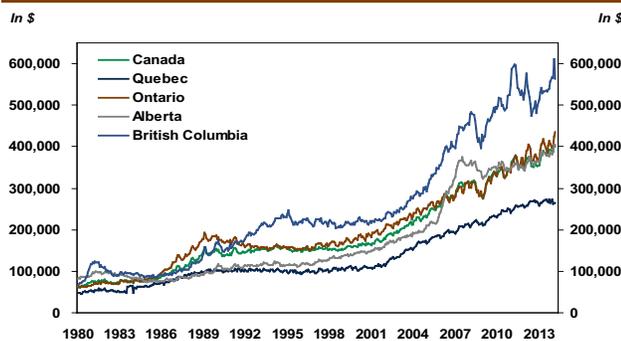


Interest rate sensitivity and the real estate market

This *Economic Viewpoint* summarizes a more comprehensive study titled *Sensibilité des marchés immobiliers canadiens régionaux : une approche vectorielle à facteurs*¹ (The sensitivity of Canada's regional real estate markets: A factor-augmented vector approach), conducted by Thomas Binet and presented as his graduate dissertation for his *Maîtrise ès sciences de la gestion de HEC Montréal, économie financière appliquée*² (Master of Science in Administration from HEC Montréal, Applied Economics option). The author sought to measure the sensitivity of Canada's housing sector in different regions against the monetary policy. The study confirmed the negative relationship between interest rates and the real estate prices often cited in the literature. The analysis of the situation in Canada is particularly relevant now that concerns are being raised about a possible overvaluation against the backdrop of high household debt.

Home prices expressed in real terms have been on an uptrend for the past 30 years in Canada (graph 1). Significant differences have been noted in property price movements between different regions, however, which make a disaggregated study on a regional level all the more interesting.

Graph 1 – Average existing home prices

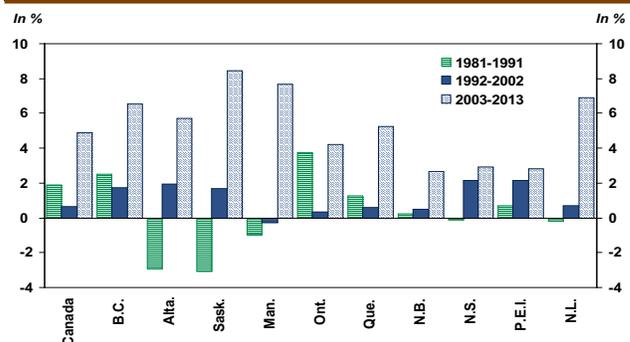


Sources: Canadian Real Estate Association and Desjardins, Economic Studies

Real estate prices did not rise in stable and regular increments between 1980 and 2013. Prices instead rose in

three separate phases (graph 2). For the period between 1981 and 1991, average annual property price growth in real terms reached 1.9%, driven for the most part by home prices in British Columbia, Ontario and Quebec. The 10-year period from 1992–2002 saw fairly weak national average growth of just 0.6%. In contrast, from 2003 and 2013, the annual average price growth exploded in all regions across Canada, especially when compared to the previous 20 years: annual average price growth reached almost 5% in Canada;

Graph 2 – Average annual growth of property prices in real terms



Sources: Canadian Real Estate Association, Statistics Canada and Desjardins, Economic Studies

¹ Thomas Binet, "Sensibilité des marchés immobiliers canadiens régionaux : une approche vectorielle à facteurs", *Sujets de recherche 2013 - M.Sc.*, HEC Montréal, July 2013, 77 p., biblos.hec.ca/biblio/memoires/2013NO62.PDF.

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NOTE TO READERS: The letters **k**, **M** and **B** are used in texts and tables to refer to thousands, millions and billions respectively.

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Table 1 – Average annual growth of nominal property prices, disposable income and household debt

	<i>Nominal home prices</i>	<i>Disposable household income</i>	<i>Total household debt</i>	<i>Consumer credit</i>	<i>Housing credit</i>
In %					
1981-1991	7.8	n/a	9.6	8.1	10.3
1992-2002	2.4	3.7	6.0	7.2	5.6
2003-2013	6.8	4.6	8.6	8.4	8.7

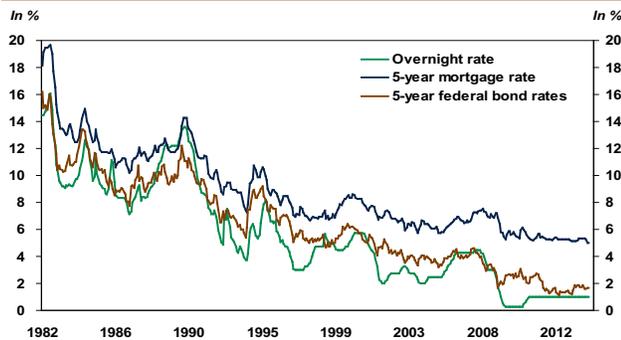
n/a: not available

Sources: Statistics Canada, Canadian Real Estate Association and Desjardins, Economic Studies

overall, in the past 30 years, real property prices in Canada have posted annual average growth of 2.5%.

The price acceleration recorded in the past 10 years coincided with a run-up in household debt (table 1) and falling interest rates (graph 3). This translates to a decrease in the interest paid on mortgages to disposable income ratio from 10.6% to 7.2% between 1992 and 2013, while the debt to disposable income ratio rose from 91% to 166% for the same period.

Graph 3 – Evolution of nominal interest rates



Sources: Statistics Canada and Desjardins, Economic Studies

OBJECTIVE OF THE DISSERTATION

The objective of the dissertation was to gain a better understanding of the impact a monetary shock or credit shock would have on property prices across Canada’s different regions. To complete the study, an econometric model³ was used to make it possible to work with a large

database consisting of 255 series to model the economy and observe reactions to a large number of variables on national and regional levels. The model was estimated based on a sampling gathered from January 1983 to July 2008. The economic crisis of 2008–2010, also known as the Great Recession, was excluded since it led to non-conventional monetary policy measures and liquidity problems. Including this period in the analysis resulted in relatively similar outcomes for the real estate sector, but more discrepancies were noted, which is why a more conservative sampling was selected.

TYPES OF SHOCKS AND RESULTS

In reality, two types of shocks yielded thought-provoking results. The first is a monetary shock consisting of a 25-basis-point increase in the Bank of Canada’s (key rate) overnight rate vs. the original equilibrium level, all else equal. The second shock analyzed the impact of an increase in property prices on the Canadian economy.

INCREASE IN THE OVERNIGHT RATE

The main results drawn from this model showed that a 25-basis-point increase in the overnight rate would trigger a contraction in the production of goods and services in Canada’s economy. In fact, the total GDP showed a slight and gradual decline that reached -0.15% below the original equilibrium level after 48 months. This does not necessarily mean that the total GDP will be weaker in four years compared to today; instead it will be weaker than it would have been without an increase in key interest rates. The same applies to all the other variables.

The GDP decline in the construction sector was slightly stronger, with a pullback of 0.6%. Employment tracked the same path. The unemployment rate rose by 10 basis points above the original equilibrium level. An increase in Canadian government bond rates and the housing credit rate with a 5-year term was noted and the spread between the housing credit rate and government bond rate for the

³ This study was conducted using a Factor-Augmented Vector Autoregressive (FAVAR) model. See: Ben S. Bernanke et al., “Measuring the Effects of Monetary Policy: A Factor-Augmented Vector Autoregressive (FAVAR) Approach,” *Economic Research & Data – Working Papers and Notes*, Board of Governors of the Federal Reserve System, 2005, 48 p., www.federalreserve.gov/Pubs/Feds/2004/200403/200403pap.pdf.

Table 2
Summary of results

Reaction of the following variables:	<i>Impact of an increase:</i>	
	Key rate	Canadian real estate prices
Key rate	Shock of +25 basis points vs. the original equilibrium level	Increase up to the second year (+20 basis points), then return to the original equilibrium level
Real GDP	-0.15% vs. the original equilibrium level after 48 months	Increase up to +0.1%, then dip into negative territory after four years
Unemployment rate	+10 basis points vs. the original equilibrium level after 48 months	Decline before returning to the original equilibrium level shortly after four years
5-year housing credit rate	Increase, then return to the original equilibrium level	Increase up to the second year then return to the original equilibrium level
Mortgage credit (level)	-0.1% vs. the original equilibrium level after 48 months	Increase vs. the original equilibrium level
Canadian real estate prices	-0.6% vs. the original equilibrium level after 48 months	Shock of +1.3% vs. the original equilibrium level

Source: Desjardins, Economic Studies

same term was positive, but negligible. The money supply and consumer credit fell in equal measure, or about -0.3% below the original equilibrium level while housing credit fell to a lesser extent. Lastly, the Canadian dollar enjoyed a bit of a boost during the first few months, followed by a decline.

With respect to real estate prices, the restrictive monetary shock triggered a decline in the average sales price of existing homes. Price levels in Canada declined by about 0.6% vs. the original equilibrium level after 48 months. Similar outcomes were observed in Quebec, Ontario and in British Columbia, while Alberta posted a slightly higher decline, at -0.75%.

In short, an increase in short-term interest rates has a non-negligible impact on the real estate sector. These results confirm the strong negative relationship between interest rates and property prices cited in the literature, where a temporary uptick of 25 basis points triggers a price pullback of between 0.30% and 1.75% vs. the original equilibrium level for property prices, based on the estimation methods used and the country.

SHOCK ON PROPERTY PRICES

In a second simulation, a shock that impacts property prices was applied to Canada's economy to evaluate the transmission mechanisms of this type of shock and quantify its impact—this type of shock on property prices could stem from a speculative bubble or sudden demand from foreigners entering the market. The shock applied (equivalent to a

standard deviation of the structural residuals) triggered an immediate 1.3% increase in property prices in Canada vs. the original equilibrium level. The interest rates showed a sudden decline which evaporated quickly, reaching a peak in the second year before declining and converging toward the original equilibrium level. Production in Canada rose slightly vs. its original equilibrium level (+0.1%) to settle back into negative territory in the fourth year, which could reflect the impact of the increase in interest rates. The GDP increase in the construction sector was stronger than in the overall economy. The unemployment rate declined before settling back to the original equilibrium level shortly after the fourth year. Employment in the construction sector outpaced total employment, suggesting that an increase in property prices stimulated investment in this sector. An increase in housing credit twice as strong as consumer credit was added to the mix. Property prices continued to rise vs. the original equilibrium level until the fifth year. Of particular note, Alberta is the region that is the least sensitive to price increases in Canada. These results could suggest that price increases trigger an increase in housing credit and real estate investments that could contribute to gradual price advances, until the impact of increased interest rates is felt.

CONCLUSION

Due to its impact on the economy and its heft in household balance sheets, the real estate market deserves special attention. Concerns about an overheated market in recent years, especially after the shakedown in the U.S. market, are justified. The spiralling increase in household debt, largely



attributable to the real estate market, makes households vulnerable to rising interest rates. This study reminds us that an increase in interest rates would clearly have a negative impact on the real estate market.

This study showed us that each 25-basis-point increase in Canada's key rate triggers a 0.6% decline in property prices after four years, vs. the original equilibrium level, all things being equal. This does not necessarily mean that home prices will be weaker in four years compared to today; instead, they will be weaker than they would have been without an increase in key interest rates.

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