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CANADA

Household Indebtedness and Financial Vulnerability

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This report reviews the evolution of household indebtedness in Canada and assesses prospects for household financial vulnerability over the medium term. It should be noted that the assessment is based on financial indicators that represent economy-wide averages, which can mask wide variation across households.

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Executive Summary

This report reviews the evolution of household indebtedness in Canada and assesses prospects for household financial vulnerability over the medium term. The assessment, however, is based on financial indicators that represent economy-wide averages, which can mask wide variation across households. An assessment of financial vulnerability based on household microdata is beyond the scope of this report.

The indebtedness of Canadian households continues to trend higher. In the third quarter of 2015, total household debt (i.e., credit market debt plus trade payables) reached 171 per cent of disposable income. In other words, for every $100 of disposable income, households had debt obligations of $171. This is the highest level recorded since 1990.

- Among G7 countries, Canada has experienced the largest increase in household debt relative to income since 2000. Households in Canada have become more indebted than any other G7 country over recent history.
- Measured relative to household assets, household debt has moderated in recent years. In the third quarter of 2015, household debt accounted for 17.0 per cent of household assets. But this was still above the average of 15.4 per cent prior to the global financial crisis.
- Analysis conducted at the Bank of Canada suggests that low interest rates, higher house prices and financial innovation have contributed to the increase in household indebtedness.

Policymakers continue to express concern about the vulnerability of households to economic shocks, such as unexpected job loss or higher-than-expected interest rates. While the household debt-to-income ratio provides an indication of household indebtedness and facilitates international comparisons, it provides a limited measure of household financial vulnerability.

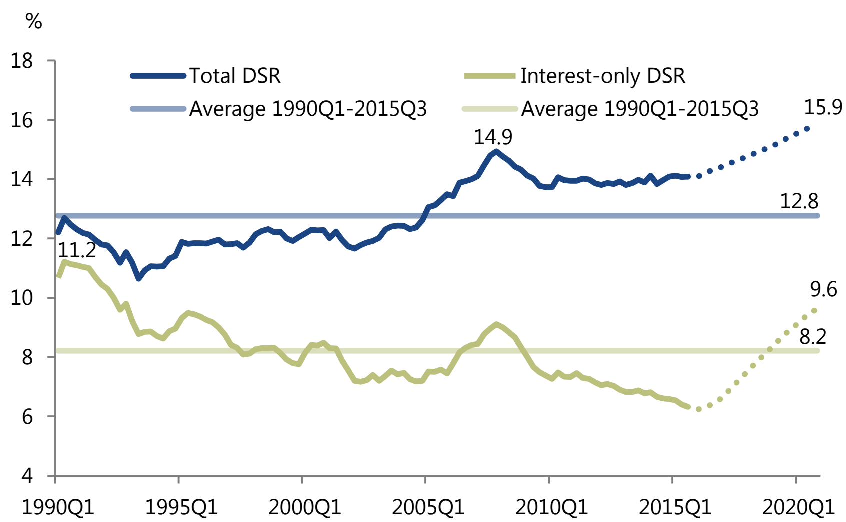
What matters more for financial vulnerability is not so much the level of the debt relative to income, but rather the capacity of households to meet their debt service obligations. A financially vulnerable household is one that is required to devote a substantial portion of its income to service its debt. It faces greater exposure to negative income and interest rate shocks, and is more likely to be delinquent in its debt payments.

Financial vulnerability is typically measured by the debt service ratio (DSR), that is, household debt payments expressed relative to disposable income. In this report, we adopt Statistics Canada's concept and measure of obligated debt payments, which includes required principal and interest payments, but excludes debt prepayments.

Based on PBO's November 2015 *Economic and Fiscal Outlook*, we project that household debt will continue to rise, reaching 174 per cent of disposable income in late 2016, before returning close to current levels by the end of 2020.

Household debt-servicing capacity will become stretched further as interest rates rise to "normal" levels over the next five years. By the end of 2020, the total household DSR, that is principal plus interest, is projected to increase from 14.1 per cent of disposable income in the third quarter of 2015 to 15.9 per cent.

Summary Figure 1 Household debt service ratios



Sources: Statistics Canada and Parliamentary Budget Officer.

Note: The projection period covers 2015Q4 to 2020Q4.

Based on PBO's projection, the financial vulnerability of the average household would rise to levels beyond historical experience.

- The projected increase in the total DSR to 15.9 per cent would be 3.1 percentage points above the long-term historical average of 12.8 per cent (from 1990Q1 to 2015Q3). It would also be almost one full percentage point above its highest level over the past 25 years, 14.9 per cent, which was reached in 2007Q4.

Analysis conducted at the Bank of Canada (see Djoudad (2012)) indicates that an increase in the DSR "would imply that households are more vulnerable to negative shocks to income or to interest rates, making household balance sheets more precarious and having a negative impact on financial institutions".

1. Introduction

The quarterly release of Statistics Canada's National Balance Sheet Accounts (NBSA) has attracted considerable attention in recent years as household debt relative to disposable income continues to trend higher, rising to its highest level in over 25 years. Indeed, policymakers continue to express concern about such high levels of household indebtedness:

> Canadian household debt levels also remain elevated relative to historical norms. While this is not a risk in and of itself, it does limit the contribution that consumption and residential investment can make to growth. Moreover, if there were a negative external shock to the economy, this could trigger deleveraging among those households holding higher levels of debt, leading to a commensurate impact on consumption and residential investment.
>
> –*Update of Economic and Fiscal Projections*
> Finance Canada, November 2015

> Household vulnerabilities could be exacerbated by a severe recession that is accompanied by a widespread and prolonged rise in unemployment. This could reduce the ability of households to service their debt and cause serious and broad-based declines in house prices.
>
> –*Financial System Review press release*
> Bank of Canada, December 2015

On its own, however, the debt-to-income ratio provides a limited measure of the financial vulnerability of households. Since households are not required to pay off all their debt in a given year, what matters more for financial vulnerability is not so much the level of the debt relative to income, but rather the capacity of households to meet their debt service obligations. This capacity is measured by comparing obligated debt service payments to household disposable income—the total debt service ratio (DSR).

Concerns about financial vulnerability are also particularly prominent in the current context given the recent economic weakness and the expectation that interest rates will rise in the coming years from their historically-low levels. Consequently, it is useful to examine how households' debt-servicing capacity may evolve as the Canadian economy recovers and interest rates return to "normal" or neutral levels.

This report reviews the evolution of household indebtedness in Canada and assesses prospects for household financial vulnerability over the medium term. It should be noted that the assessment is based on financial indicators that represent economy-wide averages, which can mask wide variation across households. An assessment of financial vulnerability based on household microdata is beyond the scope of this report.

In the remainder of this report, Section 2 examines trends in household indebtedness since the early 1990s. Section 3 incorporates household assets into the analysis and examines the evolution of household debt relative to assets. Section 4 presents and discusses trends in household debt-servicing capacity. The concluding Section 5 presents a medium-term outlook for household debt and debt-servicing capacity based on PBO's November 2015 *Economic and Fiscal Outlook*.

2. Household Debt

Statistics Canada identifies four major sources of household debt:

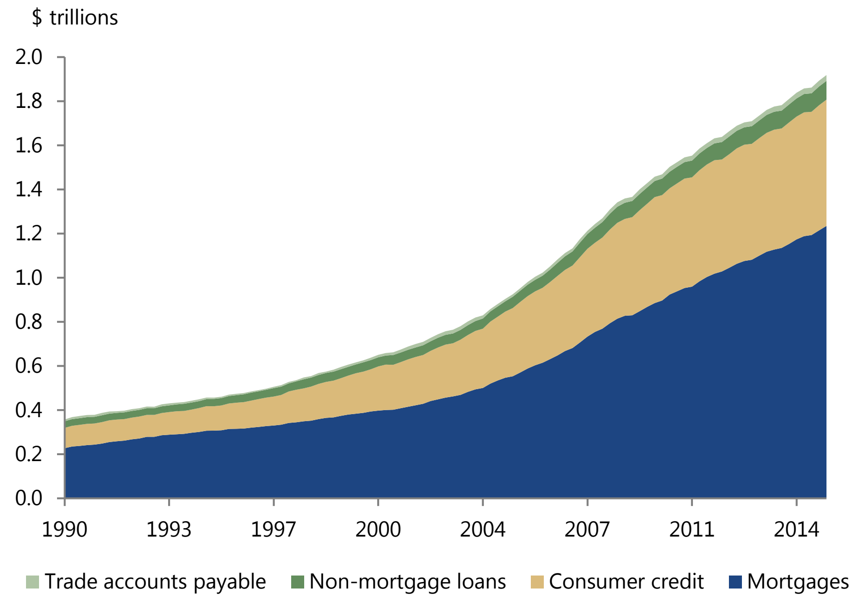
1. mortgages,
2. consumer credit,
3. non-mortgage loans and
4. trade accounts payable.

Mortgages are loans for the purchase of homes. Consumer credit includes loans for the purchase of consumer goods and other personal services, for example, a car loan or credit card debt. Non-mortgage loans are loans not intended for the purchase of consumer goods or personal services, for example, a loan to purchase securities. Finally, trade payables are short-term credit received in the ordinary course of business by suppliers of business goods and services.

Since 1991, household debt has increased each quarter, on average, by almost 7 per cent on a year-over-year basis, with the sharpest acceleration occurring over 2002 to 2008 (Figure 2-1). In the third quarter of 2015, household debt amounted to $1.9 trillion.

Over the past 25 years, the proportional breakdown of debt has remained broadly stable. On average, mortgages have represented about 63 per cent of households' total financial obligations; consumer credit, 29 per cent; and non-mortgage loans and trade accounts payable, 8 per cent.

Figure 2-1 The evolution of household debt



Source: Statistics Canada.

Household indebtedness is typically measured as the ratio of household debt to disposable income (see Box 2-1 for additional details).

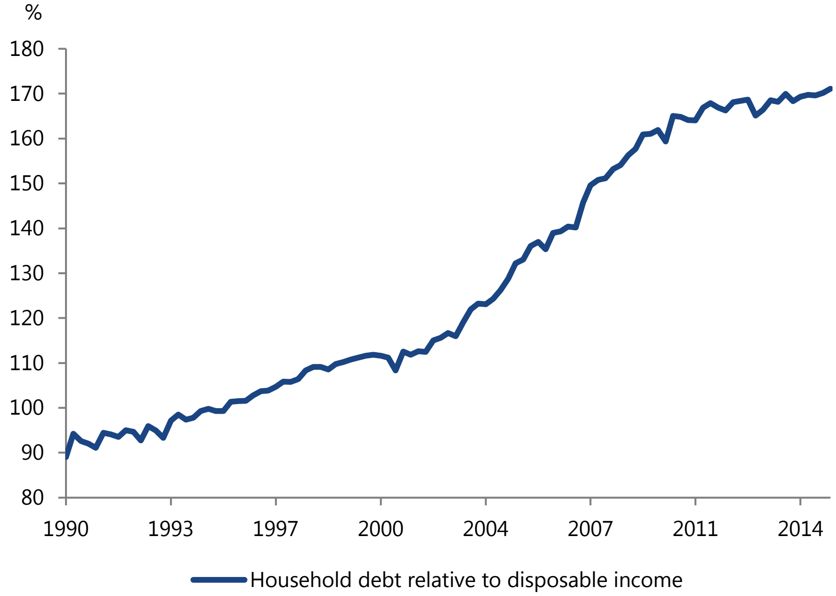
$$\text{Debt-to-income ratio} = \frac{\text{Total debt}}{\text{Disposable income}}$$

Over the past 25 years, total household debt obligations relative to disposable income have almost doubled (Figure 2-2). In the third quarter of 2015, household debt reached 171 per cent of disposable income. In other words, for every $100 in disposable income, households had debt obligations of $171. This is the highest level recorded since 1990 when the ratio was just under 90 per cent.

This increase in household indebtedness, which has risen sharply since the late 1990s, has been guided by a variety of factors. However, a comprehensive analysis of the underlying causes of this debt accumulation cannot be conducted using aggregate data alone.

In their microdata-based analysis of trends in households' indebtedness conducted at the Bank of Canada, Crawford and Faruqui (2012) noted that aggregate data "mask many important aspects of borrower behaviour". Microdata survey results, such as those from the Ipsos-Reid *Canadian Financial Monitor* of household balance sheets, or Statistics Canada's *Survey of Financial Security*, can provide a more complete picture of trends in household indebtedness.

Figure 2-2 Household debt relative to disposable income



Sources: Statistics Canada and Parliamentary Budget Officer.

Note: Household debt is comprised of total financial obligations (i.e., credit market debt plus trade payables). Disposable income is seasonally adjusted but unadjusted for pension entitlements.

Box 2-1 Measuring household indebtedness in the National Balance Sheet Accounts

Statistics Canada describes the National Balance Sheet Accounts (NBSA) as the “statements of the non-financial assets owned/used in the sectors of the economy and of the financial claims outstanding among the economic units in the sectors in the economy”.

In the household sector, financial claims consist of mortgages, consumer credit (loans for the purchase of consumer goods and services), non-mortgage loans (loans to purchase financial securities) and trade payables, which are typically the liabilities of unincorporated businesses. Credit market debt comprises mortgages, consumer credit and non-mortgage loans. Financial claims in the household sector are valued at book value.

To assist in the interpretation of the NBSA data and serve as a monitoring and evaluation tool, Statistics Canada constructs financial indicators, such as the ratio of household debt to disposable income.

Box 2-1 continued

Based on Statistics Canada's definition, disposable income includes employee compensation, net mixed income (see Note 1) and net property income (see Note 2), as well as net current transfers received from other sectors including the government sector. Net current transfers from the government are primarily Employment Insurance (EI) and public pension payments less income taxes, EI and public pension contributions.

Although Statistics Canada notes that household debt-to-income ratios can be calculated using total debt or credit market debt, the "headline" household debt-to-income ratio published in Statistics Canada's quarterly NBSA release is calculated as household credit market debt relative to a four-quarter moving sum of disposable income, unadjusted for seasonality but adjusted for pension entitlements.

This report uses a slightly broader definition of household debt "total financial obligations" (i.e., credit market debt plus trade payables) as well as seasonally-adjusted annualized household disposable income but unadjusted for pension entitlements.

Source: Statistics Canada's *Financial indicators from the National Balance Sheet Accounts available at*: http://www.statcan.gc.ca/pub/13-605-x/2012004/article/11730-eng.htm.

Notes: 1. For unincorporated businesses, net mixed income includes compensation of employees and a return on capital.

2. Net property income includes interest income received less interest income paid, royalties received on natural resources, dividends received less dividends paid.

Crawford and Faruqui (2012) examined some of these microdata and identified some underlying trends in household debt. They found that household borrowing was broadly consistent with the life-cycle hypothesis of consumption. That is, younger households borrow to smooth consumption, and use higher incomes later in life to pay off the debt.

Households headed by someone aged between 31 and 35 hold the highest levels of debt. The level of debt then steadily decreases as the age of the household head rises. Crawford and Faruqui (2012) concluded that the ageing of the population has had a "moderating" effect on growth in household debt.

However, these life-cycle effects have been more than offset by strong (positive) cohort effects. As Crawford and Faruqui (2012) noted,

> that is, for each stage of the life cycle, the mean level of household debt is systematically greater for cohorts born in later years. The widespread nature of the increases—across all age groups and in both mortgage and consumer credit—suggests that a variety of factors, such as low interest rates, higher house prices and financial innovation, have contributed to the growth in total household debt.

As interest rates have fallen, the demand for mortgage credit has increased, stimulating both house prices and household debt. The effective household borrowing rate has declined from 6.7 per cent in January 1999 to 3.1 per cent in December 2015 (Figure 2-3).

Figure 2-3 Household borrowing rates

Sources: Bank of Canada and Statistics Canada.

Despite the increase in house prices during this period, historically-low interest rates and growth in household incomes have helped to maintain the overall affordability of mortgages close to the average level observed prior to global financial crisis (Figure 2-4). Crawford and Faruqui (2012) suggested that changes to the affordability of mortgages have been a significant driver of the rise in mortgage credit since the 1990s.

Crawford and Faruqui (2012) noted that rising house prices increased total household debt levels in two ways:

1. By increasing the mortgages required for home buyers, and

2. By providing some households with more collateral for personal lines of credit (PLCs), encouraging higher consumer credit.

In fact, they found that between 1995 and 2011, PLCs increased from 11 per cent to 50 per cent of all consumer credit. Personal lines of credit are generally asset-backed, with homeowners able to use the value of their homes to secure the line of credit. Crawford and Faruqui (2012) also noted that financial innovation made it easier for households to access this type of borrowing, with increased marketing and an expanded range of these products occurring after the mid-1990s.

Figure 2-4

Bank of Canada index of housing affordability

Sources: Bank of Canada and Parliamentary Budget Officer.

Note: The Bank of Canada's affordability index is defined as the ratio of monthly housing-related costs (mortgage payments plus utility fees) to disposable income. The higher the level, the more difficult it is to afford a home.

The upward trend in household indebtedness is reflected in the debt-to-income ratio in other G7 countries, based on statistics compiled by the Organisation for Economic Co-operation and Development (OECD) (Figure 2-5). The OECD calculates household debt-to-income ratios for various countries as a standard measure of indebtedness for cross-country comparisons.

Within the G7, Canada has experienced the largest increase in household indebtedness, with household debt rising from 110 per cent of disposable income in 2000 to 166 per cent in 2014, according to OECD data. This is an increase of 56 percentage points, compared to an average increase of 13 percentage points for other G7 countries over the same period.[1]

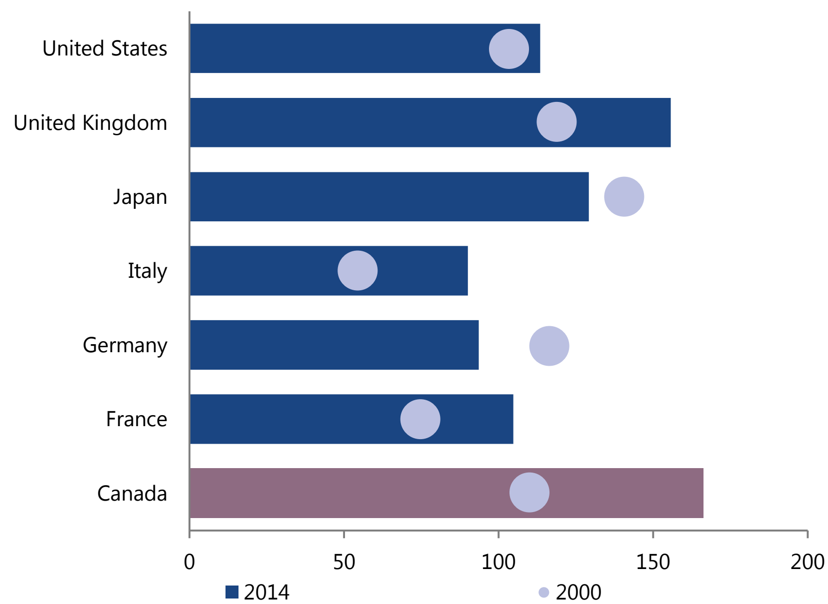
As a result of this above-average increase in the debt-to-income ratio, households in Canada have become more indebted than any other G7 country over recent history.

However, while the debt-to-income ratio allows for a comparison of household indebtedness across countries, it provides a limited perspective on the capacity of households to service their debt. Households could face high debt levels, but relatively low debt payments resulting from a low interest rate environment.

Further, as a measure of household indebtedness, the debt-to-income ratio compares household debt (a "stock" measure) to household disposable income (a "flow" measure). Borrowers need not pay off their entire stock of debt at once. Rather, they can gradually pay down their debt, typically over a period of several years.

Other indicators provide different perspectives. For example, the household debt-to-asset ratio provides a comparison between the (market) value of household assets and household debt, a comparison of two stock measures.

Figure 2-5 Household debt-to-income ratios in G7 countries (%)



Sources: OECD and Parliamentary Budget Officer.

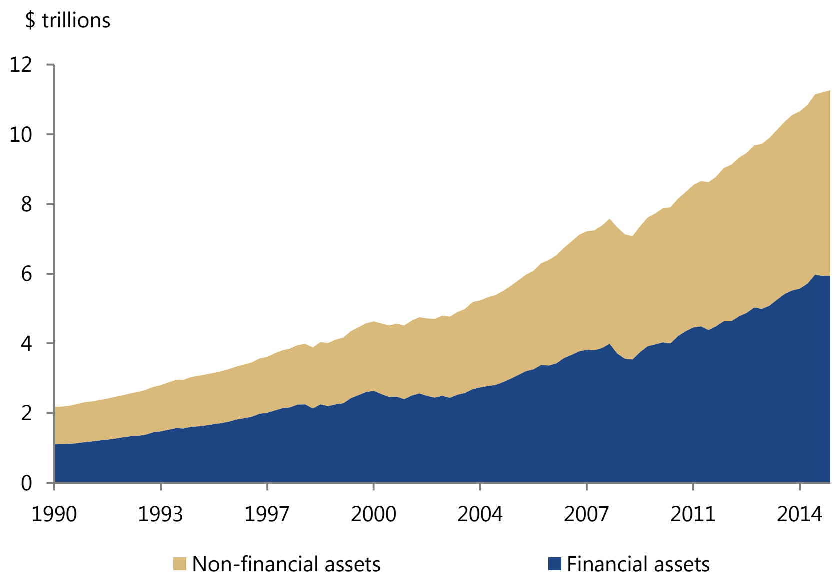
Note: OECD data for Japan is available only to 2013. The values shown for Japan correspond to 2000 and 2013.

3. Household Assets

When assessing household indebtedness, it is also useful to consider the purpose of debt. Debt is used to finance purchases, sometimes purchases of consumer goods and services, but also purchases of financial and non-financial assets. For many households, debt is used to finance the purchase of one particular asset, a home. It is therefore helpful to examine the evolution of the asset side of household balance sheets.

Total assets are divided almost evenly between financial and non-financial assets. They increased from $2.2 trillion in 1990 to $11.3 trillion (measured at market value) by the end of the third quarter of 2015 (Figure 3-1).

Figure 3-1 Financial and non-financial assets of households



Source: Statistics Canada.

Household financial assets consist of the following four broad categories:

1. life insurance and pensions,
2. equity and investment fund shares,
3. currency and deposits, and
4. other financial assets.[2]

Over the past 25 years, growth in financial assets has been fuelled by accumulation of equity and investment fund assets, with the relative shares of currency, deposits and other financial assets declining (Figure 3-2). This change in the mix of financial assets coincides with the trend decline in interest rates that began in the early 1990s, making investment funds more attractive than government bonds.

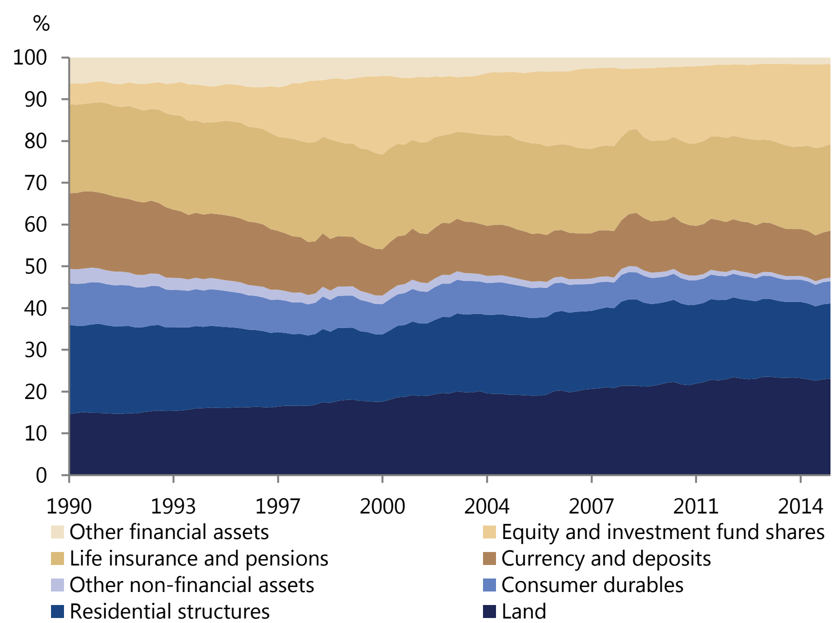
Non-financial assets of households consist of the following four broad categories:

1. residential structures
2. land
3. consumer durables, and
4. other non-financial assets.

As a share of non-financial assets, the proportion of land and residential structures has increased since 1990 (Figure 3-2). These two components represent homeowner property values. At the beginning of 1990, property values represented 73 per cent of all non-financial assets. By the end of 2014, this share had increased to 87 per cent.

After property, the remainder of household non-financial assets is almost entirely consumer durables. These durables are tangible items such as vehicles, appliances and furniture.

Figure 3-2 **Composition of household assets**



Sources: Statistics Canada and Parliamentary Budget Officer.

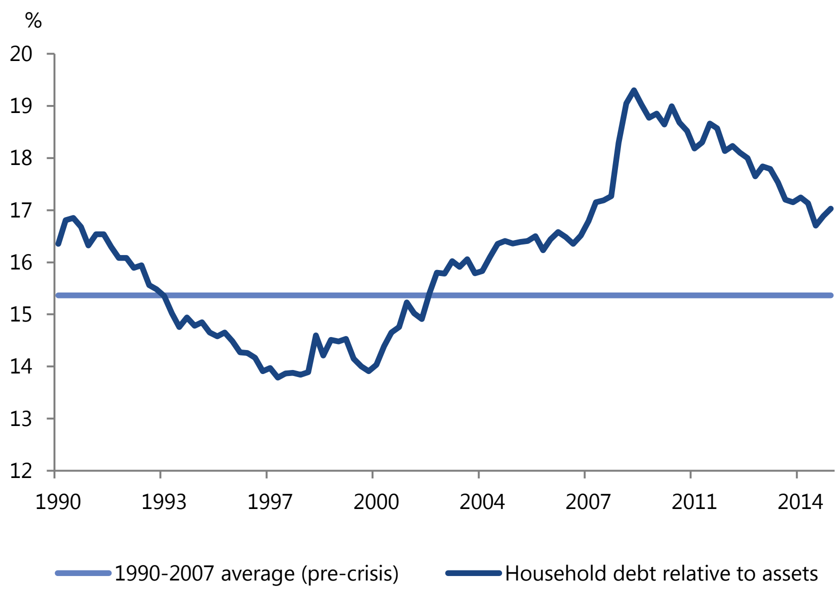
Examining how household debt compares to household assets provides a sense of how much households' assets have been financed by debt. This measure, called a leverage ratio, compares two stocks: a stock of debt and a stock of assets. An applicable leverage ratio for households is the debt-to-asset ratio and can be stated as:

$$\text{Debt-to-asset ratio} = \frac{\text{Total debt}}{\text{Total assets}}$$

An increase in the debt-to-asset ratio indicates that households are becoming more leveraged. Figure 3-3 shows the evolution of the debt-to-asset ratio over time. Since 1990, this measure has fluctuated between 14 per cent and 19 per cent.

The debt-to-asset ratio increased during the financial crisis as asset values declined. But it has been gradually returning to its pre-crisis average (15.4 per cent) as the accumulation of household debt has moderated and asset prices have rebounded.[3] In the third quarter of 2015, household debt accounted for 17.0 per cent of household assets.

Figure 3-3 Household debt relative to household assets



Sources: Statistics Canada and Parliamentary Budget Officer.

As the debt-to-asset ratio compares two stocks on household balance sheets, conceptually it provides a more appropriate measure of household indebtedness than the debt-to-income ratio. The actual measure, however, is susceptible to swings in house prices and stock market performance.

Further, this measure, like the debt-to-income ratio, provides a limited perspective on households' debt-servicing capacity—not all household debt must be repaid out of assets (or income) in a given year. Theoretically, if households have more assets than debt, they would be able to liquidate a portion of their assets to service their debt during a period of severe financial hardship.

However, residential property is not the most liquid of assets. Thus, as an indicator of financial vulnerability, the debt-to-asset ratio is somewhat lacking. It is possible to have a low debt-to-asset ratio, but still be vulnerable to negative income and interest rate shocks due to the illiquid nature of some assets.

4. Debt-Servicing Capacity

Households that are required to devote a substantial portion of their disposable income to service their debts are vulnerable to negative income and interest rate shocks, and are more likely to be delinquent in their debt payments. Financial vulnerability is typically assessed by examining a household's debt service ratio (DSR).

Statistics Canada defines the DSR as the "sum of the total payments relating to all mortgage and non-mortgage loans outstanding divided by total household disposable income".[4]

$$\text{Debt service ratio} = \frac{\text{Obligated debt payments}}{\text{Disposable income}}$$

Statistics Canada's measure does not include debt prepayments but rather obligated debt payments, for example, required principal and minimum credit card payments. Thus, the measure is designed "to both more adequately portray what Canadian households owe their creditors at a given point in time, and align with the U.S. measure of the household DSR" (Box 4-1).

Interest payments are added back to Statistics Canada's published measure of disposable income to "more accurately reflect the funds available to the household sector to meet their debt service costs". Statistics Canada also releases an "interest-only" DSR.

Box 4-1 Statistics Canada's debt service ratio

Prior to September 2015, Statistics Canada published an interest-only DSR. To provide a fuller picture of household debt obligations beginning in September 2015, Statistics Canada expanded its existing interest-only DSR estimates to include principal payments.

Statistics Canada constructs its DSR measure using data of all household sector creditors in the economy (i.e., a supply-side approach).

According to Statistics Canada, the advantage of this approach over the demand-side approach (i.e., relying on household surveys such as the Canadian Financial Monitor and the Survey of Financial Security) is the use of "more robust administrative data to complement creditor survey data".

Box 4-1 continued

In addition, the household surveys are "not aligned with the concepts and methods of the system of national accounts (SNA), and are not currently available in a timely fashion". Statistics Canada notes that the data used to estimate the DSR come from a wide array of sources such as the Office of the Superintendent of Financial Institutions, the Bank of Canada, the Canada Mortgage and Housing Corporation and the Canada Revenue Agency, among others.

Statistics Canada concludes that its newly developed DSR estimates including principal and interest payments "will help to provide a better understanding of both the trends and dynamics of increasing household debt in Canada".

Source: Statistics Canada's *Latest Developments in the Canadian Economic Accounts* available at: http://www.statcan.gc.ca/pub/13-605-x/2015006/article/14219-eng.htm.

The "total" DSR is better suited to assessing financial vulnerability than the debt-to-income or debt-to-asset ratio. Using a ratio of flow measures provides policymakers with a snapshot of the current financial constraints experienced by debt holders. With the DSR, it is possible to view the effect of changing interest rates and debt accumulation on the capacity of households to service their financial obligations.

Indeed, the Bank of Canada has used a DSR as its metric for assessing the vulnerability of households to economic shocks and the impact on financial stability.[5] According to the Bank of Canada (2014),

> in terms of their financial health, the critical issue is not the level of debt, but whether they have difficulty servicing that debt. In this sense, the debt-service ratio (DSR), which measures a household's debt-servicing costs as a percentage of its disposable income, is a better indicator of financial stress than the aggregate debt-to-income ratio.[6]

Further, the financial services industry uses a DSR in its criteria for determining lending eligibility for individuals and households.

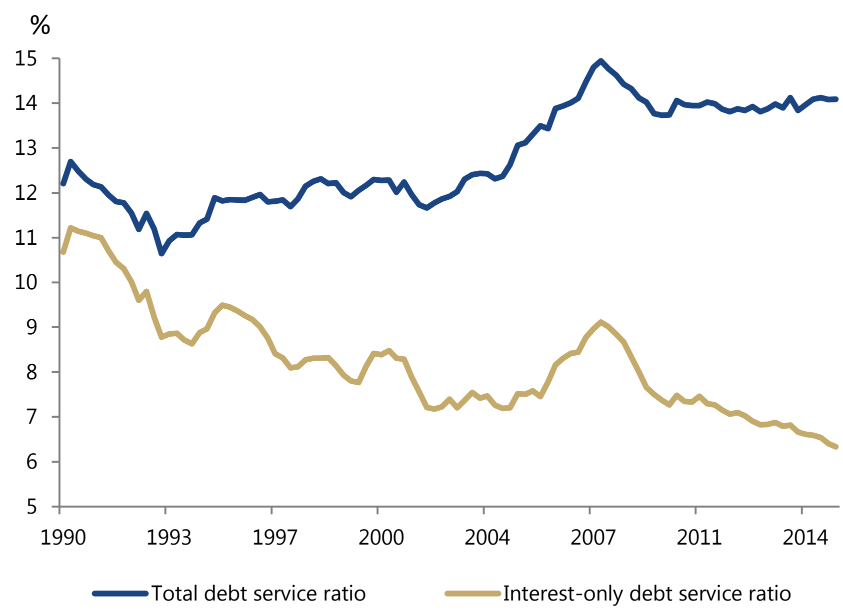
While the interest-only DSR has trended downward since 1990, the total DSR remained relatively stable over 1990 to 2004 but then increased sharply through 2007 (Figure 4-1). Despite the increase in household indebtedness since 1990 (as measured by the debt-to-income ratio), the trend decline in interest rates over this period has more than offset the impact on interest payments, pushing the interest-only DSR to historic lows.

However, increased household indebtedness has resulted in higher required principal payments, more than offsetting the impact of lower interest rates on debt service payments. As a consequence, the trajectory of the total DSR has diverged from the interest-only DSR. Although the total DSR declined during the global financial crisis, it has since edged higher and remains elevated relative to historical experience.

In addition, the increase in required principal payments relative to disposable income since 2007 does not necessarily mean that households have been paying down their debt more rapidly. First, Statistics Canada's DSR represents obligated payments and not actual flows from debtors to creditors, which would include debt prepayments. Second, the remaining maturity for mortgage and non-mortgage debt consistent with Statistics Canada's DSR measures (discussed in Section 5) is little changed from 2007 levels.[7]

That said, prepayments could have increased over this period, which would have resulted in actual flows of debt payments further exceeding obligated payments.

Figure 4-1 Household debt service ratios



Source: Statistics Canada.

It is important to reiterate that the DSR reflects the debt-servicing capacity of the "average" household. Of course there is wide variation across households, both in terms of their debt obligations and incomes, which this aggregate measure masks. Although the distribution of households' debt-servicing capacity is not considered in this report, PBO believes that the economy-wide DSR measure still serves as a useful indicator of the overall financial vulnerability of the household sector.

5. Medium-Term Outlook

Despite the increase in household debt-to-income to record levels, the total debt service ratio remains below its historical high. Looking ahead, the extent to which households' debt-servicing capacity will be stretched further will ultimately depend on the evolution of debt levels, interest rates and incomes.

To assess the potential implications for household financial vulnerability we use PBO's most recent economic outlook to construct a projection of the total debt service ratio over the next five years.

Methodology and assumptions

PBO's economic projection model includes household disposable income and debt. However, it is not sufficiently detailed to produce a projection of required principal and interest payments on household debt. To construct a consistent projection of the total DSR, we use the standard amortization formula. The total DSR can be expressed as:

$$\text{Total DSR} = \frac{\mathrm{r}}{1-(1+\mathrm{r})^{-\mathrm{reamort}}} \cdot \mathrm{D/Y}$$

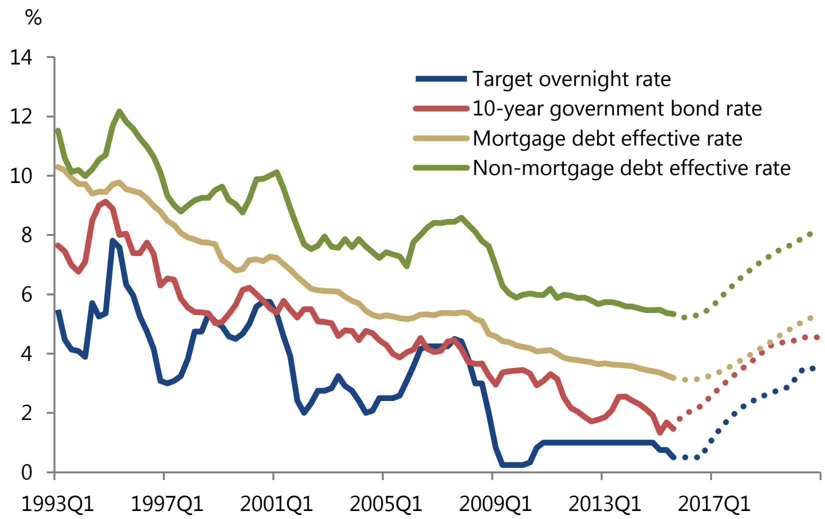
where *r* is the average effective interest rate on debt (i.e., interest payments divided by debt); *reamort* is the remaining amortization period; and *D/Y* is the household debt-to-income ratio. The product of the effective interest rate on debt and the debt-to-income ratio yields the interest-only DSR. Following Statistics Canada, we separate household debt into mortgage and non-mortgage debt.

To project the average effective interest rate on debt over the medium term (for both mortgage and non-mortgage debt), PBO uses a regression-based model. It links the effective interest rates to short- and long-term interest rates, that is, the Bank of Canada's target for the overnight rate and the Government of Canada 10-year benchmark bond rate.

In PBO's November 2015 outlook, the target for the overnight rate was projected to increase from its current level of 0.5 per cent to 3.5 per cent by the end of 2020; similarly the 10-year benchmark bond rate was projected to increase from 1.5 percent to 4.5 per cent over the same period (Figure 5-1).

Based on these projections and given their historical relationships, the effective interest rate on mortgage debt is projected to rise from 3.2 per cent in the third quarter of 2015 to 5.3 per cent by the end of 2020; the effective rate on non-mortgage debt is projected to rise from 5.3 per cent to 8.1 per cent over the same period.

Figure 5-1 Interest rates



Sources: Bank of Canada; Statistics Canada; and Parliamentary Budget Officer.

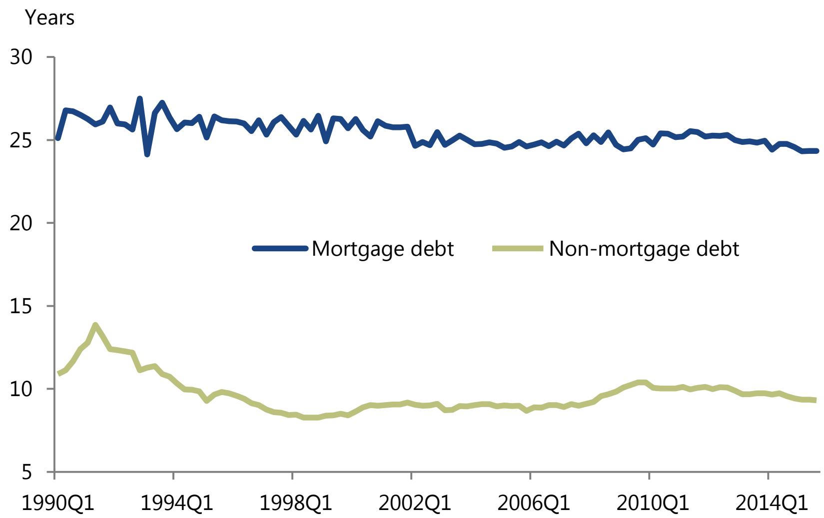
Note: The projection period covers 2015Q4 to 2020Q4.

The projected increase in the effective interest rate on mortgage debt is lower than that for non-mortgage debt. This reflects a slower speed of adjustment to long-run fundamentals (i.e., the target for the overnight rate and the 10-year government bond rate) since only a fraction of households renew their mortgages in a given quarter.

By the end of 2020, the effective interest rate on mortgage debt is 65 basis points below its long-run level (5.3 per cent versus 5.9 per cent) while the effective interest rate on non-mortgage debt is only 6 basis points below its long-run level (8.1 per cent versus 8.2 per cent).

Although Statistics Canada does not provide series for the remaining amortization periods, we can use the above relationship to calculate an implicit estimate that is consistent with the observed total DSR, the historical effective interest rate and the debt-to-income ratio data (Figure 5-2).

Figure 5-2 **Implicit remaining amortization periods**



Sources: Statistics Canada and Parliamentary Budget Officer.

Given the relative stability of the implicit amortization periods in recent years, we assume that they remain at current levels over the medium-term projection horizon: 24.3 years for mortgage debt and 9.3 years for non-mortgage debt.

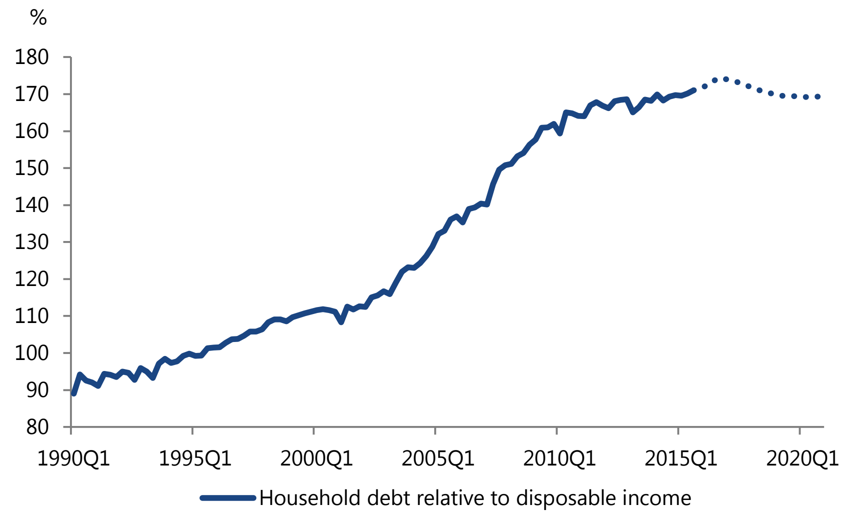
Household indebtedness and financial vulnerability over the medium term

Based on PBO's November 2015 outlook, household debt is projected to increase from 171 per cent of disposable income in the third quarter of 2015 to a high of 174 per cent in the third quarter of 2016 (Figure 5-3).[8] The projected increase reflects continued gains in real house prices.

However, as the Bank of Canada raises its target for the overnight rate, beginning in the fourth quarter of 2016, short- and long-term interest rates rise steadily. At the same time, real house price gains are projected to moderate. As a consequence, household debt relative to income is projected to decline gradually, falling to just below its current level; in 2020, it would average 169 per cent.

Since PBO's projection of household debt does not distinguish between mortgage and non-mortgage debt, we assume that the composition of household debt remains unchanged from current levels (i.e., 64 per cent mortgage debt and 36 per cent non-mortgage debt).

Figure 5-3 Household debt relative to disposable income



Sources: Statistics Canada and Parliamentary Budget Officer.

Note: Household debt is comprised of total financial obligations (i.e., credit market debt plus trade payables). Disposable income is seasonally adjusted but unadjusted for pension entitlements. The projection period covers 2015Q4 to 2020Q4.

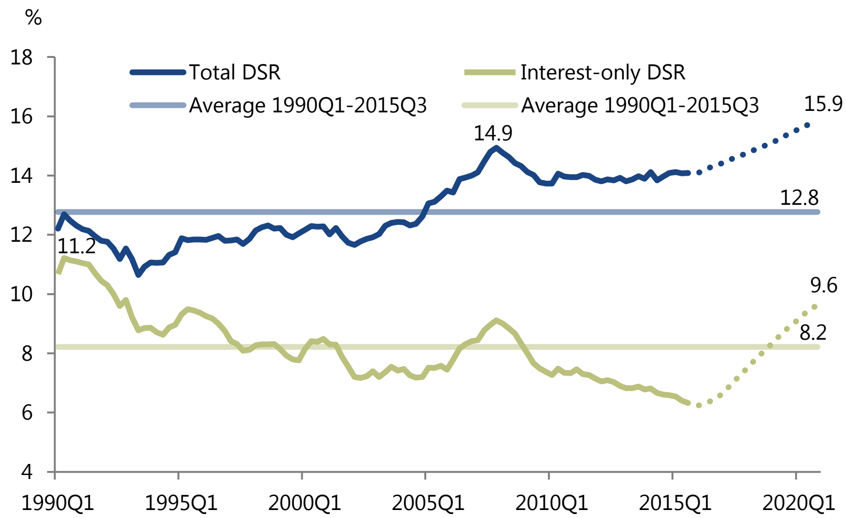
PBO projects that household debt-servicing capacity will be stretched further over the medium term as interest rates return to more normal levels. The total household DSR is projected to increase from 14.1 per cent to 15.9 per cent (Figure 5-4).

Unlike the benchmarks used by financial institutions for assessing an individual household's financial vulnerability, a threshold for the economy-wide debt service ratio does not exist.[9] However, to gauge the vulnerability at the aggregate level, it can be informative to compare the projected results for the total DSR to historical experience.

Based on PBO's projection, the financial vulnerability of the average household would rise to levels beyond historical experience. The projected increase in the total DSR to 15.9 per cent would be 3.1 percentage points above the long-term historical average of 12.8 per cent (from 1990Q1 to 2015Q3). It would also be almost one full percentage point above its highest level over the past 25 years, 14.9 per cent, which was reached in 2007Q4.

Further, if as discussed previously, effective interest rates were at their long-run levels by the end of 2020, the total DSR would rise to 16.2 per cent instead of 15.9 per cent.

Figure 5-4 Household debt service ratios



Sources: Statistics Canada and Parliamentary Budget Officer.

Note: The projection period covers 2015Q4 to 2020Q4.

The interest-only DSR is projected to increase from its historical low of 6.3 per cent in the third quarter of 2015 to 9.6 per cent by the end of 2020. This would be lower than its historical maximum of 11.2 per cent recorded in the second quarter of 1990 but 1.4 percentage points above its long-term historical average.

The projected increase in the interest-only DSR does not translate into a one-for-one increase in total DSR. The required principal payment is reduced somewhat as interest rates rise, while the debt-to-income ratio returns close to its current level over the medium term.

PBO's November economic outlook is consistent with the increased debt servicing required by households over the medium term. However, going forward, PBO projects that households will become increasingly vulnerable to negative shocks. As Djoudad (2012) notes:

> [A] higher DSR would imply that households are more vulnerable to negative shocks to income or to interest rates, making household balance sheets more precarious and having a negative impact on financial institutions. Since household debt constitutes a large part of the loan portfolio of Canadian banks, it is important to monitor and anticipate changes to household vulnerability as a function of developments in macroeconomic conditions.

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Notes

1. The OECD data for Japan is available only to 2013 and is used to calculate the 2014 average for G7 countries excluding Canada.
2. Other financial assets include debt securities (mainly Canadian bonds and debentures), accounts receivable and mortgage loans.
3. The market value of an asset changes over time, as market conditions change, while the market value of debt remains the same. Thus, all else equal, fluctuations in the market value of assets, say due to swings in house prices or the stock market, can significantly alter the debt-to-asset ratio.
4. See http://www.statcan.gc.ca/pub/13-605-x/2015006/article/14219-eng.htm in Statistics Canada's *Latest Developments in the Canadian Economic Accounts*.
5. For example, see Djoudad (2012). The Bank of Canada's analytical framework is based on microdata with DSRs calculated for individual households.
6. See the Bank of Canada Backgrounder "Household Spending and Debt" available at: http://www.bankofcanada.ca/wp-content/uploads/2011/02/household_spending_debt.pdf. However, in its most recent *Financial System Review*, the Bank of Canada appears to have shifted away from using DSRs to gauge household financial vulnerability to instead focusing on household debt-to-income ratios. For example, compare the use of household DSRs in Dey et al. (2008), Djoudad (2010), Djoudad (2012) and Faruqui et al. (2012) to Cateau et al. (2015).
7. In 2007, the remaining maturity for mortgage and non-mortgage debt averaged 25.0 years and 9.0 years, respectively. Over the first 3 quarters of 2015, the remaining maturity for mortgage and non-mortgage debt has averaged 24.3 years and 9.3 years, respectively.
8. PBO's November 2015 outlook was prepared prior to the 1 December 2015 release of Statistics Canada's 2015Q3 Income and Expenditure Accounts and the 14 December 2015 release of the 2015Q3 National Balance Sheet and Financial Flow Accounts. To project household debt and disposable income over 2015Q4 to 2020Q4, we apply the projected growth rates from PBO's November 2015 *Economic and Fiscal Outlook* for these series to their levels observed in 2015Q3.
9. Financial institutions typically identify a total debt service ratio of 40 per cent as the threshold for an individual household's lending eligibility. However, this threshold includes household payment obligations other than debt (e.g., property taxes, heating expenses and condominium fees if applicable).