Understanding Filtering:

A Long-Term Strategy to New Supply and Housing Affordability

Canada

CMHC SCHL

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Introduction

Canada's housing supply gap continues to be a significant obstacle in tackling the affordability crisis. In fact, CMHC (2023) research estimated that Canada needs an additional 3.5 million housing units (over and above what current projections suggest will be built) to restore affordability by the year 2030. But how would the development of new housing improve affordability for a broad cross-section of Canadians?

Addressing the supply gap can improve affordability for a broad cross-section of Canadians beyond just those who occupy the new units. When new homes are built, the stock of housing becomes more abundant and leads to a process called "filtering." Filtering is the gradual transition of housing units from higher-income households to lower-income households over time. This progression helps create a more complete housing market, offering a range of options to people across various income levels and contributing to overall affordability.

This research report highlights initial evidence of filtering in the Canadian rental market. We find that, in the first 2 decades following the construction of a new building, a noticeable trend in rent depreciation relative to a new structure is observed. This finding is also aligned with evidence found in the international literature.

Despite a growing body of literature in other countries, there's a strong need to better understand filtering in a Canadian context. CMHC research aims to help fill this knowledge gap by conducting further analysis to explore the various mechanisms of filtering as they relate to the Canadian housing landscape.

Project Overview

The research,[1] which is ongoing, intends to examine the main mechanisms of filtering.

This research report provides an overview of preliminary findings and is accompanied by a literature review on the fundamental mechanisms of filtering. An analysis of 1 of these mechanisms – depreciation (how rents change with a building's age) will be presented. Ultimately, this will help answer the question: How do newly constructed buildings eventually become more affordable housing?

The analysis is conducted using data from CMHC's Rental Market Survey (RMS). Building-level data from the RMS is used to estimate the effect that a building's age has on inflation-adjusted rents over time. The analysis also controls for other factors that would be expected to influence rents, including fixed characteristics of the building and neighbourhood-specific trends in rent.

In later phases, research will aim to answer the following questions:

- How long does it take for filtering to work?
- How much does filtering improve housing affordability?
- Does it work the same everywhere in Canada?

Are there cases where filtering does not seem to work or where it seems to work better than in other cases?

Key Findings

Rents depreciate rapidly in the first 20 years of a building relative to new structure

[1] Research for this project is conducted by Thomas Davidoff and Tsur Somerville, from the University of British Columbia's Sauder School of Business, on behalf of CMHC.

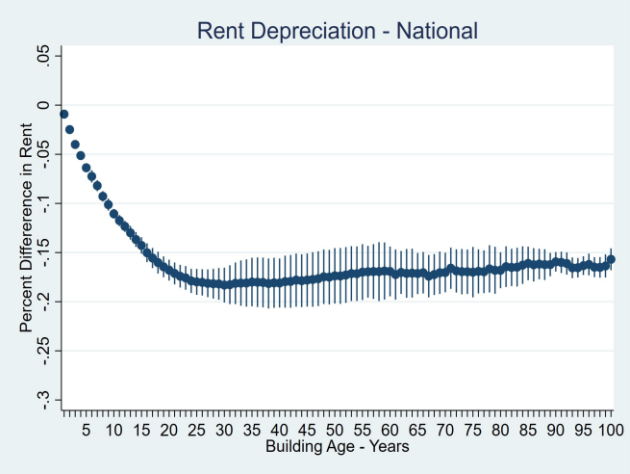
Building-level data contained in CMHC's RMS was used to model the impact of a building's age on rents in that building (adjusted for inflation). The model that we developed helps us understand how the average rent in a building is determined by its age, building fixed effects, and market trends specific to the neighbourhood.

Here, "building fixed effects" means anything expected to be constant over time about a building, such as location, the number of units, and the quality of materials used to construct the building. By controlling for these extra factors, we can more accurately pinpoint the actual influence of a building's age profile on its rent prices.

While it is true that rent levels have increased over time in Canada, this model accounts for both the overall inflation rate, and neighbourhood market trends. Therefore, these findings can be thought of as profiling rents of existing buildings *relative* to a new building, all while holding fixed the natural upward trend in rent across time.

Several different types of the model were produced, and all displayed a similar pattern of a rapid depreciation in rent initially, with the depreciation then slowing over time. Figure 1 shows the estimated percentage change in rent (blue dots), relative to a new building, by age, at the national level. Vertical lines indicate a 95 percent confidence interval.

Figure 1: National Estimates Show Strong Depreciating Relative Rents with a Building's Age



Notes: Calculations by the authors. Includes all centres with at least 10,000 inhabitants. Source: Canada Mortgage and Housing Corporation (CMHC) Rental Market Survey 1989-2021.

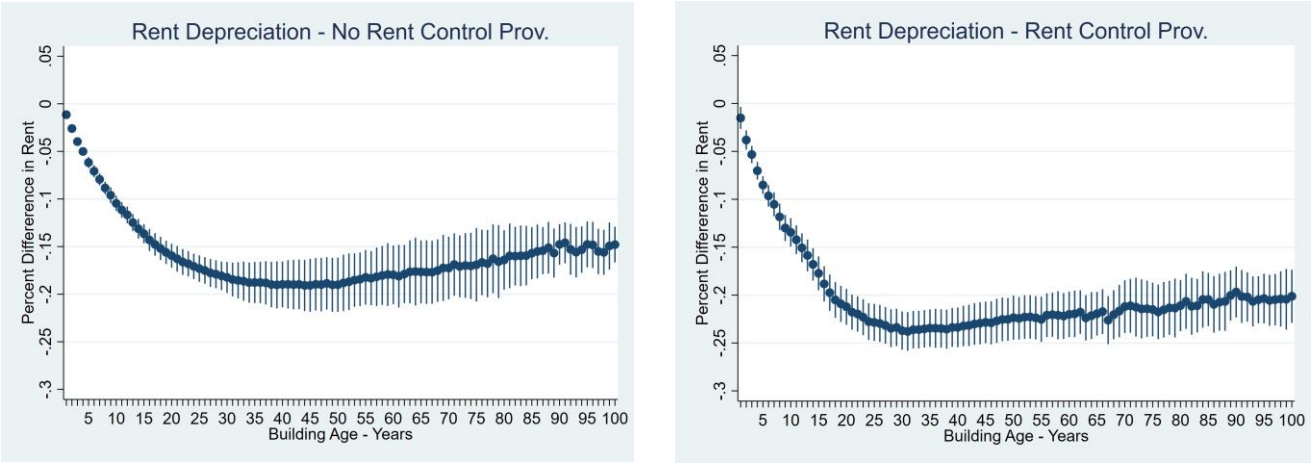
This figure shows a rapid depreciation in rent for the first 20 years of a building's life (relative to a new building), before settling in the long run. In fact, real relative rents tend to fall 5% in the first 4 years, before declining to just short of 20% near the 20-year horizon.

Among key Canadian regions, the Atlantic provinces had the slowest and shallowest relative rent depreciation over time. Ontario, meanwhile, saw the deepest declines with a building's age. Further, among metropolitan areas, Ottawa exhibited the steepest relative depreciation in real rent over time, while Vancouver exhibited the most modest effects.

The flattening of the curve in Figure 1 could be explained by renovations and demolitions that may happen over a building's lifecycle, in addition to the possible mechanisms discussed in the literature review in the next section. Finally, this analysis was also conducted within Canada's highest- and lowest-income neighbourhoods, with relative rent depreciation following a similar pattern for both groups.

Next, we show, in Figure 2, the difference in relative depreciation between buildings under rent control and those without rent controls, reflecting variation in the provincial regulation of rents.

Figure 2: We See Differences in Relative Rent Depreciation Between Regions With and Without Rent Control



Notes: Calculations by the authors. Includes all centres with at least 10,000 inhabitants. Source: Canada Mortgage and Housing Corporation (CMHC) Rental Market Survey 1989-2021.

Regions with rent control saw a faster and deeper decline in average real rents; rents fell to almost 25% below the rent level in a new building after 30 years. In comparison, regions without rent control tend to see their rents decline more slowly and bottom out at close to 20% below those of a new building after around 40 years. In provinces with rent control, the relative depreciation of real rents through the lifecycle of a building may be more pronounced because of limitations on a property owner's ability to increase rents on incumbent tenants, an effect that doesn't operate when a building is initially leased. This may reduce, for example, the property owner's incentive to invest in the property and therefore lead to lower rents.

While we focus here on renters, these findings are likely reflective of both tenure types, as the new housing of today is likely to become the relatively more affordable housing of tomorrow. For example, data from Canada's 2021 Census reveals that average household income was 30% higher in newly built homes relative to those built in the period from 1961 to 1970.

International literature supports the presence of filtering

The international literature provides some understanding of 3 key filtering mechanisms: vacancy chains, depreciation, and spillover effects.

Vacancy chains

Vacancy chains may be present in any segment of the housing market and are believed to unfold when households with relatively higher income move into newly constructed units. Their doing so releases their existing units for occupancy by households with relatively lower income. When these lower-income households move into the newly vacated units, they in turn create vacancies in their former residences – thus, a chain of vacancies takes place. Two noteworthy studies on vacancy chains, both relatively recent, examine this phenomenon in the U.S. and Finland.

Research conducted in the U.S. investigated migration patterns across census tracts, using data from 686 new buildings as the initial reference for vacancy chains (Mast, 2021). By mapping backward housing mobility of over 50,000 residents until household formation or immigration was identified, the research showed that considerable migration across census tracts occurs. The research also provided important insights on income and housing costs.

For every 100 new units in above-median-income census tracts, 70 vacancies would be generated in below-median-income census tracts. Estimates suggested that it would take 2-5 years for these filtering effects to fully manifest,

but that they begin to occur with the first 2 moves. Importantly, these results suggest that the downstream effects of new market-rate housing can benefit a wider spectrum of households, including those with lower income.

Similarly, evidence from Finnish data demonstrated results consistent with the findings in the U.S. (Bratu et al. 2021). This study found that 60% of vacancy chains from a newly constructed unit reached households in the bottom half of the income distribution.

Depreciation

Depreciation can be thought of as the gradual decline in economic value as buildings age and is believed to improve the relative affordability of these units for lower-income households over time. Several existing studies point to the presence of depreciation as leading to more cost-effective sources of housing.

Findings from a U.S.-based study found that building aging leads to new tenants having a 3%-lower income (in real terms) compared to previous tenants and a 0.5% reduction for owner-occupied incomes at turnover (Rosenthal, 2014). This suggests a trend where aging homes depreciate relative to new buildings and transition into the hands of lower-income households. This study also found that every year of aging of a building is associated with a 0.3% decrease in real prices and a 0.7% reduction in rent.

A similar study explored income profiles among owners of single-family homes within 180 U.S. metropolitan areas (Liu et al. 2022). They identified a 0.5% real decline in the average income of homeowners for every year that a building ages. However, estimates varied significantly between cities, with some exhibiting upward filtering – an increase in incomes with the age of the home.

One interpretation of the upward filtering suggests a U-shaped relationship with property age due to the challenging replication of character and location in newer builds, as is reflected in neighbourhoods experiencing gentrification. The study also concluded that filtering dynamics vary within cities. Even in those displaying upward filtering, certain areas contribute to affordable housing through downward filtering. While exploration of upward filtering in the rental market is limited, a 2022 study reported its presence among high-end rentals in Sydney, Australia (Nygaard et al. 2022).

Spillover effects

The construction of new housing units can also have important implications on the affordability of nearby housing, giving rise to possible spillover effects. The literature, however, remains inconclusive about whether these spillover effects lead to improved affordability. The net impact and its significance in improving affordability likely hinge on the specific dynamics of the local market.

For example, a U.S.-based study observed a 5%-7% decline in rents of existing buildings surrounding a newly completed development (Asquith et al. 2021). Conversely, Singh (2020) found an uptick in surrounding rents when the construction occurred in areas with abundant vacant land. Others, meanwhile, have revealed that spillover effects can vary between high- and low-rent areas. One such study discovered that rents decreased in high-rent buildings but increased in low-rent buildings, ultimately offsetting each other (Damiano and Frenier, 2020).

Because of these inconsistencies abroad, further research is needed to unravel the relationship between new construction and rents in existing buildings, particularly within a Canadian context, and among diverse communities. Subsequent stages of our research, which are already underway, aim to pinpoint instances where spillover and vacancy chain effects demonstrate greater improvements in affordability.

Implications

This analysis highlights that, as buildings age, average rents relative to a new structure experience a notable decline and eventually become relatively more affordable. Embracing this natural process is not only an economic consideration, but also a fundamental factor for cultivating a housing market that addresses the diverse needs of its inhabitants. Further to this point, the studies documented in the literature show that spillover effects and vacancy chains are 2 additional filtering mechanisms that can improve housing affordability when new supply is provided. Future research from this program will seek to better understand spillover and vacancy chain nuances from a Canadian perspective.

For Further Reading

Asquith, Brian J, Evan Mast, and Davin Reed (2021). "Local Effects of Large New Apartment Buildings in Low-Income Areas". In: The Review of Economics and Statistics, pp. 1–46. url: https://doi.org/10.1162/rest_a_01055.

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