

The U.S. Recovery from the Great Recession: A Story of Debt and Deleveraging

Brady Lavender and Nicolas Parent, International Economic Analysis

- The prolonged period of deficient demand in the United States following the Great Recession is unusual relative to past U.S. recessions, but is consistent with historical international experience in the aftermath of severe financial crises.
- Loose lending standards and relatively low interest rates in the pre-crisis period contributed to a sharp buildup in household debt. Subsequently, household deleveraging has been the most important factor holding back the recovery.
- While a large fiscal expansion helped to sustain aggregate demand during the crisis and its aftermath, the federal debt in the United States is currently on an unsustainable trajectory. The government sector now needs to delever, which will represent a drag on economic growth for years to come.
- Given Canada's close real and financial linkages with the United States, understanding the trajectory and characteristics of the U.S. recovery has important implications for the Canadian economy and thus monetary policy.

In December 2007, the U.S. economy entered its longest and deepest recession since the Great Depression. Historically, in the early stages of a recovery, U.S. GDP has typically grown at a faster rate than the potential growth rate of the economy, reflecting pent-up demand from businesses and consumers and some rebuilding of inventories. Deep economic downturns thus tend to be associated with stronger rebounds (Howard, Martin and Wilson 2011). However, the current recovery has been the weakest U.S. recovery in the postwar era. More than three years after the end of the recession, unemployment remains elevated and gross domestic product (GDP) per capita is still below its pre-recession levels.¹

Although the recovery from the 2007–09 recession is unusual relative to past U.S. recessions, the prolonged period of deficient demand in the United States is consistent with international historical experience in the aftermath

¹ This article contains information up to the end of January 2013.

of severe financial crises. Following such crises, most economies have a period of sluggish growth as households, firms and governments reduce their debt loads (IMF 2012; Reinhart and Rogoff 2008). This is particularly true when severe financial crises are associated with housing booms and busts.

In this article, we explore the reasons why the U.S. recovery has been particularly slow relative to all other postwar-era recoveries in the United States. While U.S. fiscal policy uncertainty, global imbalances and the ongoing European debt crisis have all restrained the recovery, the primary story is one of debt and deleveraging. In the years leading up to the crisis, an easing of lending standards and relatively low long-term interest rates contributed to a sharp buildup in household debt. Subsequently, unsustainable household spending and debt levels combined with a considerable drop in asset prices left consumers in a vulnerable position, making balance-sheet repair a necessity. While a large fiscal expansion in the public sector helped to sustain aggregate demand in the face of private deleveraging, further restraint will take place in coming years as the government sector reduces its deficit to return public debt levels to a sustainable path.

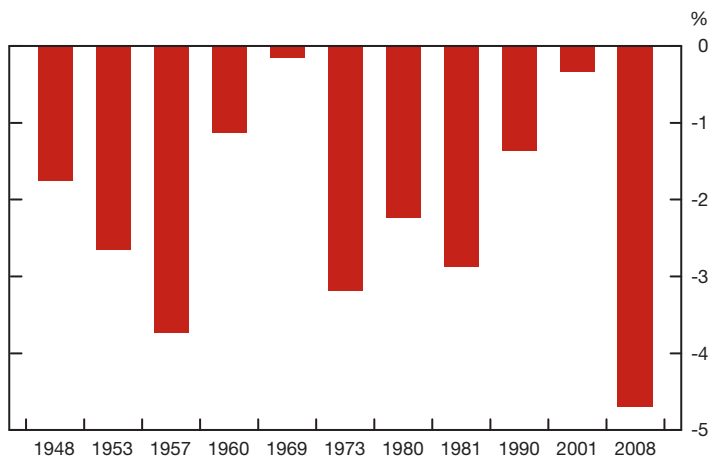
Consistent with the weak U.S. recovery, more than three years after the end of the recession, Canadian exports remain 9 per cent below their pre-recession peak. Given Canada's close real and financial linkages with the United States, understanding the trajectory and characteristics of the U.S. recovery has important implications for the Canadian economy and thus monetary policy.

◀ *Understanding the trajectory and characteristics of the U.S. recovery has important implications for the Canadian economy and thus monetary policy*

The Great Recession: Deep and Prolonged

The Great Recession in the United States started in December 2007 and lasted for 18 months. Over that period, U.S. real GDP fell by 4.7 per cent, making the recession the longest and deepest since the Great Depression (Chart 1).² U.S. residential investment plunged by almost 60 per cent from its peak in the fourth quarter of 2005 to its trough in early 2011; as a share of GDP, it dropped from 6.3 per cent in the fourth quarter of 2005 to only

Chart 1: Decline in real GDP, peak to trough, during postwar recessions in the United States

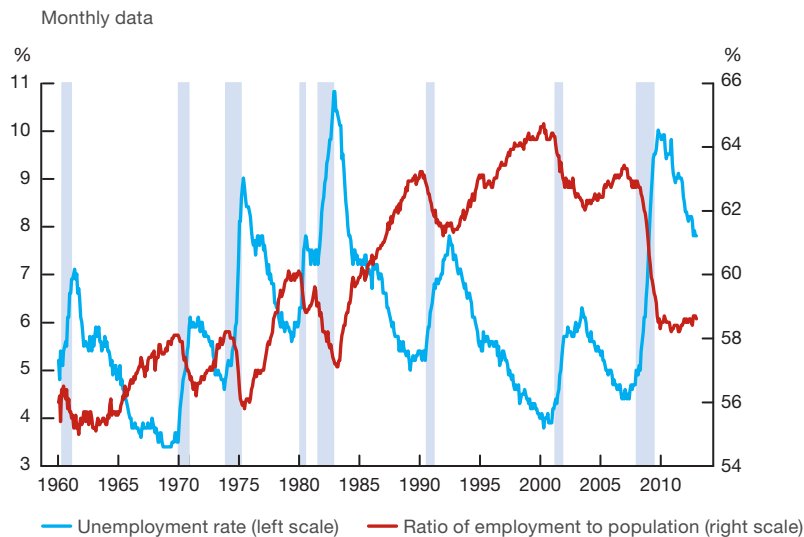


Note: The peak for the most recent recession was 2007Q4, and the trough was 2009Q2.

Source: U.S. Bureau of Economic Analysis

² Largely owing to strong linkages with the United States, Canada's GDP fell by 4.2 per cent, despite the absence of domestic deleveraging.

Chart 2: U.S. unemployment rate and the ratio of employment to population



Note: The shaded areas indicate recession periods.

Source: U.S. Bureau of Labor Statistics

Last observation: December 2012

2.3 per cent in late 2011. Consumer spending, exports and business investment also fell sharply during the recession, with the latter declining by 24 per cent from its previous high.

The Great Recession resulted in the loss of over 8.5 million jobs, sending the unemployment rate to 10 per cent (Chart 2).³ When all marginally attached workers and those who work part time for economic reasons are included, the broader measure of the unemployment rate surged to 17 per cent, an unprecedented level for the postwar era.

Despite the severity of the recession, the recovery and following expansion were disappointingly slow relative to other U.S. recoveries, but were in line with the Big Five modern financial crises experienced elsewhere (Chart 3).⁴ Growth in GDP has averaged only a little more than 2 per cent per year since the end of the recession and U.S. per capita GDP has yet to recover its pre-recession level.⁵ The ratio of employment to population, which fell to its lowest level since 1983, has shown minimal improvement since its trough in 2010. Moreover, long-term unemployment remains a significant concern. In December 2012, almost 40 per cent of the 12.2 million unemployed had been looking for work for more than 26 weeks. Although the current episode has been the weakest of postwar-era U.S. recoveries, a comparison with the Great Depression shows that the situation could have been much worse. An extraordinary coordinated policy response, both from monetary and fiscal authorities, prevented a much deeper recession (Kozicki, Santor and Suchanek 2011).

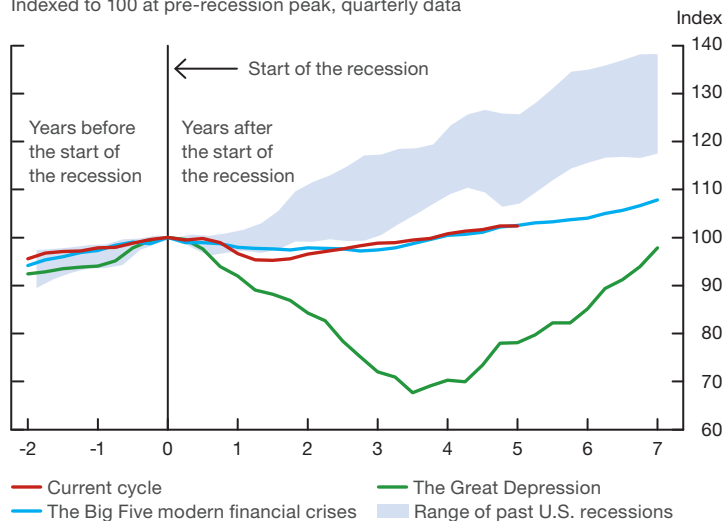
³ Cuts to private sector employment were relatively broad based; however, the construction industry was hit particularly hard because of the decline in the housing market.

⁴ The Big Five financial crises, as discussed in Reinhart and Rogoff (2008), are Spain (1977), Norway (1987), Finland (1991), Sweden (1991) and Japan (1992).

⁵ In the January 2013 *Monetary Policy Report*, the Bank of Canada projects that the U.S. recovery will take about 5 years from the trough of the recession to reach its pre-crisis level (on a GDP per capita basis). An examination of previous U.S. systemic financial crises shows that GDP per capita returned to its pre-recession peak 5 to 11 years after the crisis (Reinhart and Rogoff 2012). The dates of these system-wide financial crises in the United States are 1873 (5 years), 1892 (5 years), 1907 (6 years) and 1929 (11 years).

Chart 3: Real GDP compared with the Big Five financial crises and the Great Depression

Indexed to 100 at pre-recession peak, quarterly data



Note: The Big Five modern financial crises, as described in Reinhart and Rogoff (2008), are Spain (1977), Norway (1987), Finland (1991), Sweden (1991) and Japan (1992).

Sources: U.S. Bureau of Economic Analysis, Organisation for Economic Co-operation and Development, Gordon and Krenn (2010), and Bank of Canada calculations

Last observation: 2012Q4

One of the biggest differences between the current and past economic recoveries in the United States is the behaviour of the household sector. Personal consumption and residential investment grew more slowly following the Great Recession than in any other postwar recovery in the United States (Chart 4 and Chart 5). Since household spending represents close to 70 per cent of U.S. GDP, weak growth in this sector has largely determined the path of the overall economic recovery.⁶ In the fourth quarter of 2012, real U.S. GDP was US\$1.9 trillion below the level that would be consistent with the average path of past U.S. recessions, with US\$1.3 trillion attributable to lower consumer spending.

Debt, Deleveraging and Their Implications for the Recovery

The unusual weakness of the current recovery stems from the excessive leverage accumulated during the pre-crisis period, especially by U.S. households. The buildup of leverage is directly related to the observed global imbalances (Bernanke 2011; Carney 2011a). The combination of expansionary monetary and fiscal policies in advanced economies following the 2001 recession, together with undervalued exchange rates and high savings rates in some emerging-market economies, led to massive capital flows and large global current account imbalances.⁷ The United States, in particular, ran a large and persistent current account deficit during the pre-crisis period, since some emerging-market economies resisted appreciation of their currencies by accumulating substantial U.S.-dollar reserves. These large inflows of foreign savings contributed to very low, long-term interest

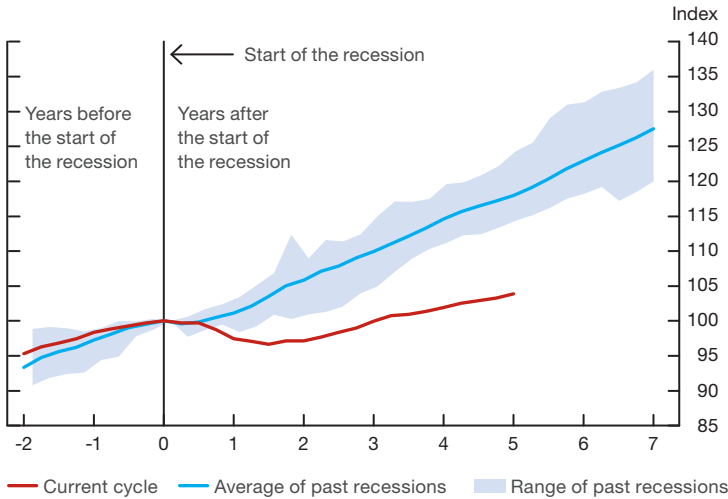
◀ *The unusual weakness of the current recovery stems from the excessive leverage accumulated during the pre-crisis period, especially by U.S. households*

⁶ Unlike consumption and residential investment, business investment has grown at an above-average pace after hitting its trough in 2009. Still, given the severity of the correction observed in that sector during the Great Recession, business investment has yet to recover its pre-recession peak. The high level of global uncertainty and the significant slack remaining in the economy are important factors restraining business investment.

⁷ Studies show that a persistent deterioration in the current account appears to increase the probability of a financial crisis (Reinhart and Rogoff 2008).

Chart 4: Personal consumption

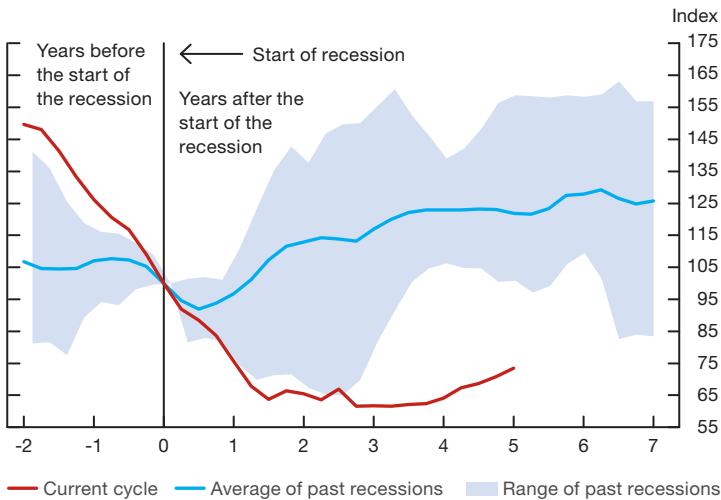
Indexed to 100 at pre-recession peak of GDP, quarterly data



Sources: U.S. Bureau of Economic Analysis and Bank of Canada calculations Last observation: 2012Q4

Chart 5: Residential investment

Indexed to 100 at pre-recession peak of GDP, quarterly data



Sources: U.S. Bureau of Economic Analysis and Bank of Canada calculations Last observation: 2012Q4

rates, and the surplus of available funds fostered intense competition for borrowers, which led to cheap credit, significantly looser lending standards and excessive leverage. Indeed, these savings inflows exposed and exploited the weaknesses in the U.S. regulatory and supervisory framework. The increased flow of foreign capital pushed down the yield on Treasury bonds and other fixed-income securities classified as low risk, leading investors to consider alternative investments in a broad search for yield.⁸

⁸ Investors substituted government bonds with mortgage-backed securities and other complex financial instruments that pooled together individual loans. Many of these securities were initially seen as relatively safe investments (i.e., with AAA ratings). Mortgage lenders were able to underwrite risky subprime loans and insulate themselves from the associated risk by securitizing these mortgages, i.e., packaging them into complex financial securities and selling them. Partly as a result of the moral hazard problem inherent in the securitization process, numerous bad loans were issued, causing these mortgage-backed securities to be much riskier than market participants had originally anticipated.

In most cases, these funds were not directed toward investments that would increase the productive capacity of the economy, but toward housing and consumption as households took on more debt, leaving their balance sheets vulnerable and house prices at unsustainable levels.⁹ This is not uncommon: research has shown that capital inflows are often correlated with house prices (Sá, Towbin and Wieladek 2011).

Household sector

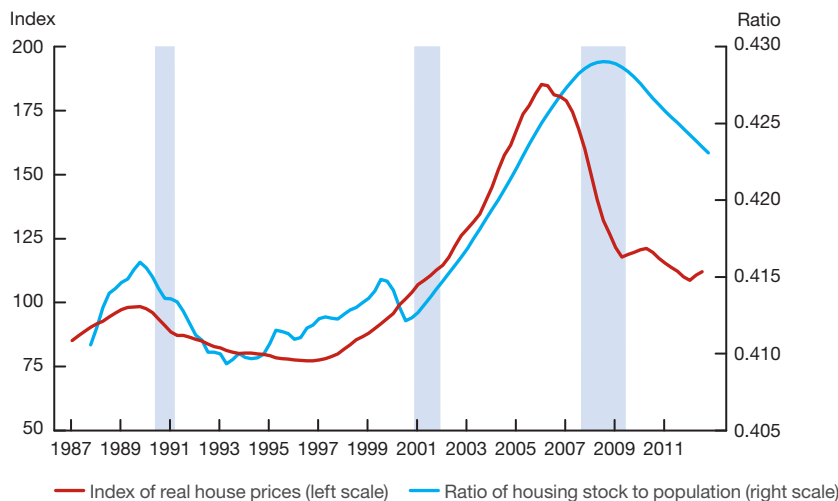
Before the Great Recession, cheap and readily available credit led to stronger demand for real estate assets. This demand contributed to a significant appreciation in real house prices—by roughly 90 per cent from early 2000 to their peak in the first quarter of 2006 (Chart 6), which represented the highest level of real U.S. house prices in the postwar period.

The increasing value of real estate assets reinforced the leverage cycle, since households had to take on more debt to finance real estate purchases. Furthermore, as overvalued real estate assets boosted household net worth, consumers were borrowing against the value of their homes to increase their consumption of other goods, resulting in additional leverage through home-equity lines of credit. Mian and Sufi (2010) find that, from 2002 to 2006, homeowners borrowed between 25 cents and 30 cents per dollar against the rising value of their home equity, and argue that this credit was likely used primarily for real outlays rather than to pay down debt subject to higher interest rates. Holdings of mortgage debt increased by about US\$5.7 trillion between 2000 and 2007; as a result, the household debt-to-income ratio increased by roughly 0.45, peaking at 1.64 (Chart 7).¹⁰ As Carney (2011b) notes, “complacency among individuals and institutions, fed by a long period of macroeconomic stability and rising asset prices, made this remorseless borrowing seem sensible.”

◀ Before the Great Recession, cheap and readily available credit led to stronger demand for real estate assets

Chart 6: Real house prices and the ratio of housing stock to population

Total housing stock over resident population (4-quarter moving average); real S&P/Case-Shiller home price index deflated with personal consumption expenditure, 2000 = 100, quarterly data

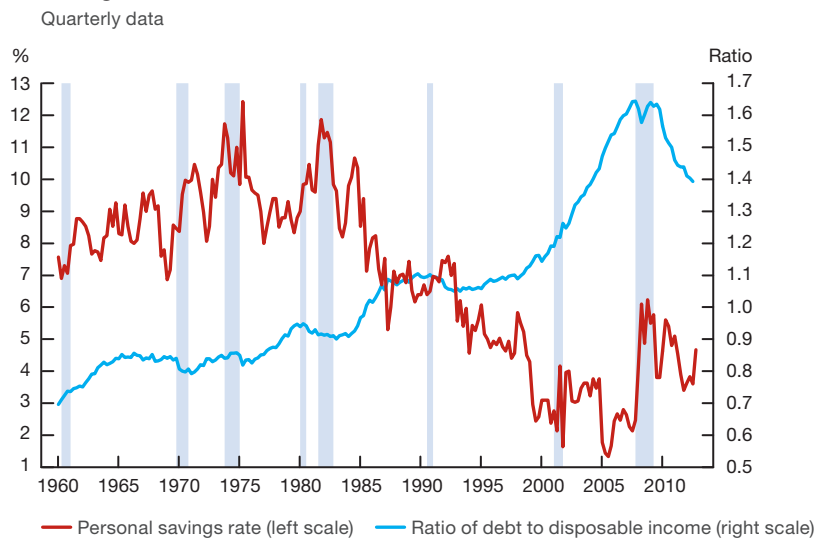


Note: The shaded areas indicate recession periods.

Sources: U.S. Census Bureau, U.S. Bureau of Economic Analysis, Standard & Poor's, Haver Analytics and Bank of Canada calculations. Last observations: real house prices, 2012Q3; housing stock/population, 2012Q4

⁹ Highly developed mortgage markets with an abundance of securitization, as well as competitive banking sectors, such as those in the United States, strengthen these links through the financial-accelerator mechanism, in which negative financial market shocks restrain economic growth through a self-reinforcing adverse feedback loop.

¹⁰ The U.S. household debt-to-income ratio is calculated to be consistent with the Canadian definition.

Chart 7: Ratio of household debt to disposable income and personal savings rate

Note: The shaded areas indicate recession periods. The ratio of U.S. debt to disposable income includes the unincorporated business sector.

Sources: U.S. Bureau of Economic Analysis and Federal Reserve Board

Last observations: savings rate, 2012Q4; debt-to-income ratio, 2012Q3

Deterioration of household balance sheets

Despite the massive accumulation of debt, the ratio of household debt to assets was relatively stable, since both house prices and stock prices were increasing significantly, masking the growing vulnerability of household balance sheets. Nominal house prices started declining in 2006, and by the autumn of 2007, it had become clear to global investors that risk in the U.S. subprime mortgage market had been mispriced and there was considerable excess supply in the housing market (Chart 6). Investor demand for mortgage-backed securities collapsed, restraining the supply of funds at financial institutions. House prices fell sharply and mortgage defaults and foreclosures rose rapidly. From its peak of about US\$67 trillion in the third quarter of 2007, household wealth decreased by 24 per cent to a trough of US\$51 trillion in the first quarter of 2009. Consequently, household net worth as a share of disposable income experienced its largest drop in the postwar era, reaching its lowest level since 1992 (Chart 8).

The severe repricing of risk and the opacity associated with complex financial instruments backed by mortgages led to concerns about the potential exposure of banks to these risky assets. Fear of future defaults and foreclosures led to a sharp contraction in interbank lending and an extreme tightening of lending standards for both consumers and businesses. The United States suffered a severe credit crunch that resulted in the deterioration in macroeconomic conditions, which amplified the number of foreclosures, leading to an adverse feedback loop between the real economy and the financial sector.

◀ *Fear of future defaults and foreclosures led to a sharp contraction in interbank lending and an extreme tightening of lending standards*

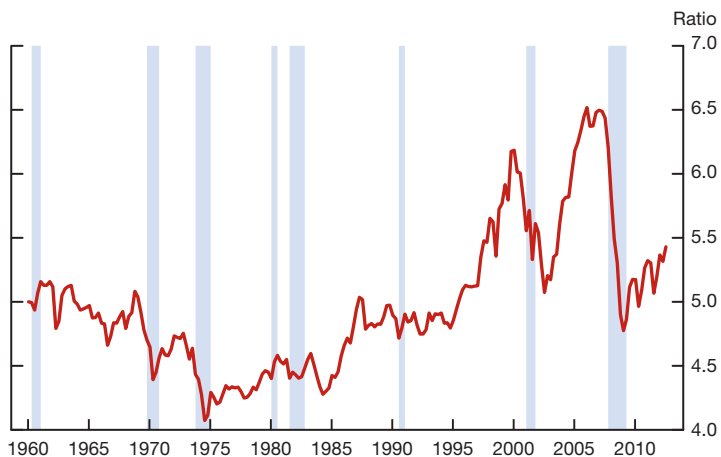
The household deleveraging process

Households have been forced to delever in an effort to repair their balance sheets, because (i) they accumulated an unsustainable amount of debt (Chart 7) and (ii) they needed to rebuild some of their unprecedented loss of wealth (Chart 8).

◀ *Households have been forced to delever in an effort to repair their balance sheets*

Chart 8: Ratio of household net worth to disposable income

Quarterly data



Note: The shaded areas indicate recession periods.

Sources: Federal Reserve Board and U.S. Bureau of Economic Analysis

Last observation: 2012Q3

The level of nominal household debt in the United States has experienced unprecedented declines since 2009 (Chart 9), driven by a mixture of debt payments and defaults, principally on mortgages.¹¹ It is difficult to determine an optimal level for household debt; however, relative to disposable income, the current ratio of roughly 140 per cent remains historically high, despite a decline of about 25 percentage points since its peak. While this decline represents significant progress in the deleveraging process, deleveraging is expected to further dampen household spending.

The loss of net worth experienced by households during the Great Recession can be recovered through a combination of increased savings (used to pay down debt or acquire new assets) and rising prices for houses and financial assets. While the value of financial assets has rebounded since the Great Recession, the level of house prices remains depressed.¹² Thus, households have sharply increased their savings, which has depressed consumption (Chart 7).¹³ In addition to compensating for the loss of wealth, the rise in savings reflects several other factors, such as households taking precautionary measures against future shocks, as well as banks' unwillingness to make loans (this is consistent with the observed sharp decline in consumption of durable goods during the recession, which was heavily driven by the availability of credit). Historically, highly indebted households will cut consumption more than less-indebted households, given the same decline in house prices. For example, Dynan (2012) finds that the extent of a household's leverage will affect consumption above and beyond a household's usual reaction to a change in wealth. Overall, there was negative growth in consumption for seven quarters since 2007, with a decline of roughly 3.4 per cent peak to trough, the largest in the postwar era (Chart 4). Moreover, since the end of the recession, consumption growth has averaged only 2.1 per cent. Jordà, Schularick and Taylor (2011) suggest that private deleveraging will reduce GDP growth by roughly 0.75 percentage points over the 2012–14 period.

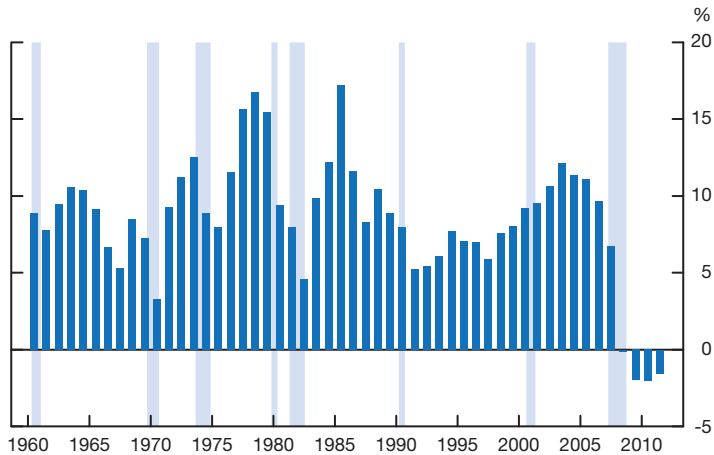
¹¹ McKinsey Global Institute (2010) estimates that two-thirds of the decline in household debt has been driven by defaults, and one-third by households paying down their debt.

¹² Total household assets currently comprise one-third real estate assets and two-thirds financial assets.

¹³ The level of the savings rate, however, remains low relative to the average from 1960 to 1980.

Chart 9: Growth in nominal household debt in the United States

Annual data



Note: The shaded areas indicate recession periods.

Source: Federal Reserve Board

Last observation: 2011

The future behaviour of asset prices, particularly house prices, will significantly influence the extent of deleveraging necessary for households to recover their desired net worth, since a robust recovery in real estate prices could limit the need for future deleveraging. On the other hand, public sector deleveraging, resulting in both higher taxes and lower government expenditures (including direct transfers to households), is expected to restrain the incomes of households and growth in GDP.

The lingering drag from a depressed housing sector

Modern U.S. recessions have often been the result of monetary policy tightening undertaken with the objective of reducing inflation (or keeping it under control). This policy tightening frequently resulted in a weak housing market; however, as monetary policy normalized, the economy benefited from a strong rebound in the housing sector and the positive wealth effect associated with increases in house prices. Multiplier effects amplify the positive impact on growth in GDP because of the purchase of goods and services associated with buying a home.

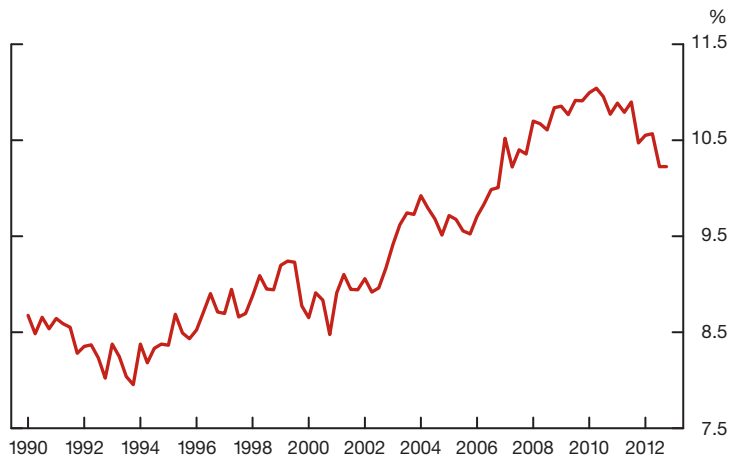
But this recovery is different. Unlike many previous U.S. recoveries, GDP growth continues to be restrained by ongoing weakness in the housing sector, since the initial negative shock largely originated in the housing market and not from restrictive monetary policy. Although some improvement in the real estate sector has been observed in recent quarters, the level of residential investment is half of its pre-recession peak and house prices remain depressed. Many factors related to the causes of the financial crisis will continue to put downward pressure on the housing market and the economy.¹⁴

The current recovery was slowed by extraordinarily tight lending standards and credit rationing that obstructed the issuance of mortgage debt, despite low interest rates. In addition, a large percentage of borrowers (more than 20 per cent, according to CoreLogic) still have mortgages that exceed the

¹⁴ An indirect effect of the depressed housing sector was observed at the state and local government levels. Declines in house prices have reduced government revenues and contributed to the elimination of roughly 700,000 state and local government jobs. In recent quarters, however, this sector has stabilized and should not constitute a significant drag on growth.

Chart 10: Vacant housing units in the United States

Year-round vacant housing units as a percentage of total units, quarterly data



Sources: U.S. Census Bureau and Bank of Canada calculations

Last observation: 2012Q4

current market value of their homes. These negative-equity positions (often described as being “underwater”) make it difficult for households to sell their homes or refinance their existing mortgages to take advantage of low interest rates. Also, many households that defaulted on their mortgages will be shut out of the housing market for years.

Oversupply in the housing sector is another important factor restraining growth. Before the financial crisis, the appreciation of real house prices coincided with a surge in building activity: between 2002 and 2006, housing starts averaged close to two million units annually, a level that surpassed the rate of household formation. This overbuilding, combined with the still-elevated stock of foreclosed homes, led to the significant oversupply. While progress has been made, housing-unit vacancies remain elevated from a historical perspective (Chart 10). This vacancy rate diminishes the need for new housing investment and will continue to put some downward pressure on prices in the near future.

◀ *Oversupply in the housing sector is another important factor restraining growth*

Firms**Financial firms**

As previously discussed, the U.S. financial sector played a crucial role in the recent crisis, enabling the rapid increase in household leverage. The subsequent deleveraging of financial firms has also had an impact on the recession and recovery.

Before the crisis, financial firms increased their leverage by relying more and more on short-term market funding and less on deposits to finance their household credit operations. Similar to the situation observed in the household sector, because of a false assessment of asset quality and the growing shadow banking sector, based on their debt-to-asset ratios, U.S. commercial banks did not appear to be overly leveraged going into the financial crisis. During the crisis, however, the massive charge-offs associated with the deterioration of U.S. residential mortgages led to large capital losses for the financial system. Severe risk aversion and elevated estimates of counterparty risk resulted in a freezing of bank funding markets and a significant credit crunch, as rapid deleveraging took place in the financial sector.

A coordinated policy response to (i) inject capital into major financial institutions and (ii) provide liquidity as needed helped to alleviate pressure on the financial sector, partly reducing the need to shed assets and limiting further harm to the real economy. Without this response, the financial industry and the supply of loans would have contracted even more severely, resulting in a deeper and more severe recession. While U.S. banks have increased their capital substantially in recent years, various factors—including persistently elevated default rates, a congested foreclosure pipeline and uncertainty surrounding future house prices—continue to hold back the flows of mortgage debt typically seen during recoveries. More than four years after the collapse of this market, private-label mortgage securitization remains virtually non-existent. In general, however, the deleveraging process of financial firms is well advanced, and there are signs that lenders are increasing the supply of consumer credit, particularly for auto loans and other big-ticket consumer expenses.¹⁵

◀ *A coordinated policy response helped to alleviate pressure on the financial sector*

Non-financial firms

In sharp contrast to the debt held by households and financial firms, the level of non-financial business debt did not increase materially before the Great Recession, and therefore only a modest adjustment over the deleveraging cycle was required. In fact, growth in business debt in 2012 was roughly in line with its average over the past 20 years. Moreover, other financial metrics, such as the non-financial corporate quick ratio, which is a measure of liquidity, suggest that balance sheets are in relatively good shape. Overall, deleveraging in this sector is unlikely to be a significant drag on GDP growth.¹⁶ While total business investment remains weak relative to previous recoveries, this is mainly the endogenous response to weaker aggregate demand and elevated uncertainty, rather than the need for non-financial businesses to delever.

The government sector

As households deleveraged and private demand collapsed in the United States, the government sector played an important role in supporting aggregate demand by taking on more leverage. Fiscal stabilizers increased significantly during the recession, reflecting both a drop in tax receipts and increases in transfer payments, including unemployment insurance benefits, the Supplemental Nutrition Assistance Program and Medicaid. In addition, as the financial crisis intensified, important fiscal stimulus programs were enacted. For example, the American Recovery and Reinvestment Act, passed in February 2009, included direct spending on infrastructure and education, various tax incentives and the extension of unemployment benefits.

◀ *The government sector played an important role in supporting aggregate demand by taking on more leverage*

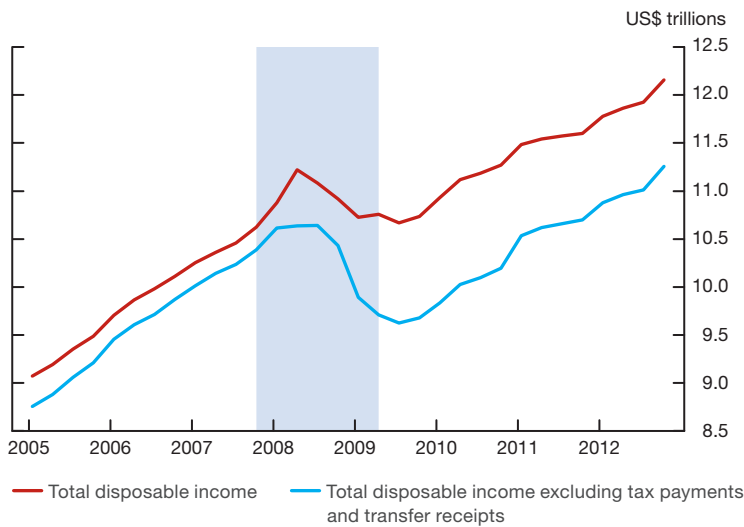
The government intervention significantly supported personal disposable income (**Chart 11**). Without the sharp increase in transfer payments and numerous tax breaks, the negative shock to household finances, consumption and the overall U.S. economy would have been much greater.

¹⁵ As of January 2013, the Federal Reserve's Senior Loan Officer Opinion Survey on Bank Lending Practices suggests an easing of credit standards across a number of industries.

¹⁶ One exception is the commercial real estate (CRE) sector, which has traditionally featured higher leverage ratios. Before the Great Recession, credit availability and relaxed underwriting standards contributed to a temporary surge in commercial property prices and the corresponding mortgage debt. Deleveraging of the CRE sector has restrained activity during the recession and over the recovery thus far.

Chart 11: Total personal disposable income and income excluding tax payments and transfer receipts

Quarterly data



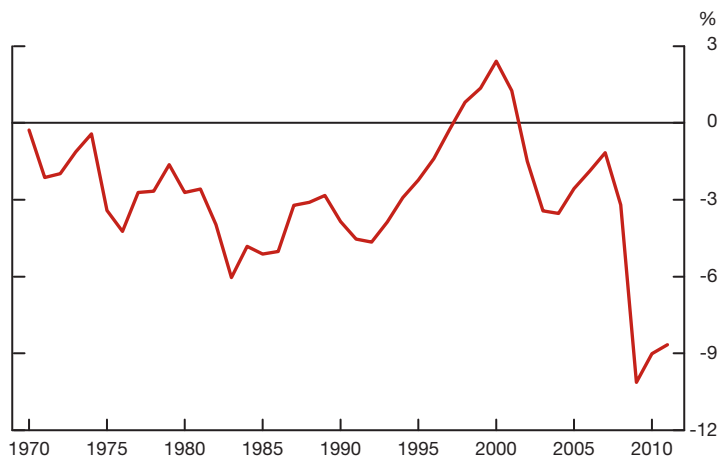
Note: The shaded area indicates the range of the 2007Q4–2009Q2 recession.

Source: U.S. Bureau of Economic Analysis

Last observation: 2012Q4

Chart 12: U.S. government budget balance as a percentage of GDP

Annual data



Sources: Congressional Budget Office and U.S. Bureau of Economic Analysis

Last observation: 2011

The downside of this significant public support is the large increase in government deficit and debt. The ratio of federal deficit to GDP, which averaged about 2.5 per cent in the three years leading up to the recession, peaked at 10 per cent of GDP in 2009, another postwar high (Chart 12). The Congressional Budget Office has estimated that the federal public debt reached 73 per cent of GDP in 2012, double its pre-recession level. As households delever, the government has taken on more debt, leaving the total debt-to-GDP ratio relatively unchanged.

With the federal debt in the United States now following an unsustainable trajectory, significant adjustments to public spending and revenue will be necessary, and the public sector deleveraging process will exert a drag on the economy for years to come.

◀ Significant adjustments to public spending and revenue will be necessary

Conclusion

The U.S. recovery from the financial crisis has been disappointingly slow relative to other U.S. recoveries. Many factors have played a role. The ongoing crisis in Europe and the debate around U.S. fiscal policy have undoubtedly increased the level of uncertainty and reduced the pace of economic activity. In addition, policies that have prevented the rotation of demand between surplus and deficit countries have likely prevented a more robust recovery in U.S. exports. Household deleveraging, however, has been the most important factor holding back the recovery. The government sector, which helped to sustain aggregate demand in recent years, now needs to deleverage as well. The impact of this public sector and private sector deleveraging will be felt over the coming years, suggesting that the U.S. economy is likely to remain on a moderate growth path for some time. Given Canada's close real and financial linkages with the United States, the weak U.S. recovery contributed to the slow rebound in Canadian exports. Looking forward, the moderate growth path of U.S. GDP projected in the January 2013 *Monetary Policy Report* will continue to have important implications for the Canadian economy and monetary policy.

Literature Cited

- Bernanke, B. S. 2011. "International Capital Flows and the Returns to Safe Assets in the United States, 2003–2007." Banque de France *Financial Stability Review* 15 (February): 13–26.
- Carney, M. 2011a. "Global Imbalances: The International Monetary System and Financial Stability." Banque de France *Financial Stability Review* 15 (February): 31–38.
- . 2011b. "Growth in the Age of Deleveraging." Speech to the Empire Club of Canada/Canadian Club of Toronto, Toronto, Ontario, 12 December.
- Dynan, K. 2012. "Is a Household Debt Overhang Holding Back Consumption?" Brookings Institution. Available at www.brookings.edu/~media/Files/Programs/ES/BPEA/2012_spring_bpea_papers/2012_spring_BPEA_dynan.pdf.
- Gordon, R. J. and R. Krenn. 2010. "The End of the Great Depression 1939–41: Policy Contributions and Fiscal Multipliers." National Bureau of Economic Research Working Paper No. 16380.
- Howard, G., R. Martin and B. A. Wilson. 2011. "Are Recoveries from Banking and Financial Crises Really So Different?" Board of Governors of the Federal Reserve System International Finance Discussion Paper No. 1037.
- International Monetary Fund (IMF). 2012. "Coping with High Debt and Sluggish Growth." *World Economic Outlook* (October).

- Jordà O., M. H. P. Schularick and A. M. Taylor. 2011. "When Credit Bites Back: Leverage, Business Cycles, and Crises." National Bureau of Economic Research Working Paper No. 17621.
- Kozicki, S., E. Santor and L. Suchanek. 2011. "Unconventional Monetary Policy: The International Experience with Central Bank Asset Purchases." *Bank of Canada Review* (Spring): 13–25.
- McKinsey Global Institute. 2010. "Debt and Deleveraging: The Global Credit Bubble and Its Economic Consequences." Available at www.mckinsey.com/insights/mgi/research/financial_markets/debt_and_deleveraging_the_global_credit_bubble_update.
- Mian, A. and A. Sufi. 2010. "The Great Recession: Lessons from Microeconomic Data." *American Economic Review* 100 (2): 51–56.
- Reinhart, C. M. and K. S. Rogoff. 2008. "Is the 2007 U.S. Sub-Prime Financial Crisis So Different? An International Historical Comparison." *American Economic Review* 98 (2): 339–44.
- . 2012. "This Time Is Different, Again? The U.S. Five Years After the Onset of Subprime." (22 October). Available at www.voxeu.org/article/time-different-again-us-five-years-after-onset-subprime-0.
- Sá, F., P. Towbin and T. Wieladek. 2011. "Low Interest Rates and Housing Booms: The Role of Capital Inflows, Monetary Policy and Financial Innovation." Bank of England Working Paper No. 411.