

**Factors Impacting Housing Tenure Choice
Of Canadian Young Adults**

by

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Author's Declaration

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

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Abstract

Deteriorating housing affordability is a pressing issue in Canada. Whereas there was a sustained housing market correction in the United States after the 2008 global financial crisis, the price of housing in major Canadian markets has since continued to reach record highs. Under the current neoliberal system, housing tenure critically impacts wealth trajectories. A lack of housing affordability in an asset-based welfare system that is mainly dependent on homeownership is very concerning. Young adults are the most disadvantaged by this issue as this age group enters into the lifecycle stage that has traditionally been marked by first-time entry into homeownership. This thesis aims to better understand the factors impacting tenure choice of Canadian young adult (25-34) households in order to inform public policy which will improve the future welfare prospects of this generation.

A cross-sectional tenure choice study is first conducted through identical individual logistic regression models for the years 1999 and 2012 using data from the Statistics Canada Survey of Financial Security. The predictors of tenure choice included in the models are age, household type, number of earners, educational attainment, market income, liquid wealth, student loans, and region. The logit models estimate the effects of these socio-demographic and economic household factors on homeownership in 1999 and in 2012. Housing policy forces influencing household tenure choice cannot be quantitatively approximated in the models, but past literature has stressed their importance. Thus, the effects of policy changes over time are analyzed through the differences between the results of the tenure choice models for the two years. Additionally, an interaction model is used to test whether these differences over time are statistically significant.

This tenure choice study shows that young adult households generally choose to enter homeownership if they are financially capable of doing so. However, the impact of rising housing prices is evident in the characteristics of young adult homeowners. Having a higher odds of homeownership in 2012 requires households to have an older major income earner, more earners in the household, higher educational attainment, and higher income. This also means that higher numbers of households are 'locked-out' of homeownership. In addition to mortgages, non-mortgage debt has a larger role in financing young adult homeownership over time. However, relatively smaller flexible asset buffers put these households at great financial risk of delinquency. This study also provides quantitative evidence that student loan debt decreases the odds of homeownership. More detailed explanations of these results are discussed as well as their policy implications.

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Table of Contents

List of Tables	vi
List of Figures	vii
CHAPTER 1 INTRODUCTION.....	1
1.1 Introduction	1
1.2 Research Context.....	5
1.3 Thesis Structure.....	14
CHAPTER 2 LITERATURE REVIEW.....	16
2.1 The Study of Tenure Choice: Theoretical Perspectives	16
2.1.1 Economic Perspective.....	16
2.1.2 Demographic Perspective	18
2.2 The Determinants of Homeownership	20
2.2.1 Micro-Level Characteristics.....	20
2.2.2 Macro-level Conditions	34
2.3 Young Adult Homeownership	38
CHAPTER 3 METHODOLOGY.....	41
3.1 Survey of Financial Security: 1999 & 2012.....	41
3.2 Operationalizing the Data.....	43
3.3 Statistical Analysis: The Logit Model of Tenure Choice.....	51
CHAPTER 4 FINDINGS	55
4.1 The Effects of Factors Impacting Tenure Choice	55
4.1.1 Regression Results: 1999.....	55
4.1.2 Regression Results: 2012.....	69
4.2 Changing Effects of Factors Over Time	80
CHAPTER 5 CONCLUSIONS.....	97
5.1 Summary	97
5.2 Policy Implications.....	101
5.3 Limitations	108
5.4 Further Research	109
REFERENCES	110
APPENDICES	121
5.5 APPENDIX A: Canadian Homeownership Rate by Age.....	121
5.6 APPENDIX B: Real Residential Property Prices for Canada.....	122
5.7 APPENDIX C: Demographic Distribution by Year, Chi-Square Tables.....	123

List of Tables

- TABLE 1. Variable Descriptions and Notes
TABLE 2. Tenure Choice Logit Model - 1999
TABLE 3. Tenure Choice Logit Model (with Flexible Assets and Other Debts) - 1999
TABLE 4. Tenure Choice Logit Model - 2012
TABLE 5. Tenure Choice Logit Model (with Flexible Assets and Other Debts) - 2012
TABLE 6. Interaction Model - 1999 to 2012
TABLE 7. Interaction Model - 1999 to 2012 (with Flexible Assets and Other Debts)

List of Figures

FIGURE 1. Logit Model Equation

FIGURE 2. Tenure Choice Logit Model Equation

FIGURE 3. Interaction Model Equation

CHAPTER 1 INTRODUCTION

1.1 Introduction

Housing tenure decisions have always been consequential in terms of their uneven impacts, but there is growing concern that homeownership affordability issues disproportionately impact young adults. Since the 1940s, Canada has developed a strong culture of homeownership, similar to the United States, the United Kingdom, and Australia. The 2008 U.S. subprime mortgage crisis and the subsequent global financial crisis brought widespread attention to the unsustainable public policies and financial practices that pushed the U.S. homeownership rate to a record high of 69% in 2004. (U.S. Census Bureau, 2016) Since 2004, the U.S. homeownership rate has been in steady decline. The ownership rate in 2015 was 63.7%, down more than 5% from its peak in 2004. About 4 million households in the U.S. experienced foreclosure of their homes from 2008 to 2011. (Belsky, 2013) Canada has maintained its high level of homeownership even after 2008 when housing markets crashed in the U.S. and internationally. For 2011, Statistics Canada estimated that 69% of households in Canada own the dwellings they resided in. This is up from the 68.4% and 65.8% estimated in the 2006 and 2001 census respectively.

A high or low national homeownership rate is in itself neither good nor bad. The homeownership rate is simply a ratio of the number of owner-occupied housing units versus the total number of occupied housing units. (U.S. Census Bureau, 2017) On the other side of that ratio is the proportion of renter-occupied housing units. A high national homeownership rate means that more people in a country have made the tenure decision to own versus rent. It is the long- and short-term economic well-being and quality of life of owner households versus renter households that require consideration, and can be a cause of concern if the choice of one tenure type results in better outcomes than another. There is already an overwhelming body of literature that has found far more beneficial socio-economic outcomes from owning one's home versus renting.

There are growing concerns over the access to and affordability of homeownership in today's asset-based welfare system. Housing policies promoting homeownership resulted in the 2008 financial crisis in which young adults were the most severely affected. In the U.S. crash, the homeownership rate of households aged 30 to 34 experienced the biggest decline compared to all other age groups. From 2004 to 2015, 11.5% of all households aged 30 to 34 sold or experienced foreclosures of their homes. (U.S. Census Bureau, 2016) The homeownership rate of young adults aged 25 to 29 declined 8.5%. The older age groups of 35-39 and 40-45 also experienced large declines in ownership rates of 10.9% and 10.3% respectively.

The impact of homeownership on societal inequalities is a major concern. There are some that argue homeownership narrows the wealth gap through its wealth accumulation effects by providing households with a source of capital gains and additional income. (Saunders, 1990) Homeowners from any income group benefit from rising property values during periods of housing boom. However, it is questionable whether homeowners at different income levels occupying differing postal codes and property types benefit equally from market gains. Of course, this argument ignores those households that have not been able to overcome the initial wealth constraint to entering homeownership. It also assumes there is always the potential for capital gains on housing, regardless of when homeowners enter the market.

. The U.S. financial crisis has shown that the progression of neoliberal housing policy and the further deregulation of mortgage markets do not sustainably increase access to homeownership. The financial innovations that eliminated down payment requirements and increased maximum amortization periods in the U.S. targeted the households that have not had the financial ability to enter homeownership previously, mainly low-income households and young adult households. These households bought homes at the peak of the market when prices were at record highs with low incomes and little savings. It is unsurprising that low-income and young households comprise the majority of households who lost their home in the 2008 recession. (Fry & Brown, 2016)

Canada's housing system has similarities and differences as compared to the American system. Financial innovations similar to those available pre-crisis in the U.S.

also developed in Canada from 2004 to 2007 as federal mortgage policies were loosened. (OECD, 2014) After the riskiness of those financial practices became evident, mortgage policies in Canada have been undergoing a series of tightening measures since 2008. The Bank of Canada interest rate dropped from 4.25% in January to 1.75% in December of 2008 in fear of an equally severe housing market crash in Canada. (Bank of Canada, 2017a) Since then, interest rates have remained below 2%. The immediate response of drastically lowering the interest rate had its intended effect. Although there was a drop from 2007 to 2008, housing prices fully recovered by 2010 and have since continued to increase. However, many sources have warned that housing prices in many major cities and metropolitan areas in Canada are far above the level supported by market fundamentals. (CMHC, 2017b; OECD, 2014)

Young adult households had one of the highest rates of foreclosure in the U.S. housing crash because they purchased homes at the peak of the market without the financial resilience to weather any economic downturns. Canada's real housing prices have climbed to a historic high. See Appendix B. The Millennial generation is aged 17 to 37 in 2017. Since most of this large population are currently young adults, many are undergoing lifecycle events such as getting married and having children, which traditionally have strongly correlated with transitions to homeownership. Entering homeownership at the peak of the market poses a great risk to young first-time homebuyers, who typically do not have the financial resilience and extra savings to sustain losses in the value of their homes for extended periods of time. Most young adults are not able to overcome the size of down payments required to buy in current market conditions due to weak income and/or existing high levels of debt such as student loans. Some have been able to enter homeownership with parental financial assistance. However, this practice puts the financial future of two generations at risk should housing prices fall.

The State of the Nation's Housing report released by the Joint Center for Housing of Harvard University (2015) noted that demographic trends are part of the reason the U.S. homeownership rate has not increased since the recession. It states that "today's younger households (aged 25-34) are increasingly likely to have characteristics

associated with lower homeownership rates" due to increases in lower-income households, unmarried households, and minority households. (pg. 21) There are also growing concerns that a high level of student loan debt is also a factor preventing young adults from entering homeownership. Canada has yet to experience a severe housing market correction, even though housing prices have far exceeded the level supported by market fundamentals. A severe housing market crash will have extensive negative consequences for all Canadian households and the Canadian economy.

Young adult tenure decisions will heavily influence the direction of the housing market. A deeper understanding of young adults and their tenure choices will help inform housing and social policy with the goal of maintaining social stability and improving the affordability of housing. Therefore, this thesis will analyze the characteristics of Canadian young adult households (25-34) and determine what factors significantly impact their tenure decisions. As part of the tenure analysis, student loan debt in Canada will be analyzed to see the extent of its impact on homeownership. Change over time of the characteristics affecting young adult tenure decisions will also be analyzed to discover any demographic or economic trends having an impact on homeownership rates.

The specific research questions analyzed in this thesis are:

1. What factors impact the tenure decisions of young adults in Canada?
2. Does student debt impact the likelihood of young adult homeownership?
3. How have the effects of socio-demographic and economic factors impacting tenure decisions changed over time?

1.2 Research Context

Ownership Nations

There has been a prevalent belief across Canada and the U.S that owning one's home has far greater social and economic benefits than renting. Studies have found that ownership housing is generally of better quality and condition than rental housing, which leads to better physical health outcomes for owners. (Ellaway & Macintyre, 1998; Rohe & Stewart, 1996) There is also evidence that homeowners have better mental health than renters due to a greater sense of control over their lives, higher residential satisfaction, and higher self-esteem. (Diaz-Serrano, 2009; K. R. Manturuk, 2012; Rohe & Lindblad, 2013) Homeownership has become a benchmark for financial success and social status. Entering homeownership is a common step for families planning to have children. Families seek the stability and security of tenure that - in Canada and the U.S - only comes with homeownership. (Burbank & Keely, 2014) Residential stability as measured by the length of tenure is positively correlated with child outcomes. (Rohe & Lindblad, 2013; Rohe & Stewart, 1996) Additional societal benefits of homeownership include increased social and political participation, more positive neighbourhood perceptions and increased social capital. Homeowners are more likely to participate in local elections, civic groups, and neighborhood associations. (DiPasquale & Glaeser, 1999; K. Manturuk, Lindblad, & Quercia, 2009; McCabe, 2013) Positive neighbourhood perceptions and social capital enable shared values and social cohesion in a community to informally maintain social control and reduce social disorder, resulting in lower levels of real crime rates. (Lindblad, Manturuk, & Quercia, 2013)

Economic decline in the 1970s put budgetary pressures on governmental spending. (Rolnik, 2013) Public housing programs established in the 1940s were increasing in costs on public finances. The neoliberal paradigm which believes that welfare can best be advanced by individual entrepreneurial freedoms and laissez-faire economics provided the rationale for governments to reduce spending on social welfare programs such as public housing. Housing policy shifted from one where governments directly supplied housing to those in need to one where governments provide incentives

for individual households to buy and maintain their own homes. Throughout the 1980s and 1990s, various policies deregulated financing, increased support for mortgage insurance, facilitated the securitization of mortgages, as well as created other mechanisms to increase the quantity and ease of financing for homebuying. (Walks, 2014) The privatization of housing meant that policy shifted to favour the tenure of ownership over rental. Private property rights were strengthened while protection of tenants was diminished. For example, Ontario effectively weakened its tenant-protection and rent-increase regulations in 1997, leading to increased evictions. (Mahoney, 2001) The proliferation of homeownership promised the middle-class life for the majority of households through ownership of an asset that is supposed to give security and stability, establish a 'stake in the system', and could be passed down through the generations. (Forrest, 2011)

Widespread homeownership implemented neoliberalism's 'asset-based' welfare. "The principle underlying an asset-based approach to welfare is that, rather than relying on state-managed social transfers to counter the risks of poverty, individuals accept greater responsibility for their own welfare needs by investing in financial products and property assets which augment in value over time. These can, at least in theory, later be tapped to supplement consumption and welfare needs when income is reduced, for example, in retirement..." (John Doling & Ronald, 2010, p. 165) Compared with other financial products, the home is a tangible asset that fulfills both living needs and investment needs. Buying a home forces households to save money with discipline and invest in equity. (Belsky, 2013) The money spent on homeownership contributes to both consumption and wealth accumulation. For renters, the money paid each month to the landlord is purely consumption and does not contribute toward their net worth. Renters would need to save additional money in order to purchase equity and invest. Only disciplined renters are able to save as much equity as homeowners each month. They also need to be very savvy and skilled investors in order to match or beat stock market indexes. Most households feel that housing is a safer investment with less risk than the stock market. Thus, housing became the main vehicle for wealth accumulation and the largest store of household wealth. A home is usually the most expensive purchase and biggest investment most households will make. (Grinstein-Weiss, Key, & Carrillo, 2015)

There is a widespread and persevering belief that homeownership is a foolproof path to wealth accumulation and one of the best long-term investments. Research has provided evidence to support this belief. Turner & Luea (2009), using the U.S Panel Survey of Income Dynamics (PSID) data for years 1994 to 2001, found that "...each additional year of homeownership increases total net wealth by \$13.7 K on average ..." (p. 104) Di, Belsky & Liu (2007), using the PSID data from 1989 to 2001, also found that both the tenure of ownership and the length of ownership are positively and independently associated with higher net wealth than renting. However, these studies were conducted using data pre-dating the severe 2008 U.S. housing market crash. A study of Canadian wealth accumulation using 1979 to 2006 data found that it was much easier for homeowners to build wealth, especially in metropolitan areas with hot housing markets. (Somerville et al., 2007) Additionally, it was only possible for savvy and disciplined investors renting in weaker housing markets to have accumulated more wealth from investing in assets other than real estate.

Changing Economic Conditions

Canadian households entering homeownership throughout the 1990s and the 2000s could have experienced drastically different economic conditions depending on when the tenure transition was made. In the 70s and 80s, Canada experienced volatile and growing levels of inflation. From 1970 to 1980, the average annual rate of inflation was almost 8%. (Bank of Canada, 2017b) Restrictive monetary policies lowered the inflation rate from its double-digit high of around 12.5% in 1981 to around 4% by 1985. (Longworth, 2002) However, market expectations for the continued growth of inflation induced heavy borrowing to purchase speculative assets, resulting in the growth of inflation once again. (Thiessen, 2001) Housing and real estate were the main assets sought for protection against inflation and for speculative profit. A housing bubble quickly grew and real housing prices increased more than 60% from 1985 to 1989. (FRED, 2017) The Bank of Canada was finally able to effectively lower inflation over the long-term after enacting inflation control targets in early 1991. (Longworth, 2002) As targeted, the inflation rate has largely stayed within a range of 1%-3% since the early 1990s.

Canada's economy fell into a prolonged slump in the 1990s due to international and national shocks to the financial system. (Cross, 2012) Internationally, Iraq's invasion of Kuwait is attributed as the event that triggered the recession in early 1990 due to its effect of spiking oil prices. Nationally, coinciding restrictive monetary policies and fiscal austerity measures contributed to a lackluster recovery and prolonged economic slump in Canada even after the recession ended in early 1992. (Curtis, 2002) The implementation of inflation control targets in 1991 required highly restrictive monetary policy. Canada was also facing escalating public debt in the early 1990s from persistent budget deficits. A number of pressures such as the downgrading of Canada government's debt credit rating, increasing interest rates on Canadian bonds to compensate lenders for the increased risk, and the Mexican peso crisis induced the government to implement strict austerity measures to reduce the federal debt-to-GDP ratio. (Traclet, 2001) Since GDP growth was especially low from the recession, government spending on social transfers, social programs and investments were severely cut.

In addition to the restricted money supply and lack of government spending, businesses and households were still dealing with the consequences of decisions made from the volatile inflationary era of the 80s. A fall in speculative asset prices resulted in even larger debts that needed to be repaid. (Thiessen, 2001) Low consumption, investment, and government spending culminated in slow GDP growth, prolonged high unemployment, and minimal wage growth throughout the 90s. (Curtis, 2002) Additionally, the forces of globalization and the Digital Revolution induced many companies to undergo restructuring. (Kwan, 2000) The North American Free Trade Agreement (NAFTA) put competitive pressures from the U.S. and Mexico on Canadian businesses and commodities. In order to achieve efficiencies, many businesses in the 90s underwent restructuring such as investing in new technologies, moving production outside of Canada, or outsourcing business administration tasks. Most of these restructurings resulted in employment cuts, which contributed to the high unemployment in the 90s. Additionally, there was an increasing trend towards the replacement of full-time workers with contract or part-time workers.

Inflation control targeting and the government's high debt-to-GDP ratio both contributed to high interest rates in the early 1990s. Due to the high interest rates and difficulties in obtaining financing, the 90s had comparatively lower housing starts. This low supply of new construction may have prevented the 1985 to 1989 housing bubble from fully correcting. Even though real housing prices increased more than 60% in the four years of the housing bubble, real housing prices only deflated around 20% in the ten years after from 1989 to 1999. (FRED, 2017) See APPENDIX B.

Canada's economy grew to have greatly different conditions in the 2000s than in the 90s. The monetary policies and fiscal policies implemented in the 90s were effective in bringing stability to the economy. Additionally, the restructuring effectively increased the competitiveness of Canadian businesses in the increasingly global market. (Thiessen, 2001) GDP per capita had a much steeper growth trajectory in the 2000s. Canada's annual unemployment rate averaged 7.1% from 2000 to 2012, whereas the annual average was 9.2% from 1987 to 1999. (Newfoundland & Labrador Statistics Agency, 2017) Wages also significantly grew, especially that of women. From 1981 to 1998, the average real hourly wage of young adult (25-34) men and women had percentage changes of -8.3 and +0.4 respectively. From 1998 to 2011, the percentage changes were +10.1 and +13.8 respectively. (StatsCan, 2015a)

Interest rates in the 2000s have also become much lower than in the 1990s. Thus, new housing construction finally recovered from its 90s slump. The average number of annual housing starts from 2000 to 2012 was around 201,000 units, whereas the average annual number from 1990 to 1999 was only 149,000 units. (CMHC, 2017d) Additionally, the condominium format of ownership housing began to proliferate after the 2000s. (StatsCan, 2017a) This format allows large quantities of units to be supplied even in metropolitan areas with scarce land supply, such as regions that have implemented urban growth plans and/or housing markets with extraordinary demand for residential real estate. Even with an elevated level of new construction in the 2000s, housing prices have continued to climb to record highs. From 2000 to 2008, real residential property prices increased more than 70%. (FRED, 2017) Even though the 2008 recession caused a 7.7%

fall in prices, the housing market quickly recovered to reach new record high prices by first quarter 2010 and have since continued to climb.

The U.S. Housing Crash

Neoliberal policies supporting the growth of homeownership combined with economic prosperity from the mid to late 1990s resulted in a housing boom. National housing prices in both Canada and the U.S started to climb upward. The rising prices further confirmed people's belief in the housing market and attracted even larger amounts of financial speculation. Based on the trajectory of prices during the early 2000s, local homebuyers rushed into the housing market fearing they would be priced out. Foreign investors looking to profit from the rapidly increasing prices also rushed to buy. The belief that real estate prices will keep increasing inflated housing bubbles in Canada and the U.S. The inflation of the U.S housing bubble has been estimated to have added \$10 trillion in residential real estate value from 2000 to 2005. (Case, 2007) However, the U.S housing bubble burst in 2006. From 2006 to 2011, the housing price index declined 30% equating to the elimination of \$8.2 trillion in residential real estate value. (Drew & Herbert, 2013) Only a few studies so far have examined the wealth of households after the financial crisis. Data show that from 2007 to 2009, average U.S household wealth declined about 20%. (PewResearchCenter, 2010) "[T]he typical homeowner lost about 10%, or \$40,000..." (Grinstein-Weiss et al., 2015, p. 436) These losses include both declines in housing equity and financial market equity.

When the housing market crashed in the U.S, young adult households (aged 25 to 34) were one of the most severely impacted age groups. The most effective policy in furthering homeownership and the asset-based welfare system in the U.S was the 1994 National Homeownership Strategy. It opened the doors for record low and even 0% down payment requirements, high debt-to-income loans, automated underwriting with little-required documentation, and reduced private mortgage insurance requirements. (Pinto, 2010) Immediately after its enactment, there was a steep and continuous increase of the national homeownership rate starting in 1995 and ending when the housing market crashed in 2004. Young adults, together with the 35 to 44 age group, were mainly responsible for this increase. (U.S. Census Bureau, 2016) Easy to obtain mortgages

allowed young households to enter the housing market with smaller savings and less stable jobs and income. The homeownership rate of older age groups - already more than 75% in 1995- did not significantly change after the enactment of the legislation because most older households already bought homes before 1994. Young adult tenure decisions were significantly altered directly as a result of this U.S national housing policy. Increasing numbers of securitized subprime mortgages ended in delinquencies and defaults, which eventually triggered the global financial crisis in 2008. (Pinto, 2010) The subsequent recession and growing unemployment from 2008 to 2012 caused even greater numbers of young adult households to default on their mortgages and lose their homes. Thus, the U.S homeownership rate of young adults dropped from 50% at its peak in 2005 to 40% in 2014, after climbing from 45% in 1995. (Drew, 2015)

Canada's Mortgage Policy: Pre- and Post-Crisis

On the macroeconomic level, federally set interest rates and mortgage provisions significantly alter the financial attractiveness of ownership housing. After the global financial crisis, the Bank of Canada responded with the typical tools used during a recession - cutting interest rates and liquid injections of cash into the economy. Both measures had significant impacts on housing. Many households viewed lower interest rates as the opportunity to enter the housing market, adding to demand and increasing prices. Canada's financial institutions received substantial liquid injections through the Insured Mortgage Purchase Program (IMPP) and the Canada Mortgage Bond (CMB) program. These programs made large quantities of mortgage financing available by allowing CMHC to purchase National Housing Act (NHA) Mortgage-Backed Securities (MBS) from approved lenders. (Walks, 2014) This effectively offloaded debt from the balance sheets of those lenders, allowing them to originate more mortgages while maintaining capital holding requirements. The large amounts of mortgage financing made available through these programs, combined with low interest rates, substantially increased the ease of entering homeownership.

Preceding the U.S crash, the proliferation of non-prime mortgages was concentrated on young and/or low-income households. Loose regulations in the U.S allowed public and private-label securitization of risky subprime mortgages. This

provided lenders with little incentive to maintain underwriting standards and more incentives to engage in predatory lending. In Canada, the amount of non-prime mortgages was limited because of the control of securitization through lending standards set by government-backed mortgage insurance. (OECD, 2014) Since only insured mortgages were eligible to be securitized through NHA MBS, mortgage insurance criteria maintained the quality of loans in Canada. (Mordel & Stephens, 2015) Also, federally regulated banks are only allowed to issue high loan-to-value (LTV) ratio mortgages if mortgage insurance is purchased. This framework made it impossible for Canadian banks to offer subprime products not covered by mortgage insurance. (MacGee, 2009) Just as the U.S mortgage machine was starting to crash in late 2006, the Canada Mortgage and Housing Corporation (CMHC) adopted looser mortgage insurance qualification conditions to allow loans with 0% down payment, 40-year amortization, interest-only payments, and no documented stable income.

The fallout from the U.S subprime crisis compelled CMHC to increasingly tighten mortgage insurance conditions. Starting in late 2008, regulations gradually reinstated a minimum 5% down payment, maximum 25-year amortization, no interest-only loans, and the verification of income and employment status. (OECD, 2014) Additionally, new regulations were enacted such as a credit score floor of 600, refinancing limitations, new securitization rules, and ending products such as 'cash-back' mortgages. It was estimated in 2006 that subprime mortgages accounted for less than 5% of new originations. (MacGee, 2009) During the financial crisis, most subprime lenders exited Canada with the collapse of private-label securitized asset-backed commercial paper (ABCP). In 2013, only 4% of mortgage holders had a credit score of 600 or less. (Crawford, Meh, & Zhou, 2013)

The State of Canada's Housing

In Canada, the homeownership rate remained high even after the global financial crisis. Although the housing market experienced a small decline from 2008 to 2009, Canadian housing prices have continued to climb. As such, there has been much discussion in the media regarding Canada's growing housing bubble. As early as 2011, experts from organizations such as the Bank of Canada, the International Monetary Fund,

and the Economist have warned that Canada's real estate values are not supported by underlying fundamentals. Five years after the initial warnings, the housing market has yet to have any indication of slowing down. Record high prices in hot local markets such as Toronto and Vancouver have pushed the national composite price to new highs in 2016. Canada's housing market has been in the Expansion phase of the real estate cycle for the past 15+ years. It is theoretically expected that the Recession phase will eventually come after the Hypersupply phase begins. (Nicolais, 2014) So far in early 2017, residential vacancy rates in economically growing cities such as Toronto and Vancouver have remained low while residential vacancy rates have spiked in declining local economies such as Calgary. (CMHC, 2017b) Although housing markets are highly local, macro-level monetary policy, fiscal policy, and mortgage policy greatly impact the cost and the demand for homeownership.

Increasing housing prices equate to larger mortgages for most new homebuyers. This can be seen in the increasing debt levels taken on by Canadian households. From 1999 to 2014, household mortgage debt grew from \$375 billion to \$1,160 billion at a compound average annual rate of 7.3%. (Alexander & Jacobson, 2015) However, personal after-tax income only grew at a rate of 4.3%. Therefore, more households have been taking on higher levels of debt compared to their disposable income in order to enter home ownership. The proportion of households with mortgage debt (primary residence) - to-income (after-tax) ratio of 300 percent or more grew to 27.4% in 2012 from 12.6% in 1999. The proportion of households with a primary mortgage debt-to-income ratio of 500 percent or more jumped to 10.8% in 2012 from 3.4% in 1999. Financial risk has increased overall for Canadian households, but more so for young adults who recently entered the housing market. As seen in the U.S crash, young households who purchased expensive housing at the peak of the housing bubble suffered the worst consequences from the deflating of over-valued assets. Cheap and easily available credit entices young households to enter homeownership through heavy amounts of debt and little equity. These households are most vulnerable to economic shocks such as unemployment or the tightening of credit through increasing interest rates.

The homeownership rate of households headed by individuals 25 to 34 years of age had one of the largest increases as compared to other age groups from 2001 to 2011, from 46.6% to 52.4%. See APPENDIX A. The increase in this age group was mostly by higher income households, who are generally considered less risky borrowers. (Hou, 2010) However, the high levels of debt taken on by young adults due to expensive housing prices are concerning. Loans with high loan-to-value ratios are highly leveraged investments, which bring exponential losses in the event of housing price declines. High debt-to-income ratios make households vulnerable to interest rate increases. Low levels of liquid financial assets relative to mortgage debt leave households with a lack of flexible funds in the event that households have trouble making mortgage payments. The lack of investment diversification makes portfolios more vulnerable to changes in housing market fluctuations. Unsustainable homeownership situations have long-term negative consequences for the social and financial well-being of households in the current neoliberal welfare system. Although the Canadian housing market has yet seen a decline, numerous sources have pointed out the vulnerability of young adults in Canada to high housing prices, high levels of debt, and macro-level policy changes. However, there have not been studies that have conducted an in-depth analysis of young adult homeownership situations.

1.3 Thesis Structure

This first chapter has provided an introduction to this thesis by identifying a problem that will benefit from additional research. The specific research questions that will be addressed have been stated. Additionally, some historical and current contexts for the research have been provided. Chapter two comprehensively reviews the body of tenure choice literature. An overview of the main theoretical perspectives examining tenure is first summarized. Then, the most important factors impacting tenure as studied throughout the body of literature are presented in two categories: Micro-level characteristics and macro-level conditions. Finally, literature that has specifically studied the tenure choices of young adults is reviewed. Chapter three establishes the methodology for undertaking the analysis. The data and statistical models to be used for

analysis are discussed in terms of their suitability for addressing the research questions. Chapter four presents and discusses the findings from the quantitative results of the analysis by comparing and contrasting to the findings in the literature. Chapter five concludes by first providing a summary of the main findings of this thesis. Then, the policy implications of those findings are discussed in depth. Any aspects of this study that encountered limitations are also noted. Finally, ideas for further research are shared.

CHAPTER 2 LITERATURE REVIEW

The purpose of this literature review is to scope the factors that have been found to impact tenure choice in general and of young adults in particular so that the new empirical research can be put in the context of existing knowledge. Housing tenure choice has been studied from a number of perspectives and through varying methodologies. This chapter will first provide an overview of tenure choice from a theoretical perspective. Then, the various factors that influence people's decisions of whether to buy or rent their homes will be reviewed, organized in two sections: Micro-level factors and macro-level factors. In the final section, literature that has specifically studied the tenure choice of young adults will be reviewed. Due to the dependence of the findings on the methodology undertaken, both findings and methodology will be examined.

2.1 The Study of Tenure Choice: Theoretical Perspectives

2.1.1 Economic Perspective

Housing tenure choice has been studied early on and extensively from an economic perspective due to its importance as a component of housing demand. (Struyk & Marshall, 1974) Understanding the factors that contribute to whether households buy or rent allows policymakers and the private real estate sector to anticipate future demand in both ownership and rental housing markets. Most studies analyzing the determinants of homeownership are conducted using a binary logit model, which is a regression model with a categorical dependent variable having only two possible outcomes - own or rent. Li's (1977) influential paper indicated that the logit model is the most appropriate for explaining homeownership. Studies prior to Li's paper "employed a linearly additive regression model having a dichotomous (0 and 1) dependent variable, which is inconsistent with the expectation of nonlinear effects and interaction effects because the probability is bounded between 0 and 1." (Li, 1977, p. 1081) Tenure choice theory expect that rational households will desire to own when the perceived net benefit of owning exceeds that of renting. (Fu, 2014) Hood (1999) explains the determinants of homeownership model through the human capital investment theory where the costs and

benefits over the ownership life are discounted to net present value. This theory states that a household should invest in ownership housing if the net present value of benefits is greater than zero. The resulting model is a logistic regression with ownership as the dependent variable. Constraint (race, gender, and educational attainment) and net benefit (age, marital status, and family size) factors are the independent variables.

Various independent variables can be tested to examine their impact on the probability of homeownership assigned as the dependent variable in the logit model. One explanatory variable that is emphasized in the economic perspective is the relative cost of owning to renting. (Bourassa, 1995; Haurin, Hendershott, & Kim, 1994; Rosen, 1979) It was found that relative cost significantly impacts tenure choice. The cost of owning is the product of the local price to purchase a property and the annual user costs of owning. The calculation of annual user costs includes tax burdens, tax benefits, financing rates, depreciation rates, maintenance costs, insurance rates, as well as expected inflation of housing value. Transaction costs and length of stay of ownership were further incorporated into these calculations. (Haurin & Gill, 2002) These models assume the available supply of same quality ownership and rental housing. Of course, the desire to own must also be supported by the capacity to own in order to enter home ownership. (Rohe & Lindblad, 2013) Tenure choice models use variations of income and wealth variables to model the capacity to own and the capacity to overcome the down payment barrier. The use and interpretation of these variables will be examined in further detail in the methodology section.

Another important approach in the economic perspective analyzes tenure choice as a function of the dual effects of consumption demand and investment demand. Henderson & Ioannides's (1983) seminal paper developed a tenure choice model incorporating both the consumption and investment behaviours of individuals. This model expects that individuals will desire to own if their investment demand is greater than their consumptive demand. Individuals try to maximize utility through optimizing "consumption demand, investment holding of housing, savings, and the rate of utilization..." (J.V. Henderson & Ioannides, 1983, p. 103) Entering homeownership when consumption and investment demand is in equilibrium will perfectly satisfy both needs

and maximize utility. For those individuals whose consumption demand is higher than investment demand, their portfolio would be over-invested in residential real estate if they were to buy instead of rent. (Gabriel & Rosenthal, 2015) However, for those individuals whose investment demand is higher than consumption demand, more housing can be occupied than needed or the extra capacity can be rented out. Once again, income determines how much consumption and investment can be realized. Wealth and borrowing constraints limit housing investment.

2.1.2 Demographic Perspective

A significant body of literature has found that tenure choice is closely linked to lifecycle stage and household events. Household decisions to buy or rent are not purely based on economic and financial considerations. Most studies from the economic perspective include demographic variables in the analysis because of the recognized importance of lifecycle stage on housing consumption and investment. (Artle & Varaiya, 1978) The literature from the demographic perspective offers more in-depth research on the impact of household circumstance on tenure. As stated earlier, tenure choice theory expects that a rational household will desire to own when the perceived net benefit of owning exceeds that of renting. (Fu, 2014) The benefits and costs of homeownership differ between households and changes between stages in the life course. (C. Mulder & Wagner, 1998) The availability of resources also differs. For example, there is widespread perception and evidence from research that homeownership has greater benefits for children's outcomes as compared with rental, although these studies tend not to be able to resolve issues of causality. The demographic perspective frequently discusses lifecycle stages in terms of its expected mobility and associated stability in relation to tenure. (Deurloo, Clark, & Dieleman, 1994; Dieleman & Everaers, 1994) Due to its high transition costs and lack of liquidity, homeownership is negatively associated with residential mobility. (Kendig, 1984) Thus, the households and the lifecycle stages that have lower anticipation of frequently moving are more likely to transition into homeownership. (Carliner, 1974) Additionally, stable financial and household situations also result in higher likelihood of being homeowners.

Two methodologies have emerged in tenure choice literature: cross-sectional and longitudinal. (Zhang & Wu, 2013) Cross-sectional analysis describes tenure at one point in time. (Dieleman, Clark, & Deurloo, 1994) The logit model introduced previously is the model used in cross-sectional analysis, in which the dependent variable is tenure. The model describes discrete tenure choice in terms of the explanatory variables. This essentially results in a description of the characteristics of homeowners because "[t]enure decision is a part of a life-time plan. Current tenure status is a result of current, past and future variables (Goodman, 1995 and 2003), so the time of the decision may not coincide with the time of the change in its determinants." (Raya & Garcia, 2012, p. 3) Since the objective in tenure choice literature is to study how the homeownership or renting decision is made, the longitudinal method was developed. The longitudinal method uses panel data to provide a more specific description of residential mobility and tenure choice. (Dieleman et al., 1994) The availability of data over time allows the analysis of changing tenure status in relation to other lifecycle events such as changes in marital status, having children, or changes in job status/income. Longitudinal tenure studies also use the logit model, but with the dependent variable being a transition from renting to the state of ownership. (Raya & Garcia, 2012)

The type of methodology chosen typically depends on the availability of data and the purpose of the study. The longitudinal method has more intensive data requirements since the sample size and the numbers of periods need to be sufficiently large enough to permit comparisons. Both methods use demographic and socio-economic variables to correlate household status with tenure status. In cross-sectional analysis, household status variables are used to represent life-cycle stage and to establish household events that have already occurred. In longitudinal analysis, changes in the household status variables over time explicitly indicate the occurrence of household events to demonstrate possible cause and effect relationships which better explain how the tenure decision is made. Cross-sectional and longitudinal studies generally result in consistent conclusions. Dieleman, Clark & Deurloo (1994) compared their earlier studies done with both methods and concluded that "longitudinal analyses enrich rather than invalidate the understanding of tenure choice gained from cross-sectional data and methods." (p. 242) Another study

(Raya & Garcia, 2012) compared all the models used to analyze the real determinants of tenure choice found that longitudinal models have greater predictive capacity and are more accurate in identifying the events resulting in a tenure transition decision.

2.2 The Determinants of Homeownership

This section will review the findings from literature regarding the specific factors impacting tenure choice. Due to the complexity of the homeownership decision, a considerable amount of factors have been studied by researchers. Only the factors that have been found to be highly important in determining tenure will be reviewed below. The discussion of these factors is organized into two categories: Micro-level characteristics and macro-level context.

2.2.1 Micro-Level Characteristics

Age

Most tenure choice literature has found that age is highly correlated with homeownership. (Goodman, 1990) In many studies, age is one of the variables that explain most of the difference in tenure decisions. (Carliner, 1974) This is likely due to the association between age and a number of other factors. Age, along with household size and relationship status, is often used as an indicator of the lifecycle stage. (Xhignesse et al., 2014) Lifecycle stage and homeownership have been widely established to have a strong relationship. (Artle & Varaiya, 1978) Households have different housing needs at different points in the lifecycle. Household events result in the transition into a new stage in the lifecycle which increases the likelihood of housing adjustments of dwelling type, size, location, and/or tenure. (Morrow-Jones & Wenning, 2005) Thus, some of these household events such as marriage or having children have been found to coincide with the transition from renting to owning. (Clark, Deurloo, & Dieleman, 1994) Additionally, the differing mobility rates associated with different stages of the lifecycle and with different age groups are emphasized. Some studies have found age to no longer have a significant relationship with tenure when expected mobility is fully captured in a model. (Kan, 2000) It is said that age acts as a proxy for expected mobility in studies with data that do not include mobility. (Boehm, 1981) Age has been found to act as a better proxy

for the stability of financial and household situations than household type. While stability is established by making commitments such as getting married or having children, it has been observed that stability also becomes established once single people get older. (Feijten, Mulder, & Baizán, 2003) Older individuals are more likely to have stable careers with higher income and accumulated enough savings for down payments. (Kendig, 1984)

Generally, there is a positive correlation between the likelihood of homeownership and age. (Goodman, 1990; Raya & Garcia, 2012) However, in cross-sectional studies that use a sample of all households, this trend may largely be the result of past decisions and past transitions into homeownership. Painter, Gabriel & Myers (2001) noted, "among households who are age 45 or older, cumulative attainment of homeownership may largely reflect the lagged effects of past choices." (p. 152) Therefore, the importance of age is often overestimated in these models. Some studies suggest that separating models by age category lowers the potential bias for age groups younger than 45. (Gyourko & Linneman, 1996) Older cohorts are "carrying forward past ownership patterns, thereby raising the ownership propensities in the older group they enter." (Gyourko & Linneman, 1997, p. 4)

Household Type

A household is defined as "a person or group of persons who occupy the same dwelling and do not have a usual place of residence elsewhere..." (StatsCan, 2016a, para. 1) Household type is another indicator of lifecycle stage and is often used as a proxy to indicate household stability. (Morrow-Jones & Wenning, 2005) Household events redefine the long-term and short-term living and financial commitments between a group of people, which translates to differing levels of stability of the household situation. (Feijten et al., 2003) Therefore, household type significantly influences tenure choice. In tenure choice literature, the typical characteristics that attribute to household type are singleness, marital status, the presence of children, and other cohabiting arrangements. These main characteristics will be discussed in greater detail below.

Different combinations of household characteristics result in varying household types such as single, couples without children, married couples with children, single parents, living with parents, living with roommates, etc. (Feijten et al., 2003; Morrow-Jones & Wenning, 2005; Smits & Mulder, 2008) However, some research has found that the influence of household type on tenure has declined over time due to changing values and views of homeownership. The attractiveness of housing as an investment may have increased ownership rates in household types typically considered less stable for committing to homeownership. (Smits & Mulder, 2008) As mentioned earlier, traditionally less stable household types achieve financial and household stability through aging. (Feijten et al., 2003) Some family units that are considered traditionally the most stable have been found to struggle financially due to a more hourglass economy and increasing housing prices. (Gyourko & Linneman, 1997)

Single-Person Households, Couples & Marital Status

Previous research has found that single-person households are less likely to become homeowners than couples. (Mulder & Manting, 1994; Smits & Mulder, 2008) Young singles, in particular, are the household type that is the least likely to have the savings and income to buy a home. (Kendig, 1984) Dual-income households are more capable of being able to afford the financial obligations of homeownership than one-earner households. (Clark, Deurloo, & Dieleman, 1997; Mulder & Hooimeijer, 1995) Studies that have controlled for socioeconomic status still found singles to have a low probability of entering homeownership. (Mulder & Hooimeijer, 1995) Single individuals are also the most likely to frequently move to labour market opportunities. Thus, they would choose a tenure that does not restrict residential mobility. (Head & Lloyd-Ellis, 2011)

Co-habiting couples have a higher likelihood of being homeowners than singles, but lower than married couples. (Lauster & Fransson, 2006) Marriage makes a significant difference in the level of long-term commitment between couples by imposing legal and financial consequences for dissolution. (Mulder & Wagner, 1998) Therefore, the different states of marital status each have implications for tenure. (Raya & Garcia, 2012) Marital status often interacts with the presence of children in a household because having

children is a main motivation for co-habiting couples to take the next step into marriage. (Mulder & Wagner, 1998)

Literature has examined the statuses of being married, separated, widowed, and divorced. The lifecycle event of marriage and homeownership are highly correlated. (Carliner, 1974; Mulder, 2006) Marriage has been found to speed up entry into homeownership. (Deurloo et al., 1994) Some studies also suggest that people may postpone marriage or having children until after being able to buy a home. (Mulder, 2006) Being divorced or separated significantly decreases the probability of being a homeowner. (Raya & Garcia, 2012) However, the divorced and widowed are still more likely to be homeowners than never-married singles. (Blaauboer, 2010) In an examination of changing Australian homeownership rates from 1975 to 1994, Yates (2000) found that single-person households at all income levels have seen an increase in the propensity for homeownership. Households in the top income quintile (except young couples with no children) also have seen an increase in the propensity for homeownership. Gyourko & Linneman (1997) found similar trends for the U.S and suggests that "delayed marriage and childbearing among the young clearly are no longer the huge impediments to ownership that they were in 1960." (pg. 17)

Children in the Household

Homeownership and residential stability have been linked to positive outcomes for children, although again causality is often not resolved. (Holupka & Newman, 2012; Rohe & Lindblad, 2013) Studies have found children living in ownership homes to have higher cognitive performance and lower behavioural problems. (Haurin, Parcel, & Haurin, 2002) Parental homeownership status has also been found to improve the children's attainment of post-secondary education and homeownership as young adults. (Galster, Marcotte, Mandell, Wolman, & Augustine, 2007) Therefore, families who have children or plan to have children often enter into homeownership. (Clark et al., 1997; Feijten & Mulder, 2005; Hood, 1999; Yates, 2000) It has been established that the lifecycle events of marriage and childbearing coincide with the transition in tenure from renting to owning. (Clark et al., 1994) Households make housing adjustments in terms of size, location, and tenure in order to gain larger living space, good schools in quality

neighbourhoods, social status, residential stability, and tenure security. (Clark & Onaka, 1983; Morrow-Jones & Wenning, 2005) The benefits of homeownership are said to be greater for households with children than childless couples or singles. (Hood, 1999) Many studies have found that couples, married or unmarried, are more likely to be homeowners than couples without children. (Fu, 2014) Married couples with children are considered the most stable and committed household type, and thus most likely to be owners. (Doling, 1976; Mulder & Manting, 1994) Single parents are also more likely to be owners as compared to single people without children. (Blaauboer, 2010)

Studies from the U.S, Germany, Australia, and the Netherlands have found positive impacts of childbearing on entry into homeownership. (Clark et al., 1997; Feijten & Mulder, 2005; Haurin et al., 1994; Yates, 2000) However, some studies from the Netherlands have found slight negative effects. (Mulder & Wagner, 1998; Smits & Mulder, 2008) The studies with positive findings may reflect countries with stronger cultural norms, social pressures, or tax policies that favour homeownership for families. (Mulder, 2006; Mulder & Wagner, 1998) The studies with negative findings may reflect the reasoning that the cost of raising children competes with the cost of homeownership. (Courgeau & Lelievre, 1992) Evidence from prior research supports this argument. It has been shown that as the number of children increases in a household beyond a certain threshold, the likelihood of homeownership decreases. (Carter, 2011; Feijten et al., 2003; Hood, 1999) Furthermore, becoming parents increases the chances of transition from a dual-income household to a single-income household as one partner leaves the labour force in favour of child-care. (Mulder & Hooimeijer, 1995) The likelihood of exchanging paid work for childrearing depends on the costs of childcare or child care subsidies in different countries. (Mulder & Wagner, 1998) It should be reasonable to expect that with more children in a household there is a higher likelihood of one parent leaving the labour force. (Hood, 1999) The factors of marriage and childbearing will likely always impact homeownership. (Gyourko & Linneman, 1996) However, as mentioned in the earlier discussion, they are no longer as big of an obstacle as compared to the 1960s when gender equality and home financing were not as easily obtained.

'Other' Household Types

In the classification of household type, the most significant types are single-person (never married), single-person (divorced), single-parent, cohabiting without children, cohabiting with children, married without children, and married with children. Households that do not match the composition of any of the types mentioned above are categorized as 'Other' in analysis. (Clark, Deurloo, & Dieleman, 2003) The 'Other' classification is rarely discussed in tenure literature because of the small number of cases observed for this category.

Number of Earners

One major advantage of being a couple household is the possibility of having two incomes contributing to the cost of housing. (Smits & Mulder, 2008) A few studies have included the number of earners variable in the tenure choice analysis to compare the ownership propensities of households with a different number of earners. This variable only started being included in tenure analyses since the 1980s when it became more common for women to join the labour force. The studies that have examined the number of earners generally found that dual-earner households are more likely to transition into homeownership than single-income households. (Clark et al., 1997; Gyourko, 2002; Myers, 1985) Myers (1985) found that the addition of a second income (the wives' employment) enabled young households to especially afford monthly mortgage payments during a period of faster housing price increases as compared to increases of male earnings from 1974 to 1980. Deurloo, Clark & Dieleman (1994) in a longitudinal study found that two-earner couples have a higher propensity to move from renting to owning than one-earner families. Additionally, the authors noted that the decision to move from renting to owning for two-earner couples were least likely to be impacted by adverse macroeconomic circumstances in different time periods and by regional pricing effects. (Deurloo et al., 1994) The propensity to own for two-earner families falls between that of two-earner couples and one-earner families. Couples households are more likely to have two-earners since the cost of childcare is not a trade-off. (Mulder & Wagner, 2001) As dual-income households became more prevalent after the 1980s, Smit & Mulder (2008) found that the more recent studies that do not control for the number of earners had the

effect of overestimating the effect of being a couple on homeownership since couples are far more likely to have two earners. However, it is important to note that none of these studies analyzed households with more than two earners. Therefore, it is unclear what the effect of having more than two earners in a household on the probability of owning is and what the dynamics of those types of households are.

Household Size

Household size is often used as a proxy for the presence of children. (Carliner, 1974a; Hood, 1999) Previous research has seen that mostly all larger households include children whereas only a small percentage of two-person households include children. (Carliner, 1974) However, the assumption of the nuclear family may not accurately portray the growing prevalence of non-traditional or multi-generational households. Research that has specific data on the presence of children or number of children in the household does not include household size in their models. (Dieleman et al., 1994; Yates, 2000) Models that do not have specific household type variables use household size as a proxy. (Hood, 1999) The ambiguity of household size in relation to tenure is reflected in literature. Some studies found that family size is positively correlated with homeownership and some studies found negative correlations. Positive: (Carliner, 1974; Henderson & Ioannides, 1987; Kan, 2000) Negative: (Hood, 1999; Kain & Quigley, 1972; Li, 1977) Positive correlations may reflect the higher level of utility and net benefit larger families gain from homeownership. (Hood, 1999; Kan, 2000) Larger households also have reduced residential mobility which is conducive to ownership (Kan, 2000) Negative correlations may reflect the wealth restraint of larger families where the savings needed for homeownership is used for larger consumption costs. (Hood, 1999; Li, 1977) Both Li (1977) and Hood (1999) found that the likelihood of homeownership increases up to a five-person household, after which the likelihood decreases. Kain & Quigley (1972) adjusted for the ownership propensities of households with children and additional workers to find a negative correlation between family size and homeownership. Demographic changes have resulted in a decreasing average household size in Canada. There are increasing numbers of smaller households due to decreased fertility rates, an aging population, and longer life expectancy. Statistics Canada (2016b) notes that seniors

are more likely to live in private households than in collective dwellings today as compared to in the past. This may be reflected in tenure if seniors do not make housing adjustments in old age.

Sex

Earlier literature has examined the impact of gender discrimination and disparity on homeownership. U.S studies of the St. Louis, Missouri metropolitan area found female-headed families to be significantly less likely to be homeowners than male-headed families. (Kain & Quigley, 1972) However, after U.S federal legislation prohibited sex discrimination, the probability of female homeowners significantly increased. (Ladenson, 1978) Some more recent literature has found that women were less likely to enter ownership. (Munro & Smith, 1989; Smits & Mulder, 2008) The main arguments claiming gender inequality in homeownership cite the wage gap and the higher likelihood of income disruption of women leaving the labour force for childbearing and childrearing. However, studies that have controlled for marital status and income found no significant relationship between gender and home ownership. (Dowling, 1998; Henderson & Ioannides, 1987) Blaauw's (2010) study of the Netherlands found that female never-married singles, female single parents, and divorced women were significantly less likely to be homeowners. However, the gender of the head of couple households did not result in having significance for homeownership. In Canada and the U.S, there has been a growing prevalence of unmarried single women in the housing market. (Drew, 2006; Williams, 2010) As women are delaying the age of marriage, there has been a growing percentage of unmarried single women entering into homeownership. (Drew, 2006)

Race

There has been a well-established history of housing discrimination based on race in the United States. The practice of redlining effectively denied mortgages to racial minorities from the 1930s up until the 1970s. Thus, it is unsurprising that many older U.S tenure studies have found a lower likelihood of homeownership for black households as compared to white households even after controlling for wealth and income. (Henderson

& Ioannides, 1989; Li, 1977) Some more recent studies still found disparities. (Boehm & Schlottmann, 2004; Painter et al., 2001) In Canada, several studies have also found inequalities in homeownership based on race and immigration status. Immigrants generally have a lower level of homeownership than native-born households. (Edmonston, 2004) However, Chinese and White immigrants have higher ownership levels than Filipino or South Asian immigrants. (Haan, 2007) Black Caribbean or African households, regardless of immigration status, still have the lowest levels of ownership in Canada overall and in Toronto specifically. (Darden & Kamel, 2000; Haan, 2007; Skaburskis, 1996) Gyourko & Linneman (1997) found "increasingly large adverse effects of race on the probability of owning among the youngest adult households." (pg. 3) This effect is due to the growing cost of housing combined with lower levels of financial family support due to historical inequities in asset ownership but not direct housing discrimination. (Gyourko, 2002; Gyourko & Linneman, 1996)

Parental Resources

The growing cost of housing in North America makes overcoming the wealth constraint more difficult for first-time homebuyers. Literature has long established the intergenerational wealth transfers that occur during parents' lifetimes and after. Most commonly, studies have established the relationship where the children are more likely to be homeowners if the parents are also owner-occupiers. (Blaauboer, 2010; Di Salvo & Ermisch, 1997; Mulder & Smits, 1999; Myers, Painter, & Zissimopoulos, 2016b) Not only are these parents in a better position to provide financial loans or gifts, the children are theorized to have developed tenure preferences, expectations, and goals from their parents' influence. (Henretta, 1984; Mulder & Wagner, 1998) Choosing homeownership allows the children to match the level of living standards, social status, and wealth accumulation they have come to expect from living in their parents' homes. (Henretta, 1984; Smits & Michielin, 2010) A number of studies have also used parents' highest level of education as a proxy for their socioeconomic status. However, most these studies have found this proxy not to be statistically significant. (Hood, 1999; Mulder & Wagner, 1998; Smits & Mulder, 2008) The tenure of the parental family is the best measure of parental resources. (Henretta, 1984; Smits & Mulder, 2008) Blaauboer (2010) additionally found

that children originating from large families had reductions in the positive effect of parental resources on homeownership because those resources had to be shared among siblings. Mulder & Wagner (1998) noted that differences between the effects of parental resources on homeownership internationally are due to the supportiveness of each country's policies on intergenerational wealth transfers and familial gifting. Several studies have found parental wealth and support to have a higher correlation with young adult homeownership when and/or where housing costs are high. (Coulter, 2016; Kennedy & Stokes, 1982; Ost, 2012) The Canadian Association of Accredited Mortgage Professionals' 2015 home buying report found that 18% of first-time homebuyers received loans and gifts from parents for their down payments. (Dunning, 2015) This is up from the 11% found for 2010 to 2014.

Educational Attainment

Most of the tenure literature uses education attainment as a proxy for household wealth or as an input to calculate permanent income. (Carter, 2011; Gyourko & Linneman, 1997; Mulder & Wagner, 1998) While immediately after graduation, higher educated individuals may be worse off financially because of the missed years of participation in the labour force and/or student debt burdens. (Feijten & Mulder, 2005) However, it is generally expected that individuals (household head) with higher levels of education would have higher income capacity over the course of his or her lifetime and thus higher probability of being homeowners. (Robst, Deitz, & McGoldrick, 1999) In terms of financing, mortgage underwriting considers current income, past income, and employment type but not education to estimate future income. (Genworth Canada, 2016) Education is also theorized to independently improve the likelihood of homeownership since the more educated are expected to better understand the benefits of homeownership and better able to navigate mortgage financing. (Blaauboer, 2010; Morrow-Jones & Wenning, 2005) Myers, Painter & Zissimopoulos (2016a), using 2013 U.S data, found having a bachelor's degree increases homeownership even after income and wealth are controlled for. It may be that higher educated individuals are more likely to choose homeownership because they have a stronger expectation for stable and rising income. (Blaauboer, 2010) Additionally, higher educated individuals are more likely to demand

higher quality housing in well-to-do neighbourhoods, which are generally provided in owner-occupied housing in North America. (Feijten & Mulder, 2005) Gyourko and Linneman (1997) found that education/income has growing influence on tenure as compared to traditional demographic factors such as marriage or children.

Income

Income is the most commonly used variable to represent the financial ability of households to afford housing, whether it be rental or ownership. (Fu, 2014) Almost all of the demographic factors discussed already in this literature review have some effect on income. Some tenure models in literature used some of these factors as proxies for income, such as age or education. However, in tenure choice models that include measured income, the independent effects of income and demographic variables can be distinguished. Since homeownership is a long-term financial decision, households "look beyond the income of the current period in making demand decisions." (Goodman & Kawai, 1982, p. 216) Thus, it is widely recognized in literature that a variable capturing long-term income is most significant for housing demand. (Goodman & Kawai, 1982; Kain & Quigley, 1972) This has been done through estimating a permanent income for each household by regressing the current annual income by any variables (human capital, employment characteristics, location, nonhuman wealth, etc.) that may cause it to be inconsistent over the long-term. (Boehm & Schlottmann, 2004; Goodman & Kawai, 1982) Due to the economic roots of tenure choice study as a component of housing demand modelling, many tenure choice models use permanent income over current income. (Carliner, 1974; Goodman, 1988; Kain & Quigley, 1972)

Goodman & Kawai's (1982) permanent income method is most commonly cited in tenure choice literature for cross-sectional analysis where they used age, education, previous residence equity, and the number of automobiles owned in the household to estimate a permanent income and a transitory income. Cited by: (Haurin, 1991; Henderson & Ioannides, 1987; Painter, 2000) The transitory component of current income is any income that is extra or missing in the current year from the stable income potential expected over the long-term. Thus, the transitory component is the difference between the estimated yearly income and the current annual income. Traditional

economic tenure choice literature also notes that the income elasticity of demand for housing is higher for permanent income than current measured income. (Harmon, 1988; Henderson & Ioannides, 1989) Some longitudinal studies using panel data calculates permanent income by averaging the recorded historical income from past years. (Carliner, 1974; Ladenson, 1978) However, "analysts have agreed that long-term, or permanent, income is necessary, at least in any equation used to estimate housing demand (as opposed, for example, to tenure choice)" (Goodman, 1988, p. 331) Bourassa (1995) found that replacing reported income with permanent income had little impact on the model output.

Whether or not the varying models use current income or permanent income, almost all tenure studies have found income to be one of the most important determinants of homeownership. (Boehm & Schlottmann, 2004; Carliner, 1974; Raya & Garcia, 2012) Almost all studies, using cross-sectional or longitudinal data, have found a positive correlation where an increase in household income increases the likelihood a household will own a home. (Carliner, 1974; Dieleman et al., 1994; Struyk & Marshall, 1974; Xhignesse et al., 2014) Haurin (1991) found that income variability over time significantly reduces the probability of homeownership where "a 10% increase in variability reduces homeownership by the same amount as a 5% decrease in income."(p. 60) Therefore, if the stability of income cannot be controlled for when estimating permanent income, the estimate of the permanent income variable would not be robust. (Haurin, 1991)

Wealth

Some tenure literature stresses the importance of wealth over income as the main factor determining a household's financial ability to transition into homeownership. (Gyourko, 2002; Jones, 1989) While income is needed to pay for housing consumption regardless of the tenure, wealth (if liquid) eases attainment of homeownership. (Fu, 2014; Linneman & Wachter, 1989) In many studies, asset income, age, or educational attainment is used as indicators of wealth due to a lack of data directly measuring wealth. (Gyourko & Linneman, 1996; Painter et al., 2001; Xhignesse et al., 2014) "[T]he household's wealth is defined as the sum of its nonhuman wealth, net liabilities, and the

present value of its prospective earnings from work." (Artle & Varaiya, 1978, p. 38)

However, some studies have found that homeownership probabilities remain low even for households with high human capital if they do not have net worth accumulation. (Jones, 1989) Therefore, it is crucial to separate the effects of human wealth from nonhuman wealth. Human wealth is the lifetime sum of labour income. (Jorgenson & Pachon, 1983) Nonhuman wealth is the total value of physical and financial assets. This theoretical shift is especially significant in the North American context due to the strong preference for homeownership and due to the lending framework for becoming a homeowner. (Jones, 1995) The importance of wealth in determining homeownership is based on the belief that households will choose to save their income in order to meet the down payment requirement for obtaining a mortgage because of their strong preference for owning. These wealth constraints are set by lending policy through maximum loan-to-value ratios and maximum total debt service ratios.

Jones (1995) empirically showed that liquefiable wealth has much more importance to tenure choice than lifetime income using U.S and Canada household consumer finances surveys. For most first-time homebuyers, overcoming the wealth constraint (saving for the down payment) is an unavoidable obstacle for entering homeownership. (Kent, 1984) The household earning capacity has importance in determining the amount of labour income that can be saved after expenditures. (Haurin, Hendershott, & Wachter, 1996) Thus, high transitory income has been found to increase the likelihood of homeownership, not just high permanent income. (Dynarski & Sheffrin, 1985) Depending on the urgency of entry into ownership, households may also lower consumption in order to increase the rate of savings. (Artle & Varaiya, 1978) However, since human capital is illiquid, the potential of future earnings cannot be extracted all at once in the present time. (Becker, 1993) Human capital is also difficult to collateralize and would be charged large liquidity premiums. Essentially, it is only the nonhuman wealth (net liabilities) that can be borrowed against for mortgage financing. In Jones' (1995) study, net worth and labour earnings are uncorrelated which suggest external sources of supplementary income such as intergenerational transfers.

Studies that use direct measures of nonhuman wealth have found it to have strong significance for tenure. Bossons (1978) found that the effect of the nonhuman wealth constraint is nonlinear. Households with equity below a certain threshold are unable to overcome the wealth constraint. Over the wealth constraint threshold, households are increasingly more likely to be homeowners as wealth increases up to a certain point. There is a second threshold for high net worth households, over which the effect of wealth on homeownership slightly decreases. (Bossons, 1978) This may be due to a higher opportunity cost of capital or the unattractiveness of investing in an indivisible and illiquid asset for these high net worth households. Jones' (1995) study only examined households under 35 years of age because he wanted to examine initial tenure decisions and limit the effect of past portfolio and homeownership decisions. He also excluded pension, business equity, and other real estate wealth from the net worth variable because "only liquefiable wealth is relevant to the tenure decision." (pg. 58) In modelling the Canadian data (the 1984 Statistics Canada Survey of Consumer Finances), he conducted separate logistic estimations for Quebec versus the rest of Canada because Quebec "appear to have weaker preferences for homeownership. Weaker homeownership preferences may be reflected in a lower likelihood of homeownership for a given liquid wealth position, controlling for the market price of houses." (pg. 62) Liquefiable wealth was found to be significant and positive for both regions. The Canadian logit ownership likelihood estimation model included the independent variables: log of household net worth, log of permanent earnings, log of transitory earnings, marital status of household head, and the number of children under 18 years of age in the household. In modelling the U.S data, a race variable was also included in Jones' (1995) study.

Student Debt

Higher levels of education also result in higher levels of student debt in countries without publically funded post-secondary education such as Canada and the U.S. Mezza, Ringo, Sherlund & Sommer (2016) discussed three factors that student debt would affect in regards to entry into homeownership. First, with the importance of overcoming the wealth constraint in order to enter homeownership, it is a reasonable argument that having debt (negative wealth) would lower the likelihood of being able to pay for a

down-payment. Second, lenders limit the maximum total debt service (TDS) ratios as a measurement of the household's ability to pay back a mortgage. TD, one of Canada's major banks, defines that "[t]he TDS ratio measures your total debt obligations (including housing costs, loans, lines of credit, car payments, and credit card bills) in relation to your income." (TD Canada, 2016, para. 3) The maximum TDS ratio is generally 40%. Having student debt would decrease the amount of mortgage financing households with existing debts would qualify for. Third, mortgages in Canada require credit score checks. Possible missed student loan payments may decrease an individual's credit score prior to applying for a mortgage. (Mezza, Ringo, Sherlund, & Sommer, 2016) Mezza, Ringo, Sherlund & Sommer's research dataset did not have homeownership status. They used the existence of a mortgage as a proxy and examined a U.S cohort of 23 to 31 year old individuals. Their results found a negative relationship between student debt and the homeownership rate during the first five years after graduation. A UK study found that student debt significantly delayed the transition to first-time homeownership. (Andrew, 2010) This study only examined graduates whose parents' total incomes were lower than thirty-five thousand pounds due to the student loan borrowing constraints placed on higher-income families. There were no studies found in this literature review that used tenure choice methodology, where the dependent variable is tenure status or tenure change. There are qualitative studies in which respondents indicated expectations that buying a home or starting a family should be delayed by high levels of student debt. (Tokarsky, 2010) However, there is evidence from quantitative research that student debt delays marriage and family formation, which may directly impact tenure decisions. (Bozick & Estacion, 2014)

2.2.2 Macro-level Conditions

Housing Markets

The forces of supply and demand direct housing markets just like they do any other goods or services for sale. The quantities of products sold depend on the price, which results from the interaction of quantities supplied and demanded. Shelter is a basic need. Thus, housing services constitute the minimum level of consumption required for every individual. In terms of tenure, housing services can be attained through renting or

owning. If the preferences for and benefits from renting and owning is assumed to be equal, people should choose to own if owning is 'cheaper' than renting and vice versa. Since housing is a durable good, the cost of owning is the product of the local price to purchase a standard property and the annual user costs of owning. (Haurin et al., 1994) "The user cost is usually defined as the price that a consumer would pay over a given time period to hold one unit of the durable good for one period of time; therefore it is also often called the rental equivalent price, although it does not always relate to observable market values." (Tomat, 2002, p. 7) The calculation of the true cost of homeownership is complicated because of its long-term financial implications due to opportunity costs, financing costs, transaction costs, etc. The average annual user cost of ownership over the expected length of stay should be calculated from the mortgage rate, down payment size, amortization length, expected housing price appreciation (or depreciation) rate, opportunity cost of investment rate, tax rates, transaction costs (buying and selling), and maintenance and other fees (such as renovation, insurance, and utilities). (Bostock, Carter, & Tse, 2016) The average annual user cost of renting can be calculated from the monthly rent plus other discretionary fees such as security deposits, broker's fees, and contents insurance. Both owning and renting costs should consider the future inflation rate.

As introduced in the section reviewing the economic perspective of tenure choice literature, the relative cost of owning and renting has been found to be one of the most important factors impacting tenure choice. Tenure models in literature have been able to representatively gauge relative cost through the development of a comprehensive equation for the user cost of owning. The factors considered in the user cost, such as interest rates and tax rates, can significantly alter the actual price of housing and thus the demand for homeownership. Therefore, using the market price of buying a house in a relative price ratio does not accurately represent the cost of owning. Bourassa (1995) compared the use of a 'market price/rent' variable versus a 'relative cost' variable that incorporates the user cost of owning, in a tenure model. Although the results showed that both variables had a negative correlation with the probability of homeownership, the 'relative cost' variable had a much larger effect on tenure. The use of the 'market price/rent' variable resulted in the overestimation of the demographic variables in the

model. A comprehensive equation to calculate the user cost of owning has developed in tenure literature to incorporate all of the factors listed in the previous paragraph. (Bourassa, 1995; Goodman, 1988; Haurin & Gill, 2002; Haurin et al., 1994; Haurin, Hendershott, & Ling, 1987; Hendershott & Shilling, 1980; Kent, 1984; Rosen, 1979) Almost all studies have found that as the relative cost of owning to renting increases, the likelihood of homeownership decreases.

These studies that include a relative cost variable in their models are generally examining tenure choice on a national scale. The relative cost of owning to renting is differentiated between housing markets at the metropolitan or city scale. Tenure studies do not consider housing markets at smaller scales because households should be able to substitute between different neighbourhoods or dwelling types in response to intra-tenure price differentials as the result of location, size, and quality tradeoffs. (Painter, 2000; Painter et al., 2001) The ability of households to afford a basic unit of housing in the metropolitan rental market or owner market would allow a tenure choice to be made. The relative cost variable is most effectively used in longitudinal studies. Observations of tenure in cross-sectional studies include tenure decisions made in the past. (Gyourko & Linneman, 1996) Some conditions that determine the user cost of owning, such as mortgage rates, tax rates, and price appreciation, vary significantly across time. Without knowing when each household made its tenure decision, it is difficult to accurately estimate 'relative cost' and gauge its impact on tenure choice. Since the purpose of the relative cost variable is to differentiate between the affordability of housing between different locales, a location variable can be used as a proxy when housing price or cost data is unsuitable. (Yates, 2000) Ideally, households would be distinguished by metropolitan area. Some studies have used state/province/territory level location variables. (Yates, 2000)

Macroeconomic and Housing Policies

There are a number of governmental policies that impact the housing market. Inherent in the user cost of owning discussed in the previous section are factors that are the direct result of housing policies, mortgage policies, tax policies, monetary policies, and other government interventions. (Davis & Nieuwerburgh, 2014; Rosen, 1985)

Mortgage policies regulate lending standards through setting the requirements for issuing, insuring, and securitizing mortgages. (CMHC, 2014) The minimum down payment and the maximum amortization length outlined in national housing acts and implemented by government guarantees directly alter the wealth constraint and user cost of owning. (Chiuri & Jappelli, 2003; Diaz & Luengo-Prado, 2011; Gyourko, 2002) Other factors such as the stringency of underwriting standards, which are harder to quantify, impact the ability of households to obtain mortgage financing and enter the housing market. (Wallison, 2009) Tax policies alter the relative cost of owning and renting by providing incentives or disincentives for either or both tenure choices. (Diaz & Luengo-Prado, 2011) Additionally, mortgage rates are based on key interest rates set by central banks as directed by monetary policy. (Bank of Canada, 2016) There are government policies regulating the types of mortgages allowed such as fixed-term versus variable-term and open versus closed mortgages. Legislation determines if mortgages are full-recourse loans or non-recourse loans, which prescribe if borrowers have an obligation to repay mortgages even after foreclosure. (CMHC, 2014) Monetary policy also directs future rates of inflation which impacts the opportunity cost of equity funds and the real value of money owed on a mortgage over the long term. (Davis & Nieuwerburgh, 2014; Peiser & Smith, 1985)

In tenure choice models, some of these macroeconomic conditions are captured through variables such as the price of housing, rents, user costs, and wealth. (Haurin & Gill, 2002; Tobin & Dolde, 1971) However, there may be underlying policy factors impacting the demand for ownership housing or rental housing that are difficult to isolate because they are hard to measure and quantify. In robust tenure choice models that have comprehensively included demographic determinants and economic determinants, the remaining error rate may be due to unexplained policy implications on tenure decisions. (Hood, 1999)

Outside of tenure choice literature, researchers have recently started to examine the impact of government policies on the homeownership rate. This research came as a response to better understand the U.S housing crash. Chambers, Garriga & Schlagenhauf (2009) constructed a general equilibrium overlapping generations model of housing and

mortgage markets in order to measure the degree to which demographic factors versus mortgage market innovations accounted for the steep increase in the U.S homeownership rate from 1994 to 2005. This study found that the effects of mortgage market innovations accounted for 56% of the modelled homeownership rate change if a combo loan with 5% down payment is assumed, whereas the effects of demographics accounted for 31%. If the model assumes a combo loan with 0% down payment, the financial innovation effect increases to account for 70% of the modelled homeownership rate change, and the demographic effect decreases to account for 16%. In addition to demonstrating the impact of lowered down payment requirements on the homeownership rate, this study also found that at least 50% of the increase in the U.S homeownership rate after the 1940s was the result of the now standard U.S fixed-rate mortgages (15 or 30 years), which were introduced by the Federal Housing Administration in the 1940s. This avenue of research into the impact of government policies on homeownership is a relatively recent focus.

While each country has different governmental policies and differing mortgage financing structures, studies have shown that government policies that impact the wealth constraint, user costs, and lending conditions will affect tenure choice. (Atterhög, 2005; Chambers, Garriga, & Schlagenhauf, 2008, 2009; Chiuri & Jappelli, 2003; Chu, 2014; Rosen, 1985)

2.3 Young Adult Homeownership

The main demographic and economic determinants examined in tenure choice literature are age, household type, household size, sex, race, parental resources, educational attainment, student debt, income, and wealth. There is some literature that has specifically analyzed the tenure choice of young adult households. Analyzing the 25 to 34 year old cohort in isolation reveals any special circumstances that specifically impact the tenure choice of this age group. For example, this age group has had less time to accumulate wealth and may also carry higher levels of student debt than older age groups, but may receive parental help in order to overcome the wealth constraint. Jones (1989) analyzed an 18 to 34 year old cohort using the 1977 and 1984 Statistics Canada Surveys of Consumer Finances. His purpose for analyzing this younger cohort was as a

method of reducing the likelihood that wealth accumulation from prior tenure decisions would reinforce the tenure choices of older cohorts. Although they are analyzing different populations, a tenure study from the Netherlands supports this reasoning by finding that households younger than 30 years of age have the highest probability of being first-time homeowners. (Feijten et al., 2003) Jones (1989) only modelled the tenure choice for urban married households with employed heads of household aged 18 to 34. In this cohort, households with older heads and the presence of children have the highest probability of ownership. The database used was the Statistics Canada 1984 Survey of Consumer Finances which assigned the husband in married couples as the head of household. (Statistics Canada, 1984) Although this study analyzed the Canadian population, it is a population of the 1970s and 80s. There are no recent tenure studies of young adults in Canada.

In the U.S, a more recent study analyzed how demographic changes may be impacting young adult homeownership trends. Drew (2015) modelled the tenure choice of young adult households aged 25 to 34 for the years 1995 to 2014. She conducted ordinary least squares regression for the years 1995, 2005 and 2014. She used OLS models instead of the typically used non-linear logit models in order to conduct shift-share analysis to estimate the expected change in the homeownership rate based on socio-demographic shifts and changes in mortgage costs (principal plus interest calculated from metro area median housing prices, 30-year fixed mortgage rate, and 10% down payment). The results of these tenure choice models of young adult households match the results from past tenure studies examining all age cohorts. Young adult households that are older, married, have children, highly educated and with higher incomes have a higher rate of homeownership. Young adult households with heads that are female, a minority, foreign-born and living in central cities have a lower rate. Additionally, a more expensive monthly mortgage cost as the result of rising housing prices negatively impacts the homeownership rate. Income and marital status were the most important factors across all three years. Age and gender have become less important to tenure over time. Being married has decreased in importance but being in a couple has increased in importance. Single adult households and multi-adult living situations both have increased relevance to the homeownership rate. The presence of children in a household is also no longer as

important to tenure. Having a college degree was increasingly more important while having a high-school degree or no degree at all has continually decreasing impact on the homeownership rate. The adjusted R-squares of the models were 27%, 26% and 24% for years 1995, 2005 and 2014 respectively. Thus, the variables used in this model only explain about a quarter of the variation in tenure choices. Also, the effects of these demographic variables on homeownership have decreased over time. From the shift-share analysis, Drew (2015) concluded that "based on changes in socio-demographic characteristics alone, young adult homeownership rates should have declined by over 5 percentage points from 1995 to 2014." (Pg. 3) This suggests that macroeconomic and housing market conditions primarily caused the changes to the young adult homeownership rate in the U.S from 1995 to 2014.

There is currently a limited body of literature examining the tenure choices of young adults specifically. Tenure studies examining the Canadian context are also limited. There are also no tenure choice studies that have incorporated student debt as an explanatory variable. The research in this thesis will thus attempt to cover new ground. It will conduct a tenure study of Canadian young adults with student debt included in the model. The methodology that will be followed to accomplish this will be discussed in the next section.

CHAPTER 3 METHODOLOGY

The majority of past tenure choice studies have used a quantitative research method regardless of the theoretical perspective. This thesis will also follow a quantitative research method. In order to address the research question of analyzing the factors impacting tenure choice of Canadian young adults, a set of data indicating tenure, socio-demographic characteristics, and economic information specific to this population is needed. Additionally, the second research question is asking if student loan debt impacts homeownership, so a variable indicating the amount of student loans owed by individual households is required for the analysis. The final research question asking if the effects of these factors have changed over time will require data collected using the same methodology for the same population at different points in time. The Survey of Financial Security datasets published by Statistics Canada fulfill these requirements and can provide evidence for all the research questions through a tenure choice analysis. A standard statistical model for analyzing tenure choice has developed through the body of literature.

3.1 Survey of Financial Security: 1999 & 2012

Datasets have been collected through the Survey of Financial Security (SFS) for 1999, 2005, and 2012. This survey has been designed by Statistics Canada to provide detailed information on the wealth/net worth of Canadian households. The values of "all major financial and non-financial assets and on the money owing on mortgages, vehicles, credit cards, student loans and other debts" are surveyed. (StatsCan, 2015b, p. 4) Similar to most surveys of population, the SFS also establishes a profile of the demographic characteristics of each household. Many tenure studies in the past have specifically noted the lack of data directly measuring wealth. Not only does the SFS data provide the most important socio-demographic indicators, but it also provides a corresponding breakdown of household assets and debts. Of particular interest to this research are the values of student loan debt. Most importantly, the SFS data includes the tenure status of each household.

The SFS sampled approximately 98% of the population from Canada's ten provinces. The approximately 2% excluded population comprise of Aboriginal people living on reserves, foreign officials living in Canada, people living in religious communes, personnel living on military bases, and people in institutions such as nursing homes or penal institutions. An area sample was drawn through a stratified, multi-stage sampling process where 1) clusters were selected from the Labour Force Survey sampling frame, 2) all addresses from each selected cluster were field listed, and 3) dwellings were selected from these clusters. Approximately 21,000 dwellings were drawn for the main sample in 1999, 7,500 for 2005, and 20,000 for 2012. A second portion of the sample was drawn for areas that predominately have high-income households to better represent the proportion of higher-income households and to better approximate net worth. 2,000 households were selected to be the second portion of the sample for 1999 and 1,500 for 2005. The 2012 second portion was drawn from a sampling frame of the urban Census Metropolitan Areas (CMAs) and Census Agglomerations (CAs) from the 2009 Annual Incomes Estimates (T1 family files). 8,409 dwellings were added.

During the beginning stages of this thesis research, the 2005 SFS data was planned to be analyzed along with the 1999 and 2012 data to gain a more detailed understanding of how factors impacting tenure are changing over time. However, it was clear early in the analysis that the 2005 data does not accurately and representatively describe the tenure situations of Canadian young adult households. This is due to the much smaller sample size surveyed in 2005. A CMHC report also found the sample size of the 2005 SFS to be too small for analysis involving tenure. (CMHC, 2010) Thus, even though an SFS dataset exists for 2005, it will not be used in this study. Only the 1999 and 2012 Survey of Security data will be analyzed.

The SFS data is not panel/longitudinal data since a new sample of households is selected in each survey year. Thus, this research will use the cross-sectional method of tenure analysis. Nonetheless, the results of the cross-sectional data between the survey years can still be compared because the SFS datasets are statistically representative of the Canadian population. It is important to note that since the data is cross-sectional, the tenure variable reports the tenure status of households for the years 1999 and 2012.

However, it is not known exactly when in the past tenure transitions occurred. Since the subpopulation studied is young adults, it is assumed that the majority of tenure transitions occurred in the late 1980s/1990s and the 2000s/early 2010s for the 1999 and 2012 survey years respectively. These two pre- and post-2000 periods had drastically different economic and mortgage policy conditions. Thus, a comparison of the 1999 tenure choice model with the 2012 model may reveal how changing macro-level conditions impact tenure decisions.

The Survey of Financial Security is collected for all households whose major income earner is 15 years of age or older. Since the analysis in this thesis only inquires about young adult households, the first step in the analysis is to isolate for the subpopulation of households aged 25 to 34. Specifically, it is the households with a major income earner aged 25 to 34 that is selected because the data only includes the exact age of the major income earner (the Age variable) for each household.

3.2 Operationalizing the Data

The fundamental factors that have been found to predict homeownership from the body of tenure literature are age, household type, household size, number of earners, sex, race/ethnicity, parental resources, educational attainment, income, wealth, relative cost, and macroeconomic policies. The variables pertaining to these factors are selected from the Survey of Financial Security dataset. The factors of race/ethnicity, parental resources, relative cost, and the effects of macroeconomic policies are not quantified in the SFS. There are also no other compatible datasets with these variables available that can be merged with the SFS data. Therefore, unfortunately, these factors cannot be analyzed in the tenure choice model.

Since the tenure choice analysis of 1999 is to be compared with 2012, the same variables need to exist in the datasets of both years. The majority of the variables can be matched between the two years. The only exception is the "Sex of the Major Income Earner" variable, which exists in the 2012 data but not the 1999 data. Due to the missing data and the results from literature that have found no gender inequalities after income is

controlled for, a variable indicating the sex of the major earner is not included in the tenure model.

A variable indicating household size is available in both years of the SFS. This variable was originally included in this study's tenure choice model with the objective of testing if larger households (possibly with larger numbers of children) would have a lower likelihood of owning because of higher consumption costs. However, it became clear through the analysis results that there is collinearity between the household size variable and the household type variable. Household type predicts household size. For example, unattached individual household types are all 1-person households. Since the average family size in Canada has not exceeded three since 1999 and since the household type variable directly indicates the presence of children (whereas household size is only a proxy), household size is removed from the tenure model.

The factors of relative cost and macroeconomic policies are complex and hard to quantify. Relative cost is the user cost of owning compared to the user cost of renting in a particular geographic location. The average annual user cost of owning has been estimated through complex models in the literature. The many inputs to calculate user cost has been discussed in detail in the literature review. It is important to note that some of these inputs are directly impacted by macroeconomic policies such as the central bank interest rates, inflation, and mortgage insurance policy. The SFS neither includes the necessary inputs to calculate user cost nor does it provide detailed location information. The only geographic location information provided is the region/province of each household. Thus, any housing cost differences impacting tenure decisions can only be differentiated between at the provincial level.

The most significant macroeconomic policies impacting tenure choice are national policies that apply Canada-wide. Thus, the supply and demand for housing that results in differences in prices between varying markets across Canada are not expected to be the outcome of national macroeconomic policies. However, some differences in the outcomes of the two tenure models in this study are expected to be the result of macroeconomic policy changes over time. As past studies have found, housing policy has immediate and dramatic impacts on homeownership rates. Since the tenure models for

1999 and 2012 are identical, the differences in their results are most likely due to socio-demographic changes, preference shifts, or changes in macroeconomic policies. While there are no variables that approximate housing policy change in this study, the differences in the results of the tenure models over time will be interpreted in the context of these changes.

The variables of the SFS to be analyzed in the tenure models are age, household type, number of earners, educational attainment, income, wealth, and region. TABLE 1 contains further details on these variables. This study also includes student debt as a new additional variable in tenure choice modelling. Each household surveyed was given an identifier variable and a weight variable. The weight for each household was determined by Statistics Canada. The application of the survey weights configures the sample data to match the demographic distribution of Canada, and thus the data constitute a representative sample of the Canadian population. Survey weights are applied prior to any and all statistical analysis.

The variables from the SFS data that are categorical (age, household type, number of earners, educational attainment, and region) do not require any modifications. They will be entered into the regression model as-is. The continuous variables (income, wealth, and student loans) will be converted to categorical variables to allow easier analysis and interpretation in the logistic regression. The income, wealth, and student loans variables are measuring dollar values. Since the third research question requires a comparison of the variable results from 1999 to 2012, all dollar amounts reported for 1999 are adjusted for inflation using rates calculated by the Bank of Canada (a 30% increase between survey years).

Market Income

The Market Income variable measures household income before taxes and government transfers. This annual figure is current to the year it was surveyed. Studies in the literature have often created an estimated long-term income variable because of the rationale that homeownership is a long-term financial decision. (Goodman & Kawai, 1982) Therefore, the income earned in one particular year may not be representative of

the true financial ability of households to afford homeownership costs. The income in any particular year may have a transitory component composed of missing or extra income. Past studies estimate permanent income variables by regressing current annual income by demographic characteristics like educational attainment and/or age. However, any demographic variable used to estimate permanent income may not be used in the tenure choice model due to possible multicollinearity. Additionally, there has been past research that has found that using permanent income instead of current income has little impact on the results of tenure choice studies (Bourassa, 1995). Instead, permanent income is more important to consider in studies of housing demand rather than housing tenure. (Goodman, 1988) Thus, the reported current income will be used in this thesis, which allows main demographic variables to be included in the tenure choice model instead of a model to estimate permanent income.

Market Income is reported as a continuous variable in the SFS. For this study, the income for each household is classified into five categories. This number of categories is ideal because most of the intrinsically categorical variables in the SFS have around 4-5 categories. The categories assigned are less than \$25,000, \$25,000 to \$49,999, \$50,000 to \$99,999, \$100,000 to \$149,999, and more than \$150,000.

Liquid Wealth

Wealth is the value of assets less debts. Some tenure choice studies stress the importance of wealth over income as a more important factor impacting tenure because only households with the ability and capacity to save enough for a down payment will be able to enter home ownership. (Artle & Varaiya, 1978; Jones, 1989) Additionally, only wealth that is liquid and can realistically be used to pay for a down payment has any effect on tenure decisions. The SFS includes detailed breakdowns of the total value of assets and the total value of debts. To calculate the value of liquid wealth, the value of consumer debts owed by the household is subtracted from the value of assets that can be withdrawn to pay for down payments. The Flexible Assets variable and the Other Debts variable are created to calculate the Liquid Wealth variable

The Flexible Assets variable is calculated from the sum value of money in the bank, mutual funds, bonds, stocks, other investments or financial assets, Registered Retirement Savings Plan (RRSP) investments, Registered Retirement Income Fund (RRIF) investments, real estate that is not the primary residence, other retirement funds, and Tax Free Saving Account (TFSA) investments (only in 2012). The value of the primary residence, the value of vehicles, non-financial assets, pension value, and business equity are the assets that are considered not able to be liquidated to pay for the down payment. The value of the primary residence is excluded for the obvious reason of creating a simultaneity bias. Vehicles are typically indispensable assets for work and everyday life in a North American context. Non-financial assets are generally considered illiquid and pensions are not able to be withdrawn. Business equity is also typically considered illiquid and difficult to withdraw because of responsibilities to stakeholders. (Jones, 1989; Schwartz, 2006) All these assets excluded from the value of the Flexible Assets variable are those that are unlikely to be drawn from to pay for the down payment of housing.

The Other Debts variable is equal to the value of total debts for a household but excluding the mortgage on the principal residence, student loan debt, and vehicle loans. The mortgage on the primary residence is also excluded because of simultaneity bias. Student loan debt is excluded because it is analyzed through its own variable in this study. Vehicle loan debt is excluded because the values of vehicles are excluded from the Flexible Assets variable. Including vehicle loan debt in the calculation of Liquid Wealth when the asset values of vehicles are not included in the calculation would result in the net worth of some households to be underestimated. The resulting value of the Other Debts variable includes the value of credit card and instalment debt, line-of-credit debts, mortgage value of other real estate, and other loans or money owed. The value of the Other Debts variable is subtracted from the Flexible Assets variable to create the Liquid Wealth variable.

The newly created Liquid Wealth variable is a continuous variable of monetary values. Like all other continuous variables, it is converted into a categorical variable for the purposes of the tenure choice analysis conducted in this thesis. The categories chosen

are \$0 or less, \$1 to \$24,999, \$25,000 to \$49,999, \$50,000 to \$99,999, and \$100,000 or more. Typically, the range of values for wealth is far larger than the range of values for annual income. However, this variable excludes the value of the primary residence, which is the main vehicle for wealth accumulation in Canada. Especially for young adults, it is less likely that a large proportion of households have accumulated more than \$100,000 of additional wealth outside the value of their homes. Therefore, households with \$100,000 or more of liquid wealth comprise the uppermost category for this variable. The lowest category is \$0 or less. It is possible for households to have no liquid wealth saved or have equal amounts of flexible assets and other debts. It is also possible for households to owe a higher value of debt than they have the value of flexible assets, resulting in negative liquid wealth. Similar to the rest of the personal wealth variables, the Liquid Wealth variable is divided into five categories.

Student Loans

Student loans are reported in dollar amounts in the SFS, so this variable also has to be converted into categorical. These values of debt are also divided into five categories. The first category is the \$0 group of households with no student loan debt. Since more than 70% of households do not have student loan debt in both years, the categories dividing the values of student loans owed should ensure that each category contains enough observations to not result in sparse data bias but able to provide meaningful interpretation. Dividing the debt values into increments of \$10,000 and with the \$30,000 or more category being the highest level fulfills these requirements. Thus, the categories of the Student Loans variable are \$0, \$1 to \$9,999, \$10,000 to \$19,999, \$20,000 to \$29,999, and \$30,000 or more.

TABLE 1. Variable Descriptions and Notes

#	Variable	Statistics Canada Description (StatsCan, 2015b)	Categories (base group bolded)	Notes
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D	Tenure	Indicates whether the principal residence is owned without a mortgage, owned with a mortgage, or not owned by the family unit.	- Do Not Own -Own	Households who do not own are assigned '0'. Households who own with and without a mortgage are assigned '1'.
I1	Age	Age of the major income earner in the family unit.	- Age 25 -Age 26 -Age 27 -Age 28 -Age 29 -Age 30 -Age 31 -Age 32 -Age 33 -Age 34	
I2	Household Type	Derived variable, composition of family units.	- Unattached individuals -Couple, no Children -Couple with Children -Lone-parent family -Other family types	
I3	Number of Earners	Number of earners aged 15 or over in the economic family for the reference year.	- None -1 -2 -3 or more	
I4	Educational Attainment	Highest level of education obtained by the major income earner in the family.	- < high school -High school diploma -Non-university post-secondary certificate/diploma -University degree or certificate	
I5	Market Income	Market income. Also, income before taxes and government transfers.	- <\$25,000 - \$25,000-\$49,999 - \$50,000-\$99,999 - \$100,000-\$149,999 - ≥150,000	1999 market income values inflated to the 2012 value of money. Converted into a categorical variable.

16	Liquid Wealth	N/A	<ul style="list-style-type: none"> - \$0 or less - \$1-\$24,999 - \$25,000-\$49,999 - \$50,000-\$99,999 - ≥100,000 	Calculated from the values of the Flexible Assets variable less the Other Debts variable. Converted into a categorical variable.
16a	Flexible Assets	N/A	<ul style="list-style-type: none"> - \$0 or less - \$1-\$24,999 - \$25,000-\$49,999 - \$50,000-\$99,999 - ≥100,000 	Value sum of money in the bank, mutual funds, bonds, stocks, other investments or financial assets, RRSP, RRIF, real estate that is not the primary residence, other retirement funds, and TFSA investments.
16b	Other Debts	N/A	<ul style="list-style-type: none"> - \$0 or less - \$1-\$24,999 - \$25,000-\$49,999 - \$50,000-\$99,999 - ≥100,000 	Value sum credit card and instalment debt, line-of-credit debts, mortgage value of other real estate, and other loans or money owed.
17	Student Loans	Accumulation of debt value of student loans.	<ul style="list-style-type: none"> - \$0 - \$1-\$9,999 - \$10,000-\$19,999 - \$20,000-\$29,999 - ≥30,000 	1999 market income values inflated to the 2012 value of money. Converted into a categorical variable.
18	Region	Region of Residence.	<ul style="list-style-type: none"> - British Columbia - Ontario - Quebec - Prairies - Maritimes 	The 1999 data included results for all ten provinces. The provincial results for the Maritimes and the Prairies were respectively summed to match the categories of the 2012 data.

3.3 Statistical Analysis: The Logit Model of Tenure Choice

The Models

Since Li's (1977) seminal paper, most tenure choice studies have used a logistic regression to analyze homeownership thereafter. Prior studies used linear regressions having a dichotomous dependent variable, which bounds the resulting probability between 0 and 1 and produces heteroscedasticity in the error term. The logistic regression results in "a logit having infinite range ($-\infty$ to ∞)" (p. 1081), which more accurately models the nonlinear effects expected from factors impacting homeownership. Li (1977) tested that "the natural logarithm of the odds in favor of homeownership is a function of income, age of head, family size, and race of head." (p. 1083) Since the establishment of logistic regression by Li (1977) as the most accurate approximation of the effects of factors impacting tenure choice, many other factors and more nuanced examinations of important factors have been conducted to build the body of tenure choice literature.

The logistic regression derives logit estimates through cell frequency distribution. To estimate the relationship between each independent variable and tenure, the data provides a count of the number of households with a particular characteristic that owns and a count of the number that do not own. One category of the variable is set as the base group to which all other categories of the variable are compared. For example, the "Unattached individuals" category is set as the base group for the Household Type variable to which all other categories of the variable are compared. A logit is first calculated for the base group. A proportion (p) is taken for the count of the households with a certain characteristic that owns over the total number of households with that particular characteristic. In most tenure studies, do not own is set as the null hypothesis. Thus, the proportion of the households that own are calculated as opposed to the proportion of households that do not own. A logit of the proportion is then calculated by taking the natural logarithm of $(p/1-p)$. This process is repeated for all categories of a variable. However, since the remaining categories are compared to the base group, the logit reported for each category is the difference between the logit of the subject category and the base group. The tenure choice logistic model fits the logit of the homeownership rate to a linear function of all the predictive variables analyzed. See FIGURE 1.

Maximum likelihood estimation is used to fit the model by maximizing the regression coefficients of B_x to find parameter estimates. The logit model equation with all the predictor variables analyzed for this thesis is shown in FIGURE 2.

To explore the changes in the effects of factors impacting tenure over time, an interaction model is also used. Each predictor variable is interacted with the dummy Year variable. The Year variable denotes the two survey years analyzed in this study. 1999 is coded as '0' and 2012 is coded as '1'. The interaction model fits two logistic regressions of tenure correlated with the predictor variables for the two years and reports the differences in parameter estimates. FIGURE 3 shows the equation.

FIGURE 1. Logit Model Equation

$$\ln\left(\frac{P_i}{1 - P_i}\right) = \beta_1 + \beta_2 X_i + u_i$$

FIGURE 2. Tenure Choice Logit Model Equation

$$\begin{aligned} \ln\left(\frac{P_i}{1 - P_i}\right) = & B_1 \textit{Age} + B_2 \textit{Household Type} + B_3 \textit{Number of Earners} \\ & + B_4 \textit{Educational Attainment} + B_5 \textit{Market Income} \\ & + B_6 \textit{Liquid Wealth} + B_7 \textit{Student Loans} + B_8 \textit{Region} + u_i \end{aligned}$$

FIGURE 3. Interaction Model Equation

$$\begin{aligned} \ln\left(\frac{P_i}{1 - P_i}\right) = & B_1 \textit{Age} * \textit{Year} + B_2 \textit{Household Type} * \textit{Year} \\ & + B_3 \textit{Number of Earners} * \textit{Year} \\ & + B_4 \textit{Educational Attainment} * \textit{Year} \\ & + B_5 \textit{Market Income} * \textit{Year} + B_6 \textit{Liquid Wealth} * \textit{Year} \\ & + B_7 \textit{Student Loans} * \textit{Year} + B_8 \textit{Region} * \textit{Year} + u_i \end{aligned}$$

Interpretation of Results

The results of the logistic regression are reported in odds ratios. A logistic model can report either logit coefficients or odds ratios. The odds ratio is the odds of having a certain outcome given a particular condition compared to the odds of the outcome happening without that condition. Whereas the logit coefficients of the subject categories are subtracted from the logit coefficient of the base group, the odds ratios directly compare the probabilities of the subject categories to that of the base group. As an example, the data reports that within the 467 households that are couples with children, 325 own their homes and 142 do not own. Within the base group of 347 unattached individual households, 96 own and 251 do not own. The odds of owning for couples with children is compared to the odds of owning for unattached individuals. The odds ratio is calculated as $(325/142)/(96/251)$, which equals 5.98. These numbers are for the purpose of illustration, whereas sampling weights are applied in the actual tenure models.

All independent variables in this study are categorical, so the odds ratios indicate the effect of each category on tenure relative to the base group for each variable. The base group is generally designated as the group of households that is least expected to own. For example, unattached individuals have been widely identified in the literature as the household type that is least likely to own. The other categories such as "Couple with children" are compared to the "Unattached individual" base group and their relative effects on tenure are reported in the form of an odds ratio. An odds ratio of exactly 1 means that there is no difference between the likelihood of owning between the subject group and the base group. If an odds ratio is larger than 1, then the likelihood of owning is bigger for the subject group as compared to the base group. If an odds ratio is smaller than 1, then the likelihood of owning is less for the subject group than the base group. The further away an odds ratio is from 1, the bigger the effect. For example, a category with an odds ratio of 0.005 has a lower likelihood of owning than a category with an odds ratio of 0.05. The results are significant if the p-values reported are lower than 0.05.

The interaction model is also reported in odds ratios. Since 1999 is the base group for the dummy Year variable, the results of the interaction terms need to be interpreted based on the results of the 1999 regression, which is also reported in the interaction

model output. If the odds ratio from a category of the 1999 model is higher than 1, then an odds ratio higher than 1 reported for the corresponding category of the interaction term means that the effect of this condition on increasing the likelihood of homeownership is higher in 2012 than in 1999. Reversely, an odds ratio lower than 1 reported for the interaction term means that this condition has a decreased effect of increasing the likelihood of ownership. However, if the odds ratio from the 1999 model is lower than 1, then an odds ratio reported for the interaction term higher than 1 means that the condition decreases the likelihood of owning to a smaller magnitude in 2012 than in 1999. Reversely, if an odds ratio in the interaction term is lower than 1, then having that condition is correlated with an even smaller likelihood of owning over time. Again, the results are significant if the p-values reported are lower than 0.05.

For all the tenure models, a 95% confidence interval is also reported in the output. Categories in logistic regressions with extremely wide confidence intervals may be indicative of sparse data bias. Sparse data bias occurs when there is not enough numbers of cases or non-cases for variables in maximum likelihood models such as logistic regressions. Greenland, Mansournia & Altman (2016) explains, "when the data lack adequate case numbers for some combination of risk factor and outcome levels, the resulting estimates of the regression coefficients can have bias away from the null (downward when the estimate is below 1, upward when it is above 1)." (pg. 2) Even in models with large datasets, the sparse data bias occurs "when there are few or no study participants at key combinations of the outcome, exposure, and covariates..." (Greenland, Mansournia, & Altman, 2016, p. 1) For categories that report wide confidence intervals, a tabulation of the data will be conducted to check if a sparse data bias exists. Then, interpretation of the result will be re-examined in light of the bias.

CHAPTER 4 FINDINGS

This section presents the results from the logit regression models (TABLES 2 to 7). The independent variables Age, Number of Earners, Market Income, and Liquid Wealth significantly impact the housing tenure of 25 to 34 year old Canadian households in both the 1999 and 2012 models. Educational Attainment is not significant in 1999 but becomes significant in 2012. Reversely, Household Type, Student Loans, and Region significantly impact tenure in 1999, but most categories of these variables become non-significant in 2012. Both the 1999 and the 2012 models overall are statistically significant since the p-values obtained from the chi-square statistic are less than 0.000. The reported Pseudo R² is 0.3282 for the 1999 model and 0.3115 for the 2012 model. The regression results of each variable are examined in further detail below. These results may be analyzed and discussed in the context of the demographic distribution of each variable. Tabulation tables of each variable according to year can be found in APPENDIX C.

4.1 The Effects of Factors Impacting Tenure Choice

4.1.1 Regression Results: 1999

The regression results from the 1999 model indicate the young adult household with the highest likelihood of owning is a household categorized as "Other family types", with a 30 year old major income earner, whose highest educational attainment is a non-university post-secondary certificate/diploma, with 2 earners making a combined market income of more than \$150,000 and have \$25,000-\$49,999 of liquid wealth, with no student loan debt, and living in the Maritimes. See TABLE 2.

Age

The base group for the Age variable is the "Age 25" category.

All age categories except for the 26, 27, and 33 year old groups have statistically significant results at the 0.05 level. All older age groups are more likely to be homeowners than the 25 year old group, controlling for all the other independent variables in the regression model. The 28, 29, and 30 year old groups have the highest odds ratios.

The correlation of the age variable to tenure in 1999 matches the expected result that the likelihood of ownership is higher for households with older heads. While all subject age groups are more likely to be homeowners than the 25 year old base group, the 28, 29, and 30 age groups have the highest odds ratios instead of the older 32, 33, and 34 age groups as would be expected. This non-continuously increasing relationship may be indicative of lifecycle transition events occurring more commonly during ages 28 to 30 in 1999 than the older ages. One or many of these transition to adulthood events such as leaving the parental home, finding full-time work, forming couple households, or having children may have coincided during ages 28 to 30. For example, the 24.42% of young adult households in 1999 with a major income earner having only high school education may have saved enough down payment by age 28 to 30 to enter home ownership. The 33.64% of households with a major income earner having non-university post-secondary education may be married and planning to have children by age 28 to 30. The average Canadian maternal age of first birth was age 27 and of all births was age 28.7 in 1999. (StatsCan, 2017b) And for the 28.09% of households with a major income earner having a university education or higher, they may be leaving the parental home after having found full-time employment or are starting co-habitation with a partner. These lifecycle events are established in the literature as coinciding with the transition from renting to owning. While this study cannot verify the timing of these lifecycle events and any corresponding tenure changes due to the absence of longitudinal data, it is reasonable to suggest this explanation for the observed higher likelihood of homeownership for households with 28 to 30 year old major income earners. The age variable in this model is likely to have captured the effect of lifecycle transition events on tenure and the innate commitment and lower mobility that develops with older households.

The age variable in tenure choice studies is frequently used as an indicator of the lifecycle stage and/or as a proxy for the financial stability or expected mobility of households. Age was often found to highly correlate with tenure because of its interconnection with these conditions that facilitate homeownership. In this study, some of these age-related factors are captured through the other variables in the model. The Household Type variable captures - to some degree - the lifecycle stage and expected mobility of households. For example, couple households or households with children

have higher commitment and lower expected mobility than unattached individuals. However, the limited categorizations in this variable do not include some crucial information that further impacts tenure such as marital status. The Market Income, Flexible Assets, and Educational Attainment variables in this study isolate for the financial stability and capacity of households to afford down payments and subsequent mortgage payments. Another consideration is that, in studies that do not analyze the young adult population in isolation, past tenure choices of older households have been found to bias ownership patterns and wealth accumulation to result in overestimated effects of age on tenure. Since this study only analyzes households with major income earners between 25 to 34 years of age, the cumulative impact of past decisions are minimized and the probability that these households are first-time homeowners is high. Thus, the results from this regression analysis should indicate a relatively independent estimate of the effects of age on tenure.

Household Type

The base group for the Household Type variable is the "Unattached individuals" category.

All household type categories have significant results and are more likely to be homeowners than the base group in 1999. The "Other family types" group surprisingly have the highest odds ratio. The category with the next highest probability is "Couple with children" households, followed by "Lone-parent family" and then "Couple, no children" households.

Categorizations of household type in this study give direct indicators of lifecycle events and transitions to adulthood that have already taken place. The two major indicators given by the Household Type variable in this analysis are whether the household consists of a couple versus a single individual and whether the household has any children. Almost all literature has found that single individual households are the least likely to be homeowners. This study results in the same finding where couples with no children, couples with children, lone-parent families, and other family types are all more likely to own than unattached individuals. As explained in past literature, single

individuals have the lowest level of household commitment and thus the highest level of mobility. Even when the number of earners in the household and financial stability is controlled for, single individuals are still the least likely homeowners. With this study controlling for the number of earners, the effect of couple households on homeownership should not have been overestimated.

Couples with no children are 2.15 times more likely to be homeowners than unattached individuals in this analysis which controls for the number of earners and other socioeconomic circumstances. This higher likelihood is indicative of the higher levels of commitment associated with couple households versus single individual households. Unfortunately, the data in this study does not differentiate between married couples and co-habiting couple. Longitudinal tenure studies have found marriage and homeownership to be highly correlated. Marriage increases the level of life and financial commitments beyond the short-term to bind a partnership for the long-term, which highly increases the chances that the household will also engage in the long-term commitment of homeownership. It is expected that married couples, with or without children, would have a higher likelihood of owning than cohabiting couples. However, this relationship cannot be confirmed in this study.

Couples with children are 5.94 times more likely to own than unattached Individuals, which is much higher than the likelihood of couple with no children. Lone-parent families also have higher odds of owning than couples with no children households. This finding matches previous literature that established the coinciding events of childbearing and transition to homeownership. The tenure transition from renting to owning allows families to establish stable living environments, which has been shown to have positive child outcomes, as they are making other functional housing adjustments such as to the size and location of their home. The result of the lone-parent family group further supports the strong impact of children on homeownership. Single-parents are more likely to be homeowners than both single individuals as well as couples with no children in 1999. The Household Type variable does not indicate the number of children in each household. There have been findings from literature that found the cost of raising children to compete with the financial commitment of ownership for

households that have a large number of children. This concern should not have a big impact on the results of this study because of the trend of declining fertility rates since the 1980s. The Canadian fertility rate was 1.54 children per woman in 1999. (StatsCan, 2017b) Some of the past studies analyzing data from the 70s or 80s may have included a larger number of households with 2 or more children. This tenure model includes the number of earners in the household, which would control for whether one parent has left the labour force to take care of children.

The "Other family types" category has an unexpectedly large odds ratio. Previous literature with an 'other' household type category generally found non-significant results. Not only did this analysis find the result to be statistically significant, this group has the highest likelihood of being homeowners. The reported odds ratio is 9.49 with a confidence interval from 5.36 to 16.80. To ensure that this result has not been influenced by sparse data bias, a tabulation of the Household Type and Tenure variables are conducted. The "Other family types" category has 70 cases of households who do not own and 193 cases of households who do own their homes in the sample. This amount of observations should be adequate in estimating a legitimate likelihood. Therefore, it is not believed that there is strong sparse data bias impacting the results to constitute an alternative interpretation.

The households that do not fit the definition of "Unattached individual", "Couple, no children", "Couple with children" and "Lone-parent family" were categorized as "Other family types". 10.55% of all young adult households identified as this category in 1999. For example, this may include households consisting of relatives living with a couple, elderly parents living with a couple and their kids, or other arrangements of relatives living with the major income earner. (Engeland, Lewis, & Shillington, 2006, p. 6) One explanation of why the odds of homeownership for other family types are so high may be that many households in this category contain married couples or couples with children. Even though there are other relatives in the household, the conditions of marriage and the presence of children should still have the same effect of increasing the likelihood of owning. However, this phenomenon cannot be confirmed with the limited data available for household type in this study.

Number of Earners

The base group for the Number of Earners variable is the None category.

Households having one earner, two earners, or three or more earners are more likely to be homeowners than households with no earners. Households with two earners have the highest likelihood of ownership, followed by households with three or more earners, and then households with one earner. The results for all categories are statistically significant. However, the wide confidence interval reported for the 3 or more earners group calls into question the results of this category.

The results confirm the logical conclusion that any household with at least one earner is more likely to own than households with no earners. As expected, dual-earner households are more likely to be homeowners than households with only one earner. Households with three or more earners have a lower odds of owning than two-earner households but higher than one-earner households. The finding that two-earner households have the highest likelihood of owning in this study aligns with previous literature that has found dual-income households are better able to afford monthly mortgage payments and have a higher propensity to move from renting to owning. Since the amount of income and other socio-economic variables are controlled for in this model, the results also suggest that having two earners intrinsically increases the likelihood of homeownership. Households may feel more secure financially committing to a long-term mortgage and transitioning to homeownership if there are two incomes in the event that one of the earners may experience loss of employment throughout the debt obligation.

The wide confidence interval of the 3 or more earners group may be indicative of a sparse data bias for this category. A tabulation of the Number of Earners and Tenure variables show that there are 17 cases of households with 3 or more earners who do not own their homes and 80 cases who do own in the sample. With the former outcome having 17 cases, it is possible that there is some sparse data bias. However, since the odds ratio is not excessively large, there does not seem to be a large bias away from the null. Even though the confidence interval ranges from 1.19 to 12.16, the significant odds ratio

of 3.80 for the "3 or more" earners category may have some validity. This finding matches the expectation that having more earners in a household increases the likelihood of owning. However, only 4.14% of all young adult households have three or more earners. If households with more than two earners (aged 15 and over) become more prevalent, more detailed research may be needed in order to confirm the earning, spending, and living dynamics of these households.

From Deurloo, Clark & Dieleman's (1994) study, two-earner couples were found to have the highest propensity for transitioning to homeownership followed by two-earner families and then one-earner families. It was reasoned that the cost of having children competes with the cost of homeownership, and thus families have lower propensities for ownership than couples. In this study, two-earner families ("2" earners + "Couple with children") have a higher probability of homeownership than two-earner couples ("2" earners + "Couple, no children"). This finding suggests that the cost of raising children does not compete with the cost of homeownership in Canada in 1999.

Educational Attainment

The base group for the Educational Attainment variable is the "< high school" educated major income earners category.

The households with major income earners who have attained a high school diploma, a non-university post-secondary certificate/diploma, or a university degree/certificate all have higher odds of homeownership than households with major income earners who have less than a high school education. However, only the "Non-uni. p-sec. certif./dipl." group has a statistically significant result in 1999. This group also has the largest odds ratio and the highest likelihood of owning.

Non-university post-secondary educated major income earners have the only statistically significant result and the highest odds of homeownership. This finding is surprising since it is generally expected that the long-term earning potential from having a university degree/certificate is the highest. Educational attainment is often used in tenure studies as an indicator of human wealth or as an input to calculate permanent income. However, since this study has variables that are more direct measures of wealth

and income, the results of the Educational Attainment variable would largely gauge the independent effects of education on homeownership. Even though income is controlled for in this study, university educated individuals should still be the most likely to own due to stronger expectations for greater long-term financial stability and growth of income.

The reason for this result may be due to the limited age range analyzed in this study. Non-university certificate/diplomas typically take 1-2 years to complete in Canada, while university undergraduate degrees take 3-5 years with additional post-graduate studies ranging from 1-7 years. Individuals who have completed university degrees, or even higher education, leave school later than those with lower educational attainment. It is well established that most young adults choose to delay transitions to adulthood until after the completion of their education. (Clark, 2014) Additionally, university graduates would have had fewer years to save for down payments than those with non-university education. It is necessary to analyze the next age bracket or the entire population to conclude whether households with non-university educated major income earners are the most likely to own. For this study, it is the case that non-university educated major income earners are the most likely to be homeowners from the age of 25 to 34.

Market Income

The base group for the Market Income variable is the "<\$25,000" category.

All categories of this variable have significant results. As the level of household income increases, the likelihood of homeownership drastically increases. Households with \$25,000 - \$49,999 of income are 2.54 times more likely to own than the base group. The likelihood increases to 5.45 times for households earning \$50,000 - \$99,999 and then 10.98 times for households earning \$100,000 - \$149,999. Households earning more than \$150,000 of income reported as having 27.05 times the odds of owning as compared to households earning less than \$25,000. However, it should be pointed out that the confidence interval for the ">\$150,000" group has a wide range from 8.58 to 85.32, which may be indicative of sparse data bias in this category. A tabulation of the Market Income and Tenure variables show that there are only 7 cases of households earning more

than \$150,000 of income who do not own their homes. Having too few cases for this outcome probably caused the odds ratio for the ">\$150,000" group to be overestimated. Nonetheless, it can be concluded that there are substantial increases in the likelihood of ownership as household income increases. This finding is congruent with many past tenure studies which have found income to be one of the most important factors impacting tenure choice.

The other independent variables in the model control for some of the most important demographic and economic conditions impacting income. Thus, the results should be indicative of the independent effects of income level on homeownership. Households earning more income per year are better able to afford the costs of homeownership such as mortgages and maintenance. These results also confirm the preference for homeownership in Canada. Households who can afford to buy housing typically do choose to own versus to rent.

Liquid Wealth

The base group for the Liquid Wealth variable is the "\$0 or Less" category.

All categories of household liquid wealth reported a higher likelihood of homeownership than the base group. All categories have significant results, except the "\$50,000-\$99,999" group. The "\$25,000-\$49,999" category has the highest odds ratio and is the most likely to own.

It is expected that the probability of homeownership increases as the level of household wealth increase, but only up to a certain point after which the highly wealthy are less likely to own because of the high opportunity cost of capital. The results show that having liquid wealth increase the likelihood of ownership as compared to having no liquid wealth at all. However, there is no discernible trend that shows the likelihood of owning increasing as the level of liquid wealth increases. While all categories of liquid wealth except the "\$50,000-\$99,999" group significantly increases the likelihood of homeownership, households with \$25,000-\$49,999 (in 2012 dollars) of liquid wealth have the highest likelihood of owning in 1999, followed by households with >\$100,000 and then households with \$1-\$24,999.

Without longitudinal data, the Liquid Wealth variable in this study does not directly speak to the ability of households to overcome the down payment constraint. However, this variable should still effectively serve to differentiate between differing levels of wealth and the ability to save, as demonstrated by the effects of its Flexible Assets and Other Debts components. The small effects and lack of discernible pattern from the results of the Liquid Wealth variable are likely due to the insufficient time young adult homeowners have had to save for investment in flexible assets. It is suspected that this variable would produce larger odds ratios and a trend where the likelihood of homeownership increases with increasing levels of wealth if the entire population of households are analyzed and not only young adult households.

Separating Liquid Wealth into Flexible Assets and Other Debts

Regressing the logit model with the Liquid Wealth variable replaced with its asset and debt components provide some further explanation of its results (see TABLE 3).

All categories of the Flexible Assets variable have a significantly higher likelihood of homeownership relative to the \$0 base group. This variable serves to distinguish between households' differing levels of financial resources and their ability to save. Its results match the expectation that households with proven capacity for saving have a higher likelihood of homeownership. Similar to the results for Liquid Wealth, the results do not follow an increasing trend where the likelihood of ownership increases as the value of flexible assets increase. The "\$25,000-\$49,999" flexible assets group has the highest likelihood of ownership, followed by the ">\$100,000" group, the "\$50,000-\$99,999 group", and then the "\$1-\$24,999" group.

In the context of this cross-sectional analysis, the values reported for this variable are flexible assets that have accumulated after tenure decisions have been made. For those young adult households that have transitioned to homeownership, it is a likely scenario that the majority of their assets and savings have gone towards the down payment on the home. Thus, it should be expected that the effect of flexible assets for renters are overestimated in this study. If renters and owners are assumed to have the same capacity and preference for saving and investing, renters should have accumulated a

bigger portfolio of liquid investments. However, there are no odds ratios less than 1. These results support the prevailing preference for choosing to invest in homeownership over other investment vehicles in North America for average households that have the capacity to save and invest.

Highly surprising are the results found for the Other Debts variable. Households owing \$1-\$24,999 of debt are significantly more likely to be homeowners. This level of other debts is the most commonly owed, by 57.41% of all young adult households. The "\$25,000-\$49,999" and "\$50,000-\$99,999" debt categories have odds ratios higher than 1, but these results are not statistically significant. While the ">\$100,000" category has an odds ratio lower than 1, its result is also non-significant. Households with no other debts are the second most prevalent group, with 34.56% of all young adult households. Although there have been no tenure studies that have examined the independent effects of debt on tenure found through the literature review, it is reasonable to expect that having high levels of debt would be detrimental to entering homeownership.

It is important to note for this study that the debt levels in this variable also reflect other debts accumulated after tenure transitions have occurred. While a portion of the value of this variable may reflect debts that were owed by households since before they became homeowners, other portions of this value may have been borrowed after households were approved for mortgages. The results of the Other Debts variable reflect the leveraged positions of young adult households and the role non-mortgage debt plays in further enabling entry into homeownership. Young adult homeowners are able to finance additional aspects of life spending through other forms of debt such as credit card loans, home equity line of credits or other lines of credits. Having these other forms of financing readily available would decrease the amount of capital needed to be spent or saved for other aspects of life and enable households to pour equity into their homes.

TABLE 3. Tenure Choice Logit Model (with Flexible Assets and Other Debts) - 1999

Logistic regression		Number of obs	=	2685			
		Wald chi2(39)	=	607.46			
		Prob > chi2	=	0.0000			
Log pseudolikelihood = -1087616.7		Pseudo R2	=	0.3313			
Tenure	Odds Ratio	Robust Std. Err.	z	P> z	[95% Conf. Interval]		
Age							
Age 25	1.0000	(base)					
Age 26	1.1668	0.3538	0.51	0.611	0.6440	2.1141	
Age 27	1.8779	0.6054	1.95	0.051	0.9982	3.5326	
Age 28	2.3596	0.7110	2.85	0.004	1.3072	4.2593	
Age 29	2.2215	0.6646	2.67	0.008	1.2360	3.9930	
Age 30	2.2937	0.6738	2.83	0.005	1.2897	4.0793	
Age 31	2.0842	0.6162	2.48	0.013	1.1675	3.7206	
Age 32	2.0087	0.5724	2.45	0.014	1.1490	3.5113	
Age 33	1.7161	0.5380	1.72	0.085	0.9283	3.1725	
Age 34	1.9403	0.5852	2.20	0.028	1.0743	3.5043	
Household_Type							
Unattached individual	1.0000	(base)					
Couple, no children	2.0908	0.5217	2.96	0.003	1.2821	3.4096	
Couple with children	5.7506	1.2172	8.26	0.000	3.7978	8.7074	
Lone-parent family	3.3586	0.9408	4.32	0.000	1.9396	5.8157	
Other family types	10.3391	2.9842	8.09	0.000	5.8722	18.2040	
Number_of_Earners							
None	1.0000	(base)					
1	2.4773	0.9627	2.33	0.020	1.1567	5.3058	
2	3.4852	1.4456	3.01	0.003	1.5458	7.8575	
3 or more	2.9475	1.7315	1.84	0.066	0.9320	9.3214	
Educational_Attainment							
< high school	1.0000	(base)					
High school diploma	1.3133	0.2679	1.34	0.182	0.8804	1.9588	
Non-uni. p-sec. cert./dipl.	1.4833	0.2884	2.03	0.043	1.0132	2.1714	
Uni. degree or cert.	1.2929	0.2936	1.13	0.258	0.8284	2.0177	
Market_Income							
<25,000	1.0000	(base)					
25,000-49,999	2.3801	0.4489	4.60	0.000	1.6446	3.4446	
50,000-99,999	4.8594	0.9509	8.08	0.000	3.3115	7.1309	
100,000-149,999	9.7399	2.9002	7.64	0.000	5.4337	17.4587	
>150,000	25.1053	14.6920	5.51	0.000	7.9731	79.0498	
Flexible_Assets							
0	1.0000	(base)					
1-24,999	2.2934	0.5888	3.23	0.001	1.3865	3.7934	
25,000-49,999	4.8245	1.5503	4.90	0.000	2.5699	9.0570	
50,000-99,999	2.8449	0.9435	3.15	0.002	1.4851	5.4497	
>100,000	3.5203	1.1784	3.76	0.000	1.8266	6.7844	
Other_Debts							
0	1.0000	(base)					
1-24,999	1.4876	0.2073	2.85	0.004	1.1321	1.9548	
25,000-49,999	1.2180	0.3682	0.65	0.514	0.6735	2.2029	
50,000-99,999	1.1523	0.3878	0.42	0.673	0.5959	2.2285	
>100,000	0.8824	0.5326	-0.21	0.836	0.2703	2.8805	
Student_Loans							
0	1.0000	(base)					
1-9,999	0.5348	0.0974	-3.44	0.001	0.3742	0.7643	
10,000-19,999	0.2526	0.0638	-5.45	0.000	0.1540	0.4145	
20,000-29,999	0.2002	0.0869	-3.70	0.000	0.0855	0.4689	
>30,000	0.2014	0.0760	-4.25	0.000	0.0962	0.4218	
Region							
British Columbia	1.0000	(base)					
Ontario	1.2096	0.2331	0.99	0.324	0.8290	1.7648	
Quebec	1.7947	0.3791	2.77	0.006	1.1863	2.7152	
Prairies	2.0186	0.3777	3.75	0.000	1.3990	2.9128	
Maritimes	3.5731	0.7651	5.95	0.000	2.3485	5.4364	
_cons	0.0031	0.0016	-11.11	0.000	0.0011	0.0086	

Student Loan Debt

The base group for the Student Loans variable is the \$0 debt category.

Having student loan debt decreases the likelihood of homeownership. The higher the level of student loans, the less likely households are homeowners. Households with more than \$30,000 of student loan debt have the lowest odds ratio and thus the lowest likelihood to be homeowners as compared to households with no student loan debt. All categories have significant results.

The results of the Student Loans variable provide a very clear indication that the likelihood of homeownership decreases as the level of student debt increases for young adult households. Households with \$1-\$9,999 worth of student loans are 1.92 times less likely to be homeowners than households with no student debt. The likelihood of owning gets progressively lower, to the degree where households with more than \$30,000 of student loans are 4.95 times less likely to own than households with no student debt. These results finally provide empirical evidence using tenure choice methodology for the expectation that having student loan debt negatively affects entry into homeownership. Since the most important demographic and economic factors impacting tenure are controlled for in this regression model, there should be confidence that these results reflect the independent effects of student loan debt on tenure. As examined in the literature review, student loan debt impacts the ability of households to afford down-payments, limits the amount of mortgage financing that can be obtained due to maximum total debt service ratios, and may lower credit scores from possible missed student loan payments. Student loan debt adds additional wealth constraints for entry into homeownership, which results in a significantly delayed transition to first-time homeownership.

Region

The base group for the Region variable is the "British Columbia" category.

In terms of location, the results show that households from Quebec, the Prairies, and the Maritimes are all significantly more likely to be homeowners than households

from British Columbia. "Ontario" has a higher odds ratio than the base group, but the result is not statistically significant. "Maritimes" has the highest odds ratio.

The inclusion of the Region variable is meant to act as a proxy to control for the variability of housing prices across provinces in Canada. The results match the relative price expectations for each province in 1999. Under the assumption that the preference for homeownership is the same for all Canadians, the Region variable would represent price differentiation across provinces. Past literature stresses the importance of accurately estimating housing costs using a 'relative cost' variable rather than a 'market price/rent' variable in order to avoid overestimation of other predictors in the tenure model. A 'relative cost' variable would include the local price to purchase a standard home plus the average user cost of owning over the local rental price. Macro-level factors such as the mortgage rate, minimum down payment size, maximum amortization length, and federal tax rates are similar across Canada. Regional factors that vary include property prices, rents, transaction costs, local tax rates, appreciation/depreciation rates, maintenance fees, utility fees, etc. Since this study does not have adequate data to calculate an accurate 'relative cost' variable, it is assumed that the differences from the results of the Region variable represent the variations of 'relative cost' between the provinces. The odds of households in Ontario owning their homes does not differ significantly from households in British Columbia. The other provinces have significant results with an increasing odds ratio from Quebec, to the Prairies, and then the Maritimes. If the assumption is that the location with the lowest relative cost has the highest probability of homeownership, then the provinces with the highest prices are British Columbia and Ontario, followed by Quebec, the Prairies, and the Maritimes. This order of the relative cost of housing for each region matches expectations.

4.1.2 Regression Results: 2012

The 2012 profile of the young adult household with the highest likelihood of owning is a couple with children household with a 34 year old major income earner whose highest educational attainment is non-university post-secondary certificate/diploma, with 2 earners making a combined market income of more than \$150,000 and have \$50,000-\$99,999 of liquid wealth, with no student loans, and living in

the Maritimes. See TABLE 4. The base categories for all variables are the same as the 1999 model.

Age

All age categories have higher odds of owning than the 25 year old base group. Except for ages 26, 27, 30, and 32, the results of all other age categories are statistically significant. Ages 29, 33, and 34 have the highest odds ratios.

Young adult households with a major income earner 29, 33, or 34 years of age have the highest odds of homeownership. Based on the same reasoning from the 1999 interpretation of this variable, these may be the ages when the transition to adulthood events most commonly occurred in 2012. The average Canadian maternal age of first birth was age 28.5 and of all births was 30.2 in 2011. (StatsCan, 2017b) Assuming the trend observed since the 1980s of the consistently increasing average age of mothers at the time of childbearing, the 2012 average age of first birth is expected to be close to 29 (actual data unavailable). Although the Age variable only reports the age of the major income earner, who may be male or female, this interpretation is assuming that the childbearing mother is of a similar age to the major income earner. The high likelihood of ownership for households with a major income earner 29 years of age coincides with the average age of first birth.

Households with the oldest young adult major income earners aged 33 and 34 having the highest likelihood of ownership are likely due to the longer time spent in school and the increasing cost of housing. With 38.19% of young adult major income earners having at least a university degree in 2012, most of these individuals at the earliest leave school at age 22. Continuing to pursue post-graduate education further delays transitions to adulthood such as finding a full-time job, leaving the parental home, getting married, or having children. Even if young adult households have entered into a stage of high commitment and low mobility in their late 20s, many may still be unable to enter homeownership until age 33 or 34 due to larger down payment requirements from the rapidly increasing price of homes over the past decade. Additionally, as single individuals get older, they are more likely to have reached the level of household and

financial stability needed to enter into homeownership without having to make commitments such as getting married or having children.

Household Type

All categories of Household Type report higher odds ratios than the "Unattached individuals" base group with the exception of the "Lone-parent family" group. However, "Couples with children" is the only category that has a statistically significant result. This group has the highest odds ratio and thus the highest likelihood of owning.

In general, the Household Type variable no longer has a significant impact on tenure in 2012. "Couples with children" is the only type of household that has a significant effect. This group is 2.85 times more likely to be homeowners than unattached individuals. The "Lone parent family" category reported lower odds of owning than the base group, but the result is strongly non-significant. "Couple, no children" reported a higher odds ratio than the base group, but it is also not statistically significant. The conditions of either being in a couple or having children no longer have enough effect to correlate with tenure choice alone. It is the combined conditions of households being both in a couple and having children that prove to impact homeownership. The effect of marital status is still unknown from this variable. The "Other family types" category reported higher odds of owning than the base group, but the result is also very non-significant.

Number of Earners

Households with 1 earner, 2 earners, and 3 or more earners all reported higher odds ratios than households with no earners. However, the result for the "1" earner group is non-significant. The "3 or more" earners group has the highest odds ratio, followed by the "2" earners group. The wide confidence intervals reported for all categories in this variable questions the reliability of the estimates.

TABLE 4. Tenure Choice Logit Model - 2012

Logistic regression

Number of obs = 1388
 Wald chi2(35) = 233.57
 Prob > chi2 = 0.0000
 Pseudo R2 = 0.3077

Log pseudolikelihood = -1140821.9

Tenure	Odds Ratio	Robust Std. Err.	z	P> z	[95% Conf. Interval]	
Age						
Age 25	1.0000	(base)				
Age 26	1.3907	0.6076	0.75	0.450	0.5907	3.2743
Age 27	2.3371	1.0330	1.92	0.055	0.9827	5.5580
Age 28	2.1786	0.8634	1.96	0.049	1.0019	4.7372
Age 29	2.4079	0.9499	2.23	0.026	1.1113	5.2171
Age 30	2.1030	1.0425	1.50	0.134	0.7959	5.5566
Age 31	2.2280	0.8849	2.02	0.044	1.0229	4.8526
Age 32	1.8438	0.7743	1.46	0.145	0.8096	4.1991
Age 33	2.5946	1.0325	2.40	0.017	1.1895	5.6596
Age 34	2.5631	1.0669	2.26	0.024	1.1336	5.7953
Household_Type						
Unattached individual	1.0000	(base)				
Couple, no children	1.3685	0.5405	0.79	0.427	0.6311	2.9678
Couple with children	2.8503	1.0197	2.93	0.003	1.4137	5.7465
Lone-parent family	0.8564	0.3375	-0.39	0.694	0.3956	1.8538
Other family types	1.7571	0.7177	1.38	0.168	0.7891	3.9127
Number_of_Earners						
None	1.0000	(base)				
1	4.4754	3.6225	1.85	0.064	0.9159	21.8681
2	7.6221	5.9858	2.59	0.010	1.6354	35.5253
3 or more	12.7151	11.3361	2.85	0.004	2.2153	72.9798
Educational_Attainment						
< high school	1.0000	(base)				
High school diploma	2.7402	0.9779	2.82	0.005	1.3615	5.5151
Non-uni. p-sec. cert./dipl.	4.7271	1.7029	4.31	0.000	2.3333	9.5770
Uni. degree or cert.	2.5842	0.9945	2.47	0.014	1.2155	5.4943
Market_Income						
<25,000	1.0000	(base)				
25,000-49,999	1.3438	0.4259	0.93	0.351	0.7220	2.5011
50,000-99,999	3.4487	1.0697	3.99	0.000	1.8777	6.3341
100,000-149,999	6.0697	2.6935	4.06	0.000	2.5436	14.4842
>150,000	15.5177	17.5804	2.42	0.016	1.6845	142.9468
Liquid_Wealth						
0 or Less	1.0000	(base)				
1-24,999	0.5714	0.1206	-2.65	0.008	0.3778	0.8641
25,000-49,999	1.1158	0.3362	0.36	0.716	0.6182	2.0140
50,000-99,999	2.6451	1.0199	2.52	0.012	1.2423	5.6316
>100,000	2.2019	0.9276	1.87	0.061	0.9643	5.0281
Student_Loans						
0	1.0000	(base)				
1-9,999	0.9283	0.2504	-0.28	0.783	0.5471	1.5749
10,000-19,999	0.8040	0.2676	-0.66	0.512	0.4187	1.5438
20,000-29,999	0.7700	0.3383	-0.59	0.552	0.3255	1.8215
>30,000	0.4067	0.1719	-2.13	0.033	0.1776	0.9312
Region						
British Columbia	1.0000	(base)				
Ontario	1.6062	0.4703	1.62	0.106	0.9048	2.8513
Quebec	1.3256	0.3735	1.00	0.317	0.7630	2.3029
Prairies	1.0997	0.3064	0.34	0.733	0.6370	1.8985
Maritimes	2.3068	0.7784	2.48	0.013	1.1907	4.4693
_cons	0.0051	0.0048	-5.65	0.000	0.0008	0.0319

Each category reported wide confidence intervals. The "1" earner group has a confidence interval from 0.92 to 21.87 and the "2" earners group has a range from 1.64 to 35.52. The "3 or more" earners group has an even wider range from 2.22 to 72.98. The suspected reason for this output may be due to sparse data bias. A tabulation of the Number of Earners and Tenure variables reveals that there are only 5 cases of households with no earners who own their homes in the sample. This small number of events observed for the base group is exerting sparse data bias on all other categories in this variable since each category is compared to the base group for odds ratio calculations.

With the presence of sparse data bias, regression coefficients are biased away from the null. Since all the estimates are above 1, the odds ratios reported are most probably overestimated. Keeping the bias in mind, the findings are within expectations. The "1" earner category has a non-significant result, which means that households with one earner do not have significantly different odds of owning than households with no earners. The true estimate for this category is expected to be lower than what is reported, which would mathematically result in an even higher p-value. This finding of non-significance for one earner households is realistic due to the high price of housing leading up to 2012.

The "2" earners category reported an odds ratio of 7.62 with a p-value of 0.10. The "3 or more" earners category has an odds ratio of 12.72 with a p-value of 0.004. Taking the bias into account, the odds ratios are expected to be lower while the p-values are expected to be higher. Based on findings from literature and the results from the 1999 model, it is probable that two-earner households are still more likely to own than households with no earners. It is also probable that 3 or more earner households have the highest odds of owning in 2012. These findings support the conclusion that more earners in a household equate to higher financial security for homeownership in the event one of the earners in the household becomes unemployed during the course of the debt obligation. As mentioned for the 1999 model, more research is needed in order to confirm the earning, spending, and living dynamics of households with three or more earners.

The results of this variable combined with the results from the Household Type variable can also conclude that two-earner families ("2" earners + "Couple with

children") have a higher propensity for homeownership than two-earner couples ("2 earners + "Couple, no Children"), which also suggests that the cost of having children does not compete with the costs of homeownership in 2012.

Educational Attainment

All categories of educational attainment have significantly higher odds ratios than the "< high school" base group. The "Non-uni. p.-sec. cert./dipl." category has the highest odds ratio and thus the highest likelihood of homeownership. The "High school diploma" category has the next highest odds, followed by the "Uni. degree or cert." category.

The result of university educated major income earners having a lower likelihood of homeownership than both non-university post-secondary educated and high school graduate major income earners does not match expectations. Literature has found that households with heads having a university or higher education should have the highest likelihood of owning due to greater long-term earning potential. As discussed for similar results found in the 1999 model, higher educational attainment and longer time spent in school results in delayed transitions into adulthood. Since 38.19% of young adults in 2012 have at least a bachelor's degree/certificate with many of these individuals having graduate degrees, the results for this variable are likely reflecting the earlier lifecycle and tenure transitions of young adults with non-university or high school education. Thus, households with a university educated 25 to 34 year old major income earner are less likely to own than households with a non-university educated or a high school graduate major income earner of this age group, but still more likely to own than households with a major income earner who has less than a high school diploma.

Another explanation may be that highly skilled jobs requiring university or higher education are often clustered in dense urban areas that have high housing prices. Non-university educated young adults may find work in smaller cities or towns that have affordable housing relative to their income. Further analysis examining an older age group or the entire population needs to be undertaken in order to confirm whether university educated major income earners actually have a lower propensity of homeownership.

Market Income

All levels of market income except for the "\$25,000-\$49,999" category have significantly higher odds of owning than the "<\$25,000" base group. The "\$25,000-\$49,999" category reported a higher odds ratio than the base group, but the result is non-significant. The likelihood of owning also increases for each increasing level of income in 2012. The ">\$150,000" category needs to be examined further because of the wide confidence interval reported.

The results of this variable match its expected relationship with tenure where the likelihood of homeownership increases as the level of income increases. The non-significant effect of the "\$25,000-\$49,999" category is likely due to the immense increases in housing prices since the early 2000s. Households earning \$25,000-\$49,999 of income are not significantly better able to afford homeownership than households earning less than \$25,000 in 2012. The \$50,000-\$99,999, \$100,000-\$149,999, and >\$150,000 income groups reported significant and increasing likelihoods of owning. The wide confidence interval and exceedingly large odds ratio of the ">\$150,000" group may be indicative of sparse data bias in this category. A tabulation of the Market Income and Tenure variables shows that there are only 4 cases of households with more than \$150,000 of income who do own their homes in the sample. Therefore, the odds ratio reported for the >\$150,000 category is most probably overestimated. If sparse data bias is not present, the odds ratio would likely be smaller and the result may or may not be significant.

These results point toward an increased housing affordability problem in Canada. Households need to have an income of at least \$50,000 to be significantly better able to enter home ownership. The positive relationship of this variable with tenure is also indicative of the continued preference for homeownership of Canadians.

Liquid Wealth

The "\$1-\$24,999" and "\$50,000-\$99,999" categories of liquid wealth have significant results while the "\$25,000-\$49,999" and ">\$100,000" categories do not. The "\$1-\$24,999" category reported an odds ratio less than 1, which means that households

with \$1-\$24,999 of liquid wealth have a lower likelihood of owning than households with \$0 or less liquid wealth. The group of households with \$50,000-\$99,999 liquid wealth has the highest odds ratio and thus the highest likelihood of homeownership. Although the "\$25,000-\$49,999" and ">\$100,000" categories have higher odds ratios than the base group, their results are non-significant.

It is important to remember that the values reported in this variable reflect the amount of liquid wealth that households accumulated after tenure decisions have already been made. The findings show that young adult households who have \$0 or less liquid wealth are more likely to be homeowners than households who have \$1-\$24,999 of liquid wealth. This result is indicative of the highly leveraged positions of homeowners. Although it is typical for young homeowners to hold undiversified portfolios, it seems especially the case in 2012. The high price of housing would leave most young households with very little liquid wealth after paying a minimum 20% down payment in order to avoid mortgage insurance requirements. High levels of non-mortgage loans are used to finance expenses that are outside of budget constraints. Thus, many homeowners end up having a greater value of other debts compared to flexible assets. Renters who have saved \$1-\$24,999 of liquid wealth are less likely to have overcome down payment constraints in 2012. Therefore, a higher proportion of households with this level of liquid wealth are renters rather than owners. Some wealthier homeowners have been able to accumulate \$50,000-\$99,999 of liquid wealth. However, only 8.23% of all young adult households have this level of liquid wealth. The proportion of homeowners who have been able to accumulate \$50,000-\$99,999 of additional wealth outside of the equity of their homes is even smaller.

Separating Liquid Wealth into Flexible Assets and Other Debts

A tenure model that separates Liquid Wealth into Flexible Assets and Other Debts has also been conducted for 2012 in order to further explain the Liquid Wealth results. See TABLE 5.

The results from the Flexible Assets variable match the expectation that the likelihood of homeownership increases as the level of flexible assets increase. Both the

"\$1-\$24,999" and "\$25,000-\$49,999" categories reported odds ratios higher than 1, but the results are non-significant. This means that households with less than \$50,000 of flexible assets saved are not better able to afford homeownership than households with no flexible assets. The "\$50,000-\$99,999" and ">\$100,000" categories have increasingly higher odds ratios that are statistically significant. Households with these higher levels of flexible assets demonstrate greater ability to accumulate financial resources and higher capacity for saving, which correlates with higher probabilities of homeownership.

All levels of Other Debts reported odds ratios higher than 1, but only the result for the "\$25,000-\$49,999" category is statistically significant. Households with \$25,000-\$49,999 of other debts are 3.33 times more likely to own than households with \$0 of other debts. However, only 5.65% of all young adult households have \$25,000-\$49,999 of other debts. Most young adult households (52.51%) have \$1-\$24,999 of other debts while 32.71% have none. The non-significant results of the Other Debts variable mean that owners and renters don't have significantly different propensities for carrying non-mortgage debt. However, when other debts are subtracted from flexible assets, the results of the Liquid Wealth variable do show that a significant proportion of young adult homeowners are more likely to be in debt than have \$1-\$24,999 of liquid wealth saved.

Student Loans

Student loan debt lower than \$30,000 no longer has a significant impact on tenure. The results for the Student Loan variable still show lower than 1 and decreasing odds ratios for the categories of "\$1-9,999", "\$10,000-19,999", and "\$20,000-29,999", but these results are non-significant. In 2012, only households with more than \$30,000 student loan debt are significantly less likely to be homeowners than households with no student debt.

Having student debt impacts the ability to obtain a mortgage by factoring into the calculation of the total debt service (TDS) ratio. Before 2012, there were no formal regulations capping the maximum TDS ratio. Although the industry standard has always been a maximum of 40% TDS, approving mortgages for households with higher TDS ratios were up to the discretion of the lenders. The TDS ratio formula is "Principal + Interest + Taxes + Heat + Other Debt Obligations / Gross Annual Income"(CMHC, 2017a, fig. 2). Student loan debt adds to other debt obligations, resulting in higher TDS ratios. Therefore, having any level of student loan debt should lower the probability of homeownership.

The finding that student loan debt lower than \$30,000 has no impact on homeownership is likely due to the easing of government-backed mortgage insurance conditions, the increased availability of mortgage credit, and the lack of regulations of the TDS ratio from the early 2000s to 2012. The Insured Mortgage Purchase Program (IMPP) and the Canada Mortgage Bond (CMB) program vastly increased the availability of mortgage credit and made it very profitable and riskless for banks to originate mortgages. CMHC would buy mortgages through these programs, leaving banks without the risk of holding these mortgages. From 2006 to late 2008, mortgage insurance regulations were also greatly eased. Additionally, since there were no regulations of the TDS ratio, it is quite possible mortgages were granted for households who had TDS ratios much higher than 40%.

The average value per household of non-mortgage consumer debt increased in the recent decade, leaving a smaller chance of meeting the TDS requirement if households have student debt. The value of housing also increased to require larger annual mortgage payments. However, the increases in the maximum length of amortization would lower yearly mortgage payments for a same sized mortgage. The maximum insurable amortization length for loans was increased to 40 years in 2006 from 25 years. After the 2008 financial crisis, maximum amortization length was scaled back to 35 years in 2008, 30 years in 2011, and 25 years in July of 2012. These mortgage insurance policy changes were likely responsible for the lack of effect student loan debt lower than \$30,000 has on homeownership in 2012.

Region

There is no longer very much variation in the propensity for homeownership across provinces. The results for Ontario, Quebec, and the Prairies do not show significantly different likelihoods of owning as compared to British Columbia. The Maritimes is the only region that is significantly more likely to own, which means that the Maritimes has lower average housing prices than British Columbia (under the assumptions presented in the discussion of this variable for the 1999 findings). While the results are largely non-significant, it is still expected that this variable has some effect in acting as a proxy to control for price variations across provinces.

4.2 Changing Effects of Factors Over Time

Tenure analyses have been conducted for 1999 and 2012 individually to examine the factors that impact tenure decisions for each subject year. This section will attempt to answer the third research question of this thesis, which asks whether the effects of the socio-demographic and economic factors impacting tenure decisions have changed over time. Differences in the findings from the analysis of the individual years already point to some changes in the effect of these factors. In order to examine this question further, time interaction terms are introduced into the tenure logistic regression model to create an interaction model. Each independent variable is interacted with the Year variable to model the changes in effect over time. As explained in the methodology section, the Year dummy variable sets 1999 as the base '0' and 2012 as '1'. Thus, the results of the interaction model are indicative of the changes in the effects of the socio-demographic and economic variables on tenure from 1999 to 2012. The interaction model is presented in TABLE 6.

This chapter will discuss the changing effects of factors impacting tenure as indicated by the results of the interaction model and through comparing the differences in findings between the tenure models of the individual years. The interaction model indicates the degree of change in the odds ratios between the two years modelled and whether the differences themselves are statistically significant. Interaction model results that report the relationship between odds ratios require the results of a base group for

interpretation. Therefore, Table 6 includes the results of the 1999 tenure choice model (Table 2) since 1999 is the base group for the Year interaction term. The interaction term results are to be interpreted relative to the 1999 model results. However, the interaction model does not reflect whether the results have statistical significance in 2012 after the changes in effect from 1999. Therefore, a comparison of the results of the individual year models is conducted in addition to the interaction model. Any 1999 results mentioned in this section can be referenced in TABLE 2 and 3 while any 2012 results can be referenced in TABLE 4 and 5. In order to place any changes in context, chi-square testing is done for each of the variables to see demographic or economic shifts that may have occurred between the 13 year period. The tabulations showing the demographic distribution of each variable and the chi-square test results are presented in APPENDIX C.

Tenure

The share of young adult households who own their principal residence is 43.47% in the 1999 data and 45.53% in the 2012 data. Thus, the percentages that do not own are 56.63% and 54.47% respectively. The chi-square test shows that the distribution of Tenure (the dependent variable) does not significantly shift between 1999 and 2012. Although the change is not statistically significant, the 25 to 34 age group still has one of the biggest increases in homeownership rate as compared to other age groups. See APPENDIX A. The relatively larger growth in homeownership by young adults after the 2000s is likely in part due to the greater increase in average wages for this age group. From 1981 to 1998, average real hourly wages changed by -8.3% for men aged 25-34 but +13.6% for men aged 45 to 54. (StatsCan, 2015a) From 1998 to 2012, wages for men 25 to 34 changed by +10.1% but only +3.2% for men 45 to 54. For women, wages changed by +0.4% for those aged 25 to 34 and +20.3% for those aged 45 to 54 from 1981 to 1998. However from 1998 to 2012, wages for women aged 25 to 34 changed by +13.8% while wages for women aged 45 to 54 changed by +10.3%. This great growth of wages for young adults combined with the loose mortgage lending conditions and expectations for the continued appreciation of housing value in the 2000s likely explain the distinct

increase in homeownership by young adults even as housing prices are bidding up to new highs.

Age

The age composition of young adult major income earners is not significantly different from 1999 to 2012 as indicated by the chi-square testing results. The interaction model also does not indicate any categories in this variable that has a significantly different relationship to tenure from 1999 to 2012. The only changes over time are as observed through the findings of the individual regression analyses.

The main difference in outcome is which ages have the highest odds ratios and are the most likely to own. Ages 28 and 30 have the highest odds ratios in 1999 while ages 33 and 34 have the highest in 2012. This increase in the ages with the highest likelihood of homeownership is likely due to delayed transitions to adulthood due to longer time spent in school, later average age of childbirth, and more expensive housing in 2012. The percentage of households whose major income earner has a university degree tremendously increased from 28.09% in 1999 to 38.19% in 2012. It is well established that young adults typically defer lifecycle events such as marriage or childbearing until after their education is complete. (Clark, 2014) Consequently, the average Canadian maternal age of first birth has been continuously increasing, from age 27 in 1999 to age 28.5 in 2011. The delay of these lifecycle events results in delayed entry into homeownership due to the correlation between these events and homeownership. Additionally, the increase in housing prices from 1999 to 2012 would contribute to the delay of homeownership due to the longer time it would take to save for larger down payments.

Household Type

Whereas all household types are significantly more likely to own than the unattached individuals in 1999, couple with children is the only household type that has significantly higher odds of owning in 2012. The interaction term estimates show the decrease in effect over time of all household types on homeownership relative to the base group. The decreases in effect for the "Lone-parent family" and "Other family types"

categories are statistically significant differences. Demographically, the chi-square testing shows there have been significant shifts in the composition of household type over time.

The likelihood of owning for couples with no children, lone-parent families, and other family types are no longer statistically different than the likelihood of owning for unattached individuals in 2012. This finding is congruent with previous literature examining tenure propensities of different household types over time. Single-person households have experienced increasing propensities for homeownership across all income levels. (Drew, 2015) Traditional lifecycle events such as marriage and/or childbearing are no longer pre-requisites for entry into homeownership. The attractiveness of housing as an investment is likely an equally pervasive motivation. Gender equality and access to home financing further enable more single individuals to be homeowners without having to be in a couple household. Unattached individuals remain the most prevalent household type, increasing to account for 37.16% of all young adult households in 2012 from 33.80% in 1999.

Continued...

Educational Attainment							
< high school	1.0000	(base)					
High school diploma	1.3486	0.2751	1.47	0.143	0.9041	2.0116	
Non-uni. p-sec. cert./dipl.	1.5087	0.2932	2.12	0.034	1.0309	2.2081	
Uni. degree or cert.	1.3669	0.3058	1.40	0.162	0.8816	2.1193	
Educational Attainment#Year							
High school diploma#2012	2.0319	0.8351	1.73	0.085	0.9079	4.5473	
Non-uni. p-sec. cert./dipl.#2012	3.1332	1.2822	2.79	0.005	1.4049	6.9874	
Uni. degree or cert.#2012	1.8906	0.8415	1.43	0.152	0.7902	4.5233	
Market Income							
<25,000	1.0000	(base)					
25,000-49,999	2.5395	0.4725	5.01	0.000	1.7635	3.6571	
50,000-99,999	5.4632	1.0511	8.83	0.000	3.7469	7.9656	
100,000-149,999	10.9773	3.2615	8.06	0.000	6.1319	19.6515	
>150,000	27.0491	15.8525	5.63	0.000	8.5762	85.3120	
Market Income#Year							
25,000-49,999#2012	0.5291	0.1945	-1.73	0.083	0.2575	1.0874	
50,000-99,999#2012	0.6313	0.2304	-1.26	0.207	0.3087	1.2908	
100,000-149,999#2012	0.5529	0.2952	-1.11	0.267	0.1942	1.5746	
>150,000#2012	0.5737	0.7316	-0.44	0.663	0.0471	6.9856	
Liquid Wealth							
0 or Less	1.0000	(base)					
1-24,999	1.3574	0.1943	2.13	0.033	1.0253	1.7970	
25,000-49,999	2.5486	0.5991	3.98	0.000	1.6076	4.0402	
50,000-99,999	1.0354	0.2540	0.14	0.887	0.6402	1.6745	
>100,000	1.6940	0.4100	2.18	0.029	1.0541	2.7222	
Liquid Wealth#Year							
1-24,999#2012	0.4209	0.1073	-3.39	0.001	0.2554	0.6938	
25,000-49,999#2012	0.4378	0.1673	-2.16	0.031	0.2070	0.9259	
50,000-99,999#2012	2.5546	1.1672	2.05	0.040	1.0433	6.2551	
>100,000#2012	1.2998	0.6314	0.54	0.589	0.5016	3.3682	
Student Loans							
0	1.0000	(base)					
1-9,999	0.5221	0.0939	-3.62	0.000	0.3671	0.7426	
10,000-19,999	0.2465	0.0619	-5.58	0.000	0.1507	0.4032	
20,000-29,999	0.2015	0.0857	-3.77	0.000	0.0876	0.4638	
>30,000	0.2019	0.0757	-4.27	0.000	0.0969	0.4210	
Student Loans#Year							
1-9,999#2012	1.7780	0.5762	1.78	0.076	0.9421	3.3558	
10,000-19,999#2012	3.2618	1.3598	2.84	0.005	1.4408	7.3845	
20,000-29,999#2012	3.8207	2.3355	2.19	0.028	1.1530	12.6610	
>30,000#2012	2.0140	1.1376	1.24	0.215	0.6657	6.0935	
Region							
British Columbia	1.0000	(base)					
Ontario	1.2165	0.2334	1.02	0.307	0.8352	1.7718	
Quebec	1.7240	0.3529	2.66	0.008	1.1543	2.5749	
Prairies	1.9580	0.3577	3.68	0.000	1.3687	2.8011	
Maritimes	3.5618	0.7577	5.97	0.000	2.3474	5.4045	
Region#Year							
Ontario#2012	1.3204	0.4622	0.79	0.427	0.6649	2.6220	
Quebec#2012	0.7689	0.2678	-0.75	0.450	0.3886	1.5215	
Prairies #2012	0.5616	0.1871	-1.73	0.083	0.2924	1.0789	
Maritimes#2012	0.6477	0.2583	-1.09	0.276	0.2964	1.4152	
_cons	0.0058	0.0029	-10.45	0.000	0.0022	0.0153	

The most stable and committed household type in this study of couples with children continues to have a significantly higher likelihood of ownership than single-person households. Although marital status is not available in the data, it is assumed that the dual effects of marriage and children are the forces that culminated in the result of couples with children being the only household type that still has a relative impact on homeownership. This category's effect is smaller in 2012 than in 1999 but has not been identified by the interaction model to be a significant difference. Couples with Children is the second most prevalent household type in both years, but its proportion has decreased from 31.78% to 26.08%.

Lone-parent families and other family types have statistically significant decreases in their effect on homeownership as compared to the base group. Lone-parent families account for 6.94% of total young adult households in 1999, slightly decreasing to 6.53% in 2012. The share of other family types also experienced a decrease from 10.55% to 9.79%. These household types have lower prevalence in 2012 and no longer have significantly higher odds of homeownership than single individuals. The presence of children in lone-parent families is no longer a strong enough condition for these households to be more likely to own. Alternatively, it is the increased likelihood of homeownership by unattached individuals that diminishes the comparative likelihoods of the other household types. Although the 1999 result for the "Other family types" category is uncertain due to its wide confidence interval, the 2012 result indicates that this household type does not have a statistically significant effect on tenure. Lastly, the "Couple, no children" category is not identified by the interaction model to have a significantly different odds ratio over time. However, the effect of this household type in 2012 is also no longer statistically significant.

Number of Earners

The results of the Number of Earners variable have not changed significantly between the two years. There are no categories that are identified by the interaction model to be significantly different. As discussed for the tenure model findings of the individual years, this variable is affected by sparse data bias. Especially for the 2012

model, where there are not enough cases in the base group, the results are interpreted in light of the bias.

Based on an educated interpretation of the biased results, two-earner households have the highest likelihood of homeownership in 1999, whereas three or more earner households have the highest likelihood in 2012. The results for these two categories in both models are statistically significant. These findings are congruent to literature. Households with more than one earner are better able to control for the risk of carrying large mortgages in the event of job loss or increases in the mortgage rate. For two-earner couples, tenure transitions from renting to owning are less likely to be impacted by adverse macroeconomic circumstances and regional price effects. (Deurloo et al., 1994) Over time, the proportion of households with two earners decreased from 43.38% to 42.00% while the proportion of households with three or more earners increased significantly from 4.14% to 7.32%. This demographic shift combined with the regression results point toward an increased importance of households with three or more earners to homeownership. No research found in the literature review has addressed households with more than two earners. While the percentage of households with three or more earners is still very low, it may be that the current high prices of housing are causing more young adult households to live in non-traditional arrangements in which more earners can help afford the increasing ownership costs.

Households with one earner have lower odds of owning than households with two earners and households with three or more earners for both years. The result of this category is statistically significant in 1999 but becomes non-significant in 2012. This means that one earner households no longer have a significantly higher odds of homeownership than households with no earners. This finding provides further evidence that the increasing price of housing over time is requiring households to have two or more earners in order to afford homeownership.

Educational Attainment

Educational attainment is more significant to tenure over time. All categories have a larger and statistically significant effect on homeownership relative to the base group in

2012, whereas only the "Non-uni. p.-sec. cert./dipl." category has a significant effect in 1999. "Non-uni. p.-sec. cert./dipl." is the only category that is identified by the interaction model to have a significant change in effect. This group's odds of owning relative to the base group increases 3.13 times from 1.51 in 1999 to 4.73 in 2012. Households with a major income earner who has a non-university post-secondary education remain the most likely to own their homes. The share of households with this level of education has decreased slightly from 33.64% to 32.18%.

The share of households with the major income earner having a university degree or certificate increased significantly over time, from 28.09% in 1999 to 38.19% in 2012. This category surpassed the non-university post-secondary group as being the most prevalent. Even though the university educated group has a significantly higher likelihood of owning than the base group in 2012, it still has a lower likelihood of owning than both the non-university educated group and the high school graduate group. The "Uni. degree or cert." and the "High school diploma" categories changed from having non-significant results in 1999 to have statistically significant results in 2012. However, the interaction model does not indicate the change in the magnitude of their odds ratios as significant.

This finding corresponds to Gyourko and Linneman's (1997) study that found education to have growing influence on tenure as compared to traditional demographic factors. Since income and wealth variables are controlled for in this study, educational attainment intrinsically has more impact on tenure in 2012. However, the income variable is of market income earned in each survey year, and the wealth variable is of liquid net worth accumulated up to each survey year. The educational attainment variable may still capture permanent income and lifetime wealth potential. (Gyourko & Linneman, 1997) Major income earners having higher educational attainment should have stronger expectations of stable and rising income, which may be more of a pre-requisite in order to afford larger mortgage payments over the long term from the much higher price of housing in 2012.

As discussed in the findings of the individual years, the propensity of homeownership for households with a major income earner having university educational

attainment may only be low for the 25-34 age group due to delays in lifecycle transitions. The results of this study show that for young adult major income earners with the educational attainment of non-university post-secondary certificate/diploma, the prospects of homeownership has increased over time.

Income

Income has a consistent effect on tenure in both years. All categories of income higher than the base group of "<\$25,000" increase the likelihood of homeownership. The propensity for ownership increases substantially as the level of market income increases in both 1999 and 2012. The interaction model does not indicate any categories that have a significantly different relationship to tenure across the two years. Comparing the regression results of the individual years, the "\$25,000-\$49,999" income category changed from being significant in 1999 to non-significant in 2012. This means that the likelihood of owning of households with \$25,000-\$49,999 of income is no longer significantly different than households making less than \$25,000 of income, which is indicative of the higher price of housing in 2012 and the increased minimum level of income needed for entry into homeownership.

The size of the effects of income on tenure is smaller in 2012 than in 1999. However, the changes are non-significant as tested by the interaction model. The smaller effect of income may be indicative of the increased role mortgage financing has played in enabling homeownership. Household market income may have lessened importance for entry into homeownership under macroeconomic conditions of loosened mortgage lending rules, abundant mortgage credit and lower interest rates, which have all taken place during the period from 2006 to 2012. In terms of changes to the income distribution as indicated by the chi-square test, there are significantly more young adult households earning higher income and less earning lower income. Household earning less than \$25,000 and \$25,000 to \$49,999 both has decreases in proportion. The lowest income category "<\$25,000" has the largest decrease from 27.95% in 1999 to 23.59% in 2012. The share of households earning \$50,000 to \$99,999, \$100,000 to \$149,999, and \$150,000 or more all have increases. The \$100,000 to \$149,999, and \$150,000 or more

groups each increase around 1.9%, from 10.22% to 12.12% and from 2.81% to 4.70% respectively.

Liquid Wealth

Almost all categories of the Liquid Wealth variable are identified by the interaction model to have significantly different effects on homeownership over time. Households with the lower two levels of wealth have a significantly lower likelihood of homeownership in 2012 than in 1999. The categories of "\$1-\$24,999" and "\$25,000-\$49,999" are 2.38 times and 2.28 times less likely to own respectively. On the other hand, the "\$50,000-\$99,999" category of liquid wealth has a significant increase of 2.56 times the odds of owning in 2012 than in 1999. The change in the effect of the ">\$100,000" category is reported by the interaction model as non-significant. These changes will be examined in more detail through the regression results of the individual years below.

While the results for both years are statistically significant, the "\$1-\$24,999" category of liquid wealth has a higher likelihood of owning than the base group in 1999 but changes to having a lower likelihood in 2012. As discussed for the findings of the 2012 model, this means that households who have \$0 or less liquid wealth are more likely to be homeowners than households who have \$1 to \$24,999 of liquid wealth. A greater proportion of less wealthy homeowners (or those with less ability to save) who have been able to obtain mortgage financing likely have needed to borrow from additional sources in order to pay for other financial needs after investing all their previously saved liquid wealth into the down payment on their home. Many more young homeowners in 2012 have not been able to accumulate additional wealth outside the equity of their homes and have non-mortgage debts such as credit cards and/or lines of credits. Additionally, this result also means that households who have accumulated \$1 to \$24,999 of liquid wealth have not been able to overcome the wealth constraint of homeownership and have higher odds of being renters. Thus, the interaction model shows that households who have \$1 to \$24,999 of liquid wealth in 2012 are significantly less likely to be homeowners than households with this level of wealth in 1999. From 1999 to 2012, the share of young adult households with \$0 or less liquid wealth significantly increases from 30.39% to

32.50% while the share of households with \$1 to \$24,999 of liquid wealth significantly decreases from 44.39% to 38.65%.

The "\$25,000-\$49,999" liquid wealth category changes from having the highest likelihood of homeownership in 1999 to having a non-significant impact on tenure relative to the base group in 2012. Young adult homeowners are able to have \$25,000-\$49,999 of liquid wealth saved outside the equity of their homes in 1999 after paying for the down payment and subsequent mortgage payments. However, with a larger proportion of homeowners having more of other debts than flexible assets in 2012, there is no longer significantly higher odds of homeowners having \$25,000 to \$49,999 of liquid wealth. Only 8.93% of young adult households have this level of liquid wealth in 1999, further decreasing to 7.98% in 2012.

The "\$50,000-\$99,999" category of liquid wealth has the highest likelihood of owning in 2012, which is significantly different from its non-significant result in 1999. This result provides evidence that more wealthy households still have a higher likelihood of homeownership. However, the finding from the "\$1-\$24,999" liquid wealth category also shows that a greater proportion of young adult homeowners in 2012 have zero or less than zero dollars of liquid wealth. Thus, a wealth disparity has developed in 2012 between those homeowners who have high ability and capacity to save versus those who rely on additional non-mortgage debt in order to afford homeownership. Only 8.23% of young adult households have \$50,000 to \$99,999 of liquid wealth in 2012, whereas 32.5% of households have \$0 or less.

The highest category of ">\$100,000" liquid wealth has not significantly changed over time as indicated by the interaction model. Both years reported higher odds ratios than the base group for this category, but the result for 1999 is statistically significant while the result for 2012 is non-significant. Therefore, households with \$100,000 or more liquid wealth are not significantly more likely to own than households with \$0 or less liquid wealth in 2012. As past literature has explained, households with high wealth over a certain point may find homeownership to be undesirable because investment in this asset would require too much capital commitment and disallow investment in other opportunities. The increase in the price of housing over the subject years would mean that

much more equity would end up being 'locked' in an illiquid and indivisible asset if high wealth households are to enter home ownership. This may explain the lack of significance of the 2012 result. Although the interaction model does not indicate a significant change of this category over time, the chi-square testing shows that the share of young adults with \$100,000 or more liquid wealth significantly increases from 8.86% in 1999 to 12.64% in 2012.

Separating Liquid Wealth into Flexible Assets and Other Debts

The Liquid Wealth variable is replaced with the Flexible Assets and Other Debts variables in the interaction model to test if the effects of these two variables on tenure have also changed significantly over time. See TABLE 7. Only these two variables are discussed below since all other variables have similar outcomes as the previous interaction model.

There are no categories of the Flexible Assets variable that have a significantly different effect on tenure over time as indicated by the interaction model. However, comparing the regression results of the individual years, the two lower categories of "\$1-\$24,999" and "\$25,000-\$49,999" no longer significantly increase the likelihood of owning as compared to the base group of "\$0" flexible assets. Whereas all categories of flexible assets have significantly higher odds of owning in 1999, only the upper two asset categories of "\$50,000-\$99,999" and ">\$100,000" significantly increase the likelihood of owning in 2012. This change is likely due to the higher price of housing over time. Households with less than \$50,000 of flexible assets are less likely to have overcome the wealth barrier and down payment requirement in 2012.

Only the "\$25,000-\$49,999" category of the Other Debts variable has a significant change as indicated by the interaction model. Households with this level of debt are 2.73 times more likely to own their homes over time. This result can also be interpreted to mean that homeowners are 2.7 times more likely to have \$25,000-\$49,999 of other debts in 2012 than 1999. Looking at the regression results for the individual years, the "\$25,000-\$49,999" category of other debts has the highest likelihood of homeownership and is the only category with a significant result in 2012. In comparison, the category of

debt that has the highest likelihood of homeownership and is the only category with a significant result in 1999 is the "\$1-\$24,999" group. The level of other debts most prevalently owed by homeowners has climbed between the two subject years.

Student Loans

Whereas all levels of student loans significantly decrease the likelihood of owning in 1999, only having student loan debt higher than \$30,000 significantly impacts homeownership in 2012. The interaction model identifies the results of the "\$10,000-\$19,999" and "\$20,000-\$29,999" categories as significantly different between the two years. Households having these levels of student loan debt are significantly more likely to be homeowners in 2012 than in 1999. The increased likelihood of owning for these categories over the subject years have resulted in the non-significance of the 2012 results. The likelihoods of homeownership for households owing any level of student loan debt less than \$30,000 are no longer significantly different than the likelihood of homeownership for households with \$0 of student loan debt. However, the proportions of young adult households with student loans at every level above \$0 have significant increases over the subject years. While young adult households with no student loan debt remain the majority, the percentage significantly decreases from 77.50% in 1999 to 72.31% in 2012. The changing impact of student loan debt on homeownership is likely due to the loosening of mortgage lending conditions since 2006.

The easing of National Housing Act (NHA) mortgage insurance qualification conditions in 2006 prompted lenders to loosen lending conditions. The NHA Mortgage-Backed Securities (MBS), Canada Mortgage Bond (CMB), and the Insured Mortgage Purchase (IMPP) programs significantly increased the availability of mortgage credit and allowed lenders to originate mortgages without having to bear the risk by holding onto these liabilities. The environment of eased regulations combined with government programs to offload risky securities from lenders may have precipitated a practice of irresponsible underwriting similar to the practices seen from the U.S. Additionally, since there were no formal regulations of the total debt service ratio before 2012, lenders may have approved loans with far higher ratios than the industry standard of 40%. Another major change in policy that would impact the total debt service ratio is the increases to

the maximum insurable length of amortization. The increase of the maximum amortization length from 25 years to 40 years effectively decreases annual mortgage payments to allow more of other debts such as student loans to be held by households trying to qualify for mortgages with a total debt service ratio of 40% or lower. As found in previous literature, changes in housing policy and mortgage market innovations have far larger impacts on the rate of homeownership than demographic factors. (Chambers et al., 2009)

Region

The region where young adult households live is included in the tenure models as a control for relative housing cost differences between differing locations in Canada. The interaction model does not find any changes in effect over the subject years to be statistically significant. However, looking at the regression results of the individual years, most categories of the Region variable no longer has a significant effect on tenure in 2012. Only households living in the Maritimes has a significantly higher likelihood of owning than households living in British Columbia. This finding indicates that the likelihood of owning in Ontario, Quebec, and the Prairies are not significantly different than the likelihood of owning in British Columbia for 2012, whereas only Ontario does not have significantly different odds of owning than British Columbia for 1999. This change points to the lessening of cost differences for home buying between different regions across Canada. The distribution of young adults living in the different regions across Canada is also not significantly different from 1999 to 2012, as indicated by the chi-square test.

Continued...

Market_Income							
<25,000	1.0000	(base)					
25,000-49,999	2.3801	0.4489	4.60	0.000	1.6447	3.4445	
50,000-99,999	4.8594	0.9508	8.08	0.000	3.3116	7.1307	
100,000-149,999	9.7399	2.9000	7.64	0.000	5.4339	17.4580	
>150,000	25.1053	14.6910	5.51	0.000	7.9737	79.0441	
Market_Income#Year							
25,000-49,999#2012	0.5570	0.2063	-1.58	0.114	0.2695	1.1513	
50,000-99,999#2012	0.6136	0.2248	-1.33	0.182	0.2992	1.2582	
100,000-149,999#2012	0.5129	0.2721	-1.26	0.208	0.1813	1.4506	
>150,000#2012	0.5542	0.6974	-0.47	0.639	0.0470	6.5293	
Flexible_Assets							
0	1.0000	(base)					
1-24,999	2.2934	0.5888	3.23	0.001	1.3866	3.7933	
25,000-49,999	4.8245	1.5502	4.90	0.000	2.5700	9.0566	
50,000-99,999	2.8449	0.9435	3.15	0.002	1.4851	5.4495	
>100,000	3.5203	1.1783	3.76	0.000	1.8267	6.7842	
Flexible_Assets#Year							
1-24,999#2012	0.4442	0.2070	-1.74	0.082	0.1782	1.1072	
25,000-49,999#2012	0.3992	0.2188	-1.68	0.094	0.1364	1.1687	
50,000-99,999#2012	0.9613	0.5659	-0.07	0.947	0.3033	3.0472	
>100,000#2012	0.9064	0.5739	-0.16	0.877	0.2620	3.1355	
Other_Debts							
0	1.0000	(base)					
1-24,999	1.4876	0.2073	2.85	0.004	1.1321	1.9547	
25,000-49,999	1.2180	0.3682	0.65	0.514	0.6735	2.2028	
50,000-99,999	1.1523	0.3877	0.42	0.673	0.5959	2.2284	
>100,000	0.8824	0.5326	-0.21	0.836	0.2703	2.8803	
Other_Debts#Year							
1-24,999#2012	0.8749	0.2212	-0.53	0.597	0.5331	1.4359	
25,000-49,999#2012	2.7300	1.3538	2.03	0.043	1.0329	7.2157	
50,000-99,999#2012	1.6091	1.0497	0.73	0.466	0.4480	5.7791	
>100,000#2012	2.0613	1.7029	0.88	0.381	0.4083	10.4071	
Student_Loans							
0	1.0000	(base)					
1-9,999	0.5348	0.0974	-3.44	0.001	0.3743	0.7643	
10,000-19,999	0.2526	0.0638	-5.45	0.000	0.1540	0.4145	
20,000-29,999	0.2002	0.0869	-3.70	0.000	0.0855	0.4689	
>30,000	0.2014	0.0759	-4.25	0.000	0.0962	0.4217	
Student_Loans#Year							
1-9,999#2012	1.6170	0.5340	1.46	0.146	0.8464	3.0889	
10,000-19,999#2012	3.0009	1.3123	2.51	0.012	1.2736	7.0711	
20,000-29,999#2012	3.9053	2.4827	2.14	0.032	1.1233	13.5768	
>30,000#2012	2.0146	1.1417	1.24	0.216	0.6634	6.1175	
Region							
British Columbia	1.0000	(base)					
Ontario	1.2096	0.2331	0.99	0.324	0.8291	1.7647	
Quebec	1.7947	0.3791	2.77	0.006	1.1863	2.7151	
Prairies	2.0186	0.3776	3.75	0.000	1.3990	2.9127	
Maritimes	3.5731	0.7650	5.95	0.000	2.3486	5.4363	
Region#Year							
Ontario#2012	1.3841	0.4839	0.93	0.353	0.6975	2.7463	
Quebec#2012	0.7300	0.2656	-0.87	0.387	0.3578	1.4894	
Prairies #2012	0.5475	0.1859	-1.77	0.076	0.2814	1.0652	
Maritimes#2012	0.7321	0.2967	-0.77	0.442	0.3309	1.6199	
_cons	0.0031	0.0016	-11.11	0.000	0.0011	0.0086	

CHAPTER 5 CONCLUSIONS

5.1 Summary

Congruence with Tenure Choice Literature

This thesis conducted a tenure choice study of young adult households for the years 1999 and 2012. The analysis uses logit regression models to estimate the relationship between tenure and various socio-demographic and economic household characteristics, which is the standard method undertaken in tenure choice literature. There have been limited tenure studies specifically analyzing the young adult population and even less using Canadian data. This study found congruent results as past tenure choice studies, but also some emerging distinctions specific to the Canadian young adult population. Similar to other populations studied, households that have an older head, living as a couple with children, earning high income from two or more earners and have a high level of liquefiable wealth, have the highest likelihood of being homeowners in both years.

A surprising result is that household heads (the major income earner) with a non-university post-secondary education has the highest likelihood of owning in both years, not those with a university education. As discussed in the Findings section, undertaking a university degree or even higher education delays lifecycle events and has opportunity costs and real costs such as lost wages and tuition fees. Thus, one explanation for this finding may be that higher educated households are making transitions to homeownership later than 34 years of age. Analysis not constricted to only the 25 to 34 year old subpopulation would be needed to confirm this explanation. Another explanation may be the lack of more powerful geographic parameters in the tenure model. Households with university or higher education may be more likely to find compatible employment in large cities with growing economies. However, these cities such as Toronto or Vancouver have a lack of housing affordability and a high cost of living. Non-university post-secondary educated households may find suitable work in smaller cities across Canada with affordable housing prices relative to their income. Then, these households would

have a higher likelihood of homeownership than the university educated households living in expensive cities. The lack of metropolitan level geographic data limits the ability to confirm this explanation of this educational attainment variable finding that differs from literature.

Student Loans and Tenure

The impact of student loan debt on tenure has not been previously analyzed in a tenure choice study. This study includes student debt as a predictor of homeownership in the tenure choice model, with the factors of age, household type, number of earners, educational attainment, income, liquid wealth, and region controlled for. In both years, households with student loan debt are less likely to be homeowners than households with no student debt. In 1999, there is a negative correlation where the likelihood of homeownership decreases as the level of student loan debt increases. In 2012, the effects also show a negative correlation, but only households with more than \$30,000 of student loan debt have statistically significant lower odds of owning. These results provide quantitative evidence that student loan debt negatively impacts young adult households' chances of homeownership.

Changes in Effect Over Time

The ages with the highest likelihood of owning between the subject ages 25 to 34 increased from 1999 to 2012. In 1999, the ages 28 and 30 have the highest likelihood of owning, whereas in 2012 it is the ages 33 and 34. As discussed in the Findings chapter, factors such as more time spent in school and higher housing prices may be delaying the transition to adulthood for many young adult households, which is correspondingly also delaying the age of transition into homeownership. Additionally, whereas all household types have significantly higher likelihood of owning than unattached individual households in 1999, only couples with children have a significantly higher likelihood in 2012. Couples with children continue to have the highest likelihood of owning over time, but being married and having children are no longer pre-requisites for buying a home. Unattached individuals are far more likely to own in 2012, likely for the purposes of

financial investment rather than for the stability beneficial for raising children. Additionally, single women owning their homes are much more of a social norm in 2012.

The educational attainment of the major income earner in young adult households became more significant to tenure over time. Only the non-university post-secondary educated group has a statistically significant higher likelihood of homeownership than the less than high school educated base group in 1999. Over time, all categories of educational attainment have a significantly higher odds of owning than the base group in 2012. Households with a major income earner having less than a high school education are likely much less able to support the substantially higher long-term cost of entering homeownership in 2012 than in 1999. Lastly, only households living in the Maritime provinces are still significantly more likely to own than households living in British Columbia in 2012, whereas households living in the Prairies and Quebec also has significantly higher likelihoods in 1999. The housing price differences between Ontario, Quebec, and the Prairies relative to British Columbia are no longer wide enough to affect tenure. Overall, young adults have a higher homeownership rate in 2012 than in 1999. This increase is likely due to the higher wages for this age group, better economic conditions, lower interest rates, and favourable lending conditions in the 2000s as compared to the 90s.

Homeowners' Increasing Levels of Non-Mortgage Debt

In addition to the debt from mortgages, young adult homeowners are also carrying substantial levels of non-mortgage debt. There has been a decrease in the percentage of young adult households earning less than \$50,000 of income and an increase of households making higher income levels. There has also been a substantial decrease of households with \$0 of flexible assets while the share of households with more than \$100,000 of flexible assets has a substantial increase. Many more young adult households are better off financially in 2012 than in 1999. However, many more young adult homeowners have higher values of non-mortgage debt than flexible assets in 2012, which is evidence of Canada's housing affordability problem.

In 1999, all levels of liquid wealth greater than \$0 reported a positive impact on the likelihood of homeownership, even though only the results for the \$25,000 to \$49,999 and \$100,000 or more levels are significant. In 2012, households with no liquid wealth or with higher values of non-mortgage debt than flexible assets are more likely to own than households with \$1 to \$24,999 of liquid wealth. Looking at liquid wealth separated into assets and debts, households owing \$25,000 to \$49,000 of non-mortgage debts are most likely to be homeowners in 2012, whereas it was households owing \$1 to \$24,999 in 1999. Not only are young adult households relying on mortgage debt to finance homeownership, but the majority are also taking on increasing levels of non-mortgage debt in order to afford the expensive cost of housing in current times.

5.2 Policy Implications

A deeper understanding of young adult tenure situations highlights some of the housing problems faced by this age group. Since homeownership has such an important role in the economic well-being of individual Canadian households and the nation as a whole, the findings from this thesis are useful for informing various public policies. The implications for housing policy and social policy will be discussed below.

Housing Policy

The importance of underwriting standards and policies that maintain prudent mortgage lending practices became very clear after the U.S. subprime mortgage crisis. Canada's National Housing Act (NHA) was amended in 2006 to allow high-risk mortgage terms through the loosening of government-backed mortgage insurance qualification conditions. With the U.S. crash occurring shortly after in 2008, the high-risk mortgage terms in Canada were gradually scaled back and even stricter underwriting standards were added by July 2012. Further tightening measures have continued to be implemented since 2012. From 1999 to 2012, the 25 to 34 age group had one of the largest increases in homeownership rate as compared to the other age groups. See APPENDIX A for the statistics. The same situation occurred in the U.S. preceding the crash where this age group also experienced one of the largest increases in homeownership. However, when the U.S. housing market crashed, young adult households were also the most severely affected.

Young adult households are the most sensitive to changes in mortgage policy. The loosened mortgage regulations from 2006 to 2012 allowed many first-time homebuyers to enter homeownership, but with risky mortgage terms such as long amortizations and low down payments. Under current conditions of low interest rates, Canadian households have been keeping up with mortgage payments. The arrears rate for mortgage holders 25-34 years of age decreased from 0.33% to 0.30% from 2013Q4 to 2016Q4. (CMHC, 2017c, fig. 6) By 2016, young adults actually have the lowest arrears rate as compared to all other age groups. However, a low delinquency rate is far from indicative of financial health. Canada had similarly low rates of arrears in 1990 and the U.S. had its lowest

delinquency rate in a decade in 2005. Shortly after, a housing crash followed in both cases.

Even when faced with financial difficulty, mortgages are typically the last payment homeowners let fall behind. Especially when credit is cheap, non-securitized debts such as credit cards, line of credits, or RRSPs are drawn from to make mortgage payments. (Terrio, 2017) This tenure choice analysis found evidence to suggest that young adult homeowners are behaving in this exact manner. The results over time show the increasing impact non-mortgage debt has on enabling homeownership. More homeowners have higher values of non-mortgage debt than they have flexible assets. These households with high levels of debt and little or no financial assets other than the equity in their homes are at high risk of mortgage delinquency should any adverse economic shocks occur such as housing market declines, unemployment, interest rate increases, or household emergencies. (Cateau, Roberts, & Zhou, 2015)

Appropriately learning from the U.S. subprime mortgage crisis, Canadian housing policy have since enacted various tightening measures to maintain prudent mortgage underwriting and borrowing. Many of the households analyzed in the 2012 data became homeowners during the period of loosened mortgage lending conditions from 2006 to 2012. It is expected that less young adult households would qualify for mortgages after 2012 under the tightened lending regulations. The period of loosened mortgage conditions not only resulted in many households carrying risky levels of debt (mortgage and non-mortgage) with small flexible asset buffers, housing prices were also quickly driven up to unaffordable levels from the inflated demand for ownership housing. For future housing policy, it is important to always remember the importance of maintaining mortgage lending standards and limiting the amount of debt carried by households relative to their income.

There is also evidence from the tenure models that most households that are financially able to enter homeownership do choose to do so. The pervasive choice for owning housing is in large part driven by federal housing policies that favour ownership versus rental tenure. The Government of Canada, through the Canada Mortgage and Housing Corporation (CMHC), provides minuscule support for rental housing as

compared to the vast extent of resources and programs that support home buying. First and foremost are the programs that extensively increase access to homeownership. CMHC's securitization guarantee programs effectively increase the funding available for mortgage lending to individual homebuyers by bundling mortgages into securities for sale to investors. Other programs such as the Canada Mortgage Bond (CMB) and Insured Mortgage Purchase (IMPP) programs further increase the liquidity of lending institutions to make even more mortgage credits available. The government-backed mortgage loan insurance program lowers the wealth constraint to allow less wealthy households to enter homeownership earlier, but with higher monthly mortgage payments over the long-term.

The other major component of the federal government's support of home buying is the tax credits available for buyers. The most significant is the tax exemption on the capital gains of homeowners' primary residences. This tax policy incentivizes homeownership and the treatment of housing as a commodity rather than a basic need. Additional tax credits for home buyers include the First-Time Home Buyers' Tax Credit, which provides first-time buyers with a one-time non-refundable federal tax credit of \$5,000, and the GST/HST New Housing Rebate, which effectively lowers the tax charged on a new construction unit bought or built to be a primary place of residence. (CMHC) Although there is a GST/HST New Residential Rental Property Rebate, the tax credit only applies to the new construction or major renovation of residential complexes and does not apply to individual units in condos or duplexes to be rented out. Additionally, it is the builders of these residential complexes that receive the rebate, so it is doubtful that any tax savings would be passed on to the future renters of these buildings.

Tenure choice is sensitive to housing policy. Consumer behaviour strongly responds to policy initiatives and tax incentives. Businesses also deeply take advantage of the opportunities and funding provided by the government. Almost all the incentives - for both consumers and businesses - are provided for ownership housing, and almost none are for rental housing. It is unsurprising that ownership housing has accounted for about 90% of all housing starts in Canada annually on average for the last two decades (1996-2015) while rental housing has accounted for about 10%. (CMHC) Even with almost all of the

new construction supplying ownership housing, housing prices reached its least affordable level in recent years due to overwhelming demand from households incentivized by favourable policies for entry into homeownership. There is also additional demand from private investors buying units with the expectation of capital gains as well the expectation of steady income from renting since there has been such a limited supply of purpose-built rental units.

A number of measures at the federal and provincial level have been enacted since 2012 to cool the demand for residential real estate, especially in housing markets with escalating prices. CMHC has continued to tighten mortgage insurance rules to limit household debt, raised underwriting standards, and stopped providing insurance for second homes. On the provincial level, most notably Ontario and British Columbia, measures have been taken to discourage speculative buying and foreign investment. Ontario has also announced rental housing measures such as rent increase control, tenant protection, lower taxes on apartment buildings, and increasing the supply of affordable housing. These measures were only recently announced in 2017, so their effect of providing more affordable ownership and rental housing has yet to be seen.

The focus of Canada's housing policy on ownership tenure has majorly contributed to the precarious housing situation of young adult households today. Young homeowners, many who took advantage of loosened lending conditions, find themselves in risky financial situations because of the growing level of real housing prices in Canada (See APPENDIX B). This thesis has found young adult homeowners to be carrying increasing levels of non-mortgage debt with small flexible asset buffers. Young renters, many who cannot overcome the wealth constraint or some who choose not to carry a massive mortgage, may not build as much equity from having to pay high rents and may have difficulty finding stable good quality housing. While the measures at the provincial level may have some effect on cooling housing markets and providing affordable housing, the federal policies remain unchanged to continue biasing tenure choice towards ownership.

Canada's mature mortgage system effectively helps households access homeownership, which is beneficial as long as prudent underwriting is maintained and

household debt is controlled. On the other hand, having extensive federal tax benefits for buyers and builders of ownership housing when there are almost no tax benefits for tenants and builders of rental housing requires a re-examination. The preferential tax treatment of ownership housing incentivizes investment in residential real estate over other types of securities, which extensively contribute to housing market demand. Additionally, with the lack of purpose-built rental construction, private investors will continue driving up prices in the ownership market to supply the private rental market. Since rents are derived from unit prices plus a premium to the investor, high housing prices also translate to higher rents. Therefore, federal support of *both* rental and ownership housing is critical for achieving housing affordability.

Social Policy

The implementation of asset-based welfare through homeownership has always raised concerns about its potential for exacerbating inequality. As the price of housing increases, concerns about widening social inequalities also grow. This thesis found that over time young adult households earning \$25,000 - \$49,999 of income no longer has a statistically different likelihood of homeownership than households earning less than \$25,000. Whereas all levels of income above \$25,000 significantly add to the probability of owning in 1999, young adult households have to be earning more than \$50,000 of income to have a significantly higher likelihood of homeownership in 2012. These results account for young adult households all across Canada. In the most unaffordable housing markets, for example Toronto and Vancouver, it is expected that the minimum income required to enter homeownership is much higher.

Climbing housing prices not only require higher income, but also enough wealth to afford correspondingly higher down payments. A number of factors make it difficult for young adults to save enough to overcome the wealth constraint. First of all, unaffordable housing markets in Canada generally have unaffordable rents. In both Toronto and Vancouver (based on 2011 data from the Statistics Canada National Household Survey), about 45% of renters spend more than 30% of their income on rent and about 24% spend more than 50% on rent. (Canadian Rental Housing Index, 2017) Secondly, there are also households carrying high levels of student loan debt. Although

more than 70% of young adult households have no student debt, the percentage is lower over time from 77.5% in 1999 to 72.31% in 2012. The largest increase is in households with the highest levels of student debt of more than \$30,000, growing from 2.69% to 4.69%. The results from the tenure models provide evidence that having student debt does decrease the likelihood of homeownership. Third, young adult households are also increasingly reliant on consumer debts, resulting in additional monthly repayments such as credit card debt or vehicle financing.

Many households analyzed in this study were able to enter homeownership during the period of loosened mortgage lending conditions from 2006 to 2012. It will be more difficult for young adult households to access homeownership as lending regulations tighten and interest rates increase in the near future. If government measures are not effective in cooling housing markets, social inequalities will be extended across generations. Past literature has found increased intergenerational transfers and parental support for children's entry into homeownership during periods when housing prices are high. However, if the ability to access homeownership in today's asset-based welfare state depends on parental wealth, then current societal inequalities will be reproduced across generations. Rich homeowner parents are able to draw on housing wealth to assist their children in overcoming the wealth constraint, but young adults with renter parents will have no assistance in accessing homeownership. There is already evidence that family-based welfare produces inequalities within the young adult generation as the average age of entry into homeownership with parental support is much lower than the average age of those without. (McKee, 2012)

As governments attempt to scale back on welfare spending and pension programs with the expectation that housing wealth will provide financial security for old age and throughout life, the inability of many young households today to access homeownership is a problem. The combination of housing-based welfare and unaffordable housing markets puts the financial future of more and more households in a state of uncertainty and insecurity. Government pushes toward a more asset-based welfare system through policy supporting homeownership contributed to more unaffordable housing, which is ironically causing more people to need social assistance and government transfers. It is

also important to recognize the prevalence of family-based welfare in Canada. For example, in addition to parental transfers for home buying, the differing ability of parents to support secondary education has also created social inequalities. Therefore, social programs such as providing free tuition for low-income students help to close inequality gaps and change wealth trajectories. A system of asset-based welfare will always have people who are priced out. Social policy should recognize the inequalities and attempt to support sustainable changes in wealth trajectories.

5.3 Limitations

This study uses cross-sectional analysis to examine factors impacting tenure instead of longitudinal analysis due to limitations of the data. While the Survey of Financial Security is conducted for different years, the same participants are not used. With the lack of panel data, it is not possible to make causal inferences linking changes in household characteristics to changes in tenure. Another major limitation of this cross-sectional data is that only the status of tenure in the year surveyed is known, not how long ago a tenure change may have occurred. Therefore, the characteristics of households in the year surveyed may be much different than the characteristics of households when they made the tenure transition. This time disparity requires some interpretation of the results according to the context of the most likely scenario. For example, the timing of when households borrowed non-mortgage debt makes a big difference in the analysis. Households who had already entered homeownership could have taken out housing equity line of credits after becoming a homeowner. A positive correlation between non-mortgage debt and homeownership likely means that households borrowed from housing equity, and not that non-mortgage debt helps households enter homeownership.

The data includes some of the most important demographic and economic factors impacting tenure, but there are other important variables that were not able to be analyzed in this study. Some variables that would further enrich understanding are marital status, parental wealth, and metropolitan location. A differentiation between couples who are married and unmarried in the household type variable would enable an estimate of the importance of marriage to tenure. A variable measuring parental wealth would help quantitatively test if parental support of young adult homeownership is increasing due to rising housing unaffordability. The only information on where young adults live is on the provincial/regional level. Especially in current housing market conditions, there are more significant average price differences between metropolitan areas rather than provinces/regions. Having in-depth geographic information would allow tenure choices to be viewed in the context of differing housing affordability levels across Canada.

As discussed, literature has found that tenure choices of young adults are especially influenced by macroeconomic policies. This study does not include any

variables that approximate the effects of government incentives or mortgage conditions, which are quite difficult and onerous to estimate with accuracy. Thus, the differences over time between the results of the tenure models are only interpreted through qualitative context and understanding of demographic and policy shifts.

5.4 Further Research

The tenure situations of young adults, especially in the Canadian context, could use further research and monitoring. The Survey of Financial Security (SFS) has proven to be a valuable source of data for analyzing tenure choice. The two survey years analyzed in this study have provided a valuable glimpse of changes in tenure choice behaviour as influenced by macroeconomic forces and demographic shifts. The SFS is a continuing publication by Statistics Canada. Many structural changes have occurred after 2012 and are ongoing such as changes to housing/mortgage policy and interest rate adjustments. Conducting tenure choice studies of new SFS data as it becomes available in the future and comparing to the past tenure models would help policymakers test the impact of housing incentives and programs as well as discover demographic trends. Additionally, a tenure choice study of other age groups for the years analyzed in this study would provide an informative comparison of the tenure situations of young adults versus other cohorts.

The impact of parental transfers on homeownership was not able to be analyzed in this study due to limitations with the data. However, there is evidence from other countries that directly show the impact parental wealth has on the ability of young adults to enter homeownership as well as the inequalities this causes. A study that can examine the extent parental wealth has on young adult households in Canada is valuable in helping inform public policy. In general, a deeper understanding of the financial relationship and wealth transfers between Millennial kids and Baby Boomer parents would be invaluable for informing social policy.

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APPENDICES

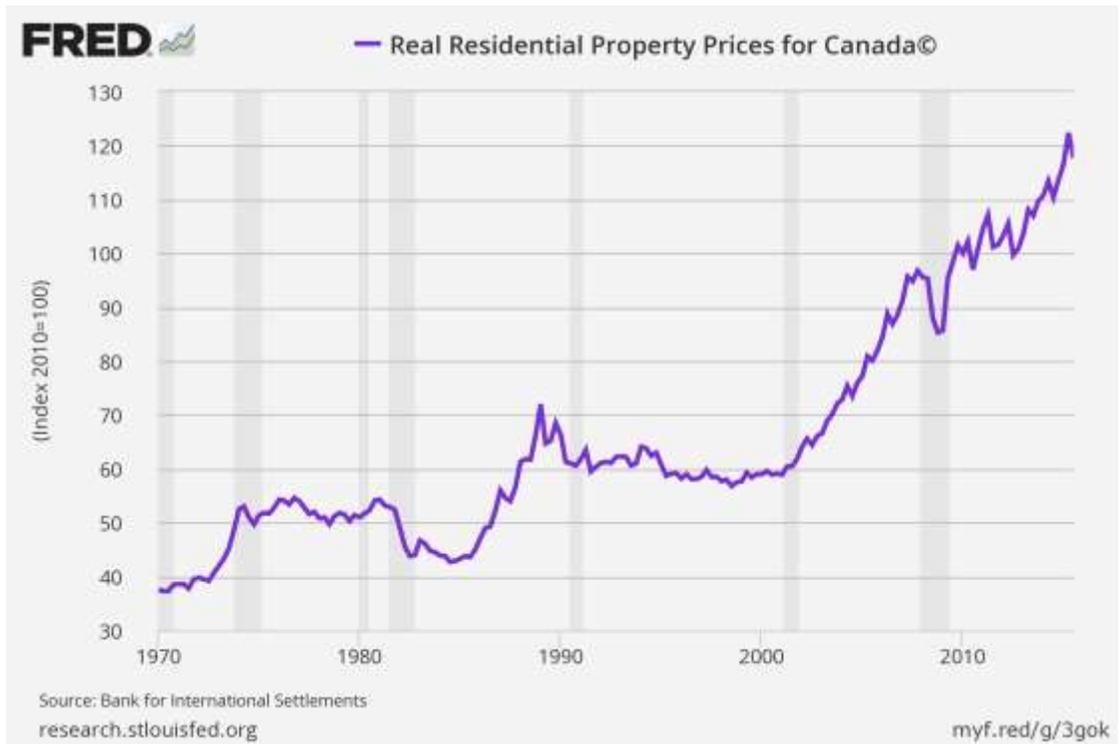
5.5 APPENDIX A: Canadian Homeownership Rate by Age

	2001 Census of Population	2011 Census of Population	Percentage Change	1999 Survey of Financial Security	2012 Survey of Financial Security	Percentage Change
15 to 24 years of age	16.1%	23.8%	7.7% (1)	11.93%	12.03%	0.1% (3)
25 to 34 years of age	46.6%	52.4%	5.8% (2)	43.47%	45.53%	2.1% (2)
35 to 44 years of age	67.1%	69.1%	2.0% (4)	63.34%	65.03%	1.7% (4)
45 to 54 years of age	74.5%	74.7%	0.2% (6)	73.01%	71.24%	-1.8% (6)
55 to 64 years of age	76.9%	77.1%	0.2% (7)	74.69%	72.71%	-2.0% (7)
65 to 74 years of age	75.2%	76.2%	1.0% (5)	71.53%	71.47%	-0.1% (5)
75 years and over	65.7%	70.5%	4.8% (3)	61.45%	70.06%	8.6% (1)

(Statistics Canada, 1999, 2001, 2011, 2012)

The Canadian homeownership rate by age is available in two sources of data by Statistics Canada: the Census of Population and the Survey of Financial Security. The rates reported are different between the two data products due to survey methodological differences. However, the order of age groups from the smallest to largest percentage change in homeownership rate over time is largely consistent between the two data products. The 25 to 34 age group has the second largest percentage change in both data products. The 15 to 24 and 75 years and over age groups have unexpectedly large percentage changes in homeownership rates and are reporting inconsistent results between the two data products. For the purposes of this study, it is adequate to find that the 25 to 34 age group has one of the highest percentage increases in homeownership rate between 1999 and 2012.

5.6 APPENDIX B: Real Residential Property Prices for Canada



(FRED, 2017)

5.7 APPENDIX C: Demographic Distribution by Year, Chi-Square Tables

Principal residence ownership status	Year		
	1999	2012	Total
Do Not Own	56.53	54.47	55.47
Own	43.47	45.53	44.53
Total	100.00	100.00	100.00

Key: column percentages

Pearson:

Uncorrected chi2(1) = 1.8104
 Design-based F(1, 4204) = 0.8390 P = 0.3597

Age of major income earner in family unit	Year		
	1999	2012	Total
Age 25	9.05	9.15	9.10
Age 26	8.45	10.25	9.37
Age 27	9.82	10.94	10.39
Age 28	11.10	10.44	10.76
Age 29	9.95	10.78	10.37
Age 30	9.92	7.86	8.87
Age 31	10.94	9.36	10.13
Age 32	10.11	9.79	9.95
Age 33	9.32	10.03	9.69
Age 34	11.33	11.39	11.36
Total	100.00	100.00	100.00

Key: column percentages

Pearson:

Uncorrected chi2(9) = 14.2979
 Design-based F(8.87, 37286.48) = 0.7170 P = 0.6917

Compositi on of family units	Year		
	1999	2012	Total
Unattach	33.80	37.16	35.49
Couple,	16.94	20.45	18.70
Couple w	31.78	26.08	28.91
Lone-par	6.94	6.53	6.73
Other fa	10.55	9.79	10.17
Total	100.00	100.00	100.00

Key: column percentages

Pearson:

Uncorrected chi2(4) = 22.2777
 Design-based F(3.83, 15660.15)= 2.8653 P = 0.0237

# of earners aged 15 or over in family unit	Year		
	1999	2012	Total
None	7.79	7.24	7.51
1	44.68	43.45	44.05
2	43.38	42.00	42.67
3 or mor	4.14	7.32	5.77
Total	100.00	100.00	100.00

Key: column percentages

Pearson:

Uncorrected chi2(3) = 19.6084
 Design-based F(2.88, 12088.14)= 2.8905 P = 0.0362

Highest edu. level of major income earner	Year		
	1999	2012	Total
< high s	13.85	7.27	10.47
High sch	24.42	22.36	23.36
Non-uni,	33.64	32.18	32.89
Uni, deg	28.09	38.19	33.28
Total	100.00	100.00	100.00

Key: column percentages

Pearson:

Uncorrected chi2(3) = 77.9553
 Design-based F(2.99, 12514.56)= 12.1887 P = 0.0000

Market income	Year		
	1999	2012	Total
<25,000	27.95	23.59	25.71
25,000-4	24.82	24.55	24.68
50,000-9	34.20	35.05	34.63
100,000-	10.22	12.12	11.19
>150,000	2.81	4.70	3.78
Total	100.00	100.00	100.00

Key: column percentages

Pearson:

Uncorrected chi2(4) = 21.3074
 Design-based F(3.85, 16190.36)= 2.5962 P = 0.0365

Liquid Wealth	Year		
	1999	2012	Total
0 or Les	30.39	32.50	31.47
1-24,999	44.39	38.65	41.44
25,000-4	8.93	7.98	8.44
50,000-9	7.43	8.23	7.84
>100,000	8.86	12.64	10.80
Total	100.00	100.00	100.00

Key: column percentages

Pearson:

Uncorrected chi2(4) = 25.7133
 Design-based F(3.95, 16616.50) = 3.1370 P = 0.0141

Flexible Assets	Year		
	1999	2012	Total
0	8.05	4.95	6.46
1-24,999	62.40	61.48	61.93
25,000-4	10.61	10.58	10.59
50,000-9	8.10	8.19	8.15
>100,000	10.84	14.80	12.88
Total	100.00	100.00	100.00

Key: column percentages

Pearson:

Uncorrected chi2(4) = 28.5905
 Design-based F(3.93, 16520.52) = 3.2172 P = 0.0125

Other Debts	Year		Total
	1999	2012	
0	34.56	32.71	33.61
1-24,999	57.41	52.51	54.89
25,000-4	3.43	5.65	4.57
50,000-9	3.03	2.99	3.01
>100,000	1.56	6.14	3.91
Total	100.00	100.00	100.00

Key: column percentages

Pearson:

Uncorrected chi2(4) = 73.2772
 Design-based F(3.87, 16284.13) = 10.1610 P = 0.0000

Debt value of student loans	Year		Total
	1999	2012	
0	77.50	72.31	74.84
1-9,999	11.06	13.00	12.06
10,000-1	6.17	7.40	6.80
20,000-2	2.58	2.60	2.59
>30,000	2.69	4.69	3.72
Total	100.00	100.00	100.00

Key: column percentages

Pearson:

Uncorrected chi2(4) = 20.6625
 Design-based F(3.99, 16779.23) = 2.4339 P = 0.0453

Region	Year		Total
	1999	2012	
British	14.64	13.84	14.23
Ontario	37.39	33.77	35.53
Quebec	24.01	26.25	25.16
Prairies	17.16	20.72	18.99
Maritime	6.80	5.42	6.09
Total	100.00	100.00	100.00

Key: column percentages

Pearson:

Uncorrected $\chi^2(4) = 16.7604$

Design-based $F(3.47, 14576.07) = 2.3594$ $P = 0.0602$