination of the Japanese Economy in the 1990s- " *Journal of Economic Behavior and Organization*, 58:1 (2005), 53-78

23