Introduction

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The declines in global equity and real estate markets that began the late-2000s have eerie parallels to what happened in Japan in the 1990s. If we are to avoid following its path to more than a decade of stagnation, we must understand what happened, and the what and why of policy successes and failures. The problems faced by the Japanese economy are neatly summarized in Figure 1.1 which shows the evolution of the log of real purchasing price parity adjusted per capita GDP in Japan and the US from the 1980 through 2008. In 1980, Japanese per capita GDP was 31 percent below that of the US. Over the next 11 years the long-term trend of convergence continued with the gap in relative incomes falling to only 16 percent by 1991. The graph suggests that about that time something shifted dramatically in Japan causing per capita growth rates to slow substantially. Indeed, Japanese per capita GDP only rose by 7 percent between 1991 and 2002 while it rose by 22 percent over the same period in the US. Consequently the per capita income gap between Japan and the US in 2002 that was actually larger than the one that had existed in 1980. Even with the improved growth of the Japanese economy between 2002 and 2008, the gap in per capita GDP between Japan and the US in 2008 remained greater than it was in 1980. The purpose of this book is to provide new prospective on what gave rise to Japan’s “lost decade” – the period from 1991 to 2003 when the growth slowdown was most pronounced.

This book is the first (to our knowledge) to look back at the lost decade having the added perspective of the global recession of 2008 and 2009. Policymakers around world
have looked to the lessons from Japan to guide their responses to the most recent financial crisis. While there have been many summaries of the financial developments and policy choices in Japan, there have been no comprehensive analyses of all the aspects of the Japanese experience.¹

These analyses approach the Japanese experience using economist’s standard tool kit. A second contribution is to demonstrate hat most of what happened in Japan can be modeled and understood with familiar economic tools. That is, although one can debate which models are most appropriate, there need be no appeals to a deus ex machina or “the Japanese are different” argument. This is important, and reassuring. As happened in Japan, policy makers this time will no doubt make regrettable choices as events unfold. But at least there can be confidence in the tool kit for analyzing policy choices. Thus armed, and having a rigorous understanding of Japan’s lost decade, we can confront the global crisis with some optimism.

1.1 A Tour of the Book

Looking across the various chapters, our reading of the evidence suggests a new picture of the lost decade. Specifically, we argue that it is appropriate to separate the slowdown into two phases. The first years of the lost decade looks for the most part like a typical recession. Standard economic theories describe well labor markets, financial markets, consumption, and international developments. Then, starting around 1997, many anomalies appear, and the conventional models break down noticeably.

¹ For a sample of these perspectives see Hoshi and Kashyap (2009) and Shirakawa (2009).
Interestingly 1997 corresponds to the peak in nominal GDP in Japan. In the early years of the post-bubble period Japanese nominal GDP continued to rise despite growing deflationary pressures, but following 1997, deflation tended to outstrip real GDP growth causing a nominal contraction in the Japanese economy. Japanese nominal GDP peaked at 516 trillion yen in 1997 and thereafter entered into a series of sustained contractions and weak gains so that nominal GDP in 2008 was below that of 1997. This contraction in nominal income may have exacerbated the bad loans problems since most loans were fixed in nominal terms, while incomes continued to slide. Put another way, if the BOJ had actually hit its target of price stability between 1998 and 2008, the GDP deflator in 2008 would have been 12 percentage points higher than it is today, but deflation in Japan had become entrenched.

Moreover, 1997 marks the end of the ability of the Japanese government’s ability to patch together partial fixes for Japan’s financial sector. Starting with the default of Sanyo Securities in 1997 – only the German Herstatt Bank had ever defaulted in an interbank market before this – Japan entered a new phase marked by massive stress and interventions in the financial sector that continued for years. Deflation became entrenched, and the stresses on corporations became extreme. In 1996, there were 8.0 trillion yen of assets tied up in bankruptcy proceedings. By 1997, this number jumped to 14 trillion yen or close to 3 percent of GDP. By 2002, assets in bankruptcy proceeding had hit 24 trillion yen, which was indicative of the enormous strains faced by corporations and the Japanese legal system. Japan was clearly undergoing a painful period of structural change.

Regardless of the mechanism, it appears that 1997 marks a shift from a deep recession to the development of a sustained structural slump. We see this in many chapters in
this book. In order to explore this, the remainder of this chapter has two parts. First we set the stage by listing parallels between the Japanese experience and current developments in major advanced economies. Then, we review the primary findings in the chapters, focusing on the evidence regarding the two phases of the lost decade.

2 The United States and Japanese Collapses: Differences and Similarities

Because of the ongoing global financial turmoil, it is especially important to identify and understand the important similarities and differences of the current crisis and the experiences of Japan during its lost decade. The more completely we understand what worked, and what did not work, in Japan as regards both theory and policy, the more likely policy makers and market participants elsewhere can act to ameliorate the global crisis. Here we look primarily at comparisons with the United States, which was at the center of the recent financial crisis.

Despite many small differences in detail, both the US and Japanese crises were triggered by real estate collapses that produced a series of failures of financial firms that quickly threatened systemic stability. The shocks to the financial system metastasized into the real sector, generating a widespread economic downturn.

[Figure 1.2 about here]

The cumulative Japanese fall in equity prices was much more severe than what the US has experienced, at least so far. At its nadir in February 2009, the Nikkei 225 was only at 19% of its peak value in December 1989. By contrast, as of February 2009 the bottom for the S&P 500 was only 44%. However, it took a long time for the Japanese stock market to fall so
far. In order to facilitate the comparison we will set “month 0” in each country to correspond to the peaks in each country - December 1989 for the Nikkei and October 2007 for S&P 500, which allows us to compare the trajectories of the stock market declines. This is done in Figure 1.2.

The run-up and sharpness of the initial decline of the S&P 500 in the first 10 months after the peak was less than that of the Nikkei, but the US experienced a much sharper decline over the first 17 months. Whereas the Nikkei fell 30% in the first 17 months after the bubble burst, the S&P fell 50% in that time period. However, after the major fiscal policy initiatives, interest rate cuts, bailouts, and liquidity provisions that marked US policy, the S&P 500 staged a remarkable rally. Longer term, as Figure 2.2 in Robert Barsky’s chapter indicates, the decline in the Nikkei was marked by a number of plateaus and rallies. This suggests that although the initial declines in equity prices were quite comparable, the 2009 US market rally was unparalleled in the first five years of Japan’s slump.

[Figure 1.3 about here]

In Figure 1.3, we make a similar comparison for land prices. For the United States, we include two land price series. The Case-Shiller index is probably a better measure of housing prices than the OFHEO (Office of Federal Housing Enterprise Oversight) index because it better-adjusts for quality, but the OFHEO index is constructed in a more similar fashion to the Japanese index. The Case-Shiller 10-city index indicates a striking run up followed by a dramatic crash in housing prices that was deeper than what happened to housing prices in Japan’s six largest cities. The decline as measured by the OFHEO index is less sharp, suggesting similar drops in the US and Japan: the OFHEO index fell 10 percent in the first two years after the peak and the Japanese index fell 7 percent.
In this figure, we continue to set “month 0” equal to stock market peaks in each country. One important difference in the two patterns of housing and equity markets concerns the timing. In the US, the collapse in real estate precedes the decline in stock prices, while in Japan the reverse is true. One should be careful about making too much out of this. Housing prices in Tokyo peaked in 1988, and declined 3.9% in 1989, which means that in the Japan’s most-important market, the decline in housing prices predates the decline in stock prices, as in the US.

[Figure 1.4 about here]

Comparisons of overall price inflation mirror the land price patterns. Figure 1.4 indicates in both Japan and the United States there was a rapid run up in inflation immediately before the equity market peak and then a fairly substantial decline in inflation following the equity market collapse. Again the decline in US inflation appears to be much more substantial than what Japan experienced in the first 17 months after the stock market peak. Deflation, as measured by a decline in the CPI over a 12-month period, did not start in Japan until 1998 – almost a decade after the stock market collapse. Indeed, Japanese CPI inflation did not fall to the levels that the US experienced in 2009 until three years after the stock market peak, indicating that the crisis seems to have moved much more rapidly in the United States.

[Figure 1.5 about here]

A major difference between the United States and Japan concerns the behavior of their central banks. Figure 1.5 shows movements in the Japanese Call Rate and the Federal Funds Rate. Important differences appear in terms of the timing, speed, and magnitude of the responses. In the United States, the Federal Reserve Bank raised interest rates long before the
stock market peaked, and cut rates very rapidly afterwards - indeed, had begun to cut before the peak. The Bank of Japan had been raising rates for some 18 months before the market peaked, and continued to raise them for over a year after the peak. A possible explanation for this is that land prices continued to rise in Japan after the stock market peak and Japan did not experience a large contraction in GDP immediately. The net impact of the difference in policy is that US rates fell very close to 0.2% within 17 months after the stock market peak, whereas (not shown on the figure) it took almost 9 years (107 months) for interest rates to move to the same level in Japan.

[Figure 1.6 about here]

The impact of interest rate policy on real interest rates is portrayed in Figure 1.6. Real interest rates became negative in the United States six months after the stock market peak, but in Japan they never moved below zero. This suggests that, rightly or wrongly, the Federal Reserve has acted much more swiftly and dramatically in its interest rate policy than the Bank of Japan. Indeed, Federal Reserve staff research (Ahearne et al (20020)) analyzing Japan’s experience had concluded as earlier as 2002 that rapid and aggressive action was called for as interest rates approached zero justified the rapid response as being necessary to avoid deflation. The Fed seems to have followed this suggestion during the current crisis.

The responses to the banking problems in the United States have mirrored many of the choices made in Japan. In particular, the acute phase of Japan’s crisis, which was between November 1997 and March 1999, has a number of similarities with the developments in the US in 2008 (see Hoshi and Kashyap (2009) for more details). In both cases, there were initial government bank recapitalizations that were relatively undifferentiated in the terms imposed on the banks receiving the capital. Accounting rules were loosened in both countries. Both
countries had half-hearted attempts to buy bad assets. Eventually some institutions got much more capital. It is too early to tell if the US policy will prove more effective than the Japanese policies.

Fiscal policy represents another area of similarity. In the early years of its slowdown, Japan engaged in a vigorous fiscal stimulus with government demand as a share of GDP rising by close to five percentage points. This was a large expansion even relative to what has been proposed in the United States. By 1996 the Japanese economy appeared to be on the path to recovery, with growth rates above 3%. These “green shoots” were soon trampled as the fiscal expansion was reversed in 1997 because many argued it was not sustainable and that it would ultimately lead to inflation. This policy reversal helped contribute to a major recession in Japan. Again, there are close parallels between the policy debate in the US and Japan.

The case of Japan is one in which an asset price collapse coupled with a slow and inadequate policy response caused a serious crisis by 1998 that appears to have fundamentally changed many structural features of the economy. The challenge for policy makers is to draw the appropriate lessons from the Japanese experience so as to prevent similar hardships in the rest of the developed world.

3 Primary Findings

The evolution of asset prices, particularly stock prices, is studied by Robert Barsky in the opening chapter. It is generally agreed that the collapse of stock prices in 1990 and land prices starting in 1992 were triggering events for the slowdown. Barsky focuses on the role
of heterogeneous expectations in the implosion of asset prices. Most prior studies on Japan have used a representative agent framework to analyze the large run up and then massive declines.

Barsky’s starting point is the observation that when there is disagreement in beliefs (whether rationally based or not), plausible restrictions on selling short mean that the views of the optimists are likely to be reflected in market prices. Given the movements in real interest rates in the mid-1980s, and uncertainty over productivity at the same time, Barsky argues that it is plausible to assume that some investors presumed these changes were likely to be very persistent. In such a case, the run up in prices is not surprising. But an equilibrium based on these assumptions is fragile. Thus, when an event or change in sentiment occurs that causes a shift toward more pessimistic beliefs, prices can adjust sharply. When real interest rates rose, and expectations of growth slowed, at the start of the 1990s, conditions were ripe for a price reversal.

The focus of the analysis, appropriately given the data, is mostly on the early 1990s, and hence does not speak directly to the two-phase hypothesis. But, as he notes, data on consumption can help distinguish between homogeneous- and heterogeneous- belief interpretations of the data. If all investors had become optimistic and were responsible for the jump in stock and land prices, then aggregate consumption should have risen relative to income – assuming borrowing was possible and that permanent income governs consumption desires. With heterogeneous beliefs, only the optimists would have raised consumption, so aggregate consumption need not respond. Barsky shows that consumption tracks income relatively closely through 1998 (when his analysis stops). Thus, there is no particular
information in this chapter suggesting the need for non-standard interpretation of the first part of the lost decade.

The asset price developments played an important role in various policy responses, most importantly monetary policy decisions. Bank of Japan (BoJ) policies since the mid-1980s have been well and widely critiqued, so we saw no need to devote a chapter to the issues.\textsuperscript{2} Rather, a long literature review of BoJ actions is included in chapter 3.

The interplay between monetary policy and the exchange rate is the focus of chapter 3 by Maurice Obstfeld. He seeks to connect monetary movements to both the real exchange rate and the nominal exchange rate. Obstfeld first analyzes the real interest parity, which clarifies the dynamic nature of real exchange adjustments. He then looks at the long-run Harrod-Balassa-Samuelson (HBS) relationship, which was found to be relatively robust in previous studies of earlier periods. The recent fit is less successful. Since the 1980s there appear to be many periods where the yen-dollar exchange rate has departed from long-run trend values. Empirically, Obstfeld has more success in explaining some of the short-run dynamics of the exchange rate, and relating these to current macroeconomic variables, than in tracing the HBS-consistent long-run real exchange rate.

Using the exchange rate to infer much about the two-phase hypothesis is complicated because 1997 is also the period of the Asian financial crisis, which had important effects on financial markets around the world. Obstfeld does find that, starting in early 1995, a nearly five-year trend of increasing Japanese real exchange rate and terms of trade ends. From April 1995 there is a trend of real depreciation of the yen and falling terms of trade. These are not reflected in the nominal exchange rate, which basically remains flat after 1995. Rather, real

\textsuperscript{2} See, for example, Ito and Mishkin (2006) for comprehensive survey.
yen depreciation is due to deflation in Japan coupled with positive inflation abroad. In August 1998, the exchange rate begins appreciating. But explaining the magnitude of the appreciation is not easy. Real long-term interest rates in Japan were slightly higher than in the United States (after having been almost 3 percentage points lower), but the real exchange rate appreciated by more than 30% against the dollar between August 1998 and December 1999.

In chapter 4 Robert Dekle and Kyoji Fukao compliment the analysis by Obstfeld by tracing the important relationship between the nominal exchange rate and the real exchange rate in Japan, and the process by which industries adjust to higher real exchange rates. This is critical, given the evidence that exchange rates can depart from long-run trends for an extended period. For example, with an overly appreciated real yen exchange rate such as in the five-year period leading up to 1995, Japanese producers were under tremendous pressure to reduce costs and improve productivity in order to keep their goods competitive.

To model this, Dekle and Fukao separate the economy into three sectors: high-productivity-growth manufacturing, low-productivity-growth manufacturing, and low-productivity-growth services. They find that labor sometimes moves from more productive sectors to less productive sectors. The relative productivity performance of traded goods producers determines long-run movements in the real exchange rates, mirroring one of the results from Obstfeld’s chapter. Dekle and Fukao tie into later chapters by noting the importance of understanding what is happening in the low-productivity sectors of the economy.

Chapter 5, by Phillip Lane, looks at a third angle on how international forces influenced the lost decade. Lane explores how financial integration with the rest of the world
affected the Japanese economy. He focuses on two main possible causes of the net foreign asset position. First, demographic factors may be important because of their impact on savings and investment. Secondly movements in output per capita may also matter if expected investment returns are lower in relatively rich economies. He then turns to examining whether these flows have a stabilizing effect and finds they do in the face of fluctuations in private investment flows and exchange rate swings.

Lane documents Japan’s increased integration with the rest of the world that began in the 1980s when capital controls were eased and financial market deregulation began. Over the next 20 years, Japan steadily accumulated a large net creditor position with the rest of the world. He finds that net financial asset holdings are importantly related to exchange rates, and contributed to the real appreciation of the yen. But the increased integration does not seem to have been particularly important in terms of risk sharing or in contributing to growth.

One striking finding is that his regression model for explaining net foreign assets fits much less well after 1998 than it does between 1980 and 1997 (when his forecast series tightly tracks the actual series). The ability to explain the exchange rate using net foreign assets also collapses starting in 1998. Until then, predicted movements are highly correlated with the actual exchange rate; from 1998 on, the correlation vanishes. This is strong evidence in favor of the two-phase hypothesis.

Chapter 6, by John Muellbauer and Keiko Murata, also examines interest rate effects. The Bank of Japan had cut its policy interest rate to 0.5% in 1995 and, it stayed below that level for the remainder of the lost decade. Real interest rates were higher, because deflation was expected during most of the period. But most forecasts of deflation were mild, so by normal standards, real interest rates were not particularly high.
Muellbauer and Murata explore the effect of interest rates on consumption, and conclude that one of the reasons for the failure of low rates to stimulate the economy is the response of Japanese consumption to interest rates. This analysis works with a full consumption function that relates consumption to its underlying determinants including interest rates. In previous work analyzing UK and US data, Muellbauer and co-authors have found that lower interest rates raise consumption (holding all else equal). They find for Japan that the opposite is true. This does not mean, however, that raising interest rates would stimulate the economy, as investment and exports would still weaken, but it can help explain why the interest rate effects were weak overall.

Their preferred empirical specification for consumption appears to be stable over their whole sample from the 1960s until 2005. But during the lost decade some the model’s fit shows some interesting patterns. The model tracks consumption growth well from the start of the slowdown through 1996, but then model misses badly over the next few years. It anticipates a much sharper downturn in 1996 and 1997, and then over-predicts noticeably in two of the next four years. Their preferred measure of actual income growth collapses at the same time.

Remarkable change in the Japanese employment system after 1997 is demonstrated by Ryo Kambayashi and Takao Kato in chapter 7. Lifetime employment was one of the key distinguishing features of the Japanese economy for much of the postwar period, and Kato and Kambayashi are the first to carefully document its declining importance. Their work provides a micro foundation for the macro analysis of Higuchi (2001) and Miyanaga (2002), suggesting that the sensitivity of employment to macroeconomic fluctuations steadily rose as
Japan’s stagnation continued. Until this work by Kato and Kambayashi it was impossible to understand the causes of this increased sensitivity.

Kato and Kambayashi are able to move past the results of previous studies along a number of dimensions. A particularly important innovation is that they are able to use the latest Employment Status Survey to bring analysis up to 2002, as opposed to 1997. This enables them to study the potential impact of the 1998 revision of the Labor Standards Law. Prior to this legal change, Japanese employment contracts had to be either annual or of indefinite length. This gave employers an incentive to offer lifetime employment contracts, as the option of multiyear contracts was not available. The 1998 revision permitted multiyear contracts, and thus provided an alternative to lifetime employment.

Kato and Kambayashi find that this change in the law was associated with some important shifts in the retention rates of workers. Until 1997, there was scant evidence that much was changing. For example, there were very small differences in 10-year retention rates for workers from 1982 to 1992 as opposed to 1987 to 1997. But retention rates from 1992 to 2002 fell dramatically. These changes were particularly pronounced for female workers and workers in small and medium enterprises, and point to some important structural changes in the Japanese economy in the last part of the lost decade.

The rise of part-time and temporary employment is examined by Kenn Ariga and Ryosuke Okazawa in Chapter 8. They begin by documenting a second massive change in employment relations. Not only did retention rates fall for workers in full-time positions, the share of the labor force in “core” (full-time, regular) positions also fell precipitously. In 1991 82% of the Japanese labor force had full-time positions; by 2007 it was only 67%.
Ariga and Okazawa argue that a major reason for the existence of regular positions was the initial belief by workers that the frequency and severity of negative productivity shocks that would force them to change sectors was relatively rare. As the decade progressed, workers became increasingly convinced – with good reason – that traditionally safe jobs were no longer safe. The problem for the economy was the limited ability of the non-core sectors to absorb the workers that no longer were entering the core sectors. This contributed to the slow rise in non-core jobs and the persistently high unemployment rates.

Ariga and Okazawa point to several forces that led to this change. The first was the very substantial real exchange rate appreciation between 1990 and 1995. This 40% real appreciation of the yen was associated with a dramatic decline in demand for domestically produced manufactured goods and a dramatic increase in offshoring. Both of these forces had strong negative consequences for workers employed in the traditionally high-productivity-growth manufacturing sectors.

These findings naturally suggest looking more explicitly at restructuring, and this is the topic of the next two chapters. In chapter 9, Joe Peek builds on his past work with Eric Rosengren, which identified anomalous connections between bank financing and firm performance during the 1990s. Here he extends this work to cover the 1980s and to the end of the lost decade so that he can track how bank assistance might have changed over time.

Peek focuses on how firms that have experienced a clear drop in profitability, and compares the subsequent profit rates for firms that did and did not receive increases in bank loans. There is a large literature suggesting that in the 1970s and 80s close ties to banks were beneficial. Peek confirms that for his sample this appears to be true through 1992. Until then, distressed firms that got more loans from their primary lender showed significantly higher
profit rates over the four years following the distress. After 1992 this correlation disappears: for 1993-97 there is a weak positive association between post-distress performance and increased lending, and from 1998 on the correlation is negative. These patterns are present, with less statistical significance, for manufacturing firms. The attention to manufacturing firms is motivated by the observation that manufacturing faces international competition and has been estimated to receive less subsidized credit. Peek concludes that the fabled bank rescues of the 1980s disappeared during the lost decade.

Takeo Hoshi, Satoshi Koibuchi, and Ulrike Schaede in chapter 10 provide additional, complimentary insight into how the restructuring process evolved between 1981 and 2007. They collected news articles on publicly traded companies that were restructured and matched the articles to data on the balance sheets and income statements of the firms; the news accounts allow them to separately analyze different types of restructuring. This unusual data set also allows them to document the characteristics of the restructured companies and to study how they changed over time, especially during the lost decade.

Historically larger firms, firms in distress, and firms with a high dependence on banks had been more likely to be restructured. During the lost decade, however, the likelihood of a distressed firm being restructuring declined, even for those that were particularly dependent on bank financing. Firms being restructured generally reduce their growth of employment, capital, and total debt, though not bank loans. But again, the lost decade was different. During this episode firms that were being reorganized did not have lower debt growth, and in fact may have seen higher bank loan growth than companies not being restructured.

Restructured firms did cut employment growth and capital growth during the lost decade, but
the size of the reductions in investment and capital growth was significantly smaller than before 1993 or after 2003.

Standard accounts of the lost decade point to the lack of restructuring as an important factor in the low productivity growth during the period. In chapter 11 Diego Comin aims to explain medium-term movements in productivity using a simple real business cycle model that emphasizes the role of technology adoption in driving growth. Comin used a similar model in previous work with Mark Gertler and was quite successful in explaining critical US macroeconomic variables - including output, consumption, hours worked, and productivity. The question in this chapter is whether the same basic model can explain events in the lost decade.

The key (exogenous) ingredient in the model is variation in the mark up of wages and the marginal rate of substitution between labor and consumption. This mark up is viewed as a stand in for a variety of possible shocks. Fluctuations in the mark up can viewed as arising from frictions in the labor markets, labor income taxes, shocks to entry costs, or changes in competition policies, to name of a few of the candidates.

The central finding is that the model performs quite well, generating predicted values for output, employment, productivity, consumption, and investment. This is particularly remarkable since Comin takes the key parameters for the model from the specification he and Gertler developed for the United States. The main mechanism in the model is the effect that the mark up has on technology adoption. Because a higher mark up reduces labor supply, it triggers a recession, which reduces the value of adopting new technologies, lowers research and development, and ultimately the level of productivity growth.
Interestingly, the model’s fit deteriorates substantially starting in 1998. The model predicts that the economy should have started recovering at that point, when in fact growth declined further. As Comin notes, if the credit disruptions in 1998 are fed into the model as an additional shock, the basic propagation mechanism in the model creates a longer lived slowdown.

Overall, we see the essays in this book as generating many new facts and filling in some missing pieces about what happened in the economy during Japan’s lost decade. It is clear that the dynamics of exchange rates, consumption, employment, and restructuring patterns all shifted around 1997 or 1998. Since the two-phase hypothesis was generated based on the findings in this project, rather than having been conjectured before the start of the research, there is much more about this supposition that remain open. What was responsible for the break? Do other important macroeconomic variables such as investment, exports or imports also show signs of changing? Is there a unified theory that can explain the dynamics of the economy after 1998? These questions are natural topics for further research.
References


Figure 1.1

Per Capita GDP in the US and Japan

Log PPP Adjusted Real Per Capita GDP in 2005 Dollars

- Japan
- United States
Figure 1.2

Relative Movements in Nikkei 225 and S&P 500
(12/89 = 1 for Japan 10/07 = 1 for US)
Figure 1.3

Movements in Housing Price Indexes
(Peak Year = 1)

- Case-Shiller 10 City Index
- OFHEO
- Japan Residential Real Estate

Years Relative to Stock Market Peak
Figure 1.4

Inflation in Japan and the US

- Inflation (Percent)
- Months Relative to Stock Market Peak

Japanese Core Inflation
US Core Inflation
Figure 1.5

Interest Rates in Japan and the US

- Japanese Call Rate
- Federal Funds Rate
Figure 1.6

Real Interest Rates in Japan and the US

Months Relative to Peak