

# Is the U.S. Economy Headed Down Japan's Slow-Growth Path?

Three years removed from the financial crisis and five years since the peak in housing prices, the U.S. economy finally appears to have gained some traction. Nevertheless, concerns remain. Some observers question whether the economic recovery is self-sustaining. Others envision a more dire outcome—a historical parallel with post-bubble Japan. The financial crisis aftermath, demographic trends, and government budget challenges confronting the U.S. do invite many Japan comparisons. So the question remaining is twofold: Is the U.S. heading for a decade-long malaise and downgrade in long-term growth prospects? Or are the similarities with Japan a mere shadow obscuring a brighter outlook for the U.S. economy?

## Similarities between the U.S. and Japan

The broad similarities between current fiscal conditions in the U.S. and in Japan during the 1990s are evident. In both nations, a credit bubble centered in the property markets left a nasty overhang of debt, the value of which collapsed as real estate asset prices plummeted. The result was significant damage to the balance sheets of banks and financial institutions that owned the real estate loans, as well as to private-sector borrowers who owed the debt. Banks and other private-sector entities thus came under deleveraging pressures, which cramped credit growth and reinforced the property downturn's affect on the rest of the economy. Subpar economic growth ensued and expansion remained lackluster, leading to significant debate about appropriate policy responses. Fiscal stimulus had mixed results. Historically low interest rates and bond yields were insufficient to spark rapid credit creation. Exacerbated by worsening demographics, the public sector balance sheet deteriorated and resulted in a dramatic expansion of government debt relative to gross domestic product (GDP).

## Considerable differences (bubble-related factors)

### Two Japanese bubbles, both more extreme

When comparing post-bubble adjustments, it's important to understand the disparity of the magnitude and character of the bubbles themselves. Japan endured two concurrent asset bubbles: a stock market mania that peaked in 1989, and a property market bubble that reached its zenith in 1991. In both cases, asset valuations reached much greater extremes than in the U.S., leading to stiffer headwinds for Japan in the post-bubble adjustment period.

The U.S. stock market experienced an unrelated bubble in technology shares that burst in 2000. But by the time its housing market peaked in 2006, the price-to-earnings (P/E) ratio of stocks was 16 and no longer expensive on a historical basis. In contrast, the 15-year bull market in Japanese stocks topped out with a P/E ratio of 68 in late 1989, leaving a hefty overvaluation to work off at the same time a property bubble was still in full force.<sup>1</sup>

The valuations and conditions of Japan's real estate sector also were more extreme. By some estimates, its land was valued in 1991 at approximately four times the value of all property in America despite being only 1/25th the physical size.<sup>2</sup>

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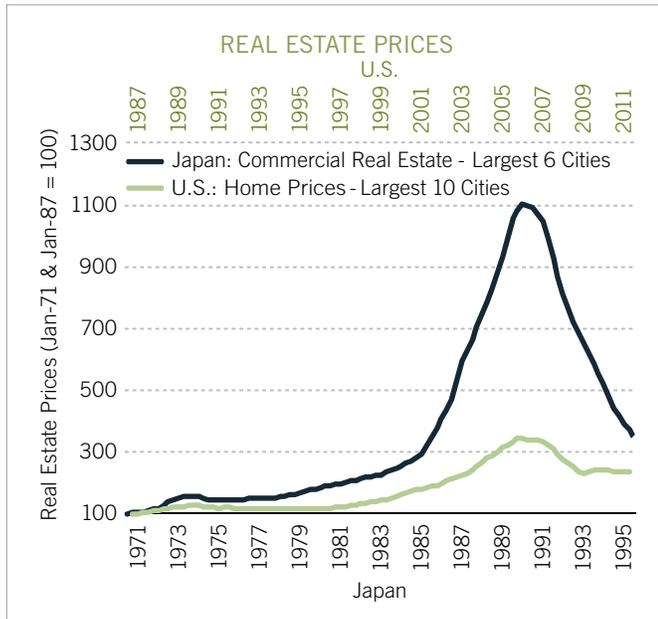
## KEY TAKEAWAYS

- Current U.S. economic conditions have similarities to post-bubble Japan; most notably, the aftermath of a real-estate-focused financial crisis and deflationary pressures from deleveraging.
- However, Japan's property and stock bubbles were more extreme, its post-crisis policy response was slower, and adjustments in key economic sectors (corporate, banking, housing, employment) took considerably longer.
- The U.S. has a more positive inflation environment underpinned by supportive central bank policy; a healthier non-financial corporate sector; stabilizing housing and banking systems; and more-favorable demographics.
- Although the U.S. economy still faces the potential of a slow-growth path if it fails to address fiscal problems and boost productivity, a long-term outlook for decent economic growth appears more likely.



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**EXHIBIT 1: Japan's commercial real estate bubble was more extreme than the U.S. home price bubble.**



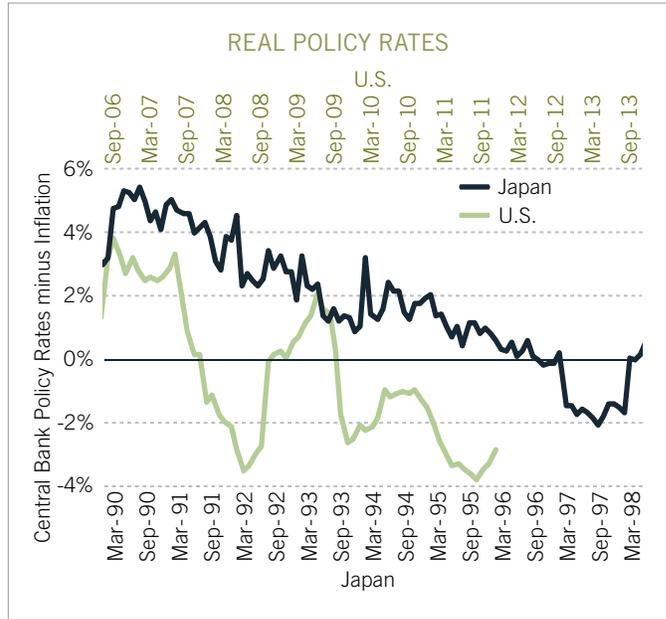
Japan data: Sep. 1971 through Sep. 1995. U.S. data: June 1987 to June 2011. U.S. home prices represented by S&P Case-Shiller 10 City Composite Home Price Index.<sup>3</sup> Japan commercial land prices represented by Commercial Urban Land Price Index of Six Large City Areas.<sup>4</sup> Source: Japan Real Estate Research Institute, Standard & Poor's, Fiserv, MacroMarkets LLC, Haver Analytics, FAM (AART) as of 6/30/11.

The worst extremes of the property bubble in Japan occurred in the commercial real estate market; in the U.S., the residential housing sector was at the center of the storm. Residential home prices rose sharply in the years leading up to the bubble apex in both the U.S. and Japan. However, the ratio of home prices-to-household income was far higher in Japan than in the U.S. at their peaks (12.3 vs. 3.9).<sup>5</sup> Commercial real estate land prices in Japan's largest six cities roughly quadrupled during the five years before 1991, while home prices in the largest 10 U.S. cities doubled during the five years before 2007 (see Exhibit 1, above).

Correspondingly, construction activity reached higher levels in Japan, with the value of total new construction rising 18% per year on average from 1987–1990. As a result, Japan was left with a larger and more overvalued glut of properties when its bubble burst. Conversely, U.S. peak construction activity was briefer and averaged less than 10% annually from 2003–2006.<sup>6</sup>

*[Due to the nature of the different bubbles in the two countries, dating the exact start of each post-bubble period is inherently subjective, but we generally cite the following: For Japan, the steep decline in stock prices after the 1989 peak (Japanese stocks, as measured by the TOPIX, fell 40% in 1990<sup>7</sup>) likely marked the start of post-bubble financial pressures; however, since real estate prices did not peak until 1991, we use the end of 1991 as the*

**EXHIBIT 2: Policymakers in the U.S. were quicker to react and implement extraordinary monetary policies.**



Japan data: March 1990 to March 1998. U.S. data: Sep. 2006 to Dec. 2011. Source: Japan Ministry of Internal Affairs and Communication, Bank of Japan, Bureau of Labor Statistics, Federal Reserve Board, Haver Analytics, FAM (AART) as of 12/31/11.

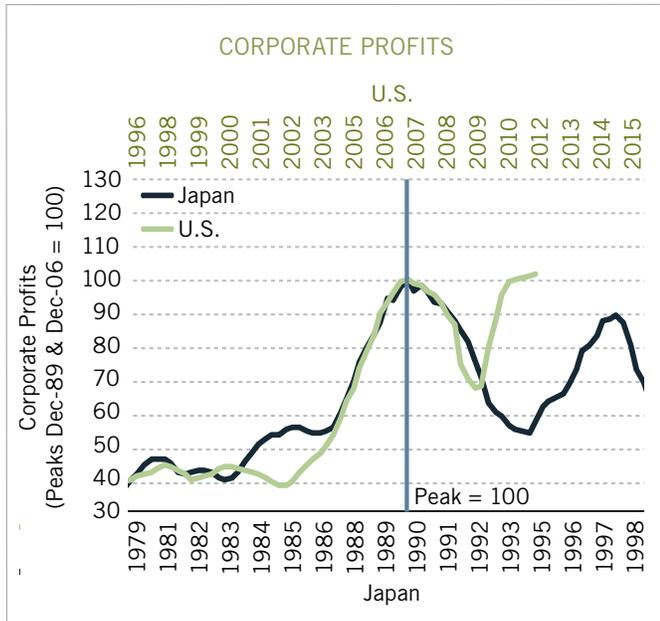
*end date of Japan's bubble period. For the U.S., housing prices peaked in 2006 but financial distress did not manifest itself until 2007 and culminated in the crisis during fall 2008, so we generally use 2008 as the end of the U.S. bubble era.]*

**U.S. policy response was quicker**

After the collapse of Lehman Brothers in the fall of 2008, U.S. officials moved quickly to counter the financial crisis. Within months, the Federal Reserve adopted extraordinary monetary policies, employing a zero interest rate policy (ZIRP) and quantitative easing that doubled the size of its balance sheet. In contrast, the Bank of Japan was more cautious. It did not move aggressively to offset the large decline in money velocity, it did not reach ZIRP until the late 1990s, and it did not employ quantitative easing until a decade after the property peak (see Exhibit 2, above).

Non-monetary policy differences also existed. In the U.S., officials approved the Troubled Asset Relief Program (TARP) legislation that was used to recapitalize ailing banks. This, in addition to regulator "stress tests," restored confidence in the U.S. financial system and allowed banks to raise capital in the public markets within months after the financial crisis. In contrast, regulatory forbearance was the key theme in the early post-bubble years for Japan, with banks doing little to deleverage or recapitalize in the aftermath of the decline in asset values. Japanese bank loan-to-deposit ratios barely budged in the first few years of the post-bubble period until bank failures stoked a broader crisis in

**EXHIBIT 3: Japanese companies were slow to cut costs, while U.S. corporate profits quickly rebounded to record levels.**



Japan data: Dec. 1979 to Sep. 1998. U.S. data: Dec. 1996 to Sep. 2011. Source: Japan Ministry of Finance, Bureau of Economic Analysis, FAM (AART) as of 9/30/11.

1997, leading to a significant government recapitalization effort beginning in 1998 (seven years into the post-bubble period). In contrast, the U.S. passed a significant fiscal stimulus package (6% of GDP) within months of the financial crisis.<sup>8</sup>

**Japan's adjustment process was slower**

Given the less extreme excesses and more active policy response, the U.S. post-bubble adjustment process has been much more rapid, particularly in the corporate sector. Businesses moved quickly to slash production, inventories, and costs, leading to a V-shaped profit recovery when economic activity stabilized (see Exhibit 3, above).

U.S. corporate profits surpassed previous record highs by 2010, only two years after the financial crisis. In contrast, Japanese companies generally honored their social contract with workers for lifetime employment, which limited business downsizing and corporate adjustment. Profits took more than a decade to recover to previous highs.

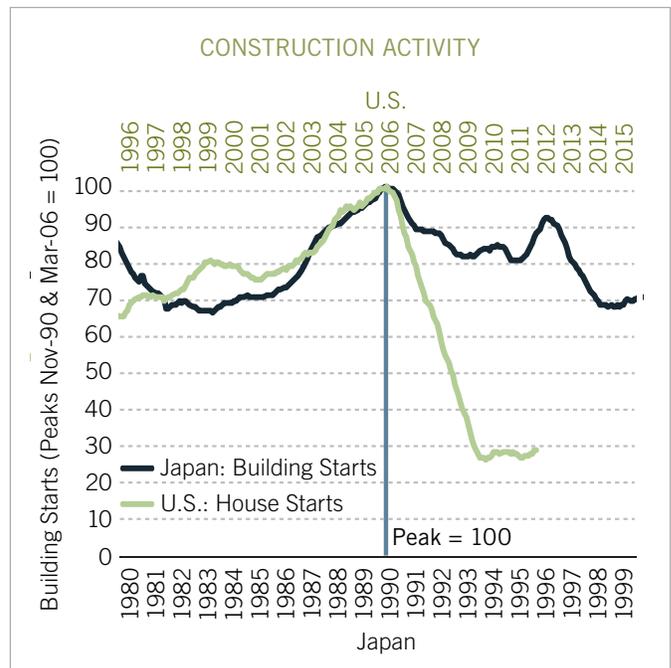
Asset price deflation also hurt Japan's corporate sector, with the unrelenting post-bubble slump in stock and commercial real estate prices further dampening corporate sentiment and financial flexibility. In the U.S., the slumping housing market also has continued to weigh on household balance sheets. Household debt levels remain elevated on a historical basis, although some deleveraging has occurred and debt-service obligations have returned to historical norms. The primary difference, however, is that the quick recovery in U.S. corporate profitability allowed businesses to return to positive (albeit slow) trends of capital spending and hiring rela-

tively soon after the crisis, while Japan's ongoing corporate deterioration acted as a multiyear anchor on Japan's internal demand.

The differences in corporate adjustment thus had significant impact on labor markets. Unemployment in the U.S. skyrocketed amid massive layoffs, reaching 10% roughly one year after the financial crisis. However, during the subsequent two years, the jobless rate dropped steadily to 8.5%.<sup>9</sup> Japanese unemployment rose slowly, increasing from about 2% to only 3.4% in the five years after the peak in property prices. Despite the lower unemployment, stunted profitability in the Japanese corporate sector hindered new hiring, and unemployment continued to rise before reaching a peak of 5.5% in 2002, eleven years after the property price peak.<sup>10</sup>

The real estate market adjustment also was more rapid in the U.S. Home prices fell 30% from 2006–2009, while a similar decline in Japan's home prices took 10 years.<sup>11</sup> Though Japan's commercial real estate bubble was much larger and more extreme, U.S. commercial real estate prices declined roughly 45% within three years of the peak. In contrast, Japan's fell only 15%.<sup>12</sup> Construction activity in the U.S. collapsed abruptly, as housing starts fell in excess of 70% below peak levels within three years of the building peak (see Exhibit 4, below). In Japan, commercial real estate extended the total building boom until 1991 despite a 1989 peak in residential construction. Overall, Japan's construction activity accounted for 18% of GDP in 1991 and fell only slightly to 16%

**EXHIBIT 4: Construction activity quickly plunged in the U.S. to levels not seen in more than 50 years.**



Japan building starts include residential and non-residential buildings. Japan data: Nov. 1980 to Aug. 1999. U.S. data: March 1996 to Dec. 2011. Source: Japan Ministry of Land, Infrastructure and Transport, U.S. Census Bureau, Haver Analytics, FAM (AART) as of 12/31/11.

four years later. U.S. construction peaked at 11% in 2006, but declined to 7% by 2010, a much larger decline off a lower base.<sup>13</sup>

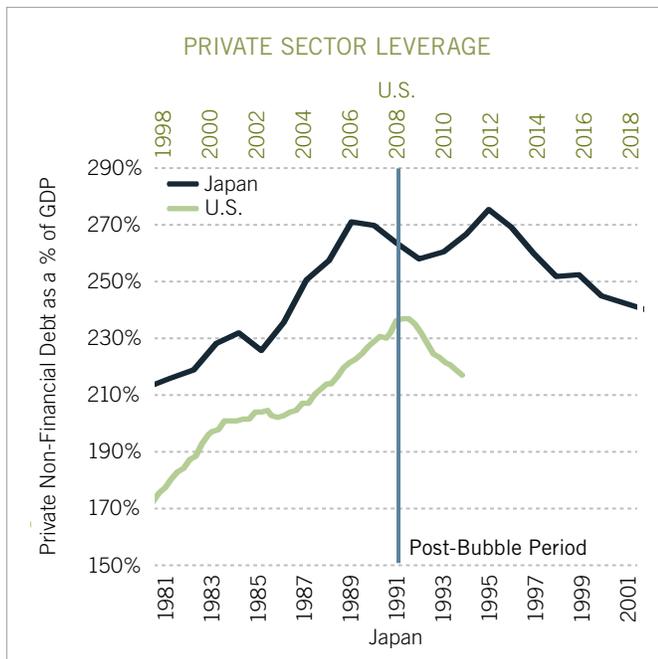
The regulatory forbearance and lack of deleveraging by Japanese banks in the early 1990s staved off a financial crisis temporarily, but it also precluded a sustainable recovery. Bank loan growth remained modestly positive until the late 1990s, while private-sector (non-financial) debt continued to rise until it reached a record high of 270% of GDP in 1995 (see Exhibit 5, below). When bank loan growth finally turned negative and private-sector debt levels began to drop later in the decade (see Exhibit 6, right), this set in motion a long-term deleveraging trend and ignited deflationary pressures that have yet to completely abate. In contrast, U.S. private-sector deleveraging began almost immediately after the 2008 financial crisis, as much of its largely securitized real estate debt was quickly marked down. Private-sector securitization seemed to disappear overnight, and bank loan growth collapsed into negative territory by the second quarter of 2009. As a result of the abrupt deleveraging, significant excesses were wrung out of the financial system, placing it on much firmer footing. Though bank loan growth has remained tepid, it has returned to positive territory.

### Other differences (non-bubble related)

#### Japan's external accounts: surplus, but currency appreciation

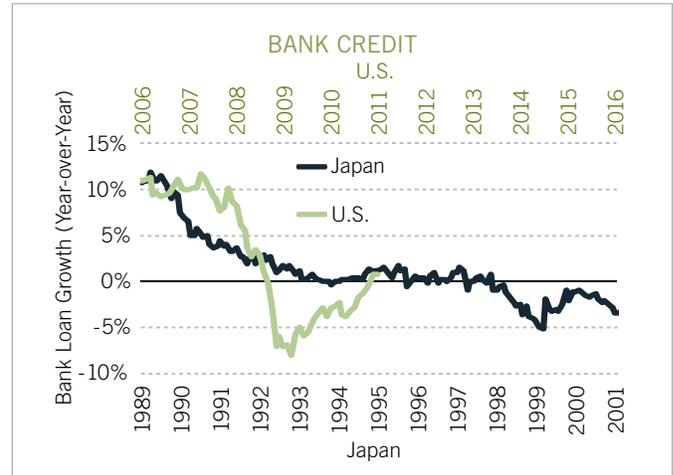
The trade and current account positions of post-bubble Japan and the U.S. are near polar opposites. Japan was a consistent

**EXHIBIT 5: In contrast to the immediate writedowns in the U.S. private sector, the Japanese private sector did not begin deleveraging until years after its credit bubble burst.**



Japan data: Jan. 1981 to Jan. 2001. U.S. data: Dec. 1998 to Sep. 2011. Source: Japan Cabinet Office, Bank of Japan, Federal Reserve Board, Bureau of Economic Analysis, FAM (AART) as of 9/30/11.

**EXHIBIT 6: The U.S. banking system curtailed lending drastically in 2009, while Japanese bank loan lending did not turn negative until the late 1990s.**



Japan data: Dec. 1989 to Dec. 2001. U.S. data: Dec. 2006 to Dec. 2011. Source: Bank of Japan, Federal Reserve Board, FAM (AART) as of 12/31/11.

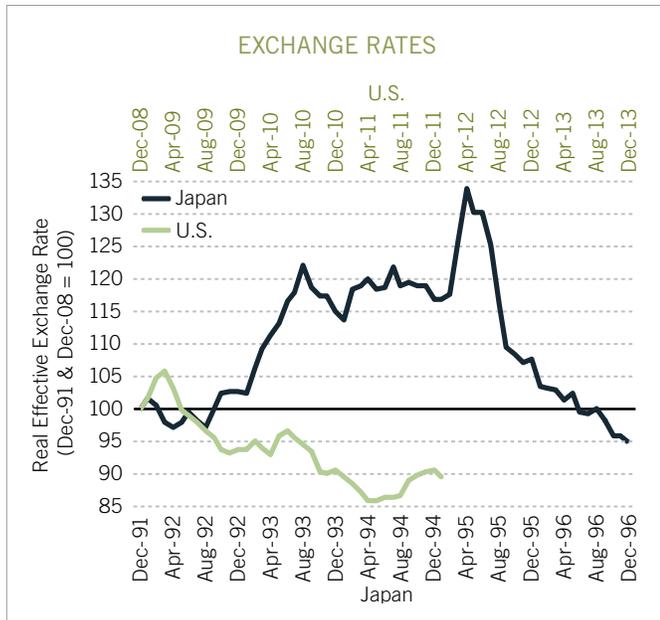
net creditor, running sizable trade and current account surpluses, while the U.S. continues to run significant trade and current account deficits. Japan used export growth during the global expansion of the 1990s to offset domestic weakness. Comparatively, the U.S. is in a less advantageous position; it is unlikely to enjoy such a robust global growth environment for its exports at this time. But since the country is a net debtor, U.S. monetary policymakers appear willing to tolerate higher inflation with the knock-on effect of currency depreciation. Thus, the U.S. is benefiting from increased international competitiveness due to a decline in the dollar's real effective exchange rate, which has fallen 10% since December 2008 and 27% during the past 10 years (see Exhibit 7, page 5). Japan, on the other hand, experienced a significant rise in its real effective exchange rate in the post-bubble years.

As a net creditor, Japan also had the advantage of large domestic savings to finance its rising public debt. The U.S., on the other hand, is much more dependent on foreign capital to finance its government borrowing. So far at least, the dependence on foreign capital has yet to produce financial instability or high interest rates, as the dollar's unique role as a reserve currency and the perception of the deep U.S. Treasury markets as a safe haven have outweighed other factors.

### Demographics

Solid growth in the working-age population (ages 15–65) boosted real GDP growth in both the U.S. and Japan in the decades immediately following World War II. However, the absolute size of Japan's working-age population peaked in the mid-1990s; since then, its decline has been a continuous headwind for the nation's rate of economic growth. That decline accelerated during the 2000s and is expected to average -0.9% over the next 40 years.

**EXHIBIT 7: Japan's post-bubble currency appreciation created headwinds for its export sector. In contrast, dollar weakness has made the U.S. more competitive.**



Japan data: Dec. 1991 to Dec. 1996. U.S. data: Dec. 2008 to Jan. 2012. Source: J.P. Morgan, Haver Analytics, FAM (AART) as of 1/31/2012.

The growth rate of the U.S. working-age population peaked in 1999 (see Exhibit 8, right). Thus, it has provided less of a boost to economic activity over the past decade, but the absolute growth has remained positive. Over the next 50 years, U.S. working-age population growth should average only about 0.4%, roughly one-third the rate of the past 50 years. However, the positive growth should continue to contribute to real GDP activity as opposed to the drag Japan is experiencing.

During the next decade, the U.S. working-age population will start to grow more slowly than its total population, which will temper per-capita GDP growth. This increase in the “dependency ratio” (non-working-age population relative to workers) has negative implications, including for government budgets. However, even in this case, Japan’s situation is worse because its working-age population has shrunk and will continue to shrink faster relative to its overall population. Hence, the increase in the dependency ratio and its moderating impact on per-capita GDP will be less acute in the U.S.

**Implications: Why the U.S. may escape Japan’s fate**

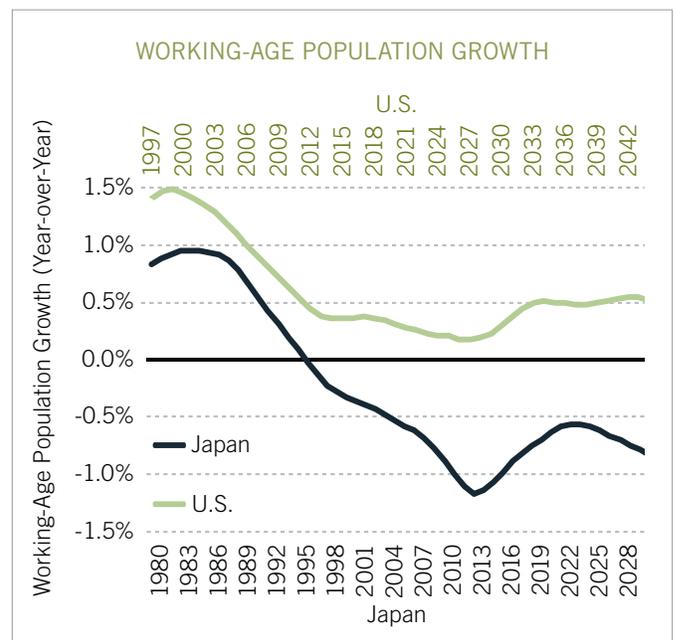
In aggregate, the U.S. and Japanese post-bubble experiences were considerably different. This suggests the U.S. economy is not predestined to follow in Japan’s footsteps, a thesis underpinned by five key arguments.

1. The swift adjustment in some areas of the U.S. economy provides the possibility for positive momentum to overcome the

still-significant challenges. While the slow bleeding in the Japanese banking system and labor markets initially staved off a financial crisis and an unemployment spike, it also prolonged the weakness in these areas for years to come. Japan’s banking crisis and credit contraction did not begin until the late 1990s. As a result, unemployment continued to rise and credit to contract a full decade after the peaks in stock and home prices. Though U.S. unemployment remains high and bank lending tepid three years after the U.S. financial crisis, both indicators have been moving in the right direction.

2. The relatively rapid adjustment in the real estate sector may indicate that U.S. asset prices have reached a sustainable floor and, thus, may not perpetuate continuous deleveraging in the private sector. Though the U.S. housing market is far from healed, the swift adjustment in home prices and building activity may have the sector poised for broad-based stabilization, which would relieve balance sheet pressure on U.S. banks and households. (see *U.S. Housing: A Late Cycle Boost for the Economy?*, July 2011) In contrast, Japan’s property price decline continued for more than a decade, creating ongoing deleveraging pressures on the economy.
3. The U.S. corporate sector is healthy and contributing significantly to the economic expansion. Though job gains have remained tepid, businesses have added to payrolls and increased capital expenditures. In addition, the strong corpo-

**EXHIBIT 8: While both countries face demographic challenges, Japan’s working-age population will continue to shrink while the U.S. will see some growth.**



Japan data: 1980 to 2030. U.S. data: 1997 to 2043. Source: United Nations, Haver Analytics, FAM (AART) as of 12/31/11.

rate profitability is a positive leading indicator for both these trends to continue. In contrast, Japan's corporations began a sustained period of deleveraging during the mid-1990s, and muted corporate profitability throughout the lost decade contributed to the overall malaise. The prolonged slump in Japan's post-bubble stock market and commercial real estate sector reinforced the negative impact on corporate balance sheets through continued asset deflation.

4. Largely due to the Fed's extraordinary efforts, the U.S. backdrop exhibits less deflation than Japan's. Quantitative easing in the U.S. helped weaken the dollar and counter falling monetary velocity, with inflation reaching more than 3% three years after the crisis.<sup>14</sup> Today, short-term real interest rates are decidedly negative and the Fed appears poised to provide more monetary assistance if necessary. Japan was not as fortunate. Its monetary stimulus was insufficient to counter a collapsing money multiplier, its real effective exchange rate rose, and short-term real interest rates remained positive for more than five years after the property market peak. At the same point as the U.S. is today (three years post-bubble), Japan's inflation rate was below 1% and on its way toward more-pronounced deflation in the mid-to-late 1990s.<sup>15</sup> While inflation is not an economic cure, more-active monetary policy has likely had some positive impact, including boosting U.S. asset prices, which has helped counter deflationary pressures. As a result, the U.S. does not appear to be following along Japan's deflationary path.

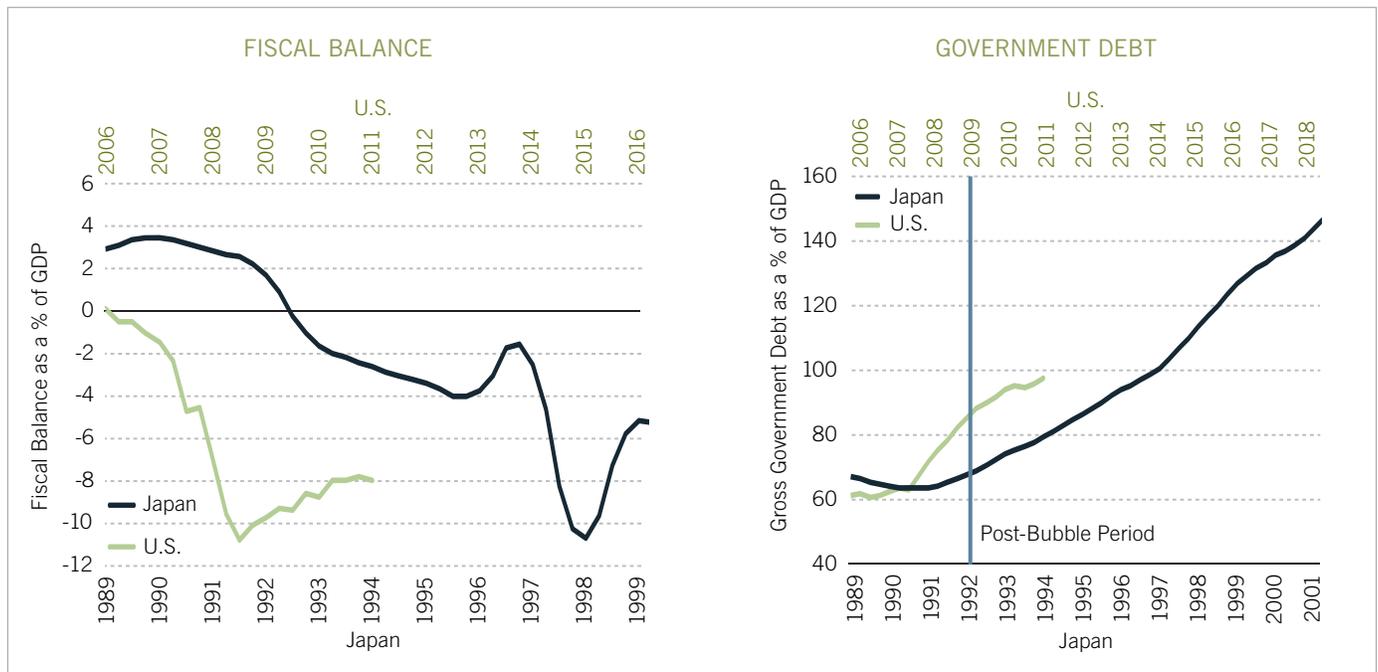
5. While U.S. demographics are following a negative trend similar to Japan, the U.S. demographic outlook is considerably better. The growth in its working-age population—albeit at a much slower rate than in the past—implies demographics will continue to remain supportive of real GDP growth and not as a headwind as in Japan.

### Fiscal trajectory is the most worrisome comparison

The deterioration in the U.S. fiscal picture and the country's dependence on foreign capital to finance its rising debt levels have yet to produce a financial crisis, but that does not imply it is out of the woods yet. In fact, the trajectory of U.S. government debt during its post-bubble period is perhaps the most pronounced similarity to the Japanese experience and represents the biggest threat of a Japan-like outcome for the U.S.

Both Japan and the U.S. entered their post-bubble periods in manageable fiscal positions, with government gross debt-to-GDP ratios of 63% and 71%, respectively (see Exhibit 9, below). The U.S. financial crisis triggered an abrupt fiscal deficit increase, which rose to 11% by 2009. Japan went from a roughly balanced budget in 1991 to a deficit of 3% of GDP by 1994, which jumped to 10% in 1997 in association with its financial crisis and bank recapitalization program. In both countries, slower economic growth, lower inflation, and increased fiscal expenditures created wider and more-persistent deficits than normal.

EXHIBIT 9: The U.S. quickly incurred sizable deficits to help stimulate the economy, while Japan reacted much slower. The worrying trend for the U.S. is the sharp rise in overall government debt to ever-higher levels.



Source: Organization for Economic Cooperation and Development (OECD) as of 12/31/11.

Accordingly, debt-to-GDP levels climbed markedly. Japan's gross debt rose from 63% to 150% in 2002 (and 212% as of this writing), while U.S. gross debt rose from 71% in 2007 to 98% in 2011 (see Exhibit 9, page 6). The current debt-to-GDP ratio likely understates the gravity of the U.S. outlook, based on projections for unfunded liabilities ranging from government-sponsored enterprises to Medicare and other entitlement spending.

The intractability of rising debt-to-GDP levels constrains the flexibility of U.S. policymakers in dealing with the slow-growth environment. Japan's intermittent attempts to follow policy easing with a quick return to austerity sometimes contributed to short-circuiting recoveries, as it did when it raised taxes in 1997. The U.S. faces a significant fiscal drag beginning in 2013 when tax cuts expire and spending is reduced under current law. Combating weak economic growth while stabilizing debt-to-GDP at a sustainable level is a difficult balance and raises the risk that a slow-growth environment may be tipped into recession.

Rising public debt burdens also may mitigate the productive capacity of the economy over time. Growing fiscal problems weigh on the confidence of businesses, investors, and consumers, as concerns mount that government policies are unsustainable and may spur tax increases or other adverse regulatory changes. Higher public debt issuance may crowd out private-sector borrowing, potentially causing businesses to reinvest at a slower rate, with negative repercussions for productivity. It also raises the risk that budget pressures may cause a shift away from productivity-enhancing government investments, such as infrastructure and research and development, in order to meet higher entitlement spending for aging populations.

For Japan, these pressures resulted in a two-decade debt-to-GDP ratio increase that rose higher than any other major economy in the modern era. Because its government debt is overwhelmingly owned by its own citizens, Japan has been able to finance this borrowing without a corresponding rise in government bond yields. While this phenomenon is unlikely to last forever, it is not a luxury that the U.S. enjoys. So far, the dollar's status as the global reserve currency, in addition to deep and historically dependable Treasury markets, have allowed the U.S. to avoid higher interest rates despite its dependence on foreign borrowing and its deteriorating fiscal position and outlook. However, the U.S. must stabilize its medium-term debt-to-GDP outlook if it is to lower the risk of following Japan into a slow-growth debt trap. Otherwise, the U.S. may confront an environment where rising government indebtedness indefinitely constrains policy flexibility, dampens business and consumer sentiment, reduces productive public investment, and increases the risk of significantly higher taxes. There are a number of potential solutions that may help the U.S. in this regard.

For example, a comprehensive plan to place the U.S. fiscal outlook on a sustainable medium-term path could go a long way toward increasing policy flexibility in the near term. Such a plan would, by mathematical necessity, require reform of Medicare and other entitlement spending to bring their costs back in line with what will be realistically affordable given government revenue estimates. Tax reform is desirable as well. It could boost economic productivity by broadening the tax base, minimizing or removing targeted tax breaks, and increasing efficiencies rather than significantly increasing tax rates. Another important consideration is the mix of government spending. With large and increasing obligations to fund retiree entitlements, the temptation may be to drift away from investments that increase the productive capacity of the economy and provide a basis for higher future growth. In this respect, it is crucial that fiscal policy not neglect the more investment-oriented portions of government spending, such as research and development, education, and infrastructure. Such an approach is politically challenging and will require tough choices. But a middle-of-the-road approach that balances fiscal sustainability with productivity-enhancing reforms could go a long way toward ensuring that the U.S. does not follow Japan down a path of inexorably rising government indebtedness.

### **Investment implications**

Two decades since the end of Japan's meteoric economic rise, there remains little consensus among economists about the exact cause of its decline into an intractably slow-growth, deflationary environment. In the U.S., the aftermath of its credit bubble and subsequent financial crisis has dampened the economic recovery by damaging balance sheets, constraining credit growth, and exacerbating its medium-term fiscal challenges. In this period of slow repair, the risk that an economic shock could push the U.S. back into recession is higher than normal. Nevertheless, three years after its 2008 financial crisis, there is ample evidence that U.S. conditions are sufficiently different from Japan's. If present trends continue and the U.S. takes steps to stabilize its medium-term fiscal position, it should avoid a lost decade of economic growth.

If current sluggishness proves to be an extended period of recovery from an extreme financial crisis—as opposed to the initiation of a secular decline—the U.S. economy should provide an adequate medium-term backdrop for stocks and other economically sensitive domestic assets. Long-term economic growth expectations may be lower due to slower working-age population growth, but the still-positive worker growth rate and continued productivity gains should generate decent long-term GDP expansion. The health and competitiveness of the U.S. business sector, in addition to moderate stock valuations and a favorable profit outlook, stand in contrast to Japan's post-bubble environment and negative real equity performance during a two-decade bear market.

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Indices are unmanaged and you cannot invest directly in an index.

**Keep in mind that investing involves risk. The value of your investment will fluctuate over time and you may gain or lose money.**

<sup>1</sup> Source: Tokyo Stock Exchange, Standard & Poor's, Haver Analytics, FAM (AART) as of 12/31/11.

<sup>2</sup> Source: Werner, Richard. *New Paradigm in Macroeconomics: Solving the Riddle of Japanese Macroeconomic Performance*. Houndmills, Basingstoke, Hampshire: Palgrave Macmillan, 2005. Print.

<sup>3</sup> The S&P Case-Shiller 10 City Composite Home Price Index, a benchmark of housing prices in the U.S., is designed to measure the average change in home prices in a particular geographic market. It is calculated monthly and covers 20 major metropolitan areas (Metropolitan Statistical Areas or MSAs), which are also aggregated to form two composites – one comprising 10 of the metro areas, the other comprising all 20.

<sup>4</sup> Japan commercial real estate represented by the Commercial Urban Land Price Index of Six Large City Areas, an index based on estimated land prices in the district areas of Tokyo, Yokohama, Nagoya, Kyoto, Osaka and Kobe. Figures are compiled by the Japan Real Estate Research Institute and released on a semiannual basis in March and September.

<sup>5</sup> Source: Japan Real Estate Research Institute, Japan Ministry of Internal Affairs and Communications, National Association of Realtors, U.S. Census Bureau, Haver Analytics, FAM (AART) as of 12/31/10.

<sup>6</sup> Source: U.S. Census Bureau, Japan Ministry of Land, Infrastructure and Transport, Haver Analytics, FAM (AART) as of 12/31/11.

<sup>7</sup> Source: Source: Nihon Keizai Shinbun (Nikkei), Haver Analytics, FAM (AART) as of 12/31/1990. The TOPIX Composite Index is a free-float adjusted market capitalization-weighted index that is calculated based

on all the domestic common stocks listed on the Tokyo Stock Exchange First Section.

<sup>8</sup> The American Recovery and Reinvestment Act of 2009 went into effect on February 17, 2009, at an approximate cost of \$787 billion at the time of passage. Source: U.S. Government Printing Office, FAM (AART) as of 2/17/09.

<sup>9</sup> Source: U.S. Bureau of Labor Statistics, FAM (AART) as of 12/31/11.

<sup>10</sup> Source: Japan Ministry of Internal Affairs and Communications, FAM (AART) as of 12/31/11.

<sup>11</sup> U.S. home prices represented by the S&P Case-Shiller 10 City Composite Home Price Index. Japanese home prices represented by the Residential Urban Land Prices Index. Source: Standard & Poor's, Fiserv, MacroMarkets, Japan Real Estate Research Institute, Haver Analytics, FAM (AART) as of 9/30/11.

<sup>12</sup> U.S. commercial real estate represented by the Moody's/MIT Commercial Real Estate National Aggregate Index, a periodic same-property round-trip investment price change index of the U.S. commercial investment property market. Japan commercial real estate represented by Commercial Urban Land Price Index of Six Large City Areas. Source: Moody's, Massachusetts Institute of Technology, Japan Real Estate Research Institute, Haver Analytics, FAM (AART) as of 9/30/11.

<sup>13</sup> Source: Japan Cabinet Office, U.S. Bureau of Economic Analysis, Haver Analytics, FAM (AART) as of 9/30/11.

<sup>14</sup> Source: U.S. Bureau of Labor Statistics, FAM (AART) as of 12/31/11.

<sup>15</sup> Source: Japan Ministry of Internal Affairs and Communications, FAM (AART) as of 12/31/11.

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