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Household Indebtedness and Financial Vulnerability

Recent Developments and Outlook

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This report reviews recent developments in household finances and assesses prospects for financial vulnerability over the medium term. However, it is important to note that analysis in this report 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.

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Executive Summary

This report reviews recent developments in household finances and assesses prospects for financial vulnerability over the medium term based on PBO's April 2017 *Economic and Fiscal Outlook*. The assessment, however, is based on financial indicators that represent economy-wide averages, which can mask wide variation across households.

- Household indebtedness increased sharply over 2002 to 2011 and then appeared to stabilise through the first half of 2015 at just under 170 per cent of disposable income.

- Since mid-2015, household indebtedness has ticked higher, reaching 174 per cent of disposable income in the first quarter of 2017. With household borrowing rates stabilising at historically low levels over this period, mortgage debt and house prices have surged.

Household indebtedness

Household indebtedness is typically measured as the ratio of household debt to disposable income. Household debt consists of mortgages, consumer credit, non-mortgage loans (loans to purchase financial securities) and trade payables. In the first quarter of 2017, for every $100 in disposable income, households had $174 of debt.

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 service their debt. 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 DSR measure, which includes required principal and interest payments, but excludes debt prepayments. Statistics Canada also publishes an "interest-only" DSR.

- The DSR remained relatively stable around 14.0 per cent from early 2009 through the first half of 2015. Even though household debt increased from 158 per cent of disposable income to 170 per cent over this period, lower borrowing rates offset the impact of this additional debt on total obligated payments.

- Since mid-2015, the DSR has edged slightly higher, reaching 14.2 per cent in the first quarter of 2017. At the same time, the interest-only DSR has continued to trend lower as household borrowing rates have stabilised at historically low levels. This suggests that increased household indebtedness is no longer being offset by lower borrowing rates.

Household financial vulnerability

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 shocks and is more likely to be delinquent in its debt payments. In the first quarter of 2017, for every $100 in disposable income, households had $14.20 in debt payments (i.e., interest plus required principal payments).

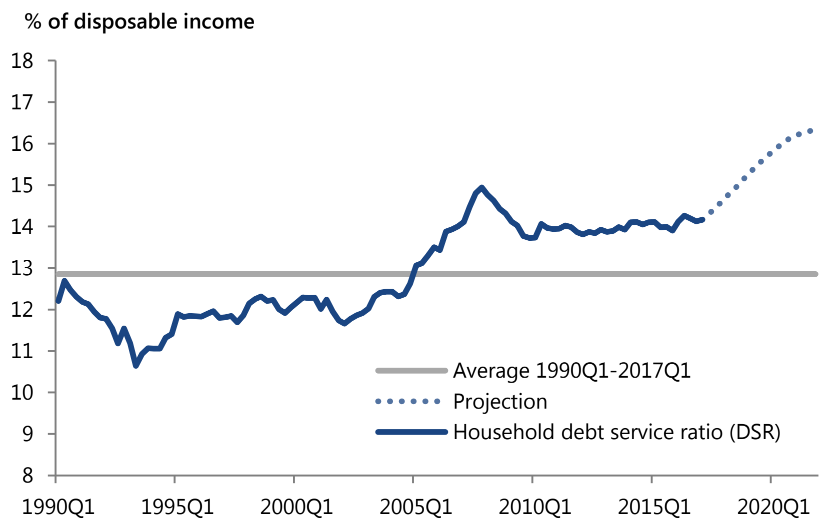
Looking ahead, the extent to which households will become more financially vulnerable will ultimately depend on their debt-servicing capacity, and therefore on the evolution of interest rates and household indebtedness. Despite a projected rise in interest rates, we expect household indebtedness to increase due to continued gains in real house prices and elevated levels of consumer confidence.

- Relative to disposable income, we project household indebtedness to rise from its current level of 174 per cent to reach and then stabilise around 180 per cent of disposable income by the end of 2018.

Household debt-servicing capacity will become stretched even further as interest rates rise to more "normal" levels over the next five years. Based on PBO's projection, the financial vulnerability of the average Canadian household would rise to levels beyond historical experience.

- By the end of 2021, the DSR is projected to increase by over 2 percentage points, from 14.2 per cent of disposable income in the first quarter of 2017 to 16.3 per cent (Summary Figure 1).
- The projected increase in the DSR to 16.3 per cent would be 3½ percentage points above the long-term historical average of 12.9 per cent (from 1990Q1 to 2017Q1).
- The projected DSR would also be almost 1½ percentage points above its highest level over the past 27 years, 14.9 per cent, which was sustained for only one quarter in 2007.

Summary Figure 1-1 Household debt service ratio



Sources: Statistics Canada and Parliamentary Budget Officer.

Note: The projection period covers 2017Q2 to 2021Q4.

Compared to our previous assessment in January 2016, we are projecting higher levels for the DSR over the medium term. Despite significant downward revisions to household borrowing rates, upward revisions to the level of household debt relative to disposable income have more than offset the impact on the DSR from lower borrowing rates.

1. Introduction

Household debt-to-income ratio

In the first quarter of 2017, total household debt reached 174 per cent of disposable income. That is, for every $100 in disposable income, households had $174 of debt.

Household debt service ratio (DSR)

In the first quarter of 2017, the household DSR stood at 14.2 per cent of disposable income. That is, for every $100 in disposable income, households had $14.20 in debt payments (i.e., interest plus principal payments).

Household debt relative to disposable income has continued to trend higher. Based on Statistics Canada's 14 June 2017 release of the National Balance Sheet Accounts, total household debt reached 174 per cent of disposable income in the first quarter of 2017.[1] Policymakers continue to express concern about the vulnerability of households to adverse economic shocks, such as unexpected job loss or higher-than-expected interest rates.[2]

On its own, however, assessing household debt relative to disposable income 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 their debt relative to disposable income, but rather the capacity of households to meet their debt service obligations. This capacity is measured by comparing total obligated debt service payments to household disposable income—the debt service ratio (DSR).

Concerns about household financial vulnerability are also prominent given the expectation that interest rates will rise from their historically low levels. Consequently, it is useful to assess how households' debt-servicing capacity may evolve over the medium term as interest rates return to "normal" or neutral levels.

This report reviews recent developments in household finances and assesses prospects for household financial vulnerability over the medium term. However, it is important to note that our analysis 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.

This report draws on and updates material presented in PBO's 19 January 2016 report *Household Indebtedness and Financial Vulnerability*.[3] The assessment of financial vulnerability in the January 2016 report was based on Statistics Canada's data up to and including the third quarter of 2015, as well as PBO's November 2015 *Economic and Fiscal Outlook*.[4]

In the remainder of this report, Section 2 reviews developments in household indebtedness and financial vulnerability since mid-2015 through the first quarter of 2017. Section 3 assesses prospects for household indebtedness and financial vulnerability over the next five years based on PBO's April 2017 *Economic and Fiscal Outlook*.

2. Recent Developments

2.1. Household indebtedness

Household indebtedness is typically measured as the ratio of household debt to disposable income. The headline debt ratio published by Statistics Canada in its quarterly release of the National Balance Sheet Accounts 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.

Household debt

Household financial obligations 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.

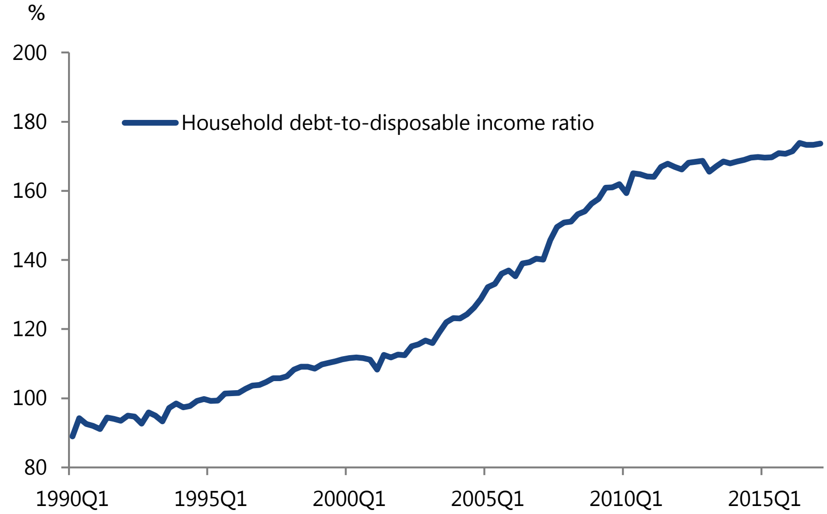
This report, however, uses a slightly broader definition of household debt "total financial obligations" (i.e., credit market debt plus trade payables), as well as seasonally-adjusted annualized household disposable income that is not adjusted for pension entitlements. The disposable income concept that we adopt better reflects the actual funds that are available to households to service their debt obligations or consumption.

Household indebtedness increased sharply over 2002 to 2011—by almost 50 per cent—and then appeared to stabilise through the first half of 2015 at just under 170 per cent of disposable income (Figure 2-1). In their analysis of household microdata, Crawford and Faruqui (2012) note that a variety of factors have contributed to the growth in household debt.[5] They highlight low interest rates, higher house prices and financial innovation as key factors.

Since mid-2015, however, household indebtedness has ticked higher, reaching 174 per cent of disposable income in the first quarter of 2017. This is the highest level recorded since early 1990 when household debt was just under 90 per cent of disposable income.

The uptick in household debt since mid-2015 has been driven by rising mortgage debt, which has increased by 11 per cent. In the first quarter of 2017, mortgage debt accounted for 65 per cent of all household debt, which is somewhat higher than its historical (1990Q1-2017Q1) average of 63 per cent. Consumer credit accounted for 29 per cent of household debt in the first quarter of 2017, in line with its historical average. Non-mortgage loans and trade payables made up the remaining 6 per cent of household debt.

Figure 2-1 **Household indebtedness, 1990Q1-2017Q1**



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.

According to Bank of Canada data, the household borrowing rate[6] fell by over 250 basis points from 5.8 per cent in the first half of 2002 to 3.2 per cent in the first half of 2015. Since mid-2015, the household borrowing rate has remained relatively stable, averaging 3.1 per cent in the first quarter of 2017.

With household borrowing rates stabilising at historically low levels over this period, mortgage debt and house prices have surged. Based on the Teranet-National Bank National House Price Index[7] (composite 11), house price gains increased from around 5 per cent year-over-year in the first half of 2015 to 10 per cent year-over-year in mid-2016. In the first quarter of 2017, house prices were 13 per cent higher on a year-over-year basis.

However, in terms of housing affordability—as measured by the Bank of Canada's national index—rising house prices (and other housing-related costs) have more than offset the impact of falling borrowing rates.[8] Since the beginning of 2002, housing affordability has deteriorated, with monthly housing-related costs rising from 26.5 per cent of disposable income to 34.6 per cent in the first quarter of 2017 (Figure 2-2). That said, overall housing affordability remains close to its historical average observed prior to the global financial crisis (1990Q1 to 2007Q4).

Figure 2-2

Bank of Canada Housing Affordability Index, 1990Q1-2017Q1

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.

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.

The household leverage ratio

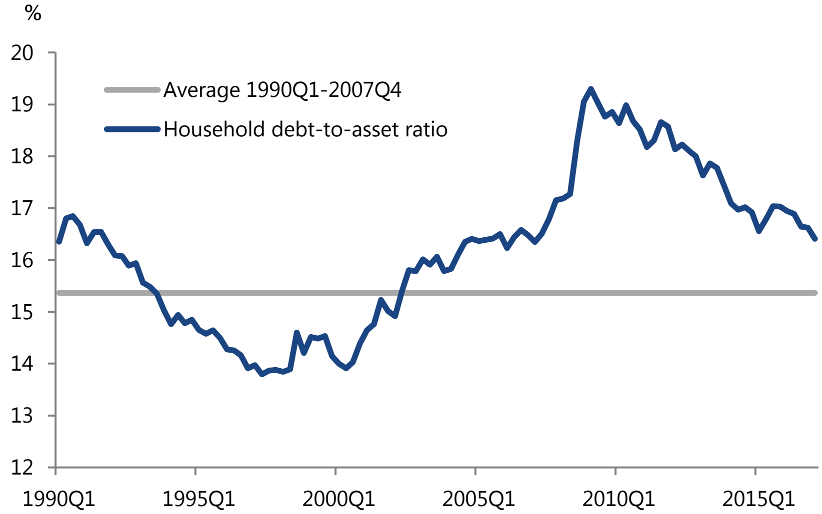
The household leverage ratio compares household debt (measured at book value) relative to household assets (measured at market value).

Measuring household indebtedness as household debt relative to household assets provides a comparison of two stock measures and gives a sense of how much of households' assets have been financed by debt. This measure is often referred to as the leverage ratio.

Prior to the financial crisis the household leverage ratio fluctuated between 14 per cent and 17 per cent (Figure 2-3). As asset values declined during the financial crisis, the leverage ratio increased sharply, reaching a peak of 19.3 per cent in the first quarter of 2009.

The household leverage ratio then trended toward its pre-crisis average through the first half of 2015, as the accumulation of household debt moderated and asset prices rebounded. However, with the acceleration in mortgage debt, the leverage ratio ticked up to just over 17 per cent in the second half of 2015. The subsequent surge in house price gains boosted the market value of household assets. As a result, the leverage ratio reversed course, falling to 16.4 per cent in the first quarter of 2017.

Figure 2-3 Household leverage ratio, 1990Q1-2017Q1



Sources: Statistics Canada and Parliamentary Budget Officer.

Note: The household leverage ratio is measured as total debt (at book value) relative to total assets (at market value) expressed in per cent.

As the leverage 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 a highly liquid asset. Thus, as an indicator of household financial vulnerability, the leverage ratio is somewhat lacking. It is possible to have a low household leverage ratio, but still be vulnerable to negative income and interest rate shocks due to the illiquid nature of some assets.

2.2. Household financial vulnerability

Households that are required to devote a substantial portion of their disposable income to service their debts are vulnerable to adverse 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). According to the Bank of Canada,

> 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.[9]

The 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".

Statistics Canada began publishing its "total" DSR measure in September 2015. Its DSR measure does not include debt prepayments but rather obligated debt payments, for example, required principal and minimum credit card payments. Thus, Statistics Canada's measure is designed to "more adequately portray what Canadian households owe their creditors at a given point in time".[10]

Statistics Canada's quarterly DSR measure is based on seasonally-adjusted data. Interest payments are added back to Statistics Canada's published measure of disposable income—which is not adjusted for pension entitlements—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.

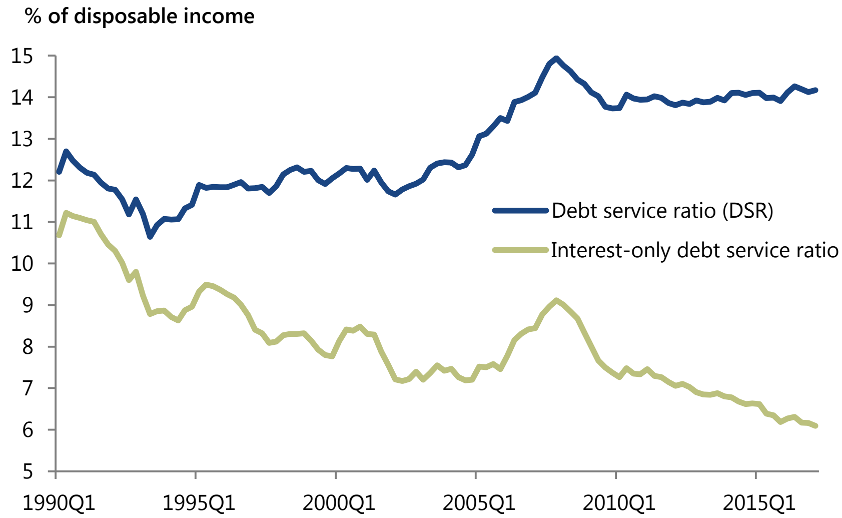
The DSR is better suited to assessing financial vulnerability of households than the debt-to-disposable income or the leverage ratio. Using a ratio of flow measures provides policymakers with a snapshot of the current financial constraints experienced by debt holders. With the DSR, it is possible to 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.[11] Further, the financial services industry uses a DSR in its criteria for determining lending eligibility for individuals and households.

The DSR remained relatively stable around 14.0 per cent from early 2009 through the first half of 2015 (Figure 2-4). Even though household debt increased from 158 per cent of disposable income to 170 per cent over this period, lower borrowing rates offset the impact of this additional debt on total obligated payments.

Figure 2-4

Household debt service ratios



Source: Statistics Canada.

Since mid-2015, however, the DSR has edged slightly higher, rising to 14.3 per cent in the second quarter of 2016. The interest-only DSR, however, has continued to trend lower as household borrowing rates have stabilised at historically low levels. Thus, the recent, albeit slight, uptick in the DSR coincident with a declining interest-only DSR, suggests that increased household debt accumulation is no longer being offset by lower borrowing rates.

The increase in required principal payments relative to disposable income (i.e., the difference between the DSR and interest-only DSR) since 2009 does not necessarily mean that households have been paying down their debt more rapidly. Statistics Canada's DSR represents obligated payments and not actual flows from debtors to creditors, which would include debt prepayments. That said, prepayments could have increased over this period, which would have resulted in actual flows of debt payments further exceeding obligated payments.

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, we believe that the economy-wide DSR measure still serves as a useful indicator of the overall financial vulnerability of the household sector.

3. Medium-Term Outlook

Looking ahead, the extent to which households will become more financially vulnerable will ultimately depend on their debt-servicing capacity, and therefore on the evolution of interest rates and household indebtedness.

3.1. Interest rate outlook

In PBO's April 2017 outlook, the Bank of Canada's policy interest rate was projected to rise from its current level of 0.5 per cent and reach its (assumed) normal or neutral level of 3.0 per cent by mid-2020; the Government of Canada 10-year benchmark bond rate was projected to increase from 1.7 per cent to its long-run level of 4.0 per cent by the end of 2021.

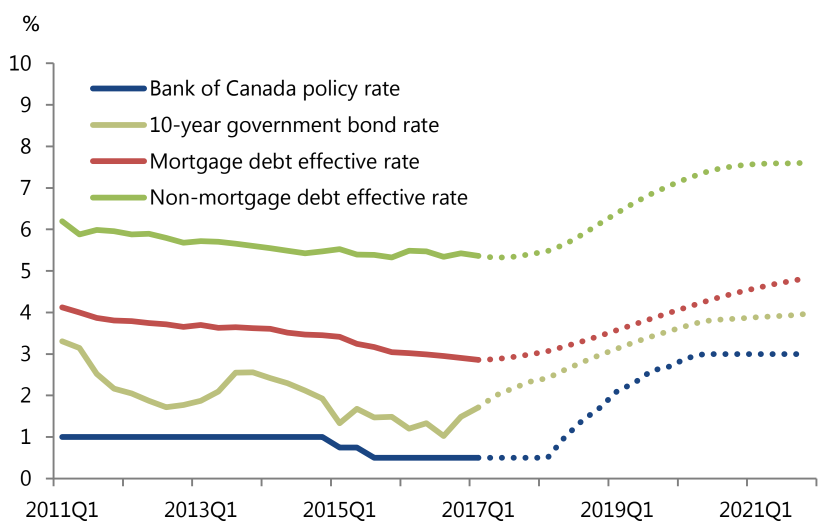
Effective interest rates on household debt

Effective interest rates are calculated as interest payments divided by the corresponding stock of household debt. The product of the effective interest rate and the debt-to-income ratio yields the interest-only DSR.

To project effective interest rates on household mortgage and non-mortgage debt, we use a regression-based model that links each effective interest rate to the policy interest rate and the 10-year bond rate. Based on PBO's April 2017 outlook and our model, we project that the effective interest rate on mortgage debt will rise from 2.9 per cent in the first quarter of 2017 to 4.8 per cent by the end of 2021 (Figure 3-1). Over the same period, we project the effective interest rate on non-mortgage debt to rise from 5.4 per cent to 7.6 per cent.[12]

Figure 3-1

PBO interest rate outlook



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

Note: The projection period covers 2017Q2 to 2021Q4.

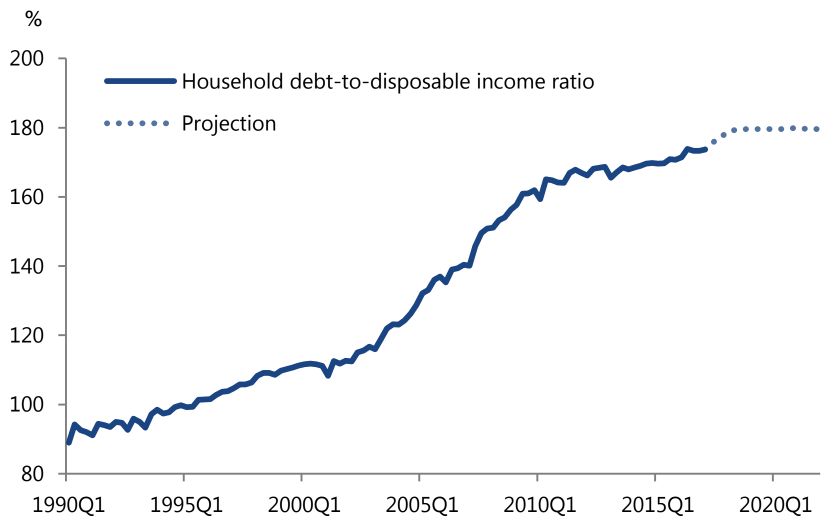
By the end of 2021, we estimate that the effective interest rate on mortgage debt would be about 60 basis points below its long-run level of 5.4 per cent while the effective interest rate on non-mortgage debt would be only 5 basis points below its long-run level of 7.7 per cent.

Compared to our January 2016 report, long-run levels of effective interest rates on mortgage and non-mortgage debt are approximately 50 basis points lower. This reduction reflects PBO's downward revision to its assumption for the neutral policy rate from 3.5 per cent to 3.0 per cent.

3.2. Household indebtedness

Based on PBO's April 2017 outlook, household indebtedness is projected to increase from its current level. Relative to disposable income, household debt is projected to rise from 174 per cent in the first quarter of 2017 to reach and then stabilise around 180 per cent by the end of 2018 (Figure 3-2). Despite the projected rise in household borrowing rates, we expect household indebtedness to increase over this period due to continued gains in real house prices and elevated levels of consumer confidence.

Figure 3-2 Household debt relative to disposable income



Sources: Statistics Canada and Parliamentary Budget Officer.

Note: Household debt is comprised of total financial obligations and disposable income is seasonally adjusted but unadjusted for pension entitlements. The projection period covers 2017Q2 to 2021Q4.

Compared to our January 2016 report, we are projecting higher levels of household indebtedness over the medium term. Over 2019 to 2020, household debt relative to disposable income is projected to be 10 percentage points higher on average. This upward revision reflects higher projected real house prices and lower projected borrowing rates.

3.3. Household financial vulnerability

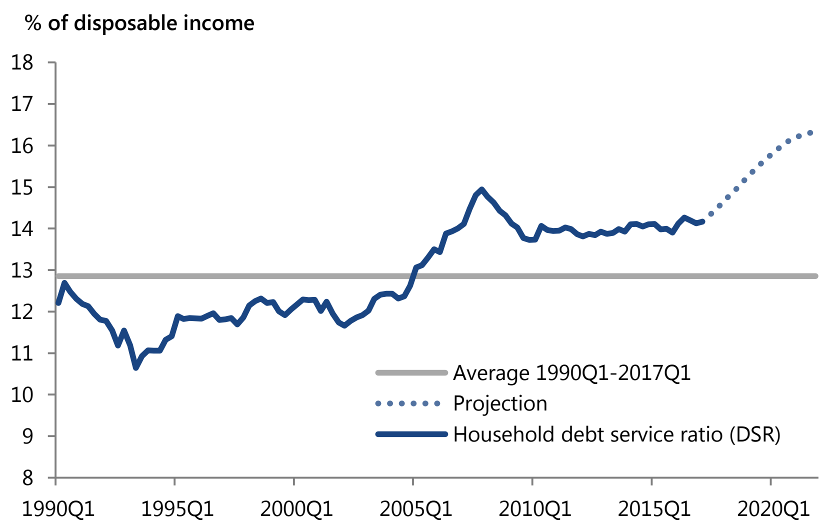
To assess prospects for household financial vulnerability we use PBO's most recent economic outlook (April 2017) to construct a projection of the household debt service ratio over the next five years.

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 DSR[13] we use the standard amortization formula that relates to the DSR to: the effective interest rate on debt; the remaining amortization period[14]; and the household debt-to-disposable income ratio. Following Statistics Canada, we separate household debt into mortgage and non-mortgage debt.[15]

Based on PBO's April 2017 outlook, we project that household debt-servicing capacity will be stretched even further over the medium term as interest rates return to more normal levels. The household DSR is projected to increase from 14.2 per cent to 16.3 per cent (Figure 3-3).

Figure 3-3 Household debt-service ratio



Sources: Statistics Canada and Parliamentary Budget Officer.

Note: The projection period covers 2017Q2 to 2021Q4.

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.[16] However, to gauge the vulnerability at the aggregate level, it can be informative to compare the projected results for the 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 DSR to 16.3 per cent would be 3½ percentage points above the long-term historical average of 12.9 per cent (from 1990Q1 to 2017Q1). It would also be almost 1½ percentage points above its highest level over the past 27 years, 14.9 per cent, which was sustained for only one quarter in 2007.

Given the same projected level of household debt relative to disposable income and assuming that effective interest rates were at their long-run levels by the end of 2021, the DSR would ultimately rise to 16.7 per cent instead of 16.3 per cent.

The interest-only DSR is projected to increase from its historical low of 6.1 per cent in the first quarter of 2017 to 9.4 per cent by the end of 2021.[17] This would be lower than its historical high 11.2 per cent recorded in the second quarter of 1990 but 1.3 percentage points above its long-term historical average of 8.1 per cent.

PBO's April 2017 economic outlook is consistent with the increased debt servicing required by households over the medium term. That said, going forward, we are projecting that the household sector will become increasingly vulnerable to negative shocks.

Compared to our January 2016 report, we are projecting higher levels for the DSR over the medium term (16.2 per cent versus 15.9 per cent by the end of 2020). Despite significant downward revisions to household borrowing rates, upward revisions to the level of household debt relative to disposable income have more than offset the impact on the DSR from lower borrowing rates.

Notes

1. Statistics Canada's "headline" measure of household debt relative to disposable income is calculated as household credit market debt (i.e., total financial obligations less trade payables) relative to a four-quarter moving sum of disposable income, unadjusted for seasonality but adjusted for pension entitlements. In the first quarter of 2017, Statistics Canada's headline measure of household debt stood at 166.9 per cent of disposable income and its measure of total household debt amounted to 169.0 per cent of disposable income.

2. For example, in its June 2017 *Financial System Review*, the Bank of Canada judged that the "vulnerability associated with household indebtedness has increased". Available at: http://www.bankofcanada.ca/wp-content/uploads/2017/06/fsr-june2017.pdf.

3. Available at: http://www.pbo-dpb.gc.ca/web/default/files/Documents/Reports/2016/Household%20Debt/Household_Debt_EN.pdf.

4. Available at: http://www.pbo-dpb.gc.ca/web/default/files/Documents/Reports/2015/EFO%202015/EFO_2015_EN.pdf.

5. See Crawford, A. and Faruqui, U. (2012), What explains trends in household debt in Canada? *Bank of Canada Review Winter 2011-2012*. Ottawa: Available at: http://www.bankofcanada.ca/wp-content/uploads/2012/02/boc-review-winter11-12-crawford.pdf.

6. The Bank of Canada's effective household borrowing rate is a weighted average of mortgage and consumer credit interest rates, where the weights are derived from residential mortgage and consumer credit data. See http://credit.bankofcanada.ca/financialindicators/eir for additional detail.

7. For additional detail on the Teranet-National Bank House Price Index, see https://housepriceindex.ca/about/our-methodology/.

8. For additional detail on the Bank of Canada's Housing Affordability Index, see http://credit.bankofcanada.ca/financialindicators/hai.

9. 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.

10. Statistics Canada constructs its DSR measure using data of all household sector creditors in the economy. According to Statistics Canada, the advantage of this approach over using 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". 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". See http://www.statcan.gc.ca/pub/13-605-x/2015006/article/14219-eng.htm for additional detail.

11. For example, see Djoudad, R. (2012), A Framework to Assess Vulnerabilities Arising from Household Indebtedness Using Microdata. *Bank of Canada Staff Discussion Paper 2012-3*. Ottawa: Available at: http://www.bankofcanada.ca/wp-content/uploads/2012/02/dp2012-03.pdf.

12. 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.

13. See PBO's 19 January 2016 report for additional details.

14. Although Statistics Canada does not provide series for the remaining amortization periods, we can calculate an implicit estimate that is consistent with the observed total DSR, the historical effective interest rate and the debt-to-income ratio data. 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: 24.1 years for mortgage debt and 9.2 years for non-mortgage debt.

15. 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 2017Q1 levels (i.e., 65 per cent mortgage debt and 35 per cent non-mortgage debt).

16. 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).

17. The projected increase in the interest-only DSR does not translate into a one-for-one increase in total DSR given that the required principal payment is reduced somewhat as interest rates rise.