

Household Borrowing and Spending in Canada

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- The sizable increase in the ratio of household debt to income in Canada over the past decade has coincided with a period of sustained strong growth in house prices. The main driver of the rise in household debt has been home-equity extraction—household borrowing against equity in existing homes through increases in mortgage debt and draws on home-equity lines of credit.
- Understanding how households use their borrowed funds is important for assessing the macroeconomic effects of increased household borrowing and for the conduct of monetary policy. If, for example, increases in household debt are used primarily for consumption and home renovation, a fall in house prices that reduces home equity could decrease household borrowing and spending.
- The evidence indicates that a significant share of borrowed funds from home-equity extraction was used to finance consumption and home renovation in Canada from 1999 to 2010. Such indebtedness constitutes an important source of risk to household spending, since it makes households more vulnerable to a potential decline in house prices.

Household debt in Canada has been rising relative to income for many decades, but the rate of increase has accelerated since the late 1990s, so that by the third quarter of 2011, it stood at more than 150 per cent of personal disposable income. A number of factors may have contributed to this sizable growth in household debt, including financial innovation, relatively low interest rates and rising house prices accompanied by high levels of borrowing against home equity.^{1,2}

In general, household borrowing can be used for a variety of purposes, such as purchasing or renovating a home, buying goods and services, investing in financial and non-financial assets, or repaying debt. Understanding how households use their borrowed funds, particularly how much of their increased debt loads are used to finance both household consumption and home renovation, is important for the conduct of monetary policy and for assessing the macroeconomic effects of increased household borrowing.³ For example, if increases in household debt are used primarily for spending,

¹ Crawford and Faruqi (this issue) identify trends in the level and composition of household debt in Canada and discuss the major factors that explain these trends.

² Peterson and Zheng (this issue) explore the key factors behind the medium-run fluctuations in Canadian house prices.

³ See Carney (2011a, b) and Côté (2011) for more on the economic and financial implications of household borrowing in Canada.

a fall in house prices that reduces home equity could decrease household borrowing and consumption (i.e., owing to a reduction in the value of the collateral).

In this article, we examine the sources and uses of household borrowing between 1999 and 2010,⁴ particularly home-equity extraction, i.e., borrowing against equity in existing houses through increases in mortgage debt and draws on home-equity lines of credit (HELOCs), to finance consumer spending, outlays for home renovation, debt repayment, and financial and non-financial investments. To assess how the accumulation of debt is related to household consumption and home renovation, we use the comprehensive data set, the *Canadian Financial Monitor* (CFM), which includes information on the uses of debt by Canadian households. This data set covers a significant period of time and the information is not available from other sources; however, it relies on household self-reporting and is therefore subject to the usual caveats regarding household survey data. For example, since financing is fungible, the initial motivation for a certain type of borrowing does not tell everything about how it is used. Nevertheless, this data set provides useful information for understanding the relationship between household borrowing and spending.

The article is organized as follows. We first present some facts regarding the evolution of Canadian household debt over the period from 1999 to 2010, emphasizing the increased importance of debt flows secured by housing. We then explore how Canadian households have used their borrowed funds over the same period, and assess the role of these borrowed funds in financing total consumption and spending on home renovation. We also examine the possible effects of a decline in house prices on consumption when household indebtedness is supported by housing equity as collateral.

Canadian Household Debt from 1999 to 2010

The rise in the ratio of household debt to income in Canada from 1999 to 2010 coincided with a period of rising house prices (**Chart 1a** and **Chart 1b**). Given that different types of debt may be used for a variety of purposes, we disaggregate household debt flows to permit identification of their use.

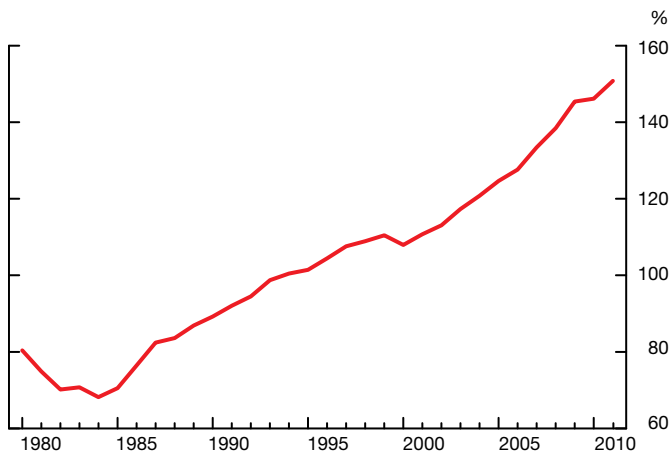
The commonly used classification of household debt flows into mortgage debt flows and consumer debt flows⁵ does not directly address our objective, since, in addition to debt secured by housing (e.g., HELOCs), consumer debt flows include unsecured debt (e.g., credit card debt). We therefore group these disaggregated flows of household debt according to whether or not they are secured by housing.

This results in three broad categories: (i) consumer debt flows not secured by housing; (ii) home-equity extraction; and (iii) mortgage debt flows associated with the purchase of newly constructed houses. The first category, consumer debt flows not secured by housing, is defined as all unsecured debt and debt secured by an asset other than housing and includes unsecured personal lines of credit and loans, credit cards, and automobile loans. The second category, home-equity extraction, is defined as the conversion by households of their housing equity into cash by borrowing, which can take three forms: (i) net mortgage refinancing, where homeowners increase the size of their mortgage or amortization term while staying in

⁴ We focus on this time period because our analysis draws on information from a micro data set that is only available as of 1999.

⁵ This is the classification used by Crawford and Faruqi (this issue).

Chart 1a: Ratio of household debt to income

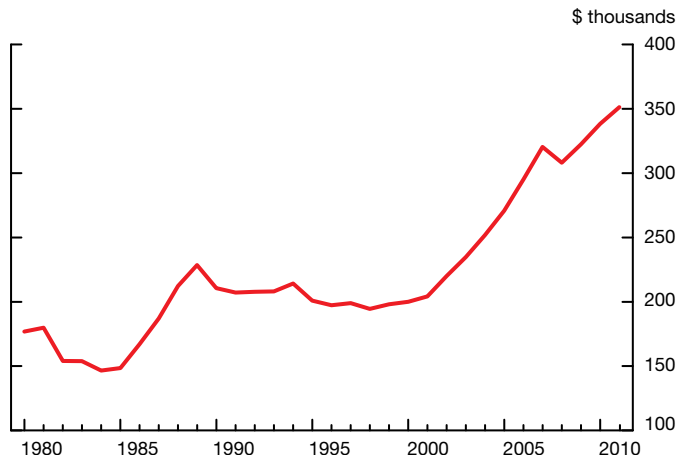


Note: The value for 2011 is the value for 2011Q3.
Source: Statistics Canada

Last observation: 2011

Chart 1b: Real house prices in Canada

Deflated by consumer price index, rebased to 2010



Sources: Canadian Real Estate Association and Statistics Canada

Last observation: 2011

the same home;⁶ (ii) draws on HELOCs;⁷ and (iii) changes in mortgage debt outstanding owing to changes in the ownership of existing homes. Such a change in ownership may affect the stock of debt if there is a difference between any mortgage debt outstanding repaid by the seller and any mortgage debt undertaken by the buyer to finance the purchase of a home.

Grouping the debt flows into these three categories allows us to match debt flows with information from the CFM on how households use the funds provided by different debt instruments (**Box 1**). Funds from home-equity extraction and consumer debt flows not secured by housing can be directly used for a variety of purposes such as consumption and home renovation, as well as investment in financial and non-financial assets. In the next section, we use CFM survey results to estimate the proportions of these debt flows used for such purposes. Since data on the use of mortgage debt associated with the purchase of newly constructed houses are not available, we assume that these debt flows are used solely for that purpose. This assumption would be valid for credit-constrained households that have saved just enough for the down payment and that are more likely to allocate their entire borrowing to the purchase of the house (Gervais 2002). However, some households can take a bigger mortgage and use a portion of it for the purchase of the house and the rest for other purposes, such as consumption and home renovation. Hence, our analysis could underestimate the extent of household debt flows used for consumption and home renovation.

Two key findings emerge from analyzing these categories of household debt flows. First, the large increase in total household debt since 1999 consisted primarily of home-equity extraction, which increased from around 2.2 per cent of disposable income in 1999 to a peak of 9 per cent in 2007 (**Chart 2a**). By comparison, mortgage debt flows associated with the purchase of newly constructed houses grew only modestly, from 2.3 per cent of disposable income in 1999 to 3.4 per cent at their peak in 2009, while consumer debt

The large increase in total household debt since 1999 consisted primarily of home-equity extraction

⁶ Existing data from the Canadian Association of Accredited Mortgage Professionals (CAAMP) and the CFM do not take into account changes in amortization terms when calculating net mortgage refinancing, potentially underestimating the amount of equity extraction they report.

⁷ This category also includes home-equity loans (i.e., non-mortgage loans secured by a home).

Box 1

Constructing Home-Equity Extraction

To construct the household debt flows used in this article, particularly home-equity extraction, we build on Greenspan and Kennedy (2005, 2007), who estimate levels of home-equity extraction for the United States (see Kartashova forthcoming). The items used in the decomposition of the household debt flows from 1999 to 2010 are summarized in **Table 1-A**.

Table 1-A: The components of debt flows secured against home equity

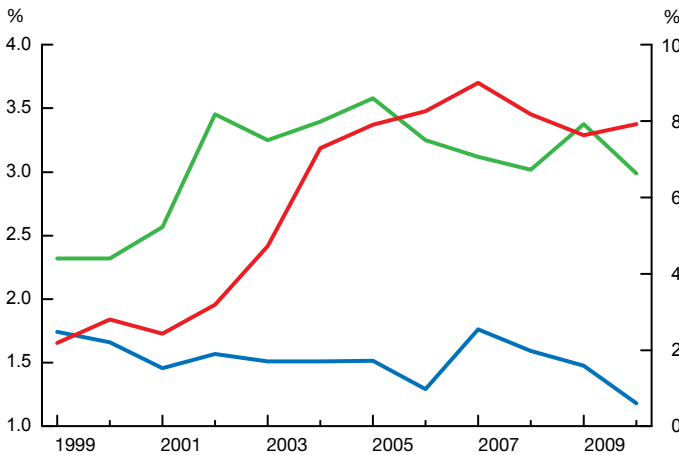
Mortgage debt flows	
Total residential mortgage originations	Total residential mortgage repayments
<ul style="list-style-type: none"> ▪ (a) To buy existing homes 	<ul style="list-style-type: none"> ▪ (d) Cancellation of mortgages outstanding on existing homes sold
<ul style="list-style-type: none"> ▪ (b) To refinance existing mortgages due to <ul style="list-style-type: none"> ▪ change in the lender ▪ increase in the mortgage amount ▪ increase in the mortgage amortization period ▪ decrease in interest rates 	<ul style="list-style-type: none"> ▪ (e) Cancellation of balances outstanding on existing mortgages refinanced due to <ul style="list-style-type: none"> ▪ change in the lender ▪ increase in the mortgage amount ▪ increase in the mortgage amortization period ▪ decrease in interest rates
<ul style="list-style-type: none"> ▪ (c) To buy newly constructed houses 	<ul style="list-style-type: none"> ▪ (f) Unscheduled mortgage payments
	<ul style="list-style-type: none"> ▪ (g) Scheduled mortgage payments
<ul style="list-style-type: none"> ▪ (h) Net draws on home-equity lines of credit (HELOCs) 	

Using this decomposition, *home-equity extraction* equals the sum of the net change in mortgage debt outstanding owing to a change in ownership of existing homes (i.e., **a - d**), net mortgage refinancing (i.e., **b - e**) and net draws on HELOCs (**h**), less unscheduled mortgage amortization payments (**f**); *mortgage debt flows associated with the purchase of newly constructed houses* are simply given by **(c)**.

Data sources

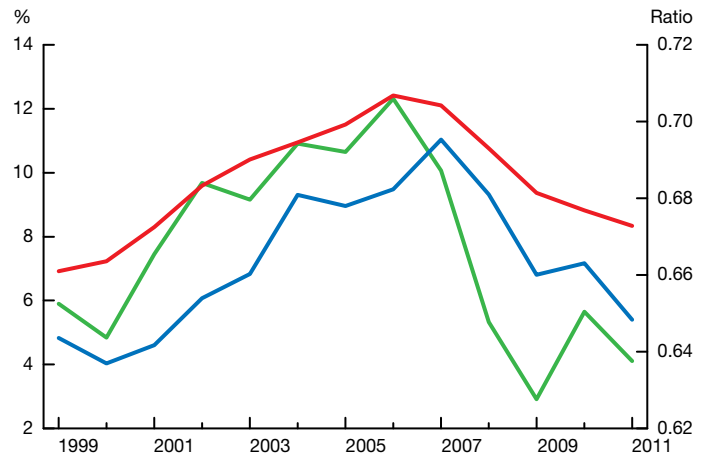
The data used to construct the debt flows are drawn from various sources and are both aggregate and micro-level data for the 1999–2010 period. For residential mortgages and consumer debt flows, we use data from Statistics Canada’s National Balance Sheet Accounts for the persons and unincorporated businesses sector, as well as the Bank of Canada’s *Banking and Financial Statistics* (BFS). To construct total mortgage originations, we use the Canada Mortgage and Housing Corporation (CMHC) survey on lending activity for the composition of mortgage approvals between different types of lenders, and the Office of the Superintendent of Financial Institutions *Mortgage Loans Report* (E2) for originations by chartered banks. For the decomposition of mortgage originations between new and existing homes, we use Multiple Listing Service (MLS) statistics from the Canadian Real Estate Association, the CMHC *Renovation and Home Purchase Report*, the CMHC Market Absorption Survey and the CMHC Starts and Completions Survey. To estimate mortgage cancellations on existing home sales, we use data from the *Canadian Financial Monitor* (CFM) to obtain an estimate of the distribution of balances outstanding on existing home sales and MLS home-unit sales. To construct unscheduled and scheduled amortization payments, we use CFM data to obtain the rate of prepayment, the average interest rate and the average term to amortization on mortgage balances outstanding. For HELOCs, we also use data from the CFM and the BFS.

Chart 2a: Household debt flows relative to personal disposable income



— Home-equity extraction (change in mortgage debt on existing homes and home-equity lines of credit) (right scale)
— Net flows of consumer debt not secured by housing (right scale)
— Mortgage debt flows associated with the purchase of newly constructed houses (left scale)

Chart 2b: Aggregate housing-equity ratio and its components



— Aggregate housing-equity ratio (right scale)
— Growth in mortgage debt (left scale)
— Growth in real estate value (left scale)

Sources: Statistics Canada and authors' calculations based on Kartashova (forthcoming)

Last observation: 2010

Source: Statistics Canada

Last observation: 2011Q3

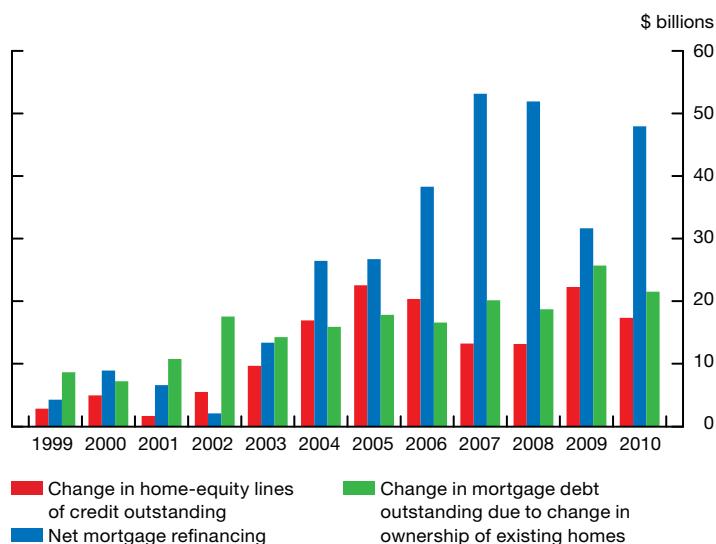
flows not secured by housing initially increased and then decreased over this period. Before 2003, net flows of consumer debt not secured by housing were similar to those associated with home-equity extraction. More recently, however, the vast majority of borrowed funds available to finance household spending on consumption and home renovation consist of home-equity extraction. Overall, home-equity extraction underpinned the robust rate of mortgage growth from 1999 to 2007. However, the value of the housing stock increased faster than mortgage debt, thereby implying a rise in the housing-equity ratio over the same period (**Chart 2b**).⁸

Second, the increase in home-equity extraction consisted mainly of net mortgage refinancing (**Chart 3**), which could be partly explained by rising housing prices from 1999 to 2010. Draws on HELOCs have also risen significantly since 1999 and increased markedly during the recent recession. Indeed, in 2009, net draws on HELOCs represented almost a quarter of the total increase in household debt, since households may have borrowed to compensate for the temporary decline in income during the recession. Some of this increase in HELOCs was also at the expense of mortgage refinancing, owing to relatively low interest rates on HELOCs. As well, HELOCs provide more flexibility in terms of draws and repayments, while mortgage refinancing requires that repayment of additional funds begin immediately.

The increase in home-equity extraction consisted mainly of net mortgage refinancing, [while] draws on home-equity lines of credit increased markedly during the recent recession

⁸ This is the measure of housing equity constructed by Statistics Canada, which does not include HELOCs.

Chart 3: Components of home-equity extraction



Source: Authors' calculations based on Kartashova (forthcoming)

Last observation: 2010

The Uses of Borrowed Funds

To examine how Canadian households allocate their borrowed funds, we draw on the CFM microdata set, which collects detailed information on many aspects of household finances. This data set is unique in that it provides information on the uses of household borrowing, so we do not have to infer them indirectly, as is done in some studies in the literature.^{9,10} Based on the uses of debt supplied in the CFM, we classify the purposes of borrowing into five broad categories: consumption,¹¹ home renovation, financial investment, non-financial investment¹² and debt repayment.

Home-equity extraction

The uses of total home-equity extraction reported in **Chart 4** are constructed as a weighted average of its three forms—mortgage refinancing, HELOCs and changes in mortgage debt outstanding owing to changes in the ownership of existing homes. The details of the uses of each form can be found in Kartashova (forthcoming).

Overall, the average share of home-equity extraction that is used to finance consumption and home renovation has been significant, at about 40 per cent, and remained relatively stable from 1999 to 2010 (**Chart 4**). About 34 per cent of the funds were used for financial and non-financial investments. The remaining 26 per cent were used to repay debt. These findings on the uses of home-equity extraction are consistent with those of other studies for the same period, which find that the majority of funds from home-equity extraction were used for consumption and home renovation.¹³

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⁹ See Mian and Sufi (2011), for example.

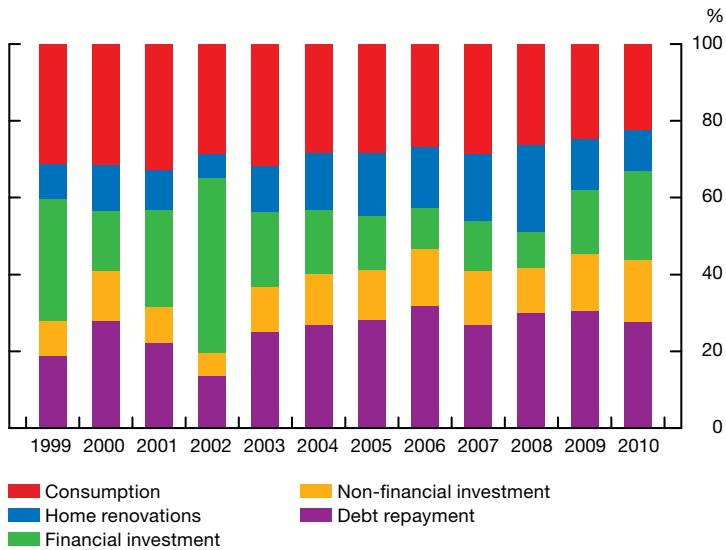
¹⁰ The CFM provides information on mortgage refinancing starting only in 2007. Thus, for the previous years, we assign average values based on known values for the period from 2007 to 2010.

¹¹ Borrowing for consumption includes borrowing for current spending, vacation spending, and the purchase of vehicles and other big-ticket items, as well as the repayment of student loans.

¹² Since this category corresponds to the CFM category "To purchase residence/business," we cannot separate the amount allocated to "residence." If this amount is large, our analysis may underestimate the household exposure to house prices.

¹³ See Mian and Sufi (2011) and Cooper (2010) for similar analyses in the United States, and Disney and Gathergood (2009) for a comparison between the United Kingdom and the United States.

Chart 4: Uses of home-equity extraction



Sources: *Canadian Financial Monitor* and authors' calculations based on Kartashova (forthcoming)

Last observation: 2010

Consumer debt flows not secured by housing

In our analysis, the majority of consumer debt flows not secured by housing (73 per cent, on average) were used to finance consumption, a share that has been fairly stable over time. The remaining funds were allocated to debt repayment (14 per cent),¹⁴ financial investment (6 per cent), home renovation (5 per cent) and non-financial investment (2 per cent).

The Role of Borrowed Funds in Financing Consumption and Home-Renovation Expenditures

To determine the extent to which household expenditures on consumption and home renovation have been financed by total flows of home-equity extraction and consumer debt not secured by housing, we aggregate these flows and their uses from 1999 to 2010.¹⁵ For information on the theoretical relationship between household borrowing and spending, see **Box 2**.

Consumption

From 1999 to 2010, home-equity extraction and consumer debt flows not secured by housing together financed an average of close to \$36 billion per year of consumer expenditures, or about 4.8 per cent of total consumption (**Chart 5**). This share increased steadily from the beginning of the period, peaking at 7.2 per cent in 2007, and has since declined, but remained higher in 2010 (at 4.5 per cent) than in 1999 (at 3.3 per cent). This behaviour largely followed the trajectory of the growth in household debt, since together these two debt flows constitute the majority of total debt

¹⁴ For example, renters may use unsecured lines of credit to repay their credit card balances, which are more costly.

¹⁵ The consumer debt flows not secured by housing include home-equity extraction used for consumer debt repayment and thus may underestimate the amount of consumption actually funded by home-equity extraction. At the end of this section, we provide an alternative higher estimate of the consumption funded by home-equity extraction by adding debt repayment from home-equity extraction to consumption.

Box 2

Household Borrowing and Spending: Their Theoretical Relationship

In general, households borrow to smooth consumption over their life cycle and to insure against uncertain events such as shocks to income. There are four widely discussed theoretical channels through which household borrowing, particularly against housing equity, can influence household spending. First, for households with a *long* expected housing tenure that are not financially constrained when making consumption decisions, the propensity to borrow against housing equity for consumption is zero (Sinai and Souleles 2005; Buiter 2010). To illustrate this, Campbell and Cocco (2007) state the following: "Housing is a consumption good, and for a homeowner who expects to live in his current house for a very long time, a higher house price is simply compensation for a higher implicit rental cost of living in the house. In other words, as Sinai and Souleles (2005) point out, homeowners with a long expected tenure are perfectly hedged against fluctuations in rents and the corresponding fluctuations in house prices. These fluctuations, however large they may be, have no *real* wealth effect, and absent any substitution effects, should not affect consumption choices."

Second, for households that have a *short* housing tenure and plan to consume part of their housing capital before death, the propensity to borrow against housing equity for consumption is positive. This propensity to borrow is strongest for older homeowners with shorter life horizons and housing tenure (Campbell and Cocco 2007).

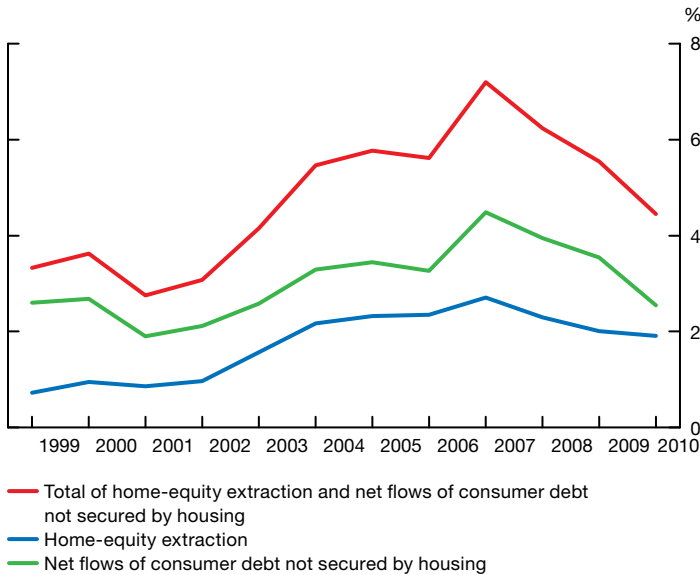
Third, for credit-constrained households, the propensity to borrow against increased housing equity is also positive, since these homeowners want to borrow more today to smooth consumption but are unable to do so because they have limited collateral (Iacoviello 2005). These homeowners would borrow more against increases in home equity to relax their budget constraints.

Finally, households that have a recurring urge for immediate consumption may aggressively borrow against their increased access to housing equity in order to finance current consumption (Laibson 1997). Although planning to be patient in the future, a household may nevertheless overspend when the future becomes the present. If households cannot restrain this behaviour, they will over-consume and over-borrow (Krusell and Smith 2003).

flows. Overall, the growth rate of consumption and the share of these borrowed funds used for consumption remained fairly stable between 1999 and 2010.

The share of consumption financed by home-equity extraction more than doubled over our sample period. However, this estimate takes into account only direct financing of consumption, i.e., household reports of debt used for consumption. A broader estimate of this share would include the indirect financing of consumption through the use of home-equity extraction to repay consumer debt not secured by housing, which was originally incurred to pay for consumption (see Greenspan and Kennedy 2007). The resulting share of consumption financed by home-equity extraction would be significantly higher (**Chart 6**), further highlighting the importance of home-equity extraction for consumption.

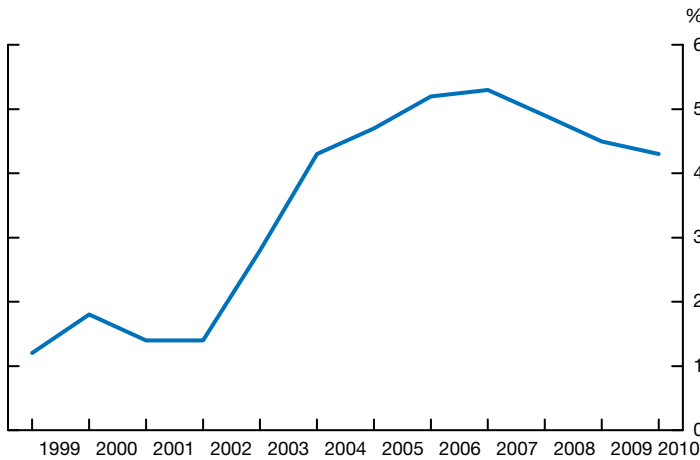
Chart 5: Share of total consumption financed by home-equity extraction and net flows of consumer debt not secured by housing



Source: Authors' calculations based on Kartashova (forthcoming)

Last observation: 2010

Chart 6: Share of total consumption financed by home-equity extraction used for consumption and debt repayment



Source: Authors' calculations based on Kartashova (forthcoming)

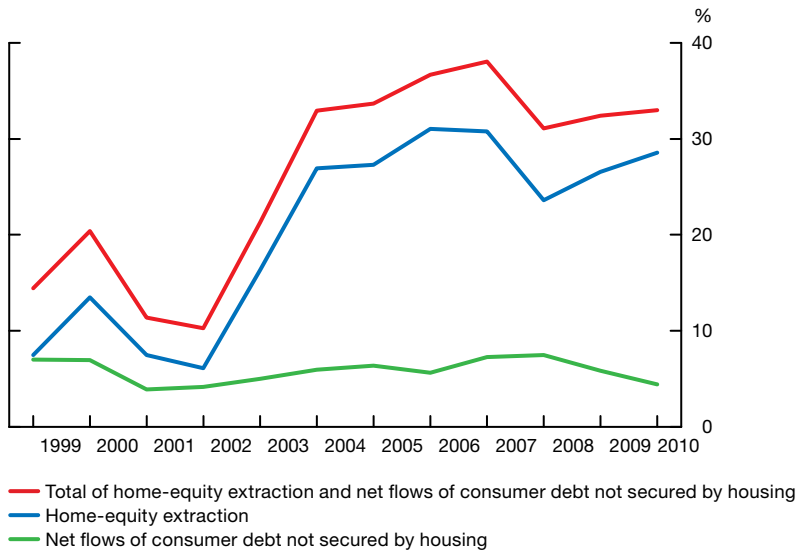
Last observation: 2010

Spending on home renovation

The proportion of spending on home renovation financed by net debt flows has, on average, been much higher than the proportion of consumption financed by debt (**Chart 7**). This may be because, in general, spending on home renovation is a “big-ticket item” that requires a larger amount of discrete financing than does consumption. From 1999 to 2010, home-equity extraction and consumer debt flows not secured by housing combined financed an average of \$8 billion per year of spending on home renovation, or about 26 per cent of the total. Similar to consumption, the share of home-renovation spending financed by debt increased over the period, reaching its peak of 38 per cent in 2007. The sustained increase in the share of spending on home renovation financed by debt could be attributed to high

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Chart 7: Share of total home-renovation spending financed by home-equity extraction and net flows of consumer debt not secured by housing



Source: Authors' calculations based on Kartashova (forthcoming)

Last observation: 2010

house prices, which increased housing equity, and financial innovation, which improved household access to this equity, among other factors.

Home-equity extraction contributed disproportionately more to spending on home renovation than did consumer debt flows not secured by housing, a trend that has been most pronounced since 2002. The share of spending on home renovation financed by home-equity extraction remained high during the recent recession, as households took advantage of fiscal incentives and relatively low interest rates. At the same time, this share also increased in relative terms, given that, as with consumption, consumer debt flows not secured by housing declined.

In summary, the growth in the size of shares of consumption and home-renovation spending financed by debt flows indicates that borrowing, particularly home-equity extraction, has played an important role in financing household expenditures. This suggests that household spending on consumption and home renovation can become vulnerable to house-price shocks, since lower house prices would reduce the value of housing collateral and thus decrease household borrowing (**Box 3**).

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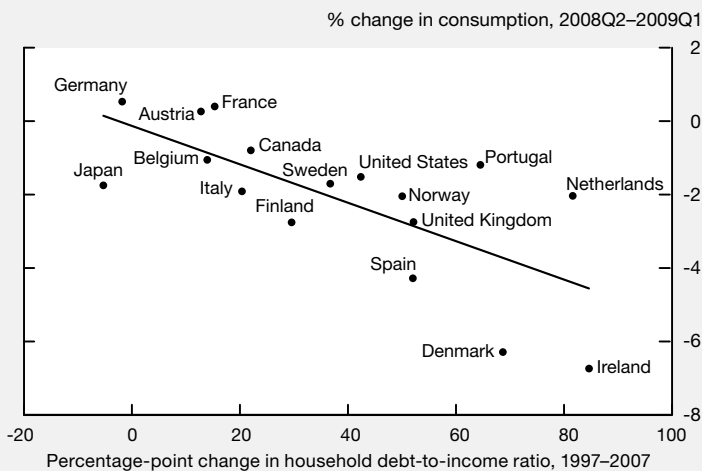
Box 3

Illustrating How a Decline in House Prices Could Affect Consumption

To illustrate the impact of a correction in house prices on consumption through the collateral channel, we start by presenting cross-country evidence on the correlation between borrowing and consumption and then we conduct two counterfactual experiments.

Consistent with the collateral channel, cross-country empirical evidence shows that a distinguishing feature of the recent financial crisis (triggered by the sharp decline in house prices) is that countries with the largest increases in both their house prices and their ratios of household debt to income in the decade leading up to the crisis tended to experience the largest contractions in consumption during the subsequent recession (**Chart 3-A**). For instance, during the recession, consumption fell dramatically (by 6.7 per cent) in Ireland, the country that experienced the largest increases in household debt and house prices over the period from 1997 to 2007 (Glick and Lansing 2010). Among the countries in the sample, Canada's increase in household indebtedness was relatively low in the years leading up to the crisis and, as a consequence, Canadian households experienced only a slight decline in their consumption levels. Since that time, however, the Canadian household debt-to-income ratio and house prices have continued to rise.

Chart 3-A: Household indebtedness and the decline in consumption



Sources: Organisation for Economic Co-operation and Development, Eurostat and Statistics Canada, based on Glick and Lansing (2010)

Last observation: 2009Q1

In the first counterfactual experiment, we use the estimates presented in the article to undertake back-of-the-envelope calculations to assess the impact on consumption if home-equity extraction used to finance consumption in 2010 were to return to its level in 1999. This suggests that a house-price shock in 2010 that would have reduced the share of consumption financed by home-equity extraction back to its share in 1999 (i.e., a decline from 2.0 per cent to 0.7 per cent) would have reduced aggregate consumption in 2010 by about 1.3 per cent,

(continued)

Box 3 (continued)

ceteris paribus. If we use our alternative measure of consumption obtained by adding debt repayment to consumption, the decline in consumption would have been about 3.1 per cent.

In the second experiment, we use a dynamic general-equilibrium model in which house prices affect endogenously the value of collateral and, hence, the amount of household borrowing (Christensen 2011; Boivin, Lane and Meh 2010). This model features a collateral channel that works as follows: A fall in house prices decreases the value of the collateral held by households, leading to a deterioration in the state of household balance sheets. This deterioration decreases the amount that households can borrow for current consumption and for housing investment.¹ Simulation results suggest that a 10 per cent decline in house prices can generate a peak drop in consumption of about 1 per cent.

¹ There is a feedback loop that may amplify the effects of the decrease in house prices on consumption. For further details, see Boivin, Lane and Meh (2010) and Christensen (2011).

Concluding Remarks

In this article, we have examined the relationship between the accumulation of household debt and spending on consumption and home renovation. We find that increases in home-secured debt, particularly home-equity extraction (increases in mortgage debt and draws on HELOCs on existing houses), contributed the largest share to the rise in total household debt in Canada between 1999 and 2010. Moreover, we show that a significant share of the funds borrowed against home equity was used for consumption and home renovation. These findings suggest that household indebtedness constitutes an important source of risk to household spending, since it makes households more vulnerable to substantial negative economic consequences in the event of a correction in house prices.

Although we have learned a great deal about the link between household borrowing and consumption and spending on home renovation, further work is needed to deepen our understanding of these issues. A future research question could focus on assessing how home-equity extraction in Canada responds to increases in house prices and identifying which types of households borrow more aggressively. In addition, further work is needed to show that countries with high ratios of household debt to income tend to experience simultaneously more severe and prolonged recessions, since it is difficult to reproduce supporting evidence using standard models.

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