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Household debt service ratio–Interest and principal

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The following symbols are used in Statistics Canada publications:

.	not available for any reference period
..	not available for a specific reference period
...	not applicable
0	true zero or a value rounded to zero
0^s	value rounded to 0 (zero) where there is a meaningful distinction between true zero and the value that was rounded
^{p}	preliminary
^{r}	revised
x	suppressed to meet the confidentiality requirements of the *Statistics Act*
^{E}	use with caution
F	too unreliable to be published
*	significantly different from reference category ($p < 0.05$)

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Household debt service ratio–Interest and principal

Introduction

Since the beginning of the 1990s, both Canadian household debt and the amount of household debt relative to disposable income have progressively risen, currently reaching historically high levels. This phenomenon has generally been influenced by declining and low interest rates as well as increased access to household credit. As was the case for some countries in the last global financial crisis and recession, elevated levels of household sector debt accompanied with increased sensitivity to fluctuations in asset prices can have important implications for the broader health of the economy. As a result, the monitoring of the debt burden of Canadian households has significantly increased over time.

One indicator of the ability of households to service their debt obligations is the debt service ratio (DSR). The debt service ratio measures the proportion of household disposable income required to meet debt obligations. This ratio provides insight into the ability of the household sector to service current and future debt obligations given their level of disposable income. Moreover, levels of the debt service ratio have direct implications for both household savings and consumption, which in turn, help determine the future growth path of the economy. An analysis of the longer-term trends in the debt service ratio can help to explain the observed accumulation of debt by Canadian households.

Currently, Statistics Canada releases a DSR (Debt Service ratio) which includes the interest paid only. However, this does not provide a complete picture of the debt obligations facing Canadian households. A fuller picture of household sector debt obligations includes the principal portion as well as the interest paid. As such, Statistics Canada has expanded existing estimates of the DSR (Debt Service ratio) to include principal payments. These data span the time period from 1990 onward, and are available on a quarterly basis. In addition, inclusion of both the interest and principal components will now better facilitate comparisons with the US household debt service ratio, which equally includes both components[1].

Household DSR (Debt Service ratio) definitions

The household sector DSR (Debt Service ratio) measures the proportion of household disposable income that is devoted to making required interest and principal payments with respect to the sector’s total liabilities. In the Canadian system of macroeconomic accounts, the household sector is comprised of two sets of transactors: households, and unincorporated businesses (including unincorporated farms). The total liabilities of the household sector, on the national balance sheet, are split into the following categories: consumer credit, non-mortgage loans, mortgages, and trade payables. For the purposes of the DSR (Debt Service ratio), consumer credit, non-mortgage loans, and trade payables are collectively referred to as non-mortgage loans.

The DSR (Debt Service ratio) is the sum of the total payments relating to all mortgage and non-mortgage loans outstanding divided by total household disposable income:

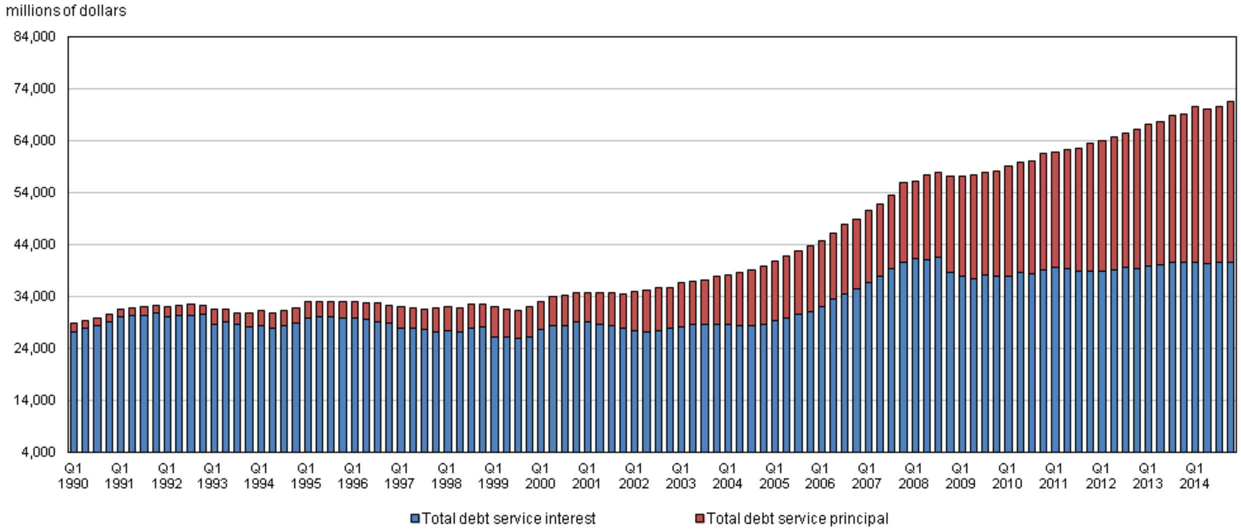
$$\mathrm{DSR} = \frac{\sum_{k=1}^{n} \mathrm{ML}_k + \sum_{k=1}^{n} \mathrm{NML}_k}{\sum_{k=1}^{n} \mathrm{DI}_k}$$

where DI stands for disposable income, ML for mortgage loan payments, NML for non-mortgage loan payments, and k is the associated debt holder. In order to more accurately reflect the funds available to the household sector to meet their debt service costs, interest payments are added back to the currently published measure of household disposable income. This treatment is required as interest payments (excluding the cost of financial intermediation services indirectly measured) are deducted from the published measure of household disposable income which follows current national accounting standards.

Trends in debt payments and the debt service ratio – Overview

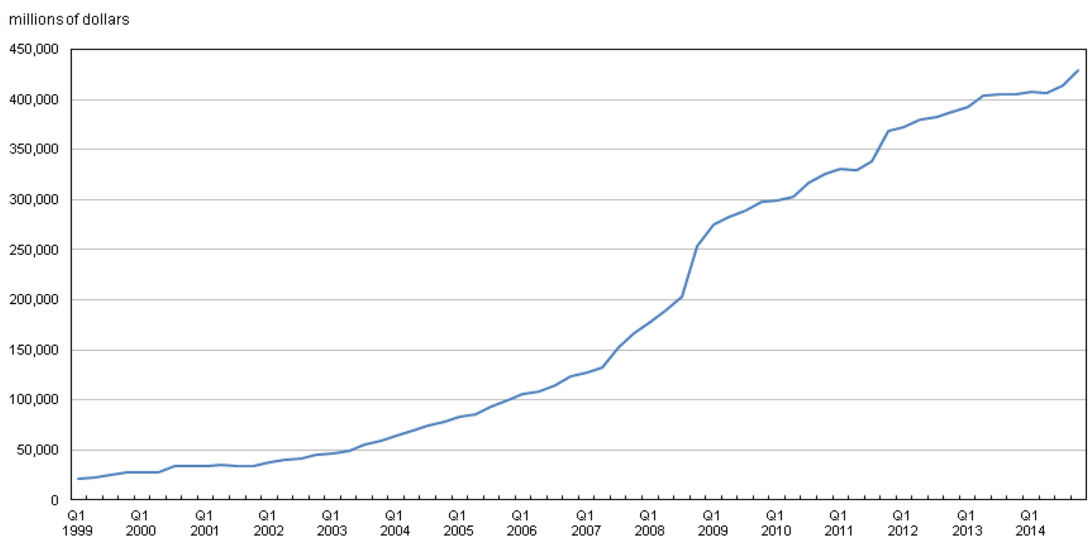
Reflecting the overall strength in the Canadian housing market and the accompanying growth in mortgage credit, the obligated mortgage debt payments of the household sector have trended upwards over the last decade and a half (Chart 1). The acceleration around the year 2000, coincides with the period whereby government-backed *National Housing Act* mortgage-backed securities (NHA MBS) both begin and continue to grow (Chart 2). In recent years historically low interest rates have resulted in the amount of interest paid remaining steady. Correspondingly, the amount of mortgage principal has increased.

Chart 1
Mortgage – total payments



Note: Seasonally adjusted at annual rates
Source: Statistics Canada.

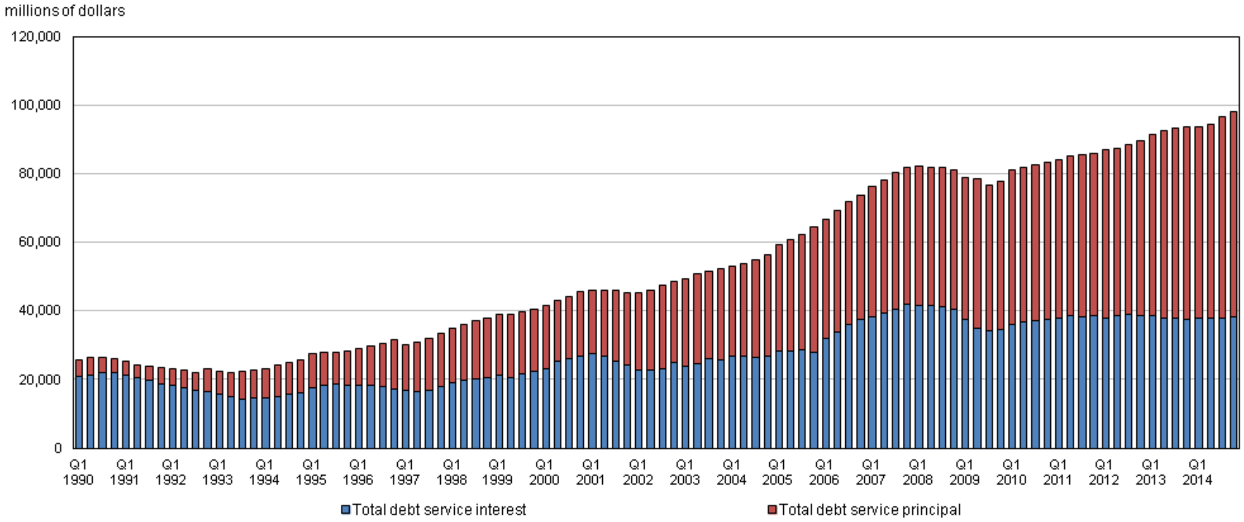
Chart 2
***National Housing Act* mortgage-backed securities outstanding**



Source: Statistics Canada.

Overall, similar to mortgage payments, the obligated non-mortgage payments have trended higher over time (Chart 3). Historically low interest rates have equally contributed to the non-mortgage interest paid remaining steady with an increasing amount of principal. Over the last decade, non-mortgage payments have been greater than mortgage payments in absolute amount. This fact may be explained by the emergence of home equity lines of credit, which are increasingly used as a substitute for more traditional mortgages.

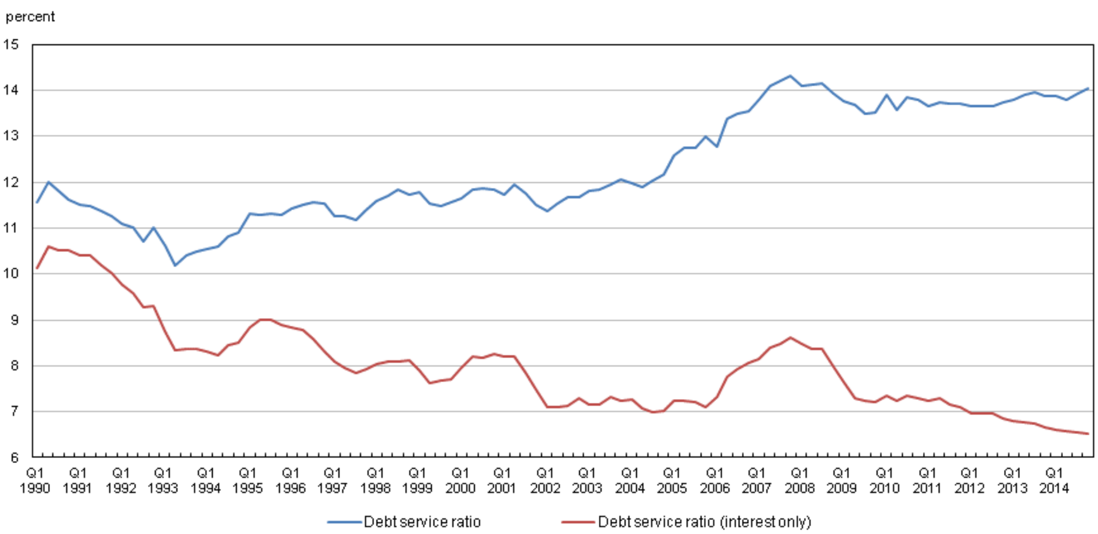
Chart 3
Non-mortgage – total payments



Note: Seasonally adjusted at annual rates
Source: Statistics Canada.

Overall, the debt service ratio (total payments) has increased over the last decade, and remains at an elevated level (Chart 4). Increases in household disposable income have been offset by continued accumulation of debt by Canadian households, requiring increased total payments. In contrast, the interest-only debt service ratio has reached historical lows due to equally low interest rates. As such, in order to better understand the dynamics of household debt it is important to view both debt service ratios. However, it is important to note the aggregate nature of the data, and how high level aggregations tend to at times mask important details and trends at a more microeconomic level. As well, the macroeconomic nature of the debt service ratio does not provide the distribution of household debt servicing within the Canadian population. Therefore, a combination of indicators, including the assets of the household sector, is essential to the complete understanding of Canadian household sector debt.

Chart 4
Debt service ratio



Note: Seasonally adjusted at annual rates
Source: Statistics Canada.

Methodology and data sources

The Canadian measure of the DSR (Debt Service ratio) relies on a supply-side approach, meaning estimates are constructed from data of all household sector creditors in the economy (i.e., (that is to say) suppliers of credit). The advantage of a supply-side approach is the use of more robust administrative data to complement creditor survey data. This is in contrast to a demand-side approach, which relies solely on household surveys (i.e., (that is to say) demand for credit) which are not aligned with the concepts and methods of the system of national accounts (SNA), and are not currently available in a timely fashion. It is important to note the DSR (Debt Service ratio) does not include debt prepayments, but rather obligated debt payments of the household sector (e.g., (for example) minimum credit card payments due). As such, in any given time period, the aggregate household payments do not equal the total flow of funds from debtors to creditors. This concept was followed in order to both more adequately portray what Canadian households owe to their creditors at any given point in time, and align with the US measure of the household DSR (Debt Service ratio).

The DSR (Debt Service ratio) for total payments, can be expressed as follows:

$$p_t = \frac{r_t d_t}{1 - (1 + r_t)^{-m_t}}$$

which can also be stated as

$$p_t = r_t d_t + p_t(1 + r_t)^{-m_t}$$

where p_t is the aggregate payment at time t, r_t is the interest rate at time t, d_t is the stock of debt at time t, and m_t is the remaining maturity at time t (amortization period of the debt). As also seen above, this formula can be alternatively stated as total payments at time t, equals the sum of interest payments and principal payments at time t. This allows one to decompose the principal and interest components of total debt payments.

To estimate the payments relating to all the different liabilities of the household sector, the liabilities are fully disaggregated into familiar segments or types of loans (e.g., (for example) lines of credit, credit cards, mortgages, etc.). For all installment loans, for example auto loans, the preceding payment formula is applied[2]. For revolving credit facilities, such as credit cards, the required payment or minimum payment amount is estimated. This treatment is as such, since the objective of the DSR (Debt Service ratio) is to capture the obligations of debtors. Of note, a different treatment is applied to payday loans since they do not charge an explicit amount of interest, but rather make revenue based on commissions, fees, and other credit charges. For example, a payday loan provider will not advertise a certain rate; instead, the payday loan provider will usually determine a fee for every tranche of $100 loaned to a particular individual. In addition, the loans are of a short duration. As such, the outstanding levels of payday loans are simply treated as principal to be paid in full.

The data used in estimating the DSR (Debt Service ratio) stem from a wide array of sources. For the banking sector data are obtained from Statistics Canada surveys, the Office of the Superintendent of Financial Institutions Canada (OSFI), and the Bank of Canada. For other financial intermediaries (e.g., (for example) credit unions, trust companies, sales financing companies, etc.) source data are obtained from the quarterly survey of financial statements conducted by the Industrial Organization and Finance Division (IOFD) of Statistics Canada. Source data for government business enterprises and general governments are obtained respectively from individual public financial statements and the public accounts of Canada. Other source data providers include Computershare Canada, the Canada Mortgage and Housing Corporation (CMHC), and the Canada Revenue Agency (CRA). In addition, both public corporate financial statements and various industry publications are utilized to further develop the estimates.

In contrast to the current US measures of the DSR (Debt Service ratio), unincorporated businesses are included in the Canadian DSR (Debt Service ratio). This is such, since unincorporated businesses are part of the household sector in the Canadian system of macroeconomic accounts, as recommended by the SNA 2008 manual.

All data are seasonally adjusted using the X-12 ARIMA method.[3]

Conclusion

The new methodology for this broader measure of the DSR (Debt Service ratio) offers additional insight into the level and decomposition of household debt and debt service, as these relate to macroeconomic trends. Further, the new measure better facilitates international comparisons of the household DSR (Debt Service ratio) (in particular with the current measure for the US). Overall, the newly developed household debt service ratio estimates encompassing obligated principal and interest payments will help provide a better understanding of both the trends and dynamics of increasing household debt in Canada.

Notes

1 Estimates of the household sector DSR (Debt Service ratio) for the United States are produced quarterly by the US Federal Reserve.

2 When the amortization period for any outstanding mortgages is unknown, an amortization period of 25 years is assumed. For auto loans, amortization periods are assumed to range from 4 to 6 years, with longer amortizations in more recent periods.

3 For more information on seasonal adjustment, see '*Seasonally adjusted data – Frequently asked questions*' *(*http://www.statcan.gc.ca/dai-quo/btd-add/btd-add-eng.htm*)*