AN EXPOLORATIVE INVESTIGATION OF THE DYNAMICS OF HOUSING AFFORDABILITY IN A BOOMING OIL ECONOMY

A Case study of St. John's, Newfoundland 1991-2011

By

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ABSTRACT

Researchers have addressed the dynamics of housing affordability in the major metropolitan areas in Canada. However, housing costs are also growing rapidly in smaller resource driven urban agglomerations during commodity booms. The objective of this thesis is to explore the dynamics of housing affordability in such urban agglomerations with a focus on St. John's, Newfoundland. This project encompasses two sections. An exploratory section of the thesis presents a descriptive data analysis approach to the evolution of incomes and housing costs between 1991 and 2011, followed by an investigation of trends in housing cost to income ratio, homeownership rate, housing debt and housing quality. The second section employs a more rigorous methodology of quantile regression analysis to ascertain the relative importance of various household characteristics on housing cost to income burden. This thesis finds that new patterns of growing housing affordability problems are emerging in smaller resource driven urban agglomerations in Canada.

Keywords: Housing affordability, Resource driven economy, labor market, housing market, oil

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS AND ACRONYMS

CAGR	Compound Annual Growth Rate
CMHC	Canada Mortgage and Housing Corporation
CMA	Census Metropoligan Area
CSD	Census Sub
FIFO	Fly-In, Fly-Out (worker)
FIRE	Finance, Insurance, and Real-Estate
GDP	Gross Domestic Product
KIBS	Knowledge-Intensive Business Services
NAFTA	Gross Domestic Product
NAICS	North American Industry Classification System
NAFTA	North American Free Trade Agreement
OECD	Organisation for Economic Co-operation and Developmenr
OLS	Ordinary Least Squares regression
QR	Quantile regression

CHAPTER 1: INTRODUCTION

St. John's, Newfoundland, has recently experienced a period of unprecedented economic growth due to the offshore oil industries in the province. Since the beginning of 1997, oil extraction industries started generating royalties, which soon became the largest contributor of the province's Gross Domestic Product (GDP). After a substantial decrease in crude oil prices and reduced production volumes for the operations, the resource industries still account for 25.7 percent of the province's nominal GDP in 2014 (Newfoundland and Labrador Government, 2016). As the provincial capital, the greatest population centre and an economic hub of the province, St. John's has benefitted most from it. Concurrently, housing prices in the city region have soared, which has made it increasingly difficult for low to moderate income earners to find housing they can afford.

While researchers have addressed housing affordability in the major Canadian metropolitan areas (Arnold, & Skaburskis, 1989; Bunting, Walks, & Filion, 2004; Moore, and Skaburskis, 2004), their findings may not be directly transferable to the dynamics of housing affordability in smaller urban agglomerations with resource-industries. Specifically, housing affordability problems in energy resource driven urban agglomerations are not primarily caused by immigration, or economic restructuring, but through interaction between labor market and the housing market (Leung, Shi & Ho Tang, 2013; Lloyd & Newlands, 1990). The labor market impact entails that resource-industries tend to generate new jobs, leading to increasing income levels for those

employed in the resource sector, and others who experience spill-over from it, while the rest of the population benefit much less from the resource-led economic growth. Like economic restructuring, labor market segmentation also contributes to increasing income disparities between individual households. Meanwhile, growing income inequalities underlie accelerating problems of housing affordability in cities in Canada and elsewhere (Dewilde & Lancee, 2013; Bunting, Walks & Filion, 2004; Matlack & Vigdor, 2008; Moore & Skaburskis, 2004) because the local housing markets react to increasing demand by the well-paid segments of the population: Housing prices will rise because housing supply is inherently slow in responding to a surging demand (Bloch, 1997; Bourne, 1981). This also affects the rental housing sector. As a result, households with low to moderate incomes become increasingly burdened by their housing costs.

Housing affordability is not only a concern for a booming economy. Revenues in resource driven urban agglomerations depend on the price levels at the international commodity markets which makes them exposed to the volatility of the resource cycles. Hence, rapid and significant economic growth and increasing income levels during a boom are followed by an economic downturn and unemployment when commodity prices drop. A similar pattern of volatility also emerges in the local housing markets when housing boom turns into stagnation and decrease in housing prices (Akbar, Rolfe, & Kabir, 2013; Harris *et al.,* 1986; Islam & Asami, 2009; Leung, Shi & Ho Tang, 2013). This can lead to negative equity for homeowners, while those in the process of buying a

house and renters may benefit, provided their incomes are not contracted by the economic downturn.

Many researchers have made a connection between rising housing prices and establishment of resource industries (Blackader & Baster, 1992; Farren, 2014; Goldenberg *et al*., 2010; Harris *et al*., 1986; Randall & Ironside, 1996; Rolfe *et al*., 2007; Stangeland, 1984) but few have focussed on housing in resource driven economies. Research conducted by Lloyd and Newlands on the interplay between labor market and housing market in Aberdeen is one of the notable exception (1990). Overall, very little attention has been given to housing affordability in smaller urban areas serving resource extraction industries in Canada, despite their significant contribution to the economic growth in Canada during the recent resource boom. Growing housing affordability problems are also an important policy concern because they have consequences for both individuals and families (Kirkpatrick & Tarasuk, 2007; Kutty, 1999; Moore & Skaburskis, 2004; O'Neill, Jinks, & Squire, 2006; Walks, 2014; Saugeres, 2011), and society as a whole (Chakrabarti & Chang, 2015; Ennis, Finlayson & Speering, 2013; Goldenberg *et al*., 2010). Furthermore, there is very little recent housing research conducted on St. John's, Newfoundland.

The objective of this thesis is to explore dynamics of housing affordability in resource driven economies. The results of this have been transformed into two manuscripts of the thesis. The first manuscript uses an explorative approach addressing the temporal evolution of housing affordability, mainly by investigating household incomes and

housing costs. The second manuscript presents a more rigorous study of households' correlates to housing affordability stress through methodology of quantile regression.

Specifically, the first manuscript addresses the question if oil-boom has generated new patterns of housing affordability problems in resource driven urban agglomerations. For the purpose of the investigation, five urban agglomerations with significant resource industry sectors are selected for a comparative study. The first manuscript thus explores the dynamics of housing affordability for St. John's, Newfoundland, Fort McMurray, Calgary, and Edmonton in Alberta and Saskatoon in Saskatchewan. The population in each of the five selected urban agglomerations is stratified by quintiles of the household income distribution. For the purpose of this study, housing affordability is conceptualized as interplay between housing cost to income, housing quality, housing tenure and housing debt. Results of the first manuscript entail a longitudinal analysis of income and housing cost evolution for each of the five selected urban agglomerations by income quintile. This is followed by an investigation of housing cost to income ratio and housing quality, trends of homeownership and mortgage rate for the bottom three income quintiles. Findings of this research point out that there are new patterns of housing related vulnerability emerging in the selected resource driven urban agglomerations.

The second manuscript of the thesis investigates the impact of household characteristics on housing affordability stress over time. The focus of this research is on two of the urban agglomerations previously examined in the first manuscript, St. John's and Fort McMurray. A more rigorous approach is used in this part of the project to investigate the

households' correlates to housing affordability stress by using quantile regression. Various household attributes covering labor market activities, education, housing arrangements, mobility and family composition are used as independent variables in the quantile regression analysis. For the purpose of this research, the dependent variable housing affordability stress is operationalised as housing cost to income ratio, and then used to rank the households in each of these urban agglomerations in four housing affordability quartiles. This makes it possible to conduct quantile regression for the Census years 1991, 2006 and 2011, which provides information about the differential effects of the household characteristics on housing cost to income burden for households with low (first quartile), median and high (fourth quartile) housing affordability stress, and how these effects change over time. The findings of this manuscript emphasize that the households' correlates are contingent on regional circumstances, and they differ for households at different strata of housing affordability stress. Furthermore, identification of households with low incomes combined to a high housing cost burden calls for mitigating policy measures.

Both sections of this research require access to Statistics Canada confidential microdata available at the Research Data Centres. Census data 1991, 1996, 2001, 2006 and National Household Survey 2011 are the sources of socioeconomic data for the study time period from 1991 to 2011. SAS software is used for the descriptive data analysis while the quantile regression was conducted with STATA software package.

The main finding of this thesis is that new patterns of housing affordability problems are emerging in booming resource driven urban agglomerations. These entail that high income earners are generally benefitting more from the commodity-led economic growth while the housing costs are rising relatively more rapidly for the low to mid income earners. Mortgaged homeowners with low to mid incomes emerge as a new particularly vulnerable group against the back-drop of the volatile resource driven economy. Furthermore, the young generation, the older people, the disabled and the newcomers are likely to be burdened by their housing costs, mostly because their current earnings potential is limited. However, for many of these households, an excessive housing cost to income burden also signals the absence of affordable housing in the market.

This thesis is arranged in accordance with the requirements for a thesis with manuscript format. Following this introduction, the second chapter will provide a comprehensive literature review. Specifically, this review will address resource driven economies, housing system, housing affordability, housing quality, and socioeconomic polarizations, and conclude by positioning St. John's, Newfoundland in this context. This is followed by the third chapter, which is the first manuscript of the thesis presenting an exploratory analysis of housing affordability dynamics. The fourth chapter entails the second manuscript with a regression analysis of households' correlates to housing affordability stress. The final fifth chapter provides conclusions after the manuscripts, summarizing the overall findings and formulating policy implications of the analysis. The cited references will be listed in the bibliography.

CHAPTER 2: LITERATURE REVIEW

Housing affordability becomes a problem when housing costs increase too fast in relation to income levels. Housing prices tend to rise in confluence with economic growth in a region because increasing income levels raise demand for housing (Rahman, 2010). However, housing markets in resource driven economies are prone to a particular kind of volatility because such economies are more directly exposed to global, national, and regional forces (Bradbury, 1979). The main area of impact is the labor market (Leung, Shi & Ho Tang, 2013), through which housing market is affected. These significant segments of the regional economy are interrelated because income earned in the labor market tends to determine one's choice of housing options. Housing may be a basic human necessity, but it has both a use and exchange value (Pattillo, 2013; Walker & Carter, 2010), which makes housing market dynamics reflect and respond to what happens in the entire regional economy (Akbar, Rolfe, & Kabir, 2013; Harris *et al.,* 1986; Islam & Asami, 2009; Leung, Shi & Ho Tang, 2013). This is particularly the case for the volatile resource driven economies.

The objective of this literature review is to explore the characteristics of resource driven economies and their influences on the labor and housing markets with a focus on housing affordability. For this purpose, the dynamics of resource-economies are discussed, particularly how primary industries affect the regional economy and thereby the labor market. Secondly, the dynamics of housing markets are discussed by addressing the

housing system through important themes in the literature that are the role of different actors in the housing market, housing market volatility, and different segments of the market. The focus of this review is placed on housing affordability which is conceptualised as encompassing housing cost, housing quality, housing tenure, and housing debt. These factors are concerned with underlying economic, demographic and social restructuring processes, and thus contribute to housing related vulnerability in its various forms. This review is complemented by a brief introduction to literature on socioeconomic polarization in urban areas. Finally, Newfoundland is situated in this context, as a resource driven economy.

I will argue that beginning of resource extraction in the province has had a significant impact on increasing housing prices and processes of socioeconomic polarization in the housing market in St. John's through segmentation of the labor market into well-paid resource-related jobs and lowly paid service sector jobs. This polarization is indicated by widening income gaps, and differential number of housing alternatives that are affordable for households with disparate income levels. All of these processes occur in an environment of deregulated financial institutions and minimal government intervention in the housing market. The well-paid segments of the population have further benefitted from tax-cuts and institutional support to home-ownership while public spending has been confined to infrastructure investments and short-term provincial expenditures rather than supporting a provision of affordable housing for low-income earners. All of these

factors have contributed to increasing housing related vulnerability across the city-region of St. John's in Newfoundland.

2.1. RESOURCE DRIVEN ECONOMIES

There are many different kinds of natural resources and resource driven communities themselves can be very diverse (Randall & Ironside, 1996). Such economies can develop and expand their economic base but their potential of doing that is determined by their geographic location, their institutions, and what technology they have access to (Hayter & Barnes, 1990). Resource industry companies, the local labor market and the local goods and services producing market play central roles in resource economies. In their own ways, each of them interacts with the local housing market, and the implications of these interrelationships are defined by the structure of the specific resource-based economy as well as the type of resource. Energy-resources tend to have the greatest impact on the regional economy. Among them, oil in particular is the most traded commodity with the highest volumes and monetary values at the market (Danielsen, 1982). Oil with its critical strategic value and constant demand brings about "very high monopoly rents" (Karl, 1997, 50) and is thus capable of generating large revenues during the booming periods (Beine, Bos, & Coulombe, 2012) and causing budget deficits and unemployment when prices drop.

Scholars have long recognized the distinct dynamics that characterize resource-based economies. The staples thesis has been a widely used conceptual lens when exploring these economies, particularly in Canada and Australia (Carson, 2011; Ivanova 2014; Randall & Ironside, 1996; Tonts, Martinus, & Plummer, 2013). The staples thesis posits that export of raw materials shapes regional economies, institutions in these economies and their trade links to other regions (Innis, 1933; Watkins, 1963). Such communities are integrated with a world-wide resource-extraction system (Bradbury, 1979) which makes them vulnerable to the variations of external demand and market conditions of the export commodity (Miller & Smith, 2011). Commodity boom and bust cycles are thus reflected by the local economic growth and decline, and they also influence the outcomes at the local housing market. However, their mechanisms of doing so can vary. Energy-resources tend to impact the housing market through macro-economic conditions, such as employment, while non-energy resources appear to affect the housing market more directly (Leung, Shi, & Ho Tang, 2013).

These boom and bust cycles have been evident in various resource-based countries and regions around the world. In Canada, oil extraction in Alberta has transformed Calgary into a resource driven city that has been subject to boom and bust periods despite the fact that the city itself is not a scene of resource-industry but hosts most of the oil and gas industry head offices and a whole array of producer-service firms are located there (Miller & Smith, 2011). The city has experienced an unprecedented growth as its population has almost tripled between 1970 and 2011 (Government of Alberta, 2016).

This period has also been characterized by a massive influx of capital, increase in in-migration, new job creation and a housing shortage during the boom times while the downturn of oil prices have brought stagnation in both economy and society of Calgary (Miller & Smith, 2011).

Boom and bust cycles have also been a long-term backdrop of the Australian economy, a nation with a high degree of resource dependency. Australia relies on exports of agricultural products, fuels, minerals and forestry to 60 percent of its GDP, while only 6 percent of the labor force works in the resource sector (Mercer & Marden, 2006). This renders the Australian economy very vulnerable to fluctuations in the currency exchange rates and global commodity market prices (ibid). Despite its wealth, Australia experiences sudden serious budget deficits, like those experienced by developing countries which rely on their primary industry exports (Bhattacharyya & Williamson, 2011). However, unlike those developing countries, Australia does not experience large GDP variations or mass unemployment (Mercer & Marden, 2006). It is very likely that well-established Australian political institutions provide the nation a chance to handle the unavoidable exogenous shocks but, more importantly, a more diversified Australian economy is able to absorb these shocks better than economies of developing countries can (Bhattacharyya & Williamson, 2011).

Commodity price variations often have a particularly profound impact on less developed countries which rely on exports of their natural resources. The inefficiency of their political and administrative systems prevents them from benefitting from their resource

wealth and obtaining economic growth and wealth accumulation (Sachs & Werner, 2001). There are examples such as Cameroon that appeared to do everything right, using some of the oil revenues to build a welfare state and saving some of the funds abroad until this image was shattered by declining crude oil price which made the deficits, corruption and overspending surface in its wake (Gauthier & Zeufack, 2011). Nevertheless, there are also genuine success stories such as Malaysia which managed to turn its resource-reliant economy into a more diversified one and, by doing so, raise living standards in the country (Yusof, 2011).

2.1.1 Resource curse

Economic downturn after commodity market decline may bring government spending cuts, tax increases and increasing unemployment, but the boom times are also challenging in resource driven economies because they are often combined with a syndrome that has been referred to as "Dutch disease". The name was first published in the Economist (Baldwin, 1977) and it has been thereafter applied to the connection between booming resource-industry and decline of the manufacturing sector. The Dutch disease was first diagnosed in the 1960s, when the Netherlands experienced increasing revenues for its natural gas exports which made the Dutch guilder appreciate relative to the currencies of country's export markets. As a result, Dutch manufactured goods became less competitive in the market and manufacturing sector contracted.

However, currency appreciation is not the only consequence of resource-related revenue influx. Both income levels and consumption are likely to increase. Surplus capital must be quickly absorbed to avoid further inflation, and many regions with booming economies increase their public spending instead of investing in diversification of the economy (Karl, 1997). The currency appreciation also makes it more cost-effective to import foreign goods than build on domestic production which compounds the manufacturing sector problems.

While a booming sector is likely to affect the overall economy, scholars have contested the mechanisms of Dutch disease as overly simplified. Impacts of Dutch disease depend on the type of resource-industry and selected period of study in relation to the commodity cycles (Dubé & Polèse, 2015). Basic causal relations can also be questioned. Corden & Neary suggest that Dutch manufacturing export problems were not caused by the currency appreciation, but the fact that the Netherlands was overspending its resource revenues on social services (1982). Excessive public spending is associated with increasing interest rates and therefore decreasing investments in non-resource sector. Forsyth and Kay (1980) argue that the appreciation was not a root cause for the British export problems during the North Sea oil boom, but it was an outcome of market mechanisms which entailed investors buying large amounts of British currency in anticipation of gains when oil is produced and put into market.

As a major resource-economy, Canada has been scrutinized for symptoms for Dutch disease. It is obvious that currency appreciation has occurred. Beine, Bos & Coulombe

explored the Canadian currency exchange rate in relation to that of the US dollar and concluded that the Canadian dollar is a commodity currency because it has followed the evolution in the commodity market since 1982 when Canada became a major exporter (2012).

Meanwhile, the adverse effects of resource industries on the Canadian manufacturing sector have been questioned. According to Gordon, the contraction of the manufacturing sector between 2002 and 2008 entailed mainly low paying jobs, the loss of which was offset by creation of a similar number of better paying jobs in other sectors (2013). Still, this does not benefit the laid-off employees unless they qualify for the new jobs, as those who do not, are confined to the low paying service sector. With ongoing demographic growth and increasing participation rate, the importance of the manufacturing sector as an employer would decline even if the absolute numbers of employees remained constant.

According to Beine, Bos & Coulombe, about a third of the Canadian manufacturing employment losses can be attributed to Dutch disease related currency appreciation (2012). The loss of remaining two thirds is explained by the relative weakness of the US dollar (ibid). Overall, Canada is dependent on the fates of its largest trade partner which has a much wider economic base. Meanwhile, Canada is a small export reliant economy, and thus very vulnerable to the volatility of the commodity market. In fact, Coulombe suggests that Canada conclusively suffers from a disease of being overly reliant on the US market (2013).

Signs of Dutch disease can also be explored for regions in sub national scale. Papyrakis & Raveh have explored regional mechanisms for mineral-rich provinces and territories, and observed increased inflation in resource-dependent regions (2014). Resource windfalls attract labor to resource industry as capital is allocated to the non-resource sector, while the flows of capital and labor go to the opposite directions in the neighbouring regions (ibid). Dubé and Polèse found no signs of Dutch disease in resource driven communities although they discovered that regions with resource transformation industries exhibited stagnating population growth and educational attainment levels (2015). The province of Newfoundland has never had a large manufacturing sector, but the region has experienced a significant increase in public spending since the beginning of offshore oil extraction and this can be regarded as a symptom of Dutch disease (Ainslie, 2014). Even during the recent oil boom, the province struggled with stagnating population growth, by some researchers identified as a symptom of Dutch disease (Dubé & Polèse, 2015).

Dutch disease is thus not inevitable, nor a permanent phenomenon. Despite all arguments for a strong institutionalizing impact that resource-dependency exerts on regional economies (e.g. Karl, 1997), manufacturing sector can rebound after a period of decline as exemplified by the Dutch export industry (Beine, Bos & Coulombe, 2012; Dubé & Polèse, 2015). Dutch disease is a problem only if the manufacturing sector remains in a state of stagnation (Beine, Bos & Coulombe, 2012) or resource boom leads to distortions

of political institutions or short-sighted investments on projects that are not beneficial to the regional economy (Dubé & Polèse, 2015).

2.1.2 Resource industry impact on region

Resource extraction industries may contribute to the regional economic growth but that impact is frequently characterized by rent-seeking dynamics and segmented labor markets (Baland & Francois, 2000; Goderis & Malone, 2011; Howie & Atakhanova, 2014; Lawrie, Tonts, & Plummer, 2011; Tonts, Martinus, & Plummer, 2013). Resource industries generate royalties and higher income levels for those employed in the sector. Increasing consumption fuels the economy and new infrastructure will be built which also benefits the region. Furthermore, surplus capital can be channelled into building social services such as health care, education and welfare (Rolfe *et al*., 2007), provided spending occurs on sustainable levels. While none of this contributes to the diversification of the regional economy, the high wages are likely to attract more population, infrastructure investments, increase consumption, and thereby further build a foundation for the economic growth of the region (Michaels, 2011).

New employment is generated but the number of jobs directly related to the resource-industries may be limited (Cadigan, 2012). Resource extraction is generally a capital intensive industry, as the productivity of labor is boosted by use of advanced technical equipment and machinery which reduces the need for manual labor. In addition to the resource sector jobs, the local labor market is also influenced by a regional multiplier

effect (Marchand, 2012): one resource sector job generates various new jobs in other sectors such as construction and technical services but even in hospitality and retail sectors.

Specifically, resource-industries tend to contribute to segmentations in the labor market. These divisions can develop on social, economic, as well as gender basis (Harris *et al*., 1986; Lloyd & Newlands, 1990). In Aberdeen, the resource sector provides jobs primarily to middle-class men, the rest of the active population, and most strikingly women, are confined to lowly paid service sector (Harris *et al*., 1986). To certain extent, this is later contested by other Canadian scholars, who have associated small resource communities with a rise of female entrepreneurship and a shift to home-based work (Bates, 2006), while more diversified resource driven economies provide plenty of opportunities for women (McLeod & Hovorka, 2008). Overall, the labor market impacts depend on the type of resource and other local circumstances. In Newfoundland, most of the new jobs for women were created in lowly paid service sector (Cadigan, 2012).

Nevertheless, in some cases, the impact of the resource industry on the regional economy is negative. This can be because of the loss of manufacturing jobs (Forsyth & Kay, 1980) or because it does not meet with expectations of replacing the number of jobs that were previously lost during a region's economic history (Cadigan, 2012). The overall labor market is also affected by resource-industries, and this can generate labor shortages and pressures to increase wages in other sectors. Resource industries can also lead to distortions in service and construction industries (Blackadder & Baster, 1992). These

altered industrial structures may be unsustainable after the decline of the resource industry (McNicoll, 1980). In the Shetland Islands, pollution from resource extraction hurt the local agriculture, fishery and tourism industries (Blackadder & Baster, 1992). Resource wealth can also exert a negative influence on the region by simply not connecting to the regional economy. For example, the resource industry in Shetland exported its products and imported most goods and services it required (McNicoll, 1980; Blackadder & Baster, 1992). Similarly, wealth extracted in Pilbara, Australia is exported and very little of it is captured locally (Tonts, Martinus & Plummer, 2013). The Shetland and Pilbara scenarios correspond with a lack of backward and forward linkages which are essential for a well-performing resource economy according to the Staple Thesis (Watkins, 1963). Shetland and Pilbara can be contrasted to what Norway and Australia as nations have done to create strong backward and forward linkages in the form of local capital and service suppliers and processing and final good production industries (Ville & Wicken, 2013).

The economic base of a resource driven region cannot be easily diversified. The boom time with its increasing wealth generates a resource-focused culture where decision makers seem less interested in developing other industries than preserving the existing one (Watkins, 1963). Consequently, local existing industries do not get political or economic favours that tend to be provided to the resource industries (Rolfe *et al*., 2007). The inflationary effect of resource-industries on labor and other factors of production (Corden & Neary, 1982; Corden, 1984) has as a consequence that higher investment

levels are required to establish other industries in a resource region. Meanwhile, resource-industries tend to attract the labor and absorb the capital that otherwise could be used to stimulate other industries. Finally, with their contribution to loss of manufacturing jobs, resource industries exacerbate the effect of economic restructuring that has already reduced the number of manufacturing jobs in many regions (Walks, 2001, 2010). All this not only contributes to making it harder for any local manufacturing industries to survive, but it also works in every level against any effort of diversification of the economic base of the region.

2.1.3 Housing in resource driven economies

Resource industries both attract and generate an influx of capital which is not without consequences for the housing market. The beginning of resource extraction, with its promise of economic growth, is often combined with population growth. New jobs are created, additional construction projects initiated and capital invested. Impacts from a resource boom can be called income shocks (Leung, Shi & Ho Tang, 2013) that fuel economic growth and increase demand for housing. The economic boom thus exerts an inflationary pressure on housing prices (Agnello & Schuknecht, 2011) and housing prices rise for all.

Growing demand for housing can fuel rising housing prices when supply struggles. Specifically, people are drawn to resource regions because they provide well-paid employment opportunities while the housing markets in many of these regions are ill-

equipped to respond to the increase in demand for housing. For example, Queensland Bowen Basin experienced a short-term housing shortage as the housing providers were unable to keep pace with the population growth (Lawrie, Tonts, & Plummer, 2011). Furthermore, the housing market has different segments and the problem in Aberdeen was not only the rising prices but also the lack of suitable types of houses at different price ranges (Harris *et al*., 1986). A resource industry can also absorb labor that would otherwise be involved in residential housing construction. This happened in the Cromarty Firth area (Scotland) where the oil development generated a grave labor shortage in many areas, including construction, resulting in a lack of housing (Storey, 1977).

Resource boom impacts on the housing market are reinforced by what happens between individuals. A mass psychosis fuelled by boom-time optimism makes people willing to pay increasingly high prices for their residential properties while they are firmly grounded on their conviction that housing is a safe investment (Bloch, 1997). Even appraisal and real-estate agents, who prefer to regard themselves as detached professionals, get influenced by this same mass psychosis and they cause housing prices to gain even more momentum with their interpretations of the signals from the market during the boom times (Smith, Munro & Christie, 2006). These same signals do not pass unnoticed by investors and speculators who occupy a position between ordinary house-buyers and these professional real-estate intermediaries.

Speculation forms an integral part of the normal dynamics in real-estate markets, but it can potentially play an even more significant role in resource driven communities.

Buying a home is the major investment and large long term expenditure for most households which also makes households potential speculators. The dual character of housing purchase as a home and as an investment makes it an attractive object in an environment where there is much capital to invest and considerable future profits that can be made. Selling a house when housing prices still are high translates into tax-free capital gains. This is the most significant way of redistributing wealth in resource driven economies (Harris *et al*., 1986).

There is a wealth of literature about speculation, both land and built property speculation but the role of speculation appears to be under debate. There is only one particular form of speculation that appears clear cut and condemned as morally reprehensible and that entails withholding land from the market while waiting for prices to go up, as they invariably will do because of this self-induced scarcity of land. Clawson points out that land speculation ties down capital that could be used in a much more productive way (1962).

Built property speculation has been associated with the boom and bust cycles in the housing market. Some observers argue that speculation is the very cause of the boom and bust cycles (e.g. Feakin, 1982). Bloch draws a distinction between "long-term serious investors" and "shorter-term speculators" (1997 p 18), implying there is a moral difference between them. The latter is getting in the market when the prices are on the way up and thereby further destabilize the market (ibid). In contrary to this, Skaburskis discovered that the short-term speculators in Vancouver actually alleviate the boom bust

cycles of the housing market because these speculators get into the market to buy when prices are down and sell when the prices are up (1988). This would stimulate the market when the demand is low and increase the supply when the market is booming and demand is high (ibid). Overall, Malpezzi and Wacter questioned if speculation was cause or consequence of housing cycles (2005). They found that speculation was most likely to cause the boom and bust cycles where the supply was inelastic, i.e the supply was not able to respond to the demand fast enough (ibid). Other potential speculative actors in the housing market are the developers, and banks which have contributed to speculative construction booms by handing out high-risk loans to these developers (Murphy & Scott, 2014)

The majority of speculators are likely to get into the housing market at a future resource community when it becomes evident that a resource-related project will be started there or when the prices already have started rising. So doing, they make the prices increase even more. Levin and Wright claim that even normal home-buyers are aware of the speculative side of the home purchase (1997) and Skaburskis argues that the general speculative behaviour of the population made housing prices soar in Vancouver (1988). No doubt some residents of resource communities get caught up with the prospect of rising housing prices when they buy their houses although they are not likely to see themselves as speculators.

2.1.4 Contesting the link between labor and housing markets

The housing market is an essential segment of the regional economy, and as such inter-linked with the regional labor market. However, economic restructuring and emergence of mobile capital and labor have altered fundamentals of this inter-linkage. Structural change in the labor market entails a rise of precarious employment, part-time and under employment (Walks, 2001, 2010) which can effectively prevent concerned households from earning enough to cover their housing costs. Moreover, ongoing economic restructuring has also brought mobile capital and labor that have the potential to create a real disconnection between local housing and labor markets because they entail capital that is not necessarily generated or consumed in the regional economy.

Mobile labor operates on different geographical and temporal scales. Among those crossing national borders, immigrants and permanent residents have the largest long-term impact because they bring their human, cultural, and factual capital and invest it in Canada. Most immigrants are skilled professionals; they are wealthy and likely to earn good incomes, as the Canadian immigration system at present is geared to favour this category of immigrants (Hou & Bourne, 2006; Ley, 2007; Ley & Tutchener, 2001). In the absence of significant domestic migration, these immigrants also make a major demographic impact on urban areas they select to move to. They preferably settle in major metropolitan areas such as Toronto or Vancouver (Moos & Skaburskis, 2010). This equates to population increase which is always associated with an increased demand for housing unless an extra supply is provided (Ley, 2007). A capital influx into the regional

housing market gives rise to an inflationary pressure and housing prices will rise as a result. This has been particularly observed in Vancouver where wealthy Chinese immigrants are investing their capital in housing (Moos & Skaburskis, 2010).

In comparison to Vancouver, many remote Australian resource towns have the opposite problem. Their labor markets depend on a large number of Fly-In, Fly-Out (FIFO) workers who bring their labor but take most of their earnings away without investing them on locally (Ennis, Finlayson & Speering, 2013; Haslam McKenzie & Rowley, 2013). The use of FIFO workers widely spread in remote Australian resource communities (Storey, 2001) although it started in Canada (Storey, 2010). Fort McMurray with thousands of FIFO employees, is the best-known Canadian example of this phenomenon (Keough 2015; Shields, 2012). Many of these workers are from the Atlantic Canada (Storey, 2001). The mobility of labor is hence of particular significance for resource-based economies (Storey, 2001, 2010).

It can be argued that these arrangements are not beneficial for regional development because they enable the resource industries to remain disconnected from local communities. These companies do not need to involve the local population in their operations or invest on infrastructure (Rolfe *et al*., 2007) although there have been some employment opportunities for the indigenous population in some regions (Storey, 2010). Furthermore, much of the wealth generated in the labor market leaves the region (Storey, 2001) to benefit other regional economies and have an impact on these housing markets. This arrangement also satisfies the companies' demand for flexible labor that can easily

be laid off when so required. Mobile labor also has no social or financial ties with resource community other than the employment. They are away from their families and friends, but the most significant practical reason for this detachment is the fact that they do not own or rent a place to call home in these resource communities.

2.2. HOUSING SYSTEM

Housing is a basic necessity of life, and an essential commodity, consumption of which is generally linked to participation in the regional labor market. However, this basis appears to be eroding when a household′s income no longer is enough to cover housing costs and a reasonable level of non-housing consumption for increasingly large segments of the population. Housing affordability is already a problem for low and moderate income earners, and there is evidence that it is also reaching the middle class (Ennis, Finlayson, & Speering, 2013; Linneman & Megbolugbe, 1992). Although this problem can be reduced to a simple dichotomy between housing supply and demand in the market place, there are various processes instrumental to the outcomes for both supply and demand. The housing market outcomes are then negotiated between the actors in the housing system against the backdrop of differential housing market volatility for homeowners and renters.

2.2.1. Housing market actors

Regional housing system is managed by private, non-profit and public actors. Private sector actors dominate the Canadian housing market since the federal government withdrawal from the social housing sector in 1994 (Walker & Carter, 2010; Wolfe, 1998). The non-profit sector continues to exist but, it has been forced to find new partners because even their funding was cut in the mid-1990s (Drummond, Burleton, & Manning, 2004). Moreover, rental housing investments in general were discouraged by the federal tax and mortgage regulation changes which made it more profitable for developers to invest in housing for ownership occupancy (ibid). The Canadian housing system has thus been described as out of balance because it favours housing built for ownership occupancy while neglecting rental housing (Hulchanski & Shapcott, 2004).

This disregard has a significant impact on low and moderate income earners because most of them are confined to the rental housing sector. A performing housing system would provide suitable housing solutions for people with disparate means, and in diverse stages of their lives (Haan & Perks, 2008; Skaburskis, 1998, 2002). However, due to the lack of federal interest, provincial governments have very little funding for housing projects, and governmental agencies have no resources to work on developing this kind of housing system. This may be one reason why many non-governmental organisations, special interest groups, faith communities and other private actors have increasingly started getting involved in housing matters to help people who cannot afford paying the private housing market prices (Wolfe, 1998). They may have local importance by helping

some families and individuals but they have no power to change institutions or economical means to make a significant difference without forming partnerships with other actors from the private sector and different levels of government. The housing system in Canada is thus mostly operated by the private market actors and housing prices are determined by market mechanisms contingent to the regional economy.

2.2.2. Housing market volatility

House prices tend to fluctuate more than incomes do, and their movements are positively correlated with the state of the overall economy (Chandler & Disney, 2014). Economic growth is thus associated with rising housing prices, and economic downturn with slow-down and decline in the housing market. This can be particularly evident in resource driven urban agglomerations in which a strong resource-led economic growth is eventually followed by a bust.While housing prices increase rapidly during a resource boom which provides a chance for current homeowners to make handsome capital gains if they sell their homes (Harris *et al*., 1986), this is also likely to prevent first-time buyers from entering the market and add pressure on the local rental market. When a resource boom turns into bust, housing prices decline. This can make it easier for first time buyers to enter the market but existing homeowners can end up with negative equity on their homes (Chan, 2001) which will slow down the market.

However, volatility in the housing market can be influenced by policies. National economies may be inter-linked with their counterparts in various ways across the borders

but national governments are still responsible for design and implementation of their own fiscal and social policies. Bloch argues that governmental policies contribute to the volatility of the housing market by favouring home buyers with tax incentives such as tax-deductible interests (as in the US) , and by requiring next to no taxes for the investment in a house (1997). In Canada, capital gains for a sale of one's primary residence are tax-free (Canada Revenue Agency, 2016). Bloch further suggests that taxation should be used to discourage land speculation (1997) which can have a major impact on volatility in the housing market.

Rather than the use of regulation to curb housing market volatility, deregulation has been an essential part of the current dominating form of governance. Deregulated global financial markets have a particular impact on the housing market. Since the mid 1980's, an easy access to mortgage funding enabled increasing numbers of Australians to get into the housing market, which escalated the demand relative to the supply, and thus contributed to rising housing prices (Yates, 2008). Domestic credit, low interest rates and international liquidity are all linked to housing booms while international liquidity combined with banking crisis creates busts (Agnello & Schuknecht, 2011).

Housing market volatility can even be driven by particular segments of the market. While the first-time buyers are an important driver of the market, the trade-up homes are the most volatile ones (Ortalo-Magné & Rady, 2006). When homeowners experience an increase in income and start looking for a larger home, even a slight increase in demand for trade-up housing is likely to have a greater impact than would be the case in the

starter home sector (ibid) because trade-up home sector is likely to be smaller. There is no research about the housing choices of resource sector employees, but it is likely that well-paid professionals look for high-end homes that would be categorized as trade-up homes although they may be these people's first homes.

In many ways, what happens in the housing market can be regarded as an extension of Dutch disease (Rolfe *et al*., 2007). During boom times, households have surplus money which is invested and tied down in housing. Housing is not only a home: For the wealthy, it is also a tool in status competition (Lance & Van de Werfhorst, 2012), and for the middle-class it is an indicator of social and economic success (Beer & Faulkner, 2011). For these reasons, and simply because of the popularity of housing as an investment and safety net (Smith, 2015), over consumption in housing is likely to occur. However, there has been little research investigating if there has been overinvestment in housing at the cost of other industries in a region (Megbolugbe & Linneman, 1993). Housing generates employment in various sectors such as retail, real estate and construction industry but it is not likely to diversify the regional economy. Specifically, the housing sector contributes to the economic growth in the region, and makes house prices increase even more, provided that the economic boom continues.

2.2.3. Housing tenure owner occupancy

Owner occupancy in the private housing market is a housing sector that is directly influenced by housing market volatility. Homeownership is by far the most popular

tenure although high housing prices keep it out of reach for parts of the population. In most countries, it is the most important way of building wealth (Megbolugbe & Linneman, 1993; Muellbauer, 2007). It provides perceived social, financial and economic benefits (Smith, Searle, & Cook, 2009; Smith, 2015) although recent history of the real estate bubble in the USA has shown that it is not always as safe and secure as it may appear. Owner occupancy is also favoured by taxation which helps home-owners in their pursuit of gaining wealth by allowing them to use their (non-taxed) registered retirement savings as a down-payment for their first home and by not asking them to pay taxes for the sale of their principal residence (Hulchanski, 2004a).

Homeowners earn higher incomes and have more wealth than renters do (Hulchanski, 2004a). However, a causal link between housing tenure and economic status can be contested. Is the wealth a cause or consequence of their housing tenure or both? The question is not without policy relevance because home-ownership has been promoted as a universal housing solution even for people with lower incomes. Schlay argues that there is little evidence that home-ownership benefits low income earners (2006) and Meyer, Yeager & Burayidi point out that low income earners are not economically stable enough to face all expenses associated with home-ownership (1994). Furthermore, home-owners in the low or moderate income bracket are less likely to reap financial and social benefits from home-ownership than their wealthy counterparts because they are more likely to be burdened by their housing costs (Foster & Kleit, 2014; Yates, 2002). Mortgage payment stress can lead to negative social and psychological outcomes and

even entrapment in an undesirable neighbourhood (Rohe, Van Zandt & McCarthy, 2001). Moreover, being a homeowner makes one less inclined to move elsewhere for employment, particularly if it is a large home (Lamont, 2008), or when housing prices have decreased, leaving homeowners with negative equity (Chan, 2001).

2.2.4. Housing debt

Most homeowners fund the purchase of their homes through a mortgage. Mortgage funding may be easily available in the present deregulated financial market, but there are still requirements about stable and sufficient income(s), sustainable current debt burden, an adequate credit history (Stone, 2006), and down-payment for a particular level of credit. In the current circumstances of very low inflation, homeowners cannot count on inflation making the debt appear negligible in relationship to the increasing value of the house (Yates, 2008). However, mortgage rates today are also historically low in Canada (and in many other countries) which makes the housing debt service seem manageable for many households.

With rising housing prices, housing debt levels have also become higher. Since the financial crisis of 2007/2008, a high debt to income ratio has become an indication that an economic growth that is financed by consumers spending borrowed money, rather than their wages from employment (Kitson, Martin & Tyler, 2011). Still, household debt does not necessarily put anyone at risk if the household has sufficient assets (Wilkins & Wooden, 2009). This does not always appear to be the case. According to Alexander and

Jacobson, one of every five mortgage indebted Canadian households has less than $5,000 in savings (2015). Also, Walks has found a disturbing pattern of regressive distribution of debt in most of the metropolitan regions of Canada: the young and low income earners carry relatively the largest debt in 2009 (Walks 2013a, 2014) which is confirmed on the national level (Alexander & Jacobson, 2015). This puts them at a serious risk of not being able to manage the debt in combination with their other expenditures.

Debt is not without consequences, particularly for those with low to moderate incomes. In the worst case, housing debt is combined with credit card debt. Overall, being in debt can be directly linked with inequalities in form of diminishing chance of other (non-housing) spending, getting targeted by predatory lending, potential lost opportunities because credit history can block one's way to new employment or housing and not having any margins if anything happens with one's employment or health or family situation. The higher the debt, the more of one's income is used for the interest payments and cannot be used for education, maintenance of one's property, or other assets (Walks 2013a, 2014) which influences one's choices, opportunities and chance of accumulating wealth.

2.2.5 Rental housing

The main alternative to owner occupancy is rental tenancy. The rental housing sector provides homes for approximately 30 per cent of Canadians (Walker & Carter, 2010). Renters are not only low-income earners without other options. Many renters are in transition, young people still saving money for down payment, even elderly who want to

downsize and escape the responsibility for a house (Pomeroy, 2012). There are also life-style renters. Anecdotal evidence suggests that demand for high-end rentals is growing but the sector is still relatively small and partly consists of rented condominiums (Mouallem, 2015). However, immigration, aging population, demographic changes in form of increasing number of one person households, and generally decreasing household size may lead to increasing overall demand for rental housing (Pomeroy,2012).

Financialization of housing market with its focus in ownership occupancy has decreased the policy interest for rental housing sector. However, the condition of the rental housing in Canada cannot solely be explained by the allure of homeownership, by far the most preferred housing tenure. Policy changes disclose why both publicly funded and private rental housing provision has stagnated. In the 1970s market conditions were changed by making it unprofitable for the private sector to build unsubsidized rental housing (Drummond, Burleton & Manning, 2004). Building condominiums was a more attractive option and the heavily subsidised rental development did not provide housing for low-income renters (Hulchanski, 2004b). Much of the existing rental housing stock has been converted into condominiums and some of it has been demolished (Walker & Carter, 2010). On-going gentrification has also contributed to decreasing low-income housing supply by displacing the original tenants who were no longer able to pay off the new higher rents (ibid). Bunting, Walks, and Filion claim that the rental market was tight before the 1990s because not much rental housing was built while the rent controls were

still there (2004). Once the controls were lifted in the 1990s, rents soared and it became even more difficult for low-income earners to find affordable housing (ibid).

Economists measure the conditions of a rental market by the vacancy rate as well as the level of rents. Rental markets in many Canadian cities are are characterized by low or extremely low vacancy rates and high rental cost levels (Walker & Carter, 2010). Vacancy rate is used to identify the overall tightness of the rental market. Too low a vacancy rate (generally less than 3 per cent) means that there is insufficient supply to meet the demand which generates pressure to increase the rents thus preventing the market from functioning in a balanced way (Walker & Carter, 2010; Drummond, 2004). However, Thalmann argues that the vacancy rate limit should be contingent on the population density and size of the community because these have an impact on which vacancy rate level a housing shortage is experienced (2012). Finally, a low vacancy rate gives the potential renters fewer options when selecting where to live.

2.2.6 Secondary rental housing

Secondary rental sector in form of accessory apartments provides affordable housing for people who cannot find it elsewhere. An accessory apartment is an additional unit of a basement apartment, shed, or cottage on a lot that would normally only accommodate one dwelling (Drummond, Burleton, & Manning, 2004). It also generates additional income for a home-owner to help paying for a mortgage (Gratton, 2011).

In different parts of Canada, constructing accessory apartments have recently caught the planners' attention as a simple way of adding affordable rental housing while using existing infrastructure. To facilitate this, St. John's and Regina, Sasketchewan, have implemented the necessary zoning changes (Carter, 1997; Canada Mortgage and Housing Corporation, 2014) that allow incorporation of these apartments. Meanwhile, it is not easy to access data on accessory apartments. A dated research report by Canada Mortgage and Housing Corporation (CMHC) states that 5.7 percent of houses in St. John's had accessory apartments and there was a generally positive attitude towards them in 1992 (Research associates, 1992). CMHC rental market report for the St. John's CMA acknowledges that accessory apartments have an impact on the vacancy rates in the private rental market, and estimates that there were 15,376 of these apartments in CMA in 2012 (2012). This indicates that there is an increase of these apartments.

There are also concerns about these apartments. While there may be regulations that require each apartment to be registered with municipal authorities, this may not always be the case (Drummond, Burleton & Manning, 2004). Consequently, some of these housing units may not fulfill quality and even fire safety standards. Furthermore, accessory apartments are not for large families (Gratton, 2011), most often they are occupied by students, elderly, or single persons. Likewise, secondary rental housing is seldom a durable long-term solution because the supply fluctuates according to the house owner's economy. Having a renter can be cumbersome and the owner can decide to discontinue with the arrangement when the financial benefit no longer outweighs the drawbacks of

having a renter living in one's house (Drummond, Burleton & Manning, 2004). Finally, these apartments are not always a welcome addition in all neighbourhoods. People occupying these apartments are likely to differ from the existing population, which can lead to apprehensions and conflicts, and there are also concerns about additional traffic and parking spaces required (Gratton, 2011).

Accessory apartments contribute to urban densification (Quastel, Moos, & Lynch, 2012) in various city-regions dominated by single-detached housing. However, densification cannot occur above the capacity of the local infrastructure, or at the cost of substandard or hazardous housing arrangements. On the other hand, as with any renovation or upgrade, there is also a risk of gentrification and associated loss of affordable units occurring (Quastel, 2009). Nevertheless, accessary apartments can be a convenient way to produce more affordable housing and simultaneously taking advantage of already existing infrastructure while adding to the social mix of urban neighbourhoods.

2.2.7 Social housing

Those who cannot afford private rental market are confined to publicly funded rental housing. Some would even argue that no such social housing system longer exists in Canada since the handing over of the federal social housing programme to the provinces in the 1990s while launching a program of cutting off the federal subsidies (Hackworth, 2009). In fact, Canada has the smallest social housing sector among developed countries apart from the United States (Hulchanski & Shapcott, 2004). Social housing stock in

Canada, corresponding with 5 per cent of total housing, is insufficient and in decline and there is no adequate funding provided for its maintenance and renewal.

This discontinuance of the social housing system has not been without consequence for low income earners. Building of social housing was terminated, just when the number of people in need of social housing increased in the aftermath of the 1990s recession (Bunting, Walks & Filion, 2004). In the wake of cod collapse, the circumstances were particularly dire in the province of Newfoundland (MacDonald, 1998). Overall, towards the end of the 1990s there were rapidly growing numbers of homeless in Canada. Public support for doing something about the situation became too widely spread to ignore, and the federal government launched the Affordable Housing Initiative (AHI) in 2001 (Canada Mortgage and Housing Corporation, 2016, 2016a). Most of the responsibility remained on provinces and territories and the funding was associated with various constraints, such as the provinces and territories had to spend a dollar for each federal dollar (ibid). Under AHI, more than $1.2 billion were spent on affordable housing, of which $25.87 million in Newfoundland (ibid). The program was renamed Investment in Affordable Housing (IAH) in 2011 and extended for a further eight years, during which the federal government has allocated more than $1.2 billion dollars for affordable housing, of which $54.480 million in Newfoundland (ibid). The constraints are similar as for AHI. It is easy to access data how much money has been spent on affordable housing in different provinces, however, there is scant information about the housing need and to which extent this program can meet up with these.

Keeping Canada's existing social housing stock by maintaining it would be much more economical than constructing new affordable housing (Drummond, Burleton, & Manning, 2004) to replace it. Many provinces are already dealing with expiring operating agreements, and the lack of funding places the operation of their existing stock at risk. According to Pomeroy *et al*. up to half of all providers may be unable to continue maintaining the housing after the federal funding expires (2006). Once agreements expire, providers may have to reduce the number and nature of their affordable units if the affordable rents that tenants pay do not suffice to account for capital and maintenance requirements. There are 10,586 social housing units in Newfoundland and Labrador facing the same uncertain future (Pearce, 2010).

2.2.8 Homelessness

Those unsuccessful in securing and retaining a dwelling in the Canadian housing system end up homeless. According to the UN definition of homelessness, the spectrum of homelessness covers all from those using emergency shelters to those who lack shelter security; these include precariously housed people or persons staying with friends or relatives because they have no other place to go to (Bourne & Walks, 2010). Only a minority is chronically homeless, the rest are homeless with recurring episodes or while going through a transition stage in life (Kneebone, 2014). Lack of affordable housing and decline of social housing contribute to the growth of homelessness, in a confluence of societal and individual related circumstances.

Much of the existing literature about homelessness is focussed on problems among the homeless rather than how to solve the problem of homelessness. There is much written about substance abuse (Bhunu, 2014; Ibabe *et al*., 2014) and mental health issues (Ganesh *et al*., 2013; Madianos, Chondraki & Papadimitriou, 2013) among the homeless in various parts of the world. This is an indication of the prevalence of these problems, but substance abuse or mental illness may not necessarily be the root cause of homelessness, as exemplified by a Toronto study. The researchers at the Clarke Institute of psychiatry involved in the 1998 pathways to homelessness study asked 300 homeless people in Toronto why they were homeless, and only 4 per cent responded that it was because of pre-existing mental illness (Mental Health Policy Research Group, 1997).

Homelessness is politics. A growing number of authors are addressing homelessness of U.S. veterans (Bossarte *et al*., 2013; Elbogen *et al*., 2013; Metraux *et al*., 2013). The vulnerability of the veterans is exacerbated by mental health problems such as post-traumatic stress syndrome and problems with relationships. This has been recognised and there seems to be a national (U.S) goal to end homelessness among veterans (National Alliance to End Homelessness, 2015). However, it seems unlikely that could be done without addressing the root causes. Other vulnerable groups among the homeless, such as abused women (Tutty *et al*., 2013) and the indigenous people in Australia (Parsell & Phillips, 2014), have been subject to research, although without rising similar interest or political will to solve the problems. There is also concern about impacts of homelessness on public health (Doran, Misa & Shah, 2013) because diseases such as tuberculosis

among the homeless can start spreading among the rest of the population. Housing is not only a basic human necessity. It is of fundamental importance for public health care for the society as a whole (Carter & Polyvychok, 2004).

Homelessness is always about housing but not necessarily only about housing (Drummond, Burleton & Manning, 2004). The Housing First approach recognizes that access to housing lays a foundation for treatment of the homeless people with mental illness and substance abuse problems by first housing them and then providing necessary support and services (Waegemakers Schiff & Schiff, 2014). Housing alone may indeed be insufficient. Silver says that it is not about "razing public housing projects, as has been the practice throughout North America during the past two decades, but rather by rebuilding public housing communities from within" (Silver, 2011 p10). Nevertheless, even the housing part of the solution is falling apart as Canada's social housing is deteriorating, due to lack of adequate funding (Hackworth, 2009). As a result, new socially mixed public housing redevelopments have emerged featuring state-driven gentrification (August, 2014). In the process, some more affordable housing has been lost.

Homelessness is a growing problem that no longer is confined to individuals with substance abuse problems or mental illness. Disturbingly enough, it is growing fast among families (Cooper, 2004). Various cities and provinces have launched campaigns to end homelessness in their regions (Orgcode, 2014; Calgary committee to end homelessness, 2008; Edmonton Committee to End Homelessness, 2009), particularly

among young people (cf. Choices for Youth, 2016). What is worth concern, homelessness has increased in a significant way during a time period when the Canadian resource economy has experienced a major boom (Walks, 2010). This suggests that deterioration of housing affordability has contributed to the growth of homelessness.

2.3. HOUSING AFFORDABILITY

Housing affordability is a popular topic in housing debates. Nevertheless, a serious problem facing researchers in this area is the fact that this fundamental term 'housing affordability' is widely used but rarely defined. An affordable housing is adequate and suitable for the size and structure of a household while still leaving household members enough disposable income for non-housing necessities and savings (Bramley, 1990; Stone, 2006). Housing affordability is frequently measured as a housing expense to gross household income ratio. Housing is considered unaffordable if the housing cost to household income ratio exceeds a predefined threshold value 30 percent (Yates, 2008) or 50 percent (Skaburskis, 2004). Furthermore, housing affordability is most often studied for low-income earners, the bottom 40 percent of income distribution (Nepal, Tanton & Harding, 2010) or below Canadian Low-Income-Cut-Off (Moore & Skaburskis, 2004) because they have the most difficulty in covering additional necessary expenses with their remaining disposable income.

Spending more than 30 percent of one's income on housing does not necessarily equate to a housing affordability problem (Hulchanski, 1995). Although doing so, a household runs a risk of having too low disposable income for non-housing consumption (Hancock, 1993). Some households may select to do so to attain a home or neighbourhood of their preference (Thalmann, 1999, 2003), or because they consider a particular property a profitable long-term investment (Rowley *et al*., 2014). There may still be enough disposable income (Stone 1990, 2006), or wealth and savings (Thalmann, 2003) that enable them to pay for their non-housing necessities. Furthermore, market earnings may not be the only source of goods and services for households as they are surrounded by socioeconomic networks that can provide them both social and material support (Hulchanski & Michalski, 1994).

On the other hand, even a low housing cost to income ratio does not warrant an ideal housing affordability situation. Housing costs may be low because of inadequate housing quality (Lerman & Reeder, 1987), or because of the location of housing far away from amenities and place of employment (Carver, 1948, Kesteloot, 1994). A smaller house than required by the size and composition of the household is also likely to cost less than a house that has sufficient space (Hancock, 1993).

Housing cost to income ratio may also be misleading because it does not cover many factors that legitimately should be taken into account when evaluating housing affordability outcomes for households. The ratio does not address family structure (Yates, 2008) which is of importance for both housing and non-housing consumption. Housing

types are diverse (Hulchanski, 1995), and housing quality or location (Yates, 2008) may not fulfill the needs of the households living in them, or provide the optimal circumstances for cost-effective transportation. Any comparisons of housing affordability can only be done in the same area because neighbourhood characteristics can have an impact on housing cost levels (Gan & Hill, 2009). Housing cost to income ratio also ignores the cost difference of living in an urban or rural area (O'Dell, Smith & White, 2008). The ratio may also be misleading because the calculation does not include the expected housing appreciation (Bogdon & Can, 1997). Most importantly of all, it does not provide information about remaining disposable income, and if that is sufficient to cover non-housing consumption for a particular household (Stone, 1990, 2006). Furthermore, this non-housing consumption is contingent on what life stage one has reached; those in the process of forming a household and having children are likely to have larger expenditures than the others do (O'Dell, Smith, & White, 2004).

Households may hence overconsume or under-consume housing for different compromises between affordability, quality and preferences. All this exerts a serious limitation to the usefulness of the housing cost to income ratio. This is particularly problematic because the ratio is often used for policy purposes, such as determining who needs housing or income assistance. However, this housing cost to income ratio combines two most significant indicators of the labor market and housing market outcomes. That makes the ratio suitable for comparative studies and trend analysis (Hulchanski, 1995).

2.3.1. Residual income approach to housing affordability

The residual income approach to housing affordability is based on the principle that one's income should be sufficient for non-housing necessities after housing costs have been covered. Stone introduced this residual income concept of housing affordability which he initially called shelter poverty (1990, 2006). The term refers to the fact that this disposable income may be too low to encompass even the most basic non-housing consumption for some low-income earners. Therefore, housing affordability should be measured using a sliding scale which takes into account household size and income (Stone, 1990). While other social scientists appear to agree about the meaningfulness and logical superiority of the residual income housing affordability concept (for example Hancock, 1993; Hulchanski, 1995; Kutty, 2005), there are only few who have operationalized the concept by actually defining what the desirable size of residual income should be for a group of people. A majority of social scientists are still using the traditional convenient housing cost to income ratio although they are aware of its shortcomings (Stone, 2006) because it is simple to calculate and it has a long history in social sciences and as a policy tool (Bogdon & Can, 1997), and there is no better alternative (Heylen & Haffner, 2013).

Some researchers have compared the residual income approach to housing cost to income ratio for the purpose of identifying households in need of assistance. These two methods yield different results. If measured with the housing cost to income ratio, a larger share of private tenants than social tenants appear to have housing affordability problems while

the residual income analysis shows that there are more social tenants than private tenants with housing affordability problems in Belgian region of Flanders and the Netherlands (Heylen & Haffner, 2013). Kutty has connected her research of residual income approach to the official U.S. poverty line and discovered that residual income approach reveals additional households that suffer from housing induced poverty (2005) The residual income method thus helps to identify social housing tenants in need of housing subsidy (Heylen & Haffner, 2013), and households whose housing costs places them under poverty line (Kutty, 2005) while the housing cost to income ratio fails to do that. This is problematic because the housing cost to income ratio is still the most common policy tool.

How difficult would it be to create an adequate minimum standard non-housing benchmark? Heylen and Haffner used the Dutch minimum budget standard (2013) while Kutty applied the minimum basket of non-housing goods by the Bureau of Labor Statistics (BLS) Lower Budgets without taxes (2005). Every nation has a similar standard defined, and appropriately so, because cost of non-housing good depends on location. That is a useful starting-point. However, this minimum standard should be evaluated by comparing it to real life consumption patterns in a region before it is used. Any flaws associated with it will otherwise be transmitted into the analysis. If that is done, residual income concept may indeed be applicable in both practice and policy. First-time home-buyers would also benefit from knowing how much residual income they would have after paying their housing cost (Stone, 2006).

2.3.2. Quality based approach on housing affordability

Housing consumption is not necessarily determined by a household's housing needs (Lerman & Reeder, 1987; Thalmann, 1999). Lerman and Reeder define housing affordability as being able to carry the cost for a "minimally adequate but decent, safe, and sanitary housing" for less than the benchmark percentage (30 percent) of income based on their minimal adequate rent (p 390, 1987). If a household decides to over-consume or under-consume housing, there will be a difference between the minimal adequate rent and a true rent (Thalmann, 1999, 2003). Thalmann further reviewed this concept by studying a combination of indicators for non-housing expenditure, overcrowding and rent to income ratio to distinguish if renters were having an income or housing cost problem (2003). This approach delivers a more nuanced housing affordability picture than use of housing cost to income ratio does.

The quality-based approach to housing affordability is associated with significant drawbacks. It is not as simple to calculate as the conventional housing cost to income ratio, and it only covers renters because the procedure would be too complicated for home-owners (Thalmann, 1999; Stone, 2006). It can also be difficult to define the minimal adequate rent because complex interplay of regulation, market segmentation and market imperfections impact the rental housing costs (Thalmann, 1999, 2003). This also requires that minimally adequate housing quality is defined for each neighbourhood (ibid). Furthermore, this housing affordability measure fails to link the housing affordability outcome to a household's real ability to pay (Stone, 1999). Renters paying

more than this minimally adequate rent may do so because they are willing to pay more for perceived higher standard housing (Thalmann, 1999, 2003). However, it is also possible that they have no choice and there is a housing affordability problem that is not discovered by this methodology (Stone, 2006).

2.3.3. Other approaches to housing affordability

Researchers have formulated various other approaches to housing affordability. For homeowners, housing affordability is fundamentally linked to house prices and a household's ability to finance and pay for housing consumption. This is exemplified by Gan and Hill who make a distinction between purchasing and repayment affordability, by which they mean ease or difficulty of obtaining mortgage funding versus the burden of paying it back with interest (2009). In their study of Sydney (Australia) 1996-2006, Gan and Hill found out that the repayment affordability had declined while purchasing affordability has remained stable despite the increased competition between lenders in the deregulated financial market (ibid). Competition among lenders only contributed to exacerbating the housing boom (ibid) which made housing prices rise even more.

Geography can also change one's perception of housing affordability. Housing costs may appear affordable, but if a house has a location in relation to one's place of employment and amenities that gives rise to high transportation costs, it may become unaffordable. Densification of residential development would reduce transportation costs and need for new infrastructure, while energy efficiency would save heating and cooling costs.

Therefore, sustainability is regarded as a way to improve housing affordability (MacKillop, 2013). A study of Auckland, New Zealand, shows patterns of deteriorating housing affordability when transportation costs are added to housing costs (Mattingly & Morrissey, 2014). However, McKillop concedes that it may be difficult to get funding for new sustainable versions of Australian housing arrangements (2013).

Housing accessibility might be more relevant than housing affordability for first-time house buyers because accessibility adds the dimensions of supply and competition while affordability only links a household's housing cost to their ability to pay it (Neuteboom & Brounen, 2011). First-time buyers drive the housing market (Ortalo-Magné & Rady, 2006) because they provide liquidity in the more easily accessible market sector with the lower priced housing. If there were no residential properties accessible for them, a chain reaction would make the entire housing market slow down (Neuteboom & Brounen, 2011). Overall, this new concept may not be necessary unless researchers discover significant market segmentation and discrimination of those planning to enter to the housing market. Housing affordability already covers supply and competition because they are some of the main mechanisms that have impact on the housing prices.

2.3.5 Dynamics of housing affordability

Housing affordability is driven by economic, social/demographic and policy changes, as depicted by Figure 1 (Bunting, Walks, & Filion, 2004). Housing affordability is fundamentally an income problem (Linneman & Megbolugbe, 1992), compounded by

ongoing demographic changes while it could be alleviated by policy tools. Uneven growth rate between Canadian metropolitan areas, income polarization within them, and retrenchment of the welfare state shape the current circumstances for growing problems of housing affordability.

Securing a sufficient employment income is the most important way of avoiding housing affordability stress. Occupational bifurcation and loss of the manufacturing sector can make it difficult for many to access jobs with a decent pay. Employment outcomes are also influenced by economic boom bust cycles in resource driven economies. Overall, educational attainment is still generally regarded as a proxy for employment income (Henley, 1998). High education level is thus associated with higher incomes and a low probability of exceeding housing affordability benchmark (Rea *et al*., 2008). However, there are well-paid jobs in resource sector that do not require high education and these can allure young people to drop off from high- school (Goldenberg *et al*., 2012), or post-pone their secondary education (Emery, Ferrer & Green, 2012). Yet, overall human capital accumulation has not decreased. Research has discovered that these young people return to school when economic downturn occurs and jobs disappear (Alessandrini, 2014).

Higher demand for educated labor, compounded with changes in the labor and housing markets has an impact particularly on the young. The young are likely to leave their parental home later to spend longer time studying before entering the labor force than previous generations did (Beaupré, Turcotte & Milan, 2006; Clark, 2007). As a result,

their household formation is post-poned. Once they have left, they are also more likely to return to their parental home if they have a chance of doing so (Otters & Hollander, 2015). Over time, their prospects in both labor and housing markets are likely to improve when the baby-boomer generation retires (Skaburskis, 2002).

Household income levels are also influenced by demographic changes. Housing affordability is hence driven by demographic change which gives rise to generally smaller household sizes and increasing numbers of single person households (Bunting, Walks & Filion, 2004). Such a household may be able to settle for a smaller house or apartment, but is still likely to exceed the housing affordability benchmark. An additional cost for child-care makes the situation even worse for single-parent households (Lamont, 2008).

A part of this demographic change entails increasing graying, which creates another polarized demographic group in the housing market. Many older persons today may have more wealth than they used to do (Quickley & Raphael, 2004). However, those without such assets, living alone at fixed incomes have scant opportunity to augment their incomes if their rents or other housing costs increase (Ryser & Halseth, 2011). Older homeowners are more likely to have paid off their mortgages but they may still be afflicted if property taxes or heating costs increase. Furthermore, housing requirements of older persons can change due to health problems or disability (Smith *et al*., 2012).

Regardless of their age, persons with physical disabilities require accessible housing that makes it possible for them to live independently in their homes. Accessible housing is scarce and modification of their current homes is likely to be expensive. Furthermore, disabled persons are not likely to earn decent incomes, because it is harder for disabled persons as young adults to attain education and later full-time employment than for the rest of the population (Leiter & Waugh, 2009). Lack of affordable and accessible housing can confine them to continued dependency on their families for support and seriously impact their chances of having a home of their own (Saugeres, 2011).

Canadian demographics rely on immigration as a part of a solution to the aging population problem but immigrants also need housing. They contribute to the uneven economic growth in Canadian metropolitan areas with their preferences of settling in the major metropolitan areas of Vancouver and Toronto (Moos & Skaburskis, 2010). Constant surging housing demand in these cities keeps housing prices escalating. Unsurprisingly, recent immigrants are likely to experience initial housing affordability stress, most likely during their first 10 years in Canada (Rea *et al*., 2008), although the probability of their doing so is likely to start declining already after four years (Hiebert, 2009).

While many recent immigrants have no problem connecting with the Canadian labor and housing markets, it is not the case for all visible minorities. Those identifying themselves as Black, Arab, or West Asian, are more likely to be afflicted by persistent housing affordability problems than other groups of immigrant populations (Hiebert, 2009).

Endogenous Canadian ethnic minority, the aboriginal persons are also more likely to exceed the housing affordability benchmark albeit not persistently due to their low income levels and because they may live in substandard housing conditions to lower their housing costs (Rea *et al*., 2008). The fact that some of these minority groups appear to have more of a problem getting established in the Canadian labor market, and improving their housing affordability circumstances, indicates that racial discrimination may exist in the Canadian society.

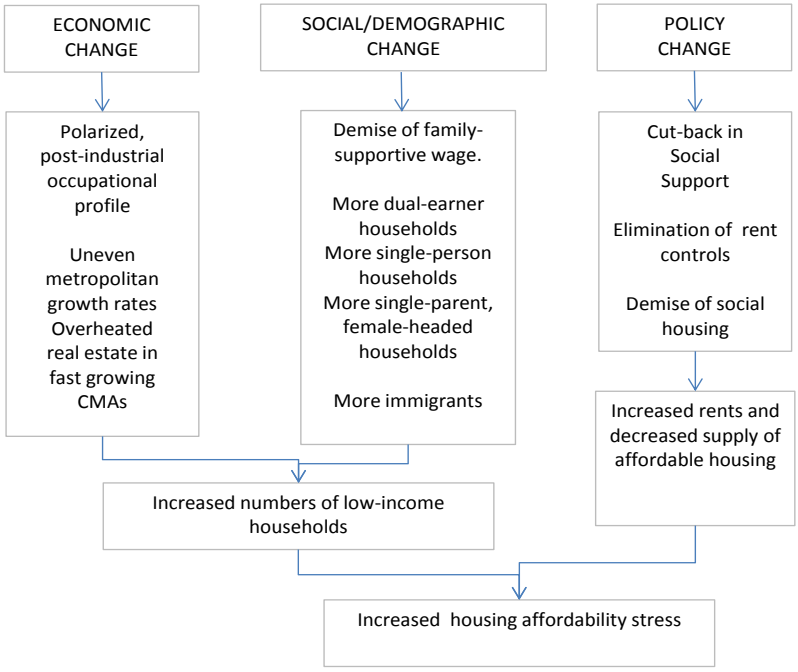

Figure 1. Housing Affordability Stress (source: Bunting, Walks, & Filion, 2004)

Finally, housing affordability is a policy problem because cut-backs on welfare and social housing made housing situation worse for the most vulnerable segments of the

population. Policy-makers favor homeowners with tax incentives and mortgage funding system through Canada Mortgage and Housing Corporation (CMHC). Provision of housing has been left to the private market actors who focus on developing high-end housing that is seldom affordable for first-time home buyers (Lamont, 2008). They have no incentive to supply housing for the low income population (Carver, 1948) because these cannot pay the market price. As a result, there may not be a shortage of housing, just housing that low to moderate income earners can afford (Pattillo, 2013). The wealthy have a larger freedom in their housing choice, while low and moderate income earners may be so constrained that they cannot access housing that would be adequate, suitable, and affordable for them (O'Dell, Smith & White, 2004).

Most people do not experience a constant housing affordability stress (Rea *et al*., 2008), but the duration of the stress is important (Wood & Ong, 2011). Households move in and out of it depending on circumstances (Baker, Mason, & Bentley, 2015). Finding a job, getting married, or moving are ways of escaping housing affordability stress, although mobility combined with a transition to homeownership is likely to entail a period of increased housing affordability stress (Rea *et al*., 2008). Others opt for potential housing affordability stress because they move into a larger home when their income level increases or they become parents (Henley, 1998). This has policy implications because separating the different cases from each other may contribute to selection of correct policy tools to address the root causes of poor housing affordability for those with the most urgent needs. Unsurprisingly, those most likely to experience persistent housing

affordability stress are those with the lowest incomes, renters, and female lone parents (Rea *et al*., 2008).

Apart from moving, there are not many ways for households to cope with excessive housing cost burden. These households may choose to take on more debt (Walks, 2013a), or be forced to cut down non-housing expenditures (Moore & Skaburskis, 2004). These efforts to reduce non-housing consumption can entail buying cheaper food with lower nutritious value (Kirkpatrick & Tarasuk, 2007), reduced heating of their homes (O'Neill, Jinks & Squire, 2006), or cutting down health care and educational expenditures (Moore & Skaburskis, 2004; Walks, 2014). All this can have consequences for the health and well-being of the concerned individuals, and impair their short and long term chances of improving their conditions.

The overall complexity of this implies that there cannot be one simple solution to the problem. Change of a whole culture may be required. Meanwhile, policies could lay a foundation for improvements. It should become a priority to establish a national housing policy, and consensus should be reached that provision of affordable housing for low income earners can no longer be left to the private market forces. The fact that housing affordability is undoubtedly associated with socioeconomic polarization, suggests that there is an urgent need for a comprehensive approach for mapping and addressing housing related vulnerability in resource driven economies and elsewhere.

2.4. HOUSING QUALITY

Housing affordability has replaced housing quality as a main topic for housing debates. However, housing quality is an important topic of its own right, and yet it is difficult to define it. Drawing from a concept of housing services, housing quality could consist of structural adequacy, extent of capital gains for owners, how a dwelling fulfills one's need for comfort, esthetics and status, and if there are sufficient resources and services in the neighbourhood, proximity to friends, and family, work and amenities, and finally, how housing provides a position in community both spatially and socially (Bourne, 1981). Therefore, focus has shifted from traditional housing quality problems, such as absence of plumbing facilities and overcrowding, to housing affordability, quality of living, social satisfaction, and neighbourhood amenities (ibid). Housing affordability also reflects housing quality (Kutty, 1999) because being burdened by housing cost has an adverse impact on quality of life. Regardless, if housing quality has improved because of changes in incomes, and housing consumer preferences, or government regulations, higher quality comes with a higher cost (Quickley & Raphael, 2004), which further shifts the focus on housing affordability.

However, structural adequacy is still worth concern. Kutty examined seven metropolitan areas in USA and identified vulnerable groups likely to have housing quality problems: African-Americans, renters, and those living in housing in the central city (1999). Some regions of Europe appear to have specific problems such as leaky roofs, dampness, rot,

even insufficient insulation and problems with poor window standards, repairing of which would make concerned dwellings more energy-efficient and thus contribute to improved housing affordability (Healy, 2003). However, a deregulated housing market does not always provide incentives to landlords to perform the necessary maintenance and renovations on their rentals. Pursuit on higher profits can make builders cut corners when putting up new subdivisions. Also, deteriorating housing affordability may make some households select a low quality dwelling or a smaller dwelling than necessary to manage their housing costs (Lerman & Reeder, 1987; Matlack & Vigdor, 2008).

Another conventional housing quality indicator is overcrowding. It is becoming less prevalent because home-owners are generally investing in larger homes, although housing affordability problems may also lead homeowners to select too small housing (Hancock, 1993). At the same time, general demographic trends today entail a growing number of single person households while families also choose to have fewer children (Linneman & Megbolugbe, 1992). Larger homes and smaller number of people per household both contribute to reducing a risk of overcrowding although it may still exist among low income earners.

Housing quality problems manifest a similar spatial distribution as most other indicators of disadvantage. Kutty reports that 2.5 percent of the US housing was still lacking some or all plumbing in 1991 and it was a problem that mostly concerned specific areas with low-income residents (1999). Housing quality research can thus overlap with poverty research (Ades, Apparicio & Séguin, 2012). Also, housing quality may not be given a

priority in resource driven communities during a boom because housing supply then is likely to struggle to meet with the excessive demand. Finally, it can be assumed that households with housing quality problems in Canada might also have some common characteristics such as being associated with low income housing and be clustered in particular areas.

Unsurprisingly, neighbourhood research as such overlaps with housing quality study. Perceived safety, proximity to a good grocery store, access to fresh fruits and vegetables, helpfulness of the neighbours and feeling of communality are important indicators of neighbourhood quality (Pollack, Griffin & Lynch, 2010). Those who regarded their housing as unaffordable had a poor opinion about the neighbourhood quality and the quality of their housing which makes the researchers conclude that the residents did not select the unaffordable house to get into a better neighbourhood and high housing cost does not guarantee an adequate housing quality (ibid). The problems with qualitative research were illuminated by the fact that the response rate was low, at place checking was not feasible, and housing affordability was self-reported. It could also be a case of some people letting their negative view on housing affordability (or any of the other topic) colour the rest of the responses.

Moreover, much of the recent housing quality research has been done by scholars in the field of public health because problems with housing quality have been associated with poor health outcomes such as asthma, hypertension, stress and obesity (Jacobs *et al*., 2009) to mention a few examples. Some research has been conducted to find out if health

outcomes can be influenced by improving the housing conditions. According to Ambrose this is the case although he argues that housing quality improvements may be necessary but not always sufficient measures to bring better health results (2001). Pearson et al. investigated if there were health benefits derived from high-quality housing in poor neighbourhoods in New Zealand, and discovered that good quality housing in poor neighbourhood was associated with good health, indicated by lower than expected mortality (2014). A thirty year longitudinal study concludes that little progress has been made in solving their health and housing problems for the low income earners in the USA (Jacobs *et al*., 2009).

Finally, housing quality is influenced by housing tenure. Home-owners are responsible for the maintenance of their homes, and likely to have higher housing quality than renters do (Elsinga, & Hoekstra, 2005; Iwata, & Yamaga, 2008). Homeowners invest on quality improvements in their homes because they can increase the value of their property and will meanwhile reap social benefits of living in a good quality home. Renters' situation is different because their landlord or property manager is responsible for the maintenance and upkeep. If there are incentives enough, the basic maintenance is carried out. Level of regulation and how this is enforced may have an impact on the extent of maintenance. However, more extensive renovations or an upgrade of a building are likely to cause an increase in rent and displace the previous renters with new ones willing and capable to pay higher rents.

There is a shortage of data on housing quality. Statistics Canada Census data provides some indicators on housing quality but even these are associated with problems, such as subjective responses based one's expectations (Jansen, 2013), other psycho-social constraints that can influence one's judgment, and potential lack of expertise in determining if one's dwelling needs structural, electrical or other type of repairs. For comparison, Census data in the USA does not provide realistic information about the distribution of housing quality problems (O'Dell, Smith & White, 2004). Overall, very little research has been conducted on housing quality in Canada recently. Only anecdotal evidence suggests that housing quality problems exist and they are most likely to afflict the already most vulnerable segments of the population.

2.5. SOCIOECONOMIC POLARIZATIONS AND INCOME INEQUALITIES

It has been suggested that ongoing economic restructuring in the labor market (Walks, 2001) and growing problems of housing affordability (Kesteloot, 1994) both contribute to increasing socioeconomic polarization in urban areas. This socioeconomic polarization is a process of segregation between different groups of population, which predominantly manifests as a clustering towards the low and high ends of the income spectrum while the middle declines (Walks, 2013). Many researchers have addressed socioeconomic polarization in terms of increasing income inequalities, but concepts of polarization and inequalities should not be used interchangeably (Esteban & Ray, 1994; Walks, 2013).

Socioeconomic polarization frequently occurs in an environment of widening income disparities although this is not necessarily the case (Esteban & Ray, 1994).

Socioeconomic polarization takes place in different ways among those still active in the labor market (Walks, 2001). This restructuring of the labor market is related to various other processes such as globalisation which for Canada mostly has entailed an increasing integration with the USA (Walks, 2013). Since the signing of the North American Free Trade Agreement (NAFTA), growing trade flows and increasing USA ownership in the Canadian economic sphere have exerted a pressure on Canada to become more like the USA to maintain its competitive edge (Bunting & Filion, 2010; Walks, 2013). This has pushed Canada towards adopting similar employment arrangements and institutional structures (or lack thereof) that had already generated a very high socioeconomic polarization in the USA (Walks, 2010; OECD, 2008). Such a society frequently derives the disadvantaged a chance of improving their situation (Badcock, 1997) while favouring those who already are well off.

Specifically, the labor market transformation over the past decades has entailed a rise of specialised financial, producer and informational service industries, and decline of traditional manufacturing industry, in combination with a growth of lowly paid service sector (Vinodrai, 2010). Manufacturing sector has come to face various challenges because globalization has created a more competitive international marketplace with mobile capital and labor (Bunting & Filion, 2010). This situation is exacerbated by the Dutch disease related currency appreciation occurring in resource driven economies such

as Canada which makes it even more difficult for manufactured exports to be competitive in the market (Corden & Neary, 1982). Advances in technology have further decreased the need for manual labor while some labor intensive manufacturing industries have moved their production to developing countries where labor is cheaper and the regulations (such as environmental and occupational safety) are not as strict as in developed countries, a phenomenon referred to as new international division of labor (Fröbel, Heinrichs & Kreye, 1980; Hutton, 2010).

As a result, many well paid manufacturing jobs were lost in Canada. However, the decline of the manufacturing sector is contested by the proponents of professionalization who argue that low-paying manufacturing jobs in Canada were replaced with well-paying employment opportunities for skilled professionals (Gordon, 2013). This may be partly true but there are large segments of the population who are not skilled professionals and thus do not qualify for these jobs. These unemployed have few options, but to look for a service job in competition with a growing number of immigrants (Walks, 2001). Unlike the manufacturing industry with its unionized jobs, the polarized service sector offers well-paid jobs for some qualified people while the rest of the service sector workers earn barely enough to survive (Yalnitzyan, 2000), and oversupply of low-skilled labor keeps the wages low. Those who do not succeed in securing a job, are marginalized to unemployment (Walks, 2010). Socioeconomic polarization is a consequence of these new labor market structures characterized by a division between specialised financial,

producer and informational service industries and the residualized manufacturing and low skilled service sector (Walks, 2001; 2010).

Polarization occurs even in the dimensions of the employment arrangement, job security and policies. Those working in low skilled service sector jobs are often underemployed, without benefits and employment security as they are easily replaceable by other low skilled service sector employees (Walks, 2001). Furthermore, low-income earners have faced the restructuring and retrenchments of the welfare state, which among others entailed shrinking unemployment insurance and other cuts (Walks, 2010). Meanwhile, the Canadian tax and transfer systems were apt to redistribute incomes to curtail growing income inequalities in the 1980s and the early 1990s but have not accomplished that to the same degree since the mid-1990s (Frenette, Green & Milligan, 2009). Parallel demographic changes such as growing numbers of single person households and lone parents have compounded the problem because rising housing cost and other expenditures make it increasingly important to have two people earning incomes (Bunting, Walks & Filion, 2010; Walks, 2010). In combination of restructuring of the labor market, weakening welfare state and ongoing demographic trends have exacerbated the effects of socioeconomic polarizations for the most vulnerable segments of the population, such as lone parents.

Large cities as major scenes of economic activity also display the most noticeable manifestations of socioeconomic polarization (Sassen, 1991; Hamnet, 1994, 1996). This polarization is driven by occupational bifurcation to well-paid professionals and low-

wage service jobs (Sassen, 1991), professionalization that makes low-skilled workers redundant (Hamnett, 1994, 1996), and also by immigration, because large cities attract the majority of immigrants.

Toronto, as the largest city in Canada and the destination of many immigrants, has also been the focus of most studies of socioeconomic polarization in Canada. In his research of Toronto between 1950 and 1985, Bourne found high and low-income districts but no conclusive evidence of income polarization (1990). However, Walks did that for the time period 1971 to 1991, as he discovered occupational and income shifts towards a more unequal and polarized city, and also found evidence of spatial polarization (2001). It can be concluded that the ways of measuring income polarization have become more sophisticated, but it may also be the case that the evidence was not yet there in the data that Bourne had access to.

Socioeconomic polarization can be measured with specific indices such as Walks coefficient of polarization (Walks, 2013) or WT Index (Wang & Tsui, 2000). The Gini-index is the best way to calculate income inequalities (Walks, 2013). However, numerous studies also assume that distribution of employment, education, and income outcomes reflect the level of socioeconomic polarization (ibid). Using Walks coefficient of polarization and WT index, Walks discovered increasing census tract income polarization in Canadian cities, among which St. John's was one of the lowest level of polarization, while Calgary scored even higher than Toronto between 1970 and 2005 (Walks, 2010). Furthermore, Gini concentration ratio for neighbourhood income inequalities was highest

for Toronto, Calgary, Hamilton, and Saint John in 2009, while St. John's was among the cities below the national average (Walks, 2014). These results differ from those of Bolton and Breau, who calculated Gini coefficient for earnings, and in their study St. John's CMA had one of the high income inequalities in Canada in 2006 (2012). This suggests that rising inequalities and socioeconomic polarization are not confined to major metropolitan cities like Toronto. These processes can even occur in cities with less than 200,000, or even 100,000 people.

Overall, processes of socioeconomic polarization are manifested by segregation and a widening gap between the rich and the poor, between households, neighbourhoods, and municipalities (Badcock, 1997; Kesteloot, 1994; Walks, 2013). Kesteloot found that the poorest people with no other alternatives move to neighborhoods dominated by the lowest quality residual rental housing in Brussels (1994). A study of poor populations across eight Canadian Census Metropolitan areas between 1986 and 2006 conclude that there are areas with greater concentrations of poor people, and these areas are socioeconomically more homogenous and more dispersed across the metropolitan areas while poverty has grown most in the suburbs (Ades, Apparicio & Séguin, 2012). Using simulated data by the private survey firm Environics Analytics, Walks added service of debt into his income inequality calculation and found increasing income inequality in the neighborhoods of most Canadian cities in 2009 (2014). Stagnated incomes, living in poor quality neighborhoods and indebtedness also contribute to increasing socioeconomic polarization (Walks, 2013a, 2014).

Income polarization is not without consequence for the housing outcomes. Those with high incomes can outbid the rest of the population in the housing market for the best housing in the most attractive areas with the best amenities (Hulchanski, 2010). The residual housing market articulates the connection between housing affordability and income polarization (Moore & Skaburskis, 2004). Low income earners not only have to pay a higher housing cost in relation to their income (Arnold & Skaburskis, 1989; Carver, 1948; Stigler, 1954), they are also likely to carry a higher debt relatively to their income (Walks, 2013a, 2014) and also have worse location in relation to amenities and places of employment (Carver, 1948; Kesteloot, 1994). The housing market thus reinforce processes of socioeconomic polarization because low income levels lead to poor housing outcomes and these housing outcomes then have an adverse impact on a household's life chances in the areas such as health, wealth accumulation and educational attainment (Moore & Skaburskis, 2004; Walks, 2014). Being confined to the residual sector of the housing market lays a foundation for growing, housing-induced socioeconomic polarization in urban areas.

The housing system itself with its primary (owner occupancy) and secondary (rental) sectors highlights a polarisation enacted by policies. Favoured by policy makers, homeowners are entailed to various tax credits and other incentives while renters have no such benefits (Hulchanski, 2010). In fact, when it comes to rental housing, even investment on rental housing and rental development in Canada are associated with disincentives in comparison to building housing for ownership occupancy (Hulchanski,

2004b). As a result, rental development has decreased over time. Rental markets in many cities in Canada are characterized by low vacancy rates, and rising rents (Walker & Carter, 2010).

The transition to homeownership is associated with wealth transfers that manifest and further contribute to generational socioeconomic polarization. Some first time house buyers have parents who can assist them with the down payment (Heywood, 2011), while others have not. Hence, level parental wealth has an impact on housing outcomes of the next generation. However, when house purchase takes place, more often than not, it is a wealth transfer from the young generation to the older one. This deepens an intergenerational gap because the older generation cash their housing wealth generated during a time period when housing prices were rising rapidly while the young contract large mortgages to pay for their homes (Mortensen & Seabrooke, 2008; Schwartz & Seabrooke, 2008; Toporowski, 2009; Walks, 2013a).

Homeownership as such can be associated with a severe, but rarely addressed polarization that concerns the distribution of wealth (Morissette, Zhang & Drolet, 2002). House purchase is a popular form of investment, and homeownership is frequently the most important and sometimes only way of accumulating wealth in most countries (Megdolugbe & Linneman, 1993; Muellbauer, 2007; Walker & Carter, 2010). Home purchase forces a household to a long-term saving which might not otherwise occur. Equity thus obtained will serve as a safety net for retirement and unexpected events (Smith, 2015; Yates & Bradbury, 2010). Particularly renters with low incomes use too

large a share of their income on rent to be able to accumulate any significant savings and obviously they will have no house to sell when they retire.

Socioeconomic polarization is thus occurring in the labor market and these processes are reinforced by the housing market. However, all Canadian research regarding income inequalities ends in 2006 because the mandatory long-form census was discontinued and replaced with the voluntary National Household Survey in 2011 (NHS). Many social scientists consider the data from the NHS 2011 flawed (Hulchanski *et al.,* 2013a, 2013b). This change of methodology has introduced a bias to the data because households with very low or very high incomes are less likely than others to respond to surveys (Green & Milligan, 2010; Veall, 2010). This critical flaw makes the 2011 data less suited for the study of rising inequalities or increasing socioeconomic polarization.

Furthermore, there is no specific Canadian research about socioeconomic polarization or income inequalities in resource driven economies. Labor market fragmentation in resource driven economies may not occur through a decline of manufacturing sector because of the minor prevalence of manufacturing industries in these economies. Instead, it can be articulated by the segmentation of the labor market into well paid resource sector jobs and lowly-paid service sector jobs. Yet, such economies are associated with economic growth and well paid employment opportunities which would suggest that income inequalities decrease. Particularly, this is the case if the non-traded sector generates employment for low-skilled labor (Goderis, & Malone, 2011; Howie & Atakhanova, 2014). This was confirmed by Fleming and Measham who used the Gini

index to examine income inequalities in mining communities in Australia and discovered that inequalities are growing slower in mining communities compared to non-mining communities (2015). However, this kind of impact may be contingent on the type of economy and what externalities are created (ibid). Residents in resource driven economies may experience an evaporation of the obtained benefits when commodity prices decline and unemployment increases (Goderis, & Malone, 2011; Fleming and Measham, 2015, Howie & Atakhanova, 2014; Lloyd & Newlands, 1990).

The consequences of increasing income inequalities and socioeconomic polarizations for smaller urban agglomerations can be similar to those previously only observed in the greatest cities; increase in alienation, social disruption, crime, substance abuse, prostitution and homelessness (Kesteloot, 1994; Walks, 2001). At present many cities focus on ending homelessness in their region. More could be achieved with a broad intervention in the areas of income inequality, and affordable housing. Specifically, housing market has a potential to alleviate the effects of income inequalities and socioeconomic polarization. But to do that, the market should be able to offer a larger spectrum of housing alternatives in a wider price range. Provision of affordable housing should not be left to the private sector because there are not enough profits to be made to attract private developers into that market (Carver, 1948). Access to affordable rental housing would enable households with low to moderate incomes to make an informed decision between renting and becoming a homeowner. For those low-income earners who have already purchased their homes, there should be targeted support systems and

counseling that enable them to make the best of their situation. Place based solutions are also required. Policies should target disadvantaged neighbourhoods because otherwise the social isolation of the residents of these areas could deprive their life chances and opportunities (Ades, Apparicio, & Séguin, 2012).

2.6. ST. JOHN'S, NEWFOUNDLAND – THE CASE STUDY

The city-region of St. John's, Newfoundland, incorporates most of these themes. As a capital of a province with resource driven economic growth, it has experienced rapidly rising housing prices and rental costs in the 2000s. The resource sector has only generated a limited number of new well-paid jobs while unskilled service sector has expanded. The province has not been able to diversify its economic base to any significant extent, despite its efforts of doing so. Meanwhile, increased consumption has also fuelled the regional economy, partly financed with borrowed money, as indicated by rising indebtedness. A large part of this indebtedness is indicative of the over-heated real-estate market. Rising housing costs have also generated growing housing affordability problems for low and moderate income earners in the city-region while the local labor market provides scant opportunities to increase their earnings.

As a province, Newfoundland and Labrador has a long history as a resource driven economy. European settlers in the province developed an early reliance on the ocean as a source of livelihood as most of them came to the island for the fishery. Moreover, they

also soon discovered that the climate of the region did not favor agriculture and soil quality was generally poor (House, 1985). Gradually, mining industry and forestry provided new opportunities onshore during the 19th century and expanded in the early 20th century (Cadigan, 2009).

Fishery continued for centuries, increasingly with harvest levels that were not sustainable, until the cod stock collapsed and a moratorium was declared in 1992 (Hutchings & Myers, 1994). The regional economy was devastated, and whole communities formerly employed in fishery and related activities lost their employment and the very foundation of their life-style (Gien, 2000). As a result, thousands of young people particularly from rural parts of the province either out-migrated or started commuting to Fort McMurray for employment opportunities in the Athabasca tar sands (Keogh, 2015). New types of fisheries were gradually developed, such as snow crab and northern shrimp. However, fishery accounts for less than 5 percent of the provincial GDP and remains heavily subsidized in the province (Shrank, 2005). This modest contribution is also explained by a shift to other resource industries. Minerals in Labrador and full-scale offshore-oil extraction started generating much higher revenues in the 2000s.

There were various apprehensions before the oil extraction started in the Newfoundland offshore. Would the province be able to control the ownership and development of these resources, given its previous history of handing out the control over its forest-industries and mineral extraction to external agents for insufficient returns and nominal safeguards (Scarlett, 1977)? What would be the impact on the labor market and housing market (Felt

& House, 1980; House, 1985; Scarlett, 1977)? Most importantly, oil related wealth and employment tend to get unevenly distributed in communities with the offshore oil industry, how would this industry contribute to increasing social inclusion and equality in Newfoundland (House, 2003)?

Some of these fears turned out to be unfounded. Three oil fields became operational between 1997 to 2011: starting with Hibernia in 1997, next Terra Nova entered production in 2002, and finally White Rose in 2005. The oil development in Newfoundland has been market-driven, controlled by the multinational oil companies (House, 2003), but the province learned from its experiences. Mistakes were made in the beginning of the off-shore oil extraction, such as accepting low royalties for Hibernia (Ainslie, 2014), although that enabled the province to get an offshore platform built in Newfoundland (House, 2003). The province then also discovered that the royalties should take into account the global oil price and production levels (Fusco, 2007). The administrative work of Canada-Newfoundland and Labrador Offshore Petroleum Board proceeded well and effectively (Ainslie, 2014), although Fusco describes delays, mechanical problems, and lack of means to enforce compliance to companies' development plans (2007). Overall, Newfoundland has benefitted from the institutional strength and experience of Ottawa in negotiations or managing relationships with multinational companies involved in the oil extraction industry (Ainslie, 2014) although the province did not get expected support from the prime minister Harper to introduce a

legislation that would only give an oil company the right to develop a field within a certain period of time after which the right would be forfeited (Fusco, 2007).

The province aspired to generate employment for Newfoundlanders and Labradorians during the built-up phase of the project. However, the province was also concerned about creating a long-term supply of technical services by generating backward and forward linkages to the economy (Ommer, 2007). The slow pace of the development provided opportunities to prepare for this but in general, the local companies did not have the know-how and resources to accomplish the work (House, 2003). During the construction phase of Hibernia, there were many jobs, albeit for a short duration (ibid). Other concerns were about adding value to the product. In 1999, more than 90 percent of the crude oil was directly exported to the USA (ibid). In 2010, about half of the petroleum was refined locally in Come By Chance, and 90 percent of these products were exported to the USA while the rest was consumed locally (Parker, 2011).

Oil wealth has not been without consequence for the public sector. Newfoundland government expenditures per capita have increased during the last ten years faster than for any other province in Canada (Locke, 2013). The public sector expanded and public servants received salary increases (Boessenkool & Eisen, 2012). There were steady $600-800 million earmarked for public administration investments to cover infrastructure deficit which was deemed necessary for ensuring the future growth of the province (Ainslie, 2014). This amount of public spending is also criticised by Locke who further condemns the cutting back of taxes while the provincial debt was (and still is) on an

unsustainable level (2011). The province of Newfoundland and Labrador is using most of its resource revenues for short-term provincial expenditures, while the rest is reserved for the Muskrat Falls Project (Ainslie, 2014). Meanwhile, manufacturing industry consisting of fish, paper print and some oil refining corresponds with 3.2 per cent of the provincial GDP in 2012 (Government of Newfoundland and Labrador, 2013).

The manufacturing sector in Newfoundland has remained small after the beginning of oil extraction. However, Ainslie argues that resource industry has contributed to diversification of the Newfoundland economy, as exemplified by the oil refinery in Come By Chance which is still operational (2014). Offshore oil-related construction industries such as Bull Arm industrial fabrication complex and other fabrication plants such as Cow Head, C&W and Newdock are highly dependent on the needs of the resource industry and besides, subject to competition abroad (ibid) which makes their present and future insecure. Overall, the population residing outside of the city-region of St. John's has not benefitted much from the resource-led economic growth in the province (Cadigan, 2012).

The resource sector has had an impact on the labor market. Still, the impressive growth of provincial GDP creates a false sense of affluence because the province was the leader of GDP growth but only eighth in employment growth (House, 2003). This is significant because the population benefits from economic growth if it creates jobs. There are currently (2012) 6,900 people employed in the off-shore oil sector which corresponds with 3 per cent of the labor force according to Newfoundland government (2013). However, spin-off employment should be considered, and at least some of the

construction (8.6%) and professional scientific services (4.2%) are related to the resource-industry (ibid). Most of the new jobs were created in the low paying wholesale and retail, food and accommodation service sector and these jobs were typically occupied by women (Cadigan, 2012). There are still a significant number of Newfoundlanders, approximately 6-7 percent who commute to other provinces to work (Storey, 2010). This is twice as much as those employed by the local resource industry. There is no research yet about their impact on the regional economy, only anecdotal (visual) evidence in form of new houses, trucks and recreational vehicles (ibid).

Resource-industry has brought population growth in many places but not so in Newfoundland. This can be indicative of the scarce employment opportunities that the capital intensive offshore-oil industry has to offer, even when the multiplier effects are concerned. The population of the province is both ageing and shrinking although St. John's has undoubtedly experienced population growth by almost 10 percent between 2002 and 2013 (Statistics Canada, 2016a). People move to St.John's from rural parts of Newfoundland (House, 1985) which are becoming even more scarcely populated. This is still an important component of population growth in the city-region.

While the oil industry brings wealth, the indirect effects of it are most significant to curb the rising inequalities. For the future, it is most important that local authorities "invest oil revenues in progressive efforts at economic diversification and improving social amenities" (House, 2003 p 20). This would distribute the benefits more equitably than they would do otherwise. One effort to redistribute resource wealth to the residents of the

province was done by launching a program of tax cuts in 2007 to stimulate consumption (Government of Newfoundland & Labrador, 2007). However, tax-cuts do little to curb rising inequalities as they mainly benefit those already wealthy. As a result, the province also collects lower levels of tax revenue that could be used for social purposes. Secondly, a large segment of minimum wage earners in Newfoundland (Brake, 2013) experienced an improvement of their income levels, as the minimum wage gradually increased from $7.00 in 2007 to $10.00 in 2010 (Government of Newfoundland & Labrador, 2015). This improvement was affected by the economic growth (Brake, 2013), but there was no further increase for four next years (Government of Newfoundland & Labrador, 2015). While some of the minimum wage earners are young people still living at home with their parents, there is no information how many are trying to support a family with these earnings. Overall, there is no evidence of any progressive initiatives yet in the province. None of the revenues is set aside for the future when the oil reserves are depleted, or even when economic downturn occurs such as the one the province experiences at present after a significant drop in oil prices.

Resource extraction industry has undoubtedly had an impact on the local housing market, as foreseen by Felt and House. Shortly after the first discovery of oil, they conducted research about how Aberdeen and Stavanger had been affected by the oil extraction industry and compiled a report which was commissioned by the Oil and Gas Sub-Committee of the Economic Development Committee. Felt and House expected that the housing prices would increase if no mitigating governmental policies were implemented,

partly because Newfoundland has a relatively low proportion of publicly owned housing compared to Aberdeen and Stavanger (1980).The authors pointed out that Scotland increased the supply of housing in anticipation of an increased demand and they suggested that Newfoundland should do the same and also that some of the oil and gas money should be used to subsidize housing (ibid).

Housing stock in St. John's reflects the history and culture of the province. Homeownership is clearly the preferred tenure. The province of Newfoundland and even the CMA of St. John's display higher levels of ownership occupancy than do other Canadian provinces or cities. Homeownership is not only a North American dream but it is culturally embedded in the province with a large share of rural population (Beaton, 2004). Not surprisingly, there is a relatively small share of conventional rental apartment buildings (Felt & House, 1980) while some single detached and row houses are also at the rental market. In addition to that, secondary rental sector is important in St. John's because many of the single detached houses have basement apartments (Canada Mortgage and Housing Corporation, 2012). This rental supply is further combined with a public housing sector which is large in the North American circumstances although some of them were built as early as in the 1950s (Sharpe, 2005). In contrast to many other regions, the province is fortunate enough to have generally positive attitudes towards secondary rental sector (Research associates, 1992), and a group of advocates who work hard to promote and maintain affordable housing in the province (Beaton, 2004).

Nevertheless, apprehensions concerning housing have proved to be justified. Housing costs both for buyers and renters increased. New House Price Index (NHPI) shows that house prices increased by 100 percent between 1997 and 2010 (Statistics Canada, 2016b). It has been suggested that the housing price increase was caused by speculation. St. John's housing market experienced rising housing prices already shortly after the discovery of off-shore oil in the 1980's and this can be attributed to speculation (House, 1985). There is only anecdotal evidence about speculation later on (McMahon, 2015). Still, it is likely that some occurred as speculation is a normal part of housing market dynamics prior and during an economic boom.

House price escalation has had an impact on the rental sector in St. John's. The rental market had a long period of high vacancy rate untill pressure from rising demand became excessive and the vacancy rate plummeted (Canada Mortgage and Housing Corporation, 2015). The rent levels which had not even kept up with the inflation, started to rise (ibid), which was a significant change for people who were used to having access to affordable housing in the city. Simultaneous in-migration of Newfoundlanders from the rural parts of the province increased housing demand in St. John's and thus compounded to the problem.

Today, after a significant drop in oil prices, the housing market is cooling down, and housing prices have decreased. The vacancy rate in the rental market has eased, although rents are still relatively high. The high-end rental sector appears to be most under pressure to decrease rents because demand has dropped after oil executives left (CBC,

2016). Meanwhile, housing boom in an environment of record low mortgage rates has increased indebtedness in the province. Housing debt in Newfoundland has risen although not close to the national top level. However, this indebtedness is combined with a credit card debt which is only second to some New Brunswick communities (Walks, 2013a, 2014). This puts many households in a vulnerable position now that oil prices have dropped, and the unemployment rate is expected to increase.

Overall, many of the themes of resource economics literature are manifested by the city-region of St. John's, Newfoundland. Globalization translates into free movement of capital and labor which enabled Newfoundland to get started with its resource-extraction industry. As part of a global resource industry system, the province relies on global capital, multinational oil companies, and specialised external workers for jobs that the province has not qualified candidates for, due to the small size of its economy and population. This has contributed to a disconnection between the local labor market and the housing market. Housing for ownership occupancy is promoted by policy-makers in the otherwise deregulated housing market while the provision of housing for low to moderate income earners has been neglected. Deregulated financial market is also instrumental in providing different mortgage products for those who purchase housing. The inflated housing values translate into high housing debt levels, and increasing property tax levels.

Fragmentation of the local labor market into well-paid employees in the resource sector and lowly paid supporting service sector contributes to socioeconomic polarization in the

housing market. Housing tenure choice is generally determined by household income. Those with low incomes are confined to the rental sector while others tend to purchase a home. Homeowners as a group is polarized as low to moderate income earners are likely to be too burdened by their housing cost to reap social and economic benefits from the tenure. Rental sector is very heterogeneous with its primary, and secondary private sectors and social housing. It is impossible to assess its realities without qualitative research. However, polarisation is likely to occur between homeowners and renters as gaps in income and wealth are widening, and even between homeowners at different strata of wealth. Those burdened by their housing cost are likely to struggle to pay for their non-housing consumption. Polarisation in the housing market reinforces the polarization that has already taken place in the labor market and impedes concerned households from finding an opportunity of improving their situation.

The local economy is further fuelled by spending. Public spending continues, feeding from an atmosphere of entitlement. Consumers are encouraged to take on debt, while spending on diverse goods and service providing sectors fuels the economy. In addition to these low paying service jobs, mainly public sector jobs are created due to the lack of diversification of the regional economy which requires even more public spending. This can only last as long as the boom continues.

2.7. CONCLUSIONS

It can be concluded that there is a wealth of evidence in the reviewed literature that resource economies give rise to processes that contribute to socioeconomic polarization in which the housing market has a central role. This is evident in what has occurred in St. John's, Newfoundland after the beginning of oil extractive industries. While resource industries generate some well paid jobs, they generally result in expansion of public sector, and counteract diversification of the regional economy. Specifically, manufacturing industries do not tend to thrive in resource-based economies. Furthermore, well-paid employees in the resource industry sector, and others experiencing the spill-over from it, profit from the resource-led economic growth. Meanwhile, other segments of the population benefit indirectly and much less, and many of them are confined to low paying service sector jobs. The segmentation of the labor market has an impact on income levels which determine housing market outcomes, as the demand of well-paid segments of the population make housing prices escalate. This reverberates to the rental housing market, giving rise to increasing rentatl costs.

Polarization in the housing market reinforces polarization already occurring in the labor market by making it more difficult for a person (or household) to improve one's situation. An insufficient income level limits one's housing choice. It may force households to

qualitative or quantitative under-consumption of housing. Despite these potential compromises, housing cost becomes a burden for both renters and mortgaged homeowners with low to moderate incomes. Others may be lured to over consumption of housing when the economy is booming. Any housing consumption that requires taking on a mortgage is associated with a risk, particularly so in the volatile environment of resource driven economy in which economic growth and increasing income levels are followed by economic decline, contracting incomes, and potential negative equity for homeowners.

CHAPTER 3: HAS THE OIL BOOM GENERATED NEW PROBLEMS OF HOUSING AFFORDABILITY IN RESOURCE DRIVEN AGGLOMERATIONS IN CANADA? A CASE STUDY OF ST. JOHN'S, SASKATOON, CALGARY, EDMONTON, AND FORT MCMURRAY, 1991-2011

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3.1. ABSTRACT

Recent studies focused on Canadian metropolitan areas suggest that growing income inequality underlies problems of housing affordability for low and moderate income earners. This article investigates how unprecedented commodity-led economic growth between 1991 and 2011 has impacted housing affordability in five resource driven agglomerations in Canada. Housing affordability is analyzed across income quintiles, looking at income, housing costs, tenure, housing quality, and housing debt. Using Statistics Canada Census micro data, we find that low to mid-income earners faced the fastest relative increase in housing costs between 1991 and 2011, combined with the smallest income gains over that period. Homeowners in the lowest income quintiles seem particularly vulnerable when carrying a mortgage, with economic volatility engendering greater risks of housing market contractions or job loss over time. Whereas previous literature has emphasized housing vulnerability in large metropolitan areas, the results highlight new patterns of housing-related vulnerability in resource driven regions in Canada.

3.2. INTRODUCTION

There is growing evidence that income inequality is positively correlated to a heightened risk of housing affordability problems for low and moderate income earners in Canada and elsewhere (Dewilde & Lancee, 2013; Matlack & Vigdor, 2008; Moore & Skaburskis, 2004; Walks, 2010). Resource booms can be expected to give rise to increasing income disparities because rapid growth in extractive activities and rent dynamics generate new well-paying jobs which tend to distort income levels within local labor markets (Goderis & Malone, 2011; Polèse & Shearmur, 2005). Increased disposable income among resource workers will likely exert an inflationary pressure on housing prices for larger segments of the local market, with the potential to generate new problems of housing affordability over time. As part of the recent and unprecedented Canadian "oil boom", metropolitan regions such as St. John's (Newfoundland and Labrador - NL), Saskatoon (Saskatchewan - SK), Calgary, Edmonton, and Fort McMurray (Alberta - AB), have been the scene of exceptional economic growth accompanied by sharply increasing housing prices between 2000 and 2014. These transformations suggest that this made it increasingly difficult for low and median income earners to access adequate, suitable and affordable housing during this period.

Past research has addressed housing affordability issues in major metropolitan areas in Canada (e.g., Arnold & Skaburskis, 1989; Bunting, Walks & Filion, 2004; Skaburskis, 2004). However, much less attention has been dedicated to smaller urban agglomerations

that are characterized by resource-led growth. Yet, since Canada's main exports shifted from manufactured goods towards petroleum and mineral production in the mid-2000s (Stanford, 2008), urban agglomerations serving expanding resource-based economies became the growth engines and epicenters of the Canadian economy. How have these rapid transformations impacted income distribution and housing-related socioeconomic dynamics in these agglomerations? Changes in housing affordability, with household income and housing costs as basic dynamics, are not without consequences. Housing has a fundamental importance for the physical, social and economic well-being of individuals and families. Affordability problems are hence at risk of generating new vulnerabilities, with the specter of larger housing-related socioeconomic polarizations taking place over time (Walks, 2013, 2010).

This paper explores the evolution of housing affordability in five resource driven urban agglomerations in Canada. Based on Statistics Canada's Census micro data, the article provides an empirical analysis of the impacts of income and housing cost changes on accessibility to affordable housing for different income groups. Housing affordability is analyzed across income quintiles for four specific dimensions between 1991 and 2011, namely housing tenure, cost to income ratio, housing quality, and housing debt. The paper provides empirical evidence that low to mid-income earners have faced the fastest relative increase in housing costs, combined with the smallest relative income gains over the period studied. Homeowners in the lowest income quintiles are particularly vulnerable when carrying a mortgage, with economic volatility engendering greater risks

of housing market contractions or job loss over time. The paper concludes that resource booms are prone to generating housing affordability problems and housing-related vulnerability in low to mid income earning segments of the population in extractive urban agglomerations.

The article is arranged as follows. The first section briefly discusses housing affordability in the context of resource driven agglomerations in Canada and elsewhere. The next section describes the data and methodology used in the study. The results are then presented in three distinct subsections: (1) incomes, (2) housing costs, and (3) housing affordability. Finally, we conclude with a general discussion of the relevance of these findings in the context of existing literature and policy.

3.3. HOUSING AFFORDABILITY IN RESOURCE DRIVEN AGGLOMERATIONS

Studies on extractive regions emphasize that economic booms linked to commodity prices engender rent-seeking dynamics and segmented labor markets characterized by unequal income distributions over time (Baland & Francois, 2000; Goderis & Malone, 2011; Howie & Atakhanova, 2014; Lawrie, Tonts, & Plummer, 2011; Tonts, Martinus, & Plummer, 2013). Increased income levels linked to fast growing resources and related support activities create a rising regional demand for labor and, as such, housing. One consequence is that booming resource regions are at greater risk of facing increasing

housing costs and rents which, over time, are likely to generate new problems of affordability for low and moderate income earners. New vulnerabilities may further impact homeowners, especially the ones carrying a mortgage, with the possibility of a sudden market contraction following a commodity-led economic downturn. Although these dynamics can be interpreted as a result of income disparities taking place in the labor market, the differentiation of housing outcomes across income distributions also implies that processes of polarization may additionally take place within the housing market.

These dynamics are not entirely new. Resource driven economic growth has previously been associated with rapidly rising housing prices in various countries around the world (Blackader & Baster, 1992; Farren, 2014; Harris, Lloyd, McGuire, & Newlands,1986; Randall & Ironside, 1996; Rolfe, Miles, Lockie, & Ivanova, 2007; Stangeland, 1984). Nevertheless, housing has seldom been a main topic of research for resource driven urban agglomerations. Notable exceptions are papers on the interaction between the labor and housing markets in Aberdeen, Scotland (Lloyd & Newlands, 1990); studies on housing-related impacts of major resource developments in Darwin, Australia (Ennis, Finlayson & Speering, 2013); and other studies that focus on vulnerable populations in peripheral and rural areas, such as indigenous groups or people living on fixed incomes in resource communities (Haslam, McKenzie & Rowley, 2013; Ryser & Halseth, 2011). A common finding is that resource driven economic growth does not benefit all segments of the population, with housing affordability stress taking place among the unemployed, and

low to middle income earners (Ennis, Finlayson & Speering, 2013). However, past research offers an incomplete picture, often limited to one dimension of the resource-related housing affordability problem. For instance, studies have so far provided only partial insights as to how affordability varies between renters, mortgaged homeowners, and across income groups. Prior research has also been fixed in time and has not looked beyond traditional measures of affordability. As a result, there are fundamental aspects currently lacking that would inform the discussions on housing policies in these agglomerations.

Several mechanisms underlie the affordability problem in extractive regions. Resource booms may generate sudden hikes in housing prices because local supply often cannot satisfy the quick increase in demand. Growing disposable income further exerts inflationary pressures on housing prices, with rising demand on real-estate properties also positively impacting rental prices and decreasing vacancy rates (Agnello & Schuknecht, 2011). This is also an ideal environment for speculative behaviors frequently associated with resource booms (Ennis, Finlayson & Speering, 2013), with the greatest impacts taking place when housing markets cannot rapidly adjust to the sudden escalation of demand (Malpezzi & Wachter, 2005).

Although rising housing prices are partially counterbalanced by increased local income levels, the capital-intensive nature of resource industries in fact often translates into limited employment opportunities. Resource extraction development in a region may add or alleviate existing income inequalities, depending on the previous circumstances in the

region and what spillovers it generates (Fleming & Measham, 2015). Yet it often contributes to a fragmentation of the labor market, since well-paying resource-related jobs are often restricted to a small segment of the population (Harris *et al*., 1986). Socioeconomic polarizations may further arise from new gendered divisions, because most resource-related employment is for men (Lloyd & Newlands, 1990; Randall & Ironside, 1989). In broad terms, resource related economic growth tends to spill over into construction and technical services, and generates a higher demand for various food, retail and accommodation services (Marchand, 2012). For instance, most of the new employment opportunities for women in Newfoundland in the 2000s—a period dominated by fisheries and oil developments in that province—were created in the low paying service sector (Cadigan, 2010). As a result, an income gap between the unskilled service workers and those working in the resource sector makes it difficult for low-income earners to be competitive in the local housing market (Rolfe *et al*., 2007).

In addition, recent general changes in the labor market and the social landscape affect household incomes, particularly in the low end of the income spectrum. The labor market in Canada, as in many other countries, has gone through major restructurings. Manufacturing and extraction industries have declined, while a precarious new flexible labor market dominated by highly paid skilled professionals and a low paid service sector has emerged (Walks, 2001, 2010). Unemployment and loss of manufacturing jobs have contributed to widening income gaps (Bolton & Breau, 2012). Low income earners are the most affected because the federal government introduced cutbacks to social assistance

programs, health care, education, and subsidized housing, downloading many of these responsibilities to the provinces in 1995 (Evans 2002; Hulchanski, 2004b; Kneebone & White, 2009). Moreover, since the mid-1990s the Canadian tax and transfer systems have not been able to redistribute incomes the way they did in the 1980s and the early 1990s (Frenette, Green & Milligan, 2009).

This study fills a knowledge gap by exploring temporal patterns of housing affordability in resource driven urban agglomerations that became the new epicentres of the Canadian economy during the past oil boom. We seek to find answers to the following research questions:

(1) Are there specific trends in income and housing costs which contribute to an increasing risk for housing affordability problems between 1991 and 2011?

(2) If so, what patterns of housing related vulnerability are emerging in these urban agglomerations?

Housing is not only a basic human need. The lack of affordable housing has adverse effects on the livability of a community if lowly paid service sector employees cannot find housing they can afford (Ennis, Finlayson & Speering, 2013; Goldenberg, Shoveller, Koehoorn, & Ostry, 2010). A deficient supply of affordable housing affects population retention, and it has also been linked to slow-down of employment growth (Chakrabarti & Chang, 2015). There is very little recent research on housing affordability in resource driven communities in Canada, and no recent housing research in St. John's,

Newfoundland. This research therefore makes an important contribution by addressing a highly topical and under-researched contemporary concern.

3.4. DIMENSIONS AND INDICATORS OF HOUSING AFFORDABILITY

Housing affordability entails that a household is able to occupy an adequate and suitable dwelling and still have enough disposable income for non-housing necessities and savings (Bramley, 1990). Researchers frequently use a shelter cost to household gross income ratio as a measure of housing affordability. Housing is considered affordable if this shelter cost to income ratio is below a predefined threshold value, usually set to 30 percent (Bogdon & Can, 1997). Although this ratio combines the two most important elements of housing affordability, namely income and housing cost, it inevitably leaves out various other conditions that have a significant impact on housing affordability outcomes, such as remaining disposable income (Stone, 1990, 2006) and household structure (O'Dell, Smith & White, 2004). A household spending less than 30 percent of its income on housing may be burdened by its housing cost whereas another household spending more than 30 percent or temporarily even 50 percent may still be able to pay for the non-housing necessities (Bogdon & Can, 1997; Rowley, Ong & Haffner, 2015; Yates, 2008). Yet most scholars still rely on the housing cost to income ratio because it is simple to calculate and offers a comparable indicator over time and in various contexts (Hulchanski, 1995). It also has a long history both in the social sciences and as a policy

tool (Bogdon & Can, 1997), with some authors arguing there is no better alternative (Heylen & Haffner, 2013).

However, housing affordability is too complex a concept to be expressed only as a cost to income ratio. In the literature, this ratio has often been coupled with overcrowding and structural adequacy of the dwelling (Bogdon & Can, 1997; O'Dell, Smith & White, 2014). Furthermore, housing affordability for homeowners involves additional dimensions that are not present in the case of renters. For instance, housing value (or market price) to income ratio links residential property market outcomes to those of the local labor market, while providing a long-term perspective on housing affordability (Gan & Hill, 2009). This ratio is widely used for the comparison of different housing markets (e.g., International Monetary Fund [IMF], n.d.). Most homeowners need to fund their house purchase by contracting a mortgage at a given rate, with the ability of doing so known as "purchase affordability" and debt service known as "repayment affordability" (Gan & Hill, 2009). Although repayment affordability can be compared to renters' housing affordability, indicators for mortgage debt and housing equity provide a more complete assessment of housing affordability for homeowners. Therefore, what housing affordability means, and how it is measured, is contingent on housing tenure (Quickley & Raphael, 2004).

Housing tenure choice is constrained by household savings, income level and credit history, the lack of which preclude a transition to homeownership. The main alternative to homeownership is private rental tenancy. The rental market is dominated by low and

moderate income earners who are more likely to be burdened by their housing costs than homeowners (Hulchanski, 2004a, 2007). Meanwhile, those who cannot afford paying market rent will be confined to a small social housing sector in decline. This sector is comprised of government subsidized social housing, non-profit and co-operative housing (Hulchanski, 2004a). Housing affordability in the social housing sector is often warranted by asking rents that are geared to income.

Ownership occupancy is associated with perceived benefits, but also real obligations and different risks than those of renters. Homeownership provides a sense of social, economic and physical security (Smith, 2015). Moreover, a housing purchase is not only about acquiring a home; it is also increasingly an investment and a safety net to secure one's retirement (Smith, Searle, & Cook 2009; Smith, 2015; Yates & Bradbury, 2010). However, scholars have started questioning if homeownership has been correctly identified as the source of all the social and financial benefits it has hitherto been associated with (Meyer, Yeager & Burayidi, 1994; Shlay, 2006). Debt service is not the only housing cost for homeowners; there are also property holding costs such as taxes, insurance, utilities, maintenance costs and emergency repairs (Meyer, Yeager & Burayidi, 1994). Although a transition to homeownership is generally regarded as a gateway to improved wealth and social status, it should also be noted that homeowners in low or moderate income brackets are more likely to be burdened by their housing costs, and less likely to reap financial and social benefits from homeownership than their wealthy counterparts (Foster & Kleit, 2014; Yates, 2002). Therefore, policy attempts to

make homeownership accessible for low-income earners can be misguided if the sustainability of this tenure for these individual households is not considered (Rohe, Van Zandt & McCarthy, 2001; Drew 2013).

Both housing affordability and tenure choices are affected by policies. Current tax incentives and financial deregulation in Canada encourage supply and demand of housing for ownership occupancy, providing scant support to the rental housing sector. As a result, there has been very little rental housing development in all of Canada since the 1990s, when federal regulations made it more profitable to invest in condominium development than private rentals (Drummond, 2004; Drummond, Burleton & Manning, 2004). As a result, much of the existing rental stock has been demolished, rehabilitated for more high-end use or converted into condominiums (Canada Mortgage and Housing Corporation, 2012; Drummond, Burleton & Manning, 2004; Walker & Carter, 2010). Meanwhile, prospective homeowners can access mortgage funding at low interest rates (Schwarz & Seebroke, 2008). Some of them will purchase overly large homes (Weller & Sabatini, 2008) because of the popularity of housing as an investment. Growing numbers of low and moderate income earners also want to become homeowners, and they all contribute to rising housing prices (Gan & Hill, 2009).

Increasing house prices lead to higher levels of indebtedness. Young people and low income earners often carry a disproportional share of this debt (Walks, 2013, 2014). They run a risk of experiencing mortgage payment stress or even default if household income decreases or interest rates rise (Smith, 2015; Smith, Searle & Cook, 2009). In Canada,

one out of five indebted households has less than $5,000 in savings to handle unexpected costs (Alexander & Jacobson, 2015). This is particularly risky in resource driven economies, which are prone to reflect the cyclic variation of commodity prices. In such an economy, an economic downturn is associated with rising unemployment in the regional labor market. The market value of houses may also decrease (Smith, 2015), and the negative equity can make homeowners unable to move elsewhere to search for employment (Chan, 2001).

Meanwhile, housing affordability has replaced housing quality as the main focus of housing research because housing affordability has deteriorated while housing quality has improved (Bogdon & Can, 1997; O'Dell, Smith & White, 2004). Yet housing quality problems still exist. For example, research has found negative health outcomes associated with housing quality problems such as dampness and mold, lack of insulation, improper heating and ventilation (Pearson, Barnard, Pearce, Kingham, & Howden-Chapman, 2014) and overcrowding (Baker *et al*., 2000). Negative social, psychological and physical outcomes can be linked to housing located in a dysfunctional neighborhood devoid of amenities, and far away from family or other social networks (Yates, 2008). Furthermore, housing quality research can overlap with poverty research because spatial concentration of low income populations tends to create disadvantaged neighborhoods (Ades, Apparicio & Séguin, 2012; Carver, 1948). A serious consequence of the lack of affordable housing is that low and moderate earners may be able to afford their housing only by

compromising in quality, amount of space and proximity to amenities (Matlack & Vigdor, 2008).

3.5. DATA AND METHODOLOGICAL APPROACH

For the purpose of this study, housing affordability is approached through interrelated dimensions of income, housing costs, the type of tenure, housing quality and housing debt. Income earned in the labor market is likely to impact housing tenure choice and housing quality, while also determining the extent of housing costs and housing debt. Each of these four dimensions constitutes a potential source of housing related polarization and vulnerability, and each of them has been linked to a risk of increasing socioeconomic polarizations, as indicated in the literature review.

The research relies on the use of Statistics Canada's quinquennial census microdata files (1991-2006) and National Household Survey 2011. In our analysis, we use a household as a basic unit because a household, by definition, is a group of people who occupy the same dwelling (Statistics Canada, 2013a). The scope of this research has been further limited to non-farm households living in private dwellings because shelter costs for farm households cannot be separated from those of the agricultural operation (Statistics Canada, 2013a). Moreover, collective housing (such as lodging houses, institutions and hotels) and band housing were excluded because they provide no data that are comparable to renters and owners in private dwellings.

Uncertainty concerning the quality of the NHS 2011 data should be taken into account. The change of name from Census to the National Household Survey in 2011 reflects a crucial difference between the respective data sets. Statistics Canada had a long established practice of conducting a national census every five years, and this mandatory long-form questionnaire provided extensive and representative socioeconomic data on the Canadian population until the government replaced it with a voluntary National Household Survey in 2010. There was no study conducted on potential effects of this change and Statistics Canada has consequently advised caution when using NHS 2011 data for longitudinal analysis (Statistics Canada, 2013b). Various scholars argue that a bias was introduced because non-respondents are not likely to be a similar population as those responding to the survey (Green & Milligan, 2010; Veall, 2010). Although the data quality of NHS 2011 is criticized by social scientists and economists, they are still the most recent census scale data available after the census of 2006. However, the direction of potential non-response bias should be anticipated in longitudinal analyses. It is reasonable to assume that the results for 2011 would display increasing real income levels, in accordance with the previous comparisons between tax filler and NHS data (Hulchanski, Murdie, Walks, & Bourne, 2013). Unfortunately, this increase is likely to be overstated for low-income earners and understated for high income earners (Green & Milligan, 2010), which would result in seemingly lower income disparities than there should be. In this analysis, the trends are hence provided for all years, but results are interpreted with the potential directionality of this bias in mind.

Trends and patterns of housing affordability are analyzed by income quintiles within the selected urban agglomerations. The sum of total gross incomes of all members of a household is used to rank and aggregate individual households into five income quintiles, excluding households with income lower than $1,000. We review income evolution and all indicators of interest for each income quintile separately because this methodology, unlike the use of aggregated average and median values, exposes the particular impacts in different positions of the income spectrum (Lawrie, Tonts & Plummer, 2011; Rowley & Haslam-McKenzie, 2010). All dollar amounts are adjusted for inflation using Bank of Canada rates to 2005 dollars.

The Census and National Household Survey datasets provide housing cost as gross rent for renters and owner's major payment for homeowners. In both cases, this housing cost refers to the total average monthly payment to secure shelter, and includes electricity, oil, gas, coal, wood or other fuels, water and other municipal services, cash rent, and, where applicable, property taxes, mortgage payments, and condominium fees (Statistics Canada, 2013a). Dimensions of housing affordability are operationalized with the help of variables available in the Census and National Household Survey datasets. The main indicators are defined and calculated from these variables as follows:

(1) Tenure as a percentage of homeowners in each income quintile.

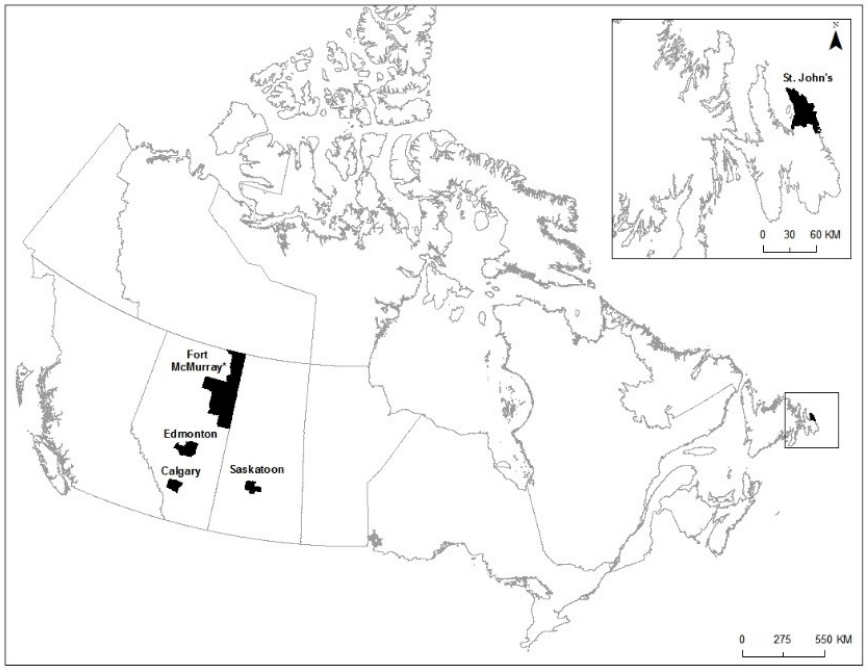
(2) Housing cost to income ratio as a percentage of households using 30 percent or more of their gross income on housing.

(3) Debt as a percentage of homeowner households with a mortgage and housing value to income ratio.

3.6. DESCRIPTION OF SELECTED RESOURCE DRIVEN AGGLOMERATIONS

The late 2000s has seen an unparalleled commodity boom that has pushed forward resource driven urban agglomerations as the epicenters of economic growth in the Canadian economy. A prime example is St. John's, Newfoundland, which ranks as the fifth fastest growing Census Metropolitan Area (CMA) for its GDP between 2001 and 2009 (Brown & Rispoli, 2014), thanks to its new role as a command and service center in a province that has recently experienced an offshore oil-related economic boom. Other urban agglomerations with expanding oil-based economies and serving a similar role during this period include the Albertan CMAs of Calgary, Edmonton and the urban service area Fort McMurray in the regional municipality of Wood Buffalo (hereafter referred to as Fort McMurray). These regions were all selected because of the prominent share of oil-related employment and royalties within their provincial economy (Lefebvre, Arcand, Sutherland, Wiebe, & McIntyre, 2013). Saskatoon is further added to offer a perspective on resource driven mid-size CMAs. Saskatoon has experienced a phenomenal growth related to its combined oil and potash commodity boom, with its GDP growth between 2001 and 2009 only second to Regina (Brown & Rispoli, 2014). The location of the five agglomerations is provided in Figure 1.

Figure 2. The location of the five agglomerations covered in this study



These five urban agglomerations have different economic profiles (Table 1). Calgary and Edmonton are large metropolitan areas that are among the fastest growing in Canada, ranking 4th and 3rd among Canadian CMAs for GDP growth with high population increase between 2001 and 2009. Saskatoon is less than half of their size, but it is also facing significant population growth because of its strong economy. The smallest CMA, St. John's, is one of the oldest English settlements in North America, although today it is a small metropolis "on the margins" (Lepawsky, Phan & Greenwood, 2010), challenged by its geographic location far away from major metropolitan areas. Despite important economic growth, its population increase is limited. The most important contributor to population growth in the St. John's census metropolitan area comes from people moving

from rural Newfoundland to the city. Fort McMurray, the epitome of a modern boomtown, is also remote, but lucrative employment opportunities kept attracting people during the oil boom, some of this occurring through fly-in, fly-out arrangements (Keogh, 2015; Storey, 2010).

Resource-related employment is above the national level in all five agglomerations, which were also ranking in the top five CMAs for their GDP growth between 2001 and 2009 (Table 1). Fort McMurray is adjacent to resource industries in the Athabasca bituminous sands, while St. John's is a provincial hub of offshore oil extraction. Edmonton serves as a regional center for petroleum industries and mining, as does Saskatoon for potash and oil. Calgary, on the other hand, has become an oil-related corporate city in which many head offices and producer services are located, and as such it has experienced very strong growth in the form of capital investment, employment growth and in-migration (Miller & Smith, 2011). Edmonton has a fairly diversified economy, and its location—about a five hour drive from the Athabasca bituminous sands—has also made it the city of choice for many of those employed in Fort McMurray (Keogh, 2015).

Table 1. Demographic and economic profiles, selected urban agglomerations, Canada.

	Population 2011*	Population growth (%) 1991-2011*	GDP growth (%) Rank among CMAs 2001-2009**	Location Quotient (LQ)*** Rank among CMAs Employment in Oil extraction (NAICS 211) in 2011
St. John's	196,966	15%	68% (5th)	2.4 (12th)
Saskatoon	260,600	24%	78% (2d)	0.3 (34th)
Calgary	1,214,839	61%	73% (4th)	11 (4th)
Edmonton	1,158,869	38%	78% (3d)	1.9 (14th)
Fort McMurray	72,807	80%	---	62 (1st)
Canada	33,476,690	23%	43% (---)	1 (---)

Source: *Statistics Canada (2010, 2012, 2016a); **Brown & Rispoli (2014). ***LQ: See equation 001 in Appendix.

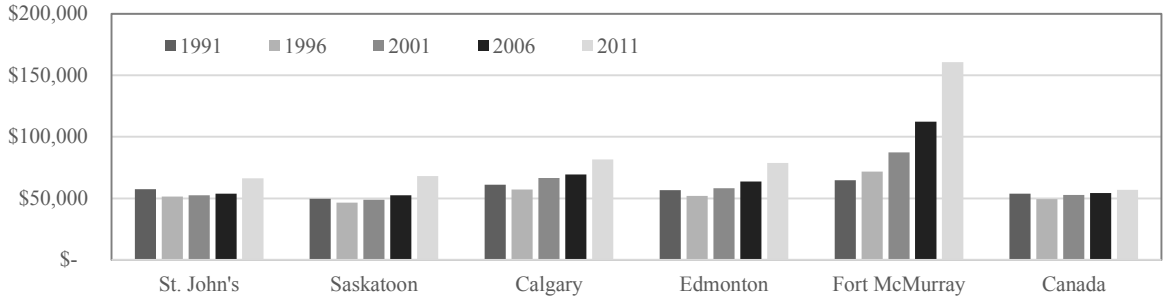
3.7. PATTERNS OF HOUSING AFFORDABILITY IN RESOURCE DRIVEN ECONOMIES

3.7.1. Household incomes

For the purpose of this study, household income is defined as gross income before taxes, adjusted for inflation in 2005 constant dollars. Overall, the evolution of median incomes across the five CMAs shows that income levels and growth remained above the national average for the entire period between 1991 and 2011, with the exception of St. John's and Saskatoon, which only exceeded the Canadian average in 2011 (Figure 2). Median incomes in Calgary and Edmonton exhibit significant gains after 1996, with Calgary moving from $57,248 to about $81,665 in 2011 and Edmonton from $51,937 to $78,683

over the period. However, the fastest increase by far has taken place in Fort McMurray, with incomes passing from $64,739 in 1991 to $160,856 in 2011—ending considerably above the Canadian median income of $56,892 in 2011. Saskatoon and St. John's show a relatively modest increase until 2006, then they sharply increase to surpass the Canadian median income level, with respectively $66,298 and $68,032 in 2011.

Figure 3. Median incomes in St. John's, Saskatoon, Calgary, Edmonton, Fort McMurray, and Canada 1991-2011



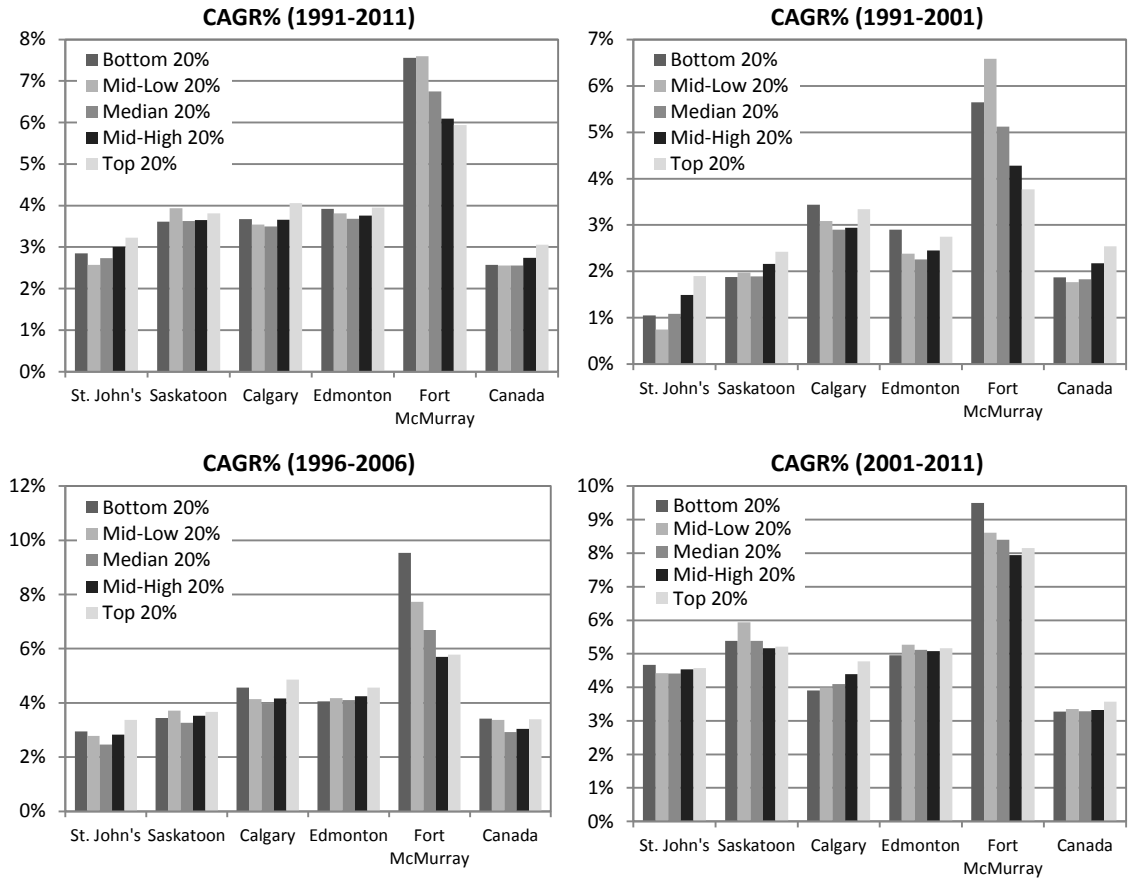
Source: Statistics Canada microdata, compiled by authors.

Figure 3 offers additional insights into the underlying changes in the distribution of income, looking at real income growth per income quintile, expressed as compound annual growth rates (CAGR). Trends between 1991 and 2011 are provided along additional decennial periods (1991-2001; 1996-2006; 2001-2011), keeping in mind the aforementioned data limitations of the 2011 NHS[1]. Unsurprisingly, the results show that revenues increased faster in the five agglomerations than the Canadian average—a trend

[1] Statistics Canada estimates that a non-response bias leads to an underrepresentation of lower income groups in the non-mandatory 2011 NHS as compared to previous Census years that are mandatory. Prior periods to 2011 offer more robust estimation of real changes, while there could be a potential underrepresentation bias among lower income groups in 2011.

shared across all income quintiles. This supports the idea that resource-led GDP growth has translated into higher income gains in these agglomerations over the period. However, these trends are not homogenous across income quintiles. The fastest increase is systematically found for the top and mid-high income quintiles in almost all five agglomerations, especially in the earlier 1991-2001 and 1996-2006 periods when resource-led economic activity was developing—a result that may not be unrelated to possible non-response bias of the 2011 NHS data. Surprisingly, Fort McMurray displays a trend which diverges from other agglomerations and the national average, with the highest increase taking place in the lowest income quintiles. One explanation may be the labor intensive nature and scale of oil sands extraction activities, which rely on several trades' jobs and a growing need for support service activities.

Figure 4. Income increase between 1991 and 2011 by quintile. Compound Annual Growth Rate (CAGR)* in percentage

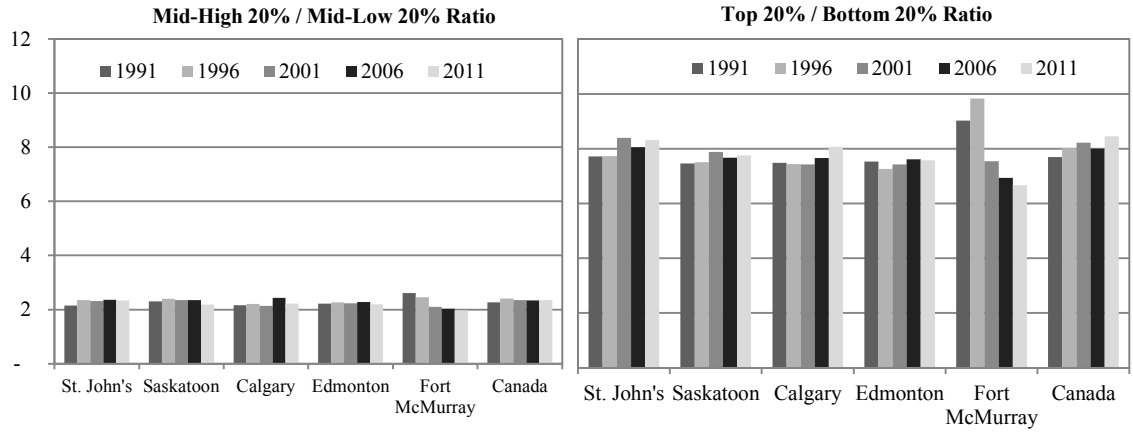


Source: Statistics Canada microdata, compiled by authors;
* CAGR%: Compound Annual Growth Rate in Percentage (See equation 002 in Appendix).

To account for the evolution of income disparities, income ratios have been calculated based on median income of top to bottom and mid-high to mid-low income quintiles. Changes in these disparities between 1991 and 2011 are displayed in Figure 4. Consistent with income trends in Figure 3, these results show that mid-range income inequalities have decreased in Saskatoon and Edmonton. Mid-range income disparities have only

increased in St. John's and Calgary, which may be indicative of the lack of well-paying employment in the lowest quintiles. Top to bottom disparity has also increased in Saskatoon and Edmonton, although only slightly. Greater economic diversity in these two agglomerations may offer an explanation for this outcome. Contrasts are found in Fort McMurray, with its large decrease in disparities, and St. John's, with inequality gains over the period surpassing the national level and other agglomerations. One explanation lies in the structure of the oil sector in both agglomerations. Offshore oil in St. John's is capital intensive, requiring a limited number of highly skilled jobs, but bituminous sand extraction in Alberta is labor intensive. Although levels of mid-range income disparity are on the national level or below for all these agglomerations, the overall results show that the top to bottom disparities are still very high. Median income in the fifth quintile is 8.3 times higher than that for the first quintile in St. John's (6.7 times in Fort McMurray), compared with the Canadian median of 8.5 times—keeping in mind that the national average is dominated by metropolitan dynamics found in Toronto, Montreal, and Vancouver, where important inequalities have previously been described (Bolton & Breau, 2012).

Figure 5. Changes in income disparities between 1991 and 2011 as quintile ratios



Source: Statistics Canada microdata, compiled by authors

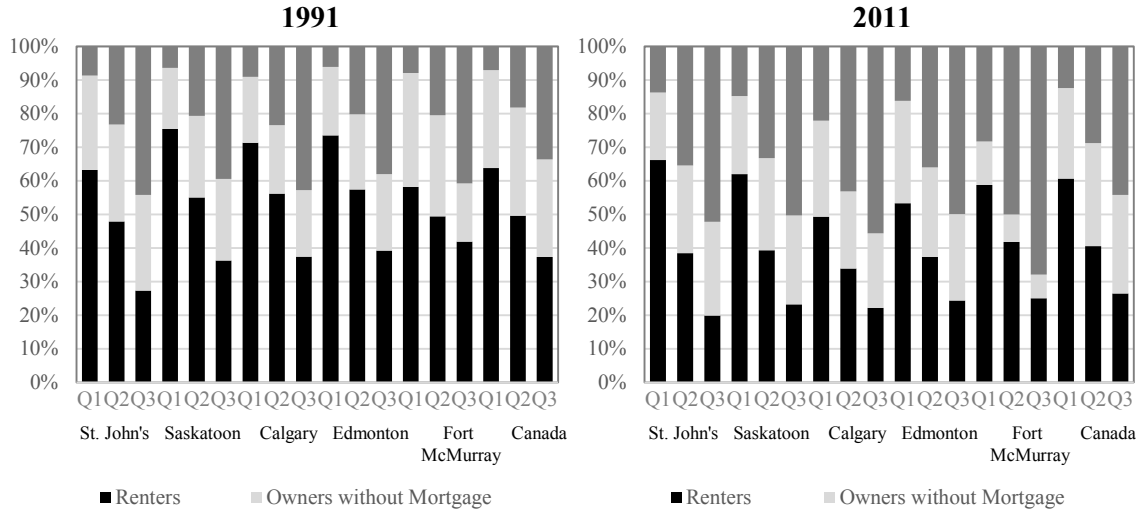
3.7.2. Housing tenure

There are only two housing tenure forms in our research: owner occupancy and rental tenancy. Owner occupancy is the dominant and most sought after housing tenure but transition into homeownership generally requires a steady income in the labor market, which makes homeownership rate an important way of exploring how the regional labor and housing markets are functioning. To allow a better view of how homeownership rates vary across income distribution, we provide details of these indicators for the lowest three incomes quintiles, while also differentiating homeowners carrying a mortgage. The results are shown in Figure 4. Overall, segmentation of ownership rates across income quintiles show that the bottom 20% (Q1) systematically exhibit the lowest share of

homeowners (39% in Canada in 2011), increasing in the mid-low (59%) and median quintiles (74%). Ownership or rental rates in the five CMAs are not too far apart from the Canadian average, although there are important differences when looking at mortgaged ownership as a proportion of homeowners, which are all exceeding the Canadian average in 2011.

Looking at changes over time, the results show that homeownership rates have grown more steadily for the bottom 40% in Saskatoon, Calgary and Edmonton. There was a significant drop in the rate of homeownership in St. John's in 1996 for the lowest income quintile. It has since slightly recovered but did not reach the 1991 level in 2011. Fort McMurray also had below national level growth for the bottom 40%, while the homeownership rate has increased much in the other agglomerations. Homeownership in the second income quintile has a very high growth rate, ending above 60% in Calgary and Edmonton. St. John's and Saskatoon are still below the national level when it comes to the homeownership rate in the bottom income quintile. Otherwise, the share of homeowners in all income quintiles in the resource agglomerations is slightly above the national level.

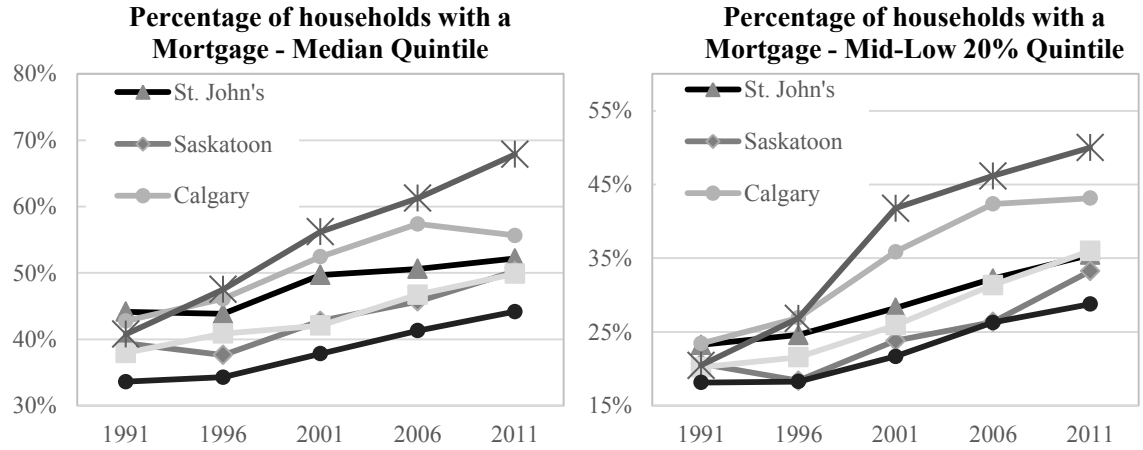
Figure 6. Homeownership and rental rates across bottom three quintiles, 1991 and 2011*



Source: Statistics Canada microdata. *Quintiles: Q1=Bottom 20%; Q2=Mid-Low 20%; Q3=Median.

Despite a slower growth rate for some income quintiles, the absolute number of mortgaged homeowners is above the national levels in all resource driven agglomerations (Figure 6). For example, the bottom income quintile in Fort McMurray had 68% homeowners with mortgages and St. John's 41%, whereas the national level was 31%. Fort McMurray shows the highest increase among all CMAs, significantly above the Canadian average. One explanation for this above average growth in mortgaged ownership rates may be found in the high level of rental costs found in these agglomerations at times of resource booms, which is analyzed in the following section.

Figure 7. Change in percentage of households with a mortgage between 1991 and 2011*



Source: Statistics Canada microdata, compiled by authors.

3.7.3. Housing costs

In this study, housing cost is adjusted for inflation and expressed in 2005 constant dollars. The definition of housing costs referred to in this study corresponds to the total average monthly payment to secure shelter, including energy costs (electricity, oil, gas, coal, wood or other fuels), water and other municipal services, cash rent, and, where applicable, property taxes, mortgage payments and condominium fees.

Overall, median housing costs in the five CMAs remained above the Canadian average for both renters and homeowners between 1991 and 2011, with few exceptions (Table 2). Renters seem to have had the fastest relative increase in costs over the period, growing far beyond the Canadian average, with median costs for renters being close to homeowners in 2011. The most striking example is Fort McMurray, which shows an incredible and sudden hike in housing costs after 2001, passing from a median monthly

cost of $934 in 1991 to $2,348 in 2011 for owners, and $779 to $1,950 for renters, respectively representing 151% and 150% growth over the period. In comparison, the Canadian average had a 28% and 11% increase over the same period, with median monthly costs respectively of $863 and $828 in 2011. While situated below Fort McMurray, most other studied CMAs also exhibit above average costs and increase, with renters facing the highest intensification over the period. However, St. John's offers a different picture, with increases below the Canadian average and a relative decrease in housing prices between 1991 and 2001—an outcome that could be associated with the local economic crisis fostered by the 1992 cod moratorium. Apart from St. John's, these trends provide a consistent explanation for the highest increase in homeownership rates in these agglomerations, as seen in Figure 6. High rental costs, it appears, have decreased the opportunity cost of acquiring a home in resource driven urban agglomerations.

Table 2. Median housing costs for homeowners and renters, 1991-2011

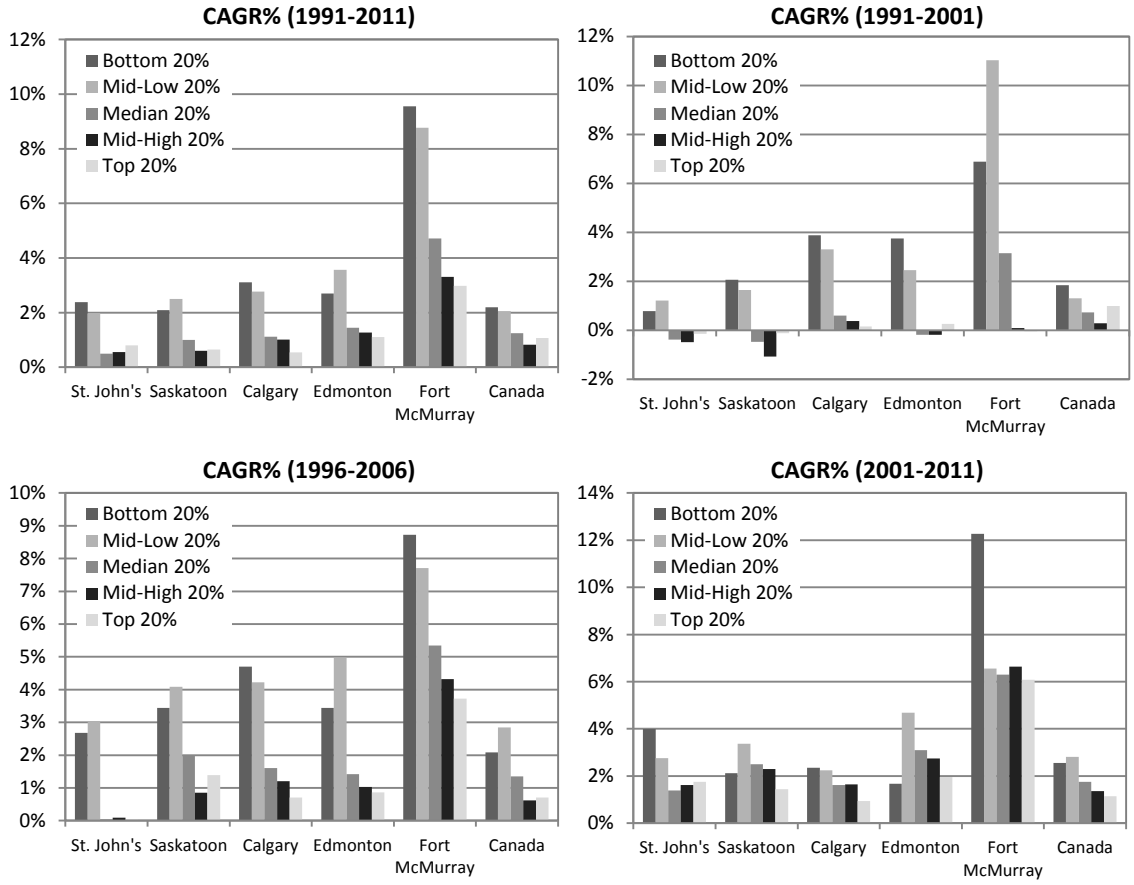
	Homeowners				Renters			
	1991	2001	2011	Δ % (91-11)	1991	2001	2011	Δ % (91-11)
St. John's	$ 868	$ 836	$ 960	11%	$ 718	$ 660	$ 759	6%
Saskatoon	$ 822	$ 784	$ 1,003	22%	$ 660	$ 683	$ 936	42%
Calgary	$ 1,080	$ 1,147	$ 1,348	25%	$ 889	$ 923	$ 1,145	29%
Edmonton	$ 924	$ 908	$ 1,232	33%	$ 775	$ 756	$ 1,070	38%
Fort McMurray	$ 934	$ 1,274	$ 2,348	151%	$ 779	$ 1,119	$ 1,950	150%
Canada	$ 674	$ 725	$ 863	28%	$ 744	$ 739	$ 828	11%

Source: Statistics Canada microdata (Census 2b 1991-2006; NHS 2011). Compiled by authors.

Figure 7 provides additional details on changes in housing costs by income quintile between 1991 and 2011, expressed as compound annual growth rates (CAGR). Overall,

the results show that housing costs for owners have increased significantly faster in the bottom 40% income quintile than the rest of the population. This increase has been above the national level in all agglomerations for the overall period. However, we can see that most of the hike in housing prices has taken place between 1991 and 2006—the 2011 data possibly underestimating the hikes in costs due to the aforementioned limitations of the NHS. It also becomes evident that the top income earners have generally experienced the lowest increase in housing costs. It should be noted that those who own their houses outright have much lower absolute housing costs than those with mortgages—a distinction not directly shown in Figure 7. However, housing costs still increase because other factors are weighted in, such as rises in energy prices or property taxes, which are adjusted for inflation over time. As such, increases in relative housing costs could in some cases be larger than that of mortgaged homeowners, whose housing cost increase was mitigated by drastically falling interest rates in the 2000s.

Figure 8. Changes in housing costs per quintile for homeowners, 1991 to 2011

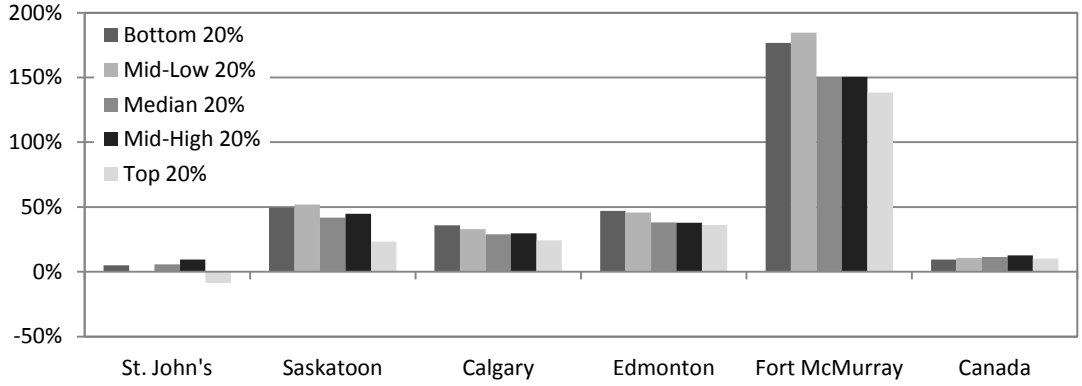


Source: Statistics Canada microdata (Census 2b 1991-2006; NHS 2011). Compiled by authors.
* CAGR%: Compound Annual Growth Rate in Percentage (See equation 002 in Appendix).

The evolution of rental costs across income quintiles shows a very different pattern from that of owners', although Fort McMurray exhibits a distinctively high increase above the national median (Figure 8). Yet it appears that renters in different income quintiles have faced more evenly distributed increases in housing costs. St. John's is an exception with its extremely low increase, and where the top quintile even saw a decreasing real rent. With the exception of St. John's, the bottom 40% have had the highest rental cost increases, and the top income earners the lowest in the selected urban

agglomerations. This pattern differs from that of Canada, where the fourth quintile increased most and the others were very evenly matched.

Figure 9. Change in housing costs for renters between 1991 and 2011



Source: Statistics Canada microdata, compiled by authors.

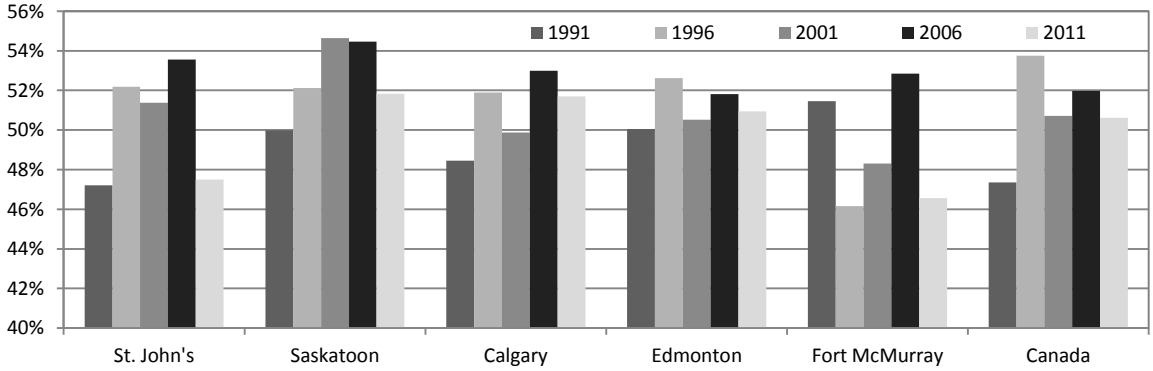
3.7.4. Housing affordability

Housing affordability is analyzed for the bottom 40% of the income distribution, looking at the prevalence of households spending 30% or more of their income on housing costs. Overall, the results indicate that about half of the low income earners were facing housing affordability problems over the period (Figure 9). However, it is difficult to discern trends taking place over time, as there appears to be a general decrease in the proportion of households facing affordability problems in 2011, which contrasts with a steady increase between 1991 and 2006. Fort McMurray shows the most volatility, followed by Calgary and Edmonton, although with a lower amplitude. In comparison, Saskatoon exhibits a growing trend that stagnates in 2006 before declining in 2011. In St. John's, the significant drop from high 2006 levels to what is recorded in 2011 is remarkable. In 1996,

the amount of households in resource driven urban agglomerations spending 30% or more of their income on housing was below the national level.

One aspect to consider in these results is the possible directionality of the non-response bias in the 2011 NHS. Statistics Canada warns that lower income households may be underrepresented within the population income distribution in the NHS, hence affecting longitudinal trends when compared with prior census years that do not suffer from non-response bias. However, while we can anticipate that housing affordability problems may not be retracting as quickly as it appears in the data because of that limitation, there are several other factors that may help to explain the decrease observed in 2011. These may stem from the fact that these results include all types of tenures, hence they include several elements affecting results in different ways, such as by decreasing interest rates or increasing heating or energy costs.

Figure 10. Percentage of households using 30% or more on housing in the lowest 40% income quintiles



Source: Statistics Canada microdata, compiled by authors

To get a more comprehensive picture of the variability in housing affordability, we provide the detailed shares of households for each type of tenure across the bottom three income quintiles in the final year 2011, also looking at changes in percentage over the 1991-2011 period (Table 3) . Unsurprisingly, there is a much greater prevalence of affordability problems within the lowest income quintiles, while the proportion of households facing this situation decreases as income distribution increases. The highest shares of households facing housing affordability problems are found among mortgaged homeowners in the bottom quintile, representing about 90% in this category—a result found in all CMAs and in line with the national average in 2011. However, these numbers are not trivial when considering the above-average increase in homeownership and given the greater economic vulnerability in these agglomerations. About half of homeowners face a similar situation within the second income quintile, while this proportion decreases in the median quintile. Renters are the second most impacted by affordability problems, followed by homeowners without a mortgage.

We anticipated that renters would be the category most impacted by affordability problems over time. However, gains in affordability problems remain limited for renters in the lowest quintile, with improvements taking place in St. John's (-1%) and Fort McMurray (-6%), although there are important gains in all CMAs in the second lowest 20%. Still, in the bottom quintile in 2011, 65% of renters in St. John's, 76% in Saskatoon, 75% in Edmonton, and 69% in Fort McMurray were dedicating 30% or more of their income to housing. For owners, the situation has become even more alarming, with an

increasing number of owners experiencing a potential housing affordability problem in the two bottom income quintiles. This proportion increased by as much as 121% in Fort McMurray, with a total of 65% of homeowners facing affordability problems in 2011. For some owners, increasing costs of energy, taxes, and other non-mortgage expenses add up to a significant share of total housing costs, with important implications for households on fixed income.

Table 3. Share and evolution of households spending 30% or more of their income on housing among the three bottom income quintiles for renters and owners, 1991-2011*

Income quintile		St. John's		Saskatoon		Calgary		Edmonton		Fort McMurray		Canada	
		2011 (%)	Δ % (91-11)	2011 (%)	Δ % (91-11)	2011 (%)	Δ % (91-11)	2011 (%)	Δ % (91-11)	2011 (%)	Δ % (91-11)	2011 (%)	Δ % (91-11)
Bottom 20%	Renters	65 %	-1%	76%	8%	71%	3%	75%	4%	69%	-6%	70%	0%
	Owners Total	55 %	36%	51%	21%	53%	39%	47%	43%	65%	121%	49%	44%
	with mortgage	91 %	4%	90%	-4%	91%	0%	92%	2%	84%	11%	90%	4%
Mid-Low 20%	Renters	15 %	-28%	29%	25%	21%	2%	22%	10%	24%	54%	27%	2%
	Owners Total	27 %	11%	26%	-18%	38%	11%	32%	4%	27%	27%	30%	37%
	with mortgage	47 %	-13%	47%	-30%	57%	-10%	55%	-14%	31%	-40%	60%	3%
Median 20%	Renters	1%	-15%	3%	33%	2%	-24%	2%	24%	2% (*)	-57%	7%	7%
	Owners Total	7%	-49%	10%	-39%	12%	-32%	11%	-29%	---	---	16%	4%
	with mortgage	10 %	-53%	15%	-42%	17%	-35%	16%	-33%	3%	-78%	27%	-7%

Source: Statistics Canada microdata, compiled by authors.
(*) Aggregated renters and owners to fulfill Statistics Canada minimum requirements.

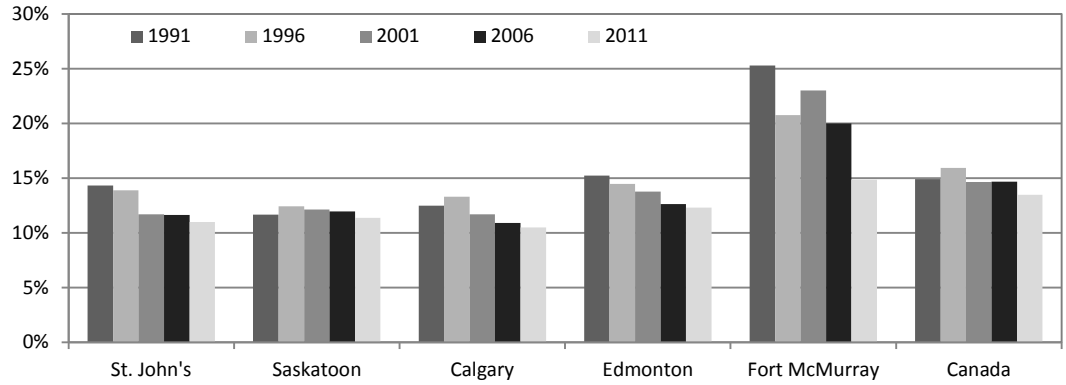
In the median income quintile, practically all resource driven economies have improving housing affordability outcomes. Interestingly, the Canadian numbers for renters and owners are still showing a trend of deteriorating housing affordability. The favorable income development in resource driven agglomerations is a reason why the share of

households using more than 30% of their income for housing decreases faster in resource driven economies than it does for the Canadian average as income levels increase. In this income quintile, less than five percent of renters in these resource driven urban agglomerations use 30 percent or more for housing, and the rest of the households doing so are homeowners.

3.7.5. Housing quality

Housing quality is analyzed for the bottom 40% of the income distribution, examining aggregated adequacy and suitability of housing. Housing is regarded as adequate if it does not need major repairs such as structural, plumbing, or electrical, and suitable if there are enough bedrooms for the household structure and size in accordance with the National Occupational Standard (Canada Mortgage and Housing Corporation, 2004). In a few cases, a household is afflicted by both of these problems, although more frequently one or the other of these shortcomings is combined with a cost to income problem. In other words, we start by looking at the prevalence of households with at least one housing quality problem, potentially in combination with a housing affordability problem, i.e., that household is spending 30% or more of their income on housing costs.

Figure 11. Percentage of households with housing quality problem in the lowest 40% income quintiles



Source: Statistics Canada microdata, compiled by authors.

Unsurprisingly, housing quality problems are less prevalent than affordability problems and generally 15% or less of the low income earners were afflicted by housing quality problems over the period (Figure 10). Regardless of 2011, the trend appears to be towards a declining number of housing quality problems, with a particular decline displayed by Fort McMurray. With the exception of Fort McMurray, all resource driven urban agglomerations appear to have a level of housing quality problems that is below the national level. As with housing affordability, these results may be associated with a possible directionality of the non-response bias in the 2011 NHS. Lower income households are more likely to be afflicted by housing quality problems and may be underrepresented within the population income distribution in the NHS, hence affecting longitudinal trends when compared with prior census years that do not suffer from non-response bias.

To get a more comprehensive picture of the variability in housing quality, we provide the detailed shares of owner and renter households across the bottom three income quintiles in the final year 2011, also looking at changes in percentage over the 1991-2011 period (Table 4) . Unsurprisingly, there is a much greater prevalence of housing quality problems for renters, and the proportion of households facing this situation generally remains the same or even increases as we move up the income distribution. In contrast, homeowners are less likely to deal with housing quality problems, and the likelihood of these problems decreases as their income increases.

Table 4. **Share and evolution of housing quality among the three bottom income quintiles for renters and owners, 1991-2011***

Income quintile		St. John's		Saskatoon		Calgary		Edmonton		Fort McMurray		Canada	
		2011 (%)	Δ % (91-11)	2011 (%)	Δ % (91-11)	2011 (%)	Δ % (91-11)	2011 (%)	Δ % (91-11)	2011 (%)	Δ % (91-11)	2011 (%)	Δ % (91-11)
Bottom 20%	Owners Total	11%	-27%	9%	-44%	8%	-45%	9%	-51%	16%	50%	12%	-22%
	Renters	15%	4%	15%	18%	14%	-2%	16%	2%	12%	-13%	15%	1%
Mid-Low 20%	Owners Total	6%	-114%	8%	-12%	8%	-17%	8%	-35%	9%	17%	10%	-28%
	Renters	13%	-34%	14%	7%	15%	8%	16%	-7%	17%	12%	17%	0%
Median 20%	Owners Total	7%	-38%	8%	-5%	7%	-17%	8%	-24%	6%	-25%	9%	-20%
	Renters	10%	-73%	18%	26%	16%	14%	18%	13%	16%	-2%	19%	7%

Source: Statistics Canada microdata, compiled by authors

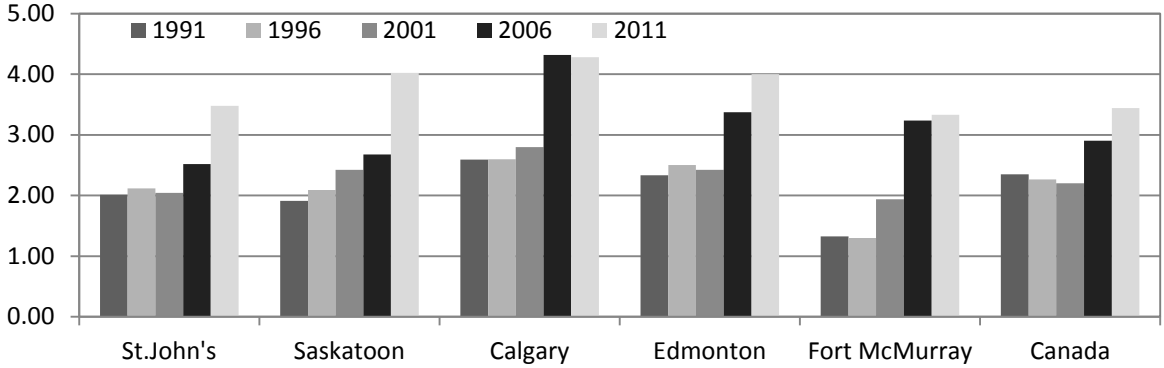
We anticipated that renters would be the category that is most impacted by housing quality problems over time. However, we see significant improvements, particularly for St. John's over time, although renters are not as likely to experience these as homeowners. While these CMAs generally have similar or slightly better housing quality

than the national average, a high prevalence of housing quality problems, even up to mid-income quintiles suggests that these problems are more widespread than expected. Overall, it is difficult to evaluate if there are households compromising their housing quality to improve their housing affordability, although the trends for the mid-low income quintile point in that direction. The ratio of the number of households with a cost problem only to the number of households with a quality problem only decreases drastically from the bottom income to mid-low income quintile. Yet, this is not necessarily because of a choice that renters make. Housing affordability also improves with increasing income level and renters may be constrained as to their access to adequate rental housing.

3.7.6. Debt and housing affordability

Results presented above provide empirical evidence that a growing share of homeowners in the bottom income quintiles are facing housing affordability problems. In resource driven agglomerations, there is an increase of mortgaged homeowners that is above the national median, suggesting that household debt may become a growing issue in these locations. One way to measure the level of indebtedness is to look at the ratio of house value to income, which is a known alternative measure of housing affordability. A ratio of 3.1 or above is often considered indicative of high indebtedness conducive to housing affordability problems for a household (Cox & Pavletich, 2016).

Figure 12. House value to income ratio for homeowners, median income quintile, 1991-2011



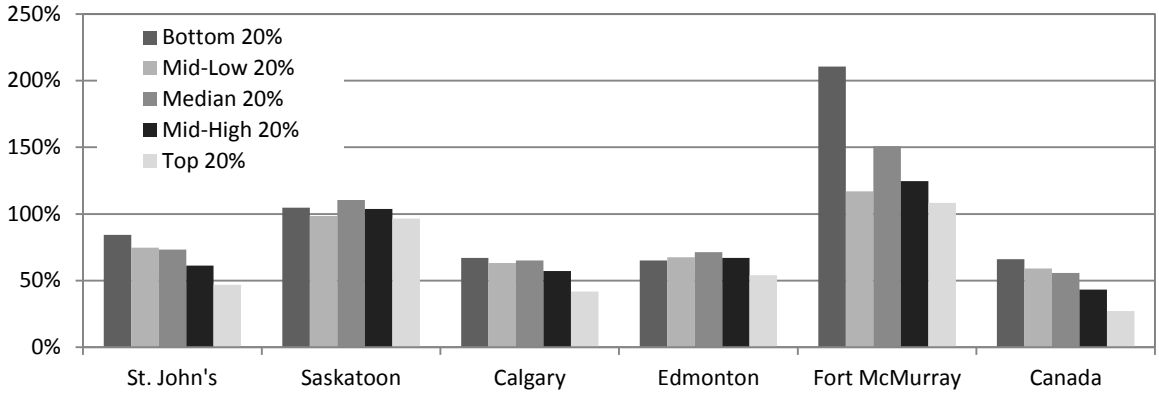
Source: Statistics Canada microdata, compiled by authors

Looking at house value to income ratio for the median income quintile (Figure 11), we find that homeowners in resource driven agglomerations have had a significantly higher increase in debt ratios than the Canadian average, with absolute values systematically above the critical threshold of 3 in 2011. In fact, most have seen this ratio increase between 2006 and 2011, which was the peak of resource-related economic development within the studied period. Albertan housing markets appear to have had the most severe increase in indebtedness, with Saskatoon, St. John's and Canada showing slower increases, although all exceeding the critical limit in 2011. If any, the directionality of the bias in the 2011 NHS is further likely to underestimate these trends taking place over time. Not shown in the figure is the variability of indebtedness across income distribution. Lower income quintiles have significantly higher ratios, ranging from 9.3 (Fort McMurray and St. John's) to 11.6 (Calgary). While median income earners may

have some difficulty if they were to buy their homes again, it would be impossible for those within the lower income quintiles to qualify for a mortgage of this magnitude.

Looking at changes over time, we can see that overall housing values have increased faster than incomes everywhere (Figure 12). St. John's, Saskatoon and Fort McMurray show particularly important escalation between 1991 and 2011, well above the national median. There are also differences in the change in indebtedness levels taking place across income quintiles. The bottom and the mid-low income quintiles appear to have the largest increases in all locations, with Fort McMurray showing very high increases in indebtedness in the bottom 20% quintile. St. John's and Calgary also exhibit an uneven distribution of debt between quintiles, although other locations such as Saskatoon and Edmonton exhibit less variability.

Figure 13. **Change: house value to income ratio across income quintiles, 1991-2011**



Source : Statistics Canada microdata, compiled by authors

3.8. DISCUSSION

Housing affordability in general became a problem in Canada in the 1990s. The major metropolitan areas in Canada are well known for their unaffordable housing (Bunting *et al*., 2004), and thus have an impact on the aggregated national housing affordability. However, our research points out specific trends in affordability, looking at its evolution across specific dimensions of housing tenure, housing costs to income, and housing debt which all indicate that there are new patterns of housing affordability problems emerging in smaller, resource driven economies. Levels of this vulnerability are not exactly the same, but they compare to the patterns described in larger city-regions in Canada.

The results presented above show that housing affordability patterns in all selected urban agglomerations have been influenced by the resource industries, as indicated by housing costs that have increased rapidly for both owners and renters. The most significant increase in housing costs has occurred in Fort McMurray, which is also the urban agglomeration with the greatest dependence on the oil industry among the studied agglomerations. Housing costs for both renters and owners have also increased in relatively higher proportions among the low to mid-income earners. Meanwhile, housing tenure choice is a watershed between two very different positions in the affordability chart. Most households spending more than 30% of their income on housing in the bottom income quintiles are renters. However, a greater share of mortgaged low income

earners is likely to stay above that benchmark with their mortgage payments and other housing-related costs.

Housing prices have indeed increased, but housing costs for homeowners are not only influenced by housing prices; they're also affected by various macro-economic factors. Owners with a mortgage initially experienced very high housing costs because of the record high inflation and interest rates in the 1980s which gradually decreased in the 1990s to the record low levels of the 2000s. In many cases, the real housing costs decreased until 2005 after which a combination of rising house prices and increased energy prices made them escalate. Only in Fort McMurray do we see extreme housing price increases that far outpaced the mitigating effect of the decreasing interest rates, generating steadily escalating housing costs during this entire time period. Costs for those who own their houses outright also increased in 2006 and 2011, as energy costs went up. This illustrates the potential importance that energy costs can have on housing affordability. Rising housing prices further translate into higher property taxes and other costs. Increasing property taxes and heating costs can particularly affect homeowners living at fixed incomes (Ryser & Halseth, 2011).

Low interest rates in combination with easy access to mortgage funding enabled many low income earners to make the transition to homeownership, as indicated by a large increase in the percentage of owners with a mortgage between 2001 and 2006. This research further demonstrates that a majority of these low income households have either moderate or severe housing affordability problems. For some of them, this problem

occurs in combination with a housing quality problem, which puts them at risk of not being able to pay for their non-housing consumption or leaves them without the necessary buffer that would enable them to handle unexpected events (Alexander & Jacobson, 2015). If they cannot afford doing the necessary maintenance and repairs, they are also likely to face depreciation of their property value. Considering that the housing cost data only include mortgage payments, property taxes, fuel and utilities but no maintenance costs (Meyer, Yeager & Burayidi, 1994), it can be anticipated that a larger contingent of homeowners is likely to be burdened by their housing-related expenses than suggested by these results. For all these reasons, these homeowners with low incomes are less likely to reap the benefits of homeownership (Foster & Kleit, 2014; Yates, 2002) than their wealthier counterparts.

Transition to homeownership requires steady income and credit history but it is also associated with benefits and potential risks that rental tenancy does not entail. Rentals have increasingly become the secondary sector in the housing system; they are for those who cannot purchase a home (Hulchanski, 2007). However, even rental housing costs are increasing faster in resource driven urban agglomerations than in Canada as a whole. St. John's is the only remarkable exception. St. John's exhibits a very low real rental cost increase, or even decrease compared to the Canadian median values, which only show a moderate increase. One explanation is that scarce new rentals combined with a high vacancy rate in St. John's in the 1990s (Canada mortgage and Housing Corporation, 2015). There was no real pressure on the rents until resource extraction activities started

and generated increased demand for rental units. When rental costs started to rise, the increase was relatively the highest among low income earners which had few other options. However, St. John's housing market has also been able to absorb some of the impact of the rising demand in the rental market because of its social and secondary rental housing sectors.

Historically, St. John's has had an unusually large social housing sector compared to the rest of Canada (Sharpe, 2006). Even today there is strong affordable housing advocacy support in the province (Beaton, 2004). Social housing provides housing to some of the lowest income earners. Unfortunately, for the purpose of this research it was generally not possible to differentiate social housing tenancy from the private rental tenancy in the datasets before 2011. Social housing cost is normally geared to income which makes it affordable by definition, and the share of subsidized housing has even been used as an indicator of regional housing affordability by other researchers (Bogdon & Can, 1997). The size of the social housing sector is significant because it provides housing for some of the low-income earners and at the same time has an alleviating effect on the level of housing affordability in the region.

The St. John's housing system also has a relatively large share of secondary rental housing. These accessory apartments are additional self-contained small dwelling units, which are subordinate to their principal dwellings, either as a part of them or as a detached building. In 1991, 5.7% of housing in St. John's had an accessory apartment, and there was a generally positive attitude towards them in the city-region (Research

Associates, 1992). The importance of accessory apartments has only grown; according to a CMHC survey in 2012, there were as many as 15,376 such apartments in St. John's (Canada Mortgage and Housing Corporation, 2012). While housing prices increased, these apartments provided solace for both homeowners and renters; they were affordable housing for low income earners while they also generated an additional income for the homeowner (Drummond, Burleton & Manning, 2004; Gratton, 2011). Zoning changes have been implemented in St. John's to encourage this rental form (Carter, 1997; Canada Mortgage and Housing Corporation, 2014), although their existence is not always popular because they can generate more traffic and parking problems in the neighborhood (Research Associates, 1992).

As suggested by the literature, housing quality and overcrowding are minor problems in comparison to housing cost to income burden. However, housing quality problems are not negligible, particularly for renters. We have used the only housing quality indicators available in the datasets, one for adequacy and another for suitability. While suitability can be assessed by calculating the crowding for each dwelling, adequacy is based on subjective evaluation by the resident. First, the person responsible for this evaluation may not actually possess the expertise to judge if there are electrical, plumbing, or structural problems in the dwelling, and, second, there may be psychological mechanisms that make one less inclined to report negative findings about one's home (Jansen, 2012). Hence it is reasonable to expect that housing quality problems are more prevalent than suggested by these results. Households may also be afflicted by other kinds of quality problems which

are not covered by census data. Of particular concern might be the housing quality requirements of the elderly and disabled, as housing accessibility may become a priority in a region where the population is aging rapidly. Furthermore, without additional qualitative research we cannot conclude if households are selecting to live in a substandard housing to improve their housing affordability prospects, although we cannot exclude it either. Thus we conclude that housing quality problems exist and may be larger for some segments of the population than suggested by census data (O'Dell, Smith & While, 2004).

The housing value to income ratio for homeowners confirms a deteriorating pattern of housing affordability. In 2011, this ratio exceeded the affordability limit for median income earners in all urban agglomerations. This indicates that not only has the affordability problem reached the mid-income earners, but housing has become severely unaffordable for the lowest income earners. This also confirms that households are carrying an increasing mortgage debt burden (Alexander & Jacobson, 2015; Walks, 2013).

Although growing housing cost relative to income is a problem, the rise in absolute housing cost is a new source of concern. Rapid increase in housing costs for low income earners suggests that there is a smaller gap in the monthly housing expenses of bottom and top income groups. This has happened in all subgroups, renters, owners with or without a mortgage, in all selected urban agglomerations and at the national level. The gaps were already smaller in 1991 in the resource driven economies than on the national

level, and they have decreased further. This indicates not only a rise of housing costs for low-income earners, but a decreasing presence of affordable housing in the market. Reliance on private developers and focus on homeownership drive the markets. This works against the provision of diverse housing options for households with different needs and financial means.

One of our hypotheses was that increasing income inequalities in resource driven economies underlie growing housing affordability problems. This analysis demonstrates that there are increasing income gaps between top and bottom income quintiles with two exceptions, Fort McMurray and Edmonton. The mid-range income inequalities either decreased or had a modest increase in all cases except in St. John's, which had the highest income inequality increase for both top to bottom and the mid-range. This is consistent with the literature. Resource industries may alleviate existing income inequalities but they can also exacerbate them, contingent on the previous economic history and present circumstances (Fleming & Measham, 2015).

Resource industries can have a differential impact on the labor market. The Athabasca bituminous sands provided numerous well-paying employment opportunities during the oil boom (Keogh, 2015), but St. John's is the hub of a capital-intensive offshore industry that does not create as many new well-paying jobs. Despite the spillover effects of resource industries to other areas, there are still many Newfoundlanders commuting to Fort McMurray for work (Storey, 2001). Newfoundland has remained a province with few sources of economic opportunities (Beaton, 2004), as indicated by its rate of

unemployment, which has never come down to the Canadian level. Nevertheless, the economic boom has had an impact on the local economy by creating some new well-paying jobs in the resource sector, feeding the construction industry and generating many new jobs in the hospitality sector while also exerting pressure to increase the salaries of those working in the public sector (Boessenkool and Eisen 2012; Locke, 2011).

However, a resource-related economic boom does not necessarily generate a demographic boom (Ennis, Finlayson & Speering, 2013). Newfoundland undoubtedly has experienced an economic boom since the beginning of the offshore oil extraction, but population growth in St. John's has remained modest compared to the other selected urban agglomerations, and mostly consists of rural Newfoundlanders moving to the city. This may have spared St. John's from some of the expected negative socioeconomic consequences (Gramling & Brabant, 1986) and larger housing affordability problems associated with commodity booms, because demand for housing and infrastructure has increased in relation to population growth.

Furthermore, we suggest that housing affordability might be even more of a problem when the boom is over. There are now many homeowners with low incomes carrying mortgages, and previous lucrative employment may have led some segments of the population to overspend on housing. A larger house means higher debt, higher heating and maintenance costs, and higher property taxes. When the economic boom is over, there will be many jobs lost in the construction sector and oil-related employment, but also in the retail and hospitality sectors. Deficits may even cause cuts in the public sector.

Many homeowners with low incomes are already at the margin of what they can spend on housing and they may have already postponed necessary housing repairs, which can have a negative impact on the quality and the future value of their housing. Some homeowners can benefit from a housing price increase, provided they bought and sold their houses at the right moment (Harris *et al*., 1986). However, capital gains associated with the rising housing values may not always become reality because housing prices may decline again when the booming phase is over (Lloyd & Newlands, 1990). When there is a decline in the resource sector, the regional economy—particularly employment—are affected. Incomes will also decline, and improvements achieved in income equality are likely to be lost.

3.9. CONCLUSION

This study shows that new problems of housing affordability have taken place in resource driven agglomerations central to the recent Canadian oil boom. In such agglomerations, the rapid increase in housing costs is not compensated by increasing income levels for all segments of the population. Growing numbers of low-income homeowners with mortgages are already burdened by their housing cost, but they are particularly vulnerable with their debt when facing an inevitable economic downturn. Problems of housing affordability are hence no longer confined to the bottom 40% of the income distribution. There is growing evidence that mid-income households are currently, or will soon be, affected by such problems. Mid-income earners have not had an ideal income evolution

between 1991 and 2011, while their housing costs have increased, at times not in proportion to other parts of the income distribution. Housing affordability is still a major problem for renters with low incomes, but also increasingly so for low income homeowners, particularly for those with mortgages. A decreasing gap between housing costs for bottom and top income groups indicates that there is a shortage of affordable housing in the market. Overall, the bottom 60% of homeowners are experiencing an increasing housing cost to income burden, while the circumstances are improving slightly for renters over time.

In view of these findings, we contend that resource booms (or busts) are prone to generate housing affordability problems and housing-related vulnerability in low to mid-income earning segments of the population in extractive urban agglomerations. The extent of these housing affordability problems may not be as high as in major metropolitan areas, but the associated risk is higher because of the volatility of resource driven economies. Economic downturn is likely to have a major impact on the regional labor market by reducing employment opportunities. Housing prices are also likely to decline, and negative equity can prevent persons from moving elsewhere to search for employment. Whereas previous literature has emphasized housing vulnerability in large metropolitan areas, the results highlight new patterns of housing-related vulnerability in resource driven regions in Canada.

There are limitations to this research. The income data are not adjusted to household size or structure. We have no access to information about wealth, or level of debt. Housing

cost to income data for homeowners can be considered understated because homeowners also have to do maintenance of their homes and these costs are not included in the owners' housing costs. Furthermore, housing affordability is not only dependent on housing tenure and household income but also on other socioeconomic characteristics of the households (Hancock, 1993), and we have not revealed which household attributes other than income, tenure, and presence of mortgage can be associated with increased risk of housing affordability problems.

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3.11. REFERENCES

Ades, J., P. Apparicio,P., & Séguin, A. M. (2012). Are new patterns of low-income distribution emerging in Canadian metropolitan areas? *Canadian Geographer,* 56, 339-361. doi: 10.1111/j.1541-0064.2012.00438.x

Agnello, L., & Schuknecht, L. (2011). Booms and busts in housing markets: Determinants and implications. *Journal of Housing Economics,* 20, 171-190. doi: 10.1016/j.jhe.2011.04.001.

Alexander, Craig, & Jacobson, Paul.(2015). Mortgaged to the Hilt: Risks from the Distribution of Household Mortgage Debt.*CD Howe Institute Commentary* 441.Retrieved from cdhowe.org.

Arnold, E.,& Skaburskis, A. (1989). Measuring Ontario increasing Housing Affordability Problem. *Social Indicators Research*.21, 501-515. doi: 10.1007/bf00513458.

Baker, Michael, McNicholas,Anne, Garrett, Nicholas, Jones, Nicholas, Stewart, Joanna, Koberstein, Vivien & Lennon, Diana. (2000). Household Crowding a Major Risk Factor for Epidemic Meningococcal Disease in Auckland Children. *The Pediatric Infectious Disease Journal*,19, 983-90. Retrieved from ovidsp.tx.ovid.com

Baland, J. M., & Francois, P. (2000). Rent-seeking and resource booms. *Journal of Development Economics*, *61*, 527–542. doi.10.1016/S0304-3878(00)00067-5.

Beaton, Elizabeth.(2004, June). *Housing in Atlantic Canada: The poverty factor.* Paper presented at Adequate and Affordable Housing for All International Conference by Centre of Urban & Community Studies, Toronto.

Blackadder, G. A., & Baster, J.(1992). Oil and remote communities-Shetland and Orkney."In W.J. Cairns (Ed.), *North Sea oil and the environment* (pp. 165-191).London: Elsevier Applied Science.

Bogdon, A. S., & Can, A.(1997). Indicators of Local Housing Affordability: Comparative and Spatial Approaches. *Real Estate Economics*.25: 43-80. doi: 10.1111/1540-6229.00707.

Bolton, K., & Breau, S. (2012). Growing Unequal? Changes in the Distribution of Earnings across Canadian Cities. *Urban Studies*, 49, 1377-1396. doi: 10.1177/0042098011410335

Boessenkool, K. J., & Eisen, B. (2012). Public Sector Wage Growth in Alberta. *SPP Research Paper*, (12-1).doi: 10.2139/ssrn.1989167.

Bramley, G.(1990, September). *Access, affordability and housing need*. Paper presented at ESRC Housing Studies Conference, University of Surrey, Guildford.

Bramley, Glen. (2012). Affordability, poverty and housing need: triangulating measures and standards. *Journal of Housing and the Built Environment*, 27, 133-151. doi: 10.1007/s10901-011-9255-4.

Brown, Mark & Rispoli, Luke. 2014.Metropolitan Gross Domestic Products – Experimental Estmates, 2001-2009.Statistics Canada, Economic Insights (Catalogue number 11-626-X-No. 04). Retrieved from http://www.statcan.gc.ca/pub/11-626-x/11-626-x2014042-eng.pdf.

Bunting, Trudi, Walks, Alan, & Filion, Pierre. (2004). The uneven geography of housing affordability stress in Canadian metropolitan areas. *Housing Studies*,19, 361-393. doi: 10.1080/0267303042000204287.

Cadigan, Sean T. (2012). Boom, Bust and Bluster: Newfoundland and Labrador's "Oil Boom" and Its Impacts on Labor in John Peters (ed.), *Boom, Bust and Crisis:Labor, Corporate Power and Politics in Canada* (pp. 68-83). Halifax: Fernwood Publishing.

CMHC.(2004*).* 2001 Census Housing Series: Issue 3 Revised – The Adequacy, Suitability and Affordability of Canadian Housing. *Research Highlights.* Retrieved from http://www.cmhc-schl.gc.ca/odpub/pdf/63403.pdf?lang=en.

CMHC.(2012). *Rental Market Report- St. John's CMA, Fall 2012*. Retrieved from http://publications.gc.ca/collections/collection_2012/schl-cmhc/NH12-84-2012-eng.pdf

CMHC.(2014). *Accessory Apartment Regulations in Census Metropolitan Areas and Census Agglomerations in Canada.(*Socio-economic Series 14-00).Retrieved from http://www.cmhc.ca/odpub/pdf/68145.pdf.

CMHC.(2015*).* Housing Market Indicators – St. John's 1990-2014. *Canadian Housing Observer.* Retrieved from http://www.cmhc-schl.gc.ca/en/hoficlincl/homain/stda/data/data_001.cfm.

Carter, T. (1997). Current practices for procuring affordable housing: The Canadian context. *Housing Policy Debate*,8, 593-631. doi: 10.1080/10511482.1997.9521268

Carver, Humphrey.(1948). *Houses for Canadians: A study of housing problems in the Toronto area*. University of Toronto Press.

Chakrabarti, R. & J. Zhang. (2015). Unaffordable housing and local employment growth: Evidence from California municipalities. *Urban Studies*,52, 1134-1151. doi: 10.1177/0042098014532854

Chan, S. (2001). Spatial lock-in: Do falling house prices constrain residential mobility? *Journal of Urban Economics*,49, 567-586. doi: 10.1006/juec.2000.2205.

Cox, Wendell, & Pavletich, Hugh.(2016). *12th Annual Demographia International Housing Affordability Survey*. Retrieved from http://www. demographia. Com.

Dewilde, C,. & Lancee, B. (2013). Income Inequality and Access to Housing in Europe.*European Sociological Review*, 29, 1189-1200. doi: 10.1093/esr/jct009.

Drew, R. B. (2013). Constructing Homeownership Policy: Social Constructions and the Design of the Low-Income Homeownership Policy Objective. *Housing Studies*. 28, 616-631. doi: 10.1080/02673037.2013.760030.

Drummond, Don. (2004). A New Paradigm for Affordable Housing: An Economist's Perspective. In J. D.; Hulchanski,& Michael Shapcott (Eds.), *Finding Room - Policy Options for a Canadian Rental Housing Strategy* (pp.215-230). Toronto : CUCS Press, Centre for Urban and Community Studies, University of Toronto.

Drummond, Don; Burleton, Derek; & Manning, Gillian. (2004). Affordable Housing in Canada: In Search of a New Paradigm. In J. D.; Hulchanski,& Michael Shapcott (Eds.), *Finding Room - Policy Options for a Canadian Rental Housing Strategy* (pp.15-68). Toronto : CUCS Press, Centre for Urban and Community Studies, University of Toronto.

Ennis, Gretchen, Finlayson,Mary, & Speering, Glen. (2013). Expecting A Boomtown? Exploring potential Housing - related Impacts of Large Scale Resource Developments in Darwin. *Human Geographies*,7, 33-42. doi: 10.1007/s11205-009-944407.

Evans, Patricia. (2002).Downloading the welfare state, Canadian style. In G.S. Goldberg & M.G. Rosenthal (Eds.), *Diminishing Welfare: A cross-national study of social provision* (pp. 75-102). Westport, Conn: Auburn House.

Farren, Michael D.(2014). Boomtowns and the Nimbleness of the Housing Market: The Impact of Shale Oil and Gas Drilling on Local Housing Markets. In *2014 Annual Meeting, July 27-29, 2014, Minneapolis, Minnesota*, no. 170644. Agricultural and Applied Economics Association.

Fleming, David A., & Measham, Thomas G. (2015). Income inequality across Australian regions during the mining boom: 2001-11. *Australian Geographer.* 46, 203-216. doi: 10.1080/00049182.2015.1020596

Foster, T. B. & Kleit, R.G. (2014). The Changing Relationship Between Housing and Inequality, 1980–2010. *Housing Policy Debate*, 25, 16-40. doi: 10.1080/10511482.2014.933118

Frenette, M., Green, D. A., & Milligan, K. (2009). Taxes, Transfers, and Canadian Income Inequality. *Canadian Public Policy / Analyse De Politiques*, *35*, 389–411. Retrieved from http://www.jstor.org/stable/27759554.

Gan, Q., & Hill, R. J. (2009). Measuring housing affordability: Looking beyond the median. *Journal of Housing Economics, 18*, 115-125. doi: 10.1016/j.jhe.2009.04.003.

Goderis, B., & Malone, S. W. (2011). Natural Resource Booms and Inequality: Theory and Evidence. *Scandinavian Journal of Economics*, *113*, 388–417. doi:10.1111/j.1467-9442.2011.01659.x

Goldenberg, S. M., Shoveller, J. A., Koehoorn, M, & Ostry, A.S. (2010). And they call this progress? Consequences for young people of living and working in resource-extraction communities. *Critical Public Health*, 20, 157-168. doi: 10.1080/09581590902846102.

Gramling, B., & Brabant, S. (1986). Boomtowns and Offshore Energy Impact Assessment: The Development of a Comprehensive Model. *Sociological Perspectives*, *29*, 177–201. doi:10.2307/1388958

Gratton, Matthew C. (2011). *An analysis of secondary suites as a policy instrument in the city of Edmonton*. Master's thesis., University of Manitoba, Winnipeg.

Green, D. A., & Milligan, K.. (2010). The Importance of the Long Form Census to Canada. *Canadian Public Policy / Analyse De Politiques*, *36*, 383–388. Retrieved from http://www.jstor.org/stable/20799664.

Hancock, K.E. (1993). 'Can Pay? Won't Pay?' or Economic Principles of 'Affordability'. *Urban Studies*, *30*, 127-145. doi: 10.1080/00420989320080081.

Harris, A.H., Lloyd,M.G., McGuire, A. J., & Newlands, D.A. (1986). Who Gains from Structural Change? The Distribution of the Benefits of Oil in Aberdeen. *Urban Studies* 23, 271-283. doi: 10.1080/00420988620080341.

Haslam McKenzie, Fiona M., & Rowley, Steven. (2013). Housing Market Failure in a Booming Economy. *Housing Studies*, *28*, 373-388. doi: 10.1080/02673037.2013.759177.

Heylen, K. & Haffner, Marietta. (2013). A ratio or budget benchmark for comparing affordability across countries? *Journal of Housing and the Built Environment, 28*, 547 - 565. doi: 10.1007/s10901-012-9325-2.

Heywood, A. (2012).London for Sale? An Assessment ofthe Private Housing Market in London and the Impact of Growing Overseas Investment. Retrieved from https://smithinstitutethinktank.files.wordpress.com/2014/11/london-for-sale.pdf

Howie, P., & Atakhanova, Z. (2014). Resource boom and inequality: Kazakhstan as a case study. *Resources Policy, 39*, 71-79. doi: 10.1016/j.resourpol.2013.11.004

Hulchanski, J. D.(1995). The Concept of Housing Affordability - 6 Contemporary Uses of the Uses of the Housing Expenditure-to-Income Ratio. *Housing Studies*,*10*, 471-491. doi: 10.1080/02673039508720833.

Hulchanski, J. D. (2004a). A Tale of Two Canadas: Homeowners Getting Richer, Renters Getting Poorer.In J. D.; Hulchanski,& Michael Shapcott (Eds.), *Finding Room - Policy Options for a Canadian Rental Housing Strategy* (pp.81-88). Toronto : CUCS Press, Centre for Urban and Community Studies, University of Toronto.

Hulchanski, J. D. (2004b). How did we get there? The Evolution of Canada's "Exclusionary" Housing System. In J. D.; Hulchanski,& Michael Shapcott (Eds.), *Finding Room - Policy Options for a Canadian Rental Housing Strategy* (pp.179-194). Toronto : CUCS Press, Centre for Urban and Community Studies, University of Toronto.

Hulchanski, J. David (2007). *Canada's Dual Housing Policy, Assisting Owners, Neglecting Renters*. (Research bulletin No 38). Retrieved from http://www.urbancentre.utoronto.ca/pdfs/researchbulletins/CUCSRB38Hulchanski.pdf

Hulchanski,David, Murdie, Robert, Walks, Alan, & Bourne, Larry. (2013). Average Individual Income 2010: National Household Survey Versus Taxfiler Data. *Neighbourhood Change Research Partnership*. University of Toronto. Retrieved from http://neighbourhoodchange.ca/documents/2014/04/nhs-oped-data-tables.pdf

International Monetary Fund [IMF].Global Housing Watch – House Price-to- Income Ratio. Retrieved from http://www.imf.org/external/research/housing/.

Jansen, S. J. T. (2012). Why is Housing Always Satisfactory? A Study into the Impact of Preference and Experience on Housing Appreciation. *Social Indicators Research, 113*, 785-805. doi: 10.1007/s11205-012-0114-9.

Keough, S. B. (2015). Planning for growth in a natural resource boomtown: challenges for urban planners in Fort McMurray, Alberta. *Urban Geography, 36*, 1169-1196. doi: 10.1080/02723638.2015.1049482

Kesteloot, C. (1994). Three Levels of Sociospatial Polarization in Brussels. *Built Environment 20*, 204-217. Retrieved from http://www.ingentaconnect.com.

Kneebone, R. D., & White, K. G.. (2009). Fiscal Retrenchment and Social Assistance in Canada. *Canadian Public Policy / Analyse De Politiques*, *35*, 21–40. Retrieved from http://www.jstor.org/stable/40213399

Lawrie, M., Tonts, M., & Plummer, P. (2011). Boomtowns, Resource Dependence and Socio-economic Well-being. *Australian Geographer, 42*, 139-164. doi: 10.1080/00049182.2011.569985

Lefebvre, Mario, Arcand, Alan, Sutherland, Greg, Wiebe, Robin & McIntyre, Jane.(2013). *Metropolitan Outlook 1: Economic Insights Into 13 Canadian Metropolitan Economies*.Retrieved from www.conferenceboard.ca.

Lepawsky, J., Phan, C., & Greenwood, R. (2010). Metropolis on the margins: talent attraction and retention to the St. John's city-region. *Canadian Geographer-Geographe Canadien, 54*, 324-346. doi: 10.1111/j.1541-0064.2010.00315.x

Linneman, Peter D., & Megbolugbe, Isaac F.(1992). Housing Affordability: Myth or Reality? *Urban Studies*, *29*, 369-392. doi: 10.1080/00420989220080491.

Lloyd, Greg, & David Newlands. (1990). The interaction of housing and labor markets: An Aberdeen case study. *Land Development Studies* 7, 31-40.

Locke, Wade. (2011). Newfoundland and Labrador, from Austerity to Prosperity - and back to Austerity (?) : Planning to Avoid a Financial Crisis.*Newfoundland Quarterly*, 104(2), 39-41.Retrieved from http://www.mun.ca/harriscentre/reports/nlquarterly/MemPre-NQ-FALL2011.pdf

Malpezzi, S., & Wachter, S.M.(2005). The role of speculation in real estate cycles. *Journal of Real Estate Literature*, *13*, 143-164. Retrieved from web.b.ebscohost.com.

Marchand, J. (2012). Local labor market impacts of energy boom-bust-boom in Western Canada. *Journal of Urban Economics*, *71*, 165-174. doi:10.1016/j.jue.2011.06.001

Matlack, J. L. & Vigdor, J. L.(2008). Do rising tides lift all prices? Income inequality and housing affordability. *Journal of Housing Economics*, *17*, 212-224. doi:10.1016/j.jhe.2008.06.004.

Meyer, P., Yeager, J., & Burayidi, M. (1994). Institutional Myopia and Policy Distortions: The Promotion of Homeownership for the Poor. *Journal of Economic Issues, 28*, 567-576. doi**:** 10.1080/00213624.1994.11505569

Miller, Byron;& Smith, Allan. (2011). 'Heart of the New West'? Oil and Gas, Rapid Growth, and Consequences in Calgary. In Larry S. Bourne; Tom Hutton ; Richard G. Sheamur; & Jim Simmons (Eds.), *Canadian Urban Regions, Trajectories of Growth and Change* (pp.). Calgary: Oxford University Press.

Green, D. A., & Milligan, K.. (2010). The Importance of the Long Form Census to Canada. *Canadian Public Policy / Analyse De Politiques*, *36*(3), 383–388. Retrieved from http://www.jstor.org/stable/20799664.

Moore, Eric, & Skaburskis, Andrejs. (2004). Canada's increasing housing affordability burdens.*Housing Studies*, *19*, 395-413. doi: 10.1080/0267303042000204296

Newfoundland Government, Department of Finance.(2005).*The Economic Review 2005.* Retrieved from the Department of Finance website: http://www.economics.gov.nl.ca/review2005/review2005.pdf

Newfoundland Government, Department of Finance.(2008).*The Economy 2008.* Retrieved from the Department of Finance website: http://www.economics.gov.nl.ca/E2008/TheEconomy2008.pdf.

O'Dell, W., Smith, M., & White, D. (2004). Weaknesses in Current Measures of Housing Needs. *Housing and Society, 31*, 29-40. doi**:** 10.1080/08882746.2004.11430496

Pearson, A. L., Barnard, L. T., Pearce, J., Kingham, S., & Howden-Chapman, P. (2014). Housing quality and resilience in New Zealand. *Building Research and Information, 42*, 182-190. Retrieved from www.scopus.com

Polèse, M., & Shearmur, R. (2005). Why some regions will decline: A Canadian case study with thoughts on local development strategies. *Papers in Regional Science*, *85*, 23–46. doi:10.1111/j.1435-5957.2006.00024.x

Quigley, J. M., & Raphael, S. (2004). Is Housing Unaffordable? Why Isn't It More Affordable? *The Journal of Economic Perspectives, 18*, 191-214. doi: 10.2307/3216881.

Randall, J. E., & Ironside, R. G. (1996). Communities on the edge: An economic geography of resource-dependent communities in Canada. *Canadian Geographer, 40*, 17-35. doi**:** 10.1111/j.1541-0064.1996.tb00430.x

Research Associates.(1992). *The role of subsidiary/accessory apartments in the St. John's CMA*. St. John's: Canada Mortgage and Housing Corporation, St. John's.

Rohe, William M., Van Zandt, Shannon & McCarthy, George. (2001). *The Social Benefits and Costs of Homeownership: A Critical Assessment of the Research* (Working Paper No. LIHO-01.12). Retrieved from http://www.jchs.harvard.edu/sites/jchs.harvard.edu/files/liho01-12.pdf.

Rolfe, J., Miles, B., Lockie, S., & Ivanova, G. (2007). Lessons from the social and economic impacts of the mining boom in the Bowen Basin 2004-2006. *Australasian Journal of Regional Studies, 13*(2), 134-153. Retrieved from apo.org.au.

Rowley, S. & Haslam McKenzie, F. (2010). Housing markets in regional Western Australia: boom and bust?, In Maria Schwensen (ed), *Australasian Housing Researchers' Conference, Aug 5 2009*. Sydney, Australia: UNSW.

Rowley, S., Ong, R., & Haffner, M. (2015). Bridging the Gap between Housing Stress and Financial Stress: The Case of Australia. *Housing Studies, 30*, 473-490. doi**:** 10.1080/02673037.2014.977851

Ryser, L., & Halseth, G. (2011). Housing costs in an oil and gas boom town: Issues for low-income senior women living alone. *Journal of Housing for the Elderly*, *25*, 306-325. doi: 10.1080/02763893.2011.595618.

Schwartz, Herman & Seabrooke, Leonard. (2008). Varieties of Residential Capitalism in the International Political Economy: Old Welfare States and the New Politics of Housing. *Comparative European Politics*, 6, 237. doi: 10.1057/cep.2008.10.

Sharpe, C. (2005). Just beyond the fringe: Churchill Park garden suburb in St. John's, Newfoundland. *Canadian Geographer-Geographe Canadien*, 49, 400-410. doi: 10.1111/j.0008-3658.2005.00104.x.

Shlay, A. (2006). Low-income Homeownership: American Dream or Delusion? *Urban Studies, 43*, 511-531. doi: 10.1080/00420980500452433

Skaburskis, A. (2004). Decomposing Canada's Growing Housing Affordability Problem: Do City Differences Matter? *Urban Studies (Routledge) 41*,117-149. doi: 10.1080/0042098032000155713

Smith, Susan J., Searle, Beverley A., & Cook, Nocole. (2009). Rethinking the Risks of Home Ownership. *Journal of Social Policy*, *38*, 83-102. doi:10.1017/S0047279408002560.

Smith, Susan J. (2015). Owner occupation: at home in a spatial, financial paradox.*International journal of housing policy,* 15, 61-83. doi: 10.1080/14616718.2014.997432.

Stanford, Jim. (2008). Staples, deindustrialization, and foreign investment: Canada's economic journey back to the future. *Studies in Political Economy, 82,7-34*. Retrieved from *spe.library.utoronto.ca*

Stangeland, Per. (1984). Getting Rich Slowly: The Social Impact of Oil Activities. *Acta Sociologica*, *27*, 215–237. Retrieved from http://www.jstor.org/stable/4194529.

Statistics Canada.(2010a) *Population and Dwelling Counts, for Census Agglomerations in Alphabetical Order, 1991 and 1996 Censuses - 100% Data*.(Catalogue number 93-357-XPB). Retrieved from https://www12.statcan.gc.ca/english/census96/data/popdwell/Table.cfm?T=206

Statistics Canada. (2010b).*Population and Dwelling Counts, for Census Metropolitan Areas in Decreasing Order of 1996 Population, 1991 and 1996 Censuses - 100% Data*. .(Catalogue number 93-357-XPB). Retrieved from https://www12.statcan.gc.ca/english/census96/data/popdwell/Table.cfm?T=205

Statistics Canada.(2013). *Housing Reference Guide, National Household Survey*. (Statistics Canada Catalogue number 99-014-XWE2011007) Ottawa. Retrieved from http://www12.statcan.gc.ca/nhs-enm/2011/ref/guides/99-014-x/99-014-x2011007-eng.cfm.

Statistics Canada. (2016c). *Focus on Geography Series, 2011 Census*. Statistics Canada (Catalogue number 98-310-XWE2011004). Analytical products, 2011 Census. Retrieved from https://www12.statcan.gc.ca/census-recensement/2011/as-sa/fogs-spg/Facts-cma-eng.cfm?LANG=Eng&GK=CMA&GC=860.

Statistics Canada.(2016b). *Table 051-0005 - Estimates of population, Canada, provinces and territories, quarterly (persons),* CANSIM (database). Retrieved Feb 22, 2016 from http://www5.statcan.gc.ca/cansim/pick-choisir?lang=eng&p2=33&id=0510005.

Statistics Canada.(2016a). Population and Dwelling count Highlight tables, 2011 Census - Population and dwelling counts, for census metropolitan areas and census agglomerations, 2011 and 2006 censuses. Retrieved from http://www12.statcan.gc.ca/census-recensement/2011/dp-pd/hlt-fst/pd-pl/Table-Tableau.cfm?T=201&S=3&O=D&RPP=150.

Stone, Michael E.(1990). *One-third of a Nation: A New Look at Housing Affordability in America*. Washington DC: Economic Policy Institute.

Stone, Michael E.(2006). What is housing affordability? The case for the residual income approach.*Housing Policy Debate, 17*, 151-184. doi: 10.1080/10511482.2006.9521564.

Storey, Keith. (2010). Fly-in/Fly-out: Implications for Community Sustainability. *Sustainability*, 2, 1161-1181.doi: 10.3390/su2051161.

Tonts, M., Martinus, K., & Plummer, P. (2013). Regional development, redistribution and the extraction of mineral resources: The Western Australian Goldfields as a resource bank. *Applied Geography*, *45*, 365–374. doi:10.1016/j.apgeog.2013.03.004.

Veall, M. R. (2010). 2B or Not 2B? What Should Have Happened with the Canadian Long Form Census? What Should Happen Now?. *Canadian Public Policy / Analyse De Politiques*, *36*, 395–399. Retrieved from http://www.jstor.org/stable/20799666

Walker, Ryan & Tom Carter. (2010). "At Home in the City Housing and Neighbourhood Transformation." In Trudi Bunting, Pierre Filion & Ryan Walker (Eds.) *Canadian Cities in Transition* , 4th Ed. (pp. 171-190). Don Mills, Ont.: Oxford University Press.

Walks, R. Alan. (2001).The Social Ecology of the Post-Fordist/Global City? Economic Restructuring and Socio-Spatial Polarisation in the Calgary Urban Region. *Urban Studies,* 38, 407-47. doi: 10.1080/00420980120027438

Walks, R. Alan.(2010). New divisions: Social polarization and neighbourhood inequality in the Canadian City. In Trudy Bunting, Pierre Filion & Ryan Walker (Eds.) *Canadian Cities in Transition* , 4th Ed. (pp. 171-190). Don Mills, Ont.: Oxford University Press.

Walks, Alan. (2013). Mapping the Urban Debtscape: The Geography of Household Debt in Canadian Cities. *Urban Geography*, 34,153-187. doi: 10.1080/02723638.2013.778647.

Walks, Alan. (2014). From Financialization to Sociospatial Polarization of the City? Evidence from Canada. *Economic Geography*, 90, 33-66. doi: 10.1111/ecge.12024.

Weller, C. E. & Sabatini (2008). "From Boom to Bust: Did the Financial Fragility of Homeowners Increase in an Era of Greater Financial Deregulation?" *Journal of Economic Issues,* 42(3): 607-632.

Weller, C., & Sabatini, K. (2008). From Boom to Bust: Did the Financial Fragility of Homeowners Increase in an Era of Greater Financial Deregulation? *Journal of Economic Issues, 42*, 607-632. doi**:** 10.1080/00213624.2008.11507170

Yates, Judith. (2002). Housing Implications of Social, Spatial and Structural Change. *Housing Studies*, 17, 581-618. doi: 10.1080/02673030220144367.

Yates, Judith. (2008). Australia's Housing Affordability Crisis. *Australian Economic Review*, 41, 200-214. doi: 10.1111/j.1467-8462.2008.00502.x.

Yates, Judith, & Bradbury, Bruce. (2010). Home ownership as a (crumbling) fourth pillar of social insurance in Australia. *Journal of Housing and the Built Environment*, 25, 193-211. doi: 10.1007/s10901-010-9187-4.

3.12. APPENDIX

1) Location Quotient: Oil industry (NAICS 211). Indicator of Economic Specialization.

$$LQ_{ij} = S_{ij} / S_{i\bullet} \qquad [001]$$

Where

LQ_{ij} = Location Quotient in industry *i* (Oil Extraction), in region *j*

S_{ij} = Share of employment in industry *i* (Oil Extraction), in region *j*

$S_{i\bullet}$ = Share of employment in industry *i* (Oil Extraction), nationally (Canada)

2) Compound Annual Growth Rate (CAGR).

$$CAGR(t_0, t) = \left(\frac{V(t)}{V(t_0)} \right)^{\frac{1}{t - t_0}} - 1 \qquad [002]$$

Where

$CAGR(t_0, t)$ = Compound Annual Growth Rate between initial period t_0 and final period t

$V(t_0)$ = Initial value at period t_0

$V(t)$ = Final value at period t

t- t_0 = Number of years between the final t and the initial period t_0

CHAPTER 4: WHO'S GOT ROOM IN THE BOOM? THE CHANGING DETERMINANTS OF HOUSING STRESS IN RESOURCE DRIVEN AGGLOMERATIONS: A QUANTILE REGRESSION ANALYSIS OF ST. JOHN'S, NEWFOUNDLAND AND FORT MCMURRAY, ALBERTA, CANADA, 1991-2011.

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4.1. ABSTRACT

There is growing evidence that resource-led economic growth generates segmented local labor markets and rapidly rising housing prices which make it difficult for low to mid income earners to find adequate, suitable, and affordable housing. This research seeks to explore these dynamics through an investigation of households' correlates of housing affordability stress in two resource driven agglomerations in Canada, namely St. John's, Newfoundland, and Fort McMurray, Alberta. Using socioeconomic variables derived from Statistics Canada confidential micro data of the 1991 and 2006 censuses and the National Household Survey (NHS) 2011, we use quantile regression techniques to construct an explanatory model for the bottom, median, and top quartiles of the housing affordability stress spectrum. We find that housing tenure, labor market activities, and other socioeconomic indicators have differentiated effects for households with low, median, and high levels of housing affordability stress. The young, lone females, female lone parents, the disabled and people working in poorly paid service sectors emerge as characteristics increasingly associated with previously unforeseen housing related

vulnerability in the population. While regional differences exist in the level of affordability stress for renters and mortgaged homeowners, the results provide clear evidence of the rising risk faced by mortgaged homeowners in a volatile economy based on commodities. Policy actions are called for to alleviate income inequalities by addressing the housing affordability problems and a shortage of housing affordable for low to mid income earners.

4.2. INTRODUCTION

The recent oil-related boom in various resource driven regions in Canada has highlighted housing market failure to provide suitable, adequate and affordable shelter for low to middle income earners (Goldenberg *et al*., 2010; Keogh, 2015; Miller & Smith, 2011). Narratives of rising homelessness and families struggling to find affordable housing have been publicized in the media during a time period when Canada has experienced an unprecedented economic growth. While a resource boom generates income gains for those employed in the resource sector and those who experience spillover of it, the rest of the population benefits more indirectly and much less from the resource-led economic growth.

This uneven income distribution is not without consequence for local housing markets. Housing prices escalate in confluence with the surging demand (Agnello and Schuknecht, 2011). This also has an impact on the rental housing sector, resulting in lower vacancy

rates and high rents (Walker & Carter, 2010). While housing affordability outcomes are undoubtedly affected by the supply and demand, there are underlying complex economic, social, and psychological rationales that shape housing demand (Hulchanski, 1995). By constructing a more nuanced portrait of households at risk of experiencing housing affordability stress, we can identify which segments of the population have not experienced income increases large enough to counterbalance their rapidly rising housing costs.

There is growing evidence that income and housing cost trends generate new patterns of housing related vulnerability in resource driven economies. However, few studies have thus far investigated how resource booms affect the socioeconomics of housing affordability of households in these locations. This article aims to provide a more detailed analysis of these dynamics by looking at the temporal trends taking place during the time of a resource boom, specifically looking at the changing impacts of household characteristics on housing affordability across the affordability spectrum.

This paper begins by presenting a brief overview of the existing literature on housing affordability, followed by a section that describes the data and methodological approach used in this study. The multivariate regression analyses provide insights on the changing impacts of household and housing characteristics on housing affordability. The paper concludes by summarizing the key findings and policy implications.

4.3. BACKGROUND

4.3.1. Dimensions of housing affordability

Housing affordability can be defined as a negotiation between housing cost and non-housing expenditures within the constraints of a household budget (Stone, 2006). Housing cost tends to be the largest one in a household budget, and it determines how much of the income remains for non-housing necessities and savings (Stone, 1990, 2006). Housing affordability is a topic of interest for both policy makers and individual households because housing affordability problems push households into compromises they would not have made if they had not experienced housing affordability stress (Yates, 2008). These can entail cutting down in expenses for adequate nutritious food (Kirkpatrick & Tarasuk, 2007), heating of one's home (O'Neill, Jinks & Squire, 2006), and even health care and educational attainment (Kutty, 1999; Moore & Skaburskis, 2004, Walks, 2014). Lack of affordable housing can also exacerbate the position of vulnerable groups of the population such as the disabled persons by reinforcing the socially constructed attitudes, and structures of dependency of the disabled from their family members (Saugeres, 2011).

The most common approach to housing affordability is to measure it as a housing cost to income ratio (CIR). Housing is considered affordable if housing costs remain below 30 percent of a household gross income. While this ratio has a long history both in social sciences and as a policy tool, it has justifiably been criticised for not taking into account

other relevant factors such as remaining disposable income (Hulchanski, 1995; Stone, 1990, 2006). Those with high incomes are likely to have enough disposable income to cover their non-housing expenditures Therefore, housing affordability is frequently studied for low to moderate income earners such as the bottom 40 percent of the income distribution (Nepal, Tanton & Harding, 2010) or those below Canadian Low-Income-Cut-Off (Moore & Skaburskis, 2004). Besides, the housing CIR does not take into account household size, composition and characteristics which have an impact on housing costs and other expenditures (Hulchanski, 1995; Marks, 1984). Overall, this paper addresses these flaws by providing a detailed analysis of how household structures, housing attributes, and characteristics of the principal household maintainer impact housing affordability stress at given points across the housing CIR continuum—the validity of the 30 percent CIR benchmark being widely disputed (Hulchanski, 1995; Stone, 1990).

The main alternative to the housing CIR is the residual income approach, which determines if a household has enough to cover a basic level of non-housing consumption after housing costs have been paid (Stone, 1990, 2006). While it may be appropriate in some cases, such an approach implicitly entails that the focus of the research switches from housing affordability to prevalence of income constraints and poverty, regardless if it is housing induced or not. The absence of generally applicable standard for a non-housing consumption basket represents another challenge with the approach, which inevitably leads to a fragmentation of the data because of the regional differences between the prices of these necessities. This adds to data availability constraints. In

Canada, there are currently no tools for longitudinal analysis for the intended time period of 1991 to 2011, since the market basket was first constructed in 2003 (Preville, 2003).

There are, nevertheless, some limitations that should be noted with the housing CIR. First, the measure only accounts for income gained through market activities and governmental transfers. In reality, households frequently have other sources of revenues and services, such as the domestic economy within the household, the informal economy with extended family and acquaintances, and the social economy with its neighborhood, and community groups and agencies (Hulchanski & Michalski, 1994). Second, while most households are forced to spend more than 30 percent of their incomes on housing, there will be cases where households deliberately choose to do so, either because they own wealth or savings that they can use for their non-housing consumption (Thalmann, 1999, 2003), or they reduce their other expenditures (Moore & Skaburskis, 2004). Some may simply want to have their dream home while others seek long-term investment benefits (Rowley, Ong & Haffner, 2015). Regardless of their rationale, they risk having a more limited disposable income for their non-housing consumption (Hancock, 1993). Meanwhile, low CIR can mask substandard housing conditions (Lerman & Reeder, 1987), housing located far away from places of employment, or in a neighbourhood devoid of amenities (Carver, 1948; Kesteloot, 1994). It can also conceal under consumption of housing for homeowners (Hancock, 1993). However, despite these potential trade-offs between housing affordability, quality and non-housing consumption, the CIR links housing market and labor market outcomes, exposing trends which are

shaped by the essential dynamics of the interplay between housing and labor markets over time (Hulchanski, 1995).

4.3.1. The determinants of housing stress

While there is a wealth of literature about housing affordability as a concept (e.g. Gan & Hill, 2004; Hulchanski, 1995; Stone, 1990, 2006), less research has been conducted on what characteristics specifically determine or explain different housing affordability outcomes, perhaps because the answer appears too obvious. Housing affordability is an income problem, therefore households with low income levels, such as persons living alone, and single parents, are often identified as those most impacted by housing affordability stress (Bunting, Walks & Filion, 2004; Lamont, 2008). Young people are likely to have difficulties in establishing themselves in the housing market because of their current low earning levels (Skaburskis, 2002; Yates, 2002). Elderly women living alone (Ryser & Halseth, 2011), and those with disabilities (Weeks & LeBlanc, 2010) also frequently spend more on their housing than they can afford. Other vulnerable groups such as recent immigrants, visible minorities and aboriginal persons are likely to struggle with their housing affordability (Bunting, Walks & Filion, 2004; Hiebert, 2009; Rea *et al*., 2008). Renters are more often than homeowners burdened by their housing costs (Hulchanski, 2004; Rea *et al*., 2008). However, far from obvious, the literature highlights the complex dynamics of housing affordability, which is positioned at the conjunction of processes related to local labor and housing markets, as well as socioeconomic and

housing conditions. It is hence not one but the detailed interaction of each of these factors that provides a comprehensive overview of the affordability problem, and how this condition varies in various contexts and for given segments of the population.

Labor market characteristics

Labor market activities are instrumental in both alleviating and exacerbating housing stress for individual households. While highly educated individuals have better access to well-paid employment which tends to decrease housing affordability stress (Rea *et al*., 2008), recent labor market restructuring has replaced many full-time jobs with a multitude of precarious, part-time, and low pay jobs (Skaburskis, 2002; Walks, 2001, 2010). In these circumstances, young people are likely to spend more time studying, and leaving the parental home and household formation may need to be postponed (Beaupré, Turcotte & Milan, 2006; Clark, 2007; Yates 2002). Meanwhile, booming sectors such as resource industries provide well paid employment which may allure young people to drop off from high-school (Goldenberg *et al*., 2012), or post-pone their post-secondary education (Emery, Ferrer & Green, 2012), although research shows that these persons return to school when an economic downturn occurs (Alessandrini, 2014; Emery, Ferrer & Green, 2012).

The labor market may provide benefits but it often excludes certain segments of the population. For a disabled person, it is harder to attain education, and find a full-time employment than for those without disabilities (Leiter & Waugh, 2009). Aboriginal

persons often end up confined to lowly paid jobs which affect their housing affordability prospects (Rea *et al*., 2008). Visible minorities identifying themselves as black, Arab, or West Asian are more likely to experience persistent housing affordability problems (Hiebert, 2009), which suggests that their assimilation in the Canadian labor and housing markets could be impeded by racial discrimination. Furthermore, those retired from labor market because of age or illness have a scant chance of augmenting their incomes to compensate for rising housing costs.

Housing market and households' characteristics

Housing affordability problems are also exacerbated by the aggregate supply and demand in the housing market. Provision of housing for low income earners has largely been left for private housing market but new housing development is generally geared towards housing that is too expensive for first-time buyers to purchase (Lamont, 2008). Meanwhile, much of the existing affordable rental housing has been lost through demolition and conversion to high-end use (Walker & Carter, 2010). This has led to a significantly lower share of housing that is affordable to low and moderate income earners. At the same time filtering of existing, older housing stock is a market mechanism that could provide housing for lower costs but processes of gentrification place the price levels of many of these units out of reach for low income earners (Skaburskis & Moos, 2010). Furthermore, low income earners may have constraints, such as special housing needs of the elderly with ailing health or disability that prevent them from accessing housing with lowest cost (O Dell, Smith & White, 2004; Rowley, Ong & Haffner, 2015).

Current housing decisions may also have an impact on the future housing affordability. Those who manage to buy and sell at the right moment in relation the resource cycles, collect tax-free capital gains (Harris *et al*., 1986) on the inflated housing values. Meanwhile, others face capital losses if they are forced to sell when the boom is over (Lloyd & Newlands, 1990). Furthermore, current increasing numbers of low to moderate income earners fund their home purchases with mortgages. This means they are carrying an amount of debt that is disproportional to their incomes (Walks, 2013), and puts them at a risk of losing their homes and credit rating if anything in their circumstances changes.

Residential mobility is one solution to discrepancies between labor markets and housing markets. Short distance mobility often follows from a discovery that the current housing no longer meets one's needs (Henley, 1998), while long distance mobility is more frequently propelled by employment reasons. There are different categories of people who move to regions that offer better employment opportunities, from immigrants to non-permanent residents, and Canadian residents moving from one province to another. Housing tenure plays a role for one's willingness to relocate. Renters are more likely to move than homeowners because they may search for both more affordable housing and better employment opportunities. However, if moving is combined with a transition to homeownership, a period of initial housing affordability stress is likely to occur (Rea *et al*., 2008). Homeowners locked in negative equity (Chan, 2001) and those with large homes (Lamont, 2008) are the least inclined to relocate.

Canada needs an influx of immigrants to fill future positions in the labor force because of its low endogenous population growth and aging population. However, unless an extra supply of housing is provided, these immigrants also contribute to rising housing prices by adding to housing demand (Ley, 2007) in the major metropolitan areas in which they prefer to settle (Moos & Skaburskis, 2010). According to recent research, most immigrants meet with an initial housing-related hardship during their first 10 years in Canada (Rea *et al*., 2008), but the differences between immigrants and other population tend to decline already after four years (Hiebert, 2009). Due to their rapid economic growth generating employment opportunities, resource driven economies receive many of the mobile workers but resource-led economic growth does not always equate numerous new jobs and population growth in the region (Ennis, Finlayson & Speering, 2013).

4.3.2. Resource booms and housing stress

Resource industries have a major impact on the local economies by creating new high wage employment (Rolfe *et al*., 2007) which attracts workers even from other regions. Increase in housing demand, partly from well-paid resource sector workers, contributes to an escalation in housing prices in the region (Agnello & Schuknecht, 2011). While rising housing prices in resource driven urban agglomerations have been noted before (e.g. Goldenberg *et al*., 2010; Randall & Ironside, 1996), there is to date limited research on what part of the population is the most affected over time. Research suggest that low to moderate income earners, such as service sector workers, may be among those who

struggle most with their housing affordability. Yet, these workers provide services that are very important for the livability of communities (Ennis, Finlayson & Speering, 2013; Goldenberg *et al*., 2010). This is particularly relevant for resource driven urban agglomerations as many of them invest in civic and social infrastructure to attract and retain workers and their families (Keogh, 2015; Ryser & Halseth, 2011).

Fort McMurray is the best known resource urban agglomeration in Canada. It is the largest settlement and urban service center for the regional municipality of Wood Buffalo in northern Alberta with a current population of 65,565 (Statistics Canada, 2016). Fort McMurray has experienced a very strong population growth due to its close proximity to the Athabasca oil sands where the Great Canadian Oil Sands Project was established in the 1960's (Keogh 2015). The region provides a multitude of well paid jobs during oil booms, about 40 percent of the primary household maintainers in Fort McMurray are employed in oil and mining industry. Meanwhile, Athabasca oil sands accounted for 70 percent of the Canadian oil production in 2009 (Natural Resources Canada, 2011). Housing demand has been much higher than housing supply in this environment of booming economy and this has resulted in soaring housing costs for both renters and homeowners.

This long history of oil extraction in Fort McMurray is contrasted by that of St. John's. The capital of Newfoundland is a natural hub for the oil extraction activities, which first started in 1997. As a result, the former province in economic decline experienced an unprecedented economic growth during the most recent oil boom. Newfoundland

accounted for 10 percent of the oil production in Canada in 2009 (Natural Resources Canada, 2011). At the same time, less than 3 percent of the employment of the primary household maintainers in the sample was in oil-sector.

These labor market outcomes have differentiated implications for households. On the one hand, these effects translate into income inequality often associated with growing problems of housing affordability (Dewilde & Lancee, 2013; Matlack & Vigdor, 2008; Moore & Skaburskis, 2004; Walks, 2010). However, housing affordability problems are also exacerbated by the excessive housing cost increases evident in resource driven urban agglomerations. How are these two general forces impacting affordability among different households over time? This paper aims to explore the changing impact of household and housing characteristics associated with heightened housing affordability problems and to analyze how these factors have evolved between 1991 and 2011 for households facing different levels of housing stress.

While resource-led economic growth adds to the local GDP by generating royalties and increasing average income levels, these frequently cited numbers provide little information about the outcomes for the lower end of the income spectrum (Lawrie, Tonts & Plummer, 2011; Rowley & Haslam-McKenzie, 2010). Resource industries may generate well paid jobs but there may be significantly higher number of lowly paid service sector jobs created during oil boom (Cadigan, 2012). These low to moderate income earners tend not to experience any substantial salary increases. In addition, general increases in cost of living and specifically increase in housing costs may

outweigh income growth they have experienced, generating housing affordability problems.

So far, researchers have addressed housing affordability problems experienced by certain socioeconomic groups in small resource towns in Canada (Goldenberg *et al*., 2010; Ryser & Halseth, 2011). However, most housing research has been conducted in major metropolitan areas in Canada (Bunting, Filion & Walks, 2004; Skaburskis, 2004). The results obtained in the major metropolitan areas may not be transferable to resource driven urban agglomerations. First, it is not evident that socioeconomic characteristics investigated in the environment of the major metropolitan areas would have the same effects on housing affordability stress in resource driven urban agglomerations such as Fort McMurray and St. John's. These resource driven urban agglomerations are smaller, they are not in the same way influenced by immigration, or even economic restructuring because they do not have any significant manufacturing sectors. Most importantly, their regional economies are different because they are exposed to the volatility of the resource cycles and that creates them a different economic backdrop that changes and generates unevenly distributed housing affordability problems over time. There is no recent research on these impacts on the populations in resource driven urban agglomerations during the most recent oil boom, despite the fact that new vulnerable segments of the population emerged during the same time when these resource driven regions had a strong GDP growth and made major contribution to the Canadian economy. While this research aims to identify these particular segments of the population, our results could

also be instrumental for aiding in the design of housing policies that target households experiencing housing-related vulnerability.

4.4. DATA AND METHODS

4.4.1. Estimation framework

As an econometric framework, we use both Ordinary Least Squares (OLS) and Quantile Regression (QR) models. While OLS estimates the conditional mean value of housing affordability for a given set of explanatory variables, it does not provide information on other parts of the housing affordability distribution, such as groups with higher or lower levels of housing stress along the distribution. These effects are likely to differ between households with severe housing affordability problems, and those that have very moderate housing costs relative to their incomes. Furthermore, OLS requires constant variance of error or homoscedasticity (Hao & Naiman, 2007), a requirement that is not likely to be fulfilled by these data sets since both incomes and housing costs are often highly skewed. Quantile regression makes it possible to display separate effects of the household characteristics on the selected different points of housing affordability stress distribution (Hao & Naiman, 2007; Koenker, 2005). This provides a more complete characterization of the data.

The general equation for quantile regression is expressed as:

$$Y_i = X_i'\beta_q + \varepsilon_i \quad [1]$$

where β_q is the vector of unknown parameters associated with the q^{th} quantile and ε_i prediction errors.

When fully specified, the estimated model equation for this study is given by:

$$CIR_i = PHM_i'\beta_{1q} + HH_i'\beta_{2q} + HOUS_i'\beta_{3q} + FE'\gamma + \varepsilon_i \quad [2]$$

where the dependant variable CIR_i offers a measure of the level of housing affordability stress through the housing cost to income ratio for a household i. PHM_i is the vector of variables for characteristics of the primary household maintainer, HH_i the vector of variables for household characteristics, and $HOUS_i$ the vector of housing attributes. The model further includes fixed effects (FE) for each municipality or Census Subdivisions (CSD) within the agglomerations as a set of extra controls. The research design here provides an opportunity to assess the differential impacts of several different explanatory variables on households experiencing low, medium and high housing affordability stress (which is operationalised as the bottom quartile, median level and top quartile of housing affordability) over time. The empirical results are presented in two separate sections for OLS and quantile regressions. This allows us to both estimate mean effects and provide a more nuanced depiction of how the impacts of households' characteristics change for different levels of housing stress.

4.4.2. Data sources

This research relies on Statistics Canada's confidential microdata from the 1991 and 2006 census as well as the National Household Survey (NHS) for 2011. The selected study period starts prior to the most recent oil boom, more specifically before Hibernia, the first oil field in Newfoundland became operational in 1997. The 2006 census reflects an approximate mid-boom point, after which the global financial crisis of 2008 brought a sharp decline of oil prices. By 2010 the market rebounded to almost the levels of 2007 (Federal Reserve Bank of St. Louis, 2016). Regrettably for the consistency of the data over time, the mandatory 2006 census was followed by the voluntary National Household Survey in 2011. Voluntary participation in surveys is generally associated with a much higher non-response rate among various segments of the population and often introduces a greater bias in the data (Green & Milligan, 2010; Veall, 2010).

This research considers households as the lowest unit of analysis and applies following limitations. This research is restricted to non-farm households living in private dwellings. All collective housing (such as lodging houses, institutions and hotels) and band housing were thus excluded from the analysis. The working sample for the analyses is further restricted to households with income levels of $1,000 or higher, and those with housing costs above zero in order to control for potential response bias.

4.4.3. Variables and descriptive statistics

Housing affordability and housing stress are measured through the housing cost to income ratio (CIR), which is used as the dependent variable in the models. The CIR is formally expressed as:

$$CIR_i = HC_i / HI_i \quad [3]$$

where CIR_i is the ratio for each household i between HC_i as housing costs—total average monthly payment to secure shelter, including energy costs (electricity, oil, gas, coal, wood or other fuels), water and other municipal services, cash rent, and, where applicable, property taxes, mortgage payments and condominium fees—and HI_i as gross household income before taxes for each in the dataset. Both are adjusted for inflation and expressed in 2005 constant dollars.

The literature on housing affordability offers preliminary grounds for the selection of the socioeconomic and housing characteristics associated with housing affordability problems. Broadly speaking, these characteristics can be divided into three categories: 1) attributes associated with the primary household maintainer (PHM); 2) household characteristics; and 3) housing attributes (see Appendix 1). Characteristics of primary household maintainers (PHM) include their age, disability, educational attainment, labor market activities, mobility, immigration and visible minority status.

These variables are defined as follows. Age is recoded into ten-year age categories starting with 15-24 years and ending with 75 years or above (45-54 is the reference category). Disability is a dichotomous variable, with a non-disabled person as a reference. Statistics Canada commentary reveals that the survey questions regarding disability were revised after the 1991 census which makes it easier for respondents to confirm a reduced amount or type of activity they were able to do in their everyday lives. This has resulted in an apparent sudden increase of disabled persons. This difference and the fact that non-responses have not been imputed, has warranted a word of caution regarding to its use from Statistics Canada (Statistics Canada, 2008). Education is coded into four categories: those with no degree, diploma or certificate, high-school diploma (the reference category), college diploma or trades training, or university graduate. Labor market activities roughly follow North American Industrial Classification System (NAICS) categories although some categories merged into one. The concordance from the 1991 Standard Industrial Classification System 1980 (SIC80) to NAICS2002 and NAICS2007 is not ideal but the industry categories of main interest here, such as resource sector (oil, gas, mining and quarrying), health care, social assistance and education services, retail, food and accommodation and public service are fairly consistent. Mobility within the last year and within the last five years is expressed for movers within census subdivision (CSD), from other CSD and outside Canada, with non-movers as a reference. Immigration status has the categories non-immigrant (the reference), immigrant and non-permanent resident. There are relatively few persons of ethnic minorities in St. John's and

Fort McMurray, therefore aboriginal persons and other ethnic minorities are covered by one variable. Visible minority status was therefore coded as visible minority and other than aboriginal person, or aboriginal person, with non-visible minority and non-aboriginal person as a reference.

Household characteristics entail family composition and number of household maintainers. Male and female single person households are regarded separedly, as are male respective female lone parents. Same-sex couples are too few to be regarded as a category of their own and they are thus incorporated in the same category with opposite-sex couples. Couple with children is the reference group for family composition.

Housing attributes entail housing tenure, housing type, new house, housing condition, and crowding. Housing tenures are non-mortgaged homeowners (the reference group), mortgaged owners, and renters. Housing type has the single-detached house as a reference. New house is a dichotomous variable that indicates whether the house was built during the last five years or not. Housing condition indicates whether the dwelling needs regular maintenance, minor repairs or major repairs. Crowding is a continuous variable that is calculated by dividing number of persons in a household with number of bedrooms in the dwelling.

4.5. EMPIRICAL RESULTS

4.5.1. Descriptive statistics

Sample characteristics for 1991, 2006 and 2011 are presented separately for Fort McMurray and St. John's (Appendix 1). Among significant changes taking place over time are aging demographics, particularly in St. John's, as well as an increase in single person households. Economic growth during the resource boom resulted in an increased participation rate and reduction of unemployment over the period. Educational attainment patterns trend towards an increasing share of post-secondary education. There is also a lower prevalence of crowding related to a general trend towards larger homes. Both agglomerations further show a growing share of mortgaged homeowners over time, while the proportion of renters has decreased. However, this decrease is only in relative terms as the absolute number of renters has increased. With regards to the type of dwelling, Fort McMurray and St. John's appear fairly similar, with single-detached house as a dominating housing type.

The sample data displays general trends such as decreasing share of couples with children in Fort McMurray and St. John's and decreasing numbers of households with just one maintainer while households with two maintainers and in Fort McMurray even households with three or more maintainers have increased. Regional differences are mostly connected with much lower prevalence and decreasing share of lone females in Fort McMurray compared to St. John's.

Variables for housing condition and crowding were added to study if households were compromising quality for cost. Housing quality does not appear to be a major problem, although compared to St. John's, crowding is more prevalent in Fort McMurray. New house (house built within last five years) was added mainly as an economic indicator for the expansion of Fort McMurray.

4.5.2. Interpretation of the OLS estimates

The OLS model entails a wide variety of explanatory variables covering age of the primary household maintainer, labor market activities, education, disability, family structure, immigration, visible minority status, mobility, and specific housing attributes (Table 8). Among all variables, housing tenure is the most important determinant housing affordability, with housing cost burden being much higher for mortgaged owners and renters than for those who own their homes outright. However, access to a decent income is equally important, and places those not in the labor force, single females, female headed families, the young, and the unemployed at a risk of experiencing housing affordability stress.

Age is often assumed to have an important impact on housing affordability. Households tend to receive higher incomes over time which contributes to favorable housing outcomes, particularly if their maintainers have high education levels and increasing professional experience. When household maintainers get older, they are more likely to be homeowners who have paid off their mortgages.When controlling for tenure and

education levels, the estimates show that age categories have distinct and significant effects on housing affordability, although more importantly so in St. John's. There is clear indication that the younger the household maintainer, the higher is the housing cost to income burden. While having a PHM in the 15-24 age group increases the housing CIR, being in the 55 to 64 years decreases the level of housing stress, although in smaller proportions. The effects have generally decreased between 1991 and 2011 for PHM between 15 and 44 years of age, while deteriorating for PHM aged 65 to 74 and improving for those aged 75 or above. The effect associated with young people (15 to 24 years) in Fort McMurray has improved, but deteriorated for the age category 25 to 34 years. The evolution has been even more concerning for the elderly, those between 65 and 74 went from significant effect of -3.839 to insignificant -1.126. Those 75 years of age or above experienced a similar trend.

Age summarizes the interconnectedness of career and housing paths. Age predicts income levels in the labor market, a young person with his or her education goes through a progression, advancing from entry level salary to that of a senior worker with experience, after which retirement makes income levels decline. There is a corresponding progression in the housing market, from young renter to young first time house buyer in the midst of household formation and a multitude of expenditures to an established homeowner who finally owns his or her home outright. During a resource boom, housing prices rise rapidly and this may make young person unable to become homeowners despite potentially well paid employment opportunities. Older persons may benefit if they

owned their homes before the boom occurred. However, older renters will struggle when their rental costs rise. As persons age, their housing needs change and this may be a particular challenge during resource booms.

The economic growth during a resource boom may nevertheless be most directly reflected by what happens in the labor market. Offshore oil extraction in Newfoundland started first in 1997, and unsurprisingly the oil and gas industry was not associated with any significant effect on housing affordability in 1991. This started to change in 2006. Having a PHM working in the resource sector was the second single most important labor market factor improving housing affordability, below utility industries which had a peak year in 2006—an outcome of the emergence of a newly established electricity Crown Corporation developing hydro projects in the province. This alleviating impact soared to -5.099 ($p<0.001$) in 2011 when oil production was at its peak in our dataset. At the same time, the effect of working in the Public services improved from -0.495 ($p<0.05$) in 1991 to -2.799 ($p<0.001$) in 2011, which matches with the rapid increase in revenues for provincial employees that followed the collective bargaining at a time of substantial oil royalties. Meanwhile, the alleviating effect of having a PHM working in the resource sector declined in Fort McMurray over the same period, from -4.664 ($p<0.001$) to -1.274 ($p<0.001$), perhaps because housing prices were rising fast or the income evolution in the reference sector (Health care and education) changed in relation to that of the resource industry sector. However, resource industry and utilities industries remain by far the best labor market characteristics improving affordability in both agglomerations.

In parallel, households with an unemployed PHM (or a PHM unable to join the labor force) are experiencing some of the highest housing cost to income burden—a situation which deteriorated over the period. Retail employment follows a similar trend, with its impact on the CIR increasing in Fort McMurray from a coefficient of 1.998 ($p<0.001$) in 1991 to 6.657 ($p<0.001$) in 2011. This is contrasted by food and accommodation employment, which experienced decrease in affordability stress from 6.008 ($p<0.001$) to 2.599 ($p<0.001$), after reaching a maximum of 7.304 ($p<0.001$) in 2006. In St. John's the effect of food and accommodation sector deteriorated from 4.281 ($p<0.001$) to 5.075 ($p<0.001$), as retail sector employment was inexplicably associated with improvement from 3.573 ($p<0.001$) to 0.464 ($p<0.05$) between 1991 and 2011.

Educational attainment also shows a more distinct effect particularly for the post-secondary education in St. John's in comparison to Fort McMurray. While university degree improved housing affordability in St. John's, it was associated with a slightly deteriorating housing affordability in Fort McMurray during the same time period. College diploma or trades had a similar pattern -in St. John's, while these effects became insignificant in 2011 in Fort McMurray. Lack of education does not appear to be associated with any evident pattern.

Among other variables is noted the effect associated with being a renter appears to be deteriorating, from a CIR impact of 11.034 ($p<0.001$) to 13.181 ($p<0.05$) in Fort McMurray and 10.775 ($p<0.001$) to 12.089 ($p<0.05$) in St. John's, while housing cost to income burden is improving slightly for mortgaged homeowners. Family structure

appears to have important effects, particularly for lone persons and female lone parents, which are likely to be correlated with the number of household maintainers. Mobility also appears to be associated with relatively high effects, as is immigration, despite the low share of immigrant and non-permanent residents particularly in St. John's.

Post estimates for the OLS model included collinearity diagnostics and Breusch-Pagan test for the presence of heteroscedasticity. No major problems with multicollinearity in the estimations were found (see Table 12 in Appendix). However, the Breusch-Pagan test for heteroscedasticity shows that variance of error is not constant for any of our regression models. This was expected as both income and housing costs tend to follow skewed distributions, which supports the choice of using quantile regression methods.

4.5.3. Interpretation of the quantile regression estimates

Quantile regression (QR) shows the effects for the same variables as presented in the OLS models, but displays them separately at 0.25th quantile, median quantile and 0.75th quantile of housing affordability stress. A test of significance further allows evaluating whether coefficients for each quantile significantly differ from OLS estimates, with the † symbol denoting difference at $p<0.05$. As before, labor market activities can be interpreted as being related to the evolution of the regional economy and this is also reflected by the housing and households indicators. Differentiation of the effects for households with light, median, and significant housing affordability burden provide important information as to which socioeconomic indicators are associated with different

levels of housing affordability stress, among which the effects at the heavy housing affordability stress (0.75^{th} quantile) are of greatest interest. Results are presented for each year in Tables 9 -11 in Appendix.

Labor market segmentation of housing stress

As for the OLS estimates, employment in resource industry has one of the most important favorable effects on housing affordability outcomes in both Fort McMurray and St. John's. While OLS indicates that its effect in Fort McMurray has declined in relation to the reference sector (health care and education), this has afflicted those already most affected by their housing cost burden (the 75^{th} percentile) while 50^{th} percentile appears to have the best housing affordability outcomes. Meanwhile, resource sector employment St. John's confirms the OLS results of a favorable trend for those employed in the resource sector. While the favorable effect was largest for the 75^{th} percentile in 2006, the results for 2011 show the 50^{th} percentile as having the largest improvement even in St. John's. However, the effects for 50^{th} percentile and 75^{th} percentile are large and almost equal in size in St. John's.

Economic growth spurs demand for various services, therefore those employed in these generally lowly paid retail and food and accommodation industries are also experiencing an employment boom. However, their earnings have often been outpaced by rising housing costs. As indicated by the OLS results, food and accommodation sector in St. John's faces an increasing housing affordability burden for all levels of housing

affordability stress. Quantile regression results further show that the effect of being employed in food and accommodation sector is almost twice as high for the households already worst afflicted by their housing cost than the effect for those in the 25th percentile of housing affordability stress. Similar trends are also observed for the Arts, entertainment, and recreation sector, with an increase in affordability stress being worse at the top of the affordability stress spectrum. Housing affordability has also deteriorated in Fort McMurray for those employed in retail sector, with the worse impact found among the highest cost to income ratio quintile. Overall, apart from the 25th percentile in Fort McMurray, those employed in these service sectors always experience higher housing affordability stress than the reference group.

However, labor market characteristics with the highest impact on housing stress are found among the unemployed and households with their PHM being outside the labor market. It is not trivial that some of the highest coefficients statistically different from the OLS estimates are found within these groups for the 75th percentile. Not only has resource driven economic growth in the two agglomerations deteriorated affordability of the most economically vulnerable groups between 1991 and 2011, but it has made their housing situation a lot more problematic. While both the unemployed and individuals outside the labor market have faced growing affordability problems, the highest impact and growth over the period is found for households already facing the highest cost to income burden.

We interpret these labor market effects as empirical evidence indicative of a segmentation of the labor market. Resource sector workers are consistently facing better

housing affordability stress than the reference group. Those working in lowly paid service jobs in retail, food and accommodation and those outside of the labor market or unemployed are consistently facing worse housing affordability prospects than the reference group over time, although the temporal patterns are not necessarily evident. What is worse for those not in the labor force, the quantiles most afflicted by housing affordability stress are generally associated with much higher effects and relative increase in housing affordability burden than the others.

Changing households and housing market impacts

The number of household maintainers is generally directly proportional to the size of income. This effect is shown by two variables, namely the number of household maintainers and family structure. Households with two or more household maintainers are generally facing improving housing affordability prospects. Meanwhile, one person households tend to be more afflicted by housing affordability stress than other forms of households.

Households headed by single females are among the most vulnerable. These household types are associated with relatively high effects, controlling all other factors, and their housing affordability stress is considerably higher than that for the reference household (couple with children). Lone females in all quantiles experienced deteriorating housing affordability prospects in Fort McMurray while their housing cost burden was getting

slightly lighter in St. John's. However, these effects indicate that these households are burdened by their housing costs.

Female lone parents are also suffering from relatively high level of housing affordability stress but they are generally facing improving housing affordability prospects. Those most afflicted by their housing cost to burden (75^{th} percentile) in Fort McMurray experienced a rapid improvement while the corresponding improvement in St. John's was more modest. However, surprisingly enough female lone parents had a better housing affordability compared to single females in St. John's since 2006.

Educational attainment, generally regarded as a prerequisite for well-paid employment, could exert an alleviating effect on housing affordability stress. While particularly post-secondary education has been associated with a favorable effect on housing cost to income burden in St. John's, the corresponding effect is much smaller in Fort McMurray. These effects prevail across the whole housing affordability spectrum in St. John's, the higher the housing cost to income burden, the higher the effect. A similar, although smaller, effect is evident for college education. In Fort McMurray, college education is associated with a fairly small decrease in housing affordability stress although this is inconsistent over time. This is a clear indication of the regional labor market differences. Prevalence of a multitude of employment opportunities even for low skilled labor force does not require high education level to access employment with a decent income.

Labor market effects can thus be alleviated by increasing the number of household maintainers and the level of education. Household income increases if there is more than one household maintainer and that has an effect on housing affordability outcomes. This opportunity does not exist for single person headed households, which is evident in their housing affordability outcomes although households with children can benefit from governmental transfers, particularly if they are granted access to a social housing unit. Meanwhile, education is prerequisite for employment and it is more important in an environment where employment opportunities are scarce for the low skilled labor.

The labor market impact on the housing market is apparent. While OLS results indicated that the general housing affordability for renters was worse than for mortgaged owners in St. John's and Fort McMurray, this appears to be true only for Fort McMurray across the whole housing affordability spectrum. While renters initially had a lower effect in 1991 compared to mortgaged homeowners in Fort McMurray and St. John's, the outcomes started to diverge. Housing affordability burden for renters started growing more rapidly than that for mortgaged owners in Fort McMurray across the whole housing affordability continuum. In contrast, the effect for renters in St. John's exceeded that of mortgaged homeowners only in the 75^{th} percentile of housing affordability stress. Housing affordability pressure in Fort McMurray has also generated more demand for new housing types such as row house and apartment or flat in a duplex. These housing types used to be more affordable than the single-detached house, but they are now rapidly becoming more expensive to rent or own.

The differences between the housing affordability stress for renters and mortgaged homeowners in these urban agglomerations reflect the regional labor market differences and a housing shortage. Rapidly expanding labor market in Fort McMurray has a higher effect on the housing market and particularly on the rental housing. A shortage of housing for ownership occupancy generates pressure on the rental housing sector which simultaneously provides accommodation for the temporary workers in the resource sector.

The outcomes for the young who are in process of entering the labor market and housing market are an important indicator as to how the regional labor and housing markets are performing. As expected, our finding is that the younger the primary household maintainer is, the higher the housing cost to income burden. However, the youngest group has generally experienced improving housing affordability prospects during this time period, for example in St. John's but it is still fairly high, and the effect in Fort McMurray dropped in the 75th percentile of housing affordability stress. At the same time those between 25 to 34 years experienced a deteriorating housing affordability in St. John's and Fort McMurray for the 75th percentile. Housing cost to income burden becomes lighter when earnings increase generally with aging. For age category 55 to 64, effects become negative, indicating improving housing affordability. However, those between 65 and 74 in Fort McMurray experienced a change that is not statistically significant, and those aged 75 or above faced a statistically significant deterioration of housing affordability. The corresponding trend was less alarming but housing

affordability stress increased in St. John's for 65-74 category while it decreased for those aged 75 and above.

Disabled persons are a growing group with housing affordability concerns particularly in the aging population of St. John's. The effects associated with disability may not be high, in fact there was a decline between 1991 and 2011. However, this effect was much higher in 2006. Regardless if the current true level is closer to 2006 or 2011 level, controlling all other factors, housing affordability for a disabled household maintainer was worse than that for a primary household maintainer without a disability.

Both age and disability are potentially associated with heightened housing affordability stress. A young person starts with a high housing affordability stress that subsequently eases when a person gets older and then deteriorates again. The fact that many of the effects for older generation are not statistically significant at given levels, can signify that the group older people is not homogenous. While housing affordability has deteriorated for some, it has not necessarily been the case for all. The elderly are more likely to own their homes outright, but living at fixed incomes can still make them vulnerable for cost increases. The likelihood of disability increases when one ages. The trend of aging population particularly in Newfoundland is of concern because the disabled have different housing needs and their housing affordability stress is generally higher than for non-disabled persons.

4.6. DISCUSSION

Labor market, interrelated housing market, and demographic trends all contribute to generating increasing housing cost to income burden for low to mid income earners in resource driven economies. Labor market contribution is evident in both Fort McMurray and St. John's, despite the difference in percentage of those employed by the resource sector. While resource industry provides 40 percent of the employment opportunities for our sample of PHM in Fort McMurray, off-shore oil extraction in Newfoundland is capital intensive and hence generates relatively few jobs for the population in St. John's. Neither of these urban agglomerations has succeeded in diversifying their economic structures to a degree that it would be evident in the housing affordability outcomes. Using relatively well-paid health care and education category as a reference, only the resource industry category and utilities industries in Fort McMurray provide enough income to decrease housing cost to income burden for household.

In St. John's, the situation is similar, with one notable exception. Part of the resource royalties have been used to fund an expanding and increasingly well-paid public service sector (Ainslie, 2014). Employment in public sector had a consistent significant effect on housing affordability in 2011 for the first time. However, public spending cuts are likely to follow during bust which can make it difficult for some former public service workers to pay for their housing and other consumption.

Population associated with any of the remaining labor market activities experienced either declining housing affordability, or they were associated with insignificant effects, compared to those working for the health care, social assistance and education sector. While its remote location in relation the major economic centres of Canada and the small population base in the province may impede diversification of the Newfoundland economy, there are reserves of both human and social capital that the region has, until now, failed to take a full advantage of.

The regional labor market is interlinked with the local housing market. Housing demand from the well-paid resource sector workers exerts an inflationary impact on housing prices which is of concern for a multitude of reasons. First, the rising housing prices prevent some first-time buyers from entering the housing market which has consequences for household formation and, perhaps, out-migration (Yates 2002). This would further exacerbate the prospects for slowing down the demographic decline in Newfoundland. Fort McMurray is not affected in the same way because workers are drawn to the region by lucrative employment opportunities during oil booms.

Inflated housing prices also increase the level of indebtedness for homeowners who manage to purchase a home. Current very low interest rates alleviate their housing cost burden, but indebtedness places them at a risk when oil boom turns into economic decline and unemployment rises. This is compounded by the fact that the low to moderate income earners tend to carry the highest debt burden in relation to their income (Walks 2013). Share of mortgaged homeowners in both urban agglomerations has increased which

indicates that it has increased even among the low and moderate income earners. Indebtedness makes them vulnerable for any changes affecting household income level, regardless if it is related to changing amount or type of labor market activities, or changes in family composition, or both.

Inflated housing values during a resource boom can be converted into profits. The housing market provides a means for diffusing resource wealth to those who manage to sell their houses at the right time point (Harris *et al*., 1986). However, literature also suggests that capital gains on housing values in a region highly dependent on resource industries may evaporate entirely when resource boom ends (Lloyd & Newlands 1990). Housing values in St. John's and Fort McMurray may not return to their pre-boom levels but a price decrease has already occurred. This may not be a concern for homeowners who have resources to make their housing payments and cover their non-housing consumption. However, housing price decline can lock down other homeowners with negative equity, preventing them from seeking new employment elsewhere (Chan 2001).

Those who own their homes outright have a much better housing affordability compared to both mortgaged homeowners and renters. However, there is a high likelihood that many of these homeowners are elderly persons living at fixed incomes. Their housing affordability may deteriorate because of other cost increases such as fuel, or property taxes based on the new inflated housing values. These homeowners may be couples and single person households. As a result, housing affordability problems for those living at

fixed incomes will no longer be confined to the elderly women living alone, a particular case addressed by Ryser and Halseth (2011).

Rising housing prices reverberate to the rental housing sector. Rental sector in St. John's was able to absorb some of this pressure because of existence of relatively large sectors of social housing and accessory apartments in the city (CMHC 2012). Fort McMurray was less successful in rapidly providing additional rental housing, despite all construction activities in the region. High demand and housing shortage made rental costs sky-rocket across the whole housing affordability spectrum. This has consequences particularly for the low to mid income earners who are normally confined to the rental sector. Meanwhile, rental housing sector also responded to a market demand by developing new high-end executive rental housing in St. John's, the demand for which evaporated after oil prices dropped. As a result, rental market sector particularly in St. John's appears to provide many relatively low quality units and some high-end ones while there is mostly anecdotal evidence about a shortage of reasonably priced decent quality rental housing.

Demographic trends exacerbate what is occurring both in the labor and housing markets. Aging population and growing numbers of lone person households are both general trends in Canada. This research demonstrates that housing cost burden is high for the young although their housing affordability appears to be improving. The young may receive financial support from their parents but this can place an unreasonable strain on the parents' economy. Persons in the age group 25 to 34 would generally be in process of having a house and starting a family but lack of housing affordability is likely to make

them post-pone these plans, which further exacerbates the demographic prospects of a region.

Our analysis conveys indications that housing affordability for the elderly is slowly deteriorating. However, the elderly are a heterogeneous group, presumably with a wide range of wealth, housing circumstances and housing needs. Some of them may be overhoused in their single-detached homes because there is a lack of affordable alternatives that would allow for downsizing. This in turn keeps another home from entering the market and being purchased by a new family (Skaburskis 2002). Aging is also linked to increasing disability rate which is of concern because little of the existing housing is accessible for disabled persons. In all, we lack information about the particular housing circumstances and needs of the elderly and disabled.

Increasing numbers of one maintainer household maintainers have scant chance of competing with households with two maintainers. It is positive that housing affordability is getting better for the lone female parents, many of whom are likely to live in social housing particularly in St. John's. However, their housing cost to income burden is still very high. All additional expenditures related to child care are likely to require most of the remaining disposable income for these households.

Mobility is connected to deteriorating housing affordability. Newcomers typically would not have the network and local knowledge required for finding an optimal housing solution. Ethnic minorities may be a vulnerable group but the sample size is too small

because there are few persons of visible minorities in St. John's. Apart from certain indications of housing affordability stress this analysis does not provide enough information about potential housing affordability trends for them.

While extremely rapid growth and associated severity of housing affordability problems may be emphasized in the regional economy as dependent on resource extraction as Fort McMurray is, all of this is particularly problematic for St. John's. The provincial capital of Newfoundland has rapidly aging population and labor market that fails to attract new population with employment opportunities. Residents in Newfoundland may decide to leave for employment elsewhere. Dependence on resource industries exposes particularly mortgaged homeowners to the volatility of resource cycles and places them at a risk when facing an economic downturn. Furthermore, the future labor force may not be able to support the growing number of senior citizens in the province. Also, the local housing market with its present structure may not be adapted to the changing population structures.

4.7. CONCLUSIONS

The impacts of resource-led economic growth on labor market segmentation and arising income inequalities have been investigated through a study of the entire spectrum of housing affordability stress. Employment in resource industry sector has a consistent favorable effect on housing affordability stress in both urban agglomerations. These effects were often more clear-cut in St. John's in comparison to Fort McMurray, because the labor market in Fort McMurray provides more employment opportunities even for the low skilled workers. The same is illustrated by the fact that post-secondary education is associated with significantly larger improvement of housing affordability in comparison to Fort McMurray. Other labor market activities such as employment in lowly paid service sector, being outside of the labor market or unemployed are associated with greater housing affordability stress. This segmentation of the labor market into well paid resource sector and poorly paid service sector lays a foundation for income inequalities and subsequent housing affordability stress particularly in St. John's. This has ramifications for the livability of the community and lack of employment opportunities can make some residents decide to leave the province.

Although there has been some improvement, the young are still facing high housing cost to income burden. The apparently deteriorating housing affordability of the elderly calls for a more targeted research designs, perhaps in a combination with qualitative research to discover the specifics of their housing affordability problems.

These results highlight housing tenure as one of the most important effects on housing affordability stress, with renters and mortgaged homeowners having a very high housing cost to income burden compared to non-mortgaged homeowners. A shortage of adequate rental housing options and relatively high rental costs may contribute to making some low income earners become homeowners despite high housing affordability stress they are likely to experience, in addition to the particular risk of economic downturn with decreasing income levels. There is not enough affordable housing for various segments of the population in resource driven urban agglomerations.

At last, we believe that policy measures are required to provide housing that is affordable for low to moderate income earners. A national housing policy should be established with a framework to encourage provision of non-profit housing and rental housing, with an additional objective to protect existing social housing. At provincial and municipal levels, the co-operation between non-profit organisations, developers and different levels government should be facilitated to create more innovative, and sustainable solutions for affordable housing that are integrated with regional infrastructure such as public transport and various amenities. Individual families might also benefit from aid of a dedicated housing advisor whose knowledge of the local housing market could help households to find an optimal housing solution for them.

4.8. APPENDIX

Table 5 Primary Household Maintainers (PHM) characteristics for the sample population*

	Fort McMurray			St. John's		
	1991	**2006**	**2011**	**1991**	**2006**	**2011**
Age (ref: 45-54)	**16.9%**	**28.2%**	**25.3%**	**17.3%**	**22.6%**	**22.5%**
15-24	8.0%	6.9%	6.6%	4.7%	3.4%	4.2%
25-34	31.4%	24.1%	28.5%	23.6%	15.8%	15.8%
35-44	31.3%	26.2%	24.6%	26.0%	22.2%	19.6%
55-64	7.0%	11.7%	12.8%	11.9%	17.5%	18.9%
65-74	3.1%	2.0%	1.8%	10.3%	10.3%	11.3%
75-	2.2%	0.9%	0.4%	6.2%	8.2%	7.7%
Disability (ref: Non-disabled)	**91.7%**	**87.4%**	**87.8%**	**89.9%**	**78.5%**	**77.7%**
Educational attainment (ref: High School diploma)	**14.9%**	**19.1%**	**19.9%**	**17.6%**	**19.7%**	**19.8%**
No certificate, diploma or degree	29.0%	12.0%	9.4%	35.4%	17.6%	13.7%
College diploma, or trades	45.0%	53.6%	50.4%	31.8%	40.8%	41.6%
University degree	11.1%	15.3%	20.3%	15.1%	21.9%	25.0%
Labor market activities (ref: Educ. Health, & Soc. Ass).	5.8%	6.3%	6.0%	14.2%	14.4%	15.6%
Not in the labor market	7.8%	4.1%	3.7%	23.1%	28.3%	26.8%
Unemployed	5.2%	2.1%	0.2%	9.4%	5.4%	4.8%
Agriculture, Forestry, Fishing, & Trapping	1.8%	0.2%	0.1%	1.0%	0.8%	0.4%
Mining, Quarrying & Oil	41.4%	38.8%	39.2%	0.3%	2.1%	2.4%
Communication & Utilities	1.0%	1.5%	0.7%	1.4%	1.0%	1.1%
Constr, Manuf., Wholesale & Warehousing	14.7%	22.6%	25.0%	17.7%	13.5%	13.4%
Retail	4.3%	4.7%	5.3%	6.0%	5.7%	6.2%
Info, culture, Finance& ins, Real-estate	6.7%	7.6%	7.0%	9.6%	10.1%	10.4%
Arts, entertainment & recreation	0.3%	0.4%	0.9%	0.5%	0.9%	0.8%
Accommodation & Food services	2.6%	2.7%	2.0%	2.0%	2.8%	2.9%
Management, Admin & Other services	3.0%	6.1%	5.5%	2.6%	6.3%	5.3%
Public service	5.5%	2.9%	4.5%	12.3%	8.7%	9.9%
Mobility in the last year (ref: Non-mover)	**77.0%**	**75.5%**	**75.8%**	**83.5%**	**86.6%**	**88.5%**
Moved within CSD	20.0%	13.8%	16.3%	14.9%	8.3%	6.6%
Moved from another CSD	2.8%	10.1%	7.2%	1.4%	4.8%	4.7%
Moved from abroad	0.2%	0.6%	0.7%	0.2%	0.3%	0.2%
Mobility in the last 5 years (ref: Non-mover)	**39.9%**	**38.8%**	**32.7%**	**56.3%**	**61.1%**	**61.8%**
Moved within CSD	34.8%	26.8%	27.4%	25.0%	21.7%	19.5%
Moved from another CSD	24.2%	31.2%	34.5%	17.8%	16.2%	17.5%
Moved from abroad	1.1%	3.3%	5.5%	0.9%	1.0%	1.1%
Immigration (ref: Non-immigrant)	**87.0%**	**86.3%**	**81.0%**	**95.6%**	**95.9%**	**96.0%**
Immigrants	12.7%	12.8%	16.6%	4.1%	3.7%	3.4%
Non-permanent residents	0.3%	0.9%	2.4%	0.2%	0.4%	0.6%
Visible minority (ref: Not a visible minority)	**78.4%**	**81.6%**	**76.8%**	**98.2%**	**97.7%**	**96.6%**
Visible minority, not aboriginal	5.6%	8.7%	15.1%	1.2%	1.5%	1.8%
Aboriginal	16.0%	9.7%	8.2%	0.6%	0.8%	1.6%

Note: Reference group for multivariate analysis denoted in bold

Table 6 Household characteristics (HH) for the sample population

	Fort McMurray			St. John's		
	1991	**2006**	**2011**	**1991**	**2006**	**2011**
Crowding						
Less than one person per bedroom	30.2%	41.8%	43.2%	28.9%	45.0%	49.1%
One person per bedroom	31.9%	29.4%	30.1%	32.9%	34.0%	33.0%
More than one person per bedroom	37.9%	28.8%	26.7%	38.2%	21.1%	17.9%
Family composition (ref: Couple with children)	**50.5%**	**40.4%**	**39.1%**	**48.5%**	**35.3%**	**32.3%**
Lone female	5.1%	4.2%	3.8%	8.5%	12.8%	13.5%
Lone male	9.4%	12.1%	12.0%	5.6%	8.3%	9.0%
Couple, no children	20.7%	27.2%	27.7%	20.3%	25.6%	27.5%
Female lone parent	6.2%	4.8%	3.7%	9.1%	10.5%	9.1%
Male lone parent	2.3%	2.8%	2.6%	1.5%	2.1%	2.3%
Other	5.9%	8.6%	11.0%	6.6%	5.4%	6.3%
Number of household maintainers (ref: One maintainer)	**64.7%**	**57.9%**	**55.5%**	**59.3%**	**55.9%**	**54.8%**
2 household maintainers	34.0%	37.9%	38.3%	38.7%	42.5%	43.0%
3 or more maintainers	1.4%	4.2%	6.2%	2.0%	1.6%	2.3%
Housing tenure (ref: Non-mortgaged homeowners)	**19.6%**	**15.1%**	**10.5%**	**26.9%**	**26.9%**	**26.1%**
Mortgaged homeowners	46.9%	58.3%	60.0%	39.0%	46.1%	45.5%
Renters	33.5%	26.6%	29.4%	31.3%	27.0%	28.3%

Note: Reference group for multivariate analysis denoted in bold

Table 7 Housing attributes (HOUS) for the sample population

	Fort McMurray			St. John's		
	1991	**2006**	**2011**	**1991**	**2006**	**2011**
Dwelling type (ref: Single-detached house)	**51.5%**	**47.9%**	**48.8%**	**59.9%**	**55.5%**	**57.7%**
Semi-detached or double	5.9%	5.4%	6.4%	4.5%	5.6%	5.2%
Row house	9.2%	9.7%	9.6%	10.1%	8.6%	7.7%
Apartment/flat in duplex	0.3%	2.1%	1.1%	11.7%	20.9%	20.8%
Apartment (building with 5 or more storeys)	1.6%	2.6%	2.3%	1.1%	0.8%	0.6%
Apartment (building with less than 5 storeys)	16.7%	18.6%	19.4%	11.8%	7.8%	7.8%
Other single-detached house	14.8%	13.8%	12.3%	1.0%	0.8%	0.2%
Build within last five years (ref: > 5 years)	**91.5%**	**73.7%**	**74.5%**	**85.0%**	**88.9%**	**88.7%**
House built during last 5 years	8.6%	26.3%	25.5%	15.0%	11.1%	11.3%
Housing condition (ref: Needs regular maintenance only)	**63.3%**	**69.4%**	**72.3%**	**73.4%**	**70.9%**	**73.7%**
Needs minor repairs	8.9%	6.5%	5.3%	5.8%	5.4%	5.9%
Needs major repairs	27.9%	24.1%	22.3%	20.8%	23.7%	20.5%

Table 8 Ordinary least squares (OLS) estimates for housing stress (dependent: Housing cost to income ratio).

	(1991)				(2006)				(2011)			
	Fort McMurray		St. John's		Fort McMurray		St. John's		Fort McMurray		St. John's	
Independent Variables	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.
PHM - Age (ref: 45-54)												
15-24	5.253	***	11.645	***	5.064	***	11.686	***	2.839	***	7.230	***
25-34	1.484	***	3.340	***	3.756	***	1.333	***	3.915	***	3.021	***
35-44	0.061		3.122	***	1.745	***	0.744	***	1.994	***	1.540	***
55-64	-0.250		-0.579	**	0.172		-0.634	***	0.570		-0.510	***
65-74	-3.839	***	-3.133	***	-0.331		-3.902	***	-1.126		-2.303	***
75-	-3.085	***	-1.941	***	1.263		-4.918	***	2.500		-3.061	***
PHM - Disability (ref: No disability)												
Disability	1.298	***	1.424	***	2.048	***	2.006	***	0.842	**	0.716	***
PHM - Education (ref: High school diploma)												
No certificate, diploma or degree	0.819	**	1.796	***	-0.330		1.370	***	0.238		-0.500	**
College or trades diploma	-1.019	***	-1.368	***	-1.081	***	-2.043	***	0.064		-2.289	***
University degree	-2.731	***	-3.682	***	-2.014	***	-4.741	***	-2.347	***	-4.783	***
PHM - Labor market activity (ref: Health care & Education)												
Not in the labor market	8.064	***	8.386	***	4.796	***	8.829	***	9.604	***	8.030	***
Unemployed	0.950		5.418	***	3.872	***	5.948	***	8.428	***	4.476	***
Agr., Forestry, Fishing, & Trapping	1.065		2.946	***	-1.106		6.712	***	5.224		1.239	
Mining, Quarrying & Oil	-4.664	***	-0.722		-2.412	***	-2.450	***	-1.274	***	-5.099	***
Communication & Utilities	-2.337	*	-0.627		-4.615	***	-2.498	***	-1.904		-1.441	**
Constr, Manuf., Wholesale & Wareh.	-1.290	**	1.094	***	0.281		1.365	***	1.191	**	0.147	
Retail	1.998	***	3.573	***	2.549	***	2.475	***	6.657	***	0.464	*
Info, Cult., FIRE, & KIBS	2.027	***	-0.060		1.857	***	0.605	**	1.075	*	0.048	
Arts, entertainment & recreation	2.977		1.464		0.405		7.075	***	1.718		2.848	***
Accommodation & Food services	6.008	***	4.281	***	7.304	***	5.770	***	2.599	***	5.075	***
Management, Admin & Other services	1.948	**	3.327	***	3.062	***	1.889	***	3.790	***	2.663	***
Public service	-1.580	**	-0.495	*	0.392		-1.472	***	-0.189		-2.799	***

Table 8 (Continued)	(1991)				(2006)				(2011)			
	Fort McMurray		St. John's		Fort McMurray		St. John's		Fort McMurray		St. John's	
Independent Variables	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.
PHM - Mobility in the last year (ref: Non-mover)												
Moved within CSD	2.272	***	2.505	***	5.207	***	3.950	***	0.947	***	3.208	***
Moved from another CSD	8.812	***	0.581		11.177	***	2.351	***	7.104	***	-0.366	
Moved from abroad	3.916		-4.000	**	14.655	***	11.302	***	2.293	*	6.911	***
PHM - Mobility in the last 5 years (ref: Non-mover)												
Moved within CSD	0.337		0.933	***	0.604	*	1.436	***	2.065	***	1.169	***
Moved from another CSD	1.045	***	0.549	**	1.399	***	1.630	***	2.317	***	0.611	***
Moved from abroad	2.747	**	5.447	***	2.571	***	2.367	***	2.688	***	3.497	***
PHM - Immigration status (ref: Not immigrant)												
Immigrants	-1.063	**	0.262		1.807	***	0.599	*	0.520		-0.026	
Non-permanent residents	-0.321		7.535	***	3.668	**	2.292	*	-4.219	***	6.644	***
PHM - Visible minority status of PHM (ref: Not a visible minority)												
Visible minority, not aboriginal	2.628	***	1.007		0.399		1.164	*	2.800	***	-0.005	
Aboriginal	1.670	***	1.405		-0.365		-0.178		2.627	***	0.326	
HH - Crowding Index	-0.792	***	-1.917	***	-0.550	**	-2.327	***	-0.989	***	-1.774	***
HH - Family composition (ref: Couple with children)												
Lone female	4.565	***	10.183	***	10.016	***	10.622	***	8.087	***	10.553	***
Lone male	1.781	***	5.903	***	3.876	***	6.949	***	2.621	***	6.926	***
Couple, no children	-1.416	***	0.942	***	-0.942	***	0.955	***	-0.909	***	1.170	***
Female lone parent	10.128	***	6.901	***	8.968	***	5.346	***	10.078	***	7.203	***
Male lone parent	-0.422		1.833	***	0.699		2.339	***	-0.586		3.761	***
Other	-3.285	***	0.792	**	-1.591	***	1.667	***	-3.825	***	1.531	***
HH - Housing tenure (ref: Non-mortgaged homeowners)												
Mortgaged homeowners	12.987	***	14.315	***	10.155	***	13.090	***	11.373	***	12.830	***
Renters	11.034	***	10.775	***	11.853	***	11.369	***	13.181	***	12.089	***
HH - Number of household maintainers (ref: One maintainer)												
2 household maintainers	-1.107	***	-2.203	***	-2.025	***	-1.213	***	-1.891	***	-1.482	***
3 household maintainers	-6.445	***	-3.410	***	-7.512	***	-2.420	***	-6.412	***	-3.202	***
4 household maintainers	-12.708	***	-0.939		-9.232		0.083		-6.199	***	2.128	**
5 household maintainers	-8.230	*	1.134		-14.317	***	-7.622	**	-9.104	***	-15.089	***
6 household maintainers	-19.328		-12.671	***								

Table 8 (Continued)	(1991)				(2006)				(2011)			
	Fort McMurray		St. John's		Fort McMurray		St. John's		Fort McMurray		St. John's	
Independent Variables	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.
DW - Build within last 5 years (ref: > 5 years)	0.787	*	0.585	***	1.127	***	-0.792	***	0.247		-0.179	
DW - Dwelling condition (ref: Needs regular maintenance only)												
Needs major repairs	2.462	***	3.217	***	0.468		1.664	***	-0.196		1.439	***
Needs minor repairs	0.547	*	0.786	***	0.269		1.318	***	0.177		0.458	***
DW - Dwelling type (ref: Single-detached house)												
Semi-detached or double	-1.745	***	-0.569	*	-0.263		0.493	*	0.763	*	-0.084	
Row house	-1.003	**	-1.148	***	-0.982	**	-1.473	***	0.720	*	-1.440	***
Apartment/flat in duplex	-8.216	***	3.244	***	2.073	**	1.302	***	-0.418		1.036	***
Apartment (bldng with 5 or more storeys)	-3.764	***	5.633	***	-1.210	*	3.240	***	3.687	***	-0.072	
Apartment (bldng with less than 5 storeys)	-1.130	**	1.711	***	-0.353		3.643	***	0.816	**	0.461	*
Other single-detached house	0.092		6.340	***	1.576		3.074	***	-4.092		14.340	***
Mobile home	-1.956	***	-0.623		-1.473	***	-2.473	**	-1.601	***	-2.443	
Other movable dwelling	-10.264		-9.217	**								
Census Subdivision FE	Yes		Yes		Yes		Yes		Yes		Yes	
N	14,330		52,980		17,355		67,965		22,065		75,700	
F	111.45		377.01		159.29		593.87		138..89		616.74	
Adjusted R^2	0.3234		0.3474		0.3575		0.3689		0.2727		0.3528	
p for Breusch-Pagan	0.0000		0.0000		0.0000		0.0000		0.0000		0.0000	

Legend: Primary Household Maintainer (PHM); Household (HH); Dwelling (DW). *** $p < 0.001$; **$p < 0.01$; * $p < 0.05$.

Table 9 Quantile regression (QR) estimates of housing stress (dependent: Housing cost to income ratio) in 1991

	(Q1-25th percentile)				(Q2- 50th percentile)				(Q3 -75th percentile)			
	Fort McMurray		St. John's		Fort McMurray		St. John's		Fort McMurray		St. John's	
Independent Variables	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.
PHM - Age (ref: 45-54)												
15-24	3.417	***†	5.696	***†	4.885	***	9.000	***†	6.058	***	14.551	***†
25-34	1.770	***	2.585	***†	1.730	***	2.918	***†	1.815	***	2.555	***†
35-44	0.772	***†	2.126	***†	0.624	*†	2.153	***†	0.009		2.206	***†
55-64	-0.404		0.129	†	-0.241		-0.553	**	-0.114		-0.925	***
65-74	-1.498	***†	0.306	†	-2.821	***	-0.637	*†	-2.676	**	-2.301	***†
75-	-0.316	†	1.282	***†	0.438	†	0.670	*†	-3.154	**	-0.062	†
PHM - Disability (ref: No disability)												
Disability	1.137	***	0.573	***†	1.081	**	1.059	***†	1.829	***	1.887	***
PHM - Education (ref: High school diploma)												
No certificate, diploma or degree	-0.068	†	0.953	***†	0.915	**	1.161	***†	0.748		2.225	***†
College or trades diploma	-0.404	*†	-0.351	**†	-0.212	†	-0.614	***†	-0.757	*	-0.630	**†
University degree	-1.801	***†	-1.805	***†	-1.377	***†	-2.324	***†	-1.838	***	-2.913	***†
PHM - Labor market activity (ref: Health care & Education)												
Not in the labor market	3.697	***†	2.816	***†	7.340	***	5.060	***†	10.505	***†	7.631	***†
Unemployed	-0.146	†	2.090	***†	0.012		3.012	***†	2.666	***†	5.066	***
Agr, Forestry, Fishing, & Trapping	1.782	***	1.134	**†	0.825		1.788	***†	0.740		3.075	***
Mining, Quarrying & Oil	-3.104	***†	1.442	†	-3.327	***†	1.090		-4.236	***	-1.134	
Communication & Utilities	-0.666	†	0.470	†	1.721	†	0.232		-0.058		-0.690	
Constr, Manuf., Wholesale & Wareh.	-0.915	***	0.561	***†	-0.267	†	0.591	**†	0.430	†	0.760	**
Retail	-0.064	†	1.137	***†	1.654	**	1.818	***†	5.498	***†	3.229	***
Info, Cult., FIRE, & KIBS	0.498	†	0.192		0.647	†	0.084		2.062	**	-0.256	
Arts, entertainment & recreation	-0.405	†	0.783		0.804		2.557	**	2.980		0.283	
Accommodation & Food services	0.997	*†	2.318	***†	4.706	***†	3.758	***	7.020	***	3.427	***
Management, Admin & Other services	0.101	†	1.221	***†	1.195	*	2.282	***†	3.812	***†	2.202	***†
Public service	-0.984	**	-0.085	†	0.175	†	-0.459	*	-1.548	*	-1.002	***

Table 9 (Continued)	(Q1-25th percentile)				(Q2- 50th percentile)				(Q3 -75th percentile)			
	Fort McMurray		St. John's		Fort McMurray		St. John's		Fort McMurray		St. John's	
Independent Variables	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.
PHM - Mobility in the last year (ref: Non-mover)												
Moved within CSD	0.258	†	1.545	***†	2.012	***	2.164	***†	2.512	***	2.835	***
Moved from another CSD	2.762	***†	0.293		6.957	***†	0.300		9.380	***	1.760	
Moved from abroad	-9.411	***†	-2.117		6.961	**	-4.221	***	2.138		-0.551	
PHM - Mobility in the last 5 years (ref: Non-mover)												
Moved within CSD	1.251	***†	1.098	***	0.570	*	1.149	***	0.545		0.757	***
Moved from another CSD	1.108	***	0.737		1.294	***	0.568	**	1.040	**	0.179	
Moved from abroad	4.096	***†	2.199	***†	2.306	*	1.333	*†	0.215		4.411	***
PHM - Immigration status (ref: Not immigrant)												
Immigrants	-0.148	†	-0.741		-0.206	†	-0.465		-0.854		-0.451	
Non-permanent residents	2.726	*†	5.587		3.124	†	5.502	***	2.770		8.759	
PHM - Visible minority status of PHM (ref: Not a visible minority)												
Visible minority, not aboriginal	-0.335	†	0.766		1.276	**†			2.350	***	1.485	
Aboriginal	0.056	†	1.547		-0.113	†	0.847		1.486	***	3.919	
HH - Crowding Index	-0.523	***†	-1.328	***†	-0.391	*†	-1.319	***†	-0.570	*	-1.410	***†
HH - Family composition (ref: Couple with children)												
Lone female	2.932	***†	5.741	***†	4.975	***	8.899	***†	5.187	***	13.786	***†
Lone male	-0.452	†	2.538	***†	0.350	†	5.767	***	2.065	***	7.043	***†
Couple, no children	-1.203	***	0.201	†	-1.092	***	0.465	**†	-1.080	**	0.950	***
Female lone parent	5.564	***†	1.948	***†	10.423	***	5.212	***†	16.116	***†	10.444	***†
Male lone parent	-0.916	*	0.278	†	-1.009		0.964	*†	-0.976		0.461	†
Other	-3.225	***	-0.484		-4.124	***†	-0.199		-4.233	***	0.081	
HH - Housing tenure (ref: Non-mortgaged homeowners)												
Mortgaged homeowners	7.947	***†	9.838	***†	10.207	***†	12.378	***†	12.583	***	15.608	***†
Renters	6.491	***†	6.719	***†	8.442	***†	8.796	***†	9.945	***†	13.116	***†
HH - Number of household maintainers (ref: One maintainer)												
2 household maintainers	-0.642	***†	-0.317	**†	-0.729	***	-1.350	***†	-1.157	***	-2.193	***
3 household maintainers	-1.850	**†	-1.880	***†	-4.204	***†	-1.565	***†	-4.736	***	-4.839	†
4 household maintainers	-9.633	***†	-1.237	*†	-4.334	†	-1.750	*	-8.997	**	-2.800	**
5 household maintainers	-4.223		0.508		-4.902		3.127		-13.618	**	6.117	
6 household maintainers	-8.321		-2.749		-17.124		-9.660	***	-23.976		-16.899	

Table 9 (Continued)	(Q1-25th percentile)				(Q2- 50th percentile)				(Q3 -75th percentile)			
	Fort McMurray		St. John's		Fort McMurray		St. John's		Fort McMurray		St. John's	
Independent Variables	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.
DW - Build within last 5 years (ref: > 5 years)	0.364		0.602	***	1.349	***	0.662	***	1.183	*	0.202	
DW - Dwelling condition (ref: Needs regular maintenance only)												
Needs major repairs	0.887	***†	0.928	***†	2.180	***	1.886	***†	2.491	***	2.887	***
Needs minor repairs	0.081	†	0.543		0.226		0.715	***	0.457		0.857	***
DW - Dwelling type (ref: Single-detached house)												
Semi-detached or double	-0.974	***	1.136	***†	-2.118	***†	0.797	***†	-1.573	**	1.834	***
Row house	-2.440	***†	3.339	***†	-3.955	***	6.009	***	-5.989	***†	5.867	***
Apartment/flat in duplex	-7.023	***	1.444	***†	-5.961	***	2.467	***†	-5.025	*	3.885	***†
Apartment (bldng with 5 or more storeys)	-3.108	***†	-2.714	**†	-2.785	***†	-2.368	*	-3.092	***†	-4.397	**†
Apartment (bldng with less than 5 storeys)	-4.273	**†	0.905	†	-2.817		4.481	***†	-1.313		7.705	***
Other single-detached house	-2.106	†	-6.992	**	-5.519		-12.147	***	-9.106		-1.508	
Mobile home	-0.449	†	-0.223	†	-1.128	**	-0.502	*†	-1.541	**	-0.912	***
Other movable dwelling	-1.119	***†	0.124		-0.636	†	-0.093		-1.888	***	0.275	
Census Subdivision FE	Yes		Yes		Yes		Yes		Yes		Yes	
N	3,745		10,315		3,745		10		3,745		10,315	
Pseudo R^2	0.23		0.24		0.23		0.25		0.25		0.26	

Legend: *** p < 0.001; **p < 0.01; * p < 0.05; † =different from OLS at p< 0.05

Table 10 Quantile regression (QR) estimates of housing stress (dependent: Housing cost to income ratio) in 2006

	(Q1-25th percentile)				(Q2- 50th percentile)				(Q3 -75th percentile)			
	Fort McMurray		St. John's		Fort McMurray		St. John's		Fort McMurray		St. John's	
Independent Variables	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.
PHM - Age (ref: 45-54)												
15-24	2.904	***†	7.719	***†	2.689	***†	11.397	***	2.843	***	18.901	***†
25-34	2.763	***†	1.899	***†	2.918	***†	2.185	***†	3.957	***†	1.799	***
35-44	1.176	***†	1.176	***†	1.314	***	1.417	***†	2.088	***	0.934	***
55-64	0.081		-0.135	†	0.152		0.070	†	0.441		0.098	†
65-74	1.255	**†	-0.591	***†	0.507		-1.221	***†	-1.294		-2.546	***†
75-	3.926	***†	-0.586	**†	3.401	***†	-1.154	***†	2.368		-4.159	***†
PHM - Disability (ref: No disability)												
Disability	0.076	†	0.545	***†	0.390	†	1.338	***†	0.810	**†	2.515	***†
PHM - Education (ref: High school diploma)												
No certificate, diploma or degree	0.505	*†	1.177	***	1.396	***†	1.224	***	0.265		2.293	***†
College or trades diploma	-0.334	*†	-0.930	***†	-0.253	†	-1.621	***†	0.082	†	-1.473	***†
University degree	-1.300	***†	-2.453	***†	-1.857	***	-3.435	***†	-2.322	***	-4.215	***†
PHM - Labor market activity (ref: Health care & Education)												
Not in the labor market	1.331	**†	4.241	***†	2.405	***†	5.872	***†	9.619	***†	9.140	***
Unemployed	-0.358	†	2.091	***†	1.571	*†	3.663	***†	8.421	***†	6.828	***†
Agr., Forestry, Fishing, & Trapping	1.551		1.486	***†	0.819		3.370	***†	5.313		6.126	***
Mining, Quarrying & Oil	-1.236	***†	-1.584	***†	-1.930	***	-1.873	***	-1.266	**	-2.656	***
Communication & Utilities	-2.509	***†	-1.167	**†	-2.157	** †	-1.056	*†	-1.899	**	-1.915	*
Constr, Manuf., Wholesale & Wareh.	-0.068		0.666	***†	-0.495	†	1.044	***	1.186	**†	0.983	***
Retail	0.081	†	0.965	***†	0.403	†	1.680	***†	6.643	***†	1.647	***†
Info, Cult., FIRE, & KIBS	-0.085	†	0.094	†	-0.228	†	0.249	†	1.087	***	0.588	
Arts, entertainment & recreation	-0.661		3.272	***†	-1.926		3.910	***†	1.682		8.475	***
Accommodation & Food services	2.933	***†	2.795	***†	4.072	***†	4.147	***†	2.503	***†	5.070	***
Management, Admin & Other services	0.985	**†	1.124	***†	2.438	***	2.109	***	3.751	***†	2.369	***
Public service	0.427		-0.128	†	0.762		-0.217	†	-0.173	*	-0.514	†

Table 10 (Continued)	(Q1-25th percentile)				(Q2- 50th percentile)				(Q3 -75th percentile)			
	Fort McMurray		St. John's		Fort McMurray		St. John's		Fort McMurray		St. John's	
Independent Variables	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.
PHM - Mobility in the last year (ref: Non-mover)												
Moved within CSD	3.365	***†	2.051	***†	4.839	***	2.329	***†	0.952	***	4.166	***
Moved from another CSD	6.386	***†	0.327	†	10.612	***	1.255	***†	7.101	***†	1.647	***
Moved from abroad	12.405	***†	-0.796	†	18.068	***†	2.494	**†	2.208	***†	16.168	***†
PHM - Mobility in the last 5 years (ref: Non-mover)												
Moved within CSD	0.577	**	0.822	***†	0.970	***	1.174	***†	2.068	***	1.444	***
Moved from another CSD	0.794	***†	0.639	***†	1.537	***	0.491	**†	2.299	***	1.664	***
Moved from abroad	-0.047	†	-0.396	†	1.639	**	2.297	***	2.669	***	4.146	***
PHM - Immigration status (ref: Not immigrant)												
Immigrants	0.580	*†	-0.717	**†	-0.316	†	-1.070	***†	0.535	***	0.246	
Non-permanent residents	1.485	†	-0.816	†	2.291	*	1.031		-4.297	***†	4.182	**
PHM - Visible minority status of PHM (ref: Not a visible minority)												
Visible minority, not aboriginal	0.235		0.235	†	2.177	***†	0.731		2.841	†	0.173	
Aboriginal	0.461	*†	-1.344	***†	-0.320		0.221		2.636		0.524	
HH - Crowding Index	-1.009	***†	-1.420	***†	-0.749	***	-1.534	***†	-0.761	**	-1.416	***†
HH - Family composition (ref: Couple with children)												
Lone female	5.099	***†	5.965	***†	7.989	***†	8.370	***†	9.014	***†	13.117	***†
Lone male	0.633	*†	2.183	***†	1.722	***†	4.459	***†	3.524	***	9.972	***†
Couple, no children	-0.621	***	0.067	†	-0.529	*	0.611	***†	0.430	*	1.006	***
Female lone parent	4.029	***†	2.807	***†	6.534	***†	4.401	***†	10.842	***†	6.415	***†
Male lone parent	0.750		1.381	***†	1.210	*	1.765	***	0.209		2.352	***
Other	-2.107	***†	-0.513	**†	-1.901	***	0.021	†	-2.984	*	1.461	***
HH - Housing tenure (ref: Non-mortgaged homeowners)												
Mortgaged homeowners	7.869	***†	9.126	***†	9.201	***†	10.923	***†	11.361	***†	13.591	***†
Renters	8.356	***†	7.360	***†	11.059	***†	10.386	***†	13.139	***†	14.005	***†
HH - Number of household maintainers (ref: One maintainer)												
2 household maintainers	-0.911	***†	-0.361	***†	-1.437	***†	-0.883	***†	-1.954	***	-1.370	***
3 household maintainers	-3.289	***†	-2.611	***	-4.296	***†	-2.923	***	-6.489	***†	-2.669	***
4 household maintainers	-3.025	***†	-2.828	***†	-6.151	***†	-3.149	***†	-6.412	***	-2.690	*†
5 household maintainers	-4.933	***†	-4.119	*†	-9.871	***†	-10.617	***	-9.300	***	-5.817	

Table 10 (Continued)	(Q1-25th percentile)				(Q2- 50th percentile)				(Q3 -75th percentile)			
	Fort McMurray		St. John's		Fort McMurray		St. John's		Fort McMurray		St. John's	
Independent Variables	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.
DW - Build within last 5 years (ref: > 5 years)	1.022	***	-0.239	†	1.166	***	0.130	†	0.227	**	-0.366	
DW - Dwelling condition (ref: Needs regular maintenance only)												
Needs major repairs	0.317		0.757	***†	0.071		1.345	***	-0.123	†	2.100	***
Needs minor repairs	-0.462	**†	0.413	***†	0.256		0.793	***†	0.185	*	1.208	***
DW - Dwelling type (ref: Single-detached house)												
Semi-detached or double	0.380	†	0.750	***	-0.016		0.106	†	0.685		0.461	
Row house	-0.602	**	-0.218	†	-0.594		-0.493	**†	0.617	†	-1.496	***
Apartment/flat in duplex	-0.375	†	0.876	***†	-0.190	†	1.231	***	-0.534		1.427	***
Apartment (bldng with 5 or more storeys)	-0.687		1.651	***†	-2.776	***†	2.350	***	3.445	***†	4.821	***
Apartment (bldng with less than 5 storeys)	0.848	***†	3.244	***†	-1.216	***†	3.172	***†	0.603	*	4.608	***†
Other single-detached house	20.169	***†	2.070	***	7.983		0.998	†	-4.216		2.082	
Mobile home	-0.408	*†	-1.985	***	-1.451	***	0.302	†	-1.657	***	-2.023	
Census Subdivision FE	Yes		Yes		Yes		Yes		Yes		Yes	
N	3,845		13,035		3,845		13,035		3,845		13,035	
Pseudo R2	0.26		0.23		0.27		0.25		0.28		0.28	

Legend: *** p < 0.001; **p < 0.01; * p < 0.05; † =different from OLS at p< 0.05

Table 11 Quantile regression (QR) estimates of housing stress (dependent: Housing cost to income ratio) in 2011.

	(Q1-25th percentile)				(Q2- 50th percentile)				(Q3 -75th percentile)			
	Fort McMurray		St. John's		Fort McMurray		St. John's		Fort McMurray		St. John's	
Independent Variables	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.
PHM - Age (ref: 45-54)												
15-24	1.511	***†	5.424	***†	2.706	***	6.683	***†	4.539	***†	8.775	***†
25-34	2.207	***†	1.804	***†	2.394	***†	2.927	***	4.205	***	4.039	***†
35-44	1.258	***†	0.944	***†	1.337	***†	1.171	***†	1.516	***	2.127	***†
55-64	0.554	*	-0.523	***	0.252		-0.593	***	0.231		-0.135	
65-74	-0.538		-0.069	†	0.794	†	-0.782	***†	-1.462		-1.786	***
75-	2.026	*	-0.161	†	4.834	***†	-1.228	***†	4.820	*	-2.505	***
PHM - Disability (ref: No disability)												
Disability	0.085	†	0.217	** †	0.354	†	0.835	***	0.230		1.048	***†
PHM - Education (ref: High school diploma)												
No certificate, diploma or degree	0.694	**	0.605	***†	0.813	**†	-0.192	†	0.154		0.468	*†
College or trades diploma	-0.273	†	-0.736	***†	-0.947	***†	-1.529	***†	-0.732	*†	-2.440	***
University degree	-1.498	***†	-2.210	***†	-1.487	***†	-3.502	***†	-1.371	**	-4.890	***
PHM - Labor market activity (ref: Health care & Education)												
Not in the labor market	0.152	†	3.459	*** †	2.830	***†	5.773	***†	15.924	***†	9.184	***†
Unemployed	10.622	***	1.807	***†	6.299	***	3.296	***†	-1.223	†	5.151	***†
Agr., Forestry, Fishing, & Trapping	0.050	†	0.739		-4.884	*†	0.922		19.092	***†	3.048	**
Mining, Quarrying & Oil	-1.225	***	-2.022	***†	-2.473	***†	-3.587	***†	-1.624	**	-3.399	***†
Communication & Utilities	-0.417		-0.107	†	-2.903	***	-0.381	†	-2.666		-0.822	
Constr, Manuf., Wholesale & Wareh.	-0.810	**†	0.215		-1.255	***†	0.399	*	1.196		0.951	***†
Retail	2.550	***†	1.029	***†	2.829	***†	0.415	*	10.365	***†	0.873	**
Info, Cult., FIRE, & KIBS	-1.595	***†	-0.074		-1.871	***†	0.112		2.051	**	0.974	***†
Arts, entertainment & recreation	1.082		2.433	***	1.566	*	3.778	***	8.253	***†	1.551	*
Accommodation & Food services	-0.365	†	2.670	***†	0.476	†	4.202	***†	2.800	**	5.272	***
Management, Admin & Other services	0.862	*†	0.977	***†	1.952	***†	1.927	***†	4.152	***	2.734	***
Public service	0.288		-0.699	***†	-0.730		-1.107	***†	0.151		-1.246	***†

Table 11 (Continued)	(Q1-25th percentile)				(Q2- 50th percentile)				(Q3 -75th percentile)			
	Fort McMurray		St. John's		Fort McMurray		St. John's		Fort McMurray		St. John's	
Independent Variables	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.
PHM - Mobility in the last year (ref: Non-mover)												
Moved within CSD	1.165	***	1.763	***†	1.070	***	2.231	***†	0.677		4.424	***†
Moved from another CSD	2.808	***†	-0.600	***	5.026	***†	-0.054		7.804	***	0.137	
Moved from abroad	-4.151	***†	0.792	†	-6.974	***†	1.569	†	1.300		7.280	***
PHM - Mobility in the last 5 years (ref: Non-mover)												
Moved within CSD	0.972	***†	0.634	***†	1.588	***†	0.842	***†	1.702	***	1.476	***
Moved from another CSD	1.501	***†	0.666	***	1.897	***†	0.768	***	2.335	***	0.103	†
Moved from abroad	2.332	***	0.446	†	2.711	***	2.185	***†	3.551	***	4.208	***
PHM - Immigration status (ref: Not immigrant)												
Immigrants	-0.746	**†	-0.616	**†	0.581	*	-0.109		1.368	*	-0.404	
Non-permanent residents	-4.332	***	0.095	†	-1.262	*†	1.731	*†	-4.426	***	15.136	***†
PHM - Visible minority status of PHM (ref: Not a visible minority)												
Visible minority, other than aboriginal	1.571	***†	-0.082		0.628	*†	-0.418		1.622	**†	1.006	
Aboriginal	0.626	** †	0.351		1.523	***†	0.892	**	2.241	***	0.373	
HH - Crowding Index	-1.240	***	-1.571	***†	-1.238	***	-1.620	***	-0.915	*	-1.430	***
HH - Family composition (ref: Couple with children)												
Lone female	4.865	***†	5.737	***†	7.310	***†	7.819	***†	8.006	***	13.142	***†
Lone male	-0.669	** †	2.540	***†	2.193	***	5.143	***†	3.194	***	9.062	***†
Couple, no children	-0.680	***	0.416	***†	-1.047	***	0.668	***†	-0.724	*	1.002	***
Female lone parent	2.795	***†	3.477	***†	5.985	***†	4.939	***†	11.315	***	8.779	***†
Male lone parent	-0.510		1.667	***†	-1.311	**	2.189	***†	-0.370		3.988	***
Other	-2.952	***†	-0.119	†	-3.252	***†	0.252	†	-3.022	***	0.785	*†
HH - Housing tenure (ref: Non-mortgaged homeowners)												
Mortgaged homeowners	8.187	***†	8.663	***†	9.807	***†	10.749	***†	11.848	***	12.578	***
Renters	8.652	***†	7.264	***†	12.648	***	9.868	***†	16.908	***†	14.229	***†
HH - Number of household maintainers (ref: One maintainer)												
2 household maintainers	-0.720	***†	-0.353	***†	-0.712	***†	-0.834	***†	-0.937	**†	-1.727	***
3 household maintainers	-2.533	***†	-1.202	***†	-4.673	***†	-2.636	***	-6.792	***	-5.079	***†
4 household maintainers	-3.942	***†	-3.132	***†	-6.969	***	-1.119	†	-9.620	***†	-0.350	†
5 household maintainers	-2.867	***†	-5.832	***†	-5.186	***†	-6.379	***†	-9.149	***	-16.743	***

Table 11 (Continued)	(Q1-25th percentile)				(Q2- 50th percentile)				(Q3 -75th percentile)			
	Fort McMurray		St. John's		Fort McMurray		St. John's		Fort McMurray		St. John's	
Independent Variables	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.
DW - Build within last 5 years (ref: > 5 years)	0.665	***†	-0.087		1.146	***†	0.026		1.449	***†	-0.346	
DW - Dwelling condition (ref: Needs regular maintenance only)												
Needs major repairs	-0.403		0.784	***†	0.676	*†	1.253	***	0.433		0.747	**†
Needs minor repairs	0.040		0.090	†	-0.101		0.503	***	-0.005		0.426	**
DW - Dwelling type (ref: Single-detached house)												
Semi-detached or double	0.638	*	0.510	***†	0.298		0.196		1.605	**	1.310	***†
Row house	0.427		0.408	**†	0.646	**	-0.115	†	-0.510	†	-1.105	***
Apartment/flat in duplex	0.013		0.383	***†	-2.138	***†	0.646	***†	0.583		2.140	***†
Apartment (bldng with 5 or more storeys)	-0.523	†	2.420	***†	-3.791	***†	2.612	***†	-1.322	†	1.267	
Apartment (bldng with less than 5 storeys)	0.723	**	2.623	***†	-0.804	***†	1.208	***†	-0.145	†	0.480	
Other single-detached house	-2.323		11.022	***†	2.669		15.464	***	-2.659		26.178	***†
Mobile home	-0.228	†	-6.431	***†	-0.830	***†	-1.379		-1.361	**	-2.022	
Census Subdivision FE	Yes		Yes		Yes		Yes		Yes		Yes	
N	4,420		11,015		4,420		11,015		4,420		11,015	
Pseudo R^2	0.20		0.22		0.19		0.24		0.20		0.27	

Legend: *** p < 0.001; **p < 0.01; * p < 0.05; † =different from OLS at p< 0.05

Table 12 Ordinary Least Squares (OLS) Models. Multicollinearity Diagnostics (Variance Inflation Factor - VIF)

	1991		2006		2011	
	FM	SJ	FM	SJ	FM	SJ
Independent Variables	VIF	VIF	VIF	VIF	VIF	VIF
Age of PHM (ref: 45-54)						
15-24	1.73	1.64	1.44	1.46	1.45	1.53
25-34	2.29	2.31	1.70	1.81	1.77	1.80
35-44	2.08	1.97	1.57	1.65	1.62	1.64
55-64	1.50	1.71	1.34	1.70	1.43	1.70
65-74	1.73	2.48	1.24	1.95	1.17	1.92
75-	1.73	2.09	1.32	2.03	1.17	1.95
Disabled PHM (ref: Not disabled)						
Disability	1.21	1.16	1.16	1.23	1.11	1.23
Education of PHM (ref: High school diploma)						
No certificate, diploma or degree	2.39	2.14	1.54	1.67	1.45	1.59
College or trades diploma	2.34	1.98	1.90	1.94	1.85	1.96
University degree	1.87	1.89	1.87	2.03	2.07	2.12
Labor market activity of PHM (ref: Health care & Education)						
Not in the labor market	3.64	4.07	2.10	3.54	1.81	3.17
Unemployed	2.05	1.70	1.37	1.39	1.07	1.35
Agriculture, Forestry, Fishing, & Trapping	1.43	1.12	1.04	1.09	1.02	1.04
Mining, Quarrying & Oil	5.70	1.04	4.86	1.15	5.15	1.16
Communication & Utilities	1.23	1.11	1.28	1.07	1.14	1.08
Constr, Manuf., Wholesale & Warehousing	3.58	2.17	3.99	1.87	4.38	1.80
Retail	1.86	1.46	1.78	1.40	1.97	1.42
Info, Cult., FIRE, & KIBS	2.18	1.59	2.16	1.57	2.14	1.52
Arts, entertainment & recreation	1.06	1.04	1.07	1.07	1.18	1.06
Accommodation & Food services	1.57	1.18	1.52	1.24	1.43	1.23
Management, Admin & Other services	1.61	1.20	2.02	1.42	1.98	1.33
Public service	2.01	1.73	1.47	1.50	1.72	1.50
Housing tenure (ref: Non-mortgaged homeowners)						
Mortgaged homeowners	2.58	1.92	2.45	1.95	3.20	1.91
Renters	3.74	3.11	3.74	2.76	4.00	2.80
Dwelling type (ref: Single-detached house)						
Semi-detached or double	2.79	1.85	1.11	1.14	1.10	1.11
Row house	1.25	1.13	1.27	1.30	1.20	1.26
Apartment/flat in duplex	1.04	1.33	1.06	1.49	1.05	1.54
Apartment (building with 5 or more storeys)	1.28	1.07	1.21	1.09	1.17	1.06
Apartment (building with less than 5 storeys)	1.02	1.03	2.37	1.58	2.05	1.59
Other single-detached house	1.01	1.01	1.02	1.02	1.02	1.02
Mobile home	1.41	1.36	1.24	1.02	1.19	1.01

	1991		2006		2011	
	FM	SJ	FM	SJ	FM	SJ
…Continued	VIF	VIF	VIF	VIF	VIF	VIF
Dwelling condition (ref: Needs regular maintenance only)						
Needs major repairs	1.19	1.06	1.16	1.08	1.09	1.10
Needs minor repairs	1.11	1.07	1.14	1.09	1.08	1.08
Family composition (ref: Couple with children)						
Lone female	1.59	1.96	1.40	2.47	1.39	2.50
Lone male	1.72	1.51	1.85	1.89	1.88	1.96
Couple, no children	1.57	1.57	1.58	1.74	1.64	1.81
Female lone parent	1.29	1.43	1.25	1.66	1.21	1.63
Male lone parent	1.09	1.05	1.12	1.13	1.12	1.16
Other	1.29	1.37	1.40	1.36	1.56	1.47
Number of household maintainers (ref: One maintainer)						
2 household maintainers	1.27	1.40	1.32	1.62	1.34	1.67
3 household maintainers	1.09	1.11	1.16	1.06	1.14	1.11
4 household maintainers	1.01	1.06	1.08	1.03	1.17	1.05
5 household maintainers	1.02	1.01	1.07	1.01	1.12	1.08
6 household maintainers	1.01	1.01				
Immigration status (ref: Not immigrant)						
Immigrants	1.52	1.25	1.96	1.30	2.59	1.30
Non-permanent residents	1.13	1.26	1.43	1.42	1.72	1.58
Visible minority status (ref: Not a visible minority)						
Visible minority, other than aborig	1.56	1.23	1.99	1.34	2.61	1.40
Aboriginal	1.38	1.02	1.15	1.01	1.15	1.03
Mobility in the last year (ref: Non-mover)						
Moved within CSD	1.35	1.35	1.24	1.30	1.22	1.23
Moved from another CSD	1.18	1.08	1.38	1.26	1.20	1.21
Moved from abroad	1.14	1.21	1.27	1.09	1.26	1.09
Mobility in the last 5 years (ref: Non-mover)						
Moved within CSD	1.67	1.71	1.75	1.64	1.78	1.58
Moved from another CSD	1.80	1.71	2.15	1.75	2.04	1.66
Moved from abroad	1.29	1.31	1.73	1.56	1.80	1.63
Crowding Index	1.62	1.63	1.68	1.72	1.81	1.66
Build within last five years (re	1.22	1.27	1.33	1.33	1.23	1.30

4.9. REFERENCES

Agnello, L., and L. Schuknecht. 2011. Booms and busts in housing markets: Determinants and implications. *Journal of Housing Economics* 20(3): 171-190.

Ainslie, K. 2014. "Dutch disease and the resource curse: Newfoundland and Labrador in focus." *Geopolitics of Energy* no. 36 (1):11-21.

Alessandrini, Diana. "On the Cyclicality of Schooling Decisions: Evidence from Canadian Data. " [working paper 16_14, The Rimini Centre of Economic Analysis,Rimini, Italy, 2014].

Beaupré, P., P. Turcotte, and A. Milan. 2006."When Is Junior Moving Out? Transitions from the Parental Home to Independence." *Canadian Social Trends,* 82: 9-15.

Bunting, Trudi, Alan Walks, and Pierre Filion. 2004. The uneven geography of housing affordability stress in Canadian metropolitan areas. *Housing Studies* 19(3): 361-393.

Carver, Humphrey. *Houses for Canadians*. Toronto: University of Toronto Press, 1948.

Chan, S. (2001). Spatial lock-in: Do falling house prices constrain residential mobility? *Journal of Urban Economics*, 49(3): 567-586.

Clark, Warren.2007. "Delayed transitions of young adults." *Canadian Social Trends* 84: 14-22.

Canada Mortgage and Housing Corporation [CMHC].2012. "Rental Market Report –St. John's CMA.", accessed June 20, 2016, http://publications.gc.ca/collections/collection_2012/schl-cmhc/NH12-84-2012-eng.pdf.

Dewilde, C,. & Lancee, B. (2013). Income Inequality and Access to Housing in Europe.*European Sociological Review*, 29, 1189-1200.

Emery, JC Herbert, Ana Ferrer, and David Green.2012. "Long-term consequences of natural resource booms for human capital accumulation." *Industrial & Labor Relations Review,* 65(3): 708-734.

Ennis, Gretchen, Mary Finlayson, and Glen Speering. 2013. "Expecting A Boomtown? Exploring potential Housing - related Impacts of Large Scale Resource Developments in Darwin." *Human Geographies,* 7 (1):33-42.

Federal Reserve Bank of St. Louis .2016. *Crude Oil Prices: West Texas Intermediate(WTI) - Cushing, Oklahoma.* Retrieved from https://fred.stlouisfed.org/series/DCOILWTICO

Gan, Quan, and Robert J. Hill. 2009. "Measuring housing affordability: Looking beyond the median." *Journal of Housing Economics*, 18 (2):115-125.

Goldenberg, S. M., J. A. Shoveller, M. Koehoorn, and A. S. Ostry. 2010. "And they call this progress? Consequences for young people of living and working in resource-extraction communities." *Critical Public Health*, 20 (2):157-168.

Green, D. A., & Milligan, K.. (2010). The Importance of the Long Form Census to Canada. *Canadian Public Policy / Analyse De Politiques*, *36*(3), 383–388.

Hancock, K.E. 1993. "'Can Pay? Won't Pay?' or Economic Principles of 'affordability'." *Urban Studies* 30(1): 127-145.

Hao, Lingxin, and Daniel Q. Naiman. *Quantile Regression*. Quantitative Applications in the Social Sciences ; Thousand Oaks, CA, USA: SAGE Publications (US), ISBN 1-4129-2628-9.

Henley, Andrew. 1998. "Residential Mobility, Housing Equity and the Labor Market." *Economic Journal* 108(447): 414-27.

Heywood, A.2011. "The end of the affair: implications of declining homeownership." London: The Smith Institute.

Hiebert, D. 2009. "Newcomers in the Canadian housing market: a longitudinal study, 2001–2005*." The Canadian Geographer / Le Géographe canadien*, 53(3): 268–287.

Hulchanski, J. D. 1995. "The Concept of Housing Affordability - 6 Contemporary Uses of the Uses of the Housing Expenditure-to-Income Ratio." *Housing Studies*, 10(4):471-491.

Hulchanski, J. D. 2004. "A Tale of Two Canadas: Homeowners Getting Richer, Renters Getting Poorer." In *Finding Room - Policy Options for a Canadian Rental Housing Strategy*, edited by J. D.Hulchanski and Michael Shapcott, 81-88. Toronto: Centre for Urban and Community Studies, University of Toronto.

Hulchanski, J.D. & Michalski, J.H. .1994. "How Households Obtain Resources to Meet their Needs: The Shifting Mix of Cash and Non-Cash Sources." Toronto: Ontario Human Rights Commission.

Keogh, S. B. 2015. "Planning for growth in a natural resource boomtown: challenges for urban planners in Fort McMurray, Alberta." *Urban Geography,* 36(8): 1169-196.

Kesteloot, C. 1994. "Three Levels of Sociospatial Polarization in Brussels." *Built Environment*, 20 (3):204-217.

Kirkpatrick, S.I., and V. Tarasuk. 2007."Adequacy of Food Spending Is Related to Housing Expenditures among Lower-income Canadian Households." *Public Health Nutrition,* 10(12): 1464-473.

Koenker, R., and G. Bassett Jr. 1978. "Regression Quantiles." *Econometrica*, 46(1): 33–50.

Kutty, N. K. 1999. "Determinants of Structural Adequacy of Dwellings." *Journal of Housing Research, 10*(1): 27-42.

Lamont, Chris. 2008. "Housing Affordability Crisis: Fact or Fiction?" *Australian Economic Review*, 41 (2):194-199.

Lawrie, M., Tonts, M., & Plummer, P. (2011). Boomtowns, Resource Dependence and Socio-economic Well-being. *Australian Geographer, 42*, 139-164.

Leiter, Valerie, and Alexandra Waugh.2009. "Moving Out: Residential Independence Among Young Adults With Disabilities and the Role of Families." *Marriage & Family Review* 45(5): 519-37.

Lerman, D. L., and W. J. Reeder. 1987. "The Affordability of Adequate Housing." *Areuea Journal-Journal of the American Real Estate & Urban Economics Association,* 15 (4):389-404.

Leung, C. K. Y., S. Shi, and E. C. Ho Tang. 2013. "Commodity house prices." *Regional Science and Urban Economics*, 43 (6):875-887.

Ley, D. 2007. "Countervailing Immigration and Domestic Migration in Gateway Cities: Australian and Canadian Variations on an American Theme." *Economic Geography,* 83(3): 231-254.

Lloyd, Greg, and David Newlands.1990. "The interaction of housing and labor markets: An Aberdeen case study." *Land Development Studies,* 7(1): 31-40.

Marks, D. 1984. “Housing Affordability and Rent Regulation” Toronto: Ontario Commission of Inquiry into Residential
Tenancies, Research Study No. 8.

Matlack, J. L. & Vigdor, J. L.(2008). Do rising tides lift all prices? Income inequality and housing affordability. *Journal of Housing Economics*, *17*, 212-224.

Miller, Byron; Smith, Allan. 2011.” 'Heart of the New West'? Oil and Gas, Rapid Growth, and Consequences in Calgary.” In *Canadian Urban Regions, Trajectories of Growth and Change*, edited by Larry S. Bourne; Tom Hutton ; Richard G. Sheamur; and Jim Simmons. Toronto: Oxford University Press.

Moore, Eric, and Andrejs Skaburskis. 2004. “Canada's increasing housing affordability burdens.” *Housing Studies,* 19(3): 395-413.

Moos, M., and A. Skaburskis. 2010. “The globalization of urban housing markets: Immigration and changing housing demand in Vancouver.” *Urban Geography,* 31(6):724-749.

Natural Resources Canada. 2011. Canadian Crude Oil, Natural Gas and Petroleum Products: Review of 2009 & Outlook to 2030

http://www.nrcan.gc.ca/sites/www.nrcan.gc.ca/files/energy/pdf/eneene/sources/crubru/revrev/pdf/revrev-09-eng.pdf.

Nepal, Binod, Robert Tanton, and Ann Harding. 2010. "Measuring Housing Stress: How Much do Definitions Matter?" *Urban Policy and Research*, 28 (2):211-224.

O'Brien, Robert M.2007. "A caution regarding rules of thumb for variance inflation factors." *Quality & Quantity,* 41(5): 673-690.

O'Dell, William, Smith, Marc T., and White, Douglas. 2004. "Weaknesses in current measures of housing needs." *Housing and Society*, 31 (1):29-40.

O'Neill, Tracey, Clare Jinks, and Anne Squire.2006. "'"Heating Is More Important Than Food"'." *Journal of Housing For the Elderly,* 20(3): 95-108.

Preville, Emmanuel.2003. . "Redefining Poverty: The Market Basket Measure.". Library of Parliament, Parliamentary Research Branch. http://www.publications.gc.ca/collections/Collection-R/LoPBdP/EB-e/prb0310-e.pdf.

Randall, James E., and R. Geoff Ironside. 1996. "Communities on the edge: An economic geography of resource-dependent communities in Canada." *Canadian Geographer*, 40 (1):17-35.

Rea, Willa, Jennifer Yuen, John Engeland, and Roberto Figueroa.2008. "The dynamics of housing affordability." *Perspectives on Labor and Income,* 20(1): 37-48,2.

Rolfe, J., Miles, B., Lockie, S., & Ivanova, G. (2007). "Lessons from the social and economic impacts of the mining boom in the Bowen Basin 2004-2006." *Australasian Journal of Regional Studies, 13*(2), 134-153.

Rowley, S. & Haslam McKenzie, F. (2010). Housing markets in regional Western Australia: boom and bust?, In Maria Schwensen (ed), *Australasian Housing Researchers' Conference, Aug 5 2009*. Sydney, Australia: UNSW.

Rowley, S., Ong, R., & Haffner, M. 2015. "Bridging the Gap between Housing Stress and Financial Stress: The Case of Australia." *Housing Studies, 30*(3), 473-490.

Ryser, L., and G. Halseth. 2011. "Housing costs in an oil and gas boom town: Issues for low-income senior women living alone." *Journal of Housing for the Elderly*, 25(3):306-325.

Saugeres, Lise.2011. "(Un)accommodating Disabilities: Housing, Marginalization and Dependency in Australia." *Journal of Housing and the Built Environment,* 26(1): 1-15.

Skaburskis, Andrejs.2002. "Generational Differences and Future Housing Markets." *The Canadian Journal of Regional Science,* 25(3): 377-403.

Skaburskis, Andrejs and Markus Moos. 2010. "The Economics of Urban Land." In *Canadian Cities in Transition*, edited by Trudi Bunting, Pierre Filion and Ryan Walker. Toronto: Oxford University Press.

Smith, Stanleyk., Stefan Rayer, Eleanor Smith, Zhenglian Wang, and Yi Zeng. 2012. "Population Aging, Disability and Housing Accessibility: Implications for Sub-national Areas in the United States." *Housing Studies,* 27(2): 252-66.

Statistics Canada.(2008). "Research Data Centres (RDC): 2006 Census Code Book"

Statistics Canada.(2016). Population and Dwelling count Highlight tables, 2011 Census - Population and dwelling counts, for census metropolitan areas and census agglomerations, 2011 and 2006 censuses. Retrieved from http://www12.statcan.gc.ca/census-recensement/2011/dp-pd/hlt-fst/pd-pl/Table-Tableau.cfm?T=201&S=3&O=D&RPP=150.

Stone, Michael E. 1990. "One-third of a Nation: A New Look at Housing Affordability in America." Washington DC: Economic Policy Institute.

Stone, Michael E. 2006. "What is housing affordability? The case for the residual income approach." *Housing Policy Debate,* 17(1):151-84.

Thalmann, Philippe. 1999. "Identifying households which need housing assistance." *Urban Studies*, 36 (11):1933-47.

Thalmann, Philippe. 2003. "'House poor' or simply 'poor'?" *Journal of Housing Economics,* 12(4): 291-317.

Veall, M. R. (2010). 2B or Not 2B? What Should Have Happened with the Canadian Long Form Census? What Should Happen Now?. *Canadian Public Policy*, *36*, 395–399.

Walker, Ryan, and Tom Carter. 2010. "At Home in the City Housing and Neighbourhood Transformation." In *Canadian Cities in Transition*, edited by Trudi Bunting, Pierre Filion and Ryan Walker, Fourth Edition, 342-356. Toronto: Oxford University Press.

Walks, R. Alan. 2001."The Social Ecology of the Post-Fordist/Global City? Economic Restructuring and Socio-Spatial Polarisation in the Toronto Urban Region." *Urban Studies,* 38(3): 407-47.

Walks, R. Alan.2010. "New divisions: Social polarization and neighbourhood inequality in the Canadian City". In *Canadian Cities in Transition*, edited by Trudy Bunting, Pierre Filion and Ryan Walker, Fourth Edition ,170-190. Toronto: Oxford University Press.

Walks, Alan. 2013. "Mapping the Urban Debtscape: The Geography of Household Debt in Canadian Cities." *Urban Geography* , 34 (2):153-87.

Walks, A. 2014. "From Financialization to Sociospatial Polarization of the City? Evidence from Canada." *Economic Geography,* 90(1): 33-66.

Weeks, Lori E, and Kristal Leblanc.2010. "Housing Concerns of Vulnerable Older Canadians." *Canadian Journal on Aging,* 29(3): 333-47.

Yates, Judith. 2002. "Housing Implications of Social, Spatial and Structural Change." *Housing Studies*,17 (4):581-618.

CHAPTER 5: CONCLUDING REMARKS

The objective of this thesis was to explore the dynamics of housing affordability in resource driven urban agglomerations in Canada, with a focus on St. John's, Newfoundland. Housing affordability, a central concept in this project, was measured using a conventional housing cost to income ratio. For a descriptive part of the project, housing affordability was further conceptualised as interplay between housing tenure, housing cost, housing quality and debt. This was followed by a ranking of the individual households based on their housing cost to income burden, after which quantile regression analysis was conducted by using various household attributes as independent variables. The results of this work show that labor market segmentation into well paid resource sector workers and lowly paid service sector workers have generated income inequalities. These underlie new problems of housing affordability that have emerged in resource driven agglomerations central to the recent Canadian oil boom. The extent and type of these problems are, however, contingent on regional circumstances.

Recent research indicates that income inequalities underlie problems of housing affordability. Economic growth in resource driven urban agglomerations can contribute to increasing or decreasing these income inequalities, depending on regional circumstances. Labor intensive resource industry in Fort McMurray generates many well-paying employment opportunities for low-skilled labor force, while capital intensive off-shore oil industry in St. John's fails to do that. In consequence, income disparities decreased in Fort McMurray where low income earners in the bottom 40% of the income

spectrum gained most. Meanwhile, the top income quintile in St. John's gained more than the bottom income quintile which generated an increase in income disparities. Mid-range disparities also increased slightly in St. John's, while they decreased in Fort McMurray. Housing markets have been affected by income increases in both regions. As a result, the housing market in St. John's was undoubtedly affected by the beginning of the resource industry, although the city-region would have been impacted even more if the economic growth in Newfoundland had been combined with a strong population growth, like in Fort McMurray.

Differences between regional housing markets also contribute to disparate housing affordability outcomes. Owner occupancy is the preferred tenure in most Canadian cities but particularly so in St. John's, as indicated by the domination of single-detached houses. The extreme pace of growth in Fort McMurray is reflected by the new house construction rate: about 25 per cent of the housing was built during the last 5 years according to Census 2006 and NHS2011, while this was only the case for 11 percent of housing in St. John's. Despite all construction activities, an acute housing shortage reverberated to the rental housing sector in Fort McMurray. Median rental housing costs in Fort McMurray increased by 150 percent between 1991 and 2011, while the increase in St. John's was 6 percent. A part of the explanation is that, in contrast to Fort McMurray, the rental market in St. John's has been able to absorb some of the pressure caused by the economic growth. Owner occupancy was always the most popular tenure choice in Newfoundland, and a shortage of rental housing has been alleviated by a significant presence of both secondary private rental market and social housing.

In a region as excessively dominated by resource industries as Northern Alberta, the oil sector employment in Fort McMurray is correlated with other labor market activities. Unsurprisingly, rental tenancy also appears to be slightly correlated to the industry sector, as many of the employees of the oil sector are likely to look for rental housing. In fact, renters in Fort McMurray are more burdened by their housing cost than mortgaged homeowners across the whole housing affordability spectrum while this is only the case for renters in the top housing affordability stress quartile in St. John's. At other levels of the housing affordability stress, renters fare better than mortgaged owners. Undoubtedly, the very high income levels in Fort McMurray alleviate housing cost to income burden for homeowners.

Purchasing a home becomes an attractive option if rental housing is scarce and very expensive. This is evident for both Fort McMurray and St. John's, but also for other resource driven urban agglomerations, such as Calgary, Edmonton, and Saskatoon. Specifically, all these urban agglomerations display a share of homeowners carrying mortgages that is higher than the national level among the bottom 60% of the income spectrum.

While housing tenure is the most important attribute related to the housing market, and as such has an impact on housing affordability, labor market activities are also important because they provide income that can be used to pay for housing. Employment in the oil industry has been a major sector in the economy of Fort McMurray already before 1991 while its effect on housing affordability was insignificant in St. John's in 1991. Since then, the oil sector has gained importance in St. John's, while it appears to have lost

some in Fort McMurray over time. Compared to Health Care, social assistance and education sector (the reference), no other sector has a consistent significant positive effect on housing cost to income burden. Utilities do that at times, and in St. John's, the public sector emerges as a labor market sector that is associated with decreasing housing affordability stress. Educational attainment is generally important for finding decent employment but, it is not as important in Fort McMurray as in St. John's. Meanwhile, labor market activities in the retail sector and food accommodation are associated with deteriorating effects on housing affordability.

Other household characteristics that deserve attention are age, family composition, mobility and disability. The young are still experiencing a high housing cost to income burden, although their housing affordability stress seems to improve over time. At the same time, housing affordability for the elderly appear to be deteriorating, which is worth concern considering the rapidly aging population in St. John's. Aging is linked with a higher disability rate, but much of the existing housing stock is not adapted to those with physical disabilities. Disabled persons tend to struggle more with their housing affordability than those without disabilities. Secondly, females living alone and female-lone parents are highlighted as a particularly vulnerable population groups. This is worth concern because the prevailing demographic trends point to growing numbers of small households. Lone persons appear to be more burdened by their housing cost than lone parents, whose situation has improved over time in St. John's, but not much in Fort McMurray. Finally, mobility is frequently associated with increasing housing cost to income burden.

While income evolution and household characteristics have impact on housing demand, the supply side is not without consequence. There are recurrent indications of lack of affordable housing. While the stagnated income evolution explains a part of housing affordability stress for low income earners, the situation is further exacerbated by decreasing segments of the housing market that remain affordable for low income earners. Evidence of this entails findings such as the gaps between housing costs for lowest and highest income quintiles are decreasing for both homeowners and renters, and housing value to income ratio for bottom 60 percent income earners is well above the affordability limit (3.1).

Housing affordability is important because ramifications of poor housing affordability are diverse and many. Those most afflicted by housing affordability stress, are also most likely to end up with insufficient funds for their non-housing consumption because their remaining disposable income is smaller, often due to a combination of low income level and high housing cost. This has an impact on both individual households and the region as a whole, because poor housing affordability has both direct and indirect consequences for the health and well-being of individuals affected by it, while it also impacts the financial, social and cultural fundamentals of the region. Housing affordability problems tend to impede household formation, and may make individuals and families decide to not to have children, or make them relocate elsewhere. This drain of human and social capital is not without consequence for livability and viability of the region. The labor force base is getting smaller while the increasing numbers of workers are required to support the growing cohorts of senior citizens in the province.

Policy measures are called for mitigation of these impacts, addressing both the labor market and housing market effects. The main goals should be to make it easier for individuals and families to find employment that provides them with a reasonable level of earnings, and provide affordable housing for those whose earnings fall short of that.

New employment opportunities are contingent on expansion of the regional economic base. Diversification of the regional economy is difficult particularly for resource driven urban agglomerations. A more diversified economy would not only provide a more varied array of employment opportunities, it would also be less prone to the volatility of the commodity market. At present, creation of new jobs may require use of federally available funding for local infrastructure projects, support of existing local industries, encouragement and facilitation of business start-ups, while intensifying research efforts on opportunities of the regional economic development.

Housing policies are required on all levels of government. A national housing policy should be re-established in Canada, with a framework to encourage development of non-profit and rental housing, and protection of still remaining social housing. Provincial and municipal governments should facilitate and support co-operation between non-profit housing organisations, developers and different levels of government representatives to find new innovative solutions to build housing that is affordable for low to moderate income earners. Those in need for advice on finding employment, or housing, might benefit of access to a counsellor hired by the municipality to inform them about existing options.

In view of these findings, we contend that resource booms (or busts) are prone to generate housing affordability problems and housing-related vulnerability in low to mid-income earning segments of the population in extractive urban agglomerations. The extent of these housing affordability problems may not be as high as in major metropolitan areas, but the associated risk is higher because of the volatility of resource driven economies. Economic downturn is likely to have a major impact on the regional labor market by reducing employment opportunities. Housing prices are also likely to decline, and negative equity can prevent persons from moving elsewhere to search for employment. Policy measures could be used to mitigate the effects of the volatility of the resource cycles on both individual households and the regional economy. Whereas previous literature has emphasized housing vulnerability in large metropolitan areas, the results highlight new patterns of housing-related vulnerability in resource driven regions in Canada.

BIBLIOGRAPHY

Ades, J., P. Apparicio, P., & A. M. Séguin. (2012). Are new patterns of low-income distribution emerging in Canadian metropolitan areas? *Canadian Geographer,* 56(3): 339-361.

Agnello, L., & L. Schuknecht. (2011). Booms and busts in housing markets: Determinants and implications. *Journal of Housing Economics,* 20, 171-190.

Ainslie, K. (2014). "Dutch disease and the resource curse: Newfoundland and Labrador in focus." *Geopolitics of Energy*, 36 (1):11-21.Calgary, Alberta : Canadian Energy Research Institute.

Akbar, D., J. Rolfe, and S. M. Z. Kabir. (2013). Predicting impacts of major projects on housing prices in resource based towns with a case study application to Gladstone, Australia. *Resources Policy,* 38 (4):481-489.

Alessandrini, Diana. "On the Cyclicality of Schooling Decisions: Evidence from Canadian Data. " The Rimini Centre of Economic Analysis, working paper 16_14. Retrieved from http://www.rcfea.org/RePEc/pdf/wp16_14.pdf

Alexander, Craig, & Paul Jacobson.(2015). "Mortgaged to the Hilt: Risks from the Distribution of Household Mortgage Debt."*CD Howe Institute Commentary* 441.Retrieved from cdhowe.org.

Ambrose, Peter J. (2001). Living conditions and health promotion strategies. *The Journal of the Royal Society for the Promotion of Health,* 121 (1):9-25.

Arnold, E., and A. Skaburskis. (1989). Measuring Ontario's Increasing Housing Affordability Problem. *Social Indicators Research*. 21 (5):501-515.

August, M. (2014). Negotiating Social Mix in Toronto's First Public Housing Redevelopment: Power, Space and Social Control in Don Mount Court. *International Journal of Urban and Regional Research*, 38(4): 1160–1180.

Badcock, B. (1997). Restructuring and spatial polarization in cities. *Progress in Human Geography*, 21 (2):251-262.

Baker, Michael, Anne McNicholas, Nicholas Garrett, Nicholas Jones, Joanna Stewart, Vivien Koberstein, & Diana Lennon. (2000). Household Crowding a Major Risk Factor for Epidemic Meningococcal Disease in Auckland Children. *The Pediatric Infectious Disease Journal*,19(10): 983-990.

Baker, Emma, Kate Mason, and Rebecca Bentley.(2015). Measuring Housing Affordability: A Longitudinal Approach. *Urban Policy and Research* 33(3): 275-90.

Baland, J. M., & P. Francois (2000). Rent-seeking and resource booms. *Journal of Development Economics*, 61(2): 527–542.

Baldwin, R. (1977). "The dutch disease." *The Economist*, November 26, pp. 82-83.

Bates, J. (2006). Gendered spaces of industrial restructuring in resource peripheries: The case of the Corner Brook region, Newfoundland. *Tijdschrift Voor Economische En Sociale Geografie*,97(2): 126-137.

Beaupré, P., P. Turcotte, and A. Milan. (2006).When Is Junior Moving Out? Transitions from the Parental Home to Independence. *Canadian Social Trends,* 82: 9-15.

Beaton, Elizabeth.(2004). "*Housing in Atlantic Canada: The poverty factor.* " Paper presented at International Conference under the auspices of Housing and the Built Environment, Research Committee 43, of the International Sociological Association, Centre of Urban & Community Studies, Toronto, June 2004.

Beer, A., and D. Faulkner. (2011). *Housing Transitions Through theLife Course*. Bristol: The Policy Press.

Beine, M., C. S. Bos, and S. Coulombe. (2012). Does the Canadian economy suffer from Dutch disease? *Resource and Energy Economics*, 34 (4):468-492.

Bhattacharyya, S., and J. G. Williamson. (2011). Commodity price shocks and the Australian economy since federation. *Australian Economic History Review*, 51(2):150-177.

Bhunu, C. P. (2014). Homelessness and drug misuse in developing countries: A mathematical approach. *Communications in Nonlinear Science and Numerical Simulation*, 19(6):1908-1917.

Blackadder, G. A., & J. Baster.(1992). “Oil and remote communities-Shetland and Orkney.” In *North Sea oil and the environment* edited by W.J. Cairns, 165-191.London: Elsevier Applied Science.

Bloch, Brian. (1997). Volatility in the residential housing market: an international perspective. *Property Management*, 15 (1):12 - 24.

Boessenkool, K. J., & B. Eisen. (2012). “Public Sector Wage Growth in Alberta.” *School of Public Policy Research Paper* 5(1) :1-13.Calgary, Alberta :School of Public Policy, University of Calgary.

Bogdon, Amy S., and Ayse Can. (1997). Indicators of Local Housing Affordability: Comparative and Spatial Approaches. *Real Estate Economics*, 25 (1): 43-80.

Bolton, K., and S. Breau. (2012). Growing Unequal? Changes in the Distribution of Earnings across Canadian Cities. *Urban Studies*, 49(6):1377-1396.

Bossarte, R. M., J. R. Blosnich, R. I. Piegari, L. L. Hill, and V. Kane. (2013). Housing Instability and Mental Distress Among US Veterans. *American Journal of Public Health*, 103: S213-S216.

Bourne, Larry S. 1981. *The Geography of Housing*. New York: V.H. Winston & Sons.

Bourne, Larry S. (1990). "Worlds apart: the changing geography of income distribution within Canadian metropolitan areas. " *University of Toronto. Department of Geography Discussion Paper no. 36.* University of Toronto.

Bourne, Larry S., and R. Alan Walks. (2010). " Conclusion: Challenges and Opportunities in the Twenty-First-Century City ". In *Canadian Cities in Transition*, edited byTrudy Bunting, Pierre Filion and Ryan Walker, Fourth Edition, 428-445. Toronto: Oxford University Press.

Bradbury, J. H. (1979). Towards an Alternative Theory of Resource-Based Town Development in Canada. *Economic Geography***,** 55(2): 147-166.

Brake, Justin.(2013). "Should we raise the Minimum Wage? " *The Independent,* September 18, http://theindependent.ca/2013/09/18/should-we-raise-the-minimum-wage/

Bramley, G.(1990, September). "*Access, affordability and housing need*. " Paper presented at the Economic and Social Research Council Housing Studies Conference, University of Surrey, Guildford. Mimeo, University of Bristol, School of Advanced Urban Studies.

Bramley, Glen. (2012). Affordability, poverty and housing need: triangulating measures and standards. *Journal of Housing and the Built Environment*, 27(2): 133-151.

Brown, Mark & Luke Rispoli. (2014). "Metropolitan Gross Domestic Products – Experimental Estmates, 2001-2009. "Statistics Canada, Economic Insights

(Catalogue number 11-626-X-No. 04). Retrieved from http://www.statcan.gc.ca/pub/11-626-x/11-626-x2014042-eng.pdf.

Bunting, Trudi and Pierre Filion.(2010). "Epochs of Canadian Urban Development." In *Canadian Cities in Transition*, edited by Trudi Bunting, Pierre Filion and Ryan Walker, Fourth Edition, 19-38. Toronto: Oxford University Press.

Bunting, Trudi, Alan Walks, and Pierre Filion. (2004). The uneven geography of housing affordability stress in Canadian metropolitan areas. *Housing Studies*, 19 (3):361-393.

Cadigan, Sean T. 2009. *Newfoundland and Labrador: A history*. Toronto : University of Toronto Press.

Cadigan, Sean T. (2012). "Boom, Bust and Bluster: Newfoundland and Labrador's "Oil Boom" and Its Impacts on Labor." In *Boom, Bust and Crisis:Labor, Corporate Power and Politics in Canada,* edited by John Peters, 68-83. Halifax: Fernwood Publishing.

Calgary Committee to End Homelessness.(2008). "Calgary's 10 year Plan to End Homelessness" Retrieved from http://calgaryhomeless.com/wp-content/uploads/Calgarys_10_Year_Plan_2008.pdf.

Canada Mortgage and Housing Corporation [CMHC]. (2004).*2001* Census Housing Series: Issue 3 Revised – The Adequacy, Suitability and Affordability of Canadian Housing. *Research Highlights.* Retrieved from http://www.cmhc-schl.gc.ca/odpub/pdf/63403.pdf?lang=en.

Canada Mortgage and Housing Corporation [CMHC].2012. "Rental Market Report –St. John's CMA.", accessed June 20, 2016, http://publications.gc.ca/collections/collection_2012/schl-cmhc/NH12-84-2012-eng.pdf.

Canada Mortgage and Housing Corporation [CMHC]. (2013). "Housing Market Outlook." Retrieved from http://www.cmhc-schl.gc.ca/odpub/esub/61500/61500_2013_Q01.pdf

Canada Mortgage and Housing Corporation [CMHC] .(2014). *Accessory Apartment Regulations in Census Metropolitan Areas and Census Agglomerations in*

*Canada.(*Socio-economic Series 14-00).Retrieved from http://www.cmhc.ca/odpub/pdf/68145.pdf.

Canada Mortgage and Housing Corporation [CMHC].2015. "Housing Market Indicators – St. John's 1990-2014. " *Canadian Housing Observer.* Retrieved from http://www.cmhc-schl.gc.ca/en/hoficlincl/homain/stda/data/data_001.cfm.

Canada Mortgage and Housing Corporation [CMHC].2016. "Affordable Housing Initiative." Retrieved from http://cmhc-schl.gc.ca/en/inpr/afhoce/fias/fias_015.cfm.

Canada Mortgage and Housing Corporation [CMHC].2016a. "Investment in Affordable Housing (IAH). " Retrieved from http://www.cmhc-schl.gc.ca/en/inpr/afhoce/fuafho/.

Canada Revenue Agency. 2016. "Principal residence and other real estate." Retrieved from http://www.cra-arc.gc.ca/tx/ndvdls/tpcs/ncm-tx/rtrn/cmpltng/rprtng-ncm/lns101-170/127/rsdnc/

Carson, Dean. (2011). Political economy, demography and development in Australia's Northern Territory. *The Canadian Geographer*, 55 (2):226-242.

Carter, T. (1997). Current practices for procuring affordable housing: The Canadian context. *Housing Policy Debate*, 8(3): 593-631.

Carter, T. and C. Polevychok.(2004). "*Housing Is Good Social Policy*." Ottawa: Canadian Policy Research Networks, Research Report F/50. Retrieved from http://www.cprn.org/documents/33525_en.pdf

Carver, Humphrey.(1948). *Houses for Canadians*. Toronto: University of Toronto Press.

CBC.2016. "More space than renters in St. John's, lower demand for high end digs."January 06, 2016. http://www.cbc.ca/news/canada/newfoundland-labrador/st-john-s-condos-executive-homes-rent-real-estate-1.3392123

Chakrabarti, R. & J. Zhang. (2015). Unaffordable housing and local employment growth: Evidence from California municipalities. *Urban Studies*, 52(6): 1134-1151.

Chan, S. (2001). Spatial lock-in: Do falling house prices constrain residential mobility? *Journal of Urban Economics*, 49(3): 567-586.

Chandler, D., and R. Disney. (2014). The Housing Market in the United Kingdom: Effects of House Price Volatility on Households. *Fiscal Studies***,** 35(3): 371-394.

Choices for Youth.(2016). accessed June 21, 2016. http://www.choicesforyouth.ca/home.

Clark, Warren.(2007). Delayed transitions of young adults. *Canadian Social Trends* 84: 14-22.

Clawson, Marion. (1962). Urban Sprawl and Speculation in Suburban Land. *Land Economics,* 38 (2):99-111.

Collier, Paul; Venables, Anthony J., ed. 2011. *Plundered Nations? Successes and Failures in Natural Resource Extraction*. New York: Palgrave Macmillan.

Collins, D. (2010). Homelessness in Canada and New Zealand: A Comparative Perspective on Numbers and Policy Responses. *Urban Geography***,** 31(7): 932-952.

Cooper, Merrill. (2004). "Housing Affordability: A Children's Issue.". In *Finding Room - Policy Options for a Canadian Rental Housing Strategy*, edited by J. D.Hulchanski and Michael Shapcott, 89-114. Toronto: CUCS Press, Centre for Urban and Community Studies, University of Toronto

Corden, W. M. (1984). Booming Sector and Dutch Disease Economics: Survey and Consolidation. *Oxford Economic Papers*, 36(3):359-380.

Corden, W. Max, and J. Peter Neary.(1982). Booming Sector and De-Industrialisation in a Small Open Economy. *The Economic Journal,* 92(368): 825-48.

Coulombe, Serge. (2013). "The Canadian dollar and the Dutch and Canadian diseases." *School of Public Policy Research Paper* 6(30) :1-13.Calgary, Alberta :School of Public Policy, University of Calgary.

Cox, Wendell, & Hugh Pavletich.(2016). *12th Annual Demographia International Housing Affordability Survey*. Retrieved from http://www. demographia.com.

Danielsen, Albert , L. (1982). *The evolution of OPEC*. New York: Harcourt Brace Jovanovich.

Dewilde, Caroline, and Bram Lancee. (2013). Income Inequality and Access to Housing in Europe. *European Sociological Review*, 29 (6):1189-1200.

Doran, K. M., E. J. Misa, and N. R. Shah. (2013). Housing as Health Care - New York's Boundary-Crossing Experiment. *New England Journal of Medicine*, 369(25):2374-2377.

Drew, R. B. (2013). Constructing Homeownership Policy: Social Constructions and the Design of the Low-Income Homeownership Policy Objective. *Housing Studies*. 28(4): 616-631.

Drummond, Don. (2004). "A New Paradigm for Affordable Housing: An Economist's Perspective. " In *Finding Room - Policy Options for a Canadian Rental Housing Strategy*, edited by J. D.Hulchanski and Michael Shapcott, 215-230. Toronto: CUCS Press, Centre for Urban and Community Studies, University of Toronto.

Drummond, Don; Derek Burleton, and Gillian Manning.(2004). "Affordable Housing in Canada: In Search of a New Paradigm." In *Finding Room - Policy Options for a Canadian Rental Housing Strategy*, edited by J. D.Hulchanski and Michael Shapcott, 15-68. Toronto: CUCS Press, Centre for Urban and Community Studies, University of Toronto.

Dubé, Jean, and Mario Polèse. (2015). Resource Curse and Regional Development: Does Dutch Disease Apply to Local Economies? Evidence from Canada. *Growth and Change*, 46 (1):38-57.

Edmonton Committee to End Homelessness.(2009). "A Place to call Home- Edmonton's 10 year Plan to End Homelessness." Retrieved from http://www.homewardtrust.ca/images/resources/2011-08-17-15-36A-Place-to-Call-Home_Edmonton-10-Year-Plan.pdf.

Elbogen, E. B., C. P. Sullivan, J. Wolfe, H. R. Wagner, and J. C. Beckham. (2013). Homelessness and Money Mismanagement in Iraq and Afghanistan Veterans. *American Journal of Public Health*,103: S248-S254.

Elsinga, Marja, and Joris Hoekstra. (2005). Homeownership and Housing Satisfaction. *Journal of Housing and the Built Environment,* 20(4): 401-24.

Emery, JC Herbert, Ana Ferrer, and David Green. (2012). Long-term consequences of natural resource booms for human capital accumulation. *Industrial & Labor Relations Review,* 65(3): 708-734.

Ennis, Gretchen, Mary Finlayson, and Glen Speering. (2013). Expecting A Boomtown? Exploring potential Housing - related Impacts of Large Scale Resource Developments in Darwin. *Human Geographies*, 7 (1): 33-42.

Esteban, Joan María, and Ray Debraj. (1994). On the Measurement of Polarization. *Econometrica*, 62(4): 819-51.

Evans, Patricia. (2002). "Downloading the welfare state, Canadian style." In *Diminishing Welfare: A cross-national study of social provision*, edited by G.S. Goldberg & M.G. Rosenthal, 75-102. Westport, Conn: Auburn House.

Farren, Michael D. (2014). "Boomtowns and the Nimbleness of the Housing Market: The Impact of Shale Oil and Gas Drilling on Local Housing Markets." Paper no. 170644 presented at the Annual Meeting of Agricultural and Applied Economics Association, Minneapolis, Minnesota, July, 2014.

Feakin, J.R. (1982). Urban real estate speculation in the United States: implications for social science and urban planning. *International Journal Of Urban & Regional Research*, 6(1): 35-59.

Felt, Larry and J. Douglas House. (1980). "The Impact of Offshore Oil-Related Development upon the Residential Housing Market in St.John's: A Preliminary Assessment. " In *Report prepared for the Oil and Gas Sub-Committee of the Economic Development Committee.* St. John's.

Fleming, David A., and Thomas G. Measham. (2015). Income inequality across Australian regions during the mining boom: 2001-11. *Australian Geographer*, 46(2): 203-216.

Forsyth, P. J., and J. A. Kay. (1980). The Economic Implications of North Sea Oil Revenues. *Fiscal Studies*, 1(3):1-28.

Foster, T. B. and R. G. Kleit.(2014). The Changing Relationship Between Housing and Inequality, 1980–2010. *Housing Policy Debate*, 25(1): 16-40.

Frenette, Marc, David A. Green, and Kevin Milligan. (2009). Taxes, Transfers, and Canadian Income Inequality. *Canadian Public Policy*, 35(4): 389-411.

Fröbel, Folker, Jürgen Heinrichs, and Otto Kreye.(1980) *The new international division of labor: structural unemployment in industrialised countries and industrialisation in developing countries*. Cambridge: Cambridge University Press.

Fusco, L. (2007). "Offshore Oil: An overview of Development in Newfoundland and Labrador." Occasional Paper #2 in *Oil, Power and Dependency: Global and Local Realities of the Offshore Oil Industry in Newfoundland and Labrador*.Retrieved from http://www.ucs.mun.ca/~oilpower/documents/NL%20oil%207-25-1.pdf

Gan, Quan, and Robert J. Hill. (2009). Measuring housing affordability: Looking beyond the median. *Journal of Housing Economics*, 18(2):115-125.

Ganesh, A., D. J. T. Campbell, J. Hurley, and S. Patten. (2013). High Positive Psychiatric Screening Rates in an Urban Homeless Population. *Canadian Journal of Psychiatry*, 58(6): 353-360.

Gauthier, Bernard; and Albert Zeufack. 2011. "Governance and oil revenues in Cameroon." In *Plundered Nations? Successes and Failures in Natural Resource Extraction*, edited by Paul Collier and Anthony J. Venables, 27-78. New York: Palgrave Macmillan.

Gien, Lan T.(2000). Land and Sea Connection: The East Coast Fishery Closure, Unemployment and Health. *Canadian Journal of Public Health,* 91(2): 121-24.

Goderis, B., & S.W. Malone (2011). Natural Resource Booms and Inequality: Theory and Evidence. *Scandinavian Journal of Economics*, 113(2): 388–417.

Goldenberg, S. M., J. A. Shoveller, M. Koehoorn, & A. S. Ostry. (2010). And they call this progress? Consequences for young people of living and working in resource-extraction communities. *Critical Public Health*, 20(2): 157-168.

Gordon, S. (2013). "The Canadian manufacturing sector, 2002-2008: why is it called Dutch disease? " *School of Public Policy Research Paper* 6(26).Calgary, Alberta :School of Public Policy, University of Calgary.

Government of Alberta. (2016). The Ministry of Municipal Affairs. *Municipal Census and Population Lists*. http://municipalaffairs.gov.ab.ca/mc_official_populations

Government of Newfoundland and Labrador, Department of Finance. (2005).*The Economic Review 2005.* Retrieved from the Department of Finance website: http://www.economics.gov.nl.ca/review2005/review2005.pdf.

Government of Newfoundland and Labrador, Department of Finance. (2007). Budget 2007 – Largest Tax Cut in the History of Newfoundland and Labrador. http://www.releases.gov.nl.ca/releases/2007/fin/0426n06.htm.

Government of Newfoundland and Labrador, Department of Finance. (2008).*The Economy 2008.* Retrieved from the Department of Finance website: http://www.economics.gov.nl.ca/E2008/TheEconomy2008.pdf.

Government of Newfoundland and Labrador, Department of Finance. (2013). The Economy 2013. http://www.economics.gov.nl.ca/E2013/TheEconomy2013.pdf

Government of Newfoundland and Labrador, Department of Finance. (2016). The Economy 2016 – Oil and Gas. Retrieved from http://www.economics.gov.nl.ca/E2016/OilAndGas.pdf.

Gramling, B., & Brabant, S. (1986). Boomtowns and Offshore Energy Impact Assessment: The Development of a Comprehensive Model. *Sociological Perspectives*, *29*(2): 177–201.

Gratton, Matthew C. "An analysis of secondary suites as a policy instrument in the city of Edmonton." Master's thesis University of Manitoba, 2011. http://mspace.lib.umanitoba.ca/handle/1993/4891

Green, D. A., & K. Milligan (2010). The Importance of the Long Form Census to Canada. *Canadian Public Policy*, 36(3): 383–388.

Guirguis-Younger, Manal, Vivien Runnels, and Tim Aubry. (2003). "A Study of the Deaths of Persons Who are Homeless in Ottawa–A Social and Health Investigation." *Ottawa: Saint Paul University and the Centre for Research on Community Services*.

Haan, M. (2007). The Homeownership Hierarchies of Canada and the United States: The Housing Patterns of White and Non-White Immigrants of the Past Thirty Years. *International Migration Review,* 41(2): 433-465.

Haan, Michael, and Thomas Perks. (2008). The Housing Careers of Older Canadians: An Investigation Using Cycle 16 of the General Social Survey. *Canadian Studies in Population,* 35(2): 223-242

Hackworth, Jason. 2009. "Political Marginalisation, Misguided Nationalism and the Destruction of Canada's Social Housing Systems." In *Where the other half lives - Lower income Housing in a Neoliberal World*, edited by Sarah Glynn, 257-280. London: Pluto Press.

Hamnett, C. (1994). Social polarisation in global cities: theory and evidence. *Urban Studies*, 31(3): 401–424.

Hamnett, C. (1996). Social polarisation, economic restructuring and welfare state regimes. *Urban Studies*, 33(8):1407–1430.

Hancock, K.E. (1993). 'Can Pay? Won't Pay?' or Economic Principles of 'Affordability'. *Urban Studies*, 30(1):127-145.

Harris, A.H., M.G. Lloyd, A.J. McGuire, and D.A. Newlands. (1986). Who Gains from Structural Change? The Distribution of the Benefits of Oil in Aberdeen. *Urban Studies*, 23(4): 271-283.

Haslam McKenzie, Fiona M, and Rowley Steven. (2013). Housing Market Failure in a Booming Economy. *Housing Studies*, 28(3): 373-388.

Hayter, Roger, and Trevor Barnes. (1990). Innis' Staple Theory, Exports, and Recession: British Columbia, 1981-86. *Economic Geography,* 66 (2): 156–73.

Healy, J. D. (2003). Housing conditions, energy efficiency, affordability and satisfaction with housing: A Pan-European analysis. *Housing Studies*, 18(3):409-42.

Henley, Andrew. (1998). Residential Mobility, Housing Equity and the Labor Market. *Economic Journal,* 108(447): 414-27.

Heylen, Kristof; and Marietta Haffner. (2013). A ratio or budget benchmark for comparing affordability across countries? *Journal of housing and the built environment*, 28(3):547 - 565.

Heywood, A. (2011). "The end of the affair: implications of declining home ownership." *London: The Smith Institute*. Retrieved from http://www.smith-institute.org.uk/wp-content/uploads/2015/10/The-end-of-the-affair-implications-of-declining-home-ownership.pdf.

Hiebert, D. 2009. Newcomers in the Canadian housing market: a longitudinal study, 2001–2005. *The Canadian Geographer* , 53(3): 268–287.

Hou, F., and L. S. Bourne.(2006). The migration - Immigration link in Canada's gateway cities: A comparative study of Toronto, Montreal, and Vancouver. *Environment and Planning A,* 38(8): 1505-1525.

House, J. D. (1985). *The Challenge of Oil: Newfoundland's Quest for Controlled Development*, *Social and Economic Studies No. 30*. St. John's: Institute of Social and Economic Research, Memorial University of Newfoundland.

House, J. D. (2003). Myths and realities about petroleum-related development: Lessons for British Columbia from Atlantic Canada and the North Sea. *Journal of Canadian Studies*, 37(4): 9-45.

Howie, P., & Z. Atakhanova. (2014). Resource boom and inequality: Kazakhstan as a case study. *Resources Policy, 39*: 71-79.

Hulchanski, J. D. (2004a). "A Tale of Two Canadas: Homeowners Getting Richer, Renters Getting Poorer. " In *Finding Room - Policy Options for a Canadian Rental Housing Strategy*, edited by J. D.Hulchanski and Michael Shapcott, 81-88. Toronto: CUCS Press, Centre for Urban and Community Studies, University of Toronto.

Hulchanski, J. David (2007). "*Canada's Dual Housing Policy, Assisting Owners, Neglecting Renters*. " Toronto *Centre of Urban and Community Studies Research bulletin* No 38. Retrieved from

http://www.urbancentre.utoronto.ca/pdfs/researchbulletins/CUCSRB38Hulchanski.pdf

Hulchanski,David, Robert Murdie, Alan Walks, & Larry Bourne (2013a). "Average Individual Income 2010: National Household Survey Versus Taxfiler Data. " *Neighbourhood Change Research Partnership*. University of Toronto. Retrieved from http://neighbourhoodchange.ca/documents/2014/04/nhs-oped-data-tables.pdf.

Hulchanski, David, Robert Murdie, Alan Walks, and Larry Bourne.(2013b). "Canada's voluntary census is worthless. Here is why." *The Globe and Mail*, October4. http://www.theglobeandmail.com/opinion/canadas-voluntary-census-is-worthless-heres-why/article14674558/

Hulchanski, J. D. (1995). The Concept of Housing Affordability -6 Contemporary Uses Of The Housing Expenditure to Income Ratio. *Housing Studies*,10(4): 471-491.

Hulchanski, J. David; and Michael Shapcott (2004). *Finding room - policy options for a Canadian Rental Housing Strategy*. Toronto: CUCS Press, Centre for Urban and Community Studies, University of Toronto.

Hulchanski, J. D. (2004a). "A Tale of Two Canadas: Homeowners Getting Richer, Renters Getting Poorer." In *Finding Room - Policy Options for a Canadian Rental Housing Strategy*, edited by J. D. Hulchanski, and Michael Schapcott, 81-88. Toronto: Centre for Urban and Community Studies, University of Toronto.

Hulchanski, J. D. (2004b). "How did we get there? The Evolution of Canada's "Exclusionary" Housing System." In In *Finding Room- Policy Options for a Canadian Rental Housing Strategy*, edited by J. D. Hulchanski, and Michael Schapcott,179-194.. Toronto : CUCS Press, Centre for Urban and Community Studies, University of Toronto.

Hulchanski, D. (2010) "*The Three Cities Within Toronto: Income Polarization among Toronto's Neighbourhoods,1970–2005*. " Toronto: University of Toronto Cities Centre.

Hulchanski, J.D. & Michalski, J.H. .(1994). "How Households Obtain Resources to Meet their Needs: The Shifting Mix of Cash and Non-Cash Sources." Toronto: Ontario Human Rights Commission.

Hutchings, Jeffrey A., and Ransom A. Myers. (1994). What Can Be Learned from the Collapse of a Renewable Resource? Atlantic Cod, Gadus morhua, of Newfoundland and Labrador. *Canadian Journal of Fisheries and Aquatic Sciences*, 51(9):2126-2146.

Hutton, Tom.(2010). "Economic Change in Canadian Cities: Locational Dynamics of Employment". In *Canadian Cities in Transition* edited by Trudy Bunting, Pierre Filion and Ryan Walker, Fourth Edition,110-130. Toronto: Oxford University Press.

Ibabe, I., J. A. Stein, A. Nyamathi, and P. M. Bentler. (2014). Predictors of substance abuse treatment participation among homeless adults. *Journal of Substance Abuse Treatment*, 46(3): 374-381.

Innis, Harold. 1933. *Problems of Staple Production in Canada*. Toronto: Ryerson Press.

International Monetary Fund [IMF]. "Global Housing Watch – House Price-to- Income Ratio." Retrieved from http://www.imf.org/external/research/housing/.

Islam, Kazi Saiful, and Yasushi Asami. (2009). Housing Market Segmentation: A Review. *Review of Urban & Regional Development Studies*, 21(2-3): 93-109.

Ivanova, G. (2014). The mining industry in Queensland, Australia: Some regional development issues. *Resources Policy*, 39 (1):101-114.

Iwata, and Yamaga. (2008). Rental Externality, Tenure Security, and Housing Quality. *Journal of Housing Economics*, 17(3): 201-11.

Jacobs, David E., Jonathan Wilson, Sherry L. Dixon, Janet Smith, and Anne Evens. (2009). The Relationship of Housing and Population Health: A 30-Year Retrospective Analysis. *Environmental Health Perspectives*, 117(4): 598-604.

Jansen, S. (2013). Why is Housing Always Satisfactory? A Study into the Impact of Preference and Experience on Housing Appreciation. *Social Indicators Research***,** 113(3): 785-805.

Karl, Terry Lynn.1997. *The paradox of plenty: Oil booms and petro-states*. Vol. 26. Berkeley : Univ of California Press.

Keough, S. B. (2015). Planning for growth in a natural resource boomtown: challenges for urban planners in Fort McMurray, Alberta. *Urban Geography*, 36(8):1169-96.

Kesteloot, C. (1994). Three Levels of Sociospatial Polarization in Brussels. *Built Environment*, 20 (3): 204-217.

Kirkpatrick, S.I., and V. Tarasuk. (2007).Adequacy of Food Spending Is Related to Housing Expenditures among Lower-income Canadian Households. *Public Health Nutrition,* 10(12): 1464-473.

Kitson, M., R. Martin, and P. Tyler. (2011). The geographies of austerity. *Cambridge Journal of Regions Economy and Society*, 4(3): 289-302.

Kneebone, R. D., & K. G. White. (2009). Fiscal Retrenchment and Social Assistance in Canada. *Canadian Public Policy*, *35*(1): 21–40.

Kneebone, R. (2014)."Patterns of Homelessness in Calgary." [Presentation, Memorial University of Newfoundland, September 19.]

Kutty, Nandinee K. (1999). Determinants of Structural Adequacy of Dwellings. *Journal of Housing Research*, 10(1): 27-42.

Kutty, Nandinee K. (2005). A new measure of housing affordability: Estimates and analytical results. *Housing Policy Debate*, 16 (1): 113-142.

Lamont, Chris. (2008). Housing Affordability Crisis: Fact or Fiction? *Australian Economic Review*, 41(2): 194-199.

Lancee, B., and H. G. Van de Werfhorst. (2012). Income inequality and participation: a comparison of 24 European countries. *Social Science Research*, 41(5):1166–1178.

Lawrie, Misty, Matthew Tonts, and Paul Plummer. (2011). Boomtowns, Resource Dependence and Socio-economic Well-being. *Australian Geographer*, 42(2):139-164.

Lefebvre, Mario, Alan Arcand, Greg Sutherland, Robin Wiebe, & Jane McIntyre.(2013). *Metropolitan Outlook 1: Economic Insights Into 13 Canadian Metropolitan Economies*.Retrieved from www.conferenceboard.ca.

Leiter, Valerie, and Alexandra Waugh. (2009). Moving Out: Residential Independence Among Young Adults With Disabilities and the Role of Families. *Marriage & Family Review,* 45(5): 519-37.

Lepawsky, J., C. Phan, & R. Greenwood. (2010). Metropolis on the margins: talent attraction and retention to the St. John's city-region. *Canadian Geographer,54*, 324-346.

Lerman, D. L., and W. J. Reeder. (1987). The Affordability Of Adequate Housing. *Areuea Journal-Journal of the American Real Estate & Urban Economics Association*, 15(4): 389-404.

Leung, C. K. Y., S. Shi, and E. C. Ho Tang. (2013). Commodity house prices. *Regional Science and Urban Economics*, 43 (6): 875-887.

Levin, E. J., and R. E. Wright. (1997). Speculation in the housing market? *Urban Studies*, 34 (9): 1419-1437.

Ley, D., and J. Tutchener.(2001). Immigration, Globalisation and House Prices in Canada's Gateway Cities. *Housing Studies*, 16(2): 199-223.

Ley, D. (2007). Countervailing Immigration and Domestic Migration in Gateway Cities: Australian and Canadian Variations on an American Theme. *Economic Geography***,** 83(3): 231-254.

Linneman, Peter D., and Isaac F. Megbolugbe. (1992). Housing Affordability: Myth or Reality? *Urban Studies*, 29(3-4): 369-392.

Lloyd, Greg, and David Newlands. (1990). The interaction of housing and labor markets: An Aberdeen case study. *Land Development Studies,* 7(1): 31-40.

Locke, Wade. (2011). Newfoundland and Labrador, from Austerity to Prosperity - and back to Austerity (?) : Planning to Avoid a Financial Crisis. *Newfoundland Quarterly*, 104 (2): 39-41.

Lowe, S. G., B. A. Searle, and S. J. Smith. 2012. From Housing Wealth to Mortgage Debt: The Emergence of Britain's Asset-Shaped Welfare State. *Social Policy and Society,* 11(1): 105-116.

MacDonald, Maureen. (1998) The impact of a restructured Canadian welfare state on Atlantic Canada. *Social Policy & Administration* 32(4): 389-400.

MacKillop, F. (2013). Sustainable as a basis of affordable? Understanding the affordability 'crisis' in Australian housing. *Australian Planner*, 50 (1):2-12.

Madianos, M. G., P. Chondraki, and G. N. Papadimitriou. (2013). Prevalence of psychiatric disorders among homeless people in Athens area: a cross-sectional study. *Social Psychiatry and Psychiatric Epidemiology* , 48 (8):1225-1234.

Malpezzi, S., and S. M. Wachter. (2005). The role of speculation in real estate cycles. *Journal of Real Estate Literature*, 13 (2): 143-164.

Marchand, Joseph. (2012). Local Labor Market Impacts of Energy Boom-bust-boom in Western Canada. *Journal of Urban Economics*, 71(1) : 165-174.

Matlack, Janna L., and Jacob L. Vigdor. (2008). Do rising tides lift all prices? Income inequality and housing affordability. *Journal of Housing Economics*, 17 (3): 212-224.

Mattingly, K., and J. Morrissey. (2014). Housing and transport expenditure: Socio-spatial indicators of affordability in Auckland. *Cities*, 38: 69-83.

McLeod, Colleen, and Alice Hovorka. (2008). Women in a transitioning Canadian resource town. *Journal of Rural and Community Development,* 3(1): 78-92.

McMahon, Tamsin. (2015). "What's happening in real estate markets outside of Toronto and Vancouver? " *The Globe and Mail*, July 23. http://www.theglobeandmail.com/report-on-business/economy/housing/canadas-other-real-estate-markets/article25608236/.

McNicoll, L. H. (1980). The Impact of Oil on the Shetland Economy. *Managerial & Decision Economics*, 1(2):91-98.

Megbolugbe, Isaac F., and Peter D. Linneman.(1993). Home ownership. *Urban Studies* 30(4-5): 659-682.

Mental Health Policy Research Group. (1997). "Mental Illness and Pathways Into Homelessness: Findings and Implications." In *Mental Illness and Pathways Into Homelessness Conference*. Toronto. November, 1997.

Mercer, D., and P. Marden. (2006). Ecologically sustainable development in a 'quarry' economy: One step forward, two steps back. *Geographical Research*, 44(2): 183-203.

Metraux, S., L. X. Clegg, J. D. Daigh, D. P. Culhane, and V. Kane. (2013). Risk Factors for Becoming Homeless Among a Cohort of Veterans Who Served in the Era of the Iraq and Afghanistan Conflicts. *American Journal of Public Health*, 103:S255-S261.

Meyer, P. B., J. Yeager, and M. A. Burayidi.(1994). Institutional Myopia and Policy Distortions: The Promotion of Homeownership for the Poor. *Journal of Economic Issues*, 28(2): 567-576.

Michaels, G. (2011). The Long Term Consequences of Resource-Based Specialisation. *Economic Journal*, 121 (551):31-57.

Miller, Byron, and Allan Smith (2011). "'Heart of the New West'? Oil and Gas, Rapid Growth, and Consequences in Calgary. " In *Canadian Urban Regions, Trajectories of Growth and Change*, edited by Larry S. Bourne, Tom Hutton, Richard G. Sheamur, and Jim Simmons, 269-290. Toronto: Oxford University Press.

Moore, Eric, and Andrejs Skaburskis. (2004). Canada's increasing housing affordability burdens. *Housing Studies*, 19 (3): 395-413.

Moos, M., and A. Skaburskis. (2010). The globalization of urban housing markets: Immigration and changing housing demand in Vancouver. *Urban Geography*, 31(6): 724-749.

Morissette, R., X. Zhang, and M. Drolet. (2002). "*The Evolution of Wealth Inequality in Canada, 1984–1999*. " Statistics Canada Analytical Studies, working paper No. 187. Cat. no. 11F0019-187.Ottawa: Statistics Canada.

Mortensen, Jens Ladefoged, and Leonard Seabrooke. (2008). Housing as Social Right or Means to Wealth? The Politics of Property Booms in Australia and Denmark. *Comparative European Politics,* 6(3): 305-24.

Mouallem, Omar. (2015). "In Edmonton, once a condo, now a rental" *The Globe and Mail*, April 10. http://www.theglobeandmail.com/life/home-and-garden/real-estate/in-edmonton-once-a-condo-now-a-rental/article23885825/

Muellbauer, John.(2007). "*Housing and personal wealth in a global context*. " United Nations University, World Institute for Development Economics Research (UNU-WIDER), Research Paper No. 2007/27. Helsinki, Finland :United Nations University, Helsinki.

Murphy, E., and M. Scott. (2014). Household vulnerability in rural areas: Results of an index applied during a housing crash, economic crisis and under austerity conditions. *Geoforum*, 51:75-86.

National Alliance to End Homelessness. (2015). "The Fact Sheet Veteran Homelessness." Retrieved from http://www.endhomelessness.org/library/entry/fact-sheet-veteran-homelessness

Nepal, Binod, Robert Tanton, and Ann Harding. (2010). Measuring Housing Stress: How Much do Definitions Matter? *Urban Policy and Research*, 28(2): 211-224.

Neuteboom, Peter, and Dirk Brounen. (2011). Assessing the Accessibility of the Homeownership Market. *Urban Studies*, 48(11): 2231-2248.

Newfoundland and Labrador Government, Department of Finance. (2005).*The Economic Review 2005.* Retrieved from the Department of Finance website: http://www.economics.gov.nl.ca/review2005/review2005.pdf.

Newfoundland and Labrador Government, Department of Finance. (2007). Budget 2007 – Largest Tax Cut in the History of Newfoundland and Labrador. http://www.releases.gov.nl.ca/releases/2007/fin/0426n06.htm.

Newfoundland and Labrador Government, Department of Finance.(2008).*The Economy 2008.* Retrieved from the Department of Finance website: http://www.economics.gov.nl.ca/E2008/TheEconomy2008.pdf.

Newfoundland and Labrador Government, Department of Finance. (2013). The Economy 2013. http://www.economics.gov.nl.ca/E2013/TheEconomy2013.pdf.

Newfoundland and Labrador Government, Labor Relations Agency.(2015). ”Minimum Wage Rates for Employees Newfoundland and Labrador 1953 to 2015” retrieved from http://www.stats.gov.nl.ca/statistics/Labor/PDF/Minimum_Wage.pdf.

Newfoundland and Labrador Government, Department of Finance. (2016). ”The Economy – Oil and Gas ” retrieved from http://www.economics.gov.nl.ca/E2016/OilAndGas.pdf.

O'Dell, William, Marc T. Smith, and Douglas White. (2004). Weaknesses in current measures of housing needs. *Housing and Society*, 31(1): 29-40.

Organisation for Economic Co-operation and Development [OECD]. (2008) "*Growing Unequal? Income Distribution and Poverty in OECD Countries*." Report 8108051E. Zurich: OECD.

Ommer, Rosemary E. (2007). *Coasts under stress: Restructuring and social-ecological health*. Montreal: McGill-Queen's Press-MQUP.

O'Neill, Tracey, Clare Jinks, and Anne Squire. (2006). “Heating Is More Important Than Food”. *Journal of Housing For the Elderly,* 20(3): 95-108.

Orgcode.2014. "A Roadmap for ending homelessness in Newfoundland and Labrador." Retrieved from http://www.nlhc.nl.ca/documents/publications/OrgCode.pdf.

Ortalo-Magné, François, and Sven Rady. (2006). Housing Market Dynamics: On the Contribution of Income Shocks and Credit Constraints. *The Review of Economic Studies*, 73(2): 459-485.

Otters, Rosalie V., and James F. Hollander. (2015). Leaving home and boomerang decisions: A family simulation protocol. *Marriage & Family Review* 51(1): 39-58.

Papyrakis, Elissaios, and Ohad Raveh. (2014). An Empirical Analysis of a Regional Dutch Disease: The Case of Canada. *Environmental and Resource Economics* 58(2): 179-98.

Parker, Alan.(2011). "How Oil Makes Canada Four (or Five) Different Countries." Canoe (blog), March 10, 2011, http://blogs.canoe.com/parker/news/how-oil-makes-canada-four-or-five-different-countries/

Parsell, C., and R. Phillips. (2014). Indigenous Rough Sleeping in Darwin, Australia: 'Out of Place' in an Urban Setting. *Urban Studies* 51(1): 185-202.

Pattillo, Mary. (2013). Housing: Commodity versus Right. *Annual Review of Sociology*, 39(1):509-531.

Pearce, Bruce. (2010). "Policy Recommendation: A Housing & Homelessness Framework for Newfoundland & Labrador." Newfoundland & Labrador Housing & Homelessness Network, St. John's, NL. Retieved from http://www.nlhhn.org/PDF/NLHHN_Framework.pdf

Pearson, A. L., L. T. Barnard, J. Pearce, S. Kingham, and P. Howden-Chapman. (2014). Housing quality and resilience in New Zealand. *Building Research and Information*, 42(2):182-190.

Polèse, M., & R. Shearmur. (2005). Why some regions will decline: A Canadian case study with thoughts on local development strategies. *Papers in Regional Science*, *85*(1): 23–46.

Pollack, Craig Evan, Beth Ann Griffin, and Julia Lynch. (2010). Housing Affordability and Health Among Homeowners and Renters. *American Journal of Preventive Medicine*, 39(6): 515-521.

Pomeroy, Steve. (2012). "The housing market and the Canada's economic recovery." Ottawa: Federation of Canadian Municipalities. http://www.fcm.ca/Documents/reports/The_Housing_Market_and_Canadas_Economic_Recovery_EN.pdf

Pomeroy, Steve, Garry Charles, Allan Gaudreault, and Paul Connelly.(2006). "*Was Chicken Little Right?: Case Studies on the Impact of Expiring Social Housing Operating Agreements*." Canadian Housing and Renewal Association. Retrieved from http://chra.olasoft.com/document/593/Was-Chicken-Little-Right.pdf

Quastel, N. (2009). Political Ecologies of Gentrification. *Urban Geography*, 30(7): 694-725.

Quastel, N., M. Moos, and N. Lynch. (2012). Sustainability-As-Density and the Return of the Social: The Case of Vancouver, British Columbia. *Urban Geography*, 33(7): 1055-1084.

Quigley, J. M., & S. Raphael. (2004). Is Housing Unaffordable? Why Isn't It More Affordable? *The Journal of Economic Perspectives,* 18(1): 191-214.

Rahman, Mohammad Mafizur. (2010). The Australian housing market – understanding the causes and effects of rising prices. *Policy Studies*, 31(5): 577-590.

Randall, James E., and R. Geoff Ironside. (1996). Communities on the edge: An economic geography of resource-dependent communities in Canada. *Canadian Geographer*, 40(1): 17-35.

Rea, Willa, Jennifer Yuen, John Engeland, and Roberto Figueroa. (2008). The dynamics of housing affordability. *Perspectives on Labor and Income*, 20 (1):37-48,2.

Research Associates. (1992). "The role of subsidiary/accessory apartments in the St. John's CMA. " St. John's: Canada Mortgage and Housing Corporation, St. John's.

Rohe, William M.; Shannon Van Zandt, and George McCarthy. (2001).”The Social Benefits and Costs of Homeownership: A Critical Assessment of the Research.” Harvard: Joint Center of Housing Studies - Harvard University. Retrieved from http://www.jchs.harvard.edu/sites/jchs.harvard.edu/files/liho01-12.pdf.

Rowley, S. & F. Haslam McKenzie. (2010). "Housing markets in regional Western Australia: boom and bust? " A paper presented at the 4th *Australasian Housing Researchers' Conference, August 5, 2009*. Sydney, Australia: UNSW.

Rowley, S., R. Ong, & M. Haffner. (2015). Bridging the Gap between Housing Stress and Financial Stress: The Case of Australia. *Housing Studies,* 30(3): 473-490.

Ryser, L., and G. Halseth. (2011). Housing costs in an oil and gas boom town: Issues for low-income senior women living alone. *Journal of Housing for the Elderly, 25*(3), 306-325.

Sachs, J. D. and A. M. Warner. (2001). The curse of natural resources. *European Economic Review*, 45(4–6): 827-838.

Sassen, S. (1991). *The Global City*. Princeton, NJ:Princeton University Press.

Saugeres, Lise. (2011). (Un)accommodating Disabilities: Housing, Marginalization and Dependency in Australia. *Journal of Housing and the Built Environment,* 26(1): 1-15.

Scarlett, Maurice.(1977). *Consequences of Offshore Oil and Gas - Norway, Scotland, and Newfoundland.* St. John's : Institute of Social and Economic Research, Memorial University of Newfoundland.

Schrank, William E. (2005). The Newfoundland fishery: ten years after the moratorium. *Marine Policy* , 29(5): 407-420.

Schwartz, Herman, and Leonard Seabrooke.(2008). Varieties of Residential Capitalism in the International Political Economy: Old Welfare States and the New Politics of Housing. *Comparative European Politics* 6(3): 237-61.

Sharpe, C. (2005). Just Beyond the Fringe: Churchill Park Garden Suburb in St. John's, Newfoundland. *Canadian Geographer,* 49(4): 400-10.

Shields, Rob. (2012). Feral suburbs: Cultural topologies of social reproduction, Fort McMurray, Canada. *International Journal of Cultural Studies*, 15 (3): 205-215.

Shlay, Anne B. (2006). Low-income homeownership: American dream or delusion? *Urban Studies*, 43(3)**:** 511-531.

Silver, Jim. 2011. *Good Places to Live - Poverty and Public Housing in Canada*. Halifax: Fernwood Publishing.

Skaburskis, A. (1988). Speculation and housing prices: a study of Vancouver's boom-bust cycle. *Urban Affairs Quarterly*, 23 (4):556-580.

Skaburskis, Andrejs. (1997). Gender Differences in Housing Demand. *Urban Studies,* 34(2): 275-320.

Skaburskis, A.(2002). Generational Differences and Future Housing Markets. *The Canadian Journal of Regional Science* 25(3): 377-403.

Skaburskis, Andrejs. (2004). Decomposing Canada's Growing Housing Affordability Problem: Do City Differences Matter? *Urban Studies*, 41 (1):117-149.

Smith, Susan J. (2015). Owner occupation: at home in a spatial, financial paradox. *International journal of housing policy* 15(1): 61-83.

Smith, Susan J., Moira Munro, and Hazel Christie. (2006). Performing (Housing) Markets. *Urban Studies*, 43(1): 81-98.

Smith, Susan J., Beverley A. Searle, & Nicole Cook. (2009). Rethinking the Risks of Home Ownership. *Journal of Social Policy*, *38*(1): 83-102.

Smith, Stanleyk., Stefan Rayer, Eleanor Smith, Zhenglian Wang, and Yi Zeng. (2012). Population Aging, Disability and Housing Accessibility: Implications for Sub-national Areas in the United States. *Housing Studies,* 27(2): 252-66.

Stanford, Jim. (2008). Staples, deindustrialization, and foreign investment: Canada's economic journey back to the future. *Studies in Political Economy,* 82(1): 7-34.

Stangeland, Per. (1984). Getting Rich Slowly: The Social Impact of Oil Activities. *Acta Sociologica*, 27(3): 215–237.

Statistics Canada.(2010a) *Population and Dwelling Counts, for Census Agglomerations in Alphabetical Order, 1991 and 1996 Censuses, 100% Data(table)*. 1996 Population and dwelling counts, 1996 Census. Census. Statistics Canada Catalogue no 93-357-XPB. Ottawa, Ontario. January 15. https://www12.statcan.gc.ca/english/census96/data/popdwell/Table.cfm?T=206.

Statistics Canada. (2010b).*Population and Dwelling Counts, for Census Metropolitan Areas in Decreasing Order of 1996 Population, 1991 and 1996 Censuses - 100% Data (table)*. . 1996 Population and dwelling counts, 1996 Census. Statistics Canada Catalogue no 93-357-XPB. Ottawa, Ontario. January 14. https://www12.statcan.gc.ca/english/census96/data/popdwell/Table.cfm?T=205.

Statistics Canada.(2012a). - *Population and dwelling counts, for census metropolitan areas and census agglomerations, 2011 and 2006 censuses*. *Population and Dwelling count Highlight tables, 2011 Census.* Statistics Canada Catalogue no. 98-310-XWE2011002. Ottawa, Ontario. October 24. http://www12.statcan.gc.ca/census-recensement/2011/dp-pd/hlt-fst/pd-pl/Table-Tableau.cfm?T=201&S=3&O=D&RPP=150.

Statistics Canada. (2012b). *Focus on Geography Series, 2011 Census*. Statistics Canada Catalogue no. 98-310-XWE2011004. Analytical products, 2011 Census. Ottawa, Ontario. October 24. https://www12.statcan.gc.ca/census-recensement/2011/as-sa/fogs-spg/Facts-cma-eng.cfm?LANG=Eng&GK=CMA&GC=860.

Statistics Canada.(2013a). *Housing Reference Guide, National Household Survey 2011*. Statistics Canada Catalogue no. 99-014-XWE2011007. Ottawa, Ontario. 11 p. http://www12.statcan.gc.ca/nhs-enm/2011/ref/guides/99-014-x/99-014-x2011007-eng.cfm.

Statistics Canada.(2013b). *NHS User Guide, National Household Survey, 2011*. Statistics Canada Catalogue no. 99-001-X2011001. Ottawa, Ontario. 23 p. http://www12.statcan.ca/nhs-enm/2011/ref/nhs-enm_guide/index-eng.cfm.

Statistics Canada. (2016a). *Table 051-0056 Estimates of population by census metropolitan area, sex and age group for July 1, based on the Standard Geographical Classification (SGC) 2011, annual (persons),* CANSIM (database). Last updated February 10, 2016. http://www5.statcan.gc.ca/cansim/pick-choisir?lang=eng&p2=33&id=0510056.

Statistics Canada. (2016b). *Table 327-0046 - New housing price index, monthly (index, 2007=100),* CANSIM (database). Last updated June 9, 2016. http://www5.statcan.gc.ca/cansim/a26?lang=eng&retrLang=eng&id=3270046&&pattern=&stByVal=1&p1=1&p2=37&tabMode=dataTable&csid= .(accessed June 21, 2016)

Stigler, G.J. (1954). The early history of empirical studies of consumer behavior, *The Journal of Political Economy*, LXII(2): 95-113.

Stone, Michael E. (1990). One-third of a Nation: A New Look at Housing Affordability in America. Washington DC: Economic Policy Institute. Retrieved from http://www.epi.org/publication/epi_virlib_studies_1990_one-thirdo/

Stone, Michael E. (2006). What is housing affordability? The case for the residual income approach. *Housing Policy Debate*, 17(1): 151-184.

Storey, Keith. (2001). Fly-in/Fly-out and Fly-over: mining and regional development in Western Australia. *Australian Geographer*, 32 (2):133-148.

Storey, Keith. (2010). Fly-in/Fly-out: Implications for Community Sustainability. *Sustainability*, 2(5): 1161-1181.

Storey, Robert J. (1977). "Oil related developments in the Highlands and Islands of Scotland --Features of social impact and policy." In *Consequences of Offshore Oil and Gas - Norway, Scotland and Newfoundland*, edited by Maurice Scarlett, 144-180. St. John's: Institute of Social and Economic Research, Memorial University of Newfoundland.

Thalmann, Philippe. (1999). Identifying households which need housing assistance. *Urban Studies*, 36(11):1933-1947.

Thalmann, Philippe. (2003). 'House poor' or simply 'poor'? *Journal of Housing Economics*, 12(4): 291-317.

Thalmann, Philippe. (2012). Housing Market Equilibrium (almost) without Vacancies. *Urban Studies***,** 49(8): 1643-1658.

Tonts, Matthew, Kirsten Martinus, and Paul Plummer. (2013). Regional development, redistribution and the extraction of mineral resources: The Western Australian Goldfields as a resource bank. *Applied Geography* , 45: 365-374.

Toporowski, Jan. (2009). The Economics and Culture of Financial Inflation. *Competition & Change,* 13(2): 145-56.

Tutty, L. M., C. Ogden, B. Giurgiu, and G. Weaver-Dunlop. (2013). I Built My House of Hope: Abused Women and Pathways Into Homelessness. *Violence against Women*, 19 (12):1498-1517.

Veall, M. R. (2010). 2B or Not 2B? What Should Have Happened with the Canadian Long Form Census? What Should Happen Now? *Canadian Public Policy,* 36(3): 395-399.

Ville, S., and O. Wicken. (2013). The dynamics of resource-based economic development: Evidence from Australia and Norway. *Industrial and Corporate Change*, 22(5): 1341-1371.

Vinodrai, Tara. (2010). "The Dynamics of Economic Change in Canadian Cities: Innovation, Culture, and the Emergence of a Knowledge- Based Economy." In *Canadian Cities in Transition*, edited by Trudi Bunting, Pierre Filion and Ryan Walker, Fourth edition, 87-109. Toronto: Oxford University Press.

Waegemakers Schiff, Jeannette, and Rebecca A. L. Schiff. (2014). Housing First: Paradigm or Program? *Journal of Social Distress and the Homeless,* 23(2): 80-104.

Walker, Ryan and Tom Carter. (2010). "At Home in the City Housing and Neighbourhood Transformation." In *Canadian Cities in Transition*, edited by Trudi Bunting, Pierre Filion and Ryan Walker, Fourth Edition, 342-356. Toronto: Oxford University Press.

Walks, R. Alan. (2001).The Social Ecology of the Post-Fordist/Global City? Economic Restructuring and Socio-Spatial Polarisation in the Toronto Urban Region. *Urban Studies,* 38(3): 407-47.

Walks, R. Alan. (2010). "New divisions: Social polarization and neighbourhood inequality in the Canadian City". In *Canadian Cities in Transition*, edited byTrudy Bunting, Pierre Filion and Ryan Walker, Fourth Edition, 171-190. Toronto: Oxford University Press.

Walks, Alan.(2013). "Income inequality and polarization in Canada's Cities: an examination and new form of measurement." Cities Centre, University of Toronto *Research Paper* 227.Retrieved from http://neighbourhoodchange.ca/documents/2015/02/ income-inequality-and-polarization-in-canadas-cities-an-examination-and-new-form-of-measurement.pdf.

Walks, Alan. (2013a). Mapping the Urban Debtscape: The Geography of Household Debt in Canadian Cities. *Urban Geography*, 34(2): 153-187.

Walks, A. (2014). From Financialization to Sociospatial Polarization of the City? Evidence from Canada. *Economic Geography*, 90(1): 33-66.

Wang, Y., and K. Tsui. (2000). Polarization orderings and new classes of polarization indices. *Journal of Public Economic Theory*, 2(3): 349–363.

Watkins, M. (1963). A staple theory of economic growth. *Can. J. Eco. Political Sci.*, 29(2): 141-158.

Weeks, Lori E., and Kristal Leblanc. (2010). Housing Concerns of Vulnerable Older Canadians. *Canadian Journal on Aging,* 29(3): 333-47.

Weller, C., and K. Sabatini. (2008). From Boom to Bust: Did the Financial Fragility of Homeowners Increase in an Era of Greater Financial Deregulation? *Journal of Economic Issues,* 42(3): 607-632.

Wilkins, Roger, and Mark Wooden. (2009). Household Debt in Australia: The Looming Crisis that Isn't. *Australian Economic Review*, 42(3): 358-366.

Wolfe, J. M. (1998). Canadian housing policy in the nineties. *Housing Studies*, 13(1): 121-133.

Wood, Gavin, and Rachel Ong. (2011). Factors Shaping the Dynamics of Housing Affordability in Australia 2001–06. *Housing Studies,* 26(7-8): 1105-127.

Yalnizyan, A. (2010). "*The Rise of Canada's Richest 1%*." Ottawa: Canadian Centre for Policy Alternatives. Retrieved from https://www.policyalternatives.ca/sites/default/files/uploads/publications/National%20Office/2010/12/Richest%201%20Percent.pdf

Yates, Judith. (2002). Housing Implications of Social, Spatial and Structural Change. *Housing Studies*, 17(4): 581-618.

Yates, Judith. (2008). Australia's Housing Affordability Crisis. *Australian Economic Review*, 41(2): 200-214.

Yates, Judith, and Bruce Bradbury. (2010). Home ownership as a (crumbling) fourth pillar of social insurance in Australia. *Journal of Housing and the Built Environment*, 25(2): 193-211.

Yusof, Zainal Aznam. (2011). "The developmental state: Malaysia." In *Plundered Nations - Successes and Failures in Natural Resource Extraction*, edited by Paul Collier, and Anthony J. Venables, 188-230. New York: Palgrave Macmillian