An Examination of the Current Canadian Housing Market

by

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Thesis Submitted in partial fulfillment of the

requirements for the Degree of

Bachelor of Arts with

Honours in Economics

Acadia University

March, 2011

This thesis by Nicholas A. Broz
is accepted in its present form by the
Department of Economics
as satisfying the thesis requirements
for the degree of Bachelor of Arts with Honours

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Acknowledgements

I would like to that Burc Kayahan and Scott Skjei for their continued help and support throughout the process of writing this thesis. Your help was greatly appreciated and I never could have done this without you. I would also like to thank my parents and my girlfriend for their patience, love and support throughout.

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Abstract

Is there a housing bubble in Canada? Analysis will first be conducted by estimating the user cost of home ownership compared to the yearly rent of a comparable home. A second analysis will be conducted to analyze the behaviour of various regional markets. I conclude that testing for an overheating of the Canadian housing market must be done at a regional level and testing for a national housing bubble is unlikely to be accurate. A policy implication is that the policy structure available to cool certain overheated markets will have adverse effects on other stable markets.

Chapter 1 - Introduction

Since the end of 2002, nominal housing prices in Canada have risen by approximately 60%. This includes significant growth prior to 2007/08, followed by a small price reduction in 2008 and a rebound to prior levels in 2010.[1] This run-up in national housing prices has brought on speculation of a national housing bubble present in Canada's housing market.

The burst of the US housing bubble in 2008 along with the effect it had on the United States financial crisis and subsequent recession has many observers of the Canadian market concerned, Recently, those market observers and concerned homeowners are calling on the federal Minister of Finance, Jim Flaherty, to intervene and enact policy to cool down the market and prevent a potential future bubble.

In this thesis, I show that the claims of Canada having a national housing bubble are unfounded and that any claim regarding the potential for a housing market must be considered at a regional level. Further, the policy structure in Canada is not adequately prepared to deal with regional housing bubbles and that any attempt to cool specific overheated markets will have adverse effects on markets that do not require intervention.

[1] (Tsounta 2009)

Chapter 2 – Literature Review

2.1 – Market Overvaluation Literature

Before examining markets to assess whether there exists a housing bubble, it is necessary to identify what the professional literature defines as a bubble. Some definitions prefer to deal with the speculative nature of the bubble growth. For example, Lawrence Roberts concludes how speculative buying fuels the increases in market value:

> A financial bubble is a temporary situation where asset prices become elevated beyond any realistic fundamental valuations because the general public believes current pricing is justified by probable future price increases. If this belief is widespread enough to cause significant numbers of people to purchase the asset at inflated prices, then prices will continue to rise. This will convince even more people that prices will continue to rise. This facilitates even more buying. Once initiated, this reaction is self-sustaining, and the phenomenon is entirely psychological. When the pool of buyers is exhausted and the volume of buying declines, prices stop rising; the belief in future price increases diminishes. When the remaining potential buyers no longer believe in future price increases, the primary motivating factor to purchase is eliminated; prices fall. The temporary rise and fall of asset prices is the defining characteristic of a bubble.[2]

Other definitions place less emphasis the speculative nature of the asset price growth and focus on the fact that unsustainable prices driven up by economic factors constitute a bubble. Canadian Mortgages Inc. defines a bubble in the quotation below:

> A real estate bubble or property bubble...is a type of economic bubble that occurs periodically in local or global real estate markets. It is characterized by rapid increases in the valuations of real property such as housing until they reach unsustainable levels relative to incomes and other economic indicators, followed by decreases that can result in many owners holding negative equity

[2] (Roberts 2008)

> (a mortgage debt higher than the value of the property). Unlike a stock market crash following a bubble, a real estate "crash" is a slow process, because sellers just decide not to sell.[3]

We can see from the various definitions presented above that depending on the definition, authors use different techniques for detecting housing bubbles. From a simplified perspective, bubble growth can be defined as asset growth that is inconsistent with historical trends. Academic literature begins by identifying the hypothesized period of the overheating and most researchers studying the subject use a wide variety of indicators to explain their view on the reasons for the existence of a potential bubble.[4]

Mints (2007) studies the impact of mortgage rates on the Russian housing market and concluded that there was a housing bubble in the 1980s. This conclusion was based on the existence of a large disparity between mortgage rates and the rate of return on risk-equivalent financial investments.[5] Mints does not study North American housing markets directly, but he does mention the possible existence of a similar disparity in the United States.

Himmelberg, Meyer, and Sinai (2005) discount the use of standard house pricing models, such as using growth rates in house prices, the price-to-rent ratio, and the price-to-income ratio. They argue that if these measures were…

[3](Canadian Mortgages Inc, 2009)

[4] (Kohn, Bryant 2008)

[5] (Mints 2007)

> …reliable indicators of a rising cost of obtaining housing, then these recent trends would indeed provide reasons to suspect overvaluation in many housing markets. However, these measures are inadequate to assess whether the housing market is (in) the grip of a speculative bubble.[6]

Instead, they favour using a comparison of the user cost of housing, or the equivalent cost to rent the property for a year with the opportunity cost of investing for that year. This comparison should include tax benefits of home ownership, property taxes, maintenance expenses, and expected capital gains. They go on to state that a bubble occurs when unreasonable expected capital gains outweigh user costs. Their analysis concluded that although standard measures of price growth indicated prices were inflated, the growth was not necessarily due to a dangerous housing bubble in most metropolitan American markets and that prices were consistent with fundamentals.

Some theorists model the speculative nature of housing bubble growth by considering the homeowners expectations of future price growth. Case and Schiller (2003) define a bubble as "a situation in which excessive public expectations of future price increases cause prices to be temporarily elevated."[7] They assert that it is the buyers' view of the house as an investment for income purposes that propel the bubble growth in the asset.

In the bubble environment, a house that is considered too expensive under normal conditions would no longer be considered overpriced because of the expectations of future price increases. The increased demand as a result of the

[6] (Himmelberg, Meyer, Sinai 2005)

[7] (Case, Schiller 2004)

expectations of future prices rising further speeds up the bubble growth process. Himmelberg et al. assert that increases in recent price trends are not sufficient evidence of a bubble and that expectations of future prices are the indicator of a speculative bubble. To test their hypothesis, they collected data on expectations, perceived risk, and word of mouth behaviour of home buyers that, in turn, impacted buyer's theories of speculative price movements in the United States. These themes were analyzed to determine their impact on housing price movements and financial markets. It was determined that four markets had experience a speculative bubble driven by expectations on investment income in the United States.

The common factor of all housing bubble analysis is that for a housing bubble to be present prices must deviate away from their historical norms. The key to determine if it is an unsustainable housing bubble is to identify what factors are driving up prices and whether these changes can be maintained in the long run. The collection and interpretation of these variables must be done carefully to ensure the results are accurate.

2.2 – Literature on the Canadian Housing Market

With the rising home prices seen in Canada in the mid to late 2000s, many studies have been conducted to investigate the presence of a potential overvaluation of prices in the Canadian housing market. Consistent with analysis on other markets, many different types of analysis have been used on the Canadian market with varying results and conclusions.

Tsounta (2009) uses an error correction econometric model based on reversion to long run trends to conclude that Canadian housing markets are not

inflated and proceeds to discount the presence of a bubble.[8] Sutton (2009) uses a VAR model to find that Canadian home prices are in line with fundamentals and policy intervention is not needed in Canada.[9] Goldman Sachs (2008) and Tomura (2009) also reach the same conclusion, rejecting the need for intervention in the Canadian housing market.[10]

Other studies in Canada determined that housing prices were overvalued by as much as 25 per cent. Somerville and Swann(2008) used price and rent data in various metropolitan markets to conclude that prices were overvalued in most markets by an average of 25 per cent. McDonald(2010) used conventional measures of housing valuation to reach the same conclusion.[11]

2.3 - Conclusions from Literature Review

From what we can see there is no consensus on the possibility for an overvaluation in Canadian Housing markets. It appears as though the methododolgy used for testing will impact the results as various methods have yielded a wide array of results in Canada.

As seen in the literature available on the subject, there are multiple definitions available for a housing bubble and an equal amount ways to detect or justify the presence of a housing bubble. The method of identifying bubble growth driven purely by expectation of future growth appears to be the most difficult to work with. To identify the presence of a speculative bubble, Case and Schiller

[8] (Tsounta 2009)

[9] (Sutton 2002)

[10] See (Goldman Sachs 2008) and (Tomura 2008)

[11] (Macdonald 2010)

surveyed homeowners in various markets about their expectations of the future price of their homes.[12] This type of analysis is likely to be subject to various types of sampling bias and the collection of the data would be costly and difficult. It is very likely that most people would not want to speculate their homes were overvalued, which may skew the survey data collected. An analysis involving data on underlying economic factors and trends in the housing markets would be easier to interpret and much less costly to collect leading to a more illustrative analysis.

[12] (Case Schiller 2004)

Chapter 3 - Methodology

3.1 – Local Markets

Six representative urban markets will be analyzed in this thesis: Halifax (Nova Scotia), Montreal (Quebec), Ottawa (Ontario), Toronto (Ontario), Calgary (Alberta) and Vancouver (British Columbia). These markets are spread across Canada and constitute as a representative market in many of the different regions that make up Canada as a whole. All of these regions are likely to be impacted by different factors that would affect their housing demand and price growth.

In analyzing these urban markets, it may be possible to determine what areas of the country are subject to overheating housing prices and will allow inference on the possibility of a Canada-wide housing bubble. Analysis of these markets across Canada will also show whether the overheating in housing markets occurred during the same time period and will potentially allow for grouping of similar markets. Looking at the trends across all of these markets will allow inference on whether there is a potential for a nation wide housing bubble across all of Canada or if the issue is a regional one.

3.2 – Study Methodology

Following the methodology used by Himmelberg et al. (2003), I discount the use of conventional measures of housing valuation such as the price to rent ratio and the price to income ratio on the basis that the purchase price of the home is not equivalent to the actual annual cost of the home. The conventional measures mentioned previously make the mistake of treating the sale price of the home as the

actual cost of home ownership for a year. Himmelberg et al. advocate that a correct calculation of the financial return associated with an owner occupied property should compare the yearly cost of ownership or the "imputed rent" to the cost of renting the same property. To do so, they adopted a formula to calculate the imputed rent and "user cost" of owning a property for a year and compared it to the yearly rent that could have otherwise been paid to live in that property as a way of judging whether housing prices were too high (or low). This analysis includes opportunity costs of investment along with direct costs associated with homeownership. They advocate that although price to rent ratio and price to income ratio may appear out of line with previous equilibrium in some markets, we may just be observing a change in the fundamental value of the homes on the basis of changes in housing costs. Therefore, we should not jump to conclusions regarding overheating in a market based on high prices or high price to rent or income ratios.

The User Cost Formula

The formula used by Himmelberg et al. (2003) to calculate the cost of homeownership, also known as the "imputed rent" is the sum of six components representing costs and offsetting benefits of homeownership. The formula presented in their analysis is:

$$\text{Annual Cost of Ownership} = P_t r_t^{rf} + P_t w_t - P_t t_t (r_t^m + w_t) + P_t d_t - P_t g_{t+1} + P_t g_t$$

The first part of the equation is the opportunity cost of not receiving interest on the money used to purchase the home. This is calculated by the price of the home P_t

times the return on a risk free asset r_t^{rf}, in this case the risk free asset will be the return on a 10-year government bond[13]. The second component of the equation is the one-year cost of property taxes, calculated by taking the price of the home times the property tax rate w_t.

The third portion of the equation put forth in Himmelberg et al. (2003) is an offsetting benefit to owning a home, which is the tax deductibility of mortgage payments and property taxes for those who itemize their taxes in the United States. In Canada however, mortgage interest payments and property taxes are not tax deductible in properties that are owner occupied[14], so in Canada there is no offsetting tax benefit to owning and living in a house. Therefore, for this analysis the offsetting benefit in component three of the equation can be ignored. The fourth component of the equation is the maintenance costs for owning a home for a year. This can be calculated using the depreciation rate of a home[15] δ_t times the price of the home. The fifth component of the equation is a benefit to owning a home, which is the expected growth in prices of the home and is subtracted from cost since it is a benefit of home ownership. This is calculated using a moving average of the previous 3 years real price growth g_{t+1} times the value of the home at time t[16]. The sixth and

[13] Using a long-term bond is representative of housing investment, as the purchase of a house is generally undertaken as a long term investment.

[14] (Aaron 2009)

[15] The housing depreciation rate in Canada is 1.5% as estimated by StatsCan

[16] In their analysis, Himmelberg et al. (2003) used the average growth rate for the entire span of the data as the expected growth.

final component of the annual cost of ownership is a risk premium that owners require for assuming the risk of owning a house as opposed to renting[17].

From this annual cost of ownership equation we can factor out the common term P_t, the price of the home paid by the owner. After factoring out the home price and eliminating the benefit term for mortgage payment tax deductions the annual cost of home ownership, or the imputed rent, becomes $P_t * u_t$ where u_t is the fraction known as the "user cost of housing." The user cost of housing is the fraction of a homes value that represents a cost to the homeowner each year or the per dollar cost of homeownership.

$$u_t = r_{trf} + \omega_t + \delta_t - g_{t+1} + \gamma_t$$

Equilibrium in the housing market would imply that the annual cost of homeownership should not exceed the annual rent for the same home. If the cost of owning a home rises without an increase in rents, prices would have to fall to convince buyers to purchase a house instead of renting. The opposite would happen if costs fell. From this logic, equilibrium in the housing market implies that the annual rent must equal the cost of owning a home for a year. Equilibrium implies:

$$R_t = P_t * u_t$$

This formula is very useful in practice, as rearrangement of the formula shows that the price to rent ratio P_t/R_t is just the inverse of the user cost of homeownership $1/u_t$. Thus if the annual cost of homeownership is 5% of the house value, that is for

[17] As is conducted in the Himmelberg et al. (2003) analysis, the risk premium on home ownership is assumed to be 2 per cent.

every dollar in price the owner pays 5 cents in costs, the owner should be willing to spend 20 times the market rent on a home (1/0.05). This user cost and price to rent equilibrium should provide a basis against which prices can be deemed as too high or low.

The imputed rent will be calculated for all markets included in the analysis using this methodology and the imputed rent will be compared to the actual annual rent as a tool to decide whether housing prices are in fact out of line with fundamentals.

Chapter 4 – Canadian Lending Market

The defining characteristic of the Canadian housing market is that the housing finance market in Canada is done on a national scale. In other words, lending and mortgage products are the same for all parts of the country.[18] The lending market in Canada is largely dominated by highly organized chartered banks which operate in all parts of the country, which accounted for over 51% of the mortgage credit in Canada at the end of 2010 with the chartered banks holding over $488 Billion in mortgage credit.[19] A large portion of the remaining mortgage credit offered in Canada is given by smaller lending institutions such as caisse-populaires and credit unions across the country.[20]

Interest bearing term loans and instruments are the main source of Canadian mortgage loans given in Canada and make up a large portion of the balance sheets of the lending institutions. Canada is viewed as having a very conservative credit culture, with a loan having a five-year fixed-rate term with a 25-year amortization period being considered the norm. However, in recent years people have began to extend their amortization period, with almost 30 per cent of loans having current amortization periods of 35 years. Even though the amortization periods may be extending recently, new regulations require all borrowers to qualify for shorter 25-year amortizations.[21]

Mortgage interest rates represent the cost to homeowners of procuring a mortgage to finance the purchase of their house. These rates are set by the banks and lending institutions, primarily the chartered banks. The presence of multiple chartered banks and

[18] (Traclet 2009)

[19] Source: *Bank of Canada*, "Residential Mortgage Credit" Cansim Cat. No 176-0069

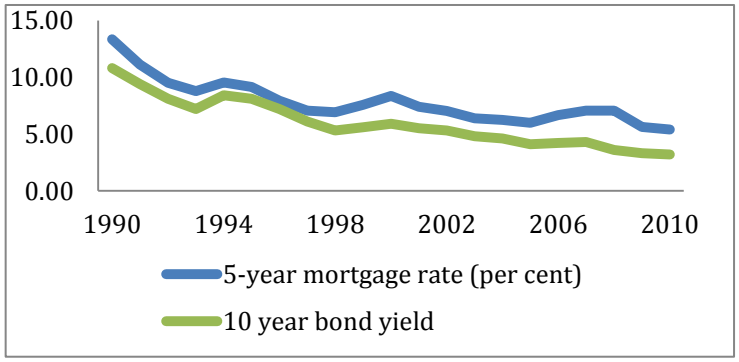
[20] These smaller lending institutions account for approximately 12.2% of mortgage credit

[21] (Kiff 2009)

various other lending institutions ensure that the market does not operate monopolistically and that the rates will be set according to the costs of offering these rates. In Canada, the risk free asset that represents the opportunity cost to banks is the Government of Canada bond. Any lending institution has the choice of investing their money in a mortgage or other loan, or purchasing a risk free government bond.

As a result, the mortgage lending rates will fluctuate with the cost of offering the loan, or the government bond rate. However, the banks issuing the mortgages are also taking on added risk by offering a mortgage instead of purchasing government bonds along with the cost of issuing and servicing those loans. The bank also must face the risk that the borrower defaults on the loan and must account for that potential loss. As a result, the institutions issuing the mortgage will charge a premium over the opportunity cost to provide some profits for the banks incurring the risks.[22] Because of the relationship between lending rates and bonds, mortgage interest rates across Canada will be identical because the return on a government bond is the same for all regions in Canada.

Figure 1 - Mortgage and Bond rates



Source: Bank of Canada

Another influential factor on the Canadian housing market is the presence of mortgage insurance. In the 1967 Bank Act, banks were forbidden to hold uninsured

[22] (Mcdonald 2004)

mortgage loans with a Loan to Value (LTV) ratio of greater than 75 per cent.[23] This means that any loan without at least a 25 per cent down payment requires mortgage insurance to cover the entirety of the loan.[24] To obtain mortgage insurance, the lender pays a premium to the insurance company and this cost is typically passed on to the borrower from the lender. The premium is determined based on the percentage of the home's value that is financed through the lender.[25] The majority of mortgage insurance is purchased through the Canadian Mortgage and Housing Corporation, which is a government-owned corporation established in 1946. Through the CMHC, the government is able to exert control over the supply of mortgages available on the market. By adjusting the qualifications necessary to obtain housing insurance through the CMHC, the government can influence the number of buyers who can obtain a mortgage. The presence of the Bank Act regulations ensure that the majority of homeowners will require mortgage insurance and therefore will have to meet the requirements set out by the CMHC. Government influence over the mortgage supply allows them some control over the price of the homes people can afford and gives them the power to affect the overall price level in the market.

The two major tools that the federal Department of Finance has at its disposal to affect the prices in the housing market are changes in bond yields and changes in lending requirements. Through changes in bond yields, the federal Department of Finance can adjust the cost of procuring a mortgage through lending institutions, and through the CMHC mortgage insurance regulations, the government can alter the supply of mortgages

[23] In 2007 this value was changed to 80 per cent.

[24] (Kiff 2009)

[25] (CMHC 2011)

available.[26] These two tools operate on a national level and any adjustment to either lending rates or regulations will affect all regions in the same way because all lending institutions will be subject to the same changes.

[26] The Canadian government cannot directly influence the supply of homes on the market, but it can adjust the supply of mortgages available for those homes.

Chapter 5 – Analysis

5.1 – Data

In this section I will look at the data to be used in the analysis along with how is is presented and how it is collected.

Housing Prices/Growth – The source for this data is the Teranet-National House Price Index data collected from 1990-2010. The Teranet-National Bank Housing Price Index is calculated by tracking the observed or registered price of a house over time in a particular market. In order to do this, they require a home to be sold at least twice, and new housing construction sales are not included. With these "sales pairs" they are able to measure the increase or decrease in property value in a linear fashion. Their fundamental assumption regarding this index is that the quality of the house used to calculate this index is constant. A house that undergoes significant renovations to change the overall quality of the property will not be considered as a regular sales pair and will be excluded from analysis. Teranet also excludes from analysis properties that involve a non-arms-length sale, properties that have unusual turnover frequency and property sales that they consider to be data error from their data sources.[27] The index provided by Teranet gives a monthly index of the growth in housing asset prices relative to the date they chose for their base of June 2003 (i.e. June 2003 = 100). To measure annual growth rates, the monthly observations on the index were averaged out over 12 months to calculate yearly growth. The Teranet index looks at the nominal growth of the house of the period between the sales, so to eliminate the inflationary growth of the price, the index provided by Teranet was deflated by the CPI

[27] Teranet National Bank "Methodology" *Teranet National Bank House Price Index 2010* (accessed 2011)

deflator gathered from the Statistics Canada comprehensive CPI index for Canada. It is important to eliminate inflationary growth from the prices as this would not signify not signify real growth in the value of the asset.

To calculate the average price in the market, the MLS average price, which is presented as a yearly average housing price in each market, is multiplied by the index given for each year. The MLS only publishes its average price in a market for the year that has just passed and any previous years are kept in their records. So for this analysis MLS data was only available for free in the year 2010. Using the Teranet data for housing price growth, the average housing prices were calculated for the years 1992-2010.

Rent – The rent data collected is from the Canadian Mortgage and Housing Corporation publication of rental market statistics for metropolitan centers in Canada. At the end of every year the CMHC publishes rental market data from major urban centers across Canada, which includes the average rent in the market. As a part of their publication they include the historical trend for this data which was used for this analysis. The rental data is presented in nominal terms, so the data was deflated by the Canadian CPI index to remove inflation in the data.

10-year Bond Yields – The 10-year government bond yield was gathered from Statistics Canada. The benchmark government bond rate on a 10-year bond was collected on a monthly basis from 1990-2010 and was averaged over 12 months to obtain a yearly average yield.

Property Tax Rates – The property tax rate used in our analysis is calculated from the Statistics Canada average property tax to home value ratio.[28] This ratio, which shows the

[28] The data used was a provincial level property tax rate from 1998. Current data at the metropolitan level were not available for collection, so the provincial tax rate will be used as a proxy.

proportion of the value of the house that people pay in taxes is also known as the "home property tax rate."

Income – Income data was collected from the household average income in certain metropolitan areas as presented by Statistics Canada. Income data will not be used in the user cost analysis but will be used in the price/income ratio calculations

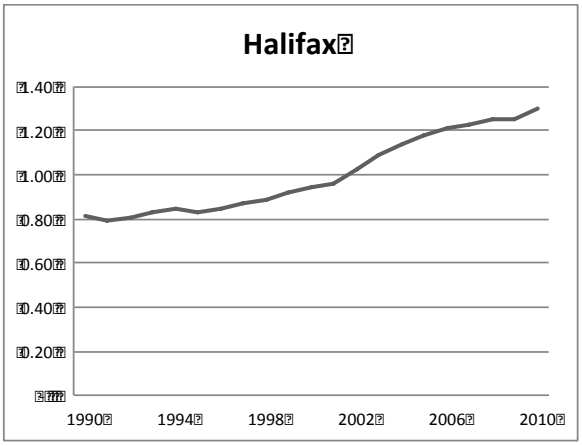
5.2 – Descriptive Statistics and Conventional House Price Measures

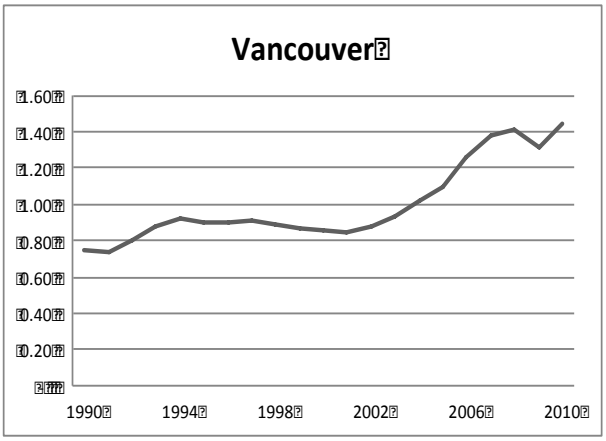
As seen in Figure 2 below, where real house prices were normalized to their averages, many Canadian housing markets began seeing significant run-ups in real housing prices between the years 1998 and 2002, although the degree to which each market experienced its run up vary. For the most part, this increase in real housing prices lasted until 2007/08 where some markets experienced a slight price correction before mostly rebounding in 2010. These trends are shown in Figure 2 and summarized in Table 1 below.

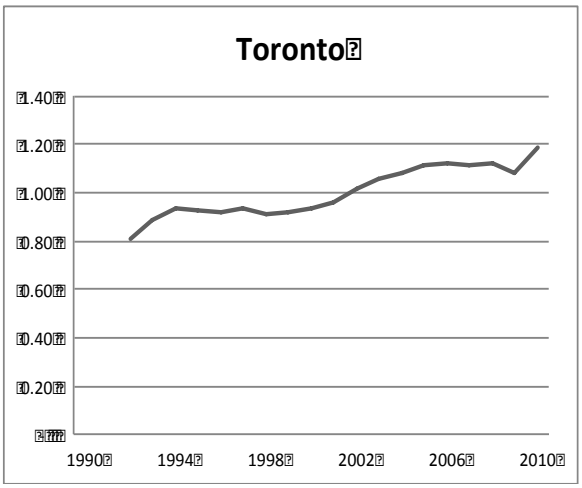
Table 1 – Summary Statistics (Index Values)

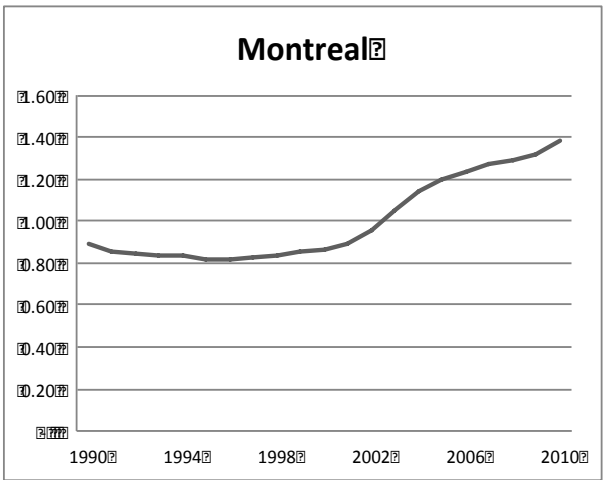
		Index Values			
	Start of Study	2001 Value	2007 Value	2009 Value	2010 Value
Halifax	0.82	0.96	1.23	1.25	1.3
Vancouver	0.75	0.84	1.38	1.32	1.45
Toronto	0.81	0.96	1.11	1.08	1.18
Montreal	0.89	0.89	1.27	1.32	1.39
Ottawa	0.93	1	1.13	1.13	1.19
Calgary	0.65	0.84	1.75	1.47	1.5

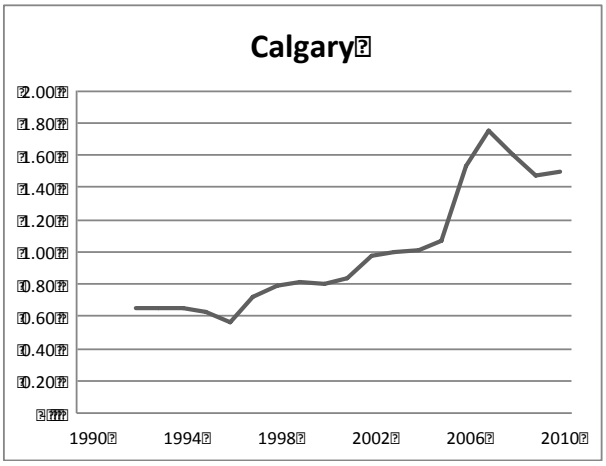
Figure 2 Real House Price Index (Normalized to Average)

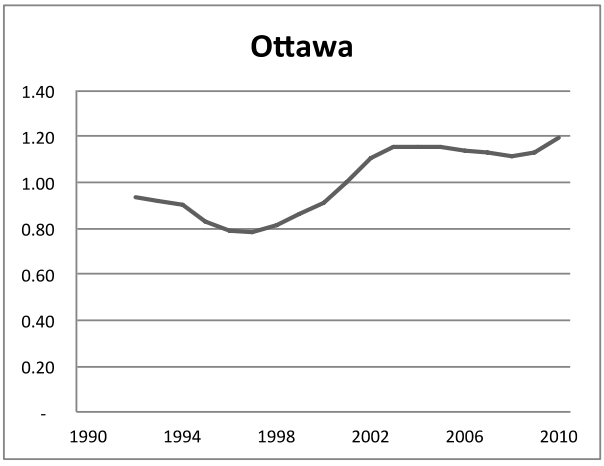












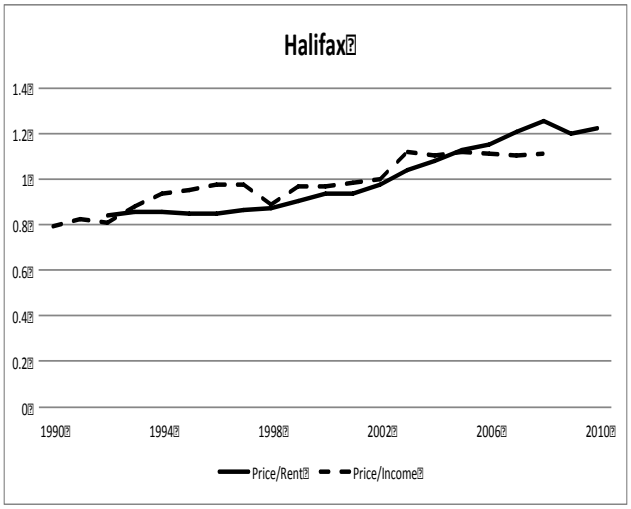
Source: Teranet, MLS, Author Calculations

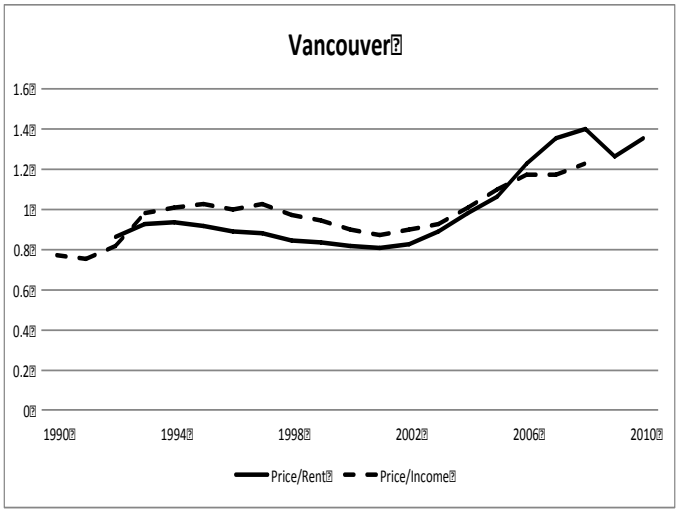
Some markets experienced extremely high run ups compared to their average prices over the sample period as is observed in Calgary and Vancouver where prices are almost 50% higher than their 20 year averages. High levels of growth in Calgary include 30% real growth in 2006, which caused prices to be 75% higher than their 20-year average. Other markets such as Toronto and Ottawa did not see their real prices rise nearly as much compared to their starting values and 20-year averages. We also observe that in all markets In Figure 3 we observe that the rents and incomes in those regions have not grown at the same rate as prices, as we see the price rent and price income ratios for some market rising significantly over their 20 year averages while others do not feature such large deviations over the study period.

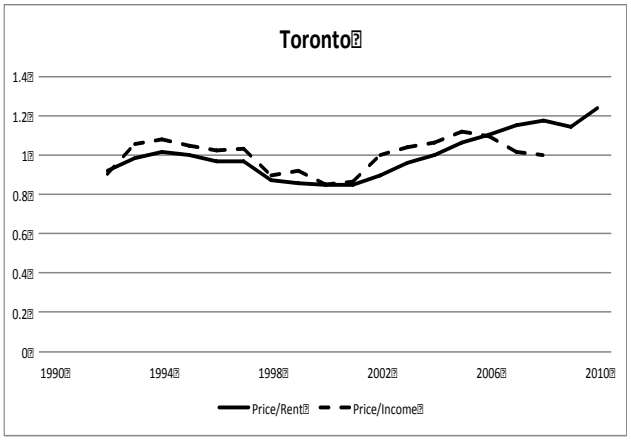
The price/rent and price/income ratios demonstrate that the increases in prices during the years of high growth are not accompanied by increases in rents or incomes in the markets studied. If the rents and incomes were to rise at the same rate as the prices, then it may be that the increases in price growth were due to rising fundamentals such as rents and incomes. Some literature points to the fact that a rising price/rent ratio or price/income would indicate the growth of a bubble[29], however as mentioned by Himmelberg et al., we must be careful when using these metrics as they mistreat the purchase price as the annual cost for homeownership. Although the data presented here may indicate a high level of overheating in areas such as Vancouver and Calgary, we must conduct further analysis before reaching any conclusions.

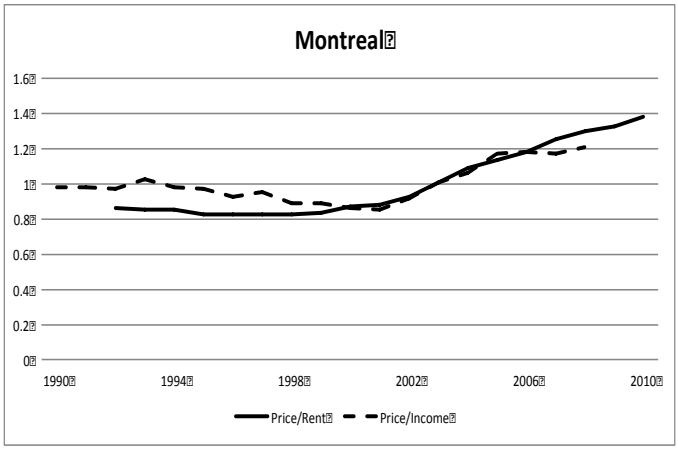
[29] (Milea 2010)

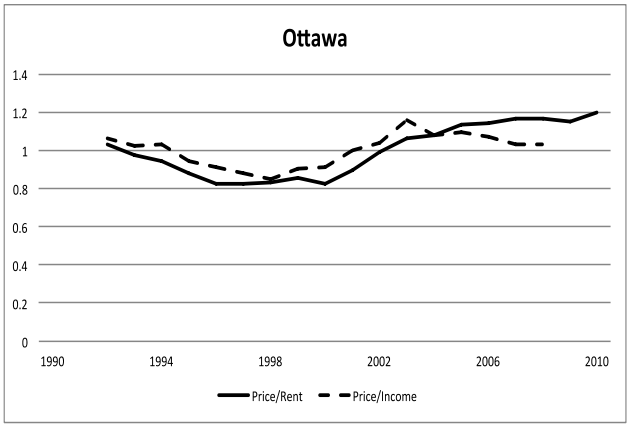
Figure 3 – Price/Rent and Price/Income Ratios

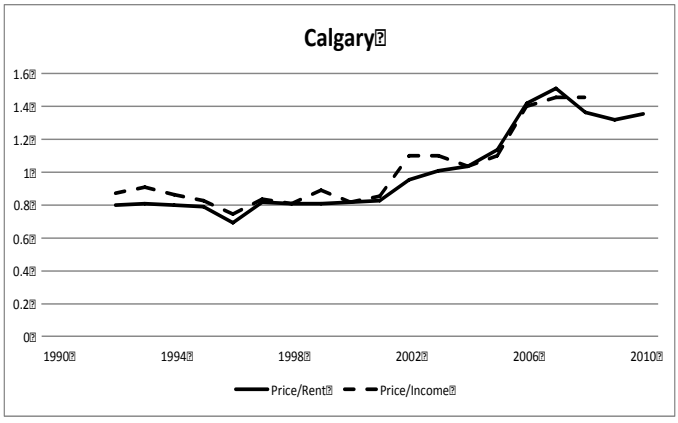










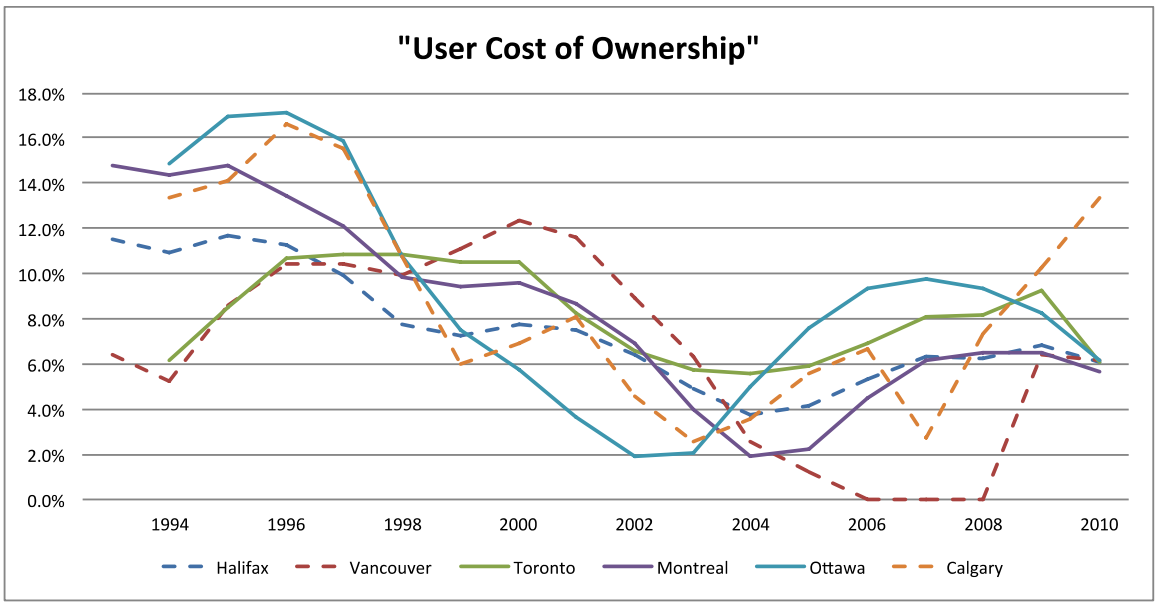


Source: StatsCan, MLS, CMHC, Teranet, Authors Calculations

5.3 – Himmelberg et al. Analysis Applied to Canadian Markets

In this section, the model developed by Himmelberg, Meyer and Sinai (2003), which is discussed in Section 3.2, will be applied to the six Canadian markets chosen for analysis. Each market will have a different set of user costs based on variation in the variables across each market. Figure 4 below plots the user cost across the sample period for all six markets considered.

Figure 4 - User Costs



The plot of all user costs across time show that there is much variation across markets in terms of user costs. This is due to markets having different property taxes and expected growth. The values for the depreciation rate and the risk premium are fixed for all markets and throughout the study period at 2% and 1.5% respectively and the return on the risk free asset is constant across markets but varies across time.

From Figure 4 it can be observed that the user cost of owning a house for one year from the user cost formula presented in Section 3.2 falls during the time period from 2002 to 2004. This is the same period in which we observe the substantial increases in prices in

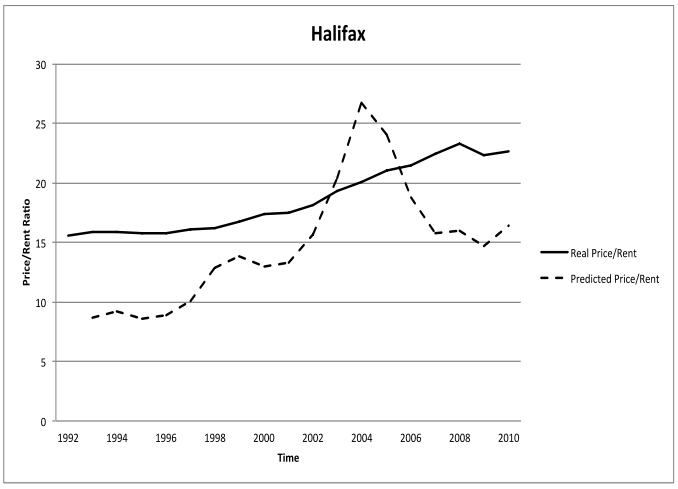
most markets. This downward trend in user cost would be indicative of the fact that the cost of owning a house for one year is falling, and that in equilibrium, prices should rise compared to rents. That is, with the lower user costs, the market should exhibit a higher price/rent ratio, which is what has happened recently. Below, in Figure 5, the actual price/rent ratio in all markets is plotted against the predicted price/rent ratio[30].

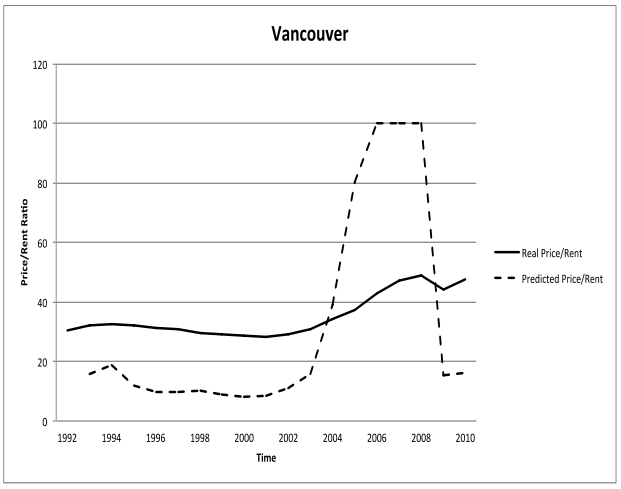
It is apparent from the plots in Figure 5 that the model does not fit the data well. For all markets, it seems to be underestimating the predicted price/rent ratio before and after the period from 2002-2005. For Toronto specifically, the model underestimates the price/rent ratio for all years. This indicates that for the majority of the sample period the model is overestimating the user cost and thus, giving a predicted price/rent ratio that is too low. During the periods of high levels of real growth, the user cost does fall to levels that would indicate that the price of homes should rise as would be expected. However, if the model were assumed to be correct, most markets would have required a decline in prices before the overheating period and after the period. While overvaluation is possible, the predicted price/rent ratios of six required for most markets in 1992 is much too low and could never be expected to be present in reality.

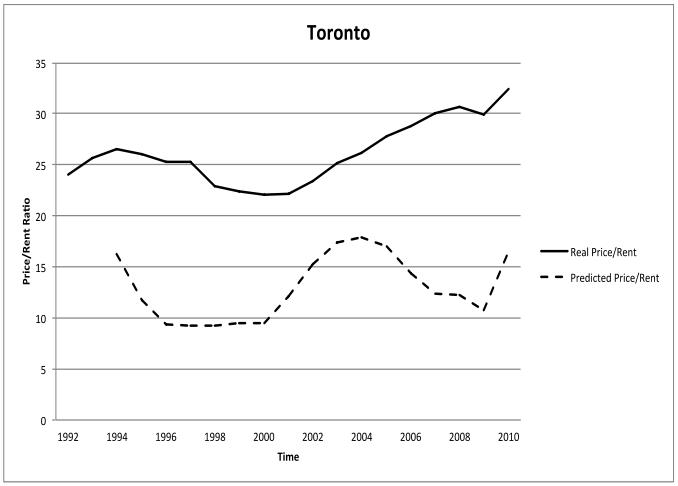
It is possible that the new specification we gave the model to fit to the Canadian framework caused the model to give faulty results. The model was developed to fit the American housing market and included an offsetting benefit in tax rebates that could not be applied to the Canadian market because of a lack of tax-deductible mortgage payments in Canada. Since the model consistently overestimates the user cost for Canadian data, we cannot draw reliable inference using its predictors for Canada.

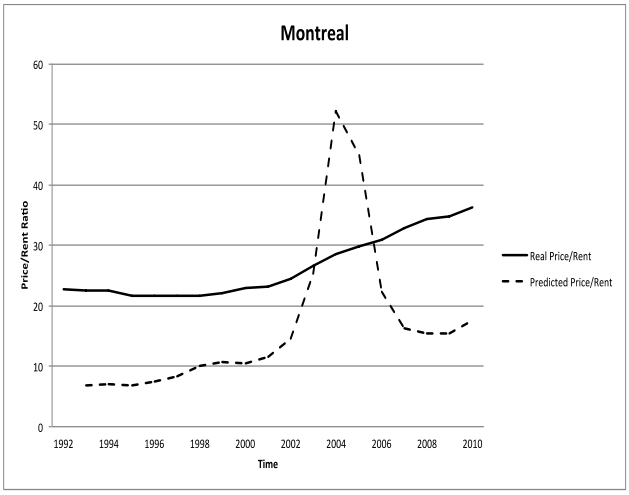
[30] From section 3.2, the predicted Price/Rent ratio is (1/User cost)

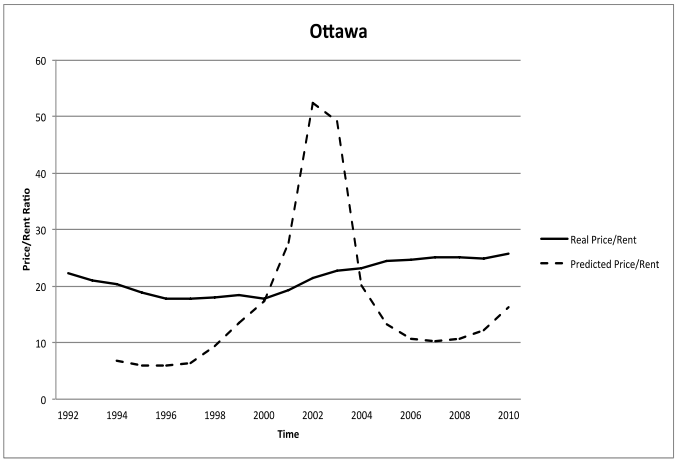
Figure 5 - Imputed Price/Rent Ratios

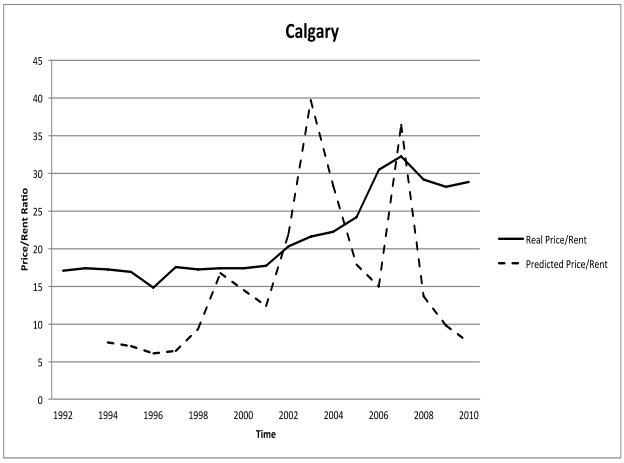












Source: Teranet, CMHC, StatsCan, Author Calculations

5.4 – Unusual Growth Analysis

Since the analysis based on the model developed by Himmelberg et al. (2003) did not yield results that were economically interpretable, a new method for overheating detection will be used in this section. Following the definition for bubble growth used by Kohn and Bryant (2010) overheating occurs when "prices of an asset grow above and beyond what is considered typical asset behavior in the past."[31] So as a part of this analysis, I will look at what might be considered unusual growth in each market and in what years the potential overheating may have occurred.

To establish what would be considered unusual growth it must first be determined what is considered to be typical behavior of the housing prices over the sample period. To do this, the geometric mean of the real price growth[32] and the standard deviation of the real price growth are calculated for each market in Canada. The geometric mean will determine what is considered to be "average" real price growth over the study period and the standard deviation of the growth will measure the underlying volatility in the market. The next step in this analysis will be to identify what years would feature what could be considered as unusual growth. This will be identified as years where the real house price growth exceeded its geometric mean growth by significantly more than one standard deviation.[33] For this to identify unusual growth, volatile housing markets will have to deviate significantly further from its mean growth. The results from this analysis is presented in table 2 with the geometric means, standard deviations and years of potential overheating and also identifies years where the growth rate was significantly below the mean growth. Years with a '+' beside them have growth that is above average and may be considered overheating and

[31] (Kohn, Bryant 2008)

[32] Geometric mean is used here instead of the standard mean calculation because it is dealing with percentage changes in housing prices.

[33] For this analysis, the critical value will be more than 1.2 standard deviations away from the mean value.

years with a '–' have growth below average and experiencing an unusual a price depreciation.

Table 2 - Summary of Unusual Growth Analysis

	Halifax	Montreal	Ottawa	Toronto	Vancouver	Calgary
Geometric Mean	2.25%	2.08%	1.13%	1.98%	2.98%	3.41%
Standard Deviation	2.17%	3.42%	4.74%	3.47%	5.45%	10.63%
Number of periods	**4**	**5**	**4**	**4**	**2**	**3**
	1991	1991	1995	1993+	2006+	1996
	1995	1995	1996	1998	2009	1997+
	2002+	2002+	2001+	2009		2006+
	2003+	2003+	2002+	2010+		
		2004+				

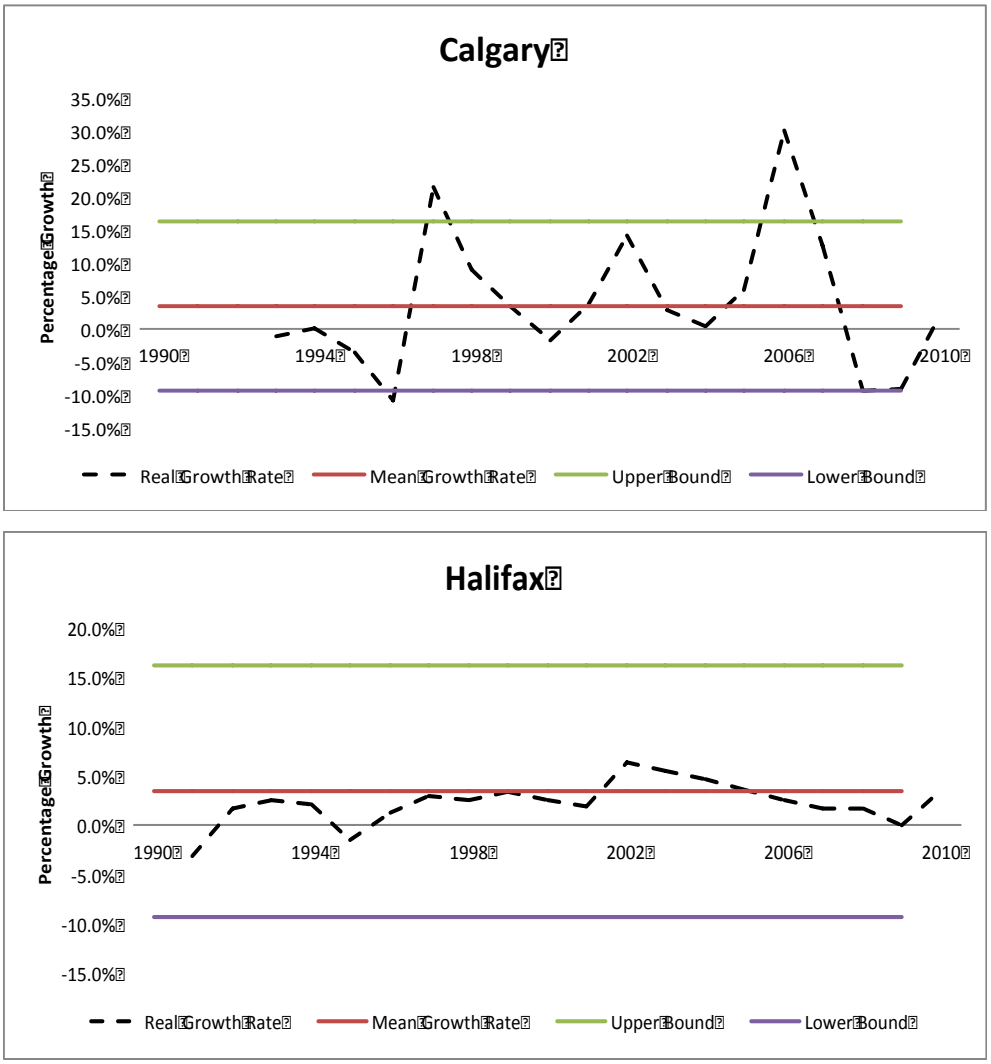
From this summary, the markets can be separated into groups based on the period in which unusual price growth has occurred. The first group of markets consists of cities that experienced unusually high growth in the early 2000s. This group experiencing high growth in the early part of the decade includes Halifax, Montreal and Ottawa. This group also features markets that have relatively low levels of mean growth indicating that they did not appreciate as much over the study period as the other markets studied.

The remaining three markets experience potential overheating in their market later in the decade. Calgary and Vancouver, the two housing markets with the highest level of volatility, as shown by the standard deviations, experienced overheating in 2006. The unusually high growth in Toronto occurred in 2010, but as is shown in Table 2, was preceded by a price correction in 2009. This would appear to indicate that the growth in 2010 was more likely a rebound in prices returning to previous levels as opposed to the growth of a bubble.

One important note that must be concluded from this analysis is that what may be considered overheating in one market, will often be considered usual asset behavior in another market. Significant overheating in Halifax would be 6 per cent for example, whereas

that would be considered slightly above average in Calgary. This would indicate that although it may be tempting to do so, we should not directly compare housing asset behavior across markets. Figure 6 illustrates this idea below where the real growth rates for Calgary and Halifax are plotted along with their mean and upper and lower bounds for unusual growth indication.

Figure 6 - Real Price Growth Rates for Halifax and Calgary



5.5 – Concluding Remarks

This section will outline the conclusions that can be inferred based on the research and analysis performed in this thesis.

5.5.1 - Consider Housing Markets Regionally not Nationally

As shown in the previous analysis, each regional market exhibits vastly different behavior patterns when it comes to housing asset prices. Any analysis that is conducted using national level data, such as a national price average, will not capture the individual behaviors of each market. Any national level data will be skewed to highly populated regions such as Toronto and Vancouver and will not properly represent the price behavior in smaller urban centers.

The reason for the variation in behavior across regions is that each housing market in Canada is subject to the influence of different factors based on the demographics of the region. Western provinces for example, which are rich in natural resources, would be much more likely to feature housing markets that are influenced by variation in energy prices than an the markets in the Atlantic region. The varying factors affecting regional markets also give regional housing markets with very different historical behavior. As shown in section 5.4, some markets have been historically volatile with high growth levels, such as Calgary, whereas others such as Halifax have been relatively stable across the sample period with little variation in their behavior.

Given that there are varying influences across markets causing each them to behave individually, any testing and inference made about housing markets in Canada must be done at a regional level and not conducted nationally and assumed true for all markets. Any analysis of housing markets must be done very carefully trying to determine the individual factors that will affect each region before inferring that price levels are too high.

5.5.2 - Canada's tools to combat overheated markets are unfocused

If the federal government begins to worry about some overheated markets in Canada and decides to enact a policy to lower the high prices, there will be adverse effects in the markets that are not overheated given that the tools at the government's disposal affect prices on a national level. Raising interest rates or reducing mortgage availability to cool the most expensive markets, Calgary and Vancouver, will also lower prices in more stable markets such as Halifax and Ottawa. This policy may protect asset owners in overheated markets against a future bubble burst, but it will adversely affect homeowners in stable markets by reducing the value of their assets and their overall wealth.

A more efficient policy to counteract overheating in the housing market would be directed at regional markets specifically. If the government were to create provincial or even regional level housing market regulators, then the policies enacted to counteract regional overheating would be much more focused at accomplishing their goal without adversely affecting others.

5.5.3 - Unlikely for Canada-Wide Housing Bubble

As seen in the previous section, Canadian housing markets have seen some unusually high growth in housing prices in the early part of the 2000's compared to their historical norms. This however, should not necessarily be interpreted as Canada having an overheated housing market. For the most part, the high growth in most markets occurred in a small number of years and mostly occurred earlier in the decade and that growth has since subsided and prices have remained fairly constant through the latter part of this decade. It is possible that markets such as Vancouver and Calgary may be overheated to some extent, but one or two years of isolated growth is not necessarily enough to conclude that the price increases indicate the development of a bubble. If the price of the asset had been growing

consistently for a long period of time without any sign of slowing down, then it may be due to the formation of a bubble. However, isolated periods of growth in a housing market are not enough to conclude that the asset has reached a dangerously high level and that prices must be corrected.

5.5.4 Canada is likely safe from US style bubble burst

If it were true that Canada's housing prices were significantly overheated and faced a price correction in the future as a result of a bubble burst, our housing market would likely not crash nearly as quickly as the United States housing market did in 2008. The main reason for this conclusion is that in Canada, the majority of borrowers who have secured loans have better ability to pay than the borrowers in the United States. In Canada, regulations ensure that people who obtain a mortgage will be able to pay that mortgage for the entirety of the loan, decreasing the possibility of loan default[34].

In the United States prior to the housing bubble burst, subprime lenders accounted for more than 22% of new loans. This means that 22% of new mortgages being loaned prior to the bubble burst were given to lenders with subprime credit ratings who may not have had the ability pay the entirety of their mortgage. In Canada, the subprime mortgage market accounted for only 6% of new loans. Canada's subprime default rate is also more than three times lower[35] than the default rate in the United States[36].

When prices began falling in the U.S., many mortgage owners began seeing their housing values fall below the value of the mortgage that they owned. Many of these subprime borrowers who could hardly afford the mortgage to begin with, began to default

[34] (Weisleder 2008)

[35] Canada has a subprime default rate of 3.8% with the US at 12%

[36] (Mortgage Architects 2008).

on their loans forcing banks to foreclose and resell their homes. The high default rate in the United States caused housing prices to fall rapidly as a large supply of foreclosed homes increased the supply available, putting further downward pressure on prices.

Since Canada does not feature a similar market for subprime mortgages, the amount of mortgage defaults and subsequent fall of prices seen in the United States should be avoided in Canada. Thus, if there is the possibility for a future price correction in certain markets due to a change in interest rates or CMHC policy, the correction would be much smoother than the decreases witnessed in the United States.

Chapter 6 – Limitations of the Study

The first limiting factor to this study is that an econometric analysis was not conducted to determine whether current housing prices are in line with their fundamentals. An econometric analysis with a proper model would have likely produced better, more interpretable results, which could have been used to establish whether the housing market was out of equilibrium. Also, an econometric model would allow me to identify properly what were the factors that were affecting the markets. Unfortunately, a proper econometric model was not found before the deadline for this paper and there was not enough time to find one and conduct the analysis. In lieu of this, the results from the user cost analysis that was conducted are presented with a second analysis on unusual growth patterns.

Another point that must be considered is that the conclusions of Himmelberg Sinai et al. (2003) were potentially incorrect in that they concluded that prices were not overheated in most US markets. In reality, many of the markets that they concluded were not overheated may have been overpriced as they faced a steep price correction in 2008. Their conclusions may have been due to misinterpretation of the results, or it may be possible that the model itself was incorrectly specified and that the theory behind it was faulty. If the model was incorrectly calculating costs and results for their analysis, then it would have been making the same errors when applied to the Canadian market in this analysis.

The data used in the study may have also impacted the results that were obtained during the analysis. The use of average prices and average price growth may be skewed by fluctuations in high value homes, which are more volatile than lower priced houses.[37] There

[37] (Mayer 2003)

is the possibility that lower priced homes may not be overvalued and making an inference for an entire market based on the average prices may misinterpret the actual level of prices.

A final and very important point to consider is that the sample only covers a limited time period and it is not possible to know whether housing prices are at a proper fundamental value prior to the study period. There is the possibility that prior to any run up in prices, the market may have been undervalued and any increase in prices could have been due to a return towards long run trends. To eliminate this possibility it would be necessary to extend the sample period significantly further in the past, however limitations on data availability make this a very difficult task.

Chapter 7 – Future Research

I would like to further my analysis of the Canadian housing market to observe how housing asset prices behave in the future. TD economics (2010) hypothesizes that Canada will see a modest housing price correction in 2011 after significant growth in 2010[38]. I would like to conduct an econometric analysis to determine what factors are causing the price correction if it does occur. It is often cited that interest and lending rates are the main determinant on housing prices and an econometric analysis on the housing market including mortgage rates in the model will be able to quantify this relationship.

In any future analysis, I would like to use a more detailed data set. Use of an average home price does allow for detailed analysis of each market. If I were able to gain access to the CMHC private data set, which includes prices by home type and an increased number of urban areas, I would be able to conduct a much more in depth and detailed analysis of each market and of Canada as a whole. For example, the housing market in Saint John's, Newfoundland has been heating up very quickly in the past three years[39], but due to lack of data I am unable to analyze it or compare it to other Canadian markets.

Future use of an econometric model would also allow me to test hypotheses on whether certain variables that have been found to impact the US market have the same effect on Canadian housing markets. If in the future I am able to apply the same econometric model to both US and Canadian housing prices it will allow me to test whether the same variables had similar impacts on the run-up in prices in both markets. It would be interesting to determine how similar the two housing markets are given that both countries are very similar demographically but vary in the style of lending markets.

[38] (TD Economics 2010)

[39] (CBC News 2008)

Future research would also allow me to examine how policy makers have reacted to the current situation and what impact those decisions had on the market. An in-depth welfare analysis would potentially illustrate any change in social welfare that occurs in markets that are not overheated as a result of any policy changes. If my conclusions are correct, any policy to cool down certain isolated markets will also have adverse effects on other relatively stable markets across the country.

Chapter 8 - Conclusion

Although national housing prices have risen significantly in the past decade, we cannot conclude that it is due to a national Canada-wide housing bubble. Due to variation in the behaviour of prices across regional markets and the different factors present in each market, one must consider each market individually. National level analysis of housing prices masks the variation present in different markets and does not give an accurate picture of what is actually occurring in the housing market. In this analysis, I have shown that the regional housing markets considered have experienced varied levels of growth occurring at varying times, which is not consistent with a Canada-wide housing bubble growing in the early 2000s.

Given that housing markets must be considered on a regional basis when looking for overheating or the presence of unusual growth, policy to control those housing markets must also be conducted at a regional level. Unfortunately in Canada, any policy to cool down certain overheated markets will ultimately have the same effect across the country because our policy tools, interest rates and lending regulations, operate on a national level. This means that if the Minister of Finance decides to cool down certain overheated markets in Calgary and Vancouver stable housing markets will also see the same price correction, and the homeowners in those markets will be negatively affected. To deal with regional housing bubbles properly, lending regulations and interest rates on borrowing would also need to operate regionally to avoid reducing housing prices in stable markets.

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