

A Summary of “Credit Conditions and Consumption, House Prices and Debt: What Makes Canada Different?”

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Abstract

We propose new ways to think about the set of equations governing the household sector in general equilibrium models by incorporating real-financial linkages between consumption, household balance sheets and credit markets. Canada shares similarities with the United States and several other countries in that a long-term increase in households’ access to credit has increased consumption relative to income and expanded household portfolios. Canada differs in that higher house prices relative to income have a mostly negative impact on consumption relative to income, except when offset by an easing in credit conditions. Much of the rise in house prices and debt since the late-1990s can be explained by cheaper and easier access to mortgage credit.

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1. Introduction

Integrating linkages between real and financial variables, particularly in the household sector, into mainstream macroeconomic models is a major challenge in the wake of the global financial crisis (Kohn 2009; Poloz 2015). General equilibrium (GE) models in levels such as the Fed's FRB-US model (Brayton and Tinsley 1996) and the Bank of Canada's Large Empirical and Semi-structural model (LENS, Gervais and Gosselin 2014) offer a promising platform for these efforts. We propose new ways to think about the set of equations governing the household sector within such a structure. We test several theoretical propositions on how real-financial linkages may operate and compare our empirical results for Canada with findings for other countries.

Consumption is the largest expenditure sector for most developed countries and is therefore a central element of GE models. Conventional approaches assume that there are two types of representative households: a fixed proportion of "liquidity-constrained" households whose consumption is limited by current income; and "unconstrained" households who respond to changes in permanent income and optimise consumption subject to adjustment costs. The cornerstone model for the latter is the "solved-out" life-cycle/permanent income hypothesis (LCH-PIH) model, where the level of consumption is a function of the discounted present value of expected future "non-property" income (labour income plus net transfers) and net assets.

The conventional two-agent approach contrasts with a heterogeneous agent view of households (Deaton 1991; Carroll 1992, 2001; Kaplan et al. 2016). In the latter view, households face differing degrees of uninsurable income uncertainty and liquidity (and credit) constraints arising from the composition and distribution of household portfolios. For example, wealthy households (but with mostly illiquid assets) may exhibit "hand-to-mouth" behaviour, or high sensitivity to transitory income changes and low sensitivity to interest rates except through portfolio rebalancing (Kaplan et al. 2014).

These features lead to much more complex responses for *average* consumption to changes in income, interest rates or wealth.

The conventional reliance on a single net worth term, where all assets have an identical and constant impact on consumption as in Ando and Modigliani (1963) and popular policy models since, is especially problematic. Cooper and Dynan (2016) review extensive literature on this point. They conclude that the marginal propensity to consume (MPC) out of assets may vary across: asset type, depending on liquidity¹ and access to credit; age, income and wealth distributions; countries, depending on institutional and distributional features; and time, depending on changes in any of the aforementioned characteristics. They also question the assumption that debt has the same impact on consumption as a negative asset. Our paper is consistent with the foregoing ideas and presents a model of consumption that can incorporate real-financial interactions and structural changes therein.

2. Methodology

We focus on the determinants of three key variables: consumption; house prices; and mortgage debt. The system could be extended with equations for liquid and illiquid financial assets, and acquisition of housing, thereby comprising the household “block” of a GE model. Central to our approach is recognition that macroeconomic time series are often subject to structural breaks, such as changes in households’ access to credit, that cause common mean-shifts or location-shifts in several variables (Stock and Watson 1988; Hendry 1997). Hendry and Mizon (2014a and 2014b) argue that models that ascertain the likely persistence of structural breaks ex-post offer the best prospects for mitigating systematic forecast failure.

1. For example, it is highly implausible that cash should have the same MPC as pension wealth.

How can policy-makers detect structural changes in households' access to credit (i.e. aside from interest rates)? In the absence of time-series data from lender surveys, an indirect approach is necessary.²

We use a Latent Interactive Variable Equation System (LIVES) approach to control for the impact of indirectly-observed, common structural changes in consumption, house prices and mortgage debt.

Each equation contains a latent variable defined as a spline function composed of a linear combination of smoothed step dummies. The spline function has a scaled effect in each equation but its slope coefficients are common and jointly estimated. The function captures time variation in the intercept and, via interaction effects, the parameters of key explanatory variables in each equation.³

Because we control for a fairly exhaustive set of controls for *other* economic and demographic factors (including interest rates, expectations about future income and about housing capital gains), thereby ruling out many alternative interpretations, we suggest that the latent variable could be interpreted as non-price mortgage credit conditions. The estimated latent variable is consistent with information about the institutional history of Canada's housing finance arrangements and with growth in household credit aggregates. We also explore a control for shifts in access to home equity finance that is based on debt data (i.e. not latent).

3. The special role of housing and housing finance

Conventional LCH-PIH theory extended to include a separate role for housing wealth (but not mortgage credit constraints) suggests that price-induced housing wealth increases may have a small negative or

2. Lender survey data on non-price credit conditions facing households are available for the US, Japan, Euro area and UK, but not Canada. The US Federal Reserve's *Senior Loan Officer Opinion Survey of Bank Lending Practices* provides useful information on unsecured credit conditions since 1966 and on the mortgage market since 1990. The Bank of Japan has surveyed lenders about household credit conditions since 2000, the European Central Bank has done so since 2003 and the Bank of England has done so since 2007.

3. See also Muellbauer and Williams (2011), Aron and Muellbauer (2013), Chauvin and Muellbauer (2013), Duca et al. (2016) and Geiger et al. (2016). For the U.S., the LIVES method can be used to capture the time varying marginal response of consumption to housing collateral (Duca and Muellbauer 2013).

negligible impact on aggregate consumption (Buiter 2010; Aron et al. 2012). This is because the predicted consumption impact comprises a negative income effect for all households (i.e. higher rent and imputed rent costs), offset by a “pure” wealth effect received by homeowners only. The net of these two effects would then depend on the tenure structure (the proportion of renters versus owner-occupiers), which differs across countries.⁴

When mortgage credit is added to the model, there are several more channels by which house prices could affect consumption. They must be evaluated empirically. First, house purchases typically involve a mortgage down-payment. This is a major savings event in the household life cycle. The size of the down-payment is determined by house prices and the cost and availability of mortgage credit, none of which can be assumed constant. Second, in some countries home-owners have gained access to home equity loans (i.e. residentially-secured, revolving lines of credit). This relatively new form of lending enables home-owners to leverage housing capital gains and use the borrowed funds for consumption or investment. The housing collateral effect therefore hinges on country- and time-specific mortgage market arrangements. Finally, the MPC out of debt may be larger than (minus) that on other assets given its greater liquidity (Otsuka 2004) or due to households’ uncertainty about future access to credit (Cooper and Dynan 2016).

4. Summary of main findings

The foregoing discussion suggests that the dichotomy between “liquidity-constrained” (current income) and “unconstrained” (permanent income) consumers is a false one. We propose and test a more generalised and credit-inclusive treatment of the household sector. Our main findings are as follows.

4. This is another reason to reject net worth as the appropriate measure of wealth for modelling consumption.

- Canada shares similarities with the United States, the United Kingdom, Australia, France, Germany and South Africa in that shifts in household non-price credit conditions have real economy effects on consumption as well as on household portfolios. A long-term easing in credit conditions has increased consumption and household portfolios relative to income.
- Canada's institutional arrangements appear to have encouraged home equity lending for investment (e.g. rental property purchases and home renovations), contributing to increases in house prices and mortgage debt after the 1990s, but not to increases in consumption relative to income once credit conditions are controlled for. Canada differs from the United States, the United Kingdom, Australia and South Africa in that higher house prices to income have a mostly negative impact on consumption unless there is an offsetting relaxation of credit access.
The reluctance of Canadian households to borrow to consume capital gains could be due to institutional features that encourage households to build housing equity: conservative individual loan screening; full recourse mortgages in most provinces; exposure to interest rate risk due to short mortgage renewal periods; and non-deductibility of mortgage interest on personal residences.
- Our results also highlight an important feature of Canada's monetary policy transmission mechanism. A decrease in borrowing rates raises consumption in the short run; however there are also negative, indirect effects on consumption via household balance sheets that take longer to materialize. Consumption adjusts to changes in interest rates within around 1½ to 2 years whereas house prices and debt levels, which dampen consumption, take closer to 5 years.
- Finally, much of the rise in Canadian house prices since the late-1990s can be explained by declining interest rates and the greater availability of mortgage credit (including home equity loans). The outlook for house prices may depend on the future paths of these variables.

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