The Effect of Immigration on Real Estate in Canada

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A Thesis in the Department of Economics

Presented in Partial Fulfillment of the Requirements
for the Degree of Master of Arts (Economics) at
Concordia University
Montréal, Québec, Canada

July 2024

CONCORDIA UNIVERSITY
School of Graduate Studies

This is to certify that the Thesis prepared

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Entitled: The Effect of Immigration on Real Estate in Canada

and submitted in partial fulfillment of the requirements for the degree of

Master of Arts (Economics)

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Abstract

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The number of immigrants in Canada has drastically increased in recent years due to permissive government immigration policies that attract people from around the world in search of a better life. This paper examines whether this surge in immigrants has affected real estate prices and the rental market in one of Canada's largest cities. The study finds that major impacts on real estate prices stem from supply factors, such as the number of houses built, and demand factors, such as changes in population and income per capita. While the overall immigrant population does not significantly affect house prices, the impact becomes evident when considering ethnic origin. This suggests that immigration tends to cluster by ethnicity, leading to a rise in house prices in certain areas, though this effect is not observed in rental markets.

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1 Introduction

The attraction of less competition and more job opportunities draws many people to various countries worldwide. This paper explores whether immigration has any effect on the real estate market in Canada, which has been deteriorating over the last decade. Recent reports indicate that in some areas, house prices have nearly doubled in just a few years, raising questions about the government's lenient immigration policies implemented in recent years. Over the past decade, Canada has experienced a significant rise in immigration, with the number of immigrants dramatically increasing from 2013 to 2023. In 2021 alone, Canada admitted a record high of 405,000 permanent residents, with targets set to reach 500,000 immigrants per year by 2025[1]. This influx coincides with substantial growth in the real estate market, where the national average home price has increased by over 80% during this period, particularly in cities like Toronto and Vancouver, where prices have nearly doubled[2]. Rental prices have also surged, driven by high demand and limited supply, with the average rent for a two-bedroom apartment in Toronto increasing by approximately 40% from 2013 to 2023[3]. This trend is evident in Figure 1 of the appendix, which shows the growth of the house price index in major cities like Toronto, Montreal, and Vancouver.

The combination of increased immigration and economic factors has significantly contributed to the rise in both housing prices and rental costs in Canada over the last ten years. This has led to widespread public concern, with many attributing the rising house prices and rents to the increase in immigration. In response, some believe the Canadian government's policy to decrease the number of study permits issued in 2024 aims to alleviate pressure on housing markets and manage the influx of new residents more effectively[4]

It seems that the Canadian government may have handled the immigration situation in a way that attracted immigrants to the big cities, without providing sufficient incentives for them to settle in less populated cities that could benefit from immigration. This paper will investigate whether the immigration actually effect the real estate market or not and, further, are there any city specific ethnic attraction in immigrating to Canada ?

The impact of immigration on the housing market presents mixed evidence. Some studies suggest that an increase in immigration leads to higher housing demand, driving up prices and rents, as seen in research from the U.S. like Glaeser and Gyourko (2018) and France d'Albis, Boubtane, and Coulibaly (2016). However, other studies like Reed (2016) find little to no effect, attributing variations to regional economic conditions and housing supply

1. The statistics are collected from the Canada.ca website
2. Canada.ca
3. Canada.ca
4. Canada.ca

elasticity. Despite general studies on the broader effects of immigration on Canadian housing, such as those by Akbari and Aydede (2012), there is a noticeable gap in research focusing on how different ethnic groups individually affect housing prices. This suggests a need for more detailed and region-specific studies to fully understand these dynamics and inform housing policy and urban planning effectively.

This paper evaluates the extent to which immigration affects the housing market using data from the ten largest Canadian cities from 1991 to 2021. A fixed-effects regression model is employed to account for both supply side factors like the number of houses completed, income and demand-side factors like the total population, which is decomposed into the non-immigrant and immigrant population influencing the real estate market. A similar study conducted by Saiz (2007) investigates the effects of the immigrant population on the US housing market, making this paper a further extension of that research within the Canadian context. Additionally, this study explores whether there is a city-specific ethnic attraction affecting the housing market.

The analysis of growth rates in the house price index across various Canadian cities from 1991 to 2021 shows notable differences in housing market performance. Major cities such as Vancouver, Victoria, and Hamilton experienced substantial growth, while Winnipeg had the lowest growth rate. Additionally, cities in Ontario, including Toronto and Ottawa, also demonstrated significant increases. Overall, there was a consistent trend of year-to-year growth across all cities, highlighting the dynamic nature of the Canadian housing market during this period. These differences can be attributed to the varying economic opportunities available in different provinces. Roback (1982) explains regional wage and housing cost differences by introducing the concept of "compensating differentials", where individuals trade off wages for quality of life, accepting lower pay in cities with better living conditions and lower rents. Climate also plays a significant role, as extreme weather conditions in some provinces may skew population preferences towards certain locations. The price increases in British Columbia's cities can be attributed to milder winter conditions, which attract both immigrant and non-immigrant populations.

The demand side, variables such as population growth, local population, immigrant population, and income per capita contribute to increased housing demand. These factors shift the demand curve to the right, potentially leading to higher housing prices. Specifically, a rising population and increased income enhance the demand for housing, with a notable impact in areas experiencing significant immigration. Contrasting findings emerge from a study conducted by Cvijanovic, Favilukis, and Polk (2010), which concludes that natural population growth does not impact house price growth, whereas the immigrant population does have an effect.

Conversely, on the supply side, the number of housing units built per capita directly affects housing availability. An increase in housing construction shifts the supply curve to the right, which may stabilize or reduce prices if demand remains unchanged. This finding contrasts with the results of the current research, which indicates that the population growth of the non-immigrant segment significantly influences increases in the house price index, while the immigrant population shows a positive but statistically insignificant effect. This disparity can be attributed to the results observed across different cities. The supply side variable of the housing units in the current research shows a positive effect with the house prices and rents.

Based on this analysis, the hypothesis is that an increase in the immigrant population is expected to raise housing demand and drive up housing prices. In contrast, an increase in the number of housing units built per capita is anticipated to boost housing supply, which may stabilize or lower prices.

The ethnic backgrounds of immigrants are crucial to understanding the diverse factors influencing housing markets and economic integration because different ethnic groups often bring varying cultural practices, economic behaviors, and settlement patterns, which can distinctly influence housing demand and prices. For instance, some immigrant groups may prefer to settle in specific neighborhoods, as found in a study by Massey and Denton (1993), driving up demand in those areas, while others may exhibit lower housing demands due to factors such as income levels or family structures. Understanding the relationship between ethnic backgrounds and housing prices can also provide insights into broader socio-economic dynamics, including integration patterns, community cohesion, and the potential for ethnic enclaves. This knowledge is essential for policymakers and urban planners aiming to address housing challenges and promote equitable development. To analyze these dynamics, the immigrant population is categorized based on their ethnic origins using Canadian census data.

The findings revealed that some ethnic origins of these immigrants positively impact house prices, while others have a negative effect, potentially attributed to interprovincial immigration among both non-immigrants and long-term immigrants residing in Canada. Additionally, the analysis highlighted that supply-side variables, such as income per capita and housing units built per capita, exhibit a positive relationship with house prices.

This paper is organized as follows: Section 2 reviews the relevant literature, providing context for the study. Section 3 presents an overview of the methodology employed in the analysis. Section 4 outlines the data sources and their significance. In Section 5, the results are discussed, highlighting city-specific growth rates and the impacts of both immigrant and non-immigrant populations on housing prices. Section 6 addresses the limitations of

the study and the research challenges encountered. Finally, Section 7 concludes with key findings and offers suggestions for future research, including a deeper exploration of the ethnic origins of immigrants and their effects on housing markets, as well as an analysis of the factors influencing population movements and housing demand in Canada.

2 Literature Review

The interplay between immigration and real estate prices has become a significant area of study in urban economics, particularly in the context of rapidly changing demographics in cities worldwide. As immigration patterns evolve, understanding their impact on housing markets is crucial for policymakers, urban planners, and economists. This literature review explores the existing research on how immigrant population, particularly their ethnicities and settlement patterns, influence real estate prices. By synthesizing findings from various studies, this review aims to highlight the complexities of this relationship, uncovering the mechanisms through which demographic shifts contribute to housing demand, supply dynamics, and ultimately, market prices. Understanding these factors is essential for addressing housing affordability and planning for sustainable urban growth in increasingly diverse communities.

The US and Canada are considered to be among the top locations for immigration for people around the world, given the high level of job opportunities and a better standard of living. Saiz (2007) is one of the pioneering researchers in the field of the relationship between immigration and real estate. He studies the US market and finds that an increase in immigration by 1% led to an increase in housing rents by 1%, primarily in urban areas. This effect is attributed to the fact that immigrants tend to settle in more urban areas where more opportunities are available to them. He also states that this phenomenon has a significant impact on cities where housing supply is limited due to governmental restrictions and the availability of land. In a similar study focused on investment immigrants, Pavlov and Somerville (2020) suggest that house prices increase by almost 9-10% due to the money these immigrants brought with them.

Fischer (2012) studies the effect of the immigrant population on house prices in Switzerland, focusing on the language of the immigrant population. He finds, if immigrants share a common language with the local population, a 1% increase in the immigrant population of the same language leads to an increase in house prices by 4.45%, conversely Tesfai (2016) shows that there is no relation in the level of English in the US market because they make connections within the community. Moallemi and Melser (2020) present a very interesting results in their study of the impact of immigration on house prices in the Australian market.

They concluded that, in a particular area, homeowners had to pay an additional amount in 2016 due to the presence of immigrants, and in the absence of immigrants, prices would have been 1.1% lower.

Chiquiar and Hanson (2005), in their study on the population of Mexicans who remain in their home country versus those who move to the US, indicate that there is self-selection among the migrant population. This means that more educated and skilled workers tend to migrate to the US, which can impact the economic factors of the host country. As a result, the increased demand for housing can drive up rents and prices. Conversely, Chiquiar and Hanson (2005) also study the impact of housing regulation in different metropolitan areas and states, areas with higher restrictions lead to a slower response to changing demographics and immigrant patterns in these cities.

The real estate markets are determined not only by population levels but also by other factors. As studied by Kerr and Kerr (2011), it is quite clear that the majority of the immigrant population is unable to reach the standards of the local population however, the second generation of immigrants often succeeds and converges to the national level. One of the main factor discussed in previous literature is income. The effect of income on real estate prices and rents has a significant impact, with Bischoff (2012) stating that income has a positive effect on house prices. This is also supported by McQuinn and O'Reilly (2008), who examine the impact of economic factors such as interest rates and income on house prices, demonstrating a positive effect on both variables.

The immigrant population impacts not only the real estate market but also other factors, such as wages and the economic well-being of the economy. A country largely invites the immigrant population for its betterment, as immigrants contribute to growth by paying taxes and bringing in capital. In a study conducted by Ottaviano and Peri (2012), from 1990 to 2006, immigration had a small effect on the wages of native workers without a high school degree (between 0.6% and positive 1.7%). It also had a small positive effect on average native wages (0.6%) and a substantial negative effect (6.7%) on the wages of previous immigrants in the long run. The study by Card (1990) investigates the impact of the 1980 Mariel Boatlift, which brought a large influx of Cuban immigrants to Miami, on the local labor market. The findings indicate that the sudden increase in the labor supply did not have a significant negative impact on the wages or employment levels of the native workers in Miami.

Akbari and Aydede (2012) conduct a study focused on the Canadian market, concluding that immigrants have an impact on real estate prices, although this effect is relatively small. This suggests that while there is some influence from immigrant populations, it does not create significant challenges for non-immigrant homebuyers, indicating a level of stability in the housing market. However, it is important to note that the study was limited to the years

1996 to 2006, which may affect its relevance to current market and population dynamics. Furthermore, Dustmann, Fabbri, and Preston (2005) explore the broader economic impacts of immigration and finds minimal effects on employment, wages, and unemployment rates from 1983 till 2000. Their analysis aligns with Akbari and Aydede (2012) findings, suggesting that the presence of immigrants may not significantly disrupt the economic fabric of the host country. Together, these studies provide insights into the complex relationship between immigration, real estate prices, and the wider economy.

Conversely, Stillman and Maré (2008) state that there is no strong relationship between house price appreciation and the inflow of immigrants in the New Zealand market; however, returning citizens had a positive impact on housing prices. In the context of the UK, Sá (2015) arrives at results that differed significantly from mainstream expectations regarding immigration's impact on housing prices. He discovered a negative effect of immigration on house prices, arguing that native populations in cities with high concentrations of immigrants tend to have lower incomes, which often forces them to relocate to other provinces. This migration helps to balance the effects of population growth and ultimately drives down the income-related pressures on housing prices.

Using similar reasoning, Saiz and Wachter (2011) demonstrate a negative relationship between immigrant density in specific metropolitan areas and the housing market. The study concludes that an increase in immigrant density correlates with a decline in housing prices and rents, primarily attributed to the displacement of the native population. This finding highlights the complexities of housing market dynamics in areas with significant immigrant populations, suggesting that the influx of newcomers can have adverse effects on housing affordability for long-term residents.

Coppel, Dumont, and Visco (2001) suggest that most host countries implement immigrant-friendly policies to counter the growing aging population. They conclude that, in the long run, these policies may not be helpful; however, immigrants do contribute to economic growth and can improve conditions in their source countries by investing or sending money back home.

The existing literature on the relationship between immigration and the real estate market suggests a generally positive correlation, with much of the analysis focused on the U.S. context whereas for the UK market Green (2018) states that there is a negative correlation between the two components supported by Graaff and Graaff (2021). However, there is a notable lack of contemporary studies addressing this issue within the Canadian market. Many of the existing studies on this topic in Canada are relatively outdated. To address this gap, this paper explores the impact of immigrants on the real estate market in Canada, specifically examining whether certain ethnic groups exhibit a preference for residing within

their own communities. Furthermore, the analysis aims to understand how these community preferences influence housing dynamics in Canada.

3 Methodology

This study draws upon the methodological framework established by Saiz (2007), who employed linear regression techniques to analyze the dependent variable, specifically the change in the logarithm of rent. Saiz's approach involved examining various independent variables, including the proportion of the immigrant population across different U.S. cities. This model provides a foundation for investigating how demographic factors, such as immigration rates, impact rental price dynamics. The section below will allow for a nuanced examination of how different population segments contribute to overall demographic shifts and economic outcomes in urban areas. This approach provides a robust framework for understanding the dynamics of population growth and its implications for housing demand.

The equation models the relationship between changes in a dependent variable, such as housing prices and rents, and key supply and demand factors, while incorporating a panel fixed effects model to control for city-specific and time-specific variations. On the demand side, changes in income are crucial because an increase typically leads to higher demand for housing, enabling individuals to afford more expensive homes. While rising prices may reflect a strong market, they can also reduce affordability and potentially lead to decreased demand. On the supply side, the availability of housing units is a significant factor, as an increase in supply can lower prices and improve accessibility, thereby positively impacting overall demand. By integrating these demand and supply factors along with fixed effects, the equation provides a nuanced understanding of housing market dynamics, illustrating how shifts in economic conditions interact to effect housing prices while accounting for unobserved heterogeneity across individuals and time.

$$\Delta \ln(X_{it}) = \beta_0 + \beta_1 \Delta \ln(Income_{it}) + \beta_2 \Delta \ln(Houses_{it}) + \beta_3 \Delta \ln(P_{it}) + \gamma_{it} + \mu_i + \epsilon_{it} \quad (1)$$

where: $\Delta \ln(z_{it}) = \ln(z_{it})$ - $\ln(z_{it-5})$

The change in the log of the variables is taken to make the data more normal and and it makes all the variables comparable in terms of percentage. $\Delta \ln(X_{it})$ is the dependant variable where X_{it} is equal to house price index or rents. This analysis examines the relationship between the dependent variable and the independent variables included in the equation. The

growth rate of income per capita is a crucial factor directly related to house prices. Most recent literature has identified a positive relationship between the two; however, a study conducted by Özmen, Kalafatcılar, and Yılmaz (2019) in the Turkish market stating different income percentiles have varying effects on house prices. To address this anomaly, this paper employs the change in the logarithm of income per capita as a variable, which helps normalize the data across different cities with varying average incomes and populations. Higher per capita income suggests greater affordability and demand for housing, making it a significant determinant of house prices and rents. Another demand side variable is the growth rate of the population this variable captures the growth rate of the population in a given area and is significant in understanding housing demand dynamics. An increase in population typically indicates a greater demand for housing, as more people require living spaces. Therefore, changes in population can directly influence housing prices and rental rates.

The growth rate of housing supply represents a critical variable on the supply side, serving as a key factor in the analysis presented in this paper. The data, sourced from Statistics Canada, reflects the number of houses built each Census year per capita. This approach allows for better comparability among cities, considering that different municipalities have varying restrictions on housing permits based on land availability and population. An increase in housing stock per capita indicates that more housing units are available per person, which can help moderate house prices and rents. Conversely, lower housing stock per capita signifies a tighter housing market, which can drive prices upward.

Unobserved factors may influence both the housing variable and the house price index. For instance, economic conditions, government policies, and shifts in housing demand could impact both the supply of houses and the house price index. If these omitted factors are correlated with the housing variable, it can lead to biased estimates. To control for common aggregate effects, years are included as time-specific factors. When employing a panel data analysis with a fixed effects model, the variable μ_i accounts for city-specific, time-invariant characteristics, such as climate and the predominant industries that provide employment in each city. As a result, the model reflects changes within cities rather than differences between them, and standard errors are clustered by city to account for potential correlations within these observations.

$$P_t = L_t + I_t \tag{2}$$

The total population of a city can be divided into two parts one being immigrant and the other being non-immigrant. Here the P_t is the total population at time t which can be decomposed into two components of L_t which is the local population of a city or the

non-immigrant population of a city and I_t denoting the total new immigrant population at time t.

Equation (2) allows for the derivation of the ratio $\frac{I_t}{P_t}$ as the share of new immigrant population denoted by α_t. Taking the ratio of the immigrants helps in the comparison and allowing for a meaningful comparison of the relative size of the immigrant population across different times or locations, irrespective of the overall population size.

Then dividing both sides of equation (2) by P_{t-5}, and subsequently multiplying and dividing each term by the lagged values of their respective components, the data collection every 5 years in the Census is accounted for. This results in the time variable being adjusted by 5 years. The fraction $\frac{I_{t-5}}{P_{t-5}}$ is denoted by the lagged share of immigrants in the total population, subtracting the ratio from one will give the lagged share of the local population. Taking the logarithm and using the approximation

$$\ln(x) \approx x - 1$$

the growth rate of the total population can be written as:

$$\Delta \ln(P_t) = \Delta \ln(L_t) + \alpha_{t-5} \left[\Delta \ln(I_t) - \Delta \ln(L_t)\right]. \tag{3}$$

Equation (3) expresses the relationship between the change in the natural logarithm of the total population at time t and two other population components: the local or non-immigrant population and the immigrant population. Specifically, the change in total population is comprised of the change in the local population and a term that captures the excess growth rate of the immigrant population relative to the local population. The coefficient α_{t-5} which represents the ratio of the total immigrant population to the overall population, indicates how past changes in the immigrant population impact current population dynamics. This lagged effect accounts for the time it takes for the influence of immigrant growth to materialize within the broader population context. This formulation highlights how the dynamics of the immigrant population can influence overall population growth, with the local population serving as a critical baseline factor. By analyzing these components, the equation provides insight into how shifts in both immigrant and local populations contribute to changes in total population levels over time.

Using equation (3), equation (1) can be further decomposed, breaking down the change in the logarithm of the total population into two derived components.

$$\Delta \ln(X_{it}) = \beta_0 + \beta_1 \Delta \ln(Income_{it}) + \beta_2 \Delta \ln(Houses_{it}) + \beta_3 \left[\Delta \ln(L_{it}) + \alpha_{it-5} \left[\Delta \ln(I_{it}) - \Delta \ln(L_{it})\right] + \gamma_{it} + \mu_{it} + \epsilon_{it}\right] \quad (4)$$

The main independent variable in the equation is the growth rate of the total population. Examining the percentage change in population allows for a more effective assessment of the elasticity of housing prices in relation to population growth. The main independent variable from the decomposed value on the total population is $\alpha_{it-5} \left[\Delta \ln(I_{it}) - \Delta \ln(L_{it})\right]$, where the term inside the brackets tell the difference between the growth rate of the immigrants and the local population or in simple terms stating whether the immigrant population is growing at a faster or a slower rate relative to the local population in different cities.

Using equation (3) the ratio of the immigrants population can be decomposed further into the ethnic origins of the immigrants. By incorporating ethnic diversity into the analysis, the equation allows for a more detailed exploration of how shifts in immigrant populations, categorized by ethnicity, interact with local populations and overall population changes.

The research question of the paper that is analyzing the ethnic attraction effect will also be done using decomposing the immigrant population into different ethnicities of the immigrants. The primary purpose of decomposing the immigrant variable by ethnic groups is to determine whether certain ethnic groups exhibit a preference for living within their own communities and how this preference influences real estate prices in the city. Specifically, it aimed to determine whether these ethnicities are willing to pay higher prices due to increased demand to live in the same area. Fong and Chan (2010) state a similar result where ethnic groups studied had family as one of the major reasons to immigrate to Canada, specifically Toronto. This refined approach can lead to more accurate estimates and better-informed strategies for managing the effects of immigration on housing markets and population dynamics. To get the α_{it-5} that can be decomposed into different ethnicities the equation (2) can be written in the following form.

$$P_t = L_t + \sum_{k=1}^{7} I_{kt} \quad (5)$$

where:

$$\frac{P_t}{P_{t-5}} = \frac{L_t}{L_{t-5}} \frac{L_{t-5}}{P_{t-5}} + \sum_{k=1}^{7} \frac{I_{kt}}{I_{kt-5}} \frac{I_{kt-5}}{P_{t-5}} \quad (6)$$

In equation (6) the ratio $\frac{L_{t-5}}{P_{t-5}}$ is the share of local population $(1 - \sum_{k=1}^{7} \alpha_{kt-5})$ and the ratio $(\frac{I_{kt-5}}{P_{t-5}})$ is the share of all the ehtnicities denoted by $(\alpha_{kt-5})$for an ethnicitiy k. Using similar transformation used to obtain equation (3), the change in the logarithm of population can be written as:

$$\Delta \ln(P_t) = \Delta \ln(L_t) + \sum_{k=1}^{7} \alpha_{kt-5} \left(\Delta \ln(I_{kt}) - \Delta \ln(L_t)\right) \tag{7}$$

The equation expresses the change in the natural logarithm of the total population as a function of the local population and the contributions of two immigrant ethnic groups. The first term, represents the change in the local population. The second term, captures the effect of the change in the immigrant population of ethnicity k , weighted by its share of the total immigrant population. In summary, the equation quantifies how changes in the local and immigrant populations affect the overall population dynamics, factoring in the shares of each ethnic group.

The equation (8) represents the share of total immigrant population in a city i that can be decomposed into different ethnicity denoted by k as shown in the above steps. The coefficient α_{kit-5} represents the share of a specific ethnic group in the previous period, $t-5$. By using the lagged value, the model accounts for the delayed impact of the ethnic composition on current housing market conditions. This variable facilitates the assessment of how differential growth rates between immigrant and local populations, weighted by the ethnic composition of the preceding period, impact housing prices and rents.

Substituting the ethnic shares derived from the above equations into equation (4) provides insights into the impact of each ethnic group on the growth of the house price index and rents. This integration allows for a more nuanced understanding of how different immigrant populations contribute to variations in housing prices and rents, facilitating a comprehensive analysis of the dynamics at play within the housing market.

$$\begin{aligned}\Delta \ln(X_{it}) = \beta_0 + \beta_1 \Delta \ln(Income_{it}) + \beta_2 \Delta \ln(Houses_{it}) + \beta_3 \left[\Delta \ln(L_{it})\right. \\ \left. + \sum_{k=1}^{7} \alpha_{kit-5} \left[\Delta \ln(I_{it}) - \Delta \ln(L_{it})\right] + \gamma_{it} + \mu_{it} + \epsilon_{it}\right.\end{aligned} \tag{8}$$

In summary, this model integrates the immigrant population's share into the analysis of population changes and their impacts on housing markets. By decomposing the total

population into immigrant and non-immigrant components, and utilizing the approximation techniques used to derive equation (3) and (7) this paper will be able to analyze whether the immigration and it's ethnic attraction has an effect on the real estate market or not.

Endogeneity is a problem that arises in statistical models, particularly in regression analysis, when an independent variable is correlated with the error term. This correlation can lead to biased and inconsistent estimates of the coefficients in the model. Hence, the housing variable is controlled using an instrumental variable, which is the lagged values of houses built per capita, to address the issue of endogeneity where the housing supply may be subject to the factors that when the housing units increase in the market it should lead to a decrease in the prices but the increase in prices observed gives the builders an incentive to build more units. Using lagged values as an instrument is beneficial because they are based on past data and, therefore, are not influenced by the current error term in the model. This temporal independence helps ensure that the lagged values are not correlated with unobserved factors affecting current house prices. Additionally, lagged housing data can serve as strong predictors of current housing supply, reflecting historical construction trends that impact availability. By controlling for these factors, the model can mitigate omitted variable bias, leading to more accurate estimates of the relationship between housing supply and the house price index. Overall, employing lagged values of houses built per capita enhances the robustness and reliability of the analysis. The paper alludes to heterogeneity among immigrants and non-immigrants which indicates that the paper recognizes significant differences within and between these groups. This heterogeneity may involve economic factors, such as varying income levels and employment sectors, as well as demographic aspects like country of origin and education levels. Additionally, immigrants may be concentrated in specific economic sectors, impacting housing demand and supply differently compared to non-immigrants. Understanding these variations is crucial for accurately interpreting how factors like income growth and housing supply relate to different groups.

Six regressions were conducted to analyze the relationship between house prices and rents with respect to population, income levels across different CMAs, and the number of houses built in each CMA. The regression for analyzing how the population growth rate affects the house price index is equation (1), (4) and (8). The independent variable representing population is decomposed into two components: the growth rate of the local population and the share of each ethnic group multiplied by the excess growth of the immigrant population compared to the local population. The coefficient of this variable will elucidate the relationship between the growth rate in the house price index and rent, as well as the extent to which the immigrant population's growth in a specific city i influences rent and house

price index. Furthermore, it will provide insights into how different ethnic groups k affect the house price index and rent in distinct ways.

4 Data

This study utilizes a comprehensive dataset to analyze the impact of immigration and immigrant ethnicities on the real estate market in Canada. The data spans from 1991 to 2021. Key variables include housing price indexes, rent levels, immigration rates, and demographic information segmented by ethnic groups. Additionally, economic indicators such as houses built, income, and population density are incorporated to control for other factors influencing the housing market. The primary data sources include Statistics Canada and Teranet. This dataset provides a solid foundation for examining the intricate relationships between immigration, ethnicity, and real estate market dynamics in Canada.

The main data for the gathering of population statistics is collected from the census data of Canada. The census data contains a wide range of information related to the population of Canada. For the research in this paper, the total population during the time period being studied was divided into immigrant and non-immigrant populations. The immigrant population data considered includes individuals above 18 years of age, as they can significantly impact the real estate market. In a recent study of Statistics Canada in the census data of 2021 almost 23% people in Canada are immigrants making it a major portion of the population growth in Canada. The share of recent immigrants settling in Atlantic Canada, which is considered usually to have extreme weather conditions almost tripled in 15 years, rising from 1.2% in 2006 to 3.5% in 2021.

The table 1 shows the summary statistics for various growth-related variables across different cities over the years, encompassing 60 observations for each variable. Population growth has a mean of 0.0636% with a standard deviation of 0.0351%, indicating a slight positive trend. Non-immigrant growth is lower, with a mean of 0.0502% and a standard deviation of 0.0296%, while immigrant growth shows a higher mean of 0.1311% and greater variability (std. dev. of 0.0887%). Rent growth has a mean of 0.0370%, though it exhibits significant variation with a standard deviation of 0.0958%, with the minimum rent growth reaching -0.1062%. The house price index growth rate has a mean of 0.1672%, reflecting a notable increase, while income growth shows a negative mean of -0.0177%, suggesting overall stagnation or decline. Finally, house completion growth has a mean of 0.0456% but a high standard deviation of 0.3867%, highlighting substantial variability in construction trends. Overall, these statistics illustrate differing trends and variability across the examined

growth metrics, with immigrant growth and housing price index growth rates showing the most significant positive means.

As seen in figure 1 and 2 the normal pattern observed in the growth rate of the prices are seen with an increase in the population as well as the immigrants only in some cities like Toronto, Vancouver and Montreal. The dip in 2010 can be seen due to the financial crisis of 2009 where the housing market was also effected. The sharp increases in real housing prices and rents observed in 2006 and 2021 can be attributed to various external factors. In 2006, a housing bubble fueled by easy credit, low interest rates, and strong economic growth drove prices up. In 2021, the COVID-19 pandemic led to increased demand for housing, as remote work prompted relocations and preferences for larger homes. Additionally, low interest rates, supply chain disruptions, and government stimulus measures contributed to heightened housing demand and rising prices during this period.

The data is collected for 10 cities in Canada, which included Halifax, Montreal, Ottawa, Hamilton, Toronto, Winnipeg, Calgary, Edmonton, Vancouver, and Victoria at the CMA (Census Metropolitan Area) level. To study the impacts of the immigrant population based on the ethnicities of the immigrants, data was also collected from the Census using the variable for ethnicities (ETHDER) and then grouped into various origins. The Census data contained information about the ethnic composition of different groups, which is categorized into seven categories, including immigrants from all of Europe, South Asia, South and Southeast Asia, Africa, Latin America, the Middle East, and all other immigrants coming from different parts of the world. The rent variable used in the study is also derived from the Census data, representing the shelter cost of the house or apartment in which individuals reside. The rent and the housiing price index variables were converted into real terms using the consumer price index (CPI) for each CMA for all goods and services. The consumer price index data for all the cities is also obtained from Statistics Canada's new price index table. The rent data is collected in a format where rent is divided by the total number of rooms in a house, which includes not only bedrooms but also bathrooms, kitchens, and storage areas.

The supply-side variables, including the average income of the population, were sourced from Statistics Canada and converted from nominal to real terms using the consumer price index. The primary variable of interest in this study is the house prices within these specific CMAs, obtained from the Teranet and National Bank of Canada website. This source provides house price indexes for 11 different cities, 10 of which are used in the analysis. The index reflects how house prices have evolved over time in these cities, calculated using historical house prices and construction costs.

The immigrant and non-immigrant populations are differentiated using the IMMSTAT variable, which indicates an individual's status in Canada. Immigrants included in the

study are those who have received Canadian permanent residency through naturalization or those living on temporary or refugee status. The non-immigrant population is derived by subtracting the total number of immigrants from the total population.

The data is collected for 10 cities, each assigned a unique CityId, with the time variable fixed as the years from 1991 to 2021. Equations (1), (4) and (8) are run twice, once with respect to the house price index and once with respect to rents. This study employs fixed effects instrumental variable regression (IV Regression with Fixed Effects) for panel data. This approach is especially useful for addressing endogeneity issues and controlling for unobserved heterogeneity across entities in a panel data setting.

5 Results

This section presents the findings from the instrumental variable regression analysis examining the impact of various factors on the change in the real house price index and real rent across Canadian cities. Utilizing a panel dataset with fixed effects to control for unobserved heterogeneity and clustered standard errors for robust inference, the analysis focuses on key independent variables such as the number of houses that got completed in an year per capita, per capita income, and changes in the local population. The results indicate significant relationships between these variables and the change in the real house price index, emphasizing the importance of economic and demographic factors in shaping housing markets. The following subsections discuss the estimated coefficients and their implications for understanding real estate dynamics in the context of immigration and local population changes.

The use of lagged houses as an instrument variable and its significance can be due to inherent characteristics of the housing market, where past construction activities influence the present supply conditions,making them a strong predictor and a relevant instrument for the analysis. The coefficient for houses is 0.1871 and statistically significant ($p = 0.000$). This indicates that a 1% increase in the number of houses is associated with a 0.1871% increase in the house price index , suggesting a positive relationship between housing supply and housing prices. The effect of the supply-side variable on housing prices contradicts the initial hypothesis. One would expect a negative coefficient for the number of houses since the increase in number of houses would increase the supply in the market and lead to lower prices. The contrary result observed here is the positive relationship between the housing supply and the prices, the above result can be due to the fact that the demand of houses is outweighing the supply side variables which leads to higher prices of the newer units coming into the market as well. The coefficient for Income is 1.1115 and significant. This implies

that a 1% increase in per capita income corresponds to a 1.1115% increase in the normalized house price index, highlighting the strong influence of income growth on housing prices. The coefficient for the growth rate of the population is 1.8958 and significant. This suggests that a 1% increase in the local population leads to a 1.8958% increase in the normalized house price index, indicating that demographic growth significantly impacts housing prices.

The next regression decomposes the population into two parts, with results presented in Table 3. The population variable is divided to separately analyze the impact of immigrants and the local population. The findings indicate that the change in the share of the immigrant population is not statistically significant. However, an increase in the immigrant population by 1% leads to a 6.2% rise in the house price index. This effect can be attributed to differing characteristics between the cities.

The same analysis is conducted with the dependent variable as the change or growth rate of rental prices per room. However, the results show insignificance for all variables. This lack of significance may stem from the complex dynamics of the housing market, where an increase in housing supply does not necessarily lead to lower rents if demand simultaneously rises due to population growth or economic factors. Additionally, potential lagged effects of housing supply on rents might mean that current changes do not immediately reflect in rental prices. The model could also be limited by omitted variables, such as local rental policies or broader economic conditions, which may influence rents but are not accounted for in the analysis.

The results for rents showing insignificance led to more focus on the effect on house prices which is further divided into the change in the share of different ethnicities as relative to the local population. The lagged values of the growth in housing units as shown in tables, is used as an instrumental variable is significant again. The equation used here is the equation 4 in the paper. The prices of the houses were significantly affected by the number of houses where a 1% increase leads to a 0.1903% increase in the house prices. The results are consistent with the income per capita as well where the house values increase by 1.27% with a 1% increase in the income per capita of a city's population. Which is consistent with the hypothesis.

The earlier results for the immigrant population as a whole do not show a significant correlation with house prices. However, when broken down by different ethnic groups, some demonstrate either a positive or negative relationship with house prices. The decomposed local population shows marginal significance at the 10% level, with prices changing by 1.74%. The ethnicities are divided into 7 categories, and in table 4, the variable representing the change in the share of the ethnicity k explains the correlation between the ethnic group k and house prices. Immigrants from the ethnic origin $k = 1$ do not have a significant impact on house prices in any city they reside in. The results are also not significant for the ethnic

origins of $k = 3, 6$.

Conversely, the immigrants coming from the ethnic origins of $k = 2$ referred to as change in share of a particular ethnic group, have a positive and significant impact on house prices. A 1% increase in the share of immigrants from this particular region tends to increase prices by 15.1035%. This can be attributed to the desirability of living in culturally diverse neighborhoods or the community's influence on the local economy. On the contrary, the ethnic group (4) has a negative impact on house prices, where an increase in this community by 1% leads to a price decrease of almost 21%. This could be explained by the fact that they may prefer not to invest in expensive houses at first. However, consistent with ethnic origin (1), the immigrants of origins (5) and (7) have a significant and positive relationship with the increase in house prices. Ethnic origin (5) shows a 6.92% increase in house prices with a 1% increase in their population, while ethnic origin (7) has an impact of a 4.3% increase in house prices.

The results indicate that changes in income and housing units are also not significant predictors of rent changes in this model, suggesting that other factors may be driving rent dynamics more than demographic shifts. The table 4 shows that along with most of the ethnic group also not affecting the rental prices of the house except ethnicity 3 having a significant impact at 10% level where the rents increase by 6.04%.

In summary, the significant coefficients for certain ethnic groups indicate that these groups have notable impacts on housing prices, either positively or negatively. This suggests that different demographic factors influence housing markets in complex ways, reflecting varied preferences, economic impacts, and community dynamics. Conversely, other ethnic groups show weaker or no significant effects on housing prices. Ethnic groups that significantly impact housing prices might have higher economic contributions to the local economy. For instance, if members of these groups have higher incomes or greater purchasing power, they may drive up demand for housing, leading to higher prices and they can also have a cultural bias or ethnic attraction which can increase the prices in some areas.

6 Discussion

The results of this study provide valuable insights into the impact of various factors on housing prices in relation to immigrant populations in the analyzed cities. The analysis reveals a nuanced relationship between the presence of different ethnic groups and housing prices, aligning with existing literature on the influence of demographic changes on real estate markets. However, no prior study has examined the ethnicity-specific impact on the real estate market in Canada. A related study by Saiz and Wachter (2011) found a negative

relationship between immigrants and housing prices, but it focused on just one specific CMA in the US. The non-significance of the immigrant variable in this paper, despite showing a positive relation with the dependent variable, can be attributed to potential multicollinearity with other variables or the absence of other relevant variables from the model.

The negative effect of certain ethnic groups on real estate prices can be understood through the study by Borjas (2006), which discusses the impact of native migration decisions. This effect may not be specific to a particular ethnic group but can also explain the non-significant impact of the overall immigrant population on real estate prices. Natives may move out of areas with a high immigrant population due to income inequality or personal preferences. The differential impact of ethnic groups on real estate prices can be attributed to various factors, including economic disparities, cultural and social dynamics, historical context, local community reactions, visibility and concentration, and media influence. Certain groups may face economic challenges or cultural differences that lead to the out-migration of existing residents, lowering demand and prices. Historical discrimination and negative media portrayals can also contribute to stigmatization, while other groups with more positive integration experiences and acceptance may not significantly impact prices.

The insignificance of the immigrant population variable can be attributed to the limited data sample. Data on immigrant ethnicities is only available through the census, conducted every five years. Additionally, the composition of these groups within the dataset changes over time, making it challenging to categorize them consistently. Another issue is that individuals with multiple origins may identify differently, complicating the assignment of weights in the data. These factors contribute to the difficulty in obtaining statistically significant results for the impact of the immigrant population on house prices.

The surprising result was the data being not significant for the rental prices, where for the US market Saiz (2007) states a positive correlation between rents and the immigrant population because most immigrants that arrive in Canada do not buy a house immediately. This pattern holds for most years, except for those who came under the Canada immigrant investor program (IIP), which was introduced in 1986. It aimed to attract wealthy immigrants by offering them permanent residency in exchange for a substantial investment in the Canadian economy. However, this program does not have a major impact on the market, as found by Pavlov and Somerville (2020).

The results can be explained much better with an increase in the number of cities and time periods analyzed to provide a more comprehensive understanding of the impact of immigrant ethnicities on housing prices. Including more recent data could also enhance the study's relevance. As available from the studies done by the Canadian Government, the total number of visas and electronic travel authorizations issued to visitors, international

students, and temporary workers has a target of 6.6 million in the year 2023-2024, from a mere 906,119 in the year 2020-2021. This growth can be captured and seen how it has impacted not just the real estate market but other economic factors in Canada.

7 Conclusion

In conclusion, this study has provided a comprehensive analysis of the impact of various immigrant ethnicities on housing prices across Canadian cities. By employing fixed effects regression models and considering multiple socioeconomic variables, which helped in gaining valuable insights into the intricate dynamics between immigration patterns and the real estate market. The findings underscore the significance of specific ethnic groups in influencing housing prices, highlighting both positive and negative effects. These results contribute to the growing body of literature on immigration and housing economics, offering important implications for policymakers, urban planners, and real estate investors. As a reflection on the outcomes of this research, it is essential to consider the broader context and potential avenues for future studies to further elucidate these complex relationships.

The paper has several limitations, the most significant being the restricted availability of data for the ethnic groups studied. Future research would benefit greatly from having annual data for these immigrant groups, as it would enhance our understanding of their impact on housing prices. This paper aligns with previous literature that explores similar topics. As expected, population growth rates are correlated with increased housing prices. Interestingly, the rise in the number of housing units also corresponds with an increase in prices. Finding's contrasts with intuitive expectations but can be explained by the internal migration of long-term residents or immigrants within Canada, coupled with higher demand than population growth. This situation may indicate complex permit approval processes for new housing construction.

The results for ethnic groups vary, with some showing a positive effect on house prices while others demonstrate a negative effect. However, most ethnic groups, regardless of the significance of their impact, exhibit an increase in house prices corresponding with the growth of their respective populations. In contrast, the analysis of rental prices did not yield significant results, indicating a need for more in-depth research in the future, potentially addressed by acquiring more comprehensive data. The specific ethnic groups influencing house prices suggest the possibility of ethnic attraction leading to immigration in Canada where the year aggregate effects seem to be an important factor for house prices. The identified groups arriving in large numbers likely face strict immigration regulations, as there may also be a considerable number of illegal immigrants entering the country. Though, the

impact of immigration on house prices is not fully justified. When considering the bigger picture, it becomes evident that factors such as housing supply should be increased, and policies to streamline permit approvals for housing construction should be implemented.

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Appendix

Methods used in deriving Equations

1. To reach till equation (3) the equation (2) is divided by P_{t-5}, and subsequently multiplying and dividing each term by the lagged values of their respective components. obtain:

$$\frac{P_t}{P_{t-5}} = \frac{L_t}{P_{t-5}}\frac{L_{t-5}}{L_{t-5}} + \frac{I_t}{P_{t-5}}\frac{I_{t-5}}{I_{t-5}} \tag{9}$$

The fraction $\frac{I_{t-5}}{P_{t-5}}$ The lagged share of immigrants in the total population can be subtracted from one to obtain the lagged share of the local population, from which equation (9) can be expressed as follows:

$$\frac{P_t}{P_{t-5}} = (1-\alpha_{t-5})\frac{L_t}{L_{t-5}} + (\alpha_{t-5})\frac{I_t}{I_{t-5}} \tag{10}$$

To finally get:

$$\Delta \ln(P_t) = \Delta \ln(L_t) + \alpha_{t-5}\left[\Delta \ln(I_t) - \Delta \ln(L_t)\right]. \tag{11}$$

2. To decompose the share of immigrant population α_{it-5} . Shown below using an example with two ethnicities:

$$P_t = L_t + I_{1t} + I_{2t} \tag{12}$$

By applying the manipulations demonstrated above, it obtains:

$$\frac{P_t}{P_{t-5}} = \frac{L_t}{P_{t-5}}\frac{L_{t-5}}{L_{t-5}} + \frac{I_{1t}}{P_{t-5}}\frac{I_{1t-5}}{I_{1t-5}} + \frac{I_{2t}}{P_{t-5}}\frac{I_{2t-5}}{I_{2t-5}} \tag{13}$$

In equation (14), the ratios $\frac{I_{1t-5}}{P_{t-5}}$ and $\frac{I_{2t-5}}{P_{t-5}}$ denote the share of immigrants of ethnicitiy (1) and (2) respectively. Using the transformation in the above equations, the change in the logarithm of population can be written as:

$$\Delta \ln(P_t) = \Delta \ln(L_t)(1-\alpha_{1t-5}-\alpha_{2t-5}) + \Delta \ln(I_{1t})\alpha_{1t-5} + \Delta \ln(I_{2t})\alpha_{2t-5} \tag{14}$$

which can be written as:

$$\begin{aligned}\Delta \ln(P_t) = \Delta \ln(L_t) + \alpha_{1t-5} \left(\Delta \ln(I_{1t}) - \Delta \ln(L_t)\right) \\ + \alpha_{2t-5} \left(\Delta \ln(I_{2t}) - \Delta \ln(L_t)\right)\end{aligned} \tag{15}$$

Table 1: Summary Statistics of Growth Rates

Variable	**Observations**	**Mean (%)**	**Std. Dev (%)**	**Min (%)**	**Max (%)**
Population Growth	60	6.36%	3.51%	0.25%	14.86%
Non-Immigrants Growth	60	5.02%	2.96%	-0.22%	14.15%
Immigrants Growth	60	13.11%	8.87%	-5.45%	52.65%
Real Rent Growth	60	3.70%	9.58%	-10.62%	53.04%
Real HPI Growth Rate	60	16.72%	19.49%	-17.30%	64.90%
Real Income Growth	60	-1.77%	7.25%	-23.28%	14.19%
House Completion Growth	60	4.56%	38.67%	-87.82%	81.92%

Figure 1: Change in Growth of Population, Immigrants, Rent, and HPI (Inflation adjusted)

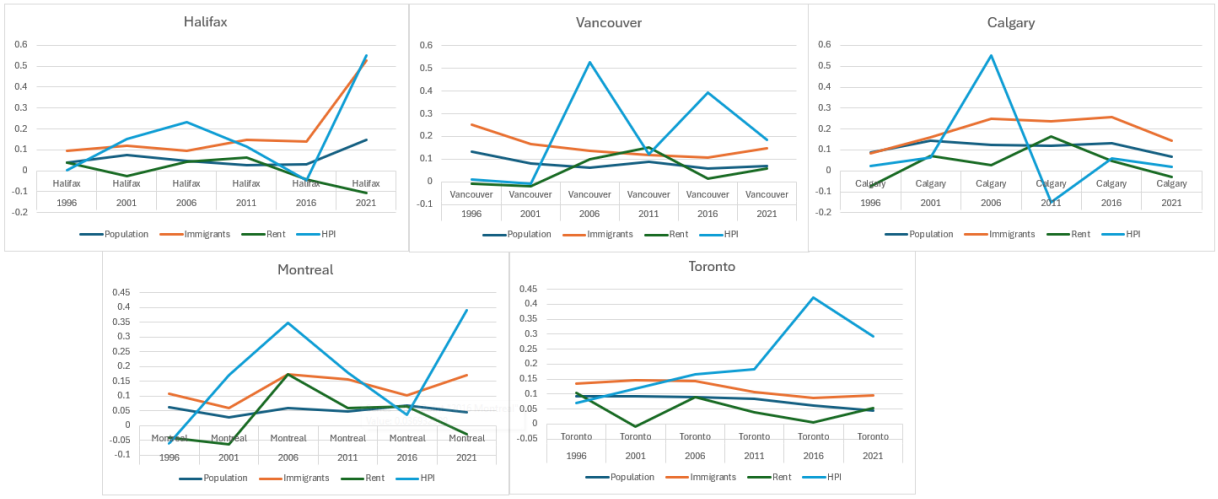

Figure 2: Change in Growth of Population, Immigrants, Rent, and HPI Inflation adjusted)

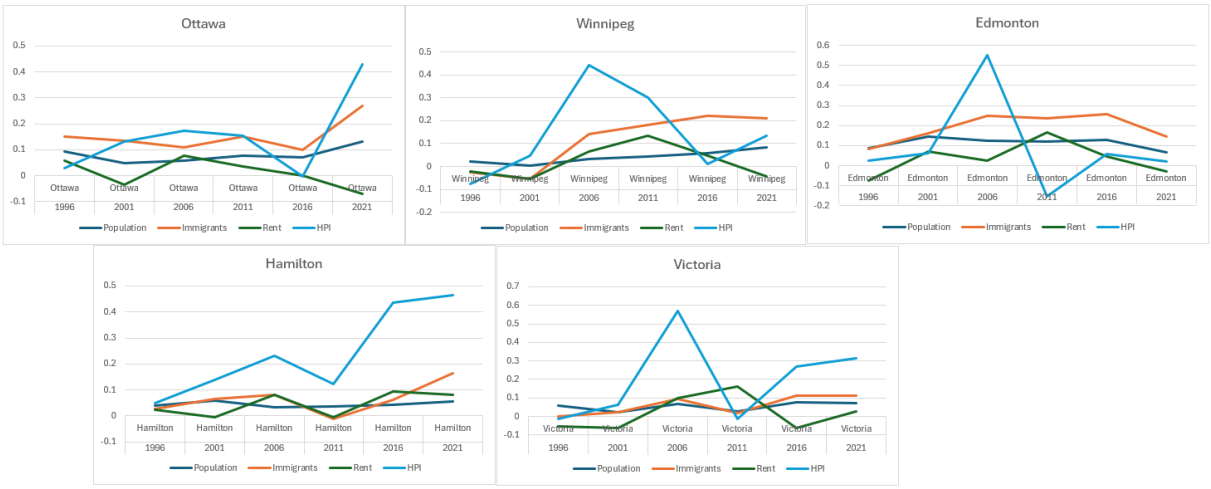

Table 2: Effects of Population, Housing Units and Income

Variables	**Change in Real Housing Price**	**Change in Real Rents**
% Change in new housing units	0.187***	-0.026
	(0.045)	(0.017)
% Change in real income	1.111***	0.066
	(0.411)	(0.147)
% Change in population	1.896**	0.317
	(0.915)	(0.284)
Census Year-2001	-0.0019	0.002
	(-0.065)	(0.026)
Census Year-2006	0.265***	0.095
	(0.081)	(0.025)
Census Year-2011	0.107	0.105
	(0.072)	(0.041)
Census Year-2016	0.089	0.025
	(0.066)	(0.024)
Census Year-2021	0.160**	-0.003
	(0.077)	(0.023)
Constant	-0.059	-0.028
	(0.076)	(0.035)
Observations	60	60

Standard Error in parentheses

$*$ p $<$0.05, $**$ p $<$0.01, $***$ p $<$0.001

Table 3: Population divided into immigrants and non-immigrants

Variables	**Change in Real Housing Price**	**Change in Real Rents**
% Change in new housing units	0.191***	-0.027
	(0.046)	(0.020)
% Change in real income	1.107***	0.065
	(0.419)	(0.146)
% Change in immigrants	2.182**	0.224
	(1.05)	(0.343)
% Change in non-immigrants	0.621	0.887
	(1.44)	(0.811)
Census Year-2001	-0.002	0.002
	(0.065)	(0.033)
Census Year-2006	0.282***	0.088***
	(0.080)	(0.046)
Census Year-2011	0.120	0.101
	(0.072)	(0.027)
Census Year-2016	0.107*	0.017
	(0.064)	(0.038)
Census Year-2021	0.199*	-0.017
	(0.071)	(-0.038)
Constant	-0.062	-0.02702
	(0.076)	(-0.25)
Observations	60	60

Standard Error in parentheses

*p <0.05, **p <0.01, ***p <0.001

Table 4: Population divided by ethnic origins

Variables	**Change in Real Housing Price**	**Change in Real Rents**
% Change in new housing units	0.190***	-0.034
	(0.066)	(0.026)
% Change in real income	1.270***	-0.001
	(0.354)	(0.157)
% Change in non-immigrants	1.740*	0.277
	(1.033)	(0.368)
% Change in Imm Ethn-1	-1.994	1.538
	(4.073)	(1.866)
% Change in Imm Ethn-2	15.103***	-0.881
	(5.789)	(5.797)
% Change in Imm Ethn-3	6.112	6.044**
	(7.137)	(3.388)
% Change in Imm Ethn-4	-21.709***	1.496
	(9.720)	(3.958)
% Change in Imm Ethn-5	6.922**	0.177
	(3.515)	(2.550)
% Change in Imm Ethn-6	8.465	7.443
	(25.567)	(6.055)
% Change in Imm Ethn-7	4.303**	-0.209
	(2.193)	(1.989)
Census Year-2001	0.090	-0.009
	(1.150)	(0.036)
Census Year-2006	0.385***	0.090**
	(0.078)	(0.044)
Census Year-2011	0.183**	0.076
	(0.065)	(0.057)
Census Year-2016	0.155**	0.020
	(0.082)	(0.035)
Census Year-2021	0.324***	-0.031
	(0.077)	(0.047)
Constant	-0.104	-0.024
	(0.107)	(0.051)
Observations	60	60

Standard Error in parentheses
*p <0.05, **p <0.01, ***p <0.001