Centre for the Study of Living Standards

Alisaleh Shariati
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EXPLAINING FALLING RESIDENTIAL CONSTRUCTION PRODUCTIVITY IN CANADA

IMPLICATIONS FOR HOUSING AFFORDABILITY

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170 Laurier Ave W Suite 604, Ottawa, ON K1P

Explaining Falling Residential Construction Productivity in Canada: Implications for Housing Affordability

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Explaining Falling Residential Construction Productivity in Canada: Implications for Housing Affordability

Abstract

The productivity performance of Canada's residential construction has been abysmal since the turn of the century. Output per hour in 2024 was 8 per cent *lower* than in 2000, reflecting an average annual decline of 0.4 per cent over the period. This report sheds light on this troubling development, with particular attention to the sharp 3.8 per cent average annual decline in labour productivity from 2019 to 2024, which has intensified cost pressure and further undermined housing price affordability in Canada.

This report identifies several factors contributing to the construction sector's poor productivity performance, including: technological stagnation marked by persistent reliance on manual building methods; an industry structure dominated by small firms that are slow to adopt innovations; and regulatory barriers, such as fragmented building codes, lengthy permitting processes, and restrictive zoning. Since 2019, "labour hoarding" (i.e., retaining workers despite reduced activity) was also a significant factor.

This collapse in labour productivity after 2019 raised unit labour costs by nearly 8 per cent annually in residential construction, well above economy-wide cost pressures. We estimate this added $6–$7.7 billion to new housing costs, accounting for 15-20 per cent of the increase in new homes from 2019 to 2024, raising average homebuyer costs by $24,000-$31,000 in 2024.

This report concludes that, without a dramatic improvement in residential construction productivity, Canada will not meet its ambitious housing supply targets. It recommends actionable strategies to boost residential construction productivity — including wider adoption of digital tools and off-site manufacturing, streamlined regulations, and stronger recruitment of skilled workers — which taken together, could lower home costs, boost supply, and ultimately restore housing affordability over the long run.

Explaining Falling Residential Construction Productivity in Canada: Implications for Housing Affordability

Executive Summary

Canada's housing affordability crisis stems from a residential construction sector that produces too few homes, too slowly, and at ever higher cost. This report, prepared by the Centre for the Study of Living Standards (CSLS) for the Canada Mortgage and Housing Corporation (CMHC), examines 25 years of data, supplemented by interviews with industry practitioners, to understand why labour productivity in home-building has stalled and how this feeds directly into higher prices for buyers and renters.

By tracing long-run trends, comparing provincial and international experience, and analyzing structural barriers that suppress productivity, the study provides an evidence base for a suite of policy and industry reforms aimed at lowering unit construction costs, accelerating housing supply and ultimately restoring affordability. Without a decisive rebound in productivity, Canada will fall decades short of CMHC's benchmark of roughly 400,000 housing starts a year — a level needed to ease price pressures in a reasonable time horizon.

Between 2000 and 2024, labour productivity in residential construction *fell* by 0.4 per cent per year on average. This period consisted of three distinct patterns of productivity growth in the residential construction sector:

1) 2000-2008 was marked by a decline of 0.7 per cent per year.
2) 2008-2019 witnessed robust growth of labour productivity of 1.5 per cent per year.
3) Unfortunately, this progress was wiped out in the post-2019 period as labour "hoarding," supply-chain disruptions and regulatory backlogs collided.

As a result, today a construction worker produces 67 per cent of the output per hour of the average Canadian worker, down from 88 per cent at the start of the century.

This weak post-2019 productivity growth pushed unit labour costs up 7.9 per cent annually. In just five years, these higher costs added an estimated $6–$7.7 billion to the

price of new homes—about 15–20 per cent of the overall rise in new-housing prices between 2019 and 2024— lifting average house prices by $24,000–$31,000 in 2024.

Provincial productivity varies widely. In 2000, Saskatchewan and Ontario were far above the national average (65 per cent and 22 per cent, respectively), while New Brunswick and Nova Scotia lagged behind. By 2024, Saskatchewan remained the leader, followed by Ontario and Alberta, with most other provinces clustered below the national level. After a strong 2008–2019 period, productivity plunged during 2019–2024 in the largest provinces (Alberta, British Columbia, Ontario, and Quebec, which together account for 90 per cent of total construction hours), driving the national decline, despite small gains in Prince Edward Island and Nova Scotia.

Several structural factors explain the sector's poor long-run productivity performance:

Technological Stagnation: Continued reliance on labour-intensive techniques with slow uptake of prefabrication, automation (such as on-site robotics or 3D printing), and advanced project management software. Even when new tools are piloted, small firms struggle to scale them up across their operations. Moreover, larger firms often stick to familiar methods rather than risk the disruption of adopting new processes. Construction firms have invested little in research and development (R&D) and often exhibit cultural resistance to change. As a result, the sector has been slow to adopt new technologies, meaning that the productivity gains achieved in other industries have largely bypassed construction. Additionally, management practices have not fully embraced "manufacturing-style" efficiency techniques.

Industry Fragmentation. Residential construction in Canada is dominated by very small firms, much more than in other sectors. Small contractors typically have lower productivity levels and slower technology adoption than larger firms. They also face disproportionately large regulatory compliance costs (permits, paperwork, etc.) relative to their size. This structural feature means the industry lacks economies of scale. Each small builder is essentially reinventing the wheel on every project (particularly across jurisdictions), and efficiency-enhancing investments (like expensive software or training programs) may not be affordable. The fragmentation is exacerbated by vast distances between cities and differing provincial trade licensing, which make it hard for firms to operate across provinces. The result is limited competition from out-of-region builders and less diffusion of innovations.

Regulatory Drag. While necessary for worker safety and quality of the product, many regulations are outdated or overly rigid, and processes like permitting and rezoning can significantly slow down projects. Stricter zoning (e.g. low-density requirements, lengthy approval timelines) tends to reduce the average size of development firms and the speed of construction. This matters from a productivity angle because when permits are delayed or rezoning drags on, crews cannot work continuously; projects stretch out, increasing labour hours per unit delivered. Lags in provinces adopting updated national building codes means builders often navigate inconsistent rules across regions. Lack of uniformity forces firms to tailor processes to each locale rather than replicating one efficient model.

Rising Complexity and Quality Expectations. The industry now delivers homes with higher average quality and features, from energy-efficient designs to custom finishes. These improvements, while beneficial to homeowners and society, often require more labour hours per unit. For example, a modern code-compliant home involves additional steps (thicker insulation, air-sealing, solar-ready wiring, etc.) that were not present decades ago. If these rising standards and design complexities are not captured in official output measures, they might act as a drag on measured productivity growth. The increasing share of renovations also plays a role, since they typically entail dealing with existing structures and more on-site problem-solving, which slows productivity.

Supply Chain Disruptions and Input Costs: The pandemic introduced supply-side shocks – shortages of key building materials, shipping delays, and price spikes – which disrupted construction schedules. If workers are idle waiting for materials, productivity falls. While this was a transitory issue, it was a major problem during 2020–2022. Supply chain frictions, along with labour market turbulence, contributed to the post-2019 productivity drop.

Cyclical Demand Swings and "Stop-and-Start" Dynamics: When the market rapidly expands, firms scramble to staff up and when it contracts, they either hold excess labour (reducing productivity) or lay off workers (losing experienced hands). Thus, unstable demand makes it hard to maintain a skilled, efficient workforce and keep productivity on track. This is especially challenging as aging trades cohorts near retirement and apprenticeship completion slows. The interest rate spike in 2022–2023 aggravated this by both discouraging buyers (weakening demand for new projects) and raising builders' financing costs (limiting funds for productivity-enhancing investments).

To address these challenges, the report recommends a comprehensive strategy to reignite productivity growth in residential construction, with the goal of producing more housing at lower cost. The following outlines these strategies and key policy recommendations:

1. Accelerate Technology Adoption and Innovation: The construction sector needs to catch up with best practices and modern technology to improve on-site efficiency and project management. This includes wider use of digital tools like 5D Building Information Modeling for detailed project planning, and analytics for performance tracking and advanced construction methods such as automation, robotics, and new materials.

2. Expand Prefabrication and Modular Construction: Off-site construction methods – from panelized components to full modular units – offer significant opportunities to raise labour productivity by shifting work from the field to controlled factory settings. Prefabrication can reduce on-site labour needs, cut construction time, and improve quality consistency.

3. Improve Financing and Reduce Construction Costs/Taxes: Reducing financial barriers and development costs can indirectly boost productivity and housing supply. Builders consistently need adequate, patient financing to undertake projects and invest in productivity improvements.

4. Support Stable Housing Demand (Demand-Side Subsidies): While the main thrust is on supply-side improvements, *extreme demand swings* can undermine productivity. Interventions on the demand side –to avoid deep lulls in construction activity – can maintain a steadier project pipeline and a stable workforce, which is ultimately more productive than a boom-bust pattern.

5. Regulatory and Process Reforms: The report suggests a suite of targets for regulatory processes to streamline approvals and encourage innovation.

6. Expand the Construction Workforce via Targeted Immigration and Training: To meet ambitious housing goals, Canada needs more skilled workers. Enhancing immigration policies to target construction labour shortages is a critical strategy.

If the construction sector were to achieve sustained productivity gains of 1.5 per cent per year — the 2008-2019 rate — Canada could hit the 400,000-start threshold within three decades while reducing 10 per cent from average construction costs, thereby improving affordability. Conversely, failing to modernize will lock in higher unit costs, prolong supply shortages and make affordability targets unattainable. Meeting Canada's housing affordability challenge requires placing construction productivity at the centre of national economic and housing policy.

Centre for the Study of Living Standards

170 Laurier Ave W Suite 604, Ottawa, ON K1P

Explaining Falling Residential Construction Productivity in Canada: Implications for Housing Affordability[1]

I: Introduction

The labour-productivity level and growth in Canada's residential construction sector are pivotal to housing supply and affordability. With prices surging because supply cannot keep pace with housing needs-and construction costs escalating-raising productivity has never been more urgent.

Between 2000 and 2019 the sector's labour productivity, measured as real output per hour worked, barely advanced, increasing by only 0.6 per cent per year. From a productivity growth analysis standpoint, real output expanded 3.9 per cent per year, but that gain was largely offset by a 3.3 per cent annual rise in hours worked. The picture worsened after 2019: from 2019 to 2024 labour productivity fell 3.8 per cent per year, as real output inched down 0.1 per cent annually while hours worked jumped 3.9 per cent per year. Understanding the forces behind these trends is essential for policymakers and industry leaders seeking solutions to Canada's housing affordability crisis.

The link between productivity and affordability shows up clearly in unit-labour costs (ULC). It is the average labour compensation required to produce one unit of output, so it rises when wage growth outstrips productivity gains and falls when productivity improves faster than wages. ULC rose 7.9 per cent per year in residential construction between 2019 and 2024, far above the 4.3 per cent pace in the broader economy. As will be shown in the paper, had residential construction ULC grown slower, new buyers would have saved anywhere between 6 to 7.7 billion dollars in new-housing costs. This surge in labour costs reflects the falling labour productivity due to factors such as slow technological progress in the industry, regulatory barriers, permitting delays, supply chain frictions, and structural inefficiencies within the industry. Absent a turnaround in productivity, housing costs will keep climbing, deepening Canada's affordability challenge.

[1] The report was written by CSLS Economist Alisaleh Shariati with the supervision of CSLS Executive Director Andrew Sharpe and assistance from CSLS Research Assistants Paul Pietraru, Aidan O'Brien and Riti Chittoor. We thank CMHC Staff Aled Ab Iorwerth and John Baker and CSLS Chief Economist and CEO Stephen Tapp for their constructive comments. This study also benefited greatly from the feedback received through our interviews with industry experts and practitioners at Canadian Home Builders Association (CHBA), Ottawa Home Builders Association (OHBA), EllisDon, Tamarack Homes and Next Generation Manufacturing Canada (NGEN). The CSLS thanks CMHC for financial support. Email: ali.shariati@csls.ca.

This report analyses labour productivity trends in residential construction over 2000-2024, distinguishing the longer period of 2000-2019 which witnessed an overall mediocre productivity growth in residential construction from the sharp post-pandemic decline 2019-2024. A key finding is that technological stagnation-a continued reliance on manual methods and traditional building techniques-has long suppressed productivity growth. The post-2019 slump was compounded by labour market and supply chain disruptions, relatively weak demand and heightened regulatory costs all of which were exacerbated by Covid-19.

This analysis presented in this report has many caveats including:

1-Statistics Canada does not provide a breakdown of the overall construction sector into its components including residential construction for many variables, including capital stock. multifactor productivity, R&D and patents.

2- Statistics Canada does not produce real output, employment and labour productivity estimates for residential construction before 1997.

3- The OECD and Eurostat only provide international productivity estimates for the overall construction sector, not for residential construction.

We also note that from 2000 to 2004 output per hour fell 0.4 per cent per year. This long-term stagnation, or more accurately slight decline in labour productivity in principle reflects the trend labour productivity in the sector. It is more than consistent with the view expressed by many practitioners that the way homes are built now has not changed in the last 20, 30, or even 50 years. However, we are unclear how to reconcile this long-term view of minimal technical change in the sector with developments in one of the cyclically neutral peak-to peak periods. From 2008 to 2019, output per hour in residential construction advanced at an average annual rate of 1.5 per cent well above that of the business sector (0.9 per cent). Large falls in labour productivity in 2000-2008 (07 per cent per year and in 2019-2024 (3.8 per cent per year) produced the negative productivity growth in 2000-2024.

Finally, it is possible that the fall in productivity in both 2000-2008 and 2019-2024 was due to special factors (e.g. interest rates, expectations, labour hoarding, skill shortages, pandemic) that affected the evolution of hours worked and the real output and that the 11 year 2008-2019 period is more representative of trend labour productivity growth in residential construction, suggesting that there is technological advance in the sector.

Residential building construction (NAICS code 2361)[2] is an industry group comprised of establishments primarily engaged in the construction or remodelling and renovation of single-family and multi-family residential buildings.[3] Included in this industry group are residential housing general contractors, operative builders and re-modellers of residential structures, residential project construction management firms, and residential design-build firms.[4]

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[2] Source: https://www23.statcan.gc.ca/imdb/p3VD.pl?Function=getVD&TVD=1369825&CVD=1370970&CPV=236110&CST=27012022&CLV=5&MLV=5

[3] "Renovations" (capital work) improve the property beyond its original state or extend its useful life; for GST/HST purposes a *substantial renovation* is met when 90 per cent or more of the interior is removed or replaced. Federal contract rules echo this distinction, defining *repair* as remedying defects and *renovation* as altering or upgrading an existing structure, including the supply and erection of prefabricated components (See https://laws-lois.justice.gc.ca/eng/regulations/SOR-87-402/FullText.html). By contrast, "Repairs" are current-expense work that simply restores an existing element of the dwelling to its original operating condition and therefore may be deducted in the year incurred (See https://www.canada.ca/en/revenue-agency/services/tax/businesses/topics/rental-income/current-expenses-capital-expenses.html)

[4] Examples include:

- additions, alterations and renovations, residential buildings
- apartment building, construction
- construction management, new residential operative builders
- cottages construction
- fire and flood restoration of residential homes, by general contractors
- handyman construction services, residential buildings
- home builders, operative
- house construction by custom home builders
- log home, construction
- modular housing assembly and installation on site, construction

Exclusion(s):

- constructing and leasing residential buildings on their own account (See 53111 Lessors of residential buildings and dwellings)
- performing manufactured (mobile) home set-up and tie-down work (See 238990 All other specialty trade contractors)
- performing specialized construction work on houses and other residential buildings, generally on a subcontract basis (See 238 Specialty trade contractors)

The report is organized as follows. Section II reviews trends in residential-construction output. Section III examines labour inputs. Section IV analyses labour-productivity performance from 2000-2024 and its key sub-periods. Section V explores provincial patterns over the same horizon, while Section VI compares Canada's productivity landscape with that of the United States, the European Union and the wider OECD. Section VII investigates the underlying causes of weak productivity growth, and Section VIII outlines strategies to raise productivity and moderate housing costs. Section IX concludes.

II: Output of Residential Construction

Measuring output in the construction sector is critical for assessing productivity, yet it poses significant challenges due to the industry's inherent complexity and variability. Broadly speaking, there are two measures of output in this sector, physical measures and monetary (price-based) metrics, each with distinct advantages and limitations. Physical measures, such as square footage built, cubic, or number of units completed, provide tangible, volume-based insights into productivity. However, these metrics struggle to account for variations in project complexity—for example, a 2,000 sq ft custom home with intricate finishes represents vastly different labour and material inputs compared to a similarly sized basic structure, undermining straightforward comparisons.

Price-based metrics, such as price per square foot or total contract value, address this by normalizing output through price, but they introduce challenges tied to inflation, regional cost disparities, and fluctuating material prices. A project's monetary value may rise due to external factors like supply chain-driven cost spikes rather than actual productivity gains, while physical output metrics may ignore quality or design upgrades that justify higher costs.

Additionally, price-based measures can obscure inefficiencies; for instance, a lower cost per square foot might reflect cheaper materials or shoddy labour rather than improved productivity. For comparison across time, the effect of inflation must be taken out of the nominal dollar measurement, using a price index (or 'deflator'). Deflated values are referred to as 'real values' and can be in 'constant dollars' or 'chained dollar'. A 'chained dollar' index takes account of substitutions that occur when the prices of input change at different rates. If the quality of the output changes over time, an allowance must be made for the improvement or reduction in quality by Statistics Canada.

Another way to understand output measures is that if output is homogenous (e.g., units built), it can be measured in physical units. If output is heterogeneous, it must be measured in dollar terms.

One of the complexities of defining residential construction output is the distinction between new construction and renovations. Unfortunately, the output measure reported by Statistics Canada, real value added, does not provide a breakdown of the residential construction in terms of new construction and renovations.[5]

A. Physical Measures

Housing Starts[6]

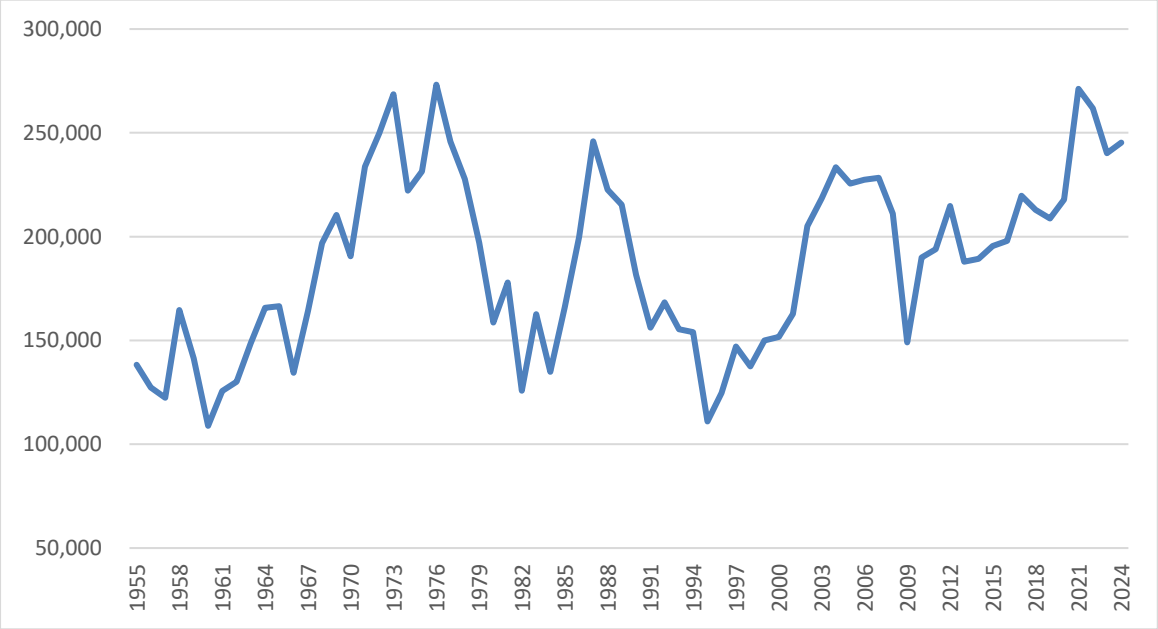
The first physical output measure discussed in this article is housing starts. Chart 1, Panel A presents the number of housings starts in Canada between 1955 and 2024. Housing starts increased steadily from 138,276 in 1955 to 268,529 in 1973, followed by a steep decline between 1976 and 1982, dropping from 273,203 to 125,860.

[5] Renovations and new construction each account for roughly half of residential construction investment, but they do so in different ways and their relative weights have shifted over time. Because investment spending becomes capital services that are recorded as real value added, a surge in renovation investment tends to raise measured output even when the housing stock is not expanding, while a rise in new construction boosts output by adding both capital services and new dwellings. In practice, nominal investment data—used here as a proxy for the unseen breakdown of real value added—show that renovations absorbed about 48–50 per cent of total residential construction spending, labour income, and jobs through most of 2010-19, slipped to 46 per cent on the eve of the pandemic, and then rebounded so that by 2024 renovations were again close to one-half of all spending, with single-family projects dominating multiple-unit work. New construction displayed the mirror image: its share of investment and value added rose steadily in the late-2010s, peaked near 54 per cent of sectoral output and employment in 2021, but fell back to about 47 per cent of spending by 2024 as higher interest rates curtailed starts—yet within that total, multiple-unit building almost doubled relative to single-family since 2010, underscoring the sector's growing orientation toward densification.

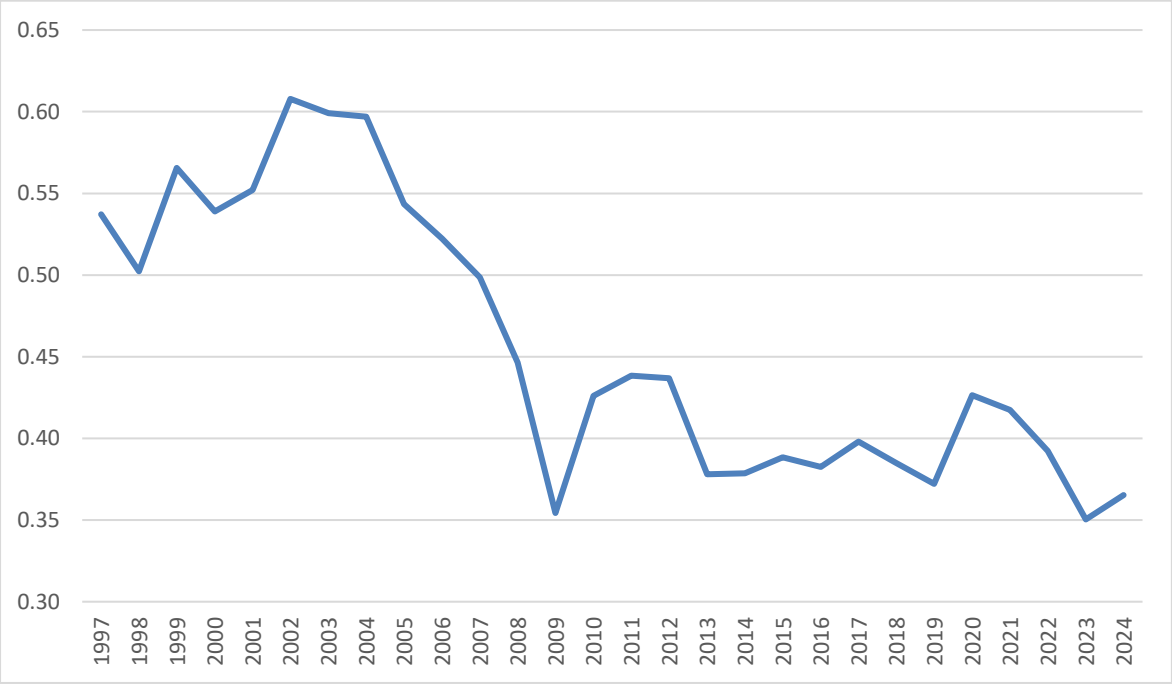
[6] Housing completions offer a contemporaneous gauge of additions to the dwelling stock, complementing the forward-looking information contained in housing starts. Annual completions rose in step with post-war urbanisation—expanding 330 per cent between 1948 and the 1978 peak—before collapsing in the 1982 recession. A second upswing peaked in 1987, but completions then slid for nearly a decade, bottoming out in 1996. Since that trough the series has more than doubled (up 105 per cent to 2022), albeit with a brief interruption during the 2008-09 financial crisis. The composition of completions has also shifted: single-detached units dominated until the mid-2000s, yet from 2007 onward multiples (especially apartments) have increasingly led growth, mirroring—but lagging by roughly three years—the earlier divergence observed in housing starts. Notably, apartment completions proved far more resilient than apartment starts during the 2008-09 downturn, indicating that projects already under construction continued to deliver new supply even as developers postponed fresh groundbreakings. Because completions translate directly into effective housing stock, their long-run climb—and the recent tilt toward higher-density forms—has tangible implications for Canada's capacity to accommodate population growth.

Chart 1: Housing Starts

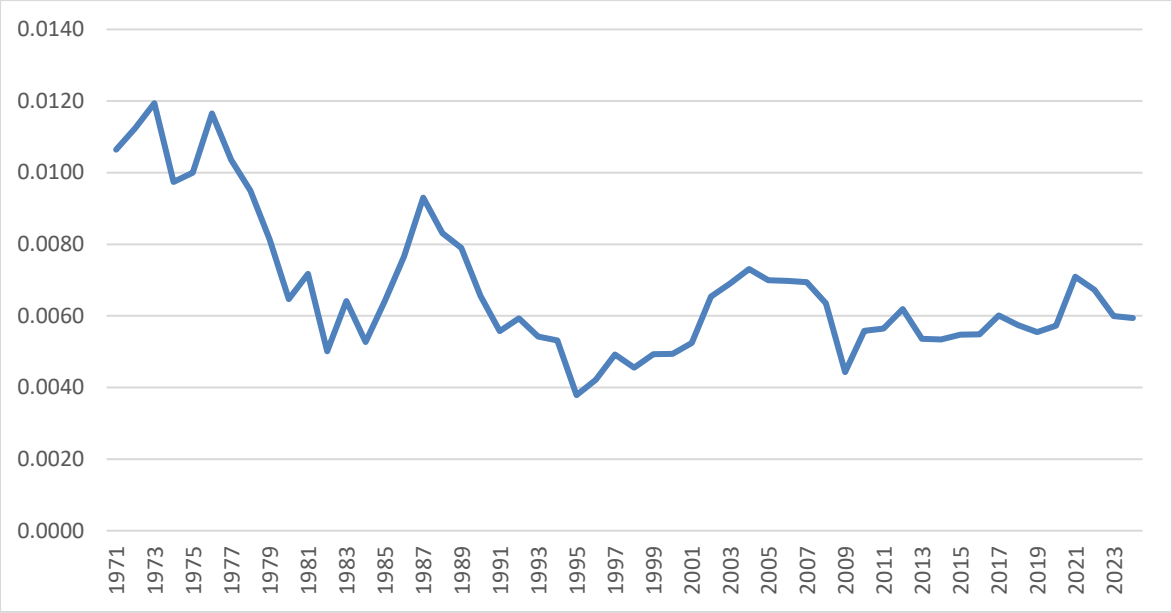
Panel A: Total Housing Starts, Canada, 1955-2024



Panel B: Housing Starts per Worker in Residential Construction, Canada, 1997-2024



Panel C: Housing Starts per Capita, 1971-2024



Source: Statistics Canada Tables for Housing Starts: 34-10-0126-01, Employment: 36-10-0480-01 and Population: 17-10-0005-01

A sharp increase occurred between 1984 and 1987, but this was followed by a precipitous decline until 110,933 in 1995. With few exceptions, housing starts have been on the rise since then.[7]

Chart 1, Panel B shifts the focus from sheer number of starts to start per residential construction workers, giving a rough sense of labour-productivity in putting new units in the ground. The ratio was strongest in the early 1970s, peaking at just under 0.012 starts per worker in 1973, before sliding to barely 0.005 by the 1982 trough. A brief recovery carried it back above 0.009 in 1987, but the deep 1990–95 housing downturn pushed the measure to its series low of 0.0038 in 1995, meaning the industry was producing barely one start for every 260 workers. Efficiency improved steadily through the 2000s, oscillating between 0.006 and 0.007 starts per worker, dipped during the 2009 recession, then climbed again, reaching 0.0071 in 2021. Although the ratio eased to roughly 0.006 starts per worker by 2024, it remains well above the mid-1990s low point, yet still far short of the early-1970s highs.

[7] Housing starts fell significantly in 2008-2009, and dropped slightly in 2013, 2019 and 2023.

Chart 1, Panel C tracks housing starts per capita, a proxy for how quickly supply is keeping pace with population growth. The ratio climbed in the late-1990s—rising from 0.54 starts per hundred residents in 1997 to a peak of 0.61 in 2002, an average gain of roughly 2.5 per cent a year. A prolonged slide followed: the measure fell at 4.0 per cent a year through the 2008 slowdown and plunged a further 22 per cent in 2009 to 0.35, its post-1995 low. Recovery was uneven. Quick gains in 2010-2012 (6 per cent a year) gave way to a gentle erosion of just over 1 per cent a year through 2019. The pandemic year of 2020 saw a one-year jump to 0.43, but the ratio eased again, settling at 0.37 in 2024—roughly 30 per cent below the early-2000s high yet 10 per cent above the late-1990s trough.

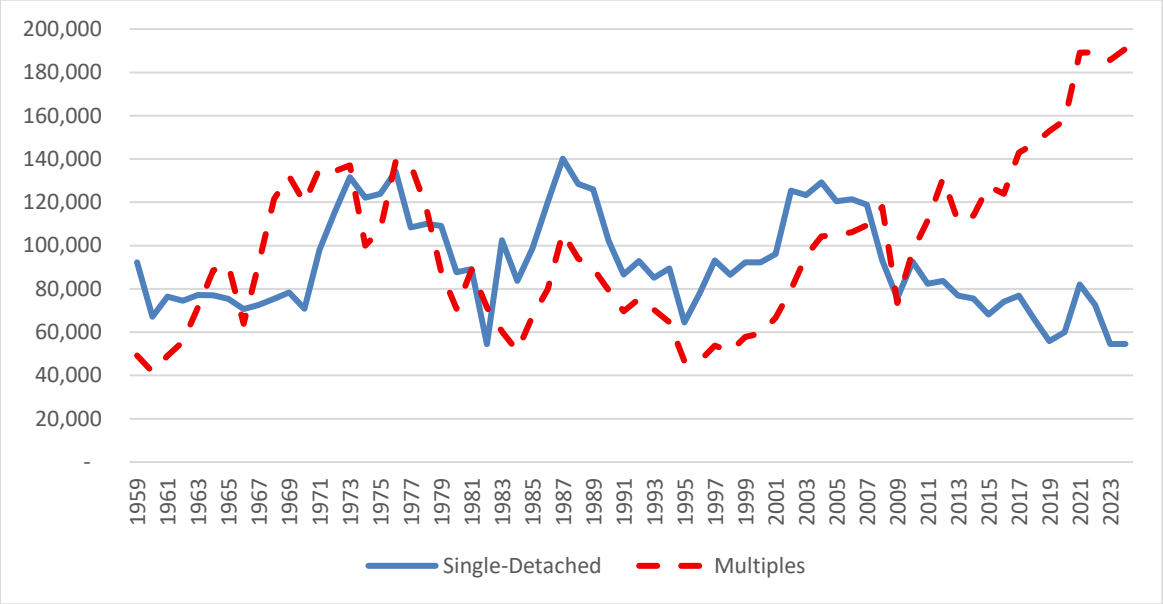
Chart 2, provides a breakdown of various types of housing starts in Canada from 1959 to 2024. Panels A and C illustrate the evolution of single-detached and multiple-unit starts. Multiple-unit starts exceeded single-detached starts throughout the 1960s and 1970s, but in the 1980s and until the mid-1990s, these values converged. However, beginning in 2004, the number of single-detached unit starts declined consistently, while multiple-unit starts increased. In fact, the gap between the two categories was greater in 2024 than in any prior year. That year, 182,880 multiple units (77 per cent of all starts) were started compared to just 44,357 single-detached units (22 per cent of all starts), a number even lower than the 58,481 single-detached units started in 1959. Panel B focuses on the different types of multiple units starts between 1959 and 2024. By far, the most prevalent type has been apartments. While apartment starts were lower in 1995 than in 1959, they surged by an astonishing 578 per cent, rising from 22,056 to 149,113 between 1995 and 2024.

As illustrated in Panel D there has been a surge in rental housing starts across Canada in the last decade, marking a sharp divergence from lagging activity in condo and homeownership construction since 2020, when rental starts have consistently outpaced other housing types. Most notably, the share of rental units rose from 31 per cent in 2020 to 41 per cent in 2024 for areas with a population above 10,000. This growth is likely driven by investor incentives, rising demand for rental units, and acute affordability pressures, particularly among Canadians shut out of ownership markets.[8]

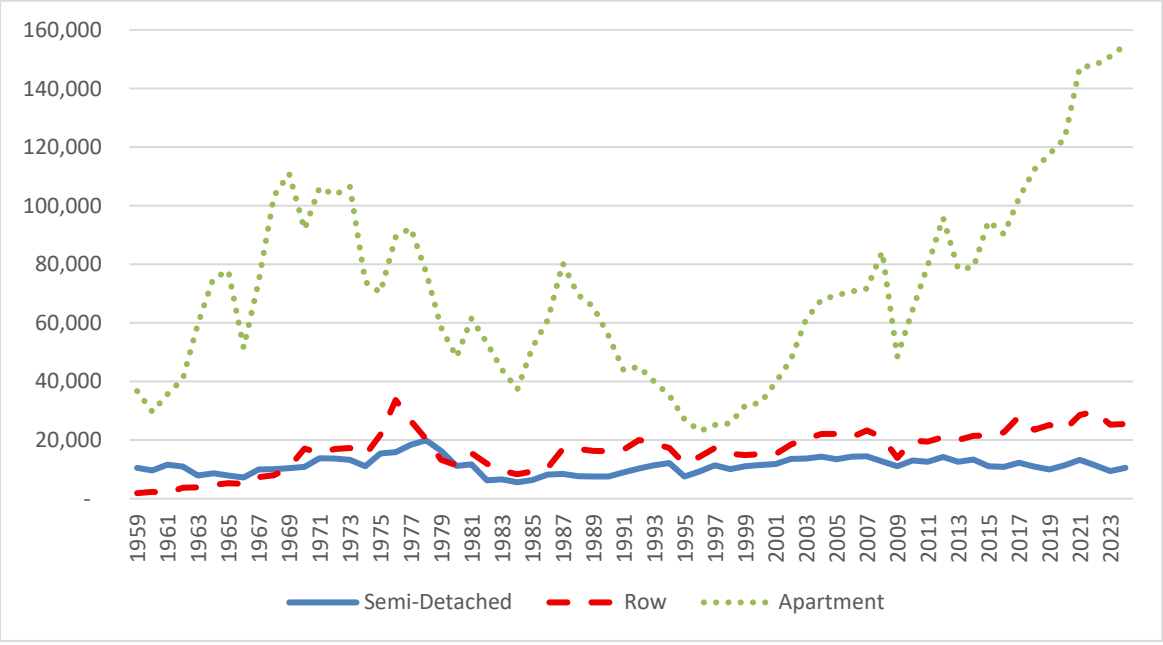
[8] While this boom is a positive development amid soaring rents, experts caution that it is not sufficient to resolve Canada's housing crisis. CMHC and industry analysts stress that rental construction alone cannot restore affordability; significant increases in ownership housing and other forms of supply are also required to meaningfully close the gap between demand and available units.
From a residential construction productivity standpoint, the rental surge partly reflects concentrated capital investment in regions where land is more accessible and permitting processes are more efficient.

Chart 2: Housing Starts by Unit Types, Canada, 1959-2024

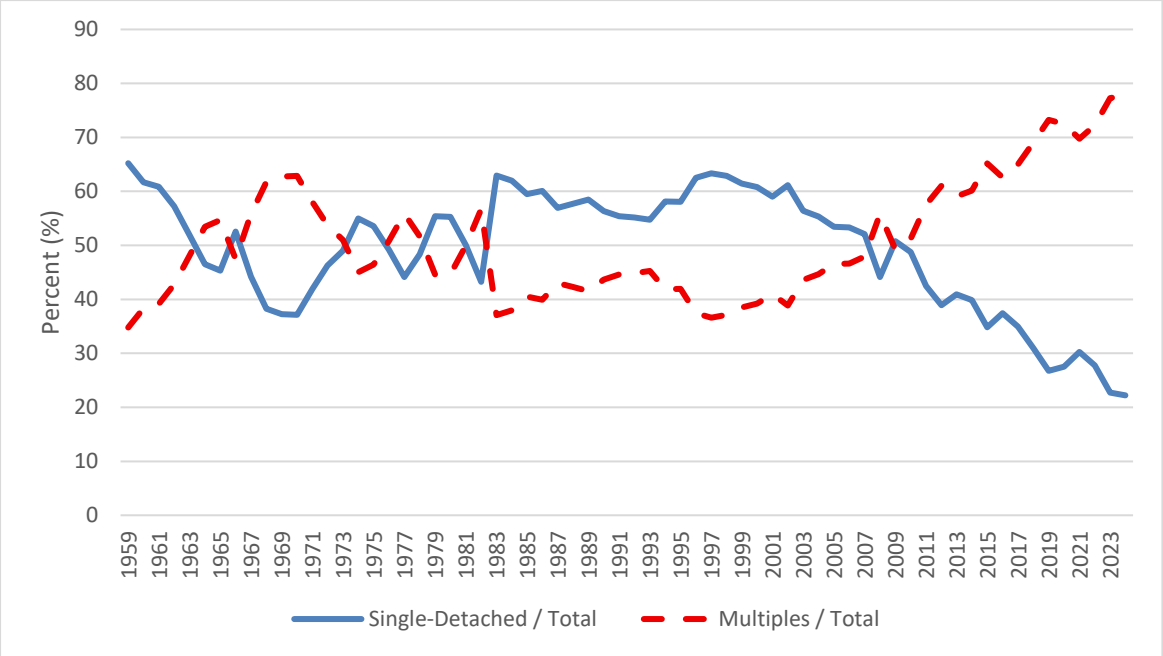
Panel A: Single-Detached and Multiples



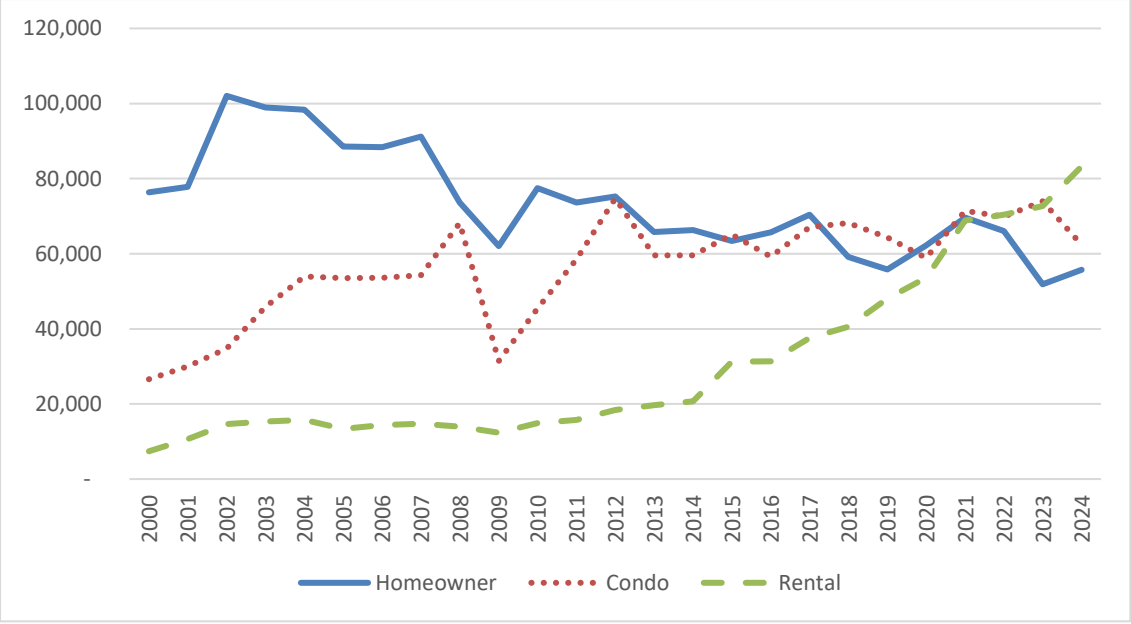
Panel B: Types of Multiples



Panel C: Share of Single-Detached and Multiples Starts of Total Starts



Panel D: Homeowner, Condos and Rentals (areas with 10k-plus population)



Note: Annual averages were calculated from monthly data.

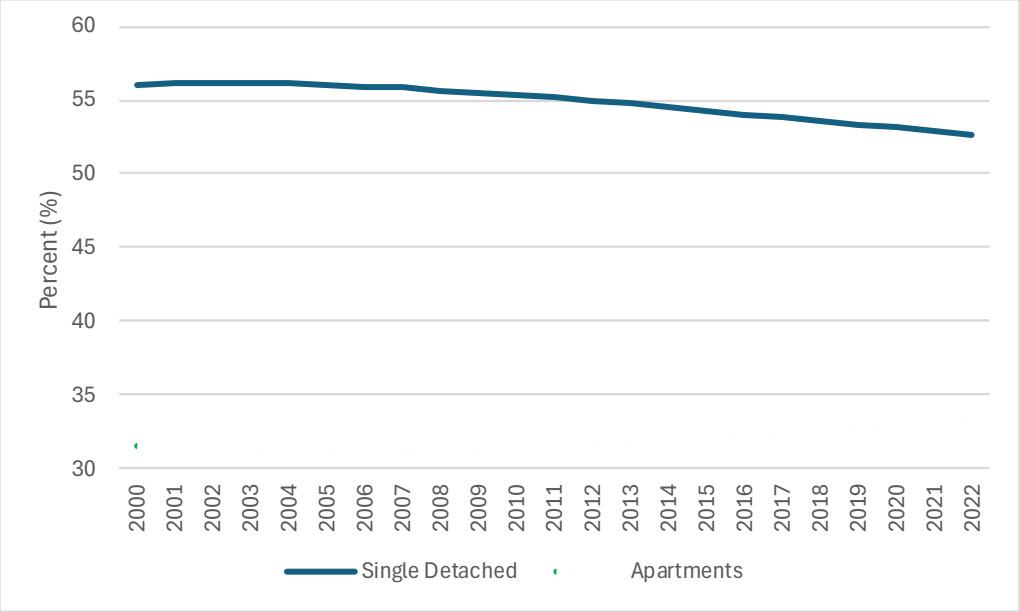
Source: Statistics Canada. Table 34-10-0143-01 Canada Mortgage and Housing Corporation, housing starts, under construction and completions in centres 10,000 and over, Canada, provinces, selected census metropolitan areas.

Housing Stock and Square Footage

Another metric for physical output in the residential construction industry is the overall housing stock and the floor space associated with the housing units in stock. Table 1 provides the total housing stock in Canada between 2000 and 2022. In this period, overall housing stock grew by 34.6 per cent (1.36 per cent per year), with single-attached housing the fastest-growing category—up 57.3 per cent (2.08 per cent per year)—and mobile homes the slowest, up 20.9 per cent (0.86 per cent per year). It is notable that the share of single detached homes of the total housing stock fell slightly from 56 per cent in 2000 to around 52.7 per cent in 2022 while the share of apartments saw a modest increase of 2.1 percentage points from 31.5 to 33.2 per cent in the same period (Chart 3).

As Table 2 illustrates, the overall floor space of houses has increased by 52.7 per cent between 2000 and 2022, reaching a high of 2,291 million m^2 in 2022. As expected, single-detached housing occupies the most floor space among all housing categories (above 60 per cent) and mobile homes the least. The fastest growth in floor space has occurred in single-attached housing and apartments, rising 81.7 per cent and 66.4 per cent, respectively, between 2000 and 2022.

Chart 3: Share of Single Detached and Apartments Units of Total Housing Stock, Canada, 2000-2022



Source: Natural Resources Canada, Residential End-Use Model, Ottawa, 2024.

Table 1: Total Housing Stock by Unit type, Canada, 2000-2022 (Thousands)

Year	Total Housing Stock	Single Detached	Single Attached	Apartments	Mobile Homes
2000	12,201	6,840	1,290	3,841	230
2001	12,345	6,926	1,319	3,868	232
2002	12,522	7,031	1,348	3,909	234
2003	12,714	7,142	1,379	3,956	237
2004	12,929	7,257	1,415	4,019	240
2005	13,144	7,363	1,451	4,087	243
2006	13,353	7,467	1,488	4,151	246
2007	13,559	7,571	1,525	4,214	249
2008	13,765	7,664	1,561	4,289	252
2009	13,938	7,732	1,594	4,358	254
2010	14,115	7,811	1,625	4,422	257
2011	14,281	7,880	1,656	4,486	259
2012	14,450	7,949	1,687	4,553	261
2013	14,624	8,016	1,721	4,625	263
2014	14,793	8,078	1,754	4,697	265
2015	14,974	8,133	1,785	4,789	267
2016	15,146	8,185	1,817	4,875	268
2017	15,320	8,244	1,851	4,955	270
2018	15,512	8,307	1,889	5,045	272
2019	15,713	8,385	1,922	5,134	273
2020	15,934	8,465	1,957	5,238	275
2021	16,175	8,552	1,994	5,352	276
2022	16,423	8,650	2,029	5,466	278
CAGR 2000-2022	1.36	1.07	2.08	1.62	0.86
CAGR 2000-2008	1.52	1.43	2.41	1.39	1.14
CAGR 2000-2019	1.21	0.82	1.91	1.65	0.73
CAGR 2019-2022	1.48	1.04	1.84	2.11	0.59

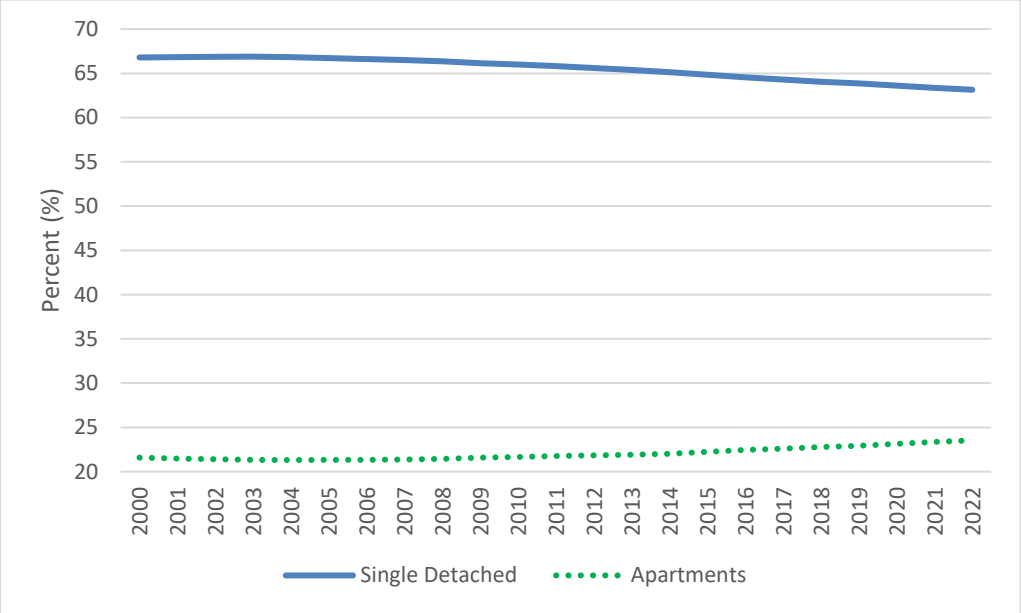
Source: Natural Resources Canada, Residential End-Use Model, Ottawa, 2024.

Table 2: Total Floor Space by Unit type, Canada, 2000-2022 (million m²)

Year	Total Floor Space	Single Detached	Single Attached	Apartments	Mobile Homes
2000	1,500	1,002	153	324	21
2001	1,528	1,021	158	328	21
2002	1,560	1,043	162	334	21
2003	1,594	1,066	166	340	22
2004	1,631	1,090	171	348	22
2005	1,668	1,113	177	356	22
2006	1,706	1,136	182	364	23
2007	1,743	1,160	188	372	23
2008	1,780	1,181	194	382	24
2009	1,811	1,198	199	391	24
2010	1,843	1,216	204	399	24
2011	1,876	1,234	209	408	24
2012	1,911	1,254	216	417	25
2013	1,947	1,273	222	427	25
2014	1,982	1,291	229	437	25
2015	2,017	1,308	235	448	26
2016	2,051	1,324	241	461	26
2017	2,086	1,341	247	472	26
2018	2,124	1,360	253	484	26
2019	2,164	1,382	259	497	27
2020	2,204	1,402	265	510	27
2021	2,246	1,423	272	525	27
2022	2,291	1,446	278	539	27
CAGR 2000-2022	1.94	1.68	2.74	2.34	1.20
CAGR 2000-2008	2.16	2.08	2.96	2.08	1.45
CAGR 2008-2019	1.79	1.44	2.69	2.41	1.13
CAGR 2019-2022	1.91	1.54	2.32	2.79	0.78

Source: Natural Resources Canada, Residential End-Use Model, Ottawa, 2024.

Chart 4: Floor Spacing by Unit Type as Fraction of Total Floor Spacing, Canada, 2000-2022



Source: Natural Resources Canada, Residential End-Use Model, Ottawa, 2024.

The bottom panels of Tables 3 and 4 show that housing-stock expansion was briskest in 2000-2008 (1.52 per cent per year), slowed to 1.21 per cent over 2000-2019, then re-accelerated to 1.48 per cent in 2019-2022, led by apartments (2.11 per cent per year). Floor-space growth followed a similar arc—peaking at 2.16 per cent annually in 2000-2008, easing to 1.79 per cent through 2019, and quickening again to 1.91 per cent in 2019-2022, with apartments (2.79 per cent) and single-attached units (1.54 per cent) driving the rebound. Over the full period single-attached units gained almost 1.8 percentage points and apartments nearly 1.8 percentage points, lifting the apartment share to 33.3 per cent in 2022, while mobile homes slipped below 1.7 per cent.

Chart 4 illustrates that the shares of single detached units of total floor area have been above 60 per cent throughout the period and only modestly declining while apartments share of total area has been on the rise but still significantly lower than that of single detached units.

Table 3 shows that average floor area per dwelling has continued to edge upward across every housing type through 2022. Single-detached homes remain the largest units, rising from 1,576 ft^2 in 2000 to about 1,800 ft^2 in 2022—an increase of 14.2 per cent, or

Table 3: Average Floor Space by Unit type, Canada, 2000-2022 (Sqft per unit)

Year	Average Floor Space	Single Detached	Single Attached	Apartments	Mobile Homes
2000	1,323.3	1,576.1	1,279.5	908.2	980.8
2001	1,332.2	1,586.5	1,285.8	913.6	983.6
2002	1,341.1	1,597.0	1,291.9	919.2	986.1
2003	1,349.9	1,607.2	1,298.0	925.0	988.5
2004	1,358.1	1,617.2	1,304.3	931.1	991.3
2005	1,365.6	1,626.5	1,310.5	937.1	993.9
2006	1,375.0	1,637.9	1,319.3	944.4	997.8
2007	1,383.8	1,648.6	1,327.5	951.2	1,001.6
2008	1,391.7	1,658.5	1,335.0	958.6	1,004.7
2009	1,398.5	1,667.1	1,342.1	965.3	1,007.6
2010	1,405.4	1,675.8	1,348.4	971.6	1,010.4
2011	1,413.6	1,685.9	1,356.9	979.3	1,014.1
2012	1,423.6	1,697.7	1,375.0	986.4	1,018.8
2013	1,433.0	1,709.0	1,391.2	993.5	1,023.5
2014	1,441.8	1,720.0	1,405.4	1,000.5	1,027.9
2015	1,449.7	1,730.5	1,417.9	1,007.8	1,032.2
2016	1,457.6	1,740.8	1,426.5	1,016.8	1,036.8
2017	1,465.7	1,751.4	1,435.2	1,024.8	1,041.4
2018	1,473.8	1,762.1	1,444.1	1,033.0	1,046.0
2019	1,482.5	1,773.8	1,452.0	1,041.0	1,050.2
2020	1,488.6	1,782.3	1,459.1	1,047.9	1,052.2
2021	1,494.8	1,790.9	1,466.4	1,054.9	1,054.1
2022	1,501.3	1,800.0	1,473.0	1,061.8	1,056.3
CAGR 2000-2022	0.58	0.61	0.64	0.71	0.34
CAGR 2000-2008	0.63	0.64	0.53	0.68	0.30
CAGR 2008-2019	0.58	0.61	0.77	0.75	0.40
CAGR 2019-2022	0.42	0.49	0.48	0.66	0.19

Source: Natural Resources Canada, Residential End-Use Model, Ottawa, 2024.

approximately 0.61 per cent per year. Single-attached units followed a similar path, expanding from about 1,280 ft^2 to 1,473 ft^2 (15.1 per cent, 0.64 per cent per year). Apartments are still the most space-efficient form of housing, yet their average size grew the fastest in relative terms, climbing from roughly 908 ft^2 to 1,062 ft^2, which is 16.9 per cent, or around 0.71 per cent per year. Mobile homes saw the smallest absolute gain but a notable relative one, moving from about 981 ft^2 to 1,056 ft^2, up 7.7 per cent, or 0.34 per cent per year.

Average floor space increased between 0.5 and 0.7 per cent per year across all types, with mobile homes and single-detached units at the upper end of that range between 2000 and 2008.

Between 2000 and 2019, Growth moderated for single-detached and single-attached dwellings (0.55–0.60 per cent per year) but accelerated for apartments and mobile homes (0.75 per cent per year). From 2019 to 2022, expansion slowed everywhere, averaging 0.4–0.5 per cent per year for detached, attached, and apartments, though mobile homes held up better at close to 0.7 per cent per year.
Taken together, these figures confirm that Canada's housing additions have not only boosted unit counts but also nudged average dwelling sizes higher, a trend that pushes total residential floor space upward even when the pace of new construction slows down.

Over the full period single-attached units gained almost 1.8 percentage points and apartments nearly 1.8 percentage points, lifting the apartment share to 33.3 per cent in 2022, while mobile homes slipped below 1.7 per cent. shows total floor spacing by unit type as fraction of total floor spacing. Because detached houses are larger, their dominance is more pronounced, yet it is eroding too: the detached share of floor space fell from 66.8 per cent in 2000 to 63.2 per cent in 2022. Apartments captured most of the ground lost, rising two full points to 23.5 per cent, while single-attached dwellings edged up to 12.1 per cent and mobile homes declined to 1.2 per cent.

Chart 5 illustrates how average floor area remains remarkably stable in proportional terms. Throughout 2000 to 2022 a typical detached house was about 119 per cent of the all-dwelling average, single-attached hovered around 97 to 98 per cent, apartments climbed from 68.6 per cent to 70.7 per cent, and mobile homes eased from 74.1 per cent to 70.4 per cent. The gradual convergence reflects slightly faster size gains for apartments and single-attached units, reinforcing the trend toward greater overall density even as individual homes become marginally larger.

Chart 5: Average Floor Size by Unit as a Share of Total Average Floor Size

Source: Natural Resources Canada, Residential End-Use Model, Ottawa, 2024.

B. Price-Based Measures

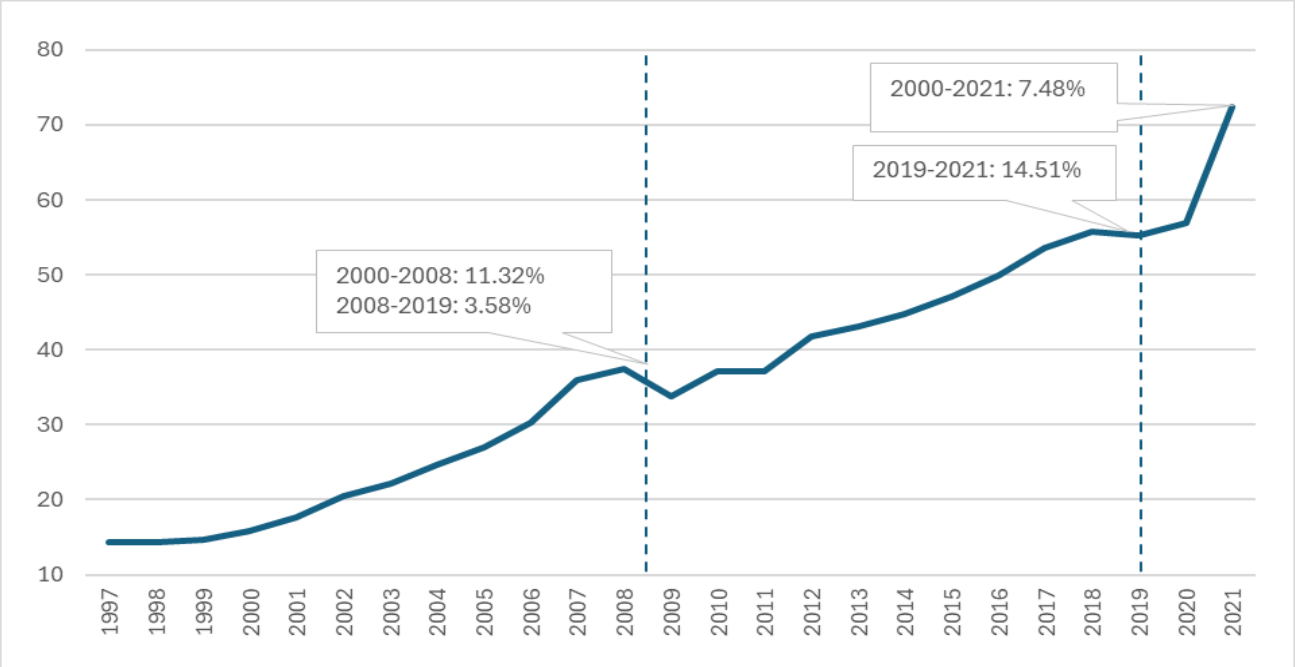
Nominal Output

We now turn attention to output measures that are commonly used in the context of productivity analysis, starting with nominal value added in the residential construction industry. Chart 6, Panel A shows the evolution of nominal value added in the residential construction industry in absolute terms in Canada between 1997 and 2021. Nominal value added increased from 1997 to 2008 by 11.32 per cent per year reaching a peak at 37.5 billion dollars in 2008. It then fell in 2009 and rebounded in 2010. From 2008 to 2019, nominal value added grew by 3.6 per cent per year and in the pandemic period of 2019-2021 it grew by 14.5 per cent per year. As will be discussed in the next subsection, this massive increase in nominal output is driven by the rapid growth in output price in that year.

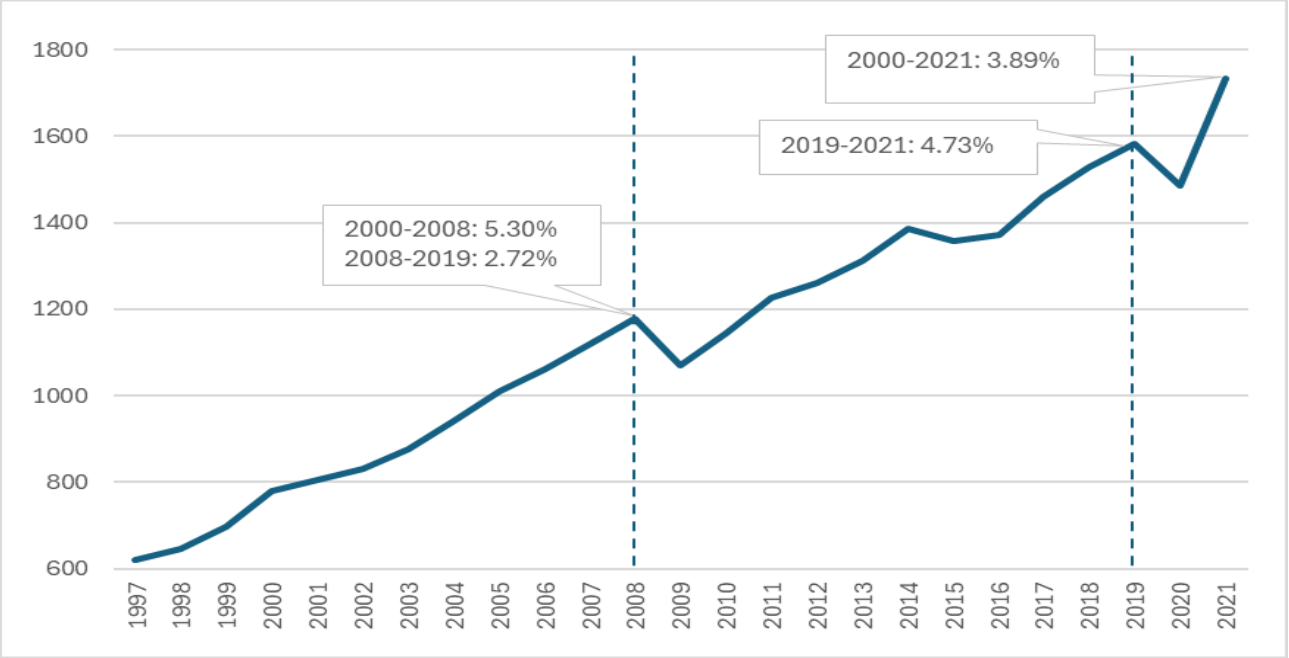
Chart 6, Panel B shows the same trends for the overall business sector. The growth rate in nominal value added in residential construction has consistently been higher than that of the business sector.

Chart 6: Nominal Value Added, Canada, 1997-2021 (Billions of Current Dollars)

Panel A: Residential Construction Industry



Panel B: Business Sector



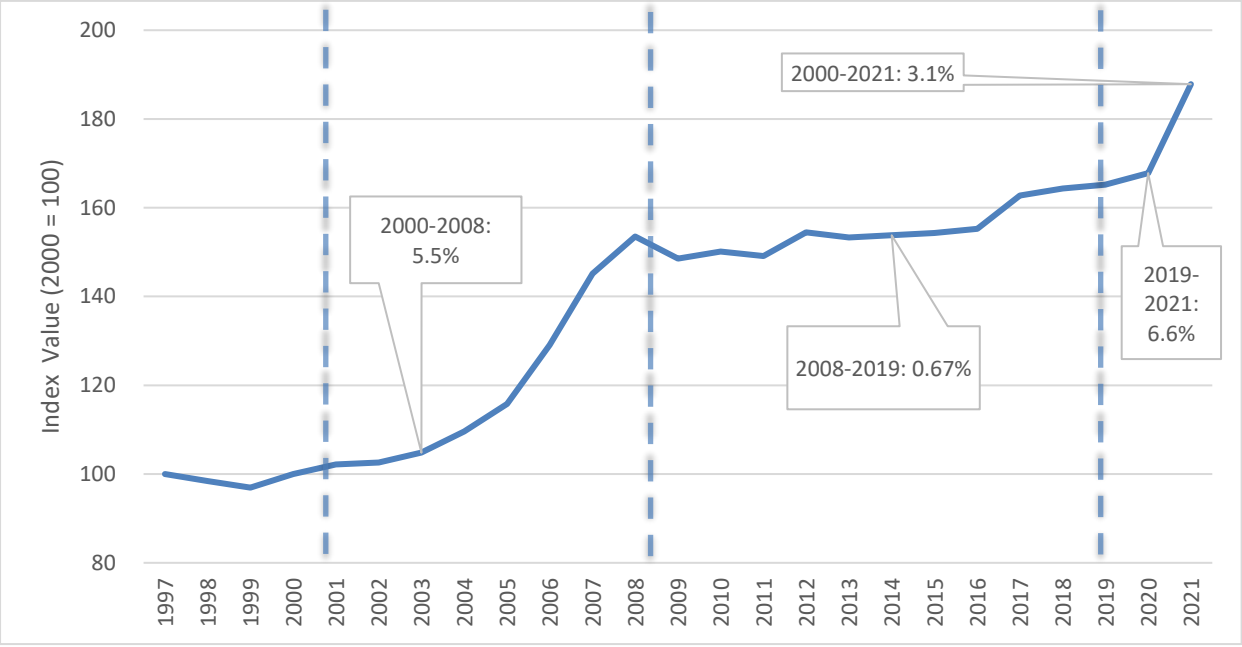
Source: Statistics Canada. Table 36-10-0480-01. Labour productivity and related measures by business sector industry and by non-commercial activity consistent with the industry accounts.

Output Prices

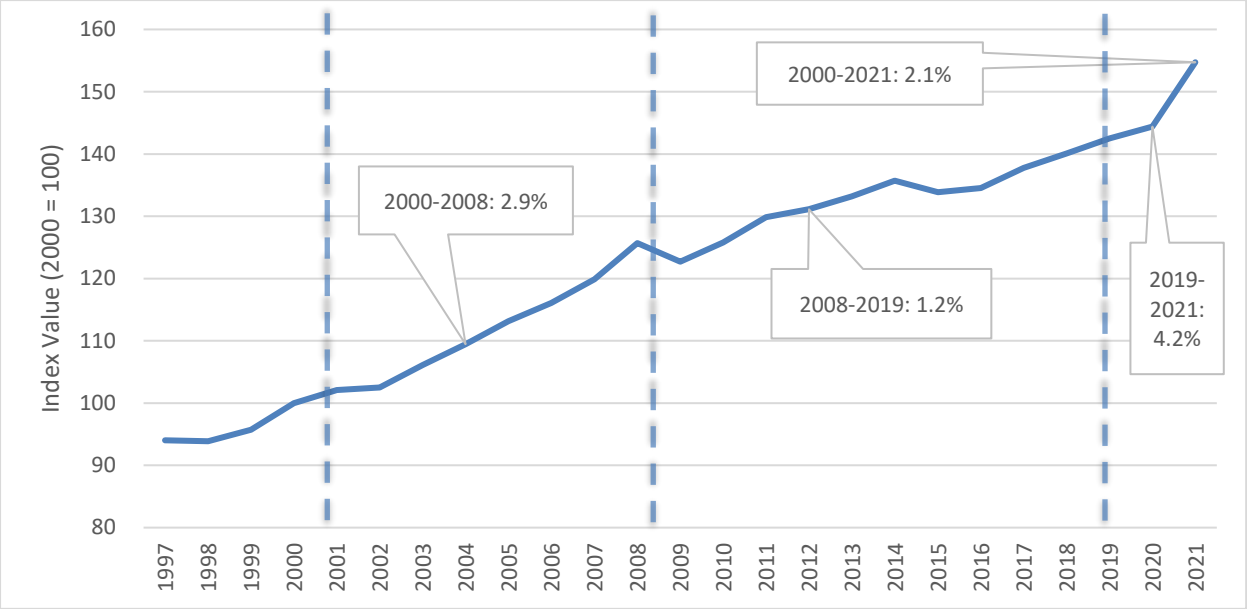
To understand the trends in output prices, we first use the price deflator implied by the ratio of nominal value added over real valued added in the residential construction sector. Chart 7, Panel A shows the price deflator for residential construction sector and Panel B does the same for total economy. The residential construction GDP deflator has risen faster—and in more pronounced cycles—than the all-industry deflator. The residential index grew by 5.5 per cent per year between 2000 and 2008, while the corresponding growth was 2.9 per cent for the total economy. During the 2008-2019 period, housing-price pressures abated, and the residential deflator advanced only 0.7 per cent per year, trailing total economy deflator's 1.2 per cent. Between 2019 and 2021 the residential deflator jumped 6.6 per cent per year, while the economy-wide measure rose 4.2 per cent. Over the full 2000-2021 span the residential deflator grew 3.1 per cent annually, outpacing the total-economy rate of 2.1 per cent underscoring the sector's heightened sensitivity to housing-market booms and busts.

Chart 7: Price Deflator, 1997-2021 (Index = 100 in 2000)

Panel A: Residential Construction



Panel B: Total Economy



Source: Statistics Canada. Table 36-10-0480-01. Labour productivity and related measures by business sector industry and by non-commercial activity consistent with the industry accounts.

An alternative measure of output price in the context of residential construction is the New Housing Price Index (NHPI). It is a monthly series that measures changes over time in the builders' selling prices of new residential houses, where detailed specifications pertaining to each house remain the same between two consecutive months.[9] Chart 8 shows the new housing price index between 1981 and 2024 for new construction (total), and house and land price indexes separately. Chart 8 reveals that new housing prices have been experiencing a significant growth in the past few decades.

Except for 1990s when housing prices fell slightly in the beginning of the decade and were somewhat stable afterward, and a minor drop in new housing prices in 2009, new housing prices were rising throughout this period. It is worth noting that house price increases were the main driver of the rise in the new housing price index in the 1980s and since 2011 while land price increases where the reason behind stable housing price index in the 1990s despite the fall in the price of new houses.

[9] The survey covers new single homes, semi-detached homes and townhomes (row or garden homes). It also collects builders' estimates of the current value (evaluated at market price) of the land. The current value of the structure is also independently indexed and is presented as the house series. For more details see: https://www23.statcan.gc.ca/imdb/p2SV.pl?Function=getSurvey&SDDS=2310

Chart 8: New Housing Price Index, Canada, 1981-2024 (Index = 100 in 1981)

Source: Statistics Canada. Table 18-10-0205-01 New housing price index, monthly

Table 4: New Housing Price Indexes Growth Rates, Canada, 1981-2024

New housing price indexes	1981-2000	2000-2008	2008-2019	2019-2024	1981-2024	2000-2024
Total	1.97	5.37	1.46	3.86	2.68	3.25
House only	1.88	5.86	1.61	4.46	2.84	3.60
Land only	2.62	4.12	1.07	2.34	2.46	2.34

Source: Statistics Canada. Table 18-10-0205-01. New housing price index, monthly.

The growth in price implied by the price deflator is consistent with the new housing price index growth in Table 4 for the same period. The table shows the growth rates of the new housing price indexes (total, house only and land only) between 1981 and 2024 and its various subperiods. New housing price index grew by 2.7 per cent per year between 1981 and 2024 with the highest growth rate occurring between 2000 and 2008 at 5.4 per cent per year followed by the 2019-2024 period at 3.9 per cent per year growth rate.

House prices grew by 2.8 per cent per year in 1981-2024, with growth in prices being the fastest in 2000-2008 at 5.9 per cent per year followed by 4.5 per cent per year in 2019-2024 and growth in 1981-2000 being the slowest at 1.9 per cent per year.

Land prices grew by 2.5 per cent per year in 1981-2024. They grew by 4.1 per cent per year in 2000-2008 (fastest growth rate) and only 1.1 per cent per year (slowest growth rate) in 2008-2019. Since 2009, house prices have outstripped land prices, and this indicates that most of the increase in the new housing price index is likely due to increase in housing construction costs and less because of land price increases.

Interestingly, the new housing price index grew twice as fast as the residential construction price deflator in 2008-2019, which likely reflects relative decline in renovations prices. Due to data availability up to 2021 for the price deflator, a comparison for the 2019-2024 is not possible.

Real Output

The second economic output measure that accounts for the price increase over time is the real value added in the residential construction industry.[10]

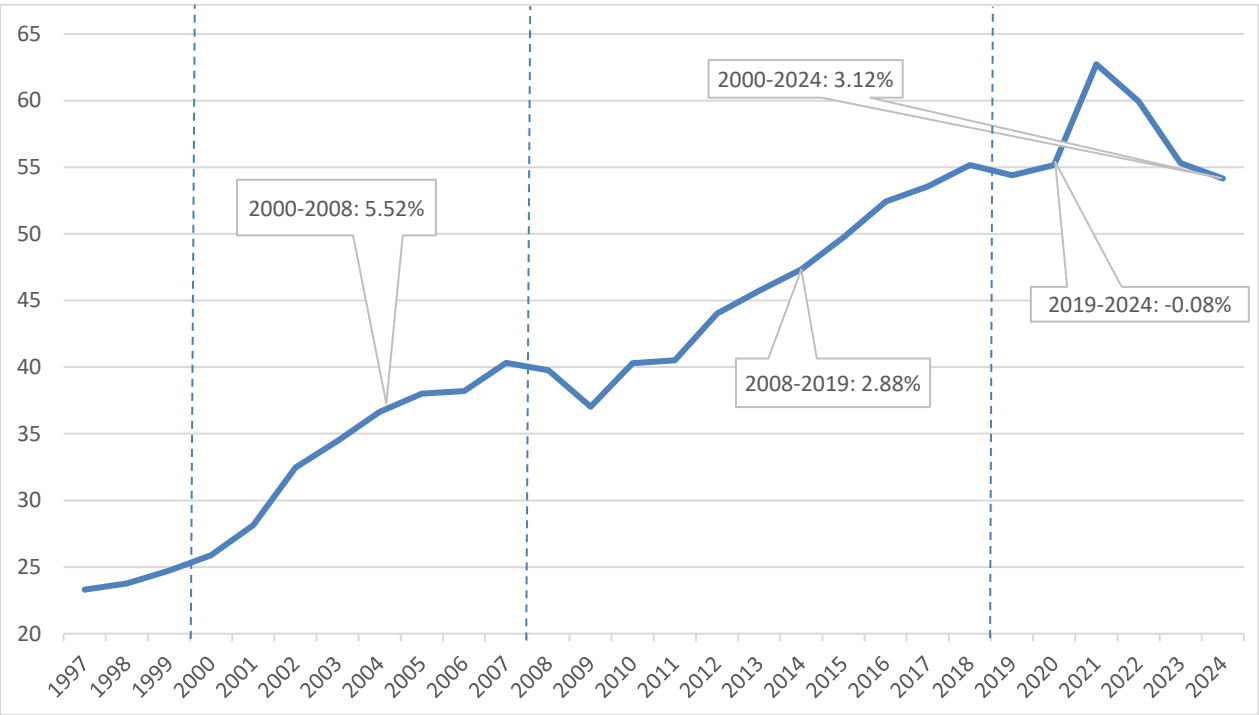
Chart 9, Panel A shows the real value added in the residential construction industry between 1997 and 2024 in Canada. Real value added soared by 5.5 per cent per year between 2000-2008. Real value added fell by about 6.8 per cent between 2008 and 2009; however, it rebounded strongly after 2009 and rose by 2.9 per cent per year between 2008-2019. Interestingly, real value added was not affected by the pandemic in 2020 and 2021 and in fact rose sharply to a peak of 62.7 billion dollars. Between 2019 and 2024, real value added was essentially flat, edging down by about 0.1 per cent per year, which marks a significant weakening compared with earlier periods.

Chart 9, Panel B illustrates the share of real value added in residential construction in the construction industry. Real value added in residential construction accounted for 29 per cent of total real value added in construction in 1997, rising steadily to 33.7 per cent in 2004

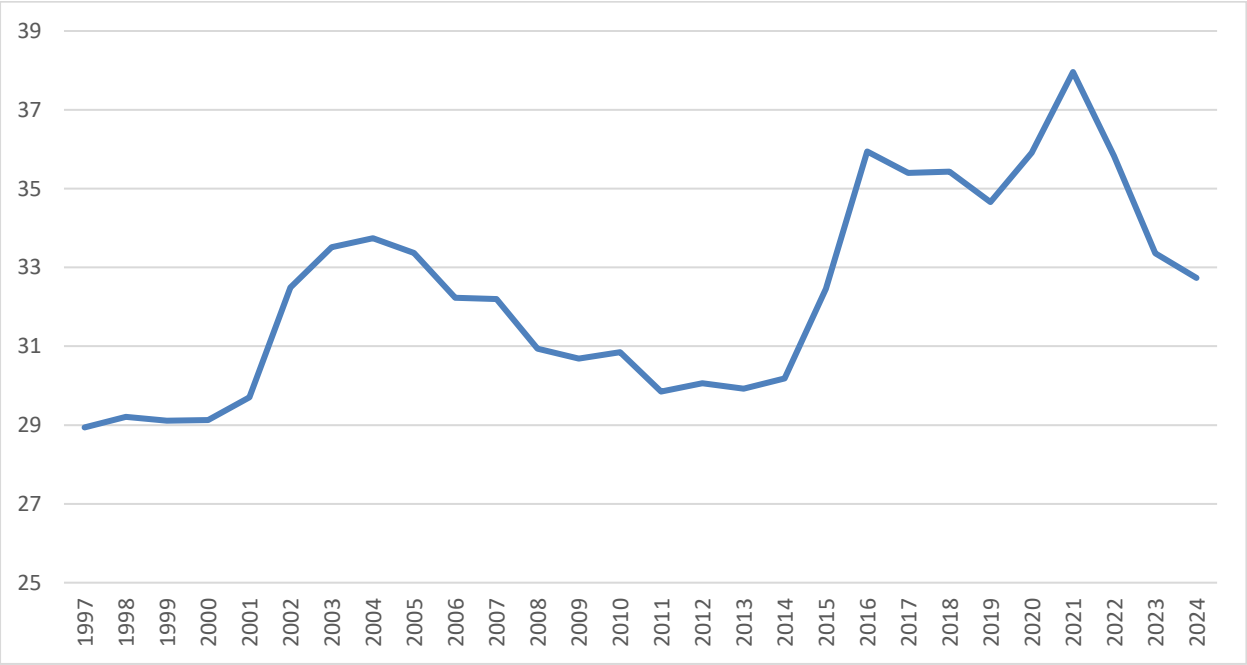
[10] Real value added is evaluated in 2017 chained dollars. A double-deflation procedure is used to measure real value added: real intermediate inputs are subtracted from real gross output. For productivity measurement, a real value-added Fisher chain index is used for each industry. Chain indexes are calculated for consecutive periods to determine variation of quantities from one period to another. The chain indexes offer the advantage of reducing the variation in the values recorded by the various fixed-base indexes.

Chart 9: Real Value Added, Canada, 1997-2024 (Billions of 2017 Constant Dollars)

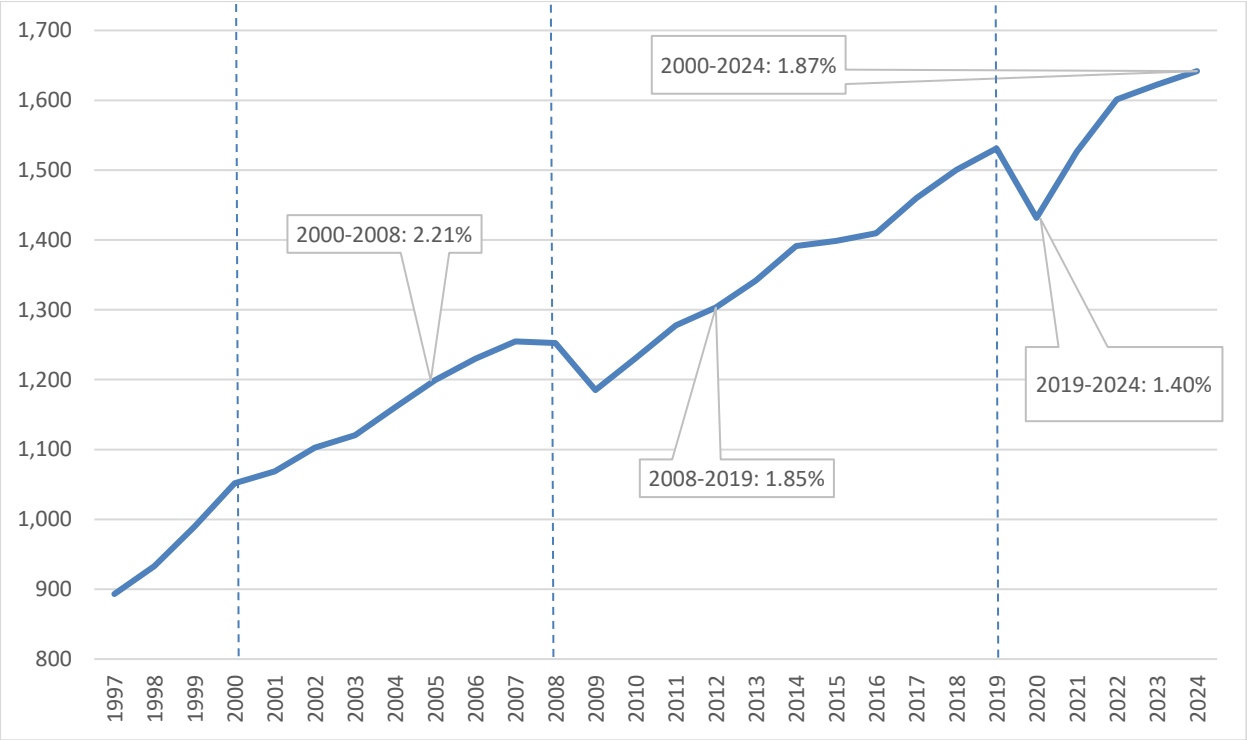
Panel A: Residential Construction



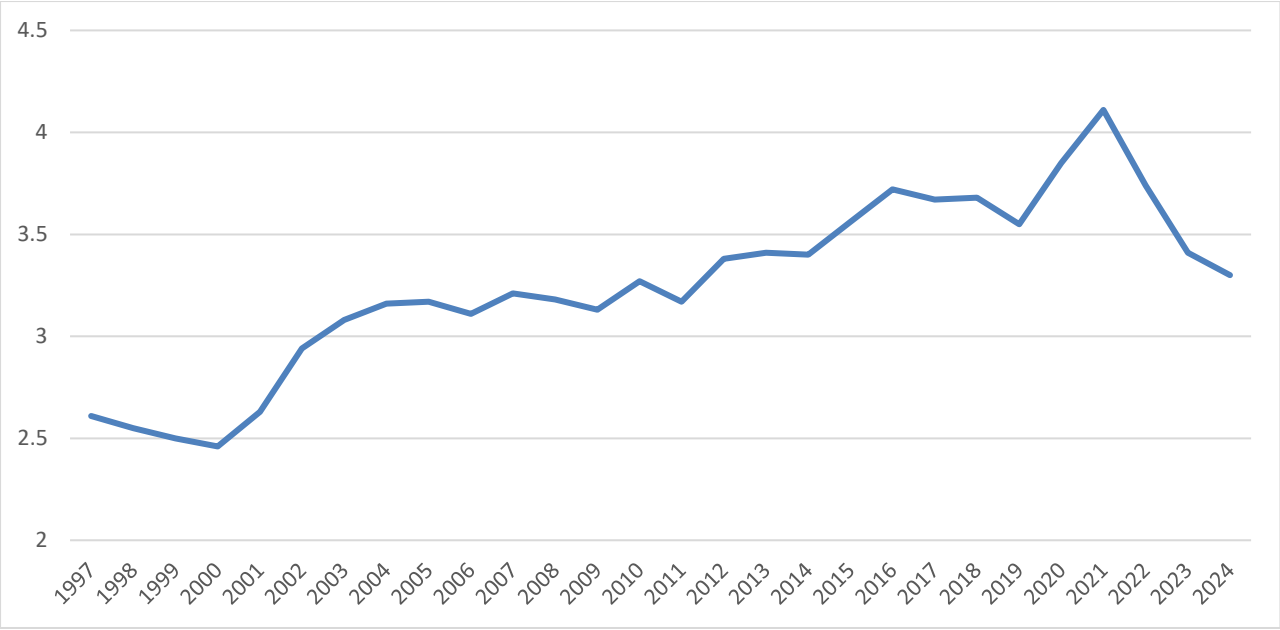
Panel B: As Share of Overall Construction Sector (Per cent)



Panel C: Business Sector



Panel D: Share of Residential Construction Real Value Added in Business Sector (Per cent)



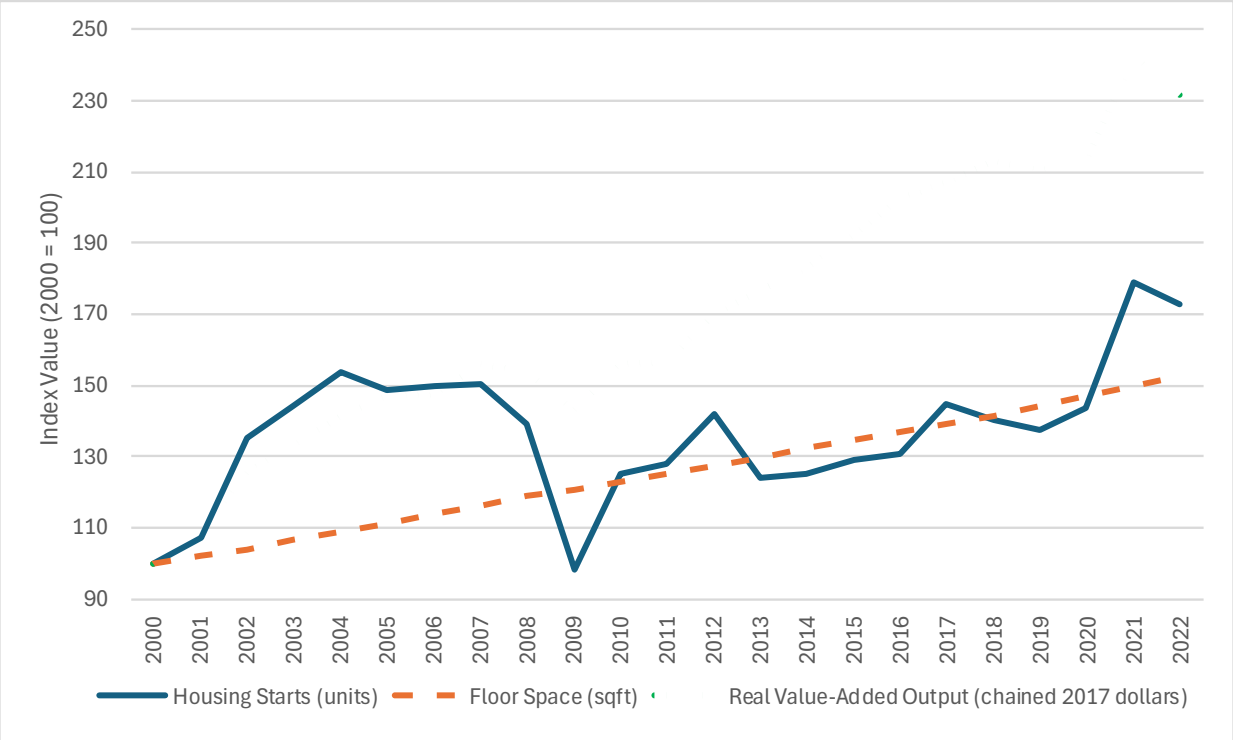
Source: Statistics Canada. Table 36-10-0480-01. Labour productivity and related measures by business sector industry and by non-commercial activity consistent with the industry accounts.

and falling gradually to 30.1 per cent in 2014. There was a steep increase in residential construction real-output share in 2014-2016 when the share reached 36 per cent. After another period of decline between 2016-2019, the real-value-added share of residential construction rose to 38 per cent in 2021 and fell in 2022, 2023, and 2024, reaching 33.3 per cent in 2023 and 32.7 per cent in 2024.

Chart 9, Panel C shows that real value-added growth in the business sector lagged the residential sector throughout the 2000-2019 period. However, in the most recent period of 2019-2024, the growth rate of residential construction real value added (-0.08 per cent per year) fell well below that of the business sector (1.40 per cent per year).

Chart 9, Panel D plots residential construction's share of total business-sector real value added. That share climbed to a peak of about 4.1 per cent in 2021 before slipping to 3.4 per cent in 2023 and 3.3 per cent in 2024, mirroring the softening in Panel A.

Chart 10: Various Measures of Output in Residential Construction, Canada



Sources: Housing Stock: Natural Resources Canada, Residential End-Use Model, Ottawa, 2024.

Floor Space: Natural Resources Canada, Residential End-Use Model, Ottawa, 2024.

Real Output: Statistics Canada Table 36-10-0480-01

Chart 10 provides a summary of trends of output measures in residential construction. Residential construction output has expanded along three very different trajectories since 2000. Housing starts, the most volatile indicator, rose at an average rate of about 2.8 per cent per year through 2000-2021, but that headline masks sharp cycles: starts surged 4.2 per cent per year in 2000-2008, slumped slightly (-0.1 per cent a year) in the post-financial-crisis decade of 2008-2019, and then spiked almost 14 per cent per year between 2019 and 2021 as pandemic-era demand and low mortgage rates pulled forward new projects. Total floor space—which adds the effect of larger-than-before dwellings—grew more smoothly, at 1.9 per cent per year overall (2.2 per cent in 2000-2008, 1.8 per cent in 2008-2019, and 1.9 per cent in 2019-2021), showing that upsizing and renovations cushioned the physical production line even when starts dipped. Real value added, the broadest measure that encompasses new construction and renovations market value, climbed fastest of all, averaging 4.3 per cent per year thanks to the labour-intensive finishing and renovation work that the GDP metric captures; its growth moderated after 2008 (2.9 per cent per year) but accelerated again to 7.4 per cent per year in 2019-2021 as builders worked through backlogs and households channelled savings into home improvements. The divergence among the three series illustrate why residential construction's GDP can rise far more (or fall far less) than either unit counts or square metres: shifts toward larger homes, costlier finishes, and renovation activity amplify real value added relative to the underlying physical metrics.

III: Labour Inputs for Residential Construction[11]

There are various measures of labour input that can utilized at the residential construction sector level including employment, average hours and total hours of work. In this section we start by analyzing employment in the residential construction sector followed by an analysis about average hours and total hours of work in residential construction.

[11] Statistics Canada's multifactor-productivity tables, available only at the aggregate-construction level, indicate that this sector remains labour-intensive—labour's share of output stayed above 65 per cent from 2000-2021—but that share has been eroding, falling most sharply after 2019 at roughly -2.3 per cent per year. On the capital side, construction has consistently deepened faster than the business sector as a whole: capital *input* expanded by about 3.4 per cent per year over 2000-2019 (vs. 2.9 per cent for the economy), and the real *capital stock* rose 85 per cent between 2000 and 2022 (2.9 per cent per year), outpacing the business-sector increase of 62 per cent (2.2 per cent per year). The divergence widened in 2019-2022, when construction capital stock grew 2.4 per cent per year while the economy managed only 0.8 per cent. These figures pertain to total construction; comparable data for residential construction alone are not published, so direct inference is not possible.

A. Employment[12]

The first labour input measure we utilize is the total number of jobs in the residential construction industry. Chart 11, Panel A plots employment from 1997 to 2024. Employment in residential construction has been increasing overall, growing by about 4.0 per cent per year between 2000 and 2024. In both major recessions of the last three decades—the Great Financial Crisis of 2008-09 (down 11 per cent) and the Covid recession (down 9 per cent)—employment fell in the industry. In the 2000-2008 sub-period, employment rose a robust 6.7 per cent per year, followed by a much slower 1.5 per cent per year between 2008-2019. Over 2019-2024, employment growth still accelerated relative to the previous decade.

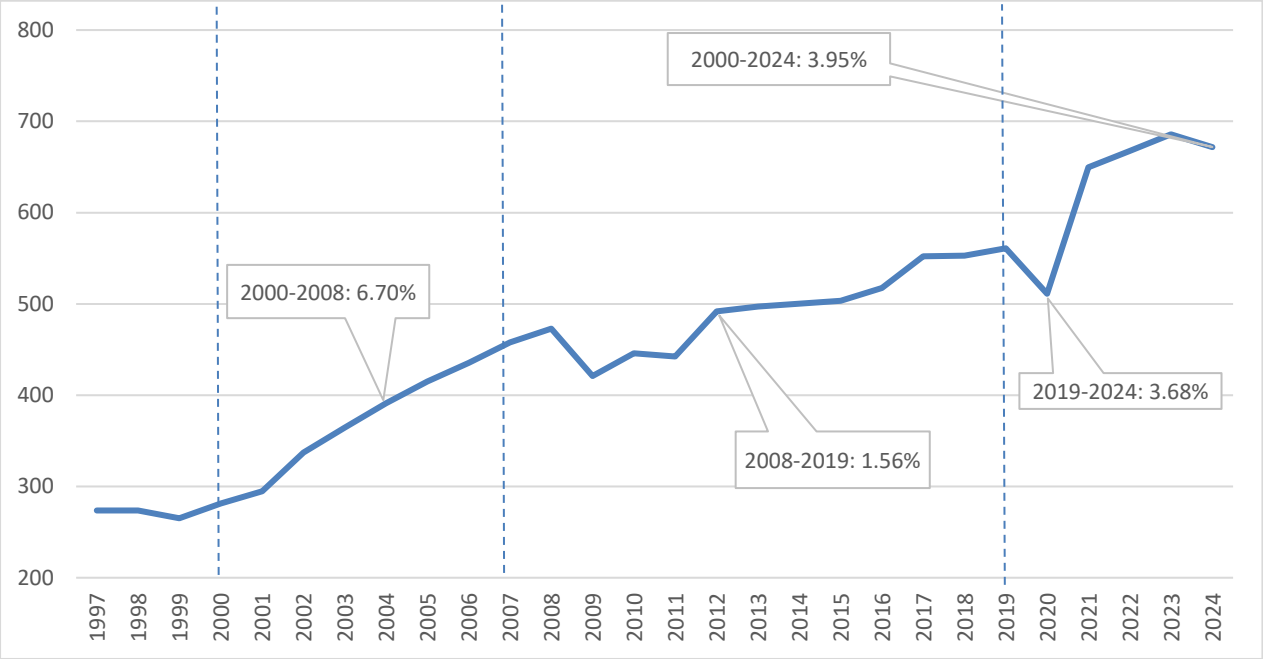
Chart 11, Panel B shows residential construction employment as a share of total construction employment. The share peaked at 41.2 per cent in 2021 and then slipped to 39.6 per cent in 2023 and 39.2 per cent in 2024. Notably, the employment share of residential construction remains consistently above its real-output share (see Chart 9, Panel B). Chart 11, Panel C portrays employment growth in the business sector as a whole; although employment is rising, its pace remains well below that of residential construction.

Chart 11, Panel D displays residential construction's share of total business-sector employment. That share reached roughly 4.4 per cent in 2021, then edged down to 4.3 per cent in 2023 and 4.2 per cent in 2024, mirroring the modest slowdown seen in Panel A.

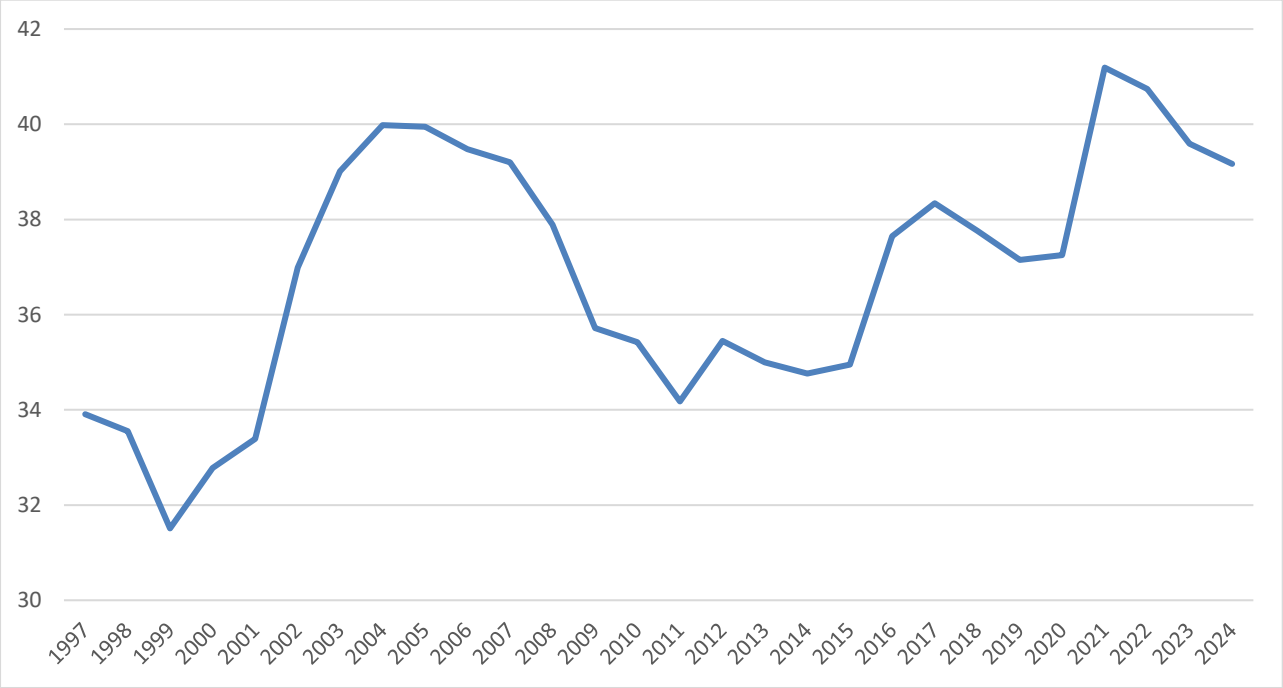
[12] We had hoped to distinguish between employees and the self-employed within residential construction employment. However, Statistics Canada's annual employment series (Table 14-10-0202-01) counts only workers classified under "construction of buildings." It omits those engaged in related specialty trades or land-subdivision work, even when those activities are residential in nature. Consequently, a full breakdown for the residential construction workforce is not available.

Chart 11: Employment, Total Number of Jobs, Canada, 1997-2024

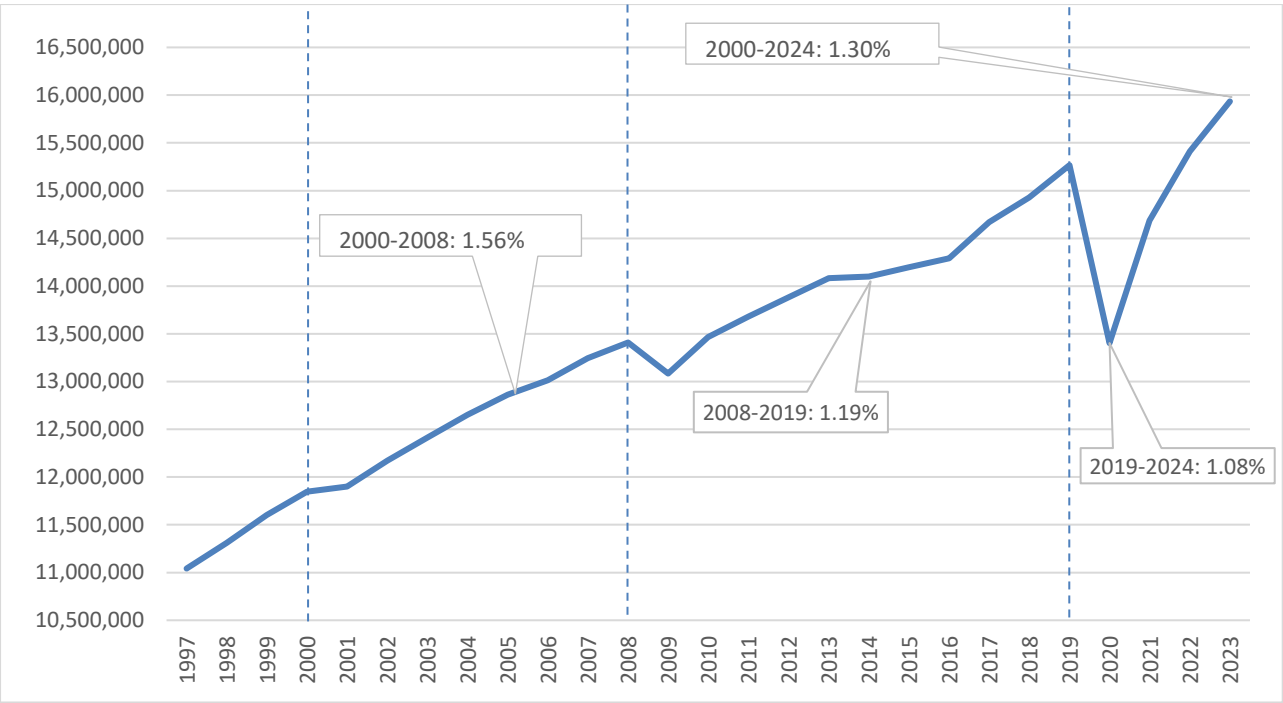
Panel A: Residential Construction



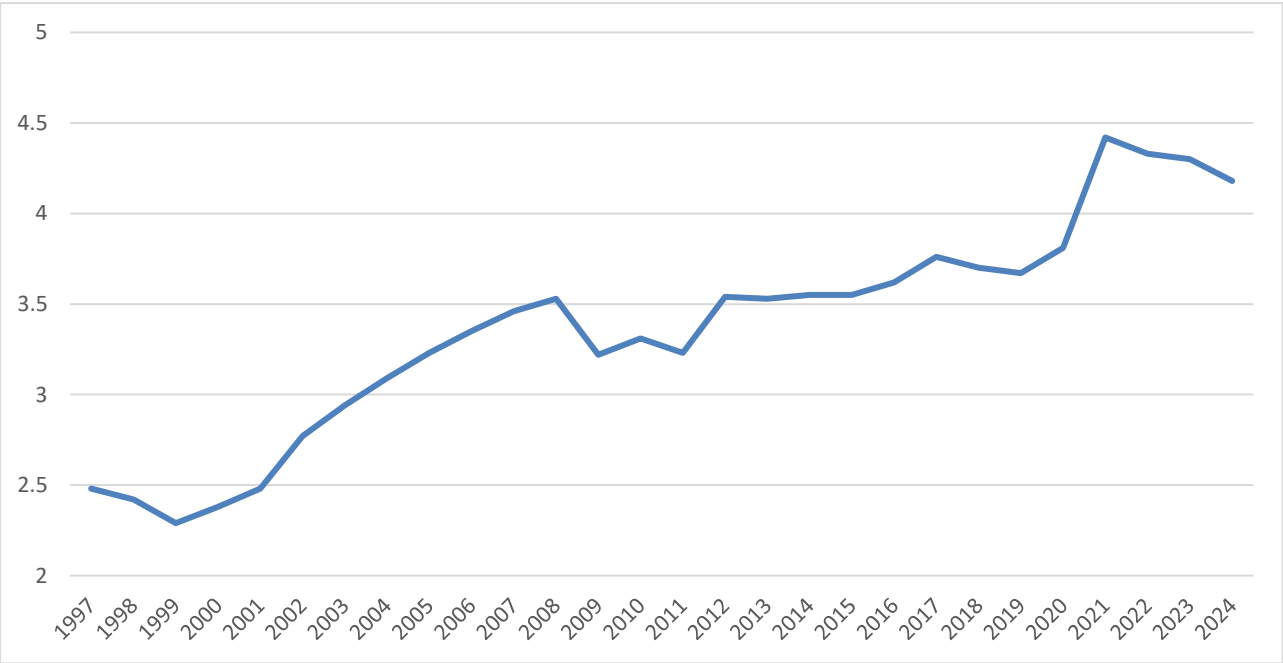
Panel B: As Share of Overall Construction Sector (Per cent)



Panel C: Business Sector



Panel D: Share of Residential Construction Employment in Business Sector (Per cent)



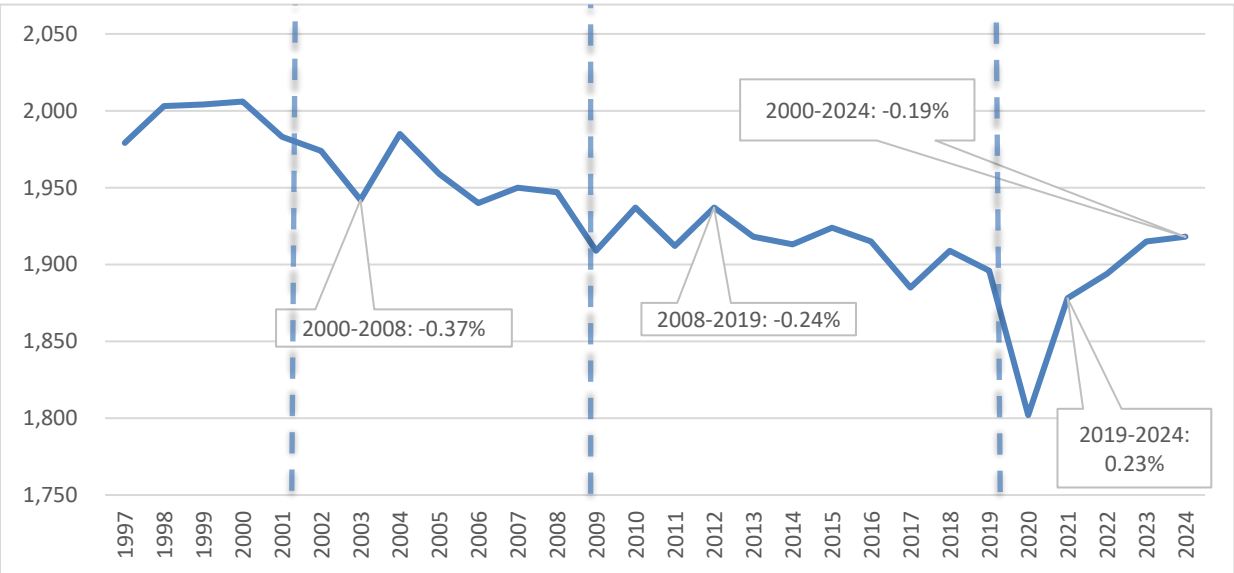
Source: Statistics Canada. Table 36-10-0480-01. Labour productivity and related measures by business sector industry and by non-commercial activity consistent with the industry accounts.

B. Average Hours

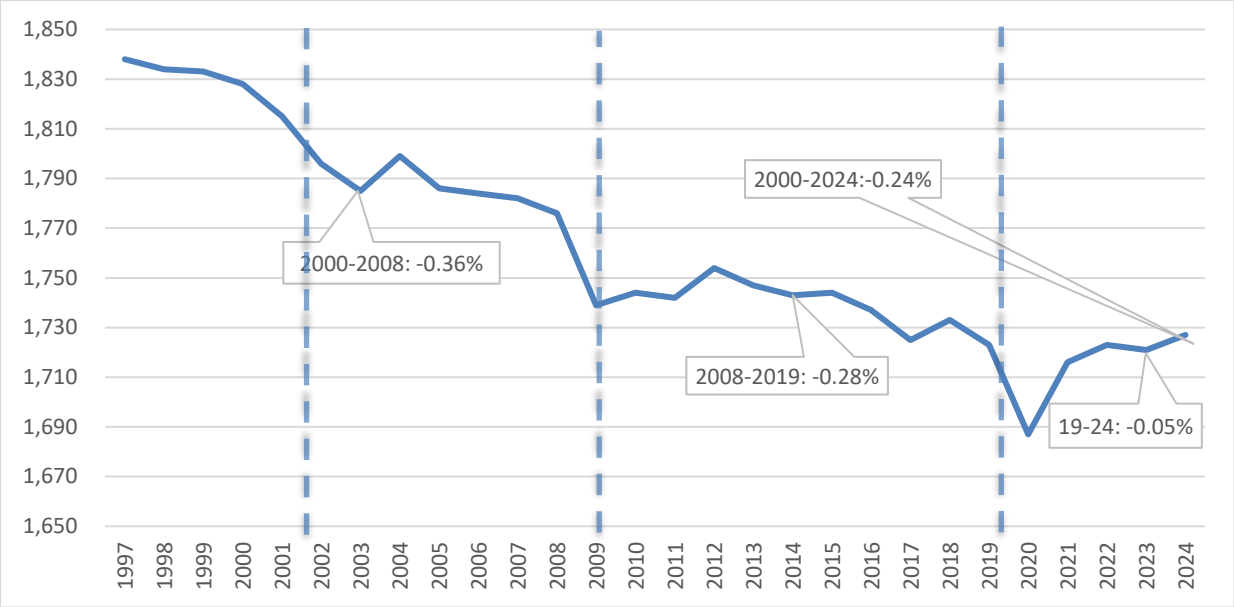
Across all employment arrangements (employees and self-employed) workers in residential construction worked an average of 1,918 hours per year. This represents a 6 per cent increase compared to the trough in the average hours of work in 2020 at 1 802 hours per year. In the pandemic year of 2020, average working hours dropped by 5 per cent compared to 1,896 hours annually in 2019. Chart 12, Panel A shows the evolution of average hours of work in residential construction which was on a steady declining path leading to the pandemic since 200. Between 2000 and 2024, average hours of work in residential construction fell by about 0.1 per cent per year, with the fastest decline occurring between 1997-2008 at -0.37 per cent growth, followed by a negative growth rate of 0.24 per cent per year between 2008 and 2019, and a growth rate of 0.23 per cent per year between 2019 and 2024. As Chart 12, Panel B shows, business-sector average hours of work followed a similar path to that of residential construction until 2019 when they fell slightly despite their growth in residential construction.

Chart 12: Average Hours of Work, Canada, 2000-2024

Panel A: Residential Construction Industry



Panel B: Business Sector



Source: Statistics Canada. Table 36-10-0480-01. Labour productivity and related measures by business sector industry and by non-commercial activity consistent with the industry accounts.

to that of residential construction until 2019 when they fell slightly despite their growth in residential construction.

C. Total Hours of Work

Another metric of labour supply, and one that is commonly used for productivity analysis, is the total hours of work across all jobs in an industry. Total hours of work equal average hours of work multiplied by the number of employees in a sector. In 2024, residential construction workers supplied about 1.29 billion hours[13], down slightly from the 1.31 billion hours recorded in 2023.

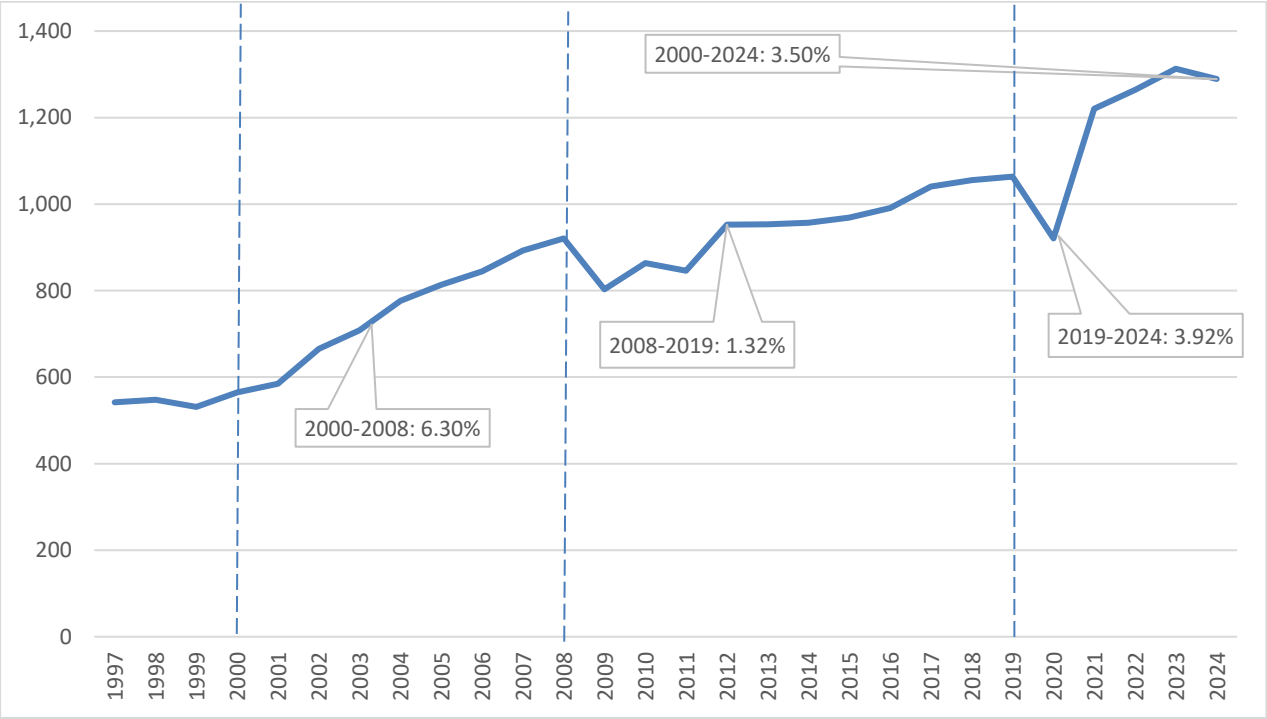
Chart 13, Panel A illustrates the changes in total hours of work in residential construction between 1997 and 2024.

- Between 2000 and 2024 total hours of work increased by about 3.5 per cent per year
- 2000-2008 still shows a strong rise of 6.3 per cent per year.
- 2008-2019 remains a much slower 1.3 per cent per year.
- Between 2019-2024, total hours grew by 3.9 per cent per year.

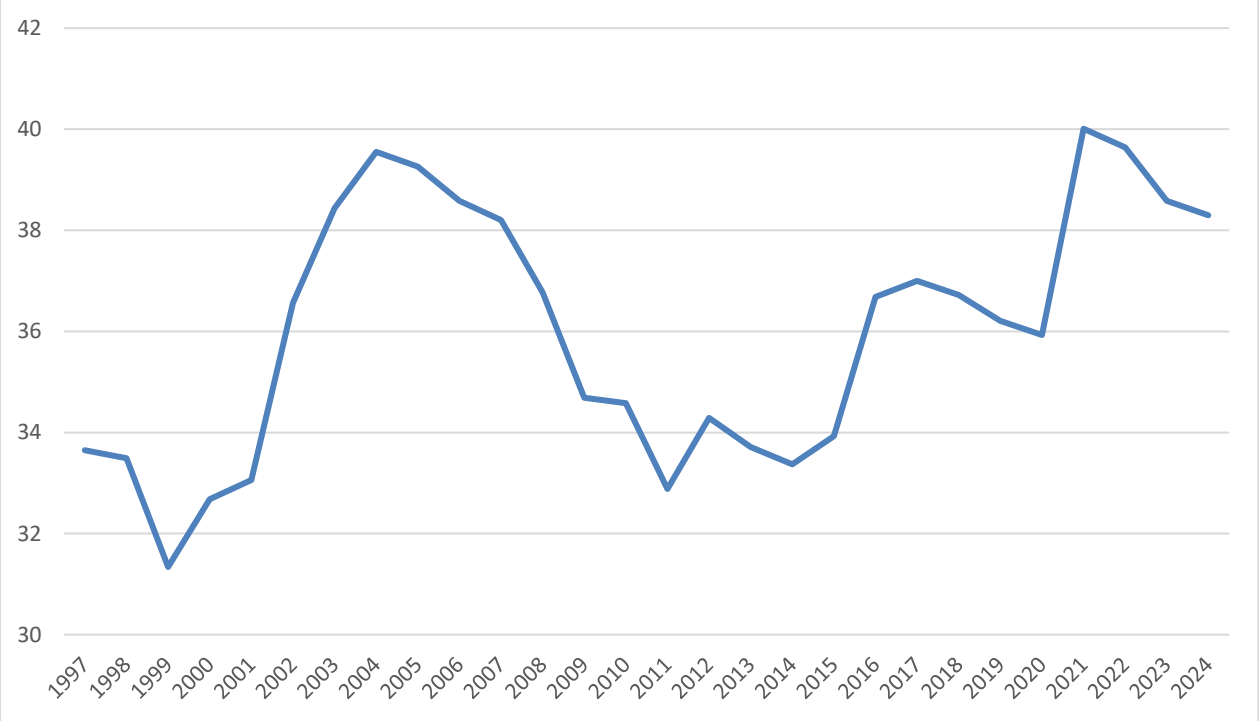
[13] 1.29 billion = 1,918 (Average hours of work annually) * 671,835 (Number of Jobs in residential construction)

Chart 13: Total Hours of Work, Canada, 2000-2024 (thousands)

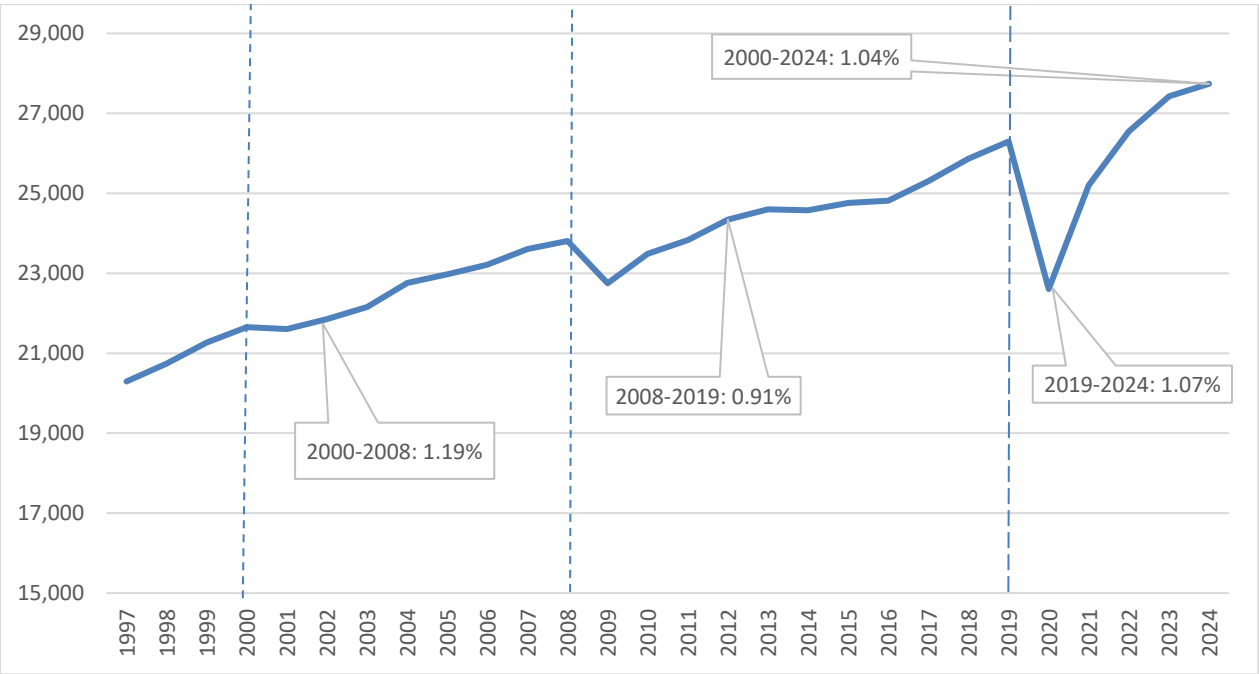
Panel A: Residential Construction Industry



Panel B: As Share of Overall Construction Sector (Per cent)



Panel C: Business Sector



Source: Statistics Canada. Table 36-10-0480-01. Labour productivity and related measures by business sector industry and by non-commercial activity consistent with the industry accounts.

As Chart 13, Panel B shows, residential construction represents a significant share of total hours worked in the construction sector. The share rose from 33.7 per cent in 1997 to 39.6 per cent in 2004, slipped to 32.8 per cent in 2011, climbed back to about 40 per cent in 2021, and then eased to 38.5 per cent in 2023 and 38.3 per cent in 2024.

Chart 13, Panel C confirms that total hours growth in the business sector has been much slower than in residential construction, especially in the 2000-2008 and 2008-2019 periods. From 2019-
2024 business sector hours increased by only about 1.1 per cent per year, versus the 3.9 per cent pace in residential construction.

Finally, the rise in residential construction hours over 2019-2024 was still driven mainly by hiring: employment grew by 3.7 per cent per year, while average hours per worker inched up by about 0.2 per cent per year.

IV: Residential Construction Labour Productivity

This section will take an in depth look at productivity data for the Canadian residential construction sector. For the purposes of this report, productivity is defined as real value added divided by total hours worked for the year in question. Statistics Canada[14] provides data on productivity and related measures for the total economy, the business sector, construction industry, and each sector of construction, all of which will be relevant to the discussion. Besides residential construction, there is non-residential building construction, which comprises commercial and office building; engineering construction, which builds infrastructure projects; and repair construction.[15]

A. Labour Productivity Developments

The section starts by providing a summary of the existing literature in residential construction productivity in Canada. After that a discussion of the overall trends from 2000 to 2024 is presented, followed by analysis for cyclically neutral periods of 2000-2008 and 2008-2019. Finally, the post-2019 productivity trends will be examined for the data from 2019-2024.

The issue of lagging construction productivity has been studied by numerous papers in recent decades. In the Canadian context, Sharpe (2001) documents that real output per hour in the construction sector in Canada in 2000 was well below levels achieved in the early 1980s. The study also finds that the construction sector did particularly poorly in the 1990s, with the level of output in 2000 still below that of 1989 and that employment growth in the construction sector was also well below the economy wide average. Sharpe (2001) points to several structural and cyclical factors behind lagging construction growth including the high interest rates in the late 1980s and early 1990s; large government deficits and spending cuts on public infrastructure and social housing, the slower rate of population growth, and the shift in employment from goods-producing to service-producing activities.

More recently with the worsening of housing crisis in Canada, studies have focused on various factors impacting residential construction productivity and its implications for the

[14] Statistics Canada. Table 36-10-0480-01 Labour productivity and related measures by business sector industry and by non-commercial activity consistent with the industry accounts

[15] The fifth sector in the dataset, other activities of the construction industry, will be omitted when discussing sectoral breakdowns in construction given that its share of hours worked in the construction industry has been less than 1 per cent in every year since 2000.

broader economy. Caranci et al. (2024) discuss the implications of the growing role of construction in the Canadian economy given its lack of productivity growth in the past forty years. The study highlights the differences in residential construction productivity across the country, suggesting that differences in regulations and permitting play a role in productivity performance. More than other sectors, construction is characterized by very small firms that have lower levels of productivity and are slower to adopt new technologies than larger firms (DesLauriers and Gagne, 2023). Since they also face larger regulatory burdens relative to their size than larger businesses, which materially weighs on productivity, it can be expected that these small firms are a drag to productivity growth in this sector (Tu, 2020). Caranci et al. (2024) argue that there are several 'low-hanging fruit' barriers to growth in construction such as building codes, permitting and licensing requirements that differ across provinces and make it difficult for firms to operate across jurisdictions. A lack of standardization is another challenge that makes innovation harder to scale up across the industry.

Studies in civil engineering have attempted to create comprehensive technical frameworks for measuring and promoting productivity gains in construction. In a 2-year study commenced with the collaboration of four contractors to investigate human, management, and external issues, Hewage and Ruwanpura (2006) recommend developing and analyzing a new expectancy model considering construction workers' effort and performance and the tool times observed to mitigate the reasons for non-tool time. Hewage (2007) highlights the importance of worker motivation, factors influencing worker skills and team spirit, and working efficiencies in the commercial construction industry of Calgary (Alberta) using an interview and questionnaire survey design. It advocates for improving on-site communication on construction projects by adding an information technology (IT) based communication system for on-site operations. Tsehayae and Fayek (2014) use Project Management (PM) and trade surveys to develop the rankings of the labour productivity parameter categories, with normalized category evaluation scores from both the building and industrial contexts.

Based on the PM survey respondents from the building and industrial contexts "equipment and tools" category (e.g., "adequate and quality work tools") was identified as the top ranked category positively contributing to labour productivity and global (e.g., "global economy's uncertainty in facing another slow down") and "engineering and instruction" (e.g., "drawings and specifications unavailability well ahead of implementation") having the most negative impact on labour productivity in the construction sector. The trade survey

Table 5: Compound Annual Growth Rates for Relevant Variables in Residential Construction, Canada, 2000-2024

Variable \ Period	2000-2024	2000-2008	2008-2019	2019-2024	2019-2021	2021-2024
Labour productivity	-0.4	-0.7	1.5	-3.8	0.3	-6.5
Hours worked	3.5	6.3	1.3	3.9	7.1	1.8
Employment	3.7	6.7	1.6	3.7	7.6	1.1
Real value added	3.1	5.5	2.9	-0.1	7.4	-4.8
Hourly compensation	2.8	3.5	1.9	3.7	4.5	3.2
Unit labour cost	3.2	4.3	0.4	7.9	4.2	10.4

Source: Statistics Canada. Table 36-10-0480-01 Labour productivity and related measures by business sector industry and by non-commercial activity consistent with the industry accounts

respondents from the building context identified "foreman" as the top category having positive effects on labour productivity, while industrial context trade respondents identified "labour and crew" category. The trade respondents from the building context identified "material and consumables" as the top category having negative productivity effects while industrial context trade respondents identified "equipment and tools" category.

2000-2024[16]

From 2000 to 2024, the residential construction sector experienced negative productivity growth, declining at a rate of 0.4 per cent per year. Table 5 illustrates that this fall in residential construction productivity was driven by the faster growth of the total number of hours worked (3.5 per cent per year) compared to the growth in output (3.1 per cent per year) in this period.[17]

The gap between the growth in hours worked and the growth in real output means that more labour was required to produce a given unit of real output in 2024 than in 2000. This trend is also seen in the total-construction industry, as growth of hours worked has outpaced growth of real output, creating a similar annual average productivity decline. When

[16] The focus of this report throughout this section is explaining the trends in growth in labour productivity rather than labour productivity levels. Construction Sector Council (2007: Table 2) documents output and productivity growth for the residential construction sector going back to 1961. Such data is not available in the most recent published Statistics Canada productivity tables. It is worth noting that residential construction labour productivity grew at 1.1 per cent per year between 1961-2003 which was almost the same as the construction sector's productivity growth at 1.2 per cent.

[17] Real output in residential construction increased much faster (growing at 3.1 per cent per year) than real output in the total economy, which grew at only 1.9 per cent per year on average during the same period.

compared with the overall economy, these productivity declines in construction appear particularly troubling. From 2000 to 2024, labour productivity in the total economy

Table 6: Labour Productivity and Hours, Construction Sector and Sub-industries, Canada, 2000-2024

Industry	Hours Share in 2000	Hours Share in 2024	Labour Productivity in 2000 (Chained 2017 Dollars)	Labour Productivity in 2024 (Chained 2017 Dollars)	Labour Productivity as a Share of Total Economy in 2000 (Percent)	Labour Productivity as a Share of Total Economy in 2024 (Percent)	CAGR: 2000-2024
All Industries	100	100	52.3	63.2	100	100	0.79
Construction Sector	6.41	9.37	51.4	49.2	98.3	77.8	-0.18
Residential Construction	2.10	3.59	45.8	42.0	87.6	66.5	-0.36
Non-Residential Construction	1.38	1.46	53.1	44.6	101.5	70.6	-0.72
Engineering Construction	1.48	2.25	68.9	66.6	131.7	105.4	-0.14
Repair Construction	1.41	2.02	36.7	43.8	70.2	69.3	0.74
Other activities	0.05	0.05	55.1	172.9	105.4	273.6	4.88

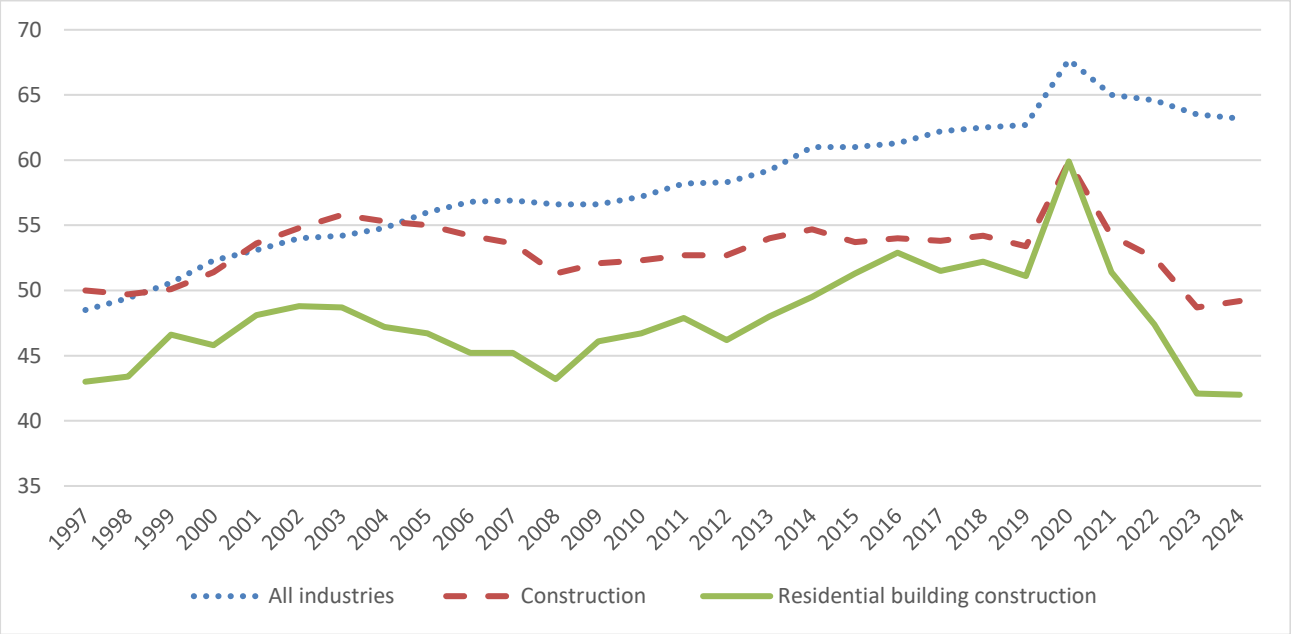
Source: Statistics Canada. Table 36-10-0480-01 Labour productivity and related measures by business sector industry and by non-commercial activity consistent with the industry accounts

increased at an average rate of about 0.8 per cent per year. As workers in Canada became more productive on average, those in the residential construction industry became less productive both in absolute terms, and also relative to the overall economy, as seen in Chart 14.

While a residential construction worker was only 88 per cent as productive as the average Canadian worker in 2000 (in real terms), they were about 70 per cent as productive in 2024, the lowest point in any year in the time series Appendix Chart A1, Panel C. As Table 6 shows,

other sectors of the construction industry have also experienced low or negative productivity growth.

Chart 14: Labour Productivity in Residential Construction, Construction and the Total Economy, Canada, 1997-2024 (2017 Dollars per hour)

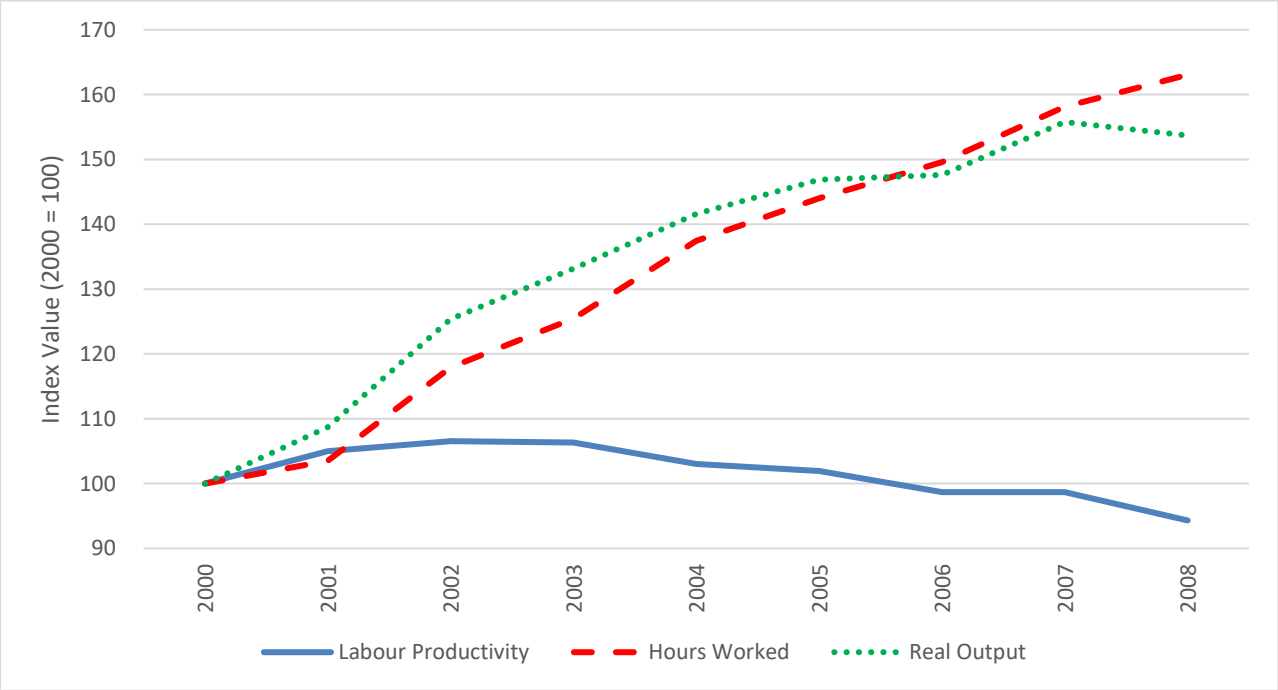


Statistics Canada. Table 36-10-0480-01 Labour productivity and related measures by business sector industry and by non-commercial activity consistent with the industry accounts

Non-residential building construction is the poorest performer, with an annual-average productivity growth rate of -0.7 per cent from 2000 to 2024. Its level of productivity in 2024 was about 9 per cent below the construction-industry average and 29 per cent lower than the average for the total economy. While the repair-construction sector has a slightly higher level of productivity than the residential sector, its growth rate has been higher: repair-construction productivity increased by about 0.7 per cent per year on average from 2000 to 2024, a bright spot in the construction industry, albeit still below the total-economy average growth rate of about 0.8 per cent per year. Real output per hour in 2024 for repair construction was $1.8 above residential construction (in chained 2017 dollars) and $5.4 below the construction-industry average. Engineering construction has by far the highest level of productivity among the construction sectors, measured at about $66.6 per hour worked in 2024, which is $17.4 above the construction-industry average. However,

productivity growth for engineering construction declined from 2000 to 2024 at a rate of about -0.1 per cent per year.

Chart 15: Labour Productivity, Hours and Real Output in Residential Construction, Canada, 2000-2008 (index= 100 in 2000)



Source: Statistics Canada. Table 36-10-0480-01 Labour productivity and related measures by business sector industry and by non-commercial activity consistent with the industry accounts.

2000-2008

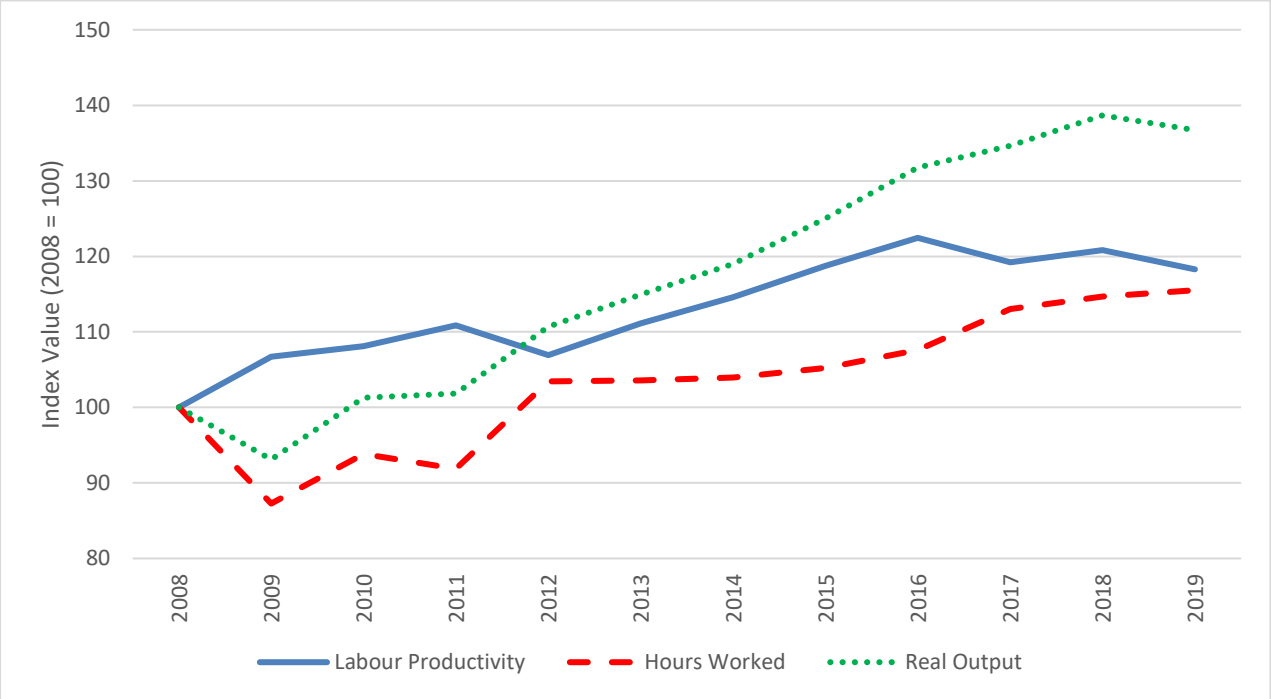
Productivity in residential construction fell at an average rate of 0.7 per cent per year during the cyclically neutral period from 2000 to 2008, as seen in Chart 15.

This period is most notable for the surge in total hours worked in residential construction. Over the eight-year time span, hours worked grew at a rate of 6.3 per cent per year, outpacing both the growth rates of the construction industry (4.8 per cent) and the total economy (1.4 per cent).[18] Real output in the sector was also increasing rapidly, averaging 5.5 per cent annual growth. This growth rate of real output again eclipsed those of the

[18] This led to the residential sector accounting for 40 per cent of hours worked in construction in 2004, a peak that has not been reached since.

construction industry and the total economy, which averaged 4.7 per cent and 2.4 per cent annual increases respectively. This large increase in hours worked and real output in residential construction was characteristic of the housing boom in the United States and Canada that culminated in the Global Financial Crisis of 2007-2008. While annual growth

Chart 16: Labour Productivity, Hours and Real Output in Residential Construction, Canada, 2008-2019 (index= 100 in 2008)



Source: Statistics Canada. Table 36-10-0480-01 Labour productivity and related measures by business sector industry and by non-commercial activity consistent with the industry accounts.

in real value added (10.0 per cent) exceeded annual growth in hours worked (7.9 per cent) from 2000 to 2003, this trend reversed in the latter years of the period. From 2004 to 2008, hours worked, and real value added grew at average annual rates of 4.4 per cent and 2.1 per cent respectively.

2008-2019

From 2008 to 2019, residential construction productivity grew at an impressive rate of 1.6 per cent per year, as seen in Chart 16. As Appendix Table A1 shows, this growth rate was the highest among the four construction sectors, and even higher than the 1.0 per cent annual growth in productivity in the total economy during this period. This productivity improvement was especially notable given that the period from 2008 to 2019 also saw labour productivity growth in both construction and the total economy. This cyclically

neutral period had a higher growth rate of labour productivity for the total economy than in the preceding and succeeding periods. Except for engineering, the same is true for all sectors in construction, and the construction industry overall. This cyclically neutral period was a very bright spot for productivity in the sector.

Table 7: Hours worked and Real Value Added in Residential Construction, Canada, 2019-2024

Year	2019	2020	2021	2022	2023	2024	Percent Change: 2020	Percent Change: 2021	Percent Change: 2022	Percent Change: 2023	Percent Change: 2024
Real value added (millions of chained 2017 dollars)	54,387	55,155	62,728	59,953	55,303	54,158	1.41	13.7	-4.42	-7.76	-2.07
Hours worked (millions)	1,063	921	1,220	1,264	1,313	1,289	-13.4	32.5	3.62	3.84	-1.83
Labour Productivity (chained 2017 dollars per hour)	51	60	51	47	42	42	17.2	-14.2	-7.78	-11.2	-0.24

Source: Statistics Canada. Table 36-10-0480-01 Labour productivity and related measures by business sector industry and by non-commercial activity consistent with the industry accounts

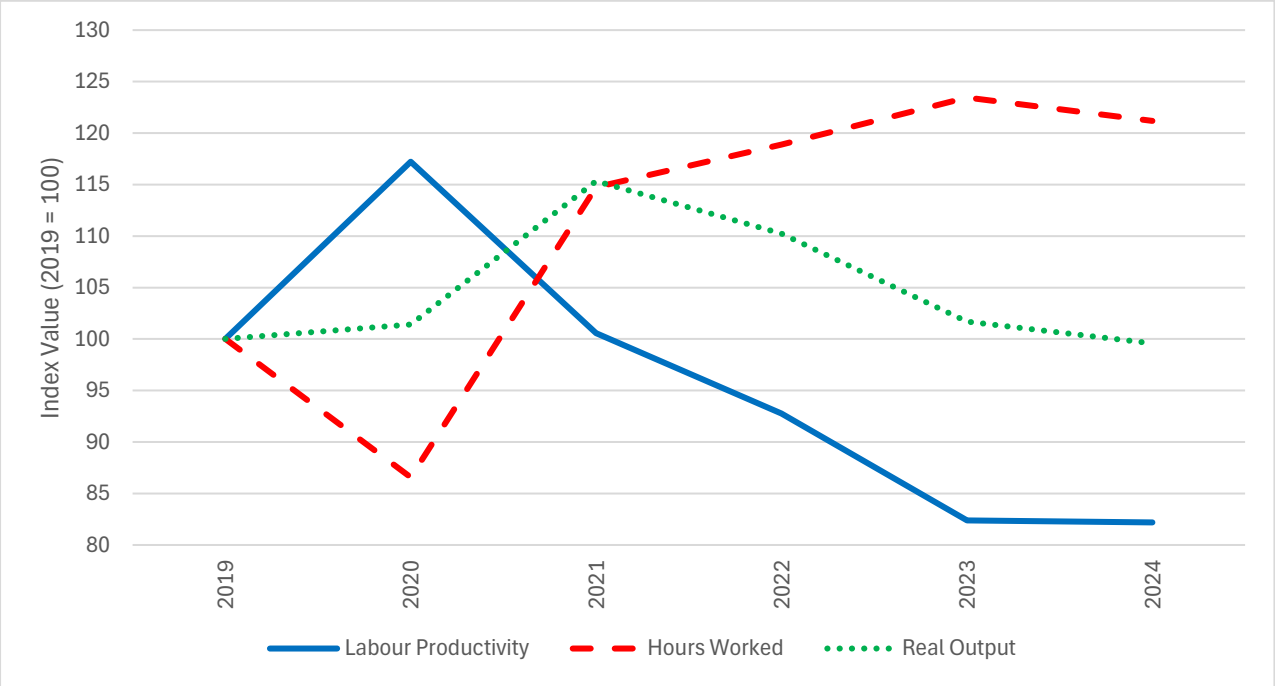
2019-2024

The productivity advances made from 2008 to 2019 have been reversed in recent years. From 2019 to 2024, productivity in residential construction decreased by 3.8 per cent per year on average. This period is characterized by a large productivity increase in 2020, followed by four straight years of decline (Table 7). While this trend was also seen in the total economy, the magnitude of the productivity swing has been significantly more muted (Appendix Table A1).

The total economy's productivity level experienced low growth from 2019 to 2024, at an average annual rate of 0.2 per cent. Appendix Table A1 illustrates that the only construction sector with productivity gains in the period was engineering construction, which grew by about 1.2 per cent per year on average. Non-residential building and repair-construction

productivity both declined, at rates of roughly 6.8 per cent and 2.9 per cent, respectively, which contributed to the 2.6 per cent annual decrease in productivity in the overall construction industry during the period.

Chart 17: Labour Productivity in Residential Construction, Canada, 2019-2024 (2017 Chained dollars per hour)



Source: Statistics Canada. Table 36-10-0480-01 Labour productivity and related measures by business sector industry and by non-commercial activity consistent with the industry accounts.

Due to layoffs in the first months of the Covid-19 pandemic, hours worked in residential construction plunged 14.1 per cent in 2020. Real value added nevertheless inched up 1.4 per cent, lifting labour productivity by 17.9 per cent, the highest level in the series. At that peak, residential construction productivity sat only 11.6 per cent below the all-industry average, an improvement from the 12.4 per cent gap in 2000. The surge proved short-lived. As demonstrated in Chart 17, Hours ballooned in 2021 growing at 32.5 per cent and hitting a record 1.22 billion, while real output rose only 13.0 per cent, so productivity fell 10.1 per cent. Output then dropped -4.7 per cent in 2022, -9.7 per cent in 2023 and a further -2.1 per cent in 2024. Hours edged higher in 2022 (4.1 per cent) and 2023 (2.9 per cent) before slipping -1.8 per cent in 2024. Productivity therefore fell 8.5 per cent in 2022, 12.2 per cent in 2023 and a marginal 0.2 per cent in 2024. Over the full 2019-2024 span, hours grew 3.9

per cent per year, while real value added ticked down 0.1 per cent per year; productivity therefore contracted 3.8 per cent per year.

Table 7: Compound Annual Growth Rates for Labour Productivity by Industry, Canada, 2000-2024 (Per cent)

Industry / Period	Construction	Construction Excluding Residential	Residential building construction	Total economy
2000-2008	0.0	0.4	-0.7	1.0
2008-2019	0.4	-0.2	1.5	0.9
2019-2024	-1.6	-0.4	-3.8	0.2
2000-2019	0.2	0.1	0.6	1.0
2000-2024	-0.2	0.0	-0.4	0.8

Source: Statistics Canada. Table 36-10-0480-01 Labour productivity and related measures by business sector industry and by non-commercial activity consistent with the industry accounts

Productivity growth rates and related variables for the residential construction sector are shown in Table 8. After breaking down the trends in labour productivity from 2000 to 2024 by cyclically neutral periods, it is clear that the residential construction sector has experienced two different productivity problems. Firstly, the period from 2000 to 2019 is characterised by slow growth rather than decline. Negative growth from 2000 to 2008 was offset by the growth from 2008 to 2019, resulting in an overall annual growth rate of 0.6 per cent for residential construction.

While higher than the construction-industry average annual growth rate of 0.3 per cent, residential construction still lagged productivity growth in the total economy, which grew by 1 per cent per year from 2000 to 2019. Comparisons of growth rates between residential construction, overall construction, and the total economy can be seen in Table 8.

Secondly, there has been a sharp decline in residential construction productivity from 2019 to 2024. In this period, real value added fell despite large increases in hours worked. Given that productivity advances from 2000 to 2019 were modest, this recent trend of decline has sent the productivity level in residential construction back to a low not seen in decades. However, it is worth noting the period of 2019 to 2024 is not cyclically neutral. As the economy continues to grow, a future year will mark the peak of economic activity, providing a full cyclically neutral period that will tell a more complete story of productivity since 2019.

B. Contribution to the Total Economy and Construction Sector Productivity

Residential building construction's swing in labour productivity has had effects on overall construction productivity that are far larger than its share of hours would suggest. Residential accounted for 32.7 per cent of total construction hours in 2000, 36.2 per cent in 2019 and 38.3 per cent in 2024. From 2000 to 2019, residential labour productivity rose 1.5 per cent per year while overall construction productivity rose only 0.2 per cent per year. If residential had contributed in strict proportion to its 2000 hours share, it would have added just 0.1 percentage point per year to the aggregate. Instead, multiplying its actual growth by its share implies a contribution of 0.5 percentage point per year. The remainder of construction therefore must have subtracted about 0.3 point, leaving the total at 0.2 per cent. The pattern reverses in 2019 to 2024. Residential productivity fell 3.8 per cent per year versus a 1.6 per cent annual decline for construction overall. On a proportional basis (using the 2019 share) residential would have contributed a -0.6 point drag; in fact, its within-sector collapse pulled the aggregate down by about -1.38 points (about 85 per cent of the total decline), implying the rest of construction reduced productivity by only about -0.2 point. Using the average 2019 to 2024 hours share (37.3 per cent) pushes the residential drag to roughly -1.4 points. In short, residential construction lifted aggregate construction productivity more than proportionally in the long pre pandemic expansion and has weighed it down more than proportionally in the post 2019 period.

As Table 9 shows, across the rest of the economy, only a handful of two-digit industries follow the same three-stage arc that afflicts construction—sluggish growth in 2000-08, a brief revival in 2008-19, and a decisive slide after 2019. Utilities matches that trajectory most closely: productivity rose just over 1 per cent per year before the financial crisis, edged up another 0.9 per cent in the long expansion, then plunged 3.4 per cent annually in 2019-24. Manufacturing and administrative-and-support services show a milder version of the same pattern, moving from modest gains pre- and post-2008 to small outright declines in the most recent period. By contrast, most goods and service sectors kept positive momentum after 2019—retail, information and cultural industries, finance and insurance, and real-estate activities all continued to post gains, while agriculture maintained the strongest long-run record of any sector. The up-shot is that the construction complex, and especially its residential branch, is almost alone in converting a mid-period rebound into a sustained post-2019 collapse, leaving its long-term productivity trend firmly negative while the wider economy still clocks average annual gains of 0.8 per cent.

Table 9: Labour Productivity CAGR for Two-Digit NAICS Industries and Residential Construction, 2000-2024

Industry	2000-2024	2000-2008	2008-2019	2019-2024
All industries	0.79	0.99	0.93	0.16
Agriculture, forestry, fishing and hunting	2.65	1.89	3.73	1.52
Mining and oil and gas extraction	-0.93	-4.47	1.36	-0.13
Utilities	0.03	1.07	0.87	-3.38
Construction	-0.18	-0.02	0.37	-1.62
Residential building construction	**-0.36**	**-0.73**	**1.54**	**-3.85**
Manufacturing	0.64	1.08	0.76	-0.33
Wholesale trade	2.01	3.27	1.85	0.38
Retail trade	1.65	2.69	1.02	1.39
Transportation and warehousing	0.82	1.57	0.37	0.60
Information and cultural industries	1.61	2.69	0.91	1.43
Finance and insurance	1.92	1.70	2.64	0.68
Real estate, rental and leasing	0.71	0.19	0.70	1.57
Professional, scientific and technical services	0.51	0.45	0.65	0.31
Administrative and support, waste management and remediation services	0.29	0.72	0.50	-0.86
Educational services	0.94	1.43	-0.40	3.16
Health care and social assistance	-0.63	0.09	-0.52	-2.04
Arts, entertainment and recreation	0.32	-1.01	0.08	3.03
Accommodation and food services	0.54	0.84	0.12	1.00
Other private services	1.14	1.42	1.03	0.94

Source: Statistics Canada. Table 36-10-0480-01 Labour productivity and related measures by business sector industry and by non-commercial activity consistent with the industry accounts

To better identify the contribution of the residential construction to overall construction sector, we use the decomposition method developed by Sharpe (2010) which breaks down aggregate productivity growth into within-sector effects and re-allocation effects. This method effectively weighs the contributions of each industry to aggregate productivity growth both based on their hours shares and productivity levels and growth rates. We modify the decomposition slightly and apply it once to the business sector as the aggregate sector, and then to the construction industry as the aggregate sector to obtain the within-

industry and re-allocation effects. Mathematically, the decomposition can be expressed as follows:

$$\Delta \mathrm{P} \quad = \sum_i \mathrm{h}_i^o \Delta \mathrm{P}_i + \sum_i (P_i^0 - \bar{P}^0)\Delta h_i + \sum_i \Delta h_i \, (\Delta P_i - \Delta \bar{P}_i) \quad (3)$$

Where P is the overall business sector (construction industry) labour productivity level , Pi is the labour productivity level in 2-digit (3-digits construction industry) i , h is the share of total sector-wide labour hours which is employed in the 2-digits (3-digit industry) i, the subscript 0 indicates a variable in time 0 (the beginning of the period) as opposed to time 1 (the end of the period), Δ indicates change over the period, and ΔP is the average change in business sector (construction sector) productivity levels. The first term in the decomposition captures the "Within-sector" effects which reflect the productivity growth within each 2-digit industry (3-digit industry) that contributes to the to overall productivity growth in the business sector (construction industry). The second term in equation (3) is the "re-allocation level" effect which is the ceteris paribus effect of net labour influx into 3-digit industries with higher-than-average productivity (relative to the average of the business sector or construction industry depending on the level of aggregation). The last term in the same equation represents what we refer to as the "re-allocation growth" effect that demonstrates the sector-wide (industry-wide) productivity growth implications of the net movement of workers into 2-digit (3-digit industries) that have higher than average productivity growth rates (relative to the average of the business sector or construction industry depending on the level of aggregation).

The next section applies this decomposition framework to the 2000-2024 period to identify the contributions of the three effects to the declining productivity growth in the construction industry.

Construction-sector labour productivity fell by 0.18 per cent per year in Canada between 2000 and 2024, with non-residential building construction showing the steepest drop (-0.72 per cent per year), closely followed by residential building construction (-0.36 per cent per year). Engineering construction posted a small decline (-0.14 per cent per year), whereas repair construction and "other activities" recorded gains of 0.74 and 4.88 per cent per year, respectively.

As Table 10 illustrates, 91 per cent of the fall in construction sector labour productivity can be explained by the within-sector fall in productivity. The within-sector fall in labour

Table 10: Contributions to Construction Productivity Growth, 3-digit Industries, 2000-2024 (percentage points)

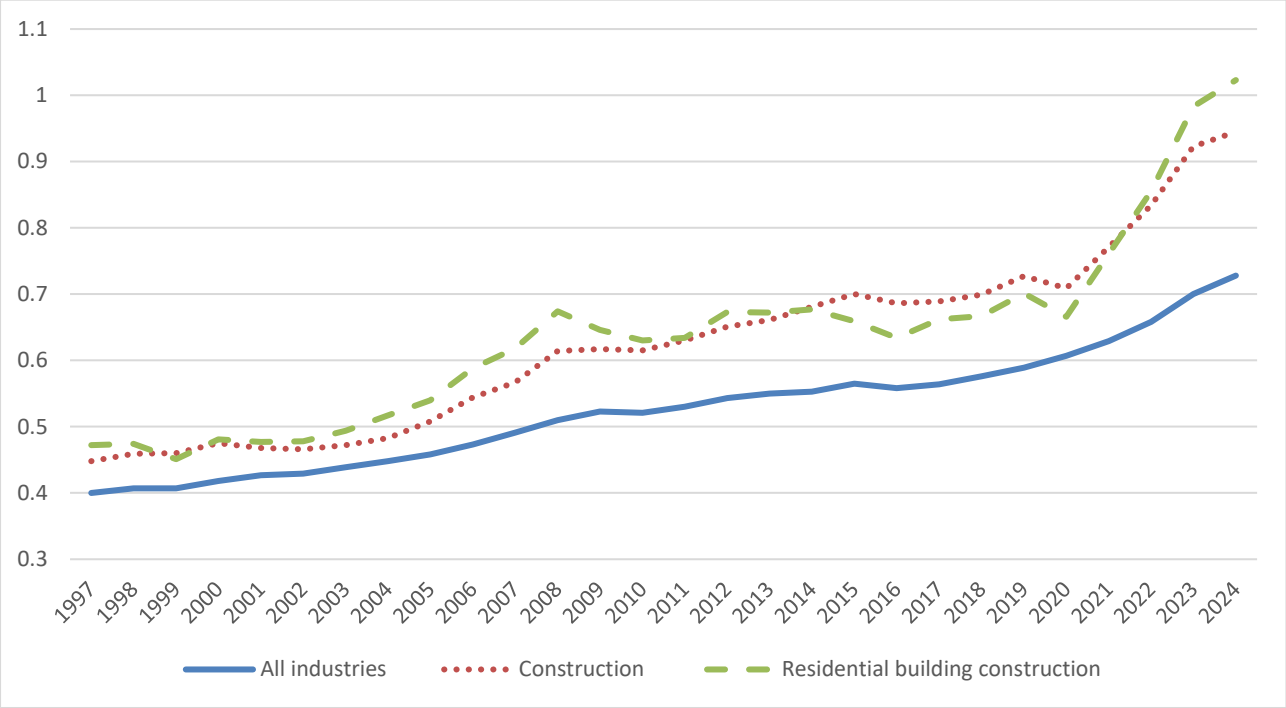
Region	Within-Sector (1)	Reallocation Level (2)	Reallocation Growth (3)	Summed Effect (4 = 1+2+3)
Construction	-0.10	-0.02	0.00	-0.11
Residential building construction	-0.10	-0.03	-0.01	-0.14
Non-residential building construction	-0.15	-0.01	0.03	-0.13
Engineering construction	-0.04	0.01	0.00	-0.03
Repair construction	0.13	0.01	0.00	0.13
Other activities of the construction industry	0.07	0.00	-0.02	0.05

Source: CSLS calculations

productivity in residential is the most significant contributing factor to this decline (90 per cent) followed by the non-residential construction (133 per cent). The reallocation level effect in residential construction has contributed 14 per cent to the fall in the overall construction sector productivity and reallocation growth effect's contribution has been at 0 per cent.[19]

[19] Statistics Canada does not publish multifactor-productivity (MFP) estimates for residential construction, so we rely on construction-sector figures, noting that residential work comprises roughly forty per cent of that sector. From 2000 to 2024 construction MFP declined at a compound rate of 0.5 per cent per year, compared with a 0.2 per cent annual drop in the business sector. The path is cyclical: 2000-2008 recorded a small loss of 0.1 per cent per year; 2008-2019 was flat; 2019-2024 saw a sharp fall of 2.3 per cent per year, while the business sector slipped only 0.3 per cent per year. Brouillette et al. (2024) project no revival in construction MFP through the 2020s. Given residential construction's weight, it almost certainly mirrors these trends.

Chart 18: Unit Labour Costs, Residential Construction, Construction and the Total Economy, Canada, 1997-2024 (Dollars per unit of real GDP)



Statistics Canada. Table 36-10-0480-01 Labour productivity and related measures by business sector industry and by non-commercial activity consistent with the industry accounts

C. Unit Labour Costs

Unit labour costs (ULC) represent the cost of labour required to produce one unit of output. They show the relationship between wages and productivity by measuring how much businesses pay workers relative to the value of what they produce. A rise in ULC can indicate that wages are increasing faster than productivity, which may lead to higher prices (inflation) if businesses pass costs onto consumers.

Conversely, if productivity grows faster than wages, ULC decrease, making production more efficient and competitive. Chart 18 shows the unit labour costs in residential construction, construction and the total economy in Canada. ULC have been rising across all industries and overall construction as well as residential construction between 2000 and 2024. As Table 11 shows, ULC have risen more rapidly in residential construction than elsewhere in the 2000-2024 period. Between these years, ULC in all industries increased by 2.3 per cent per year, compared with 2.9 per cent in the broader construction sector and 3.2 per cent in residential construction—evidence that the latter has lost the most cost-competitiveness.

Table 8: Compound Annual Growth Rates for Unit Labour Costs in the Construction Industry and All Industries, Canada, 2000-2024 (per cent)

Year	Residential Construction	Construction	Construction Excluding Residential	All Industries
2000-2024	3.19	2.91	2.75	2.34
2000-2008	4.31	3.26	2.74	2.52
2008-2019	0.36	1.55	2.14	1.32
2019-2024	7.85	5.39	4.12	4.33

Statistics Canada. Table 36-10-0480-01 Labour productivity and related measures by business sector industry and by non-commercial activity consistent with the industry accounts

During the first cycle (2000-2008) residential ULC jumped 4.3 per cent per year, outpacing construction's 3.3 per cent and the all-industry average of 2.5 per cent. Growth then slowed sharply: between 2008 and 2019, residential ULC crept up by only 0.4 per cent per year, versus 1.5 per cent in construction and 1.3 per cent economy wide. That respite proved temporary. In the post-pandemic span (2019-2024) residential ULC surged again, rising 7.9 per cent per year, well above the 5.4 per cent increase for construction as a whole and the 4.3 per cent gain across all industries.

Construction excluding residential has likewise seen its cost-competitiveness erode, but at a pace that splits the difference between the residential boom-bust pattern and the broader economy. Unit labour costs in this segment rose 2.8 per cent per year from 2000 to 2024—faster than the 2.3 per cent increase across all industries, yet slower than the 3.2 per cent surge in residential construction. During the 2000-08 upswing, its ULCs climbed 2.7 per cent annually, again below the 4.3 per cent jump in residential but above the economy-wide 2.5 per cent. Gains moderated to 2.1 per cent a year between 2008 and 2019, mirroring the mid-cycle pause seen in residential and keeping in step with the 1.3 per cent rise for all industries. The post-2019 period, however, brought a renewed squeeze: from 2019 to 2024-unit labour costs in construction excluding residential accelerated to 4.1 per cent per year—significantly lower than the 7.9 per cent spike in residential building and slightly below the 4.3 per cent recorded for the economy as a whole. These figures show that the post-2019 period has been somewhat positive for construction excluding residential from a ULC perspective. They also confirm that while labour-cost pressures are now pervasive across

the entire construction sector, residential construction has been the main driver of the rising ULC in the sector post.

D. Hourly Labour Compensation

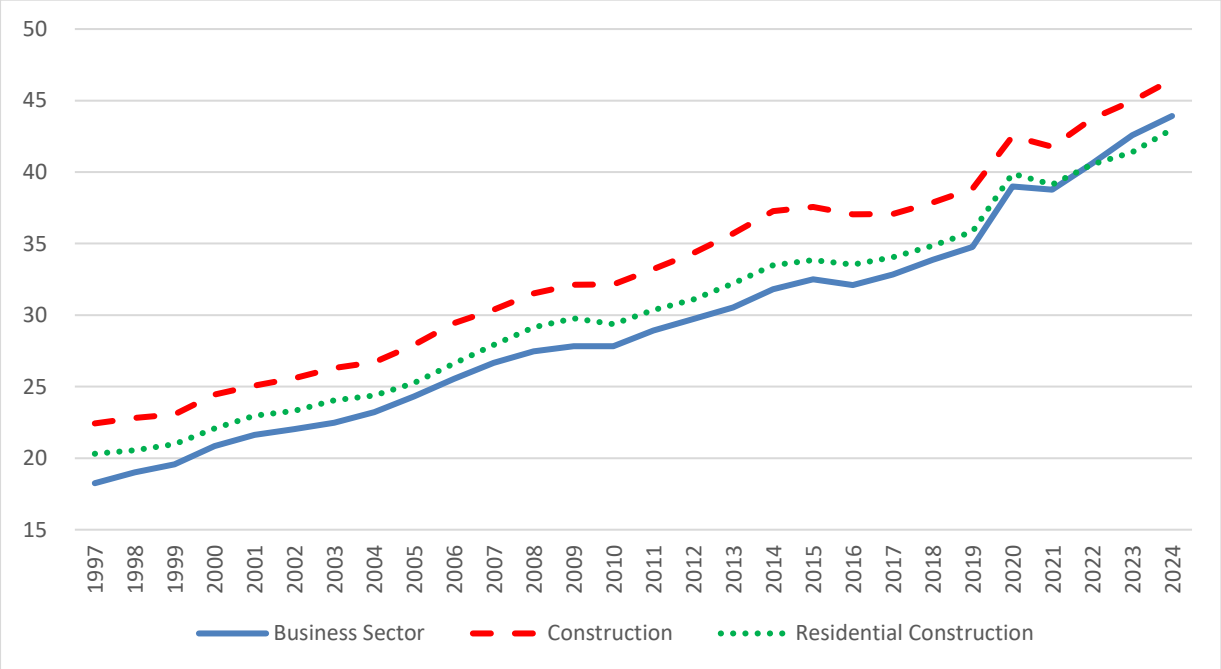
Nominal hourly labour compensation is the ratio between total compensation for all jobs and the number of hours worked. Chart 19 shows the evolution of nominal wages in residential construction, overall construction and the business sector in Canada between 1997 and 2024. Nominal hourly wages have risen across all three groupings, with construction wages consistently the highest and residential construction wages in the middle—until 2022, when business-sector wages surpassed those in residential construction for the first time and have remained higher since.

To better understand these trends, Table 12 reports growth rates in nominal wages for residential construction, overall construction and the business sector between 2000 and 2024. Over that span, residential construction wages grew by 2.8 per cent per year, construction wages by 2.7 per cent, and business-sector wages by 3.2 per cent.

Residential construction wages expanded in 2000-2008, rising 3.5 per cent per year, essentially matching the business sector (3.5 per cent) and outpacing overall construction (3.2 per cent). Wage growth then decelerated across all sectors: in 2008-2019 residential construction wages increased by only 1.9 per cent per year, down sharply from the previous period, while construction and business-sector wages advanced 1.9 per cent and 2.2 per cent per year, respectively.

The most notable development came in 2019-2024. Residential construction wages rebounded to 3.7 per cent per year, but this still trailed the business sector (4.8 per cent) and stayed below overall construction (3.7 per cent), underscoring continued upward pressure on economy-wide pay that is also reflected in the residential construction labour market.

Chart 19: Nominal Hourly Labour Compensation, Canada, 2000-2024 (Dollars per hour)



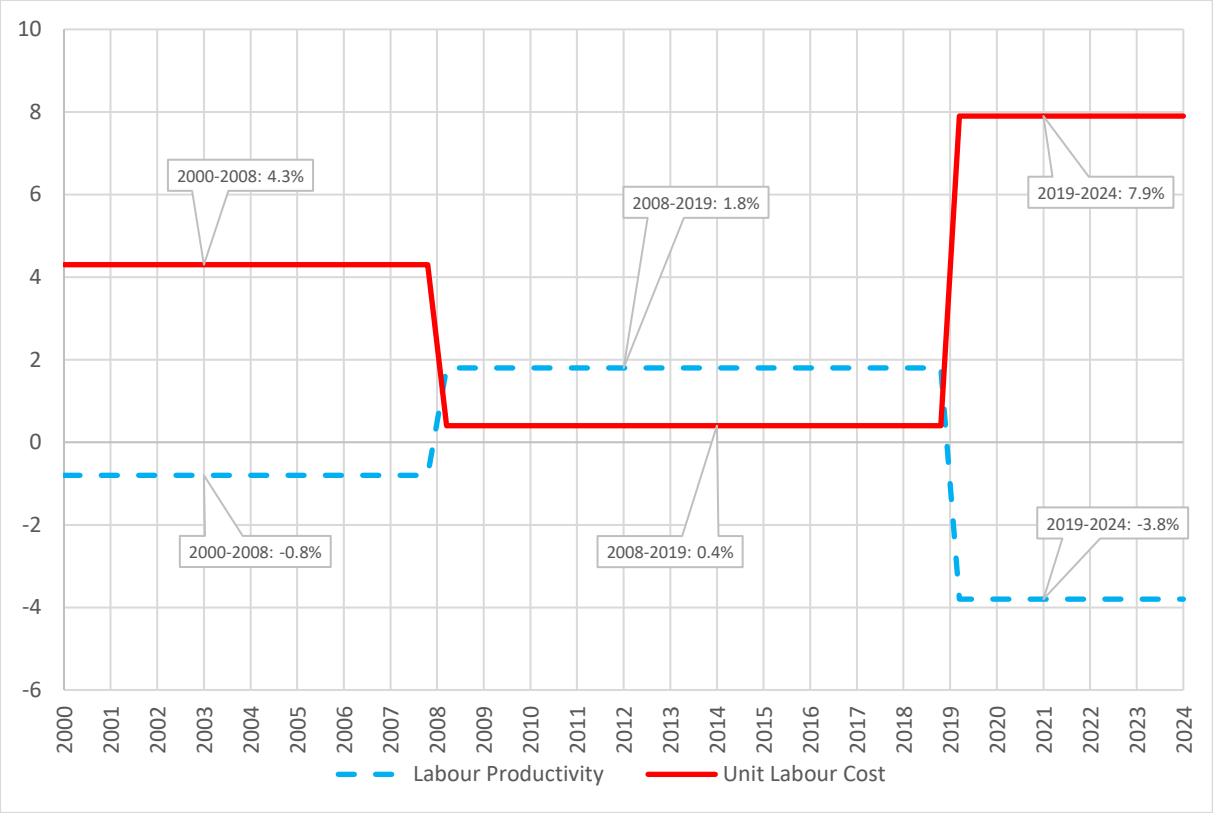
Source: Statistics Canada. Table 36-10-0480-01 Labour productivity and related measures by business sector industry and by non-commercial activity consistent with the industry accounts

Table 9: Compound Annual Growth Rates for Nominal Hourly Compensation in the Construction Industry and Business Sector (per cent)

Year	Construction	Residential Building Construction	Business Sector Industries
2000-2024	3.15	2.71	2.82
2000-2008	3.51	3.23	3.53
2008-2019	2.17	1.91	1.90
2019-2024	4.78	3.65	3.71

Source: Statistics Canada. Table 36-10-0480-01 Labour productivity and related measures by business sector industry and by non-commercial activity consistent with the industry accounts

Chart 20: Residential Construction Labour Productivity and Unit Labour Cost Growth Rate Averages, 2000-2008, 2008-2019 and 2019-2024, Canada



Note: 2000-2008 and 2008-2019 are cyclically neutral periods.
Source: Statistics Canada. Table 36-10-0480-01 Labour productivity and related measures by business sector industry and by non-commercial activity consistent with the industry accounts

E. Implications of Residential Construction Productivity Growth for Housing Prices

This section explores the implications of the poor productivity performance of residential construction sector for housing affordability. Chart 20 provides a visual illustration of the negative relationship between ULC and labour productivity. Both 2000-2008 (cyclically neutral period) and 2019-2024 periods experienced negative productivity growth of 0.8 per cent per year and 3.8 per cent per year respectively.

These productivity declines were associated with increases in ULC by 4.3 and 7.9 per cent per year respectively. Conversely, the strong 1.8 per cent per year growth rate in residential construction labour productivity in 2008-2019 coincided with a considerably slower ULC growth which only increased by 0.4 per cent per year.

To gauge what productivity growth meant for costs, we project alternative productivity paths from the 2019 starting point through 2024, while *holding the actual path of nominal hourly compensation fixed* (observed 3.7 per cent per year over 2019-2024). We then recompute the implied 2024 ULC and compare it with the actual outcome.

Finally, we scale the resulting gap between projected ULC values and observed ones by 2024 residential construction investment ($102.4 billion) to get an estimate of the gross dollar impact *if* every labour-cost saving flowed directly into project prices.[20] Because labour in residential construction accounts for roughly 32 per cent of total building cost in the 2021 Supply-and-Use tables for NAICS 2361[21], we also show a "cost-structure" savings estimate that applies the ULC gap only to the labour cost proportion of the total housing costs.

The four scenarios:

1. **Scenario A –** Continue the strong pre-pandemic residential trend (use 2008-2019 CAGR = 1.5 per cent per year growth). Productivity would have risen instead of falling, trimming ULC to about 76 per cent of the actual 2024 level, yielding 8 billion dollars in savings after adjusting for the proportion of labour cost in total housing costs.
2. **Scenario B –** Continue the broader 2000-2019 residential trend (0.6 per cent per year growth). Productivity still improves modestly; ULC would run about 80 per cent of actual resulting in 7 billion dollars in savings considering the proportion of labour cost in total housing costs.
3. **Scenario C –** Match the *total-economy* 2019-2024 productivity performance (0.16 per cent per year growth). Even this very modest gain would have muted ULC

[20] The $102.4 billion figure used in the scenarios is current-dollar residential construction investment in 2024 from Annual summary in The Daily: Investment in building construction, December 2024 (Released: 2025-02-13). That investment aggregate covers spending on new residential structures, renovations, and ownership transfer costs (legal fees, real-estate commissions, etc.) for dwellings.

[21] Compensation of employees (COE) was estimated to be $ 34.1 billion (Counted 100 per cent as labour cost.)
in 2021 Supply-and-Use tables. Mixed income (unincorporated owner-operators) was $ 14.5 billion (Treated 60 per cent (≈ $ 8.7 billion) as labour, the rest as proprietor profit/overhead.) Total labour cost was obtained to be = $ 42.8 billion given by COE + 0.60 × Mixed income. Those labour costs were compared with the SUT output of the residential-building-construction product at purchaser's price (materials + labour + equipment + overhead + profit, land and design fees excluded), which was about $ 135 billion in 2021. Dividing 42.8 / 135 ≈ 31.8 per cent, which were rounded to 32 per cent. We note that the total labour compensation reported in Statistics Canada Table 36-10-0480-01 for residential construction in 2021 was $ 47.7 billion which is fairly close to the 42.8 billion estimate from Supply-and-Use Tables.

growth; aggregate ULC falls to about 82 per cent of actual providing 6 billion dollars of savings in housing costs.

4. **Scenario D –** Match the *total-economy* long-run 2000-2024 productivity pace (0.79 per cent per year growth). A sustained but not spectacular productivity improvement narrows the gap almost as much as Scenario A; ULC would be roughly 79 per cent of actual with about 7 billion dollars savings in housing costs.

Table 13 summarizes the difference counterfactual productivity scenarios, implied ULC and cost effects.

Table 10: Counterfactual Productivity Scenarios, Implied ULC and Cost Effects, Residential Construction, Canada

Scenario	Labour Productivity CAGR 2019-2024	Implied 2024 Productivity Index (2019 = 100)	Implied 2024 ULC Index (2019 = 100)	ULC gap vs Actual (per cent)	Full Pass-through Gross Savings (billion $) in 2024	Key assumption(s)
Observed Values	-3.8	82.4	146.3	0	0	N/A
A. Continue residential 2008-2019 trend	1.5	107.7	111.2	-23.6	7.7	Productivity keeps growing at its pre-pandemic pace; wages follow observed path.
B. Continue residential 2000-2019 trend	0.6	103	117	-20.2	6.6	Longer historical residential average persists; wages as observed.
C. Match total-economy 2019-2024 pace	0.2	100.8	119.9	-18.4	6.0	Residential productivity moves in line with broad economy's recent (weak) gains. Wages as observed.
D. Match total-economy 2000-2024 pace	0.8	104	115.5	-20.8	6.8	Residential productivity keeps up with long-run all-industry trend; wages as observed.

Note: Productivity and ULC indexes are author calculations from Statistics Canada Table 36-10-0480-01 (labour productivity, hourly compensation, ULC) and Table 34-10-0286-01 (residential construction investment). 2019 = 100 base

for productivity; actual 2024 ULC = 100 base for comparison. ULC gap = (Implied ULC – Actual ULC) / Actual ULC. Negative values represent savings.
Gross savings = ULC gap × 2024 residential construction investment ($102.4B). Labour-share savings apply a 0.32 multiplier drawn from the 2021 Supply-and-Use tables (NAICS 2361) and the Building Construction Price Index cost weights.
Numbers rounded; therefore, savings columns may not sum exactly to the percentages shown.

All scenarios considered here bring about multibillion-dollar potential cost relief in 2024 of investment. Spread across several years of building activity, persistent productivity shortfalls compound into materially higher affordability pressures. Conversely, maintaining sustained productivity growth could meaningfully slow the rise in new-home costs without requiring wage restraint.

We now turn to the implications of these costs savings of $6-8 billion in residential construction in 2024. The price of new houses excluding land increased 24.4 per cent from an index value of 102.6 in 2019 to 127.6 in 2024.

We assume that actual housing starts of 245,367 in 2024 equals new home sales. The average price of a new house in 2024 was around $700, 000. The total value of housing sales is therefore, 245,367 *700,000 or about $172 billion. A saving in costs of $6 billion arising from better productivity performance in residential construction from 2019 to 2024 would reduce the price of a house by 3.5 per cent to $166 billion while a $7.7 billion saving would reduce the price of a house by 4.7 per cent to $164 billion.

Instead of rising by 24.4 per cent between 2019 and 2024, new house prices would have risen 19.7-20.9 per cent depending on the productivity growth assumption. In other words, falling productivity growth after 2019 explains 14-19 per cent of the increase in new home prices over the period.

This smaller increase in housing prices because of better productivity growth translates into an average housing price that would have been $24,000-$31,000 lower in 2024 than the actual house price of $700,000. The collapse of productivity growth in residential construction after 2019 has consequently contributed significantly to the higher housing prices and the housing affordability crisis.[22]

[22] Perrault et al. (2025) estimate that from 2019 Q3 to 2024 Q4, worsening construction-sector supply constraints (lower productivity, higher material costs) and faster-than-normal population growth since 2022 each added a little over $50 000 to the MLS Home Price Index. Our estimates are in line with these figures as

F. Implications of Residential Construction Productivity Growth for Housing Starts

Another way to look at the role of productivity growth is the number of years it would take for housing starts to reach around 400,000 units per year approximately in line with CMHC's target for restoring affordable housing.[23]

Raising annual housing starts from 245,367 in 2024 to 400,000 depends entirely on how quickly labour productivity improves, given the assumption of constant employment and a one-to-one link between productivity and unit output. In plain terms, only Scenario A's strong 1.5 per cent yearly productivity gain gets us there within a generation; the weaker trajectories stretch the timeline well beyond mid-century.

As Box 1, Column 1 shows, with productivity gains of 1.5 per cent a year (Scenario A) and no growth in construction sector employment, the 400 000-unit threshold could be achieved around 2057. The long-run all-industry rate (Scenario D) would delay the milestone to roughly 2086, while the more muted historical or economy-wide rates (Scenarios B and C) push achievement well into the next century, making it clear that faster productivity growth is critical if Canada hopes to meet ambitious housing-supply targets within a practical horizon.

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we are only isolating the impact for labour productivity growth and not accounting for material costs and population growth.

[23] Coyne (2025) argues that the CMHC's 2030 affordability target (between 430,000 and 480,000 new housing units per year across the ownership and rental markets by 2035) is unrealistic due to the sheer scale of housing cost reductions required—such as a 70per cent drop in Toronto—amid persistent supply constraints, stagnant construction productivity, and limited labour and materials. Doubling housing starts is deemed implausible, and even if achievable, would face political resistance from homeowners unwilling to accept the price declines real affordability would entail. An article by Schecter (2025) notes that CMHC's goal of restoring housing affordability by 2030 requires doubling current construction levels—an additional 3.5 million homes—but faces steep challenges, including labour shortages, high development costs, and regulatory delays. The agency stresses that affordability hinges on large-scale supply increases, especially in cities like Montreal, Toronto, and Vancouver, and cannot be achieved through demand-side measures alone. However, without major improvements in construction productivity, workforce capacity, and streamlined approvals, this target remains more aspirational than feasible.

To test the sensitivity of the results, we relax the constant employment constraint and allow the construction labour force to grow exogenously by 1 per cent (Column 2) or 2 per cent per year (Column 3).[24]

Under this variant, the *effective growth rate of housing starts* each year is simply the sum of productivity growth and labour growth:[25]

$$g_{eff} = g_P + g_L \quad (2)$$

Given an initial level of starts $S_0 = 245{,}367$ (2024) and a target $S^* = 400{,}000$, the years needed to reach the target are computed as:

$$n = \frac{ln(S^*/S_0)}{ln\,(1 + g_{eff})} \quad (3)$$

Using the same four productivity scenarios from Box 1, the timelines shorten materially once labour force grows. Nevertheless, even with 2 per cent labour growth, low productivity growth

[24] Over the last two decades, Canada's aggregate labour force typically grew around 1 per cent per year, with brief periods near or above 2 per cent in 2023–2024 driven by record immigration and higher participation. Using 1 per cent is therefore a conservative, historically grounded assumption; 2 per cent represents an ambitious but still plausible upper-bound under continued, targeted immigration and successful credential-recognition/retention policies focused on construction trades.

[25] This formulation has multiple implicit assumptions about productivity growth:
1) Additivity: We assumed starts grow like LP + L. A more structural model could use a Cobb-Douglas production function with explicit capital and elasticities.
2) No bottlenecks: We did not model land, permitting, or financing constraints.
3) Independence: We assume no correlation between labour productivity and employment growth. One could impose negative correlation (e.g., when labour grows fast, productivity slips) or positive (e.g., scale enables tech adoption).
4) Fixed target: 400k is static. A moving target (e.g., scaled to population growth) would change the dynamics.

Box 1: Productivity Growth Assumptions and Implications for Housing Affordability

Scenario	Productivity CAGR	Path to 400k Starts		
		No LF Growth (1)	*1% per year LF Growth (2)*	*2% per year LF Growth (C)*
A — Continue 2008-2019 residential trend	1.5 %	33 years (2057)	20 years (2044)	14 years (2038)
B — Continue 2000-2019 residential trend	0.6 %	82 years (2106)	31 years (2055)	19 years (2043)
C — Match total-economy 2019-2024 pace	0.2 %	306 years (well beyond the planning horizon)	42 years (2066)	23 years (2047)
D — Match total-economy 2000-2024 pace	0.8 %	62 years (2086)	28 years (2052)	18 years (2042)

Source: CSLS Calculations

still pushes the 400,000-start target well beyond the 2030 window, underscoring the significance of productivity growth for restoring housing affordability.

V: Overview of Residential Construction Productivity Developments in Provinces

As Chart 21, Panel A shows, at the start of the century the dispersion in residential construction labour productivity levels across provinces was very wide. In 2000, Saskatchewan and Ontario were well above the national average (about 65 per cent and 22

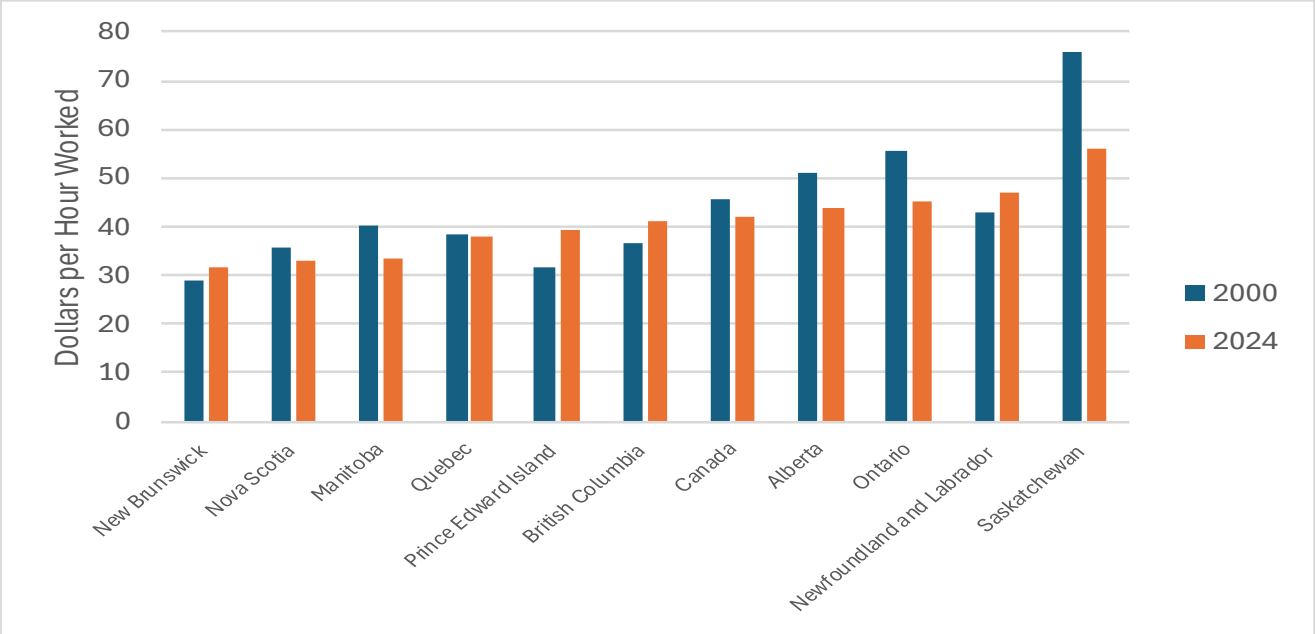
per cent higher, respectively), Alberta stood 11 per cent above, while Newfoundland and Labrador was modestly below and most other provinces—especially New Brunswick (about 37 per cent below), Prince Edward Island (30 per cent below), Nova Scotia (22 per cent below) and British Columbia (20 per cent below)—lagged markedly. By 2024 the dispersion had narrowed. Saskatchewan remained the productivity leader (about one-third above the Canadian average), Newfoundland and Labrador moved from below to roughly 12 per cent above, Ontario slipped but stayed about 7 per cent above, and Alberta was about 5 per cent above. Quebec, British Columbia, Manitoba and the Atlantic provinces clustered within roughly 10 to 25 per cent below the national level, indicating some convergence over the period.

Residential construction productivity has not fallen uniformly across Canada's provinces and territories. As illustrated in Chart 21, Panel B, over 2000-2024 three provinces managed to post positive average growth: Newfoundland and Labrador and New Brunswick (each 0.7 per cent per year), British Columbia (0.6 per cent). These three regions, however, represent only a small slice of the national market; together they accounted for roughly one-fifth of all residential construction hours worked in 2024.

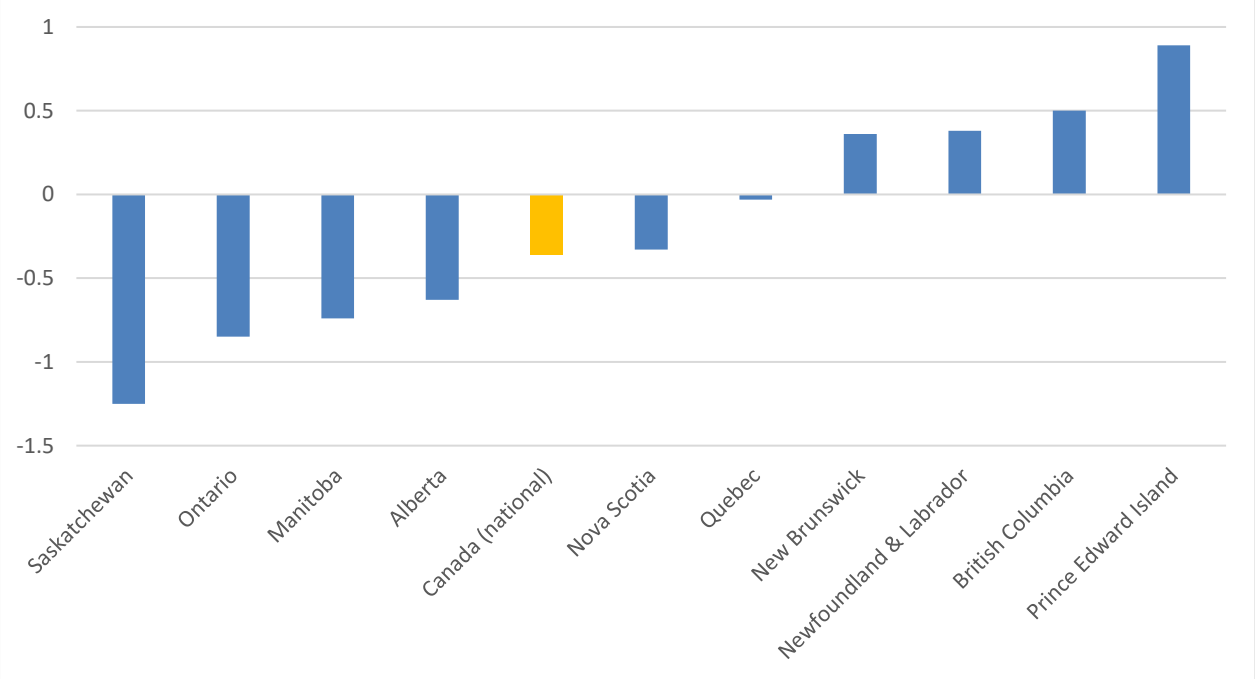
Chart 21, Panel C shows that productivity generally trended up across most provinces through the 2008-2019 period. Nine of ten provinces avoided decline; only Prince Edward Island slipped (down 0.7 per cent per year). Growth was strongest in British Columbia (up 3.8 per cent per year), Alberta (2.5 per cent) and Quebec (2.0 per cent); the Canadian average rose 1.5 per cent per year. Manitoba and Newfoundland and Labrador each advanced 1.0 per cent, New Brunswick 0.8 per cent, Nova Scotia 0.5 per cent and Saskatchewan 0.3 per cent, while Ontario was essentially flat.

Chart 21: Residential Construction Labour Productivity by Province

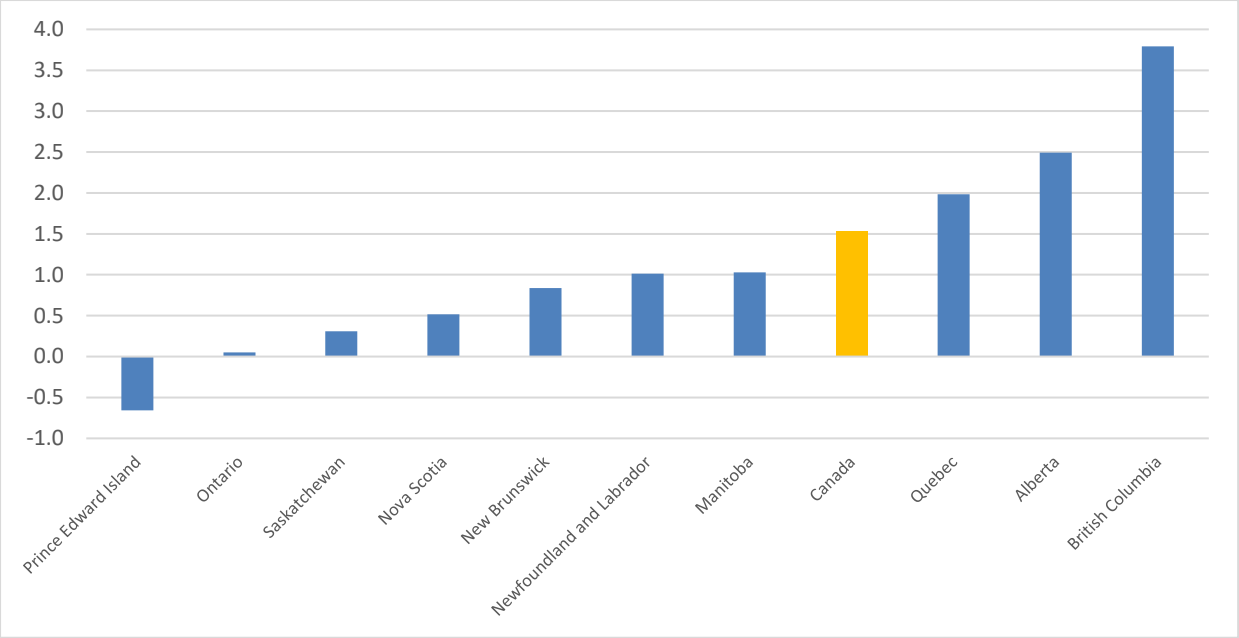
Panel A: Real Output per Hour Worked, 2000 and 2024 (Chained 2017 dollars)



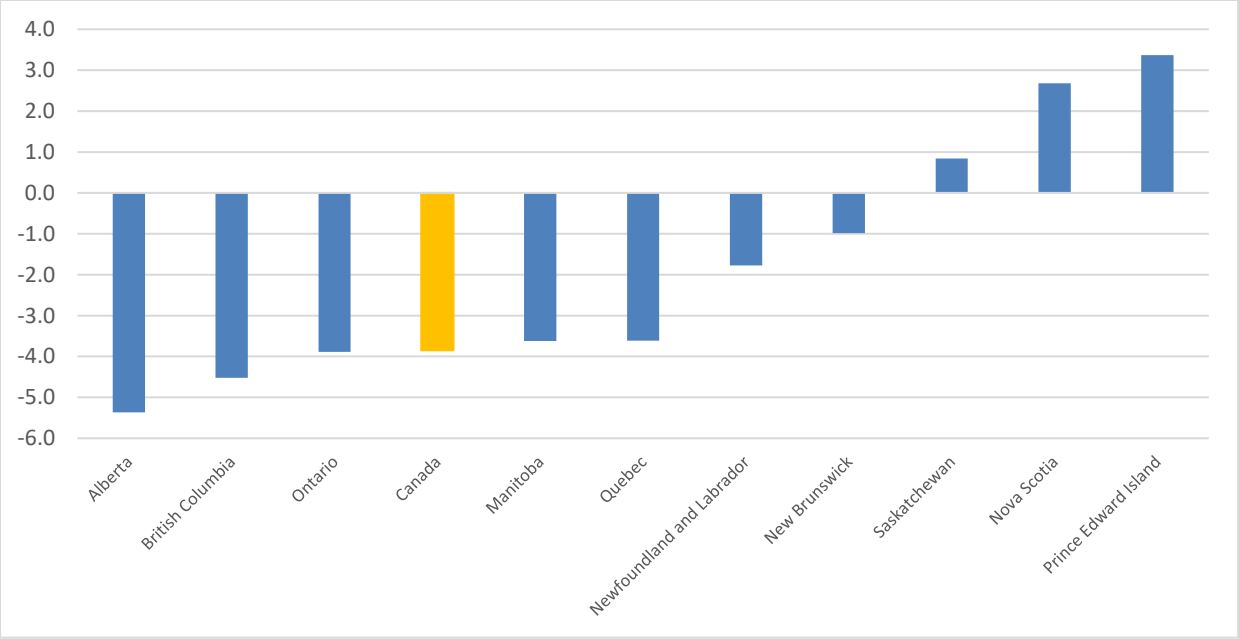
Panel B: Residential Construction Labour Productivity, 2000 to 2024 (Compound average annual growth rate)



Panel C: Residential Construction Labour Productivity, 2019-2024 (Compound average annual growth rate)



Panel D: Residential Construction Labour Productivity, 2008-2019 (Compound average annual growth rate)



Source: Statistics Canada. Table 36-10-0480-01 Labour productivity and related measures by business sector industry and by non-commercial activity consistent with the industry accounts.

Chart 21, Panel D illustrates how the pattern reversed sharply in the most recent five-year window of 2019-2024. Productivity fell steeply in Alberta (down 5.4 per cent per year), British Columbia (4.5 per cent) and Ontario (3.9 per cent); the Canadian average declined 3.8 per cent per year. Manitoba and Quebec also moved lower (each 3.6 per cent), and Newfoundland and Labrador (1.8 per cent) and New Brunswick (1.0 per cent) weakened more moderately. Only three provinces managed gains: Saskatchewan (up 0.8 per cent per year), Nova Scotia (2.7 per cent) and Prince Edward Island (3.4 per cent). Because residential construction hours are heavily concentrated in the large provinces—Ontario (about 40 per cent of 2024 hours), Quebec (about 19 per cent), Alberta (about 12 per cent) and British Columbia (about 17 per cent)—the simultaneous declines in three of the four, together with the drop in Quebec, exerted heavy downward pressure on the national result, more than offsetting the modest improvements recorded in smaller jurisdictions. Table 14 provides longer-run context for provincial performance.

Table 11: Residential Construction Labour Productivity Growth by Province (CAGR), 2000-2024

Region	2019-2024	2000-2008	2008-2019	2000-2024
Canada	-3.8	-0.7	1.5	-0.4
Newfoundland and Labrador	-1.8	0.9	1.0	0.4
Prince Edward Island	3.4	1.5	-0.7	0.9
Nova Scotia	2.7	-3.3	0.5	-0.3
New Brunswick	-1.0	0.6	0.8	0.4
Quebec	-3.6	-0.5	2.0	0.0
Ontario	-3.9	-0.2	0.0	-0.9
Manitoba	-3.6	-1.3	1.0	-0.7
Saskatchewan	0.8	-4.6	0.3	-1.2
Alberta	-5.4	-1.8	2.5	-0.6
British Columbia	-4.5	-0.7	3.8	0.5

Source: CSLS calculations based on Statistics Canada. Table 36-10-0480-01 Labour productivity and related measures by business sector industry and by non-commercial activity consistent with the industry accounts.

Across all provinces and periods, the most pronounced swings remain Alberta's 9 per cent annual decline in 2019-2024 and British Columbia's 3.8 per cent annual gain in 2008-2019.

VI: Overview of Residential Construction Productivity Developments in the International Context

A. United States

Most of the international studies about the construction sector labour productivity are related to the US construction industry. Previous studies including Douglas (1965), Stokes (1981), Allen (1985) and Pieper (1989) as well as more recent ones by Preston (2004), Teicholz (2013); The Economist (2017), Smith (2021), Garcia and Molloy (2023) and Goolsbee and Syverson (2023) documented declining construction productivity since the 1960s in the United States.

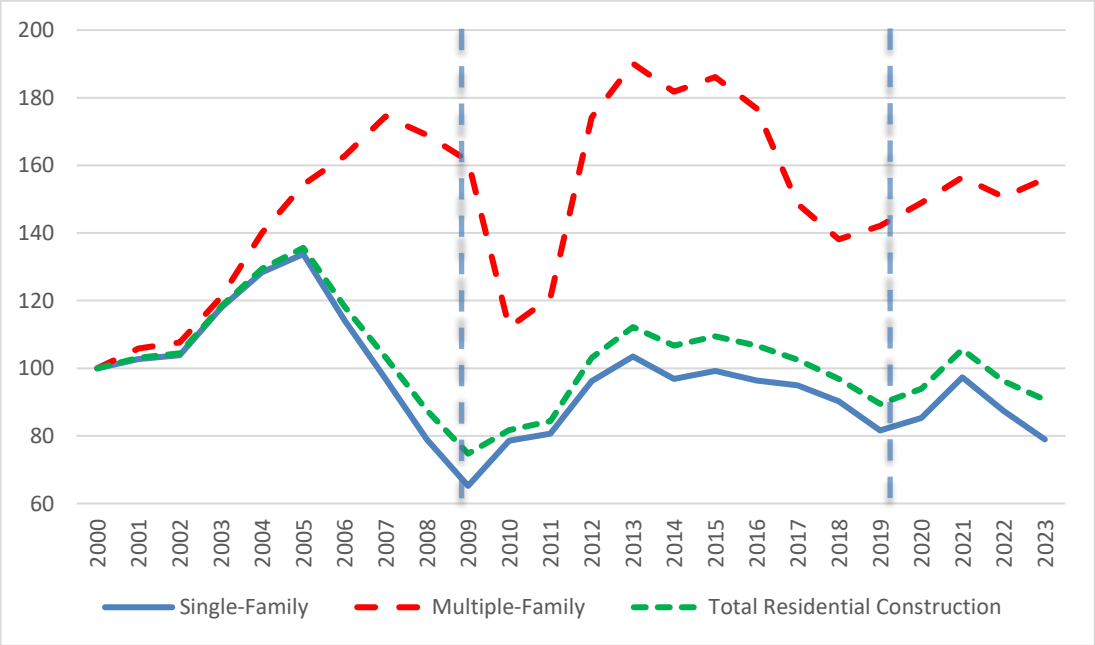
Another dimension of construction sector productivity that US studies have examined is technological progress and innovation. Goodrum and Haas (2002) argue that despite a decrease in industry level measures in construction labour productivity (output per hour), there has been a steady increase in construction productivity at the activity level. This research examines equipment technology as one factor that may explain that increase over five technology factors: energy, control, functional range, information processing, and ergonomics. Colton and Ahluwalia (2019) use the US home builder survey; there has been relatively little change in the construction methods of building homes over the last forty years. This reinforces the lack of improved productivity in the home building industry. However, the authors find that while large majority of houses in the US are still "stick-built," but other approaches to complement "stick- built" such as "pre-cut" (including roof trusses and engineered floor trusses) as well as open wall and closed wall panels and factory-built/modular housing are being used that are likely to enhance the sector's productivity overtime.

Residential construction productivity in the United States has followed a similar path to Canada. The U.S. Bureau of Labour Statistics[26] breaks down the residential sector into two categories, giving a more granular picture of productivity growth (Chart 22, Panel A).

The first category, single-family housing construction, experienced 1.0 per cent average annual declines in productivity from 2000 to 2023, a more extreme negative growth rate compared to the Canadian residential construction average of 0.4 per cent decline per year. However, the second category, multiple-family housing construction, saw strong productivity gains of 2.0 per cent per year during the same period (Table 15). Constructing a measure of total residential construction in the United States by adding single-family and multiple family output and hours, we find that the sector as a whole had a 0.4 per cent per year decline in its labour productivity, which is identical to the rate of productivity decline in Canada in this period (Chart 22, Panel B).

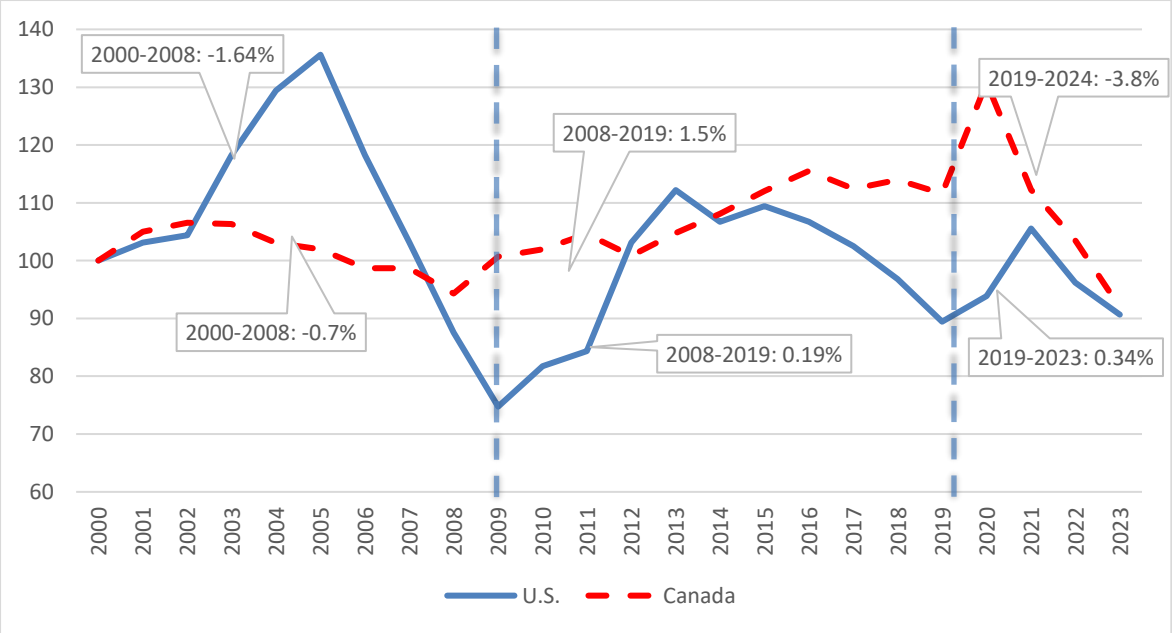
Chart 22: Labour Productivity and Unit Labour Cost, Residential Construction, 2000-2023

Panel A: Single-Family, Multiple-Family, and Total Residential Construction Labour Productivity Index, United States (index = 100 in 2000)

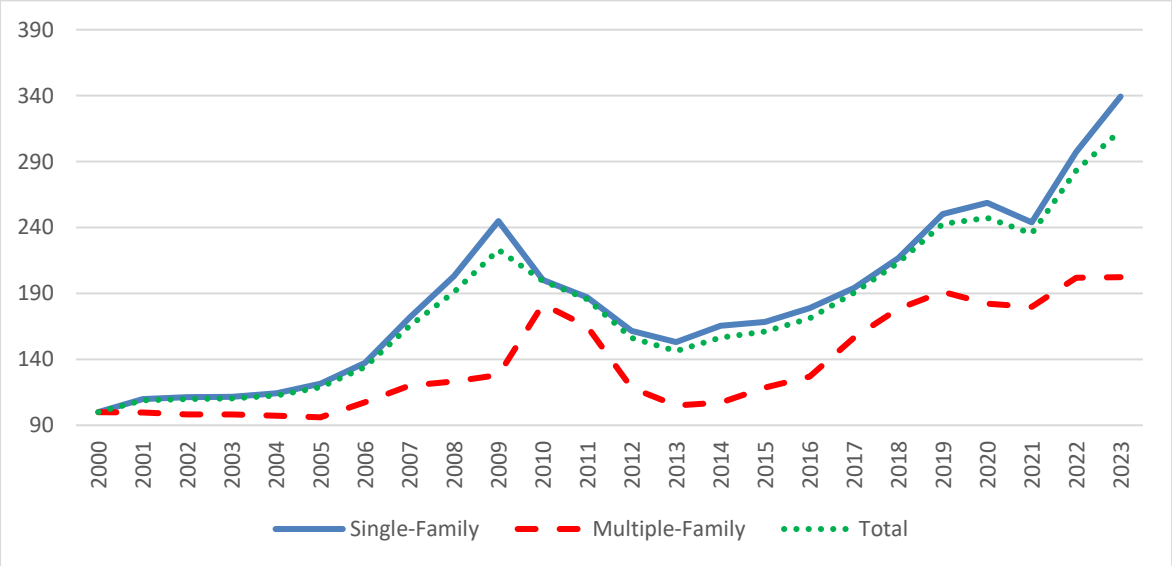


[26] U.S. Bureau of Labor Statistics. Construction labor productivity https://www.bls.gov/productivity/highlights/construction-labor-productivity.htm

Panel B: Canada and U.S. Residential Construction Labour Productivity (index = 100 in 2000)



Panel C: U.S. Residential Construction Unit Labour Cost (index = 100 in 2000)



Note: US uses sectoral output while Canada uses value-added output. The U.S. total is an estimate since the separate real chained output series for single-family and multiple-family output aren't additive. We add these two amounts, and the industries respective hours worked to calculate the total labour productivity for residential construction. Canada data is from 2000-2024, US data is from 2000-2023. Source: U.S. Bureau of Labour Statistics. Construction labour productivity https://www.bls.gov/productivity/highlights/construction-labor-productivity.ht

Table 12: Single-family and Multiple-family Residential Construction Labour Productivity Growth, United States 2000-2023

Industry	2000-2023	2000-2008	2008-2019	2019-2023
Single-Family Residential Construction	-1.02	-2.90	0.29	-0.81
Multiple-Family Residential Construction	1.95	6.77	-1.56	2.36
Total Residential Construction	-0.43	-1.64	0.19	0.34

Source: CSLS calculations based on U.S. Bureau of Labour Statistics. Construction labour productivity https://www.bls.gov/productivity/highlights/construction-labor-productivity.htm

While over the long run the headline numbers look similar: labour productivity in residential construction fell by about 0.4 per cent per year in both Canada and the United States over 2000 to 2023, the underlying paths were quite different. In the United States nearly all of the drag came early; total residential productivity contracted 1.64 per cent per year in 2000 to 2008 (driven by a 2.9 per cent drop in single family even as multiple family rose 6.8 per cent), then stabilized and edged up 0.2 per cent per year in 2008 to 2019, and managed a modest 0.3 per cent gain in 2019 to 2023 as a 2.4 per cent rise in multiple family offset renewed weakness in single family (-0.8 per cent). Canada showed the opposite sequencing. After a small decline in 2000 to 2008 (-0.7 per cent per year), productivity improved 1.5 per cent per year in 2008 to 2019 but then collapsed 3.8 per cent per year in 2019 to 2024. Splitting that last interval reveals a brief uptick in 2019 to 2021 (0.3 per cent per year) followed by a steep 6.5 per cent annual drop in 2021 to 2024 as hours worked continued to rise while real value added weakened, pushing unit labour costs up 7.9 per cent per year in 2019 to 2024. The contrast suggests that cyclical swings in mix (single versus multiple family) were central to the U.S. pattern while the same cannot be said about Canada given available data.

As Illustrated in Chart 22, Panel C, ULCs in U.S. residential construction have climbed substantially since 2000, but the pace has varied sharply across cycles and been shaped by the shifting mix of single- and multiple-family building. Starting from about 53 in 2000 (index), aggregate residential ULC nearly doubled to 100 by 2008—an 8 per cent compound annual increase—as the housing boom pushed up wages and non-labour-related costs faster than productivity, especially in the dominant single-family segment (its ULC roughly doubled) while the multiple-family segment also rose. The post-crisis stretches from 2008

to 2019 saw much slower growth (2.5 per cent per year) in the aggregate measure: both components retrenched early, and a rising output share for (generally lower-ULC) multiple-family construction helped restrain overall cost escalation even as the recovery matured. Between 2019 and 2023 total residential ULC jumped about 6 per cent per year. Single-family ULC rose faster than multifamily, and because single-family still accounted for roughly four-fifths of output, the aggregate moved sharply higher.

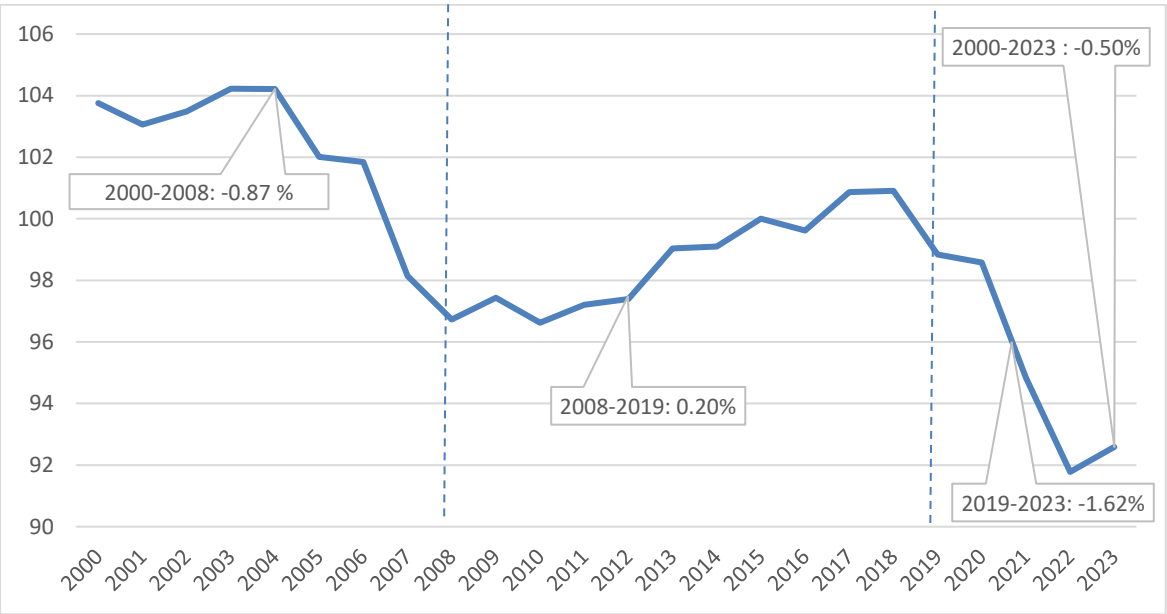
As discussed, Canada's residential construction ULC also accelerated recently, but from a lower long-run base. Over 2000-2024 Canada's aggregate ULC grew 3.2 per cent per year (vs 5.0 per cent in the United States over 2000-2023). Canada's pre-2019 run-up was strong but milder (4.3 per cent per year 2000-2008), then growth nearly stalled in 2008-2019 (0.4 per cent), before a 7.9 per cent surge in 2019-2024 that actually outpaced the U.S. post-2019 increase. The contrast suggests U.S. cost pressures were front-loaded in the 2000s housing boom, whereas Canada's most intense ULC escalation has come in the most recent period.

B. OECD and European Union

Studies in other countries other than the United States include a comprehensive study by Barbosa et al. (2017) that analyzes the global construction industry's productivity challenges, with a focus on Europe. It highlights that while other sectors have significantly improved productivity, construction has lagged, attributing this to factors like fragmentation, inadequate risk management, and limited innovation. The report recommends strategies such as adopting digital
technologies, rethinking design processes, and improving procurement practices to boost productivity.

A more recent analysis, the RICS Construction Productivity Report (2024), provides further insights into industry productivity trends. The study finds that while 34 per cent of construction firms have seen an increase in labour productivity over the past year, 26 per cent report a decline, highlighting ongoing inefficiencies. Key strategies identified for improvement include workforce upskilling, increased investment in digitization, and better procurement and supply chain management. The report underscores the importance of automation and offsite construction methods as avenues for long-term productivity gains, reinforcing earlier calls for innovation and structural reforms in the sector. Gruneberg et al. (2004) study reveals that the UK's construction labour productivity lags these counterparts,

Chart 23: Apparent Labour Productivity, Euro Area, Construction, 2000-2023 (Index 2015=100)



Source: Eurostat. Labour productivity and unit labour costs at industry level.
https://ec.europa.eu/eurostat/databrowser/view/nama_10_lp_a21__custom_15987765/default/table?lang=en

particularly the United States and France. The report also highlights significant data limitations, such as inconsistencies in industrial classifications and challenges in international comparability, which hinder precise productivity assessments.

The apparent labour productivity[27] of the EU's construction of buildings sector in 2021 was €47,500 per person employed, €12,700 per person less than the non-financial business economy average of €60,200 per person employed, but slightly above the construction average of €45, 800 per person employed.[28]

[27] Apparent labour productivity is defined by Eurostat as value added at factor costs divided by the number of persons employed. This ratio is generally presented in thousands of euros per person employed.
[28] In EU, the construction of buildings sector is composed of two subsectors: the development of building projects (Group 41.1) and the construction of residential and non-residential buildings (Group 41.2) Around 922,000 enterprises operated in the EU's construction of buildings sector in 2021, accounting for 3.0 per cent of all enterprises in the non-financial business economy. These enterprises employed over 3.3 million persons, 2.1 per cent of the employment in non-financial business economy and 24.8 per cent of the total number of persons employed in construction. They generated €158.1 billion of value added, representing 1.7 per cent of the non-financial business economy total and 25.7 per cent of the construction total.

While productivity data for the 27 current European Union member states is not available for the residential sector, productivity in the overall construction industry fell by 0.5 per cent per year from 2000 to 2023. Appendix Table A2 documents the growth in construction sector's labour productivity in EU member states between 2000 and 2023. Chart 23 shows the overall EU area's construction sector apparent labour productivity in the same time period. As was the case in Canada and United States, construction productivity's productivity declined in 2019-2023. However, in EU's case, the decline in construction productivity occurred in earlier periods 2000-2008 and 2008-2019.

Using OECD Data, Appendix Table A3 shows that Lithuania and Estonia were the outliers in construction labour productivity growth between 2000 and 2023, growing at 4 and 3.3 per cent per year respectively. Austria and Luxemburg had the worst construction productivity performance falling at 1.9 and 1.4 per cent per year respectively. Canada logged a decline of 0.5 per cent per year in this period, placing it below countries like Spain, Portugal and Greece.

VII: The Drivers of Residential Construction Productivity Trends in Canada

This section describes factors that could explain the fall in the residential construction sector's productivity performance in Canada between 2000 and 2024. Output per hour in residential construction in 2024 was 20 per cent less than its value in 2000. As illustrated in Chart 18, there are three key sub-periods that need to be analyzed separately: 2000-2008 when residential construction labour productivity posted a modest decline of 0.7 per cent per year. 2008-2019 where the sector experienced strong productivity growth of 1.6 per cent per year, and the 2019-2024 period when residential construction labour productivity declined by 3.8 per cent per year.

A. Compositional Factors

There are a series of compositional factors that could be used to explain the residential construction's labour productivity performance in the last two decades. We note that compositional factors relate to any changes in the composition of types of structures being built, including types of construction work (new construction vs renovations), type of structures (single dwellings vs multiples) and regional shifts (urban vs rural/ provincial

shifts). For instance, there may be labour productivity growth gains by shifting away from single family residential units to multiple family units through economies of scale.

Types of Construction Work (New construction vs renovations)

There are multiple dimensions along which renovations and new construction are different that are important for productivity analysis:

- *Project Scope and Predictability*

New construction involves building from scratch with standardized plans, allowing for predictable workflows and efficient resource allocation that can in theory enhance labour productivity growth. Economies of scale and prefabrication enhance productivity. On the other hand, renovations often face unpredictability due to existing structural conditions (e.g., outdated systems, hidden damages), leading to delays and rework, which reduce productivity.

- *Labour and Skills*

New construction utilizes specialized trades working in sequence, enabling repetitive tasks and streamlined processes. Workers may require less adaptability but more task-specific efficiency whereas renovations demand versatile labourers skilled in problem-solving and adapting to unforeseen challenges. Confined spaces and phased work limit simultaneous labour deployment, lowering output per worker.

- *Materials and Waste Management*

New construction benefits from bulk material purchases and standardized components, minimizing waste and delays. Modular techniques further boost efficiency.
Renovations involve demolition, waste disposal and sourcing materials to match existing structures, increasing time and cost. Custom orders may disrupt supply chains.

- *Technology and Innovation*

New construction embraces advanced technologies (e.g., Building Information Modeling (BIM), 3D printing and modular construction), driving productivity gains through automation and precision while renovations are limited by existing layouts, often relying on traditional methods. Technology adoption is slower due to structural constraints.

- *Regulatory and Site Conditions*

New construction's permits and inspections follow standardized processes, though initial approvals can delay starts. Sites are prepared (e.g., graded, utilities planned) for efficiency. However, in terms of renovations, compliance with historic preservation or zoning laws complicates approvals. Working around occupied spaces or hazardous materials (e.g., asbestos) adds safety protocols and delays.

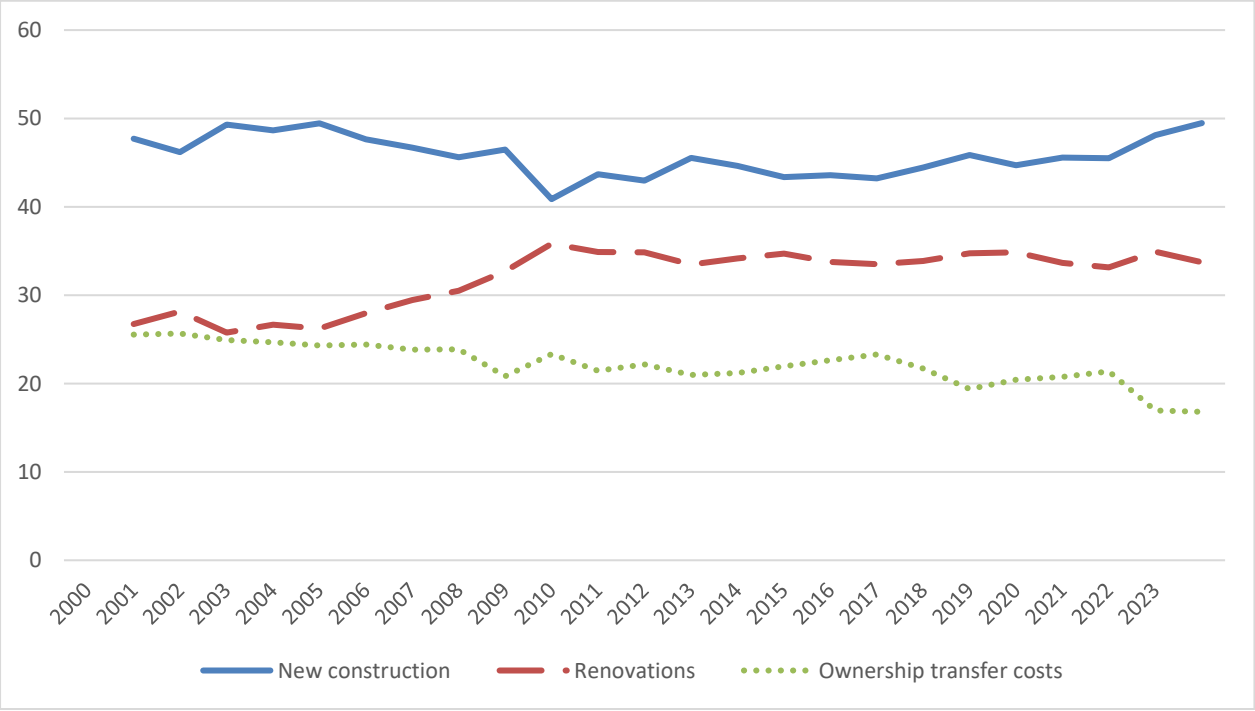
- *Client Involvement and Customization*

In new construction client input is typically confined to the design phase, reducing mid-project changes and standardized designs minimize disruptions. Renovations however involve higher client involvement during execution, leading to change orders and scope creep, which hinder productivity.

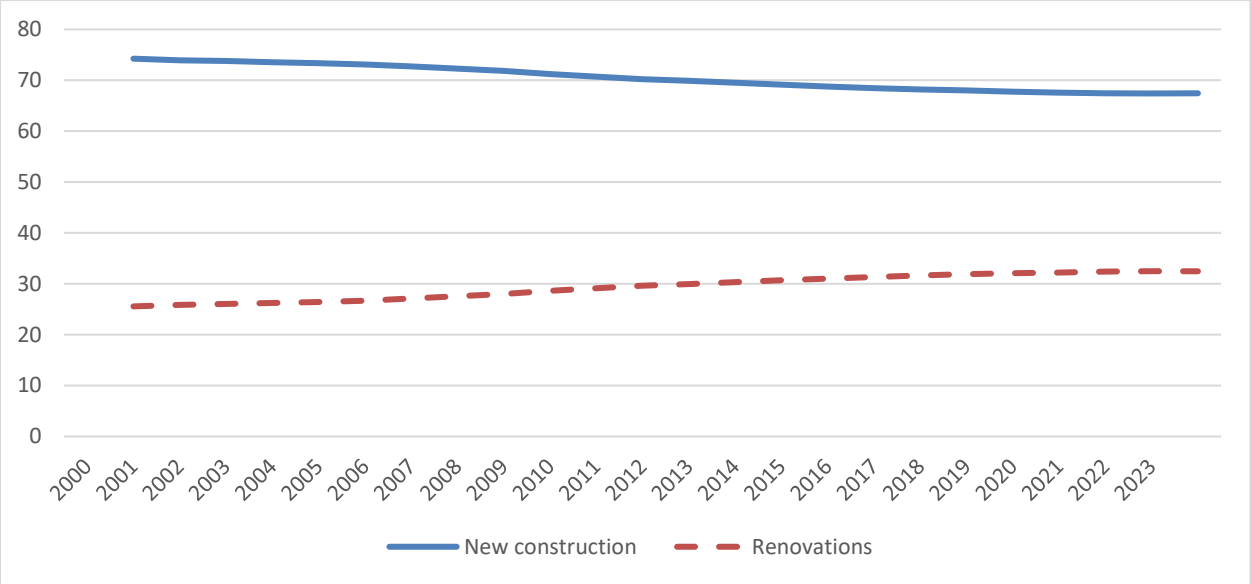
Focusing on the productivity developments in the post-2019 period, renovations make an increasing share of both the flow and stock in fixed residential capital as Chart 24, Panel A illustrates the rise in the share of renovations in fixed residential investments from 26.7 per cent in 2000 to 33.7 per cent in 2023. Most of this increase was at the expense of the fall in theownership transfer fee's share in fixed residential investment and while new

Chart 24: Flow and Stock of Fixed Residential Capital Shares by Asset Type, Canada, 2000-2023 (2017 Constant Prices)

Panel A: Flow of Residential Investment



Panel B: Stock of Residential Capital (Geometric end-year net stock)



Source: Table 36-10-0099-01 Flows and stocks of fixed residential capital by type of asset, provincial and territorial

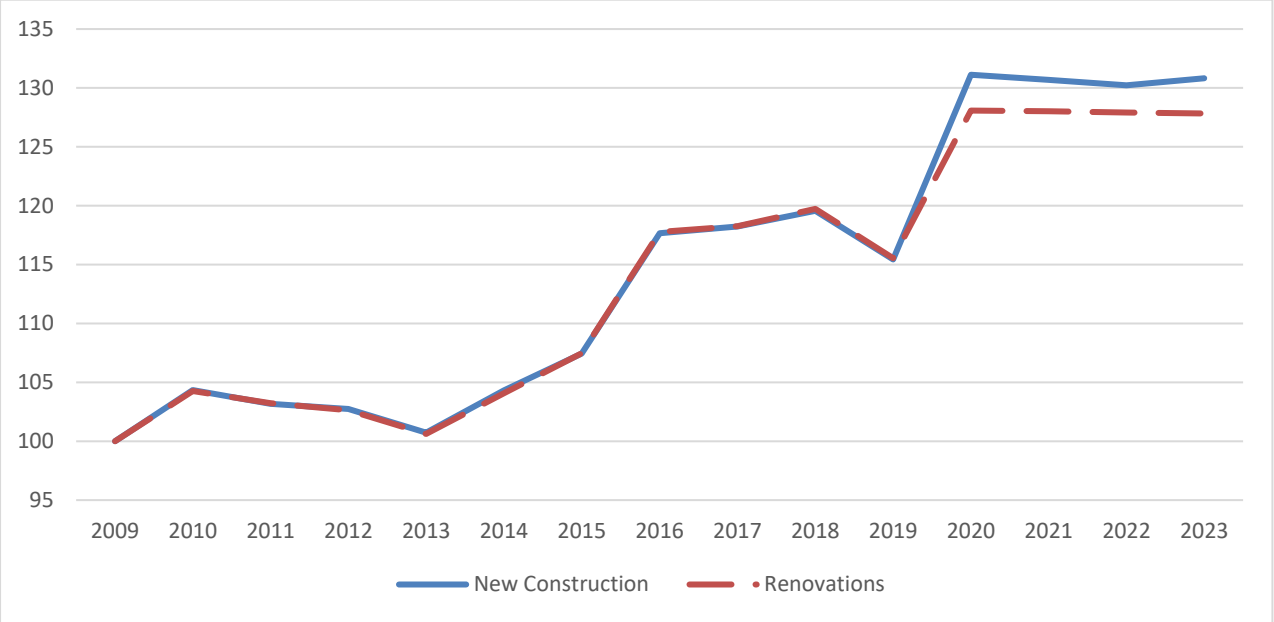
Table 13: Growth Rate of Nominal Value Added, Number of Jobs and Labour Productivity, Total Industries and Construction Sector, Canada, 2009-2023 (per cent)

	Total residential construction			New construction			Renovations		
Total industries	**2009-2024**	**2009-2019**	**2019-2024**	**2009-2024**	**2009-2019**	**2019-2024**	**2009-2024**	**2009-2019**	**2019-2024**
Nominal Value added	5.2	4.4	6.8	6.1	5.1	8.1	3.9	3.2	5.2
Number of jobs	2.9	2.2	4.1	3.7	2.9	5.3	1.6	1.2	2.5
Nominal Labour Productivity	2.3	2.1	2.6	2.3	2.1	2.7	2.2	2.0	2.6
Construction									
Nominal Value added	5.2	4.6	6.4	6.4	5.6	8.0	3.9	3.7	4.4
Number of jobs	3.5	3.1	4.1	4.6	4.1	5.7	2.2	2.2	2.3
Nominal Labour Productivity	1.7	1.4	2.1	1.7	1.4	2.2	1.6	1.5	2.0

Note: Construction sector accounts for roughly half of value added and employment impacts of residential construction in the economy.

Source: Table 36-10-0679-01 Housing Economic Account, economic impact by asset, industry, and housing type

Chart 25: Nominal Value Added per Worker of Residential Renovations and New Construction, Construction Sector, Canada, 2009-2023



Source: Statistics Canada. Table 36-10-0679-01 Housing Economic Account, economic impact by asset, industry, and housing type

construction's share remained almost the same throughout this period. In the more recent period of 2020-2023 however, the share of renovations in fixed residential investment has remained unchanged.

Chart 24, Panel B shows the trends of the net fixed residential stock and its gradual increase from 25.8 per cent to 32.4 per cent from 2000 to 2023. It is notable that the rise of renovations shares in investment flows and residential capital stock mostly occurred between 2000-2010. This implies that to the extent that renovation construction is inherently less productive than new construction, the relative rise in the share of renovations in residential construction may have contributed to the slower labour productivity growth in the sector. [29]

To contextualize the implications of this rise in the significance of the renovations in the residential construction sector, we calculate the nominal value added per worker of renovations and new construction and compare the two based on Statistics Canada Table 36-10-0679-01. Chart 25 shows the nominal value added per worker of residential

[29] Appendix Table 7 provides Data for the overall Construction and Total Economy Capital Stock, 2000-2023.

renovations and new construction between 2009 and 2023. Interestingly, new construction and renovations experienced the same nominal value added per worker growth path from 2009 to 2019 after which renovations nominal value added per worker lagged new construction.

Table 16 illustrates the growth rate of output (value added), employment (number of jobs) and nominal value added per worker (value added/number of jobs) for both all industries and construction sectors broken down by total residential construction, new construction and renovations. The lagging productivity growth in renovations done by the construction industry in 2019-2023 is due to the relatively fast employment growth (up by 3.3 per cent per year) and the slower growth in value added compared to new construction (5.9 per cent per year growth of value added in renovation vs 8.4 per cent per year growth in new construction).

Absent an estimate of a breakdown of real output in residential construction by new construction and renovations it is difficult to estimate how much the slight increase in renovations' share of investment in recent years or the modest increase in the share of renovations in fixed residential capital flow in earlier periods impact the labour productivity growth of the sector. Given the relatively small magnitude of changes in these shares and the insignificant value added per worker gap between renovations and construction (that only appeared after 2019) it is inconceivable that expansion in renovations activity can account for much of the stagnant labour productivity growth rate observed in residential construction.

Types of Structures (Single dwellings vs multiples)

As seen in US data, labour productivity growth in the residential construction sector differs between single-dwelling and multiple-dwelling buildings due to factors such as economies of scale, standardization, and workforce specialization. Multiple-dwelling projects, such as apartments and condominiums, benefit from repetitive designs, bulk material usage, and streamlined workflows, allowing for higher efficiency in labour and resource allocation. In contrast, single-dwelling homes often require customized designs, individualized site preparation, and more frequent worker mobilization, which reduces productivity. Additionally, multi-unit developments are more likely to incorporate prefabrication and modular construction, further enhancing efficiency, while single homes typically rely on traditional on-site methods. The regulatory environment also plays a role, as high-density projects often undergo more centralized permitting processes, whereas single-family

homes may face stricter zoning regulations and approval delays. These factors contribute to higher labour productivity growth in multiple-dwelling construction compared to the more fragmented and labour-intensive nature of single-dwelling housing.

As evidenced by the data in Chart 2 and Table 1, Multiple family units are taking up a higher share of housing starts and the overall housing stock, especially in the post-2019 period, which can be a harbinger of productivity growth improvements down the road in the sector.

Provincial shifts

There is concern that residential construction suffers from a lack of allocative efficiency, a process by which resources are moved away from lower-productivity uses towards higher-productivity ones. Goolsbee and Syverson (2023) find that from 1972 to 2017, states with higher residential construction productivity levels saw their shares of construction activity fall in the American residential construction industry. Consequently, the states with lower productivity levels saw their shares increase. This phenomenon has the effect of bringing down average productivity numbers, through compositional effect, as the most productive areas in residential construction become a smaller part of the sector overall.

Between 2000 and 2024 the provincial mix of labour input in residential construction changed only at the margin. British Columbia was the only province to post a material gain: its share of hours worked rose from just under 12 per cent in 2000 to almost 17 per cent in 2024. That five-percentage-point increase came mainly at the expense of Ontario and Quebec. Ontario's share slipped from about 43 per cent to 39 per cent, while Quebec's fell from 21 per cent to 18 per cent. (The other provinces each continued to account for no more than 4 per cent of national hours.) Notably, B.C. is also the only large province to record positive productivity growth over the period, whereas Ontario and Quebec both saw declines.

Shifts in provincial weights, however, have had almost no impact on the national productivity level. If one holds provincial employment shares fixed at their 2000 values and applies those weights to 2024 productivity levels, the implied national productivity is $43.8 per hour, virtually identical to the actual 2024 figure of $43.7. Thus, compositional change trimmed national growth by only a few hundredths of a percentage point.

A shift-share decomposition confirms the point. National residential construction productivity fell by 0.6 per cent per year over 2000-2024. As Table 17 indicates, the entire

Table 14: Residential Construction Productivity Growth Decomposition, Canadian Provinces, 2000-2023

Region	Within-Province (1)	Reallocation level (2)	Reallocation growth (3)	Summed Effect (4 = 1+ 2+3)
Canada	-0.49	-0.03	0.03	-0.49
Newfoundland and Labrador	0.01	0.00	0.00	0.00
Prince Edward Island	0.00	0.00	0.00	0.00
Nova Scotia	-0.01	0.00	0.00	-0.01
New Brunswick	0.01	0.01	0.00	0.01
Quebec	-0.01	0.03	-0.01	0.01
Ontario	-0.44	-0.04	0.02	-0.45
Manitoba	-0.02	0.00	0.00	-0.02
Saskatchewan	-0.03	0.01	0.00	-0.02
Alberta	-0.09	0.01	-0.01	-0.08
British Columbia	0.05	-0.04	0.04	0.05

Source: CSLS calculations

decline originated within provinces themselves (-0.5 percentage points). The reallocation-level effect was modestly negative (-0.03 percentage points), while the reallocation-growth effect was equally modest but positive (0.03 percentage points), the two essentially offsetting each other.

Ontario accounts for almost all of the within-province drag (-0.44 percentage points) because of its large employment share and persistent productivity slide. British Columbia contributes 0.05 percentage points through its own productivity gains, but this is balanced by the small negative effect of its rising employment share. Small positive contributions from Newfoundland & Labrador and New Brunswick are outweighed by declines in Manitoba, Saskatchewan and Alberta.

In short, Canada's residential construction productivity shortfall since 2000 is overwhelmingly stems from efficiency within most provinces, especially Ontario, rather than from workers migrating toward lower-productivity regions.

To investigate this further, we now employ the productivity growth decomposition method explained in Section 2 to the provincial contributions to the residential construction productivity growth in Canada. Between 2000 and 2024, labour productivity fell by 0.4 per cent per year in Canada. Within-Canada productivity decline can explain more than all the decrease in residential construction productivity in this period (0.5 per cent). Reallocation level and growth effect has had an insignificant and offsetting impacts on residential construction productivity in this period (-0.04 and 0.05 per cent per year respectively.)

As Table 17 demonstrates, the largest contributor to the decline in residential construction productivity in Canada is Ontario. The fall in productivity within that province accounts for 0.5 percentage point decrease in residential construction productivity in Canada (almost equal to all the productivity decline). Alberta was the second most important contributor to the fall in Canada's residential construction productivity at 0.1 percentage point contribution to the decline. British Columbia was the only province that significantly boosted the national residential construction productivity through gains in within-province productivity (0.1 percentage point).

Overall, the composition effects explanation does not apply to the sharp decline in productivity from 2019 to 2024. Given that this period is quite short, there have not been any significant reallocations of labour input between provinces. Appendix Tables A4-A6 provide the provincial decompositions for 2000-2008, 2008-2019 and 2019-2024 periods.

B. Measurement Issues

Previous work has identified measurement error as the source of the apparent productivity growth challenges in the construction sector. In the Canadian context, Mohammadian and Seymour (1997) show that output price indexes reflect more accurately the true price movements of both the residential and non-residential construction. The authors show that in comparison, input indexes based on selected materials and union wage rates alone are generally associated with several important limitations from the standpoint of providing an accurate picture of price movements for deflation purposes.

Harrison (2007) finds that the use of input cost indexes to adjust nominal output to obtain real output, instead of the more appropriate use of output price indexes, for certain sub-industries of the construction sector represents the most likely source of measurement error of the construction sector between 1981-2006. This procedure may result in a downward bias to labour productivity growth in the construction sector of up to 0.44

Table 15: Growth Rate in Output per Hour, Housing Starts per Hour, Value and Number of Permits per Hour Worked, Canada, 2000-2024

Productivity Measure	2000-2024	2000-2008	2008-2019	2019-2024
Number of Permits	n/a	n/a	n/a	-6.72
Housing Starts per Hour	-1.42	-1.96	-1.40	-0.60
Labour Productivity	-0.36	-0.73	1.54	-3.85

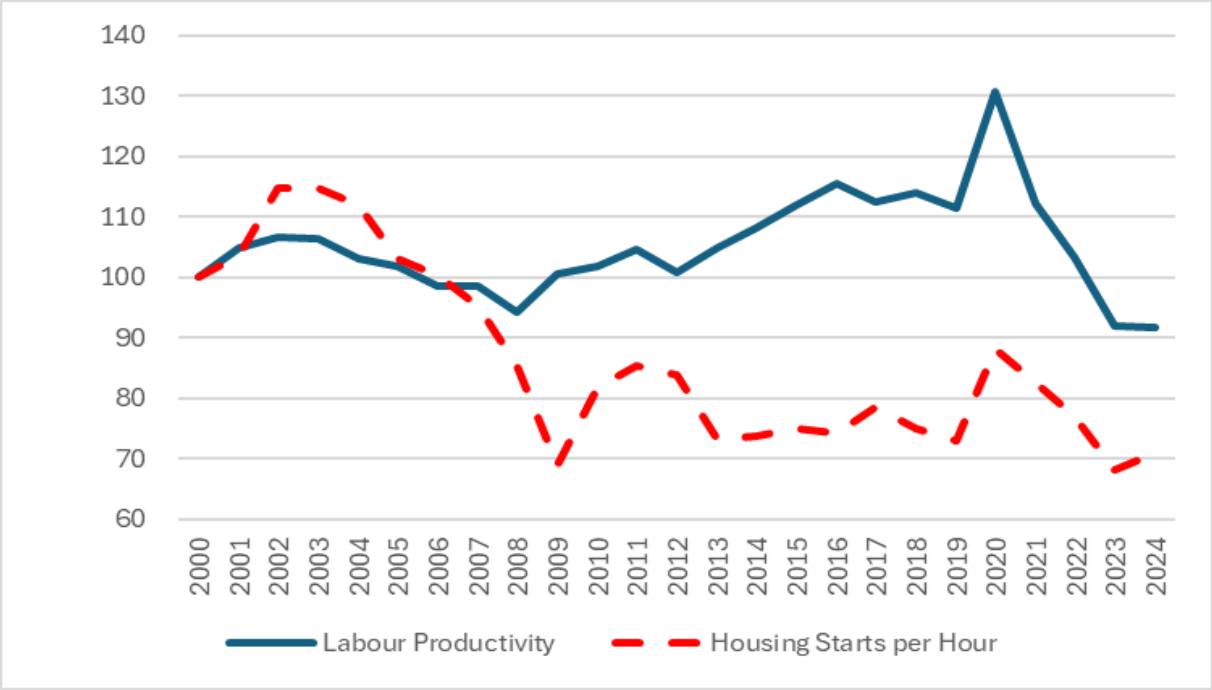
Source: Same as Chart 26

percentage points per year. It is thus likely that measurement error explains some, but not all, of the gap in labour productivity growth between the construction industry and the business sector. Statistics Canada has been using the New Housing Price Index for deflating new residential construction output prices since 2000. In 2024, a separate series for renovation output prices called "The Residential Renovation Price Index (RRPI)" was introduced which measures the quarterly change over time in the prices that renovation contractors charge to provide renovation services for a range of residential renovation projects. [30]

US studies have paid close attention to the possible role of mismeasurement of construction productivity as well. Rojas and Aramvareekul (2003) find that the raw data used to calculate construction productivity values at the macroeconomic level and their further manipulation and interpretation present so many problems that the results should be deemed unreliable and that it cannot be determined if labour productivity has actually increased, decreased, or remained constant in the construction industry for the 1979–1998 period. Sveikauskas et al. (2018) examine the measurement challenges in assessing productivity growth in the U.S. construction sector. The study highlights issues such as the difficulty of accounting for quality changes, reliance on input-based measures, and limitations in price deflators. The authors suggest that conventional productivity estimates may understate real growth, emphasizing the need for improved measurement techniques.

[30] The RRPI is composed of 8 separate project groups, containing a total of 37 individual projects. The prices include the value of all materials, labour, equipment, overhead and profit required to construct each project. They exclude value added taxes and any costs for project design.

Chart 26: Housing Starts per Hours Worked and Labour Productivity, Residential Construction, Canada, 2000-2024 (Index = 100 in 2000)



Note: Number of Permits: Data is only available from 2018 to 2024.
Source: Statistics Canada Table 34-10-0066-01 and Table 36-10-0480-01.

Garcia and Molloy (2023) find evidence of an upward bias in construction price deflators related to unobserved improvements in structure quality, but the magnitude is not large enough to alter the view that construction-sector productivity growth has been weak since 1987 in the US. They find only small contributions from other potential sources of measurement error. In a related recent study, Goolsbee and Syverson (2023) conclude that measurement error is probably not the sole source of the construction sector's productivity stagnation. They reach this conclusion by using measures of physical productivity in housing construction and demonstrating that productivity is falling or, at best, stagnant over multiple decades. In addition, they show that there has been a noticeable decline over time in the efficiency with which construction firms translate materials inputs into output, and a corresponding shift toward more value-added-intensive production.

To determine if the labour productivity growth path is sensitive to the measure of output, we analyze the trend in three 'output per hour worked' measures. First, we take the nominal (current) value of permits per hour of work in the residential construction sector. Second, we use housing starts per hour of work in the sector and finally we use the standard real

value added per hour of work (labour productivity measure). Chart 26 shows that while the exact growth rates are sensitive to the measure of output chosen, all measures show a sharp decline after 2020. This demonstrates that the 2019-2024 fall in productivity growth in residential construction is not merely a measurement error issue.

In conclusion, despite the potential for a long-term systematic bias in estimating construction productivity due to measurement issues, it is not possible to attribute the poor post-2019 productivity performance of this sector to measurement. Except for the recent introduction of RRPI in 2024, there has not been any methodological shifts in that period that can explain the decline in residential construction.

A. Capacity Utilization[31]

A report by Statistics Canada (2024) sheds light on another dimension of the productivity issue in the construction sector.[32] As Chart 27 shows, the industrial capacity-utilization rate (the ratio of actual output to potential output) for the construction sector was 83 per cent in 2024, which implies that the industry is not efficiently using its resources. Rising inflation, the rising cost of inputs and rising interest rates and debt costs, shortage of labour force, recruiting and retaining skilled employees were the top challenges reported by construction firms.

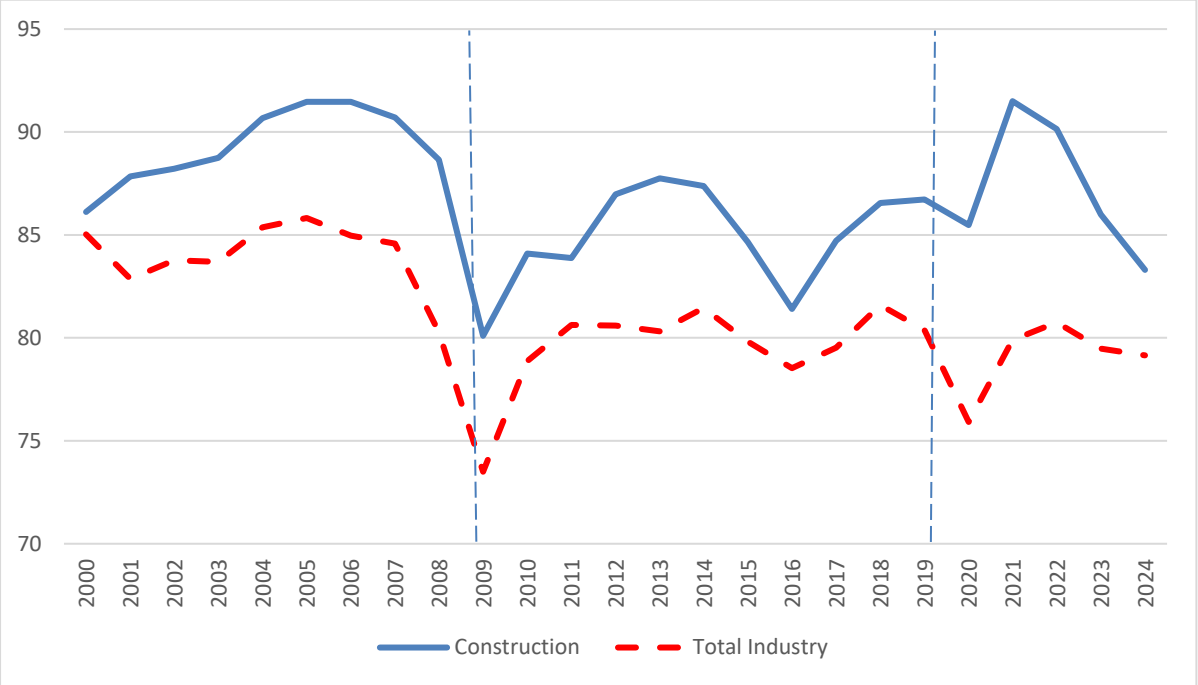
[31] Unfortunately, we lack capital investment data specific to residential construction and must rely on Statistics Canada's aggregate construction series (Table 36-10-0208-01).
Capital input in construction grew 3.18 per cent per year from 2000 to 2023, outpacing hours worked (2.8 per cent) but lifting capital per hour only 0.30 per cent—well below the business-sector growth rate of 1.5 per cent. The chronology is telling:

- 2000-2008 – capital input up 5.3 per cent, hours almost as fast; capital per worker 0.5 per cent, productivity flat.
- 2008-2019 – investment slowed (2.1 per cent) yet hours slowed more, nudging capital per worker up 0.6 per cent, productivity still stagnant.
- 2019-2023 – hours rebounded while investment rose only 2.3 per cent; capital per worker fell 0.7 per cent and construction labour productivity dropped about 2 per cent per year.

The pattern suggests that when capital deepening keeps pace with labour growth it can hold productivity steady, but it has not been sufficient to raise it; once capital lags, productivity declines quickly. If residential construction mirrors the aggregate sector, the recent shortfall in investment is amplifying the post-2019 productivity slide, whereas earlier stagnation reflects that even robust investment could merely offset other structural headwinds rather than deliver gains.

[32] Unfortunately, capacity utilization data are not available at the residential construction level.

Chart 27: Construction Capacity Utilization, Canada, 2000-2024



Source: Statistics Canada. Table 16-10-0109-01 Industrial capacity utilization rates, by industry

Table 16: Capacity Utilization, Select Industries, Canada, 2000-2024

Industry	2000 Level	2024 Level	2000-2008 Average	2008-2019 Average	2019-2024 Average
Total Industry	85.0	79.2	84.0	79.6	79.3
Construction	86.1	83.3	89.3	85.2	87.2
Manufacturing	85.8	77.7	82.3	79.1	76.7
Mining	82.6	75.5	81.8	72.4	73.2

Source: Statistics Canada. Table 16-10-0109-01 Industrial capacity utilization rates, by industry

More than one-third (36.7 per cent) of construction businesses reported supply-chain challenges, specifically with delays in deliveries of inputs, products or supplies. While construction has historically enjoyed higher capacity utilization compared with other industries, the recent dramatic fall in utilization between 2021 and 2024 (which was significantly faster than other industries) can be a contributing factor to the poor residential-construction labour-productivity growth performance in 2019-2024, as residential construction is a major part of the overall construction sector and it is very likely that the capacity-utilization rate is similar to the overall sector.

Table 19 underlines these points. Construction started the century with a utilization rate of 86.1 per cent—slightly above the economy-wide figure and ahead of manufacturing and mining—and still led the pack in 2024 at 83.3 per cent. Over the full 2000-2024 span construction averaged higher utilization than total industry and the other two goods-producing sectors in every sub-period: 89.3 per cent in 2000-2008, 85.2 per cent in 2008-2019, and 87.2 per cent in 2019-2024. By contrast, total industry held steady near 79 per cent in the two most recent windows, while manufacturing and mining slipped below that level. The data therefore confirm that although construction has seen the sharpest recent drop, it continues to operate closer to full capacity than other major industries—an indication that its productivity challenges stem not from chronic under-utilization relative to peers, but from cyclical swings that can quickly erode efficiency when investment, labour supply, or materials availability tighten.

B. Supply Chain Disruptions and Pandemic Effects

The Covid-19 pandemic severely disrupted global and domestic supply chains, hitting construction especially hard. Shortages and delays in critical materials (lumber, steel, windows, appliances, etc.) slowed down projects and left crews idle waiting for parts (CHBA, 2022). The CHBA report notes that pandemic-era supply challenges "caused extensive delays in home closings and made predicting construction timelines extremely difficult," with average build times delayed by about 10 weeks during late 2021. At various points, factories for construction goods (from lumber mills to plumbing fixture manufacturers) were shut down or backlogged. Shipping bottlenecks and price spikes further hampered productivity, as builders either paused work or spent extra labour hours sourcing alternatives. These supply chain disruptions meant that even with more labour on site, output could not increase commensurately – reducing output per hour. Although supply conditions have been gradually improving since 2022, the pandemic shock exposed the fragility of construction's just-in-time supply chains. It forced inefficiencies (e.g. resequencing work or using less efficient methods due to material unavailability) that lowered productivity, and some bottlenecks persist in the post-pandemic recovery.

C. Market Structure Factors

The Canadian residential construction industry is made up of many small, geographically dispersed firms (Laberge, 2024). The size of construction firms has an impact on labour productivity because companies that only employ a few workers are unable to take advantage of economies of scale, nor can they realistically undertake R&D investment (Hughes, 2024). The author highlights particular challenges in achieving that goal due to the

residential construction's unique regional and segmented nature (e.g. single-detached market where some firms will build one house a year). Low market consolidation hinders investment in R&D and efficient recruitment, training, resource allocation and project management. On the other hand, multi-residential buildings (100 units and over) built by larger firms that are better poised to utilize technologies such as AI, 3D modeling and building automation can present a solution to residential construction's productivity challenges.

In addition to regulations on building sizes, Canadian geography works against consolidation in construction. Given the country's large size, the long distances between urban areas, and the differences in licencing requirements between provinces and municipalities, the construction industry is regionally fragmented with little overlap (Caranci & Marple, 2024). When firms are restricted in their ability to expand, competition in the construction business suffers. Competition between firms has a positive effect on productivity, as a more productive workforce gives a firm a cost advantage over its competitors (Deslauriers & Gagné, 2023). In the absence of competition, a firm's incentive to make its workers more productive is decreased.

Residential construction is a highly regulated industry, and obtaining the requisite permits and certifications to start a business could prove to be a barrier to entry. However, given that the residential construction market is made up of many small firms, it seems entry is accessible. This could be a factor that increases competition, increasing productivity by consequence. Even if the existing residential construction firms are small enough not to be in competition with each other, new firms entering the market could displace them by employing more efficient construction methods.

Statistics Canada does not publish the data on the number of employees per firm in residential construction, but the values 2023 are available on the Innovation, Science and Economic Development Canada (ISED) website.[33] Firms are classified as micro (1-4 employees), small (5-99), medium (100-499), and large (500). Of the 38,284 residential construction firms in Canada in 2022, 100 were in the medium category, and only 2 were classified as large. 2023 saw the medium and large categories expand to 104 and 5 firms respectively, out of a total of 39,530. For the purposes of this dataset, firms are only classified as being in the residential construction sector if residential construction activity

[33] See https://ised-isde.canada.ca/app/ixb/cis/businesses-entreprises/2361

is that firm's primary revenue stream. This may result in large construction firms who do various types of construction work to be classified in a different sector.
However, a similar distribution of firm sizes exists for the overall construction industry as well. Of the construction firms in Canada in 2023, only 1.1 per cent had 100 or more employees, which is lower than the respective percentages in many industries. Manufacturing (6.8 per cent), mining (5.4 per cent), arts and entertainment (3.7 per cent), retail trade (2.6 per cent), and finance and insurance (2.3 per cent) all had higher shares of firms with 100 or more employees.

To obtain a better grasp of the dynamics of firms' structures and they could have had shaped the productivity trends in residential construction, we examine the trends in entry and exits in the overall construction sector.[34] Chart 28, Panel A shows the number of active employer businesses in construction which has grown considerably (2.5 per cent per year). This growth in the number of construction businesses is a result of high entry into the sector and relatively low exits (Chart 28, Panel B) between 2001-2022. The only exception is 2020 when exits outpaced entries.

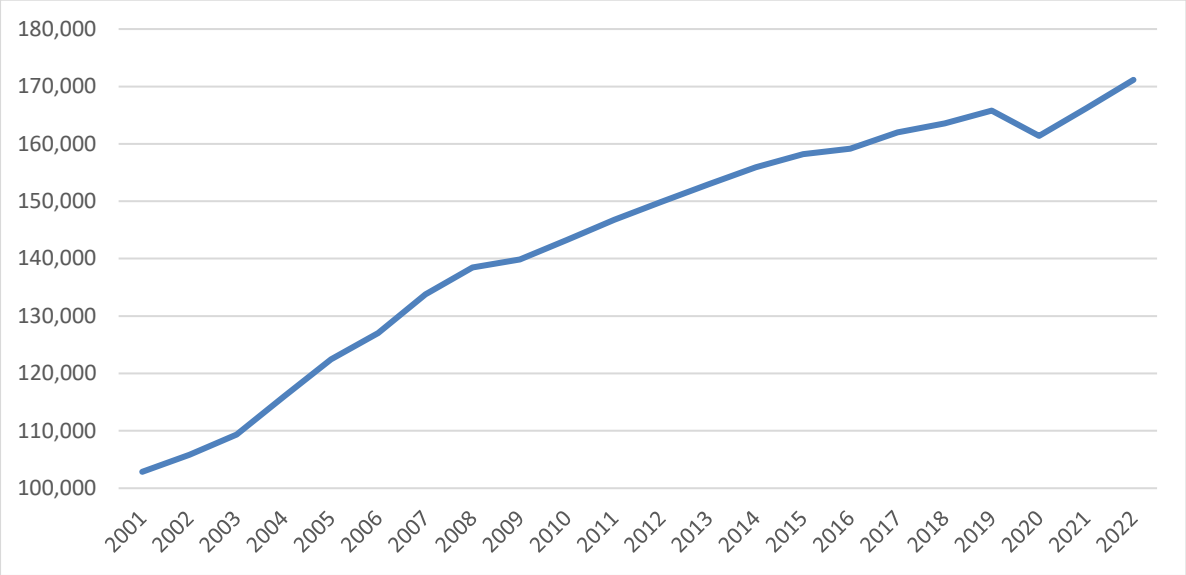
Chart 28, Panel C shows that the share of new entrants as total employers has fallen since early 2000s but has rebounded somewhat after 2020. This is consistent with the fact that number of incumbents in the construction industry grew by 2.8 per cent per year between 2001 and 2022 whereas incumbents' numbers grew only by 1.5 per cent per year in the overall private sector. This implies that incumbents in construction are more likely to stay in business. This is drag on long-term productivity growth in the construction (and residential construction sector) as entrants have shown to be more innovative and productive than incumbent firms (Statistics Canada, 2004).

The main takeaway message from this section is that market structure factors in residential construction negatively affect the sector's long-term labour productivity growth both through a market concentration channel and lack of innovation. However, there is no evidence that the recent decline in residential construction labour productivity growth is attributable to market structure factors.

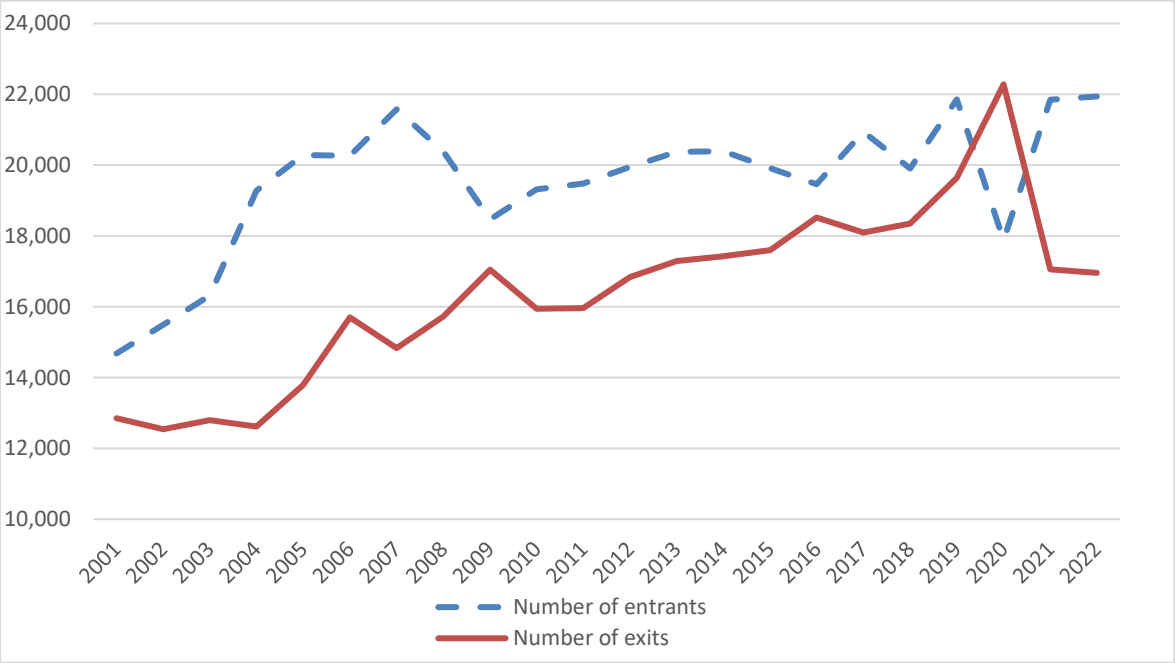
[34] Again, unfortunately we have to rely on the data available for overall construction and not for residential construction as the data are not disaggregated for the construction sub-industries.

Chart 28: Business Dynamics, Construction Sector, Canada, 2001-2023

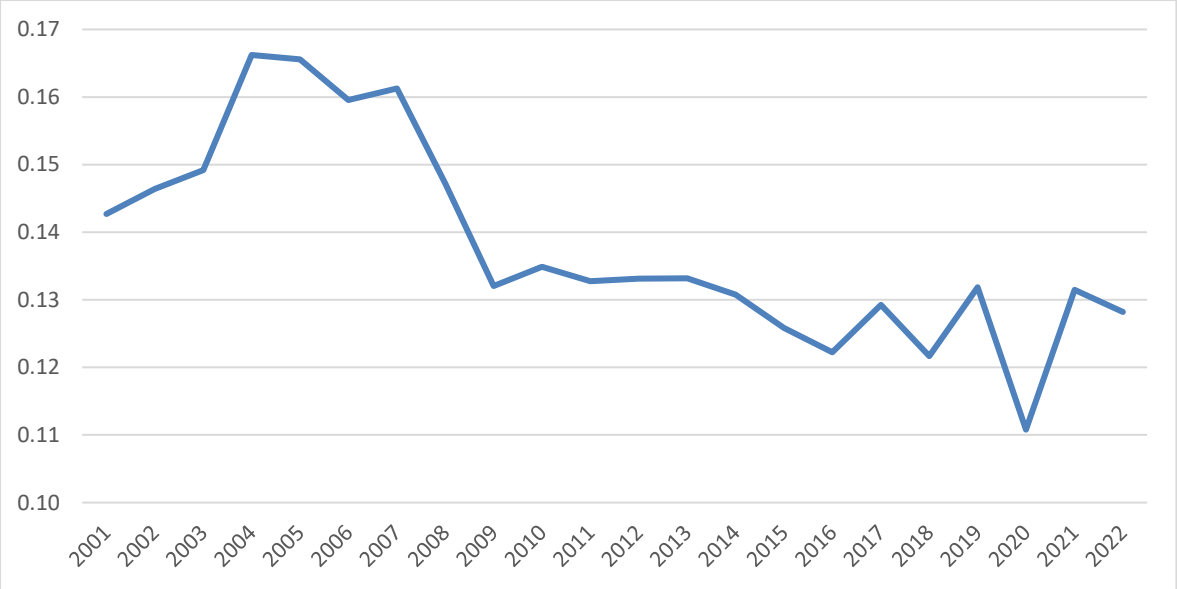
Panel A: Number of active employer businesses



Panel B: Number of Entrants and Exits



Panel C: Share of Entrants among all Employers



Source: Table 33-10-0164-01 Business Dynamics measures, by industry

D. Technological Developments

Technical progress is the major contributor to productivity gains in most industries. When workers are equipped with better machinery and production processes, productivity increases as the time required to generate the same level of real output falls. Fundamentally, there are two challenges in technological progress: first, developing new building technologies and methods, and second, incorporating these innovations into day-to-day practice. Given the available data—and the global nature of technology development and associated knowledge spill-overs—we cannot accurately distinguish between these two issues in our discussion of labour-productivity growth.

On the adoption side, the nature of residential construction imposes serious limits on technical progress. The sectors' output is heterogeneous, as each house built is built to different budget, land, climate, and regulatory constraints. As discussed earlier, the residential construction is made up of many small firms, partly because of the heterogeneity of output. This may be a limiting factor for technical progress in the sector, as small firms are slower to adopt new technologies due to cost.

As stated by Barbosa et al. (2017), the construction industry's uptake of technology has been slow over the past several decades. Historically, construction companies spent an

average of less than 1 per cent of revenues on IT, less than a third of what is common, for example, in automotive and aerospace. In addition, the more established technological advances focus on increasing control or other priorities, such as design, safety, and usage of new materials, and less on direct workforce productivity.

Patents

There are no publicly available data sources that provide specific information on patent applications or on how those patents are used in the residential construction industry. A report by Abbes et al. (2022) found that overall, the number of patent applications by Canadian-resident businesses increased the most in civil engineering (for example, the construction of buildings and roads, and some mining infrastructure). Between 2001 and 2015, the number of patent applications in civil engineering grew by 317. Medical technology (198), IT methods for management (153), computer technology (153) and transport (127) were the four other areas that showed the largest increases between 2001 and 2015. However, we note that patents in civil engineering are not all used in residential construction, and therefore it is unclear if residential construction's productivity has been benefiting from this boom in civil engineering patents.

R&D

A more readily quantifiable measure of technological investment is R&D investment that captures businesses' in-house research and development expenditures.

Table 20 shows the R&D investment in all industries as well as select other industries including construction in Canada between 2014 and 2022. The low levels of R&D investment in this sector are only comparable to that of agriculture, forestry, fishing and hunting. In fact, construction makes less than 0.5 per cent of total industrial in-house R&D expenditure by businesses. Despite this low level, construction R&D has had the fastest growth rate since between 2014 and 2022 of any other industry having been doubled in that period.

While the in-house research conducted by construction firms is relatively low, publicly funded research through universities and higher learning institutions in this sector is likely much higher.[35]

[35] $14 billion of research annually was conducted across all disciplines in Canada as of 2022 (Canadian Construction Association, 2022).

Table 20: Business Enterprise In-House Research and Development Expenditures, By Industry, Canada, 2014-2022 (Millions of current dollars)

Industry	2014	2015	2016	2017	2018	2019	2020	2021	2022
Total all industries	18,207	17,954	18,723	19,032	20,855	21,920	23,679	27,783	30,404
Agriculture, forestry, fishing and hunting	83	x	155	153	175	161	206	192	175
Mining, quarrying, and oil and gas extraction	1,449	x	830	809	1,043	1,002	890	1,023	1,317
Construction	90	x	96	107	121	118	189	168	185
Manufacturing	6,097	x	6,680	6,556	6,598	6,408	6,475	7,296	7,449

Source: Statistics Canada. Table 27-10-0343-01 Business enterprise in-house research and development expenditures, by industry group based on the North American Industry Classification System (NAICS), country of control and field of research and development.

Lagging Adoption of Best Practice Technologies

There are numerous emerging areas of technologies that can be promising for the productivity growth in the residential construction (and broader construction sector's) productivity. However, evidence suggest that the industry is struggling to realize these potential productivity gains effectively. For instance, most Canadian construction companies rate their digital maturity as fairly low and are not leveraging technological adoption or are merely experimental (KPMG-CCA, 2021). In a survey and trend analysis of Virtual Reality (VR) and Augmented Reality (AR) adoption in the Architecture, Engineer and Construction (AER) industry in the United States, researchers found that the AEC industry is far behind other sectors in adopting these technologies (Noghabaei et al. 2020).

Modular and Pre-fabricated Construction

Another important emerging field is modular homes. They are notable because they eliminate the problem of uniqueness that otherwise defines residential construction. Instead of being built on-site, they can be prefabricated and mass produced, then transported to the property where they are to be installed. Modular homes, and other types of prefabricated housing can take advantage of economies of scale, which reduces the on-site labour hours necessary to build certain components of a house, increasing

Table 17: Hours, Output and Labour Productivity Growth Rates, All Other Wood Product Manufacturing, Canada, 2000-2024

Period	Hours Worked	Output	Labour Productivity
2000-2024	-0.85	1.00	1.86
2000-2008	0.16	1.01	0.83
2008-2019	-1.20	-0.74	0.47
2019-2024	-1.67	4.91	6.71

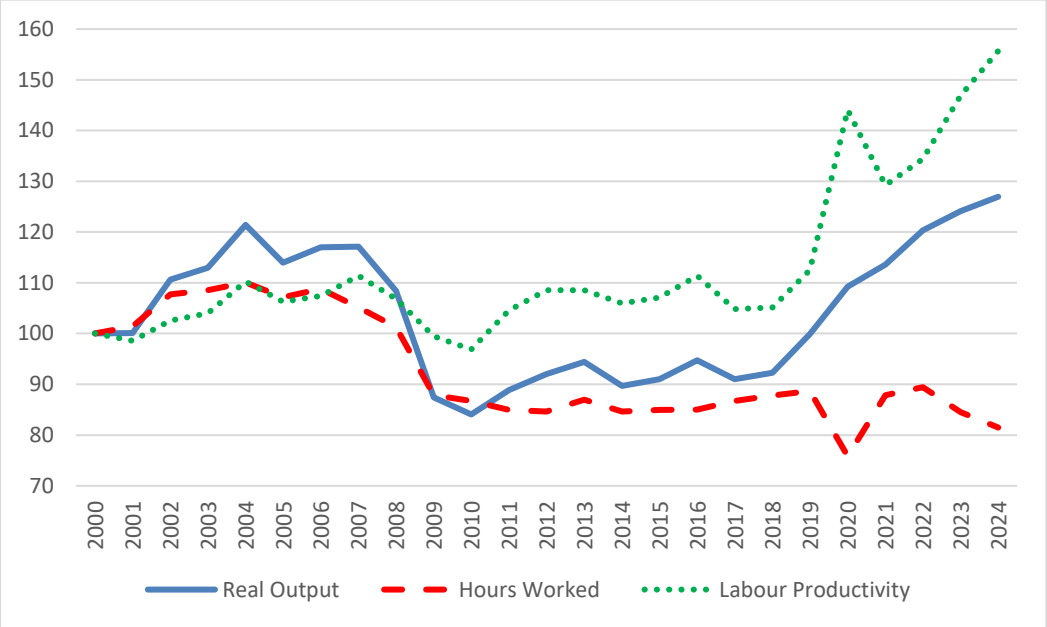
Source: Statistics Canada. Table 36-10-0480-01 Labour productivity and related measures by business sector industry and by non-commercial activity consistent with the industry accounts

productivity. Modular home building occupies a small but rapidly growing segment of the North American construction industry. In 2022, it made up 6 per cent of construction starts, up from 2 per cent in 2018 (Dragicevic & Riaz, 2024).

Modular building technology faces several unique challenges that limit its expansion. Schmitz (2020) offers a perspective that argues that current players in the construction industry may resist widespread adoption this technology, because they are hesitant to change and are familiar with the prevalent practice of stick-built housing. He notes that technical progress has been artificially delayed in the United States. This is due to the efforts of large homebuilders' industry associations and trade unions to block the development of modular home building technology. Through lobbying politicians, these groups were able to impose regulations on the burgeoning modular home industry in the latter half of the twentieth century. These regulations, combined with subsidies for traditionally built homes, have prevented the growth of modular homes, and hence limited productivity advances for the sector. It is not clear to what extent this argument applied to the Canadian context. CSLS interviews suggest that developers may wield significant local market power. In Ottawa, for example, roughly eight firms undertake most new-building activity, facing little competition from companies based outside the region.

This resistance is not only in the form of organized lobbying as Schmitz describes, but also just a lack of knowledge in the industry about how modular construction works. Residential construction is a multi-step process, involving architects, engineers, and tradespeople. Unfamiliarity with modular housing methods and applications due to path dependence limits its uptake. Furthermore, while zoning regulations in Canada do not prohibit modular construction outright, its novelty means that building inspectors familiar with modular

Chart 29: Output, Hours and Labour Productivity in All Other Wood Product Manufacturing, Canada, 2000-2024 (index = 100 in 2000)



Source: Statistics Canada. Table 36-10-0480-01 Labour productivity and related measures by business sector industry and by non-commercial activity consistent with the industry accounts

construction are few and far between. This can cause delays in approvals, making the practice less efficient (Dragecevic & Riaz, 2024).

In Canada, modular construction, is included in the NAICS code 32199 - All other wood product manufacturing- and therefore their output and hours are captured in that industry's estimates. [36]

Appendix A provides a detailed breakdown of the definitions of these industries. It is worth noting that the majority of output and hours in all-other wood-product manufacturing is attributable to mobile-home and prefabricated-building producers. Chart 29 and Table 21 provide the labour-productivity, hours-worked and output trends in this sector between 2000 and 2024.

[36] The US NAICS code disaggregates NAICS 32199 - All other wood product manufacturing into NAICS 321991 manufactured (mobile) home manufacturing and 321992 prefabricated wood building manufacturing.

Labour productivity growth in all-other wood-product manufacturing has been consistently positive across all periods. In both 2000-2008 and 2008-2019, annual gains were modest—0.8 per cent and 0.5 per cent, respectively—before surging to 6.7 per cent per year in 2019-2024. While output growth was negative before 2018, a major reversal followed: the sector posted strong output growth of 4.9 per cent per year in 2019-2024 even as hours worked declined by 1.7 per cent per year. That combination drove the recent productivity leap. If such robust gains continue, they could bode well for productivity in residential construction and, ultimately, housing affordability—though quantifying the direct spill-over remains beyond this report's scope.

The trajectory of modular construction illustrates the challenges of innovation in residential building. Although sluggish modular-housing uptake is not the root cause of productivity declines, it exemplifies how a practical tool has yet to enter the mainstream. Wider adoption of modular methods and similar innovations could lift future residential-construction productivity.

The key insight of the analysis presented in this section is that the long-term stagnant labour productivity growth rate in residential construction is in large part due to the challenges of developing and adopting new technologies in this sector. However, these technological challenges offer no explanation for the 2019-2024 fall in labour productivity observed in residential construction.

E. Labour Market Issues

Workforce

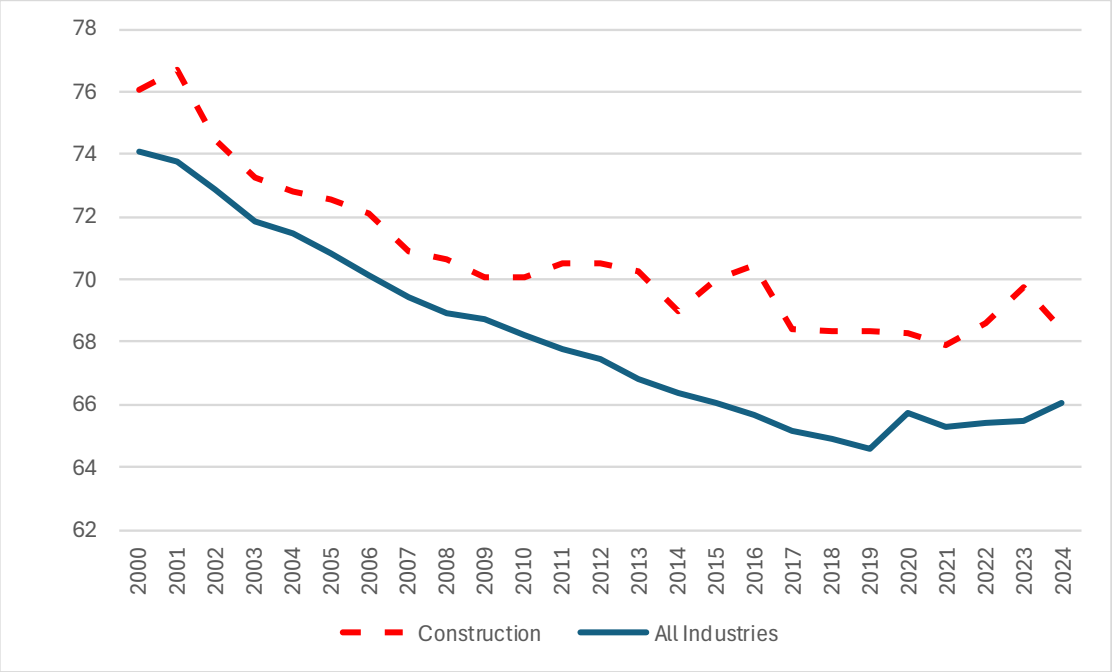
As stated by the Fall Economic Statement (2024) declining residential construction productivity across the country, partly a product of supply chain congestion and labour market challenges, is holding back the sector's ability to build homes and infrastructure and weighing on Canada's overall productivity performance.

To address the labour-market aspects of the residential-construction section, we examine the workforce-age statistics captured in the Labour Force Survey, which collects monthly data on workforce characteristics and employment.

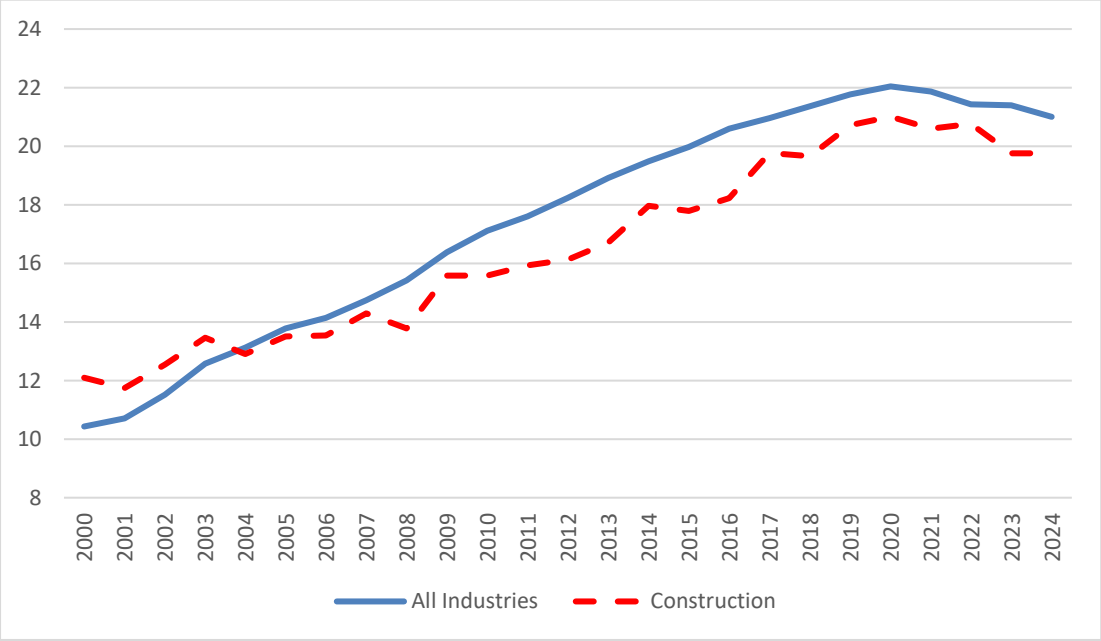
Chart 30, Panels A, B and C show that the age profile of the construction workforce is nearly identical to that of the business sector and has been since 2000.

Chart 30: Workforce Age Composition in Construction and Business Sector, Canada, 2000-2024

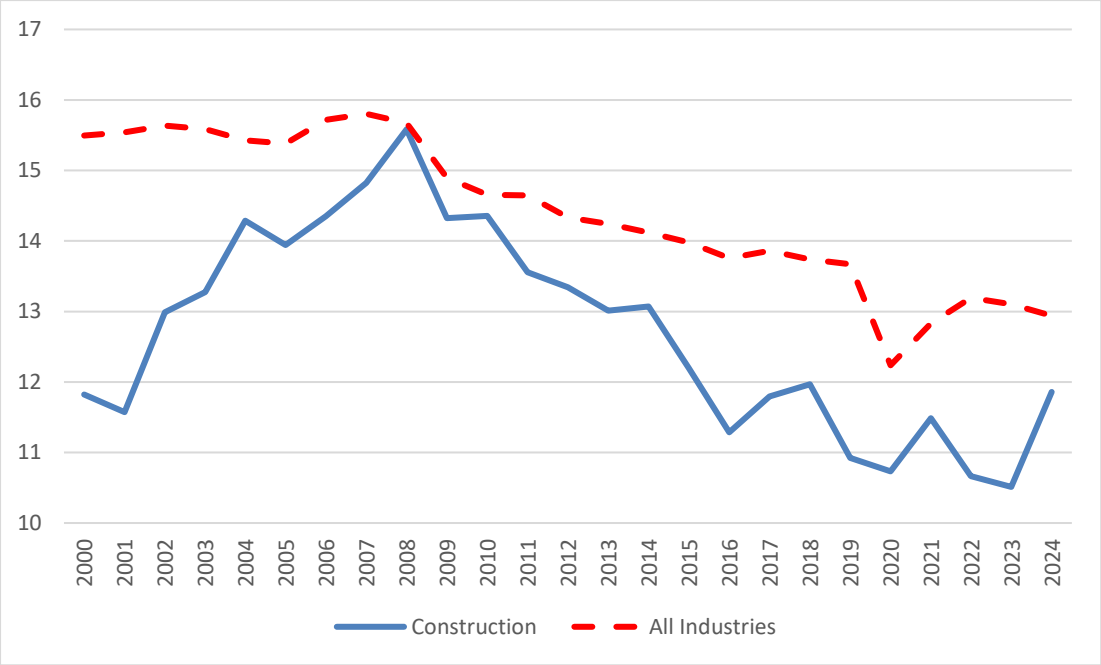
Panel A: Percentage of Workforce Aged 25 to 54



Panel B: Percentage of Workforce Aged 55 and over



Panel C: Percentage of Workforce aged 15 to 24



Source: Statistics Canada. Table 14-10-0023-01 Labour force characteristics by industry, annual (x 1,000)

Data from the 2021 Census on ages in the residential-construction workforce are consistent in showing that the sector's age profile was very close to the total-economy average that year. Assuming this relationship has been constant through time, it may partially explain productivity declines, as Canada's population and workforce are aging.

As seen in Chart 30, Panel B from 2000 to 2024 the share of workers aged 55 and over in the construction industry increased by eight percentage points, from 12 per cent to 20 per cent. Over the same period, the share of construction workers aged 25 to 54 fell from 76 per cent to 68 per cent (Chart 30, Panel A), while the 15-to-24 age bracket remained roughly steady at 12 per cent in this industry. This demographic shift would cause disproportionately larger productivity declines in construction relative to the total economy, given that youth is a more important factor for productivity in construction than average because of the physical demands of the job.

The general business environment for construction has worsened since the pandemic, which has contributed to the 0.4 per cent annual average decline in real value added for the residential construction sector from 2019 to 2023. Construction has also been hit particularly hard by labour shortages. 28 per cent of construction firms had difficulty retaining experienced workers in the second quarter of 2024, considerably higher than the

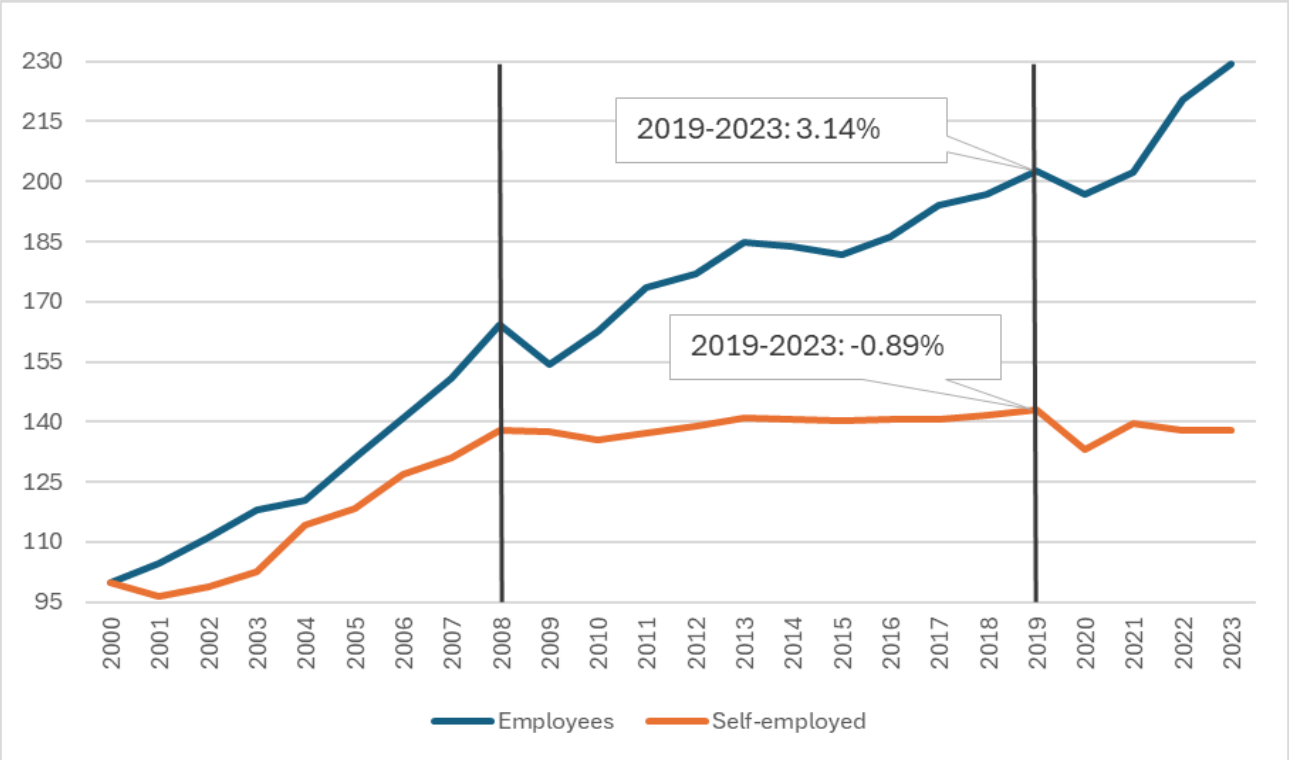
average of 21 per cent for all businesses (Statistics Canada, 2024). An above average loss of experienced workers is a contributing factor to the decline in residential construction productivity since 2019.

Self-Employment

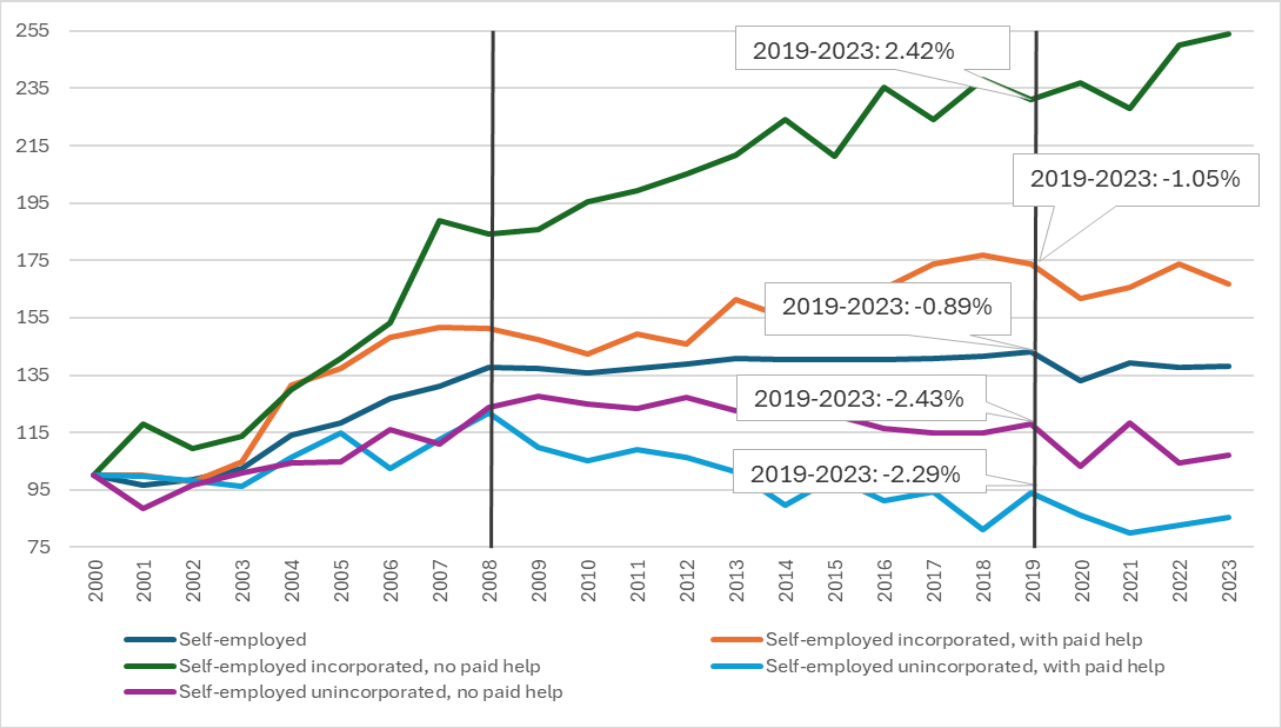
Unfortunately, a time series data for self-employment for residential construction is not readily available. However, the trends in overall construction sector (Chart 31, Panel A) illustrate that self-employment growth in construction has been virtually zero and in fact in the most recent period (2019-2023) it has fallen by 0.9 per cent per year. Notably, the category of self-employment in construction that has had the highest growth rate since 2000 was self-employment incorporated without paid help. This category of self-employment was the only one that grew in the 2019-2023 period (2.4 per cent per year). This is consistent with the notion that construction sector's employment dynamics are shaped by smaller firms that have few employees. Importantly, the

Chart 31: Self-employment, Canada, 2000-2023

Panel A: Self-employment and Employees (index = 100 in 2000)



Panel B: Self-employment Types (index = 100 in 2000)



Source: Statistics Canada. Table 14-10-0027-01 Employment by class of worker, annual (x 1,000)

entry of these incorporated self-employed workers that work individually has a negative impact on labour productivity growth as it makes economies of scale and technological adoption more difficult.

Labour Market Mismatches

In this subsection we investigate the role of labour market mismatches defined as labour shortages and over-supply of labour (mostly taking the form of labour hoarding—keeping workers despite reduced activity) in residential construction. A focal point of Canadian studies on labour market issues in residential construction is the issue of labour shortages and their impact on construction-sector productivity. According to a report by Build Force Canada (2024), an estimated 133,800 workers—about 22 per cent of the 2023 labour force—are projected to retire, creating a substantial gap in skilled personnel for residential construction. In addition, anticipated demand growth means the industry will need to recruit roughly 158,400 workers between 2024 and 2033.

These shortages are more accurate in some occupations than others. Carmichael (2025) notes that societal emphasis on university education over trades has “drained the labour

pool of talented and experienced carpenters," leaving fewer highly skilled workers on job sites in recent decades. Conference Board (2023) estimates that carpenters and construction trades helpers and labourers are forecasted to have the highest labour gap in residential construction in 2030.

Lyall (2022) argues that, given the difficult nature of construction work and low entry-level wages, the industry is not attractive to younger workers. However, new technologies such as drones, robotics, digital tools and modular-housing systems could appeal to younger recruits and aid hiring. Conference Board Canada (2024) echoes these concerns, highlighting persistent skills shortages in the construction sector and linking them to slower productivity growth.

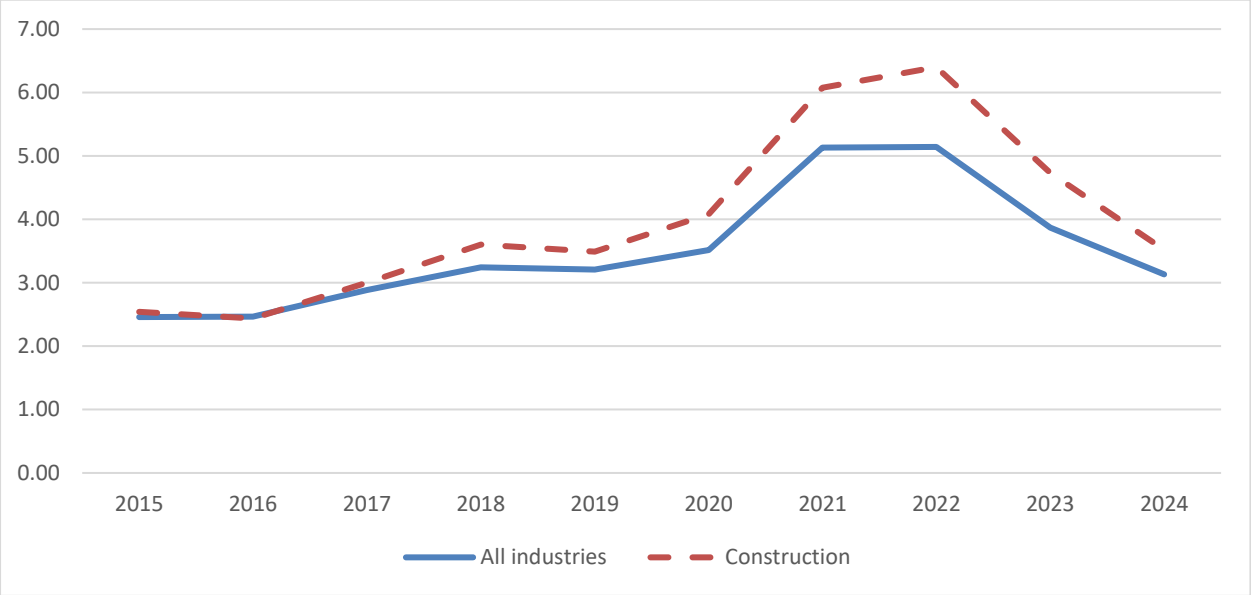
On a positive note, efforts to recruit underrepresented groups – e.g. women now comprise 14 per cent of the construction labour force, a 30-year high – will expand the workforce but still require upskilling and experience to boost productivity (Build Force Canada, 2024).

Interviews with practitioners confirm that the residential-construction sector is grappling with labour-market shortages. Because technological progress in the industry advances only slowly, the looming retirement of baby-boomer workers is especially worrisome; these employees possess substantial, industry-specific human capital that is difficult to replace with younger hires.[37] Experts therefore emphasize that the sector must recruit more workers than it loses to retirement to offset this knowledge drain—particularly given the current push to accelerate home building.

Job vacancies in residential construction can have an impact on the sector's labour-productivity growth and levels as they could lead to bottlenecks in production processes and impede firms' ability to operate. Lacking data on residential construction, we take the vacancy trends in overall construction as a proxy for developments in residential construction.

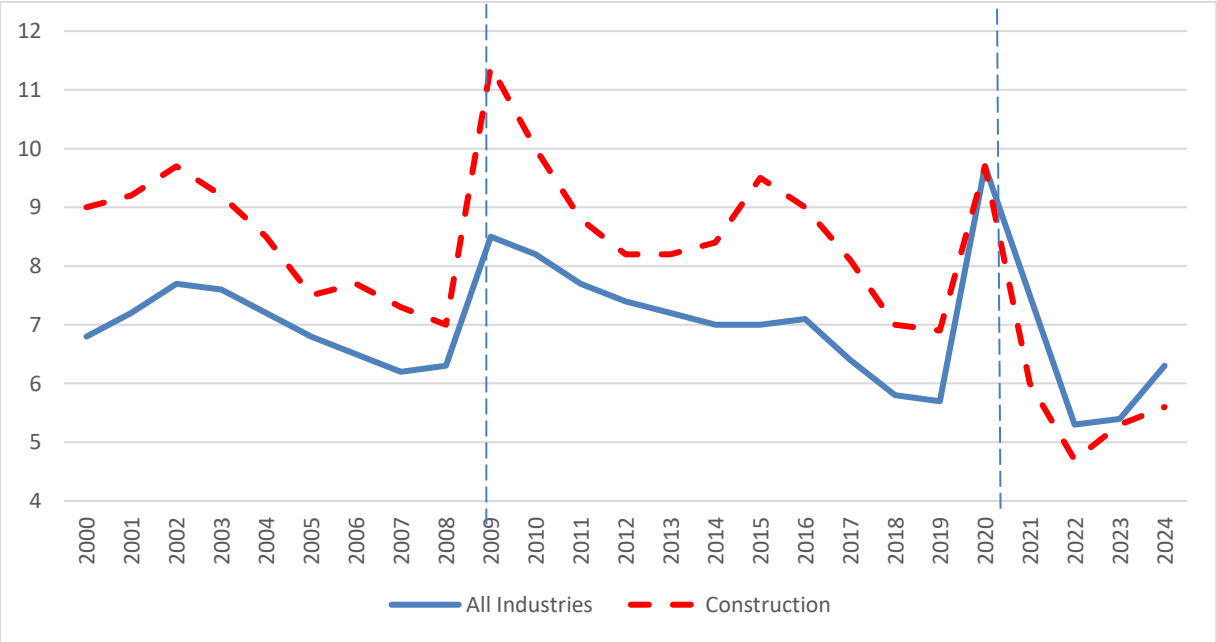
[37] This is a more acute issue in residential construction compared to other industries as the technology progress has been slow so younger workers would essentially have to work the same way that retiring workers were only with less experience and on the job know-how.

Chart 32: Vacancy Rates, Construction and All Industries Canada, 2015-2024



Source: Table 14-10-0372-01 Job vacancies, payroll employees, and job vacancy rate by industry sector, monthly, unadjusted for seasonality

Chart 33: Unemployment Rates, Construction and All Industries Canada, 2000-2024 (per cent)



Source: Statistics Canada. Table 14-10-0023-01 Labour force characteristics by industry, annual

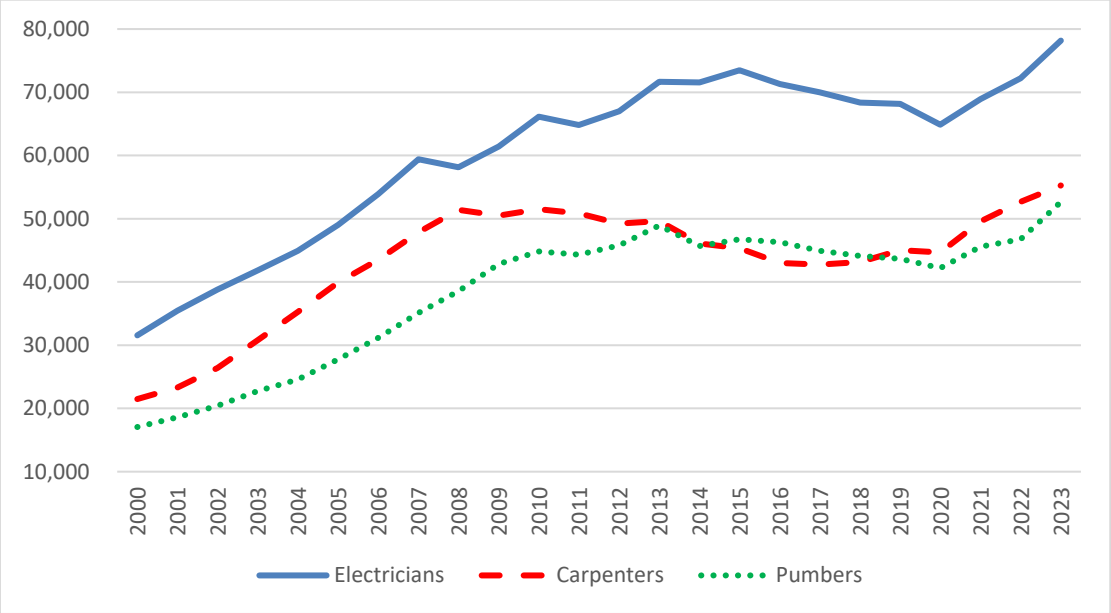
Chart 32 illustrates the job-vacancy rates for all industries and the construction sector from 2015 to 2024. The vacancy rate grew by 3.7 per cent per year in construction, while it was up by 2.5 per cent per year for all industries. This larger increase in vacancies in the construction sector could be a contributing factor to the long-term lagging productivity growth in the sector.

The more recent period of 2019-2024 has been interesting as well because of the sharp pandemic-era surge and subsequent retreat in construction vacancies, which still left the rate marginally higher than in 2019. Over this horizon vacancy rates rose by 1.2 per cent per year in construction versus 0.1 per cent in all industries. While vacancies fell for both industries in 2024, construction vacancy rates remained higher in construction. This could be a contributing factor to the poor productivity performance of the sector in the 2019-2024 period.

Unemployment rates in the two sectors paint a similar picture. Chart 33 shows that unemployment in construction was higher than in all industries between 2000 and 2020. However, there is also evidence for labour hoarding in residential construction industry. Since 2020 the unemployment rate in construction (proxy for residential construction unemployment) has fallen sharply and has been consistently below the all-industries rate. One important observation is that the spike in construction unemployment was much stronger than in all industries during the Great Financial Crisis (consistent with the highly cyclical nature of the sector); however, during the Covid recession construction's unemployment was not higher than all industries and in fact grew less than other industries. This is evidence that construction firms may have engaged in labour hoarding, which is consistent with high vacancy rates in the sector and therefore can partly explain the decline in labour-productivity levels of the sector in the 2019-2024 period.

Industry practitioners report that many residential-construction firms, expecting a post-pandemic surge in activity during 2021-2022, hired aggressively. Real output, however, declined after 2021. Despite weaker sales, firms have resisted layoffs, anticipating a rebound driven by supportive government policies and the prospect of lower interest rates—and aware of how hard it is to replace skilled labour once lost. One expert estimated that as much as 10 per cent of the current workforce could be let go without materially affecting output, highlighting the slack now embedded in the system.

Chart 34: Total Number of Registered Trades Apprentices: Electricians, Carpenters, and Plumbers, 2000-2023



Source: Statistics Canada Table 37-10-0219-01

Trade Apprenticeships

Chart 34 shows trends in the number of total registered trade apprenticeships for electricians, carpenters, and plumbers. In a given year, this measure includes new registrants, those already registered, and those reinstating their position in an apprenticeship program. These trades had the three largest proportions of total trades registration in 2023, and they are also the most relevant when it comes to residential construction. By 2023, absolute and relative increases in registrations, compared to 2000, were observed as follows: electricians saw an increase of 46,614 registrants (or 148 percent), plumbers saw an increase of 35,589 registrants (or 209 percent), and carpenters saw an increase of 33,777 registrants (or 157 percent). Each of the trades followed similar trends, exhibiting rapid growth during 2000-2008 followed by a subsequent slowdown in the 2008-2019 period. Growth picked up again in 2019-2023 but remained below first period levels. In every period, each trade's CAGRs were positive apart from carpenter apprenticeship registrations, which saw slightly negative growth in 2008-2019 (as shown in Table 22).

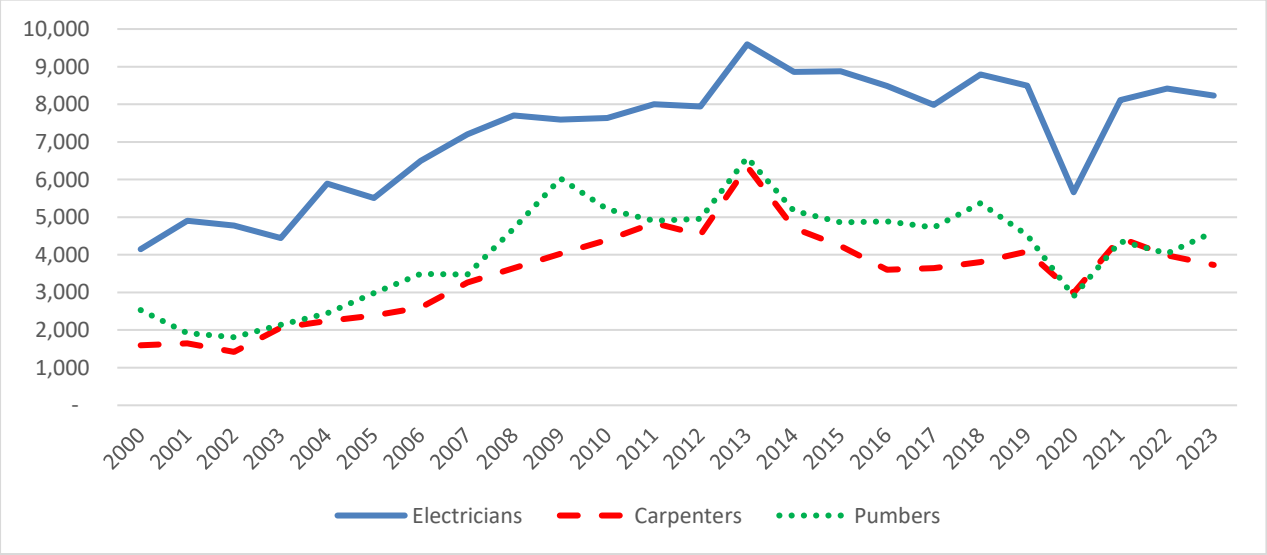
Table 18: Trade Apprenticeship Registrations and Certifications, CAGR, 2000-2023

	2000-2023	2000-2008	2008-2019	2019-2023
Apprenticeship Registrations				
Electricians	3.85	7.94	1.46	2.77
Carpenters	4.01	11.52	-1.20	4.18
Plumbers	4.81	10.73	1.13	3.82
Certifications Granted				
Electricians	2.89	8.04	0.90	-0.64
Carpenters	3.60	10.86	1.06	-1.82
Plumbers	2.52	8.02	-0.34	0.36

Source: Statistics Canada Tables 37-10-0089-01 and 37-10-0219-01

Chart 35 illustrates trends in the total number of certificates granted for the same trade categories. This number includes those who have completed their formal apprenticeship requirements and "trade qualifiers" who have passed some sort of skills assessment examination. [38] Again, each of these trades observed large increases between 2000 and 2023 in the number of certificates granted each year.

Chart 35: Total Number of Trades Certificates Granted: Electricians, Carpenters, and Plumbers, 2000-2023



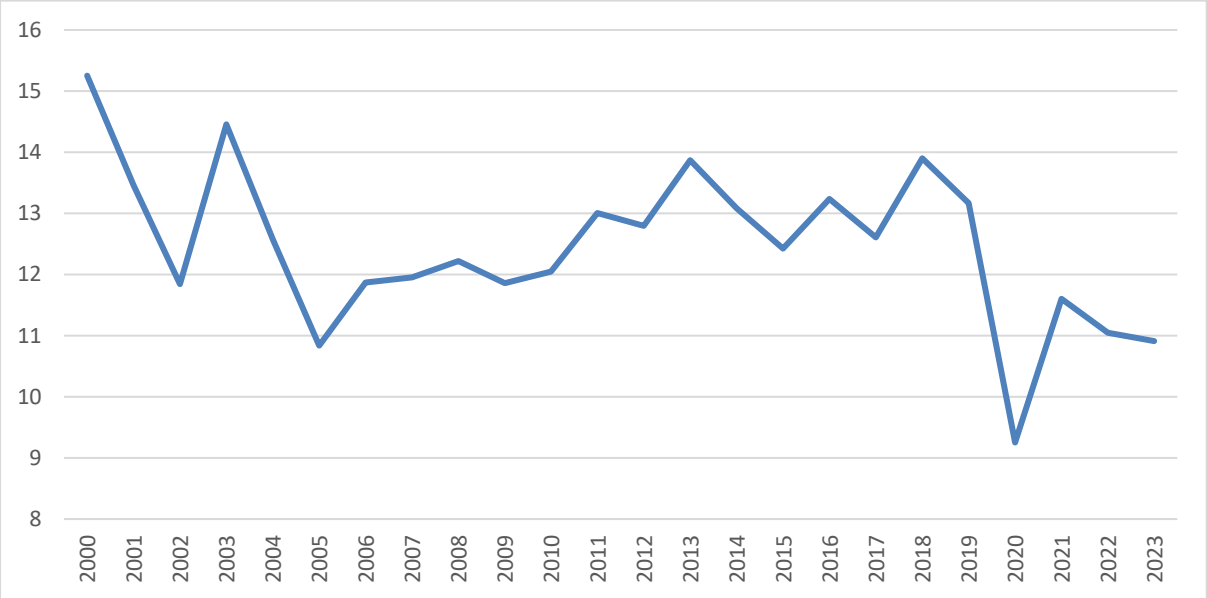
Source: Statistics Canada Table 37-10-0089-01

[38] Trade qualifiers are experienced tradespeople who have not completed a formal apprenticeship but have accumulated enough practical experience to challenge the certification exam for a specific trade.

These increases were as follows: electricians saw an increase of 4,080 certifications (or 98 percent), carpenters saw an increase of 2,136 certifications (or 134 percent), and plumbers saw an increase of 2,070 certifications (or 82 percent). Growth was strong during 2000-2008 and weak in the subsequent period of 2008-2019, matching that of registrations. Interestingly, this pattern did not follow to 2019-2023. While growth in the number of registrants rebounded, growth in the number of certificates granted slowed further, even contracting in the case of electricians and carpenters (as seen in Table 22). These charts may offer a potential explanation for the recent decrease in labour productivity observed in residential construction as 72 percent of building construction jobs are held by this sector. This trend is consistent with previous data indicating that the labour productivity fall was the result of accelerating growth in total hours worked. The rapid increase in registrations suggest that the share of total hours worked by inexperienced workers increased disproportionately compared to that of higher-skilled, certified workers.

This idea would partially explain the drag in labour productivity seen in recent years and is supported by Chart 36 which shows total trades certifications granted as a fraction of total trades registrations. Furthermore, in 2021 residential construction experienced an increase of 27 percent in its total employment, corroborating the influx of inexperienced labour.

Chart 36: Total Certificates Granted as a Fraction of Total Registrations



Source: Statistics Canada Tables 37-10-0089-01 and 37-10-0219-01

Note that many of the persons in the building trades may not end up working in residential construction, but rather in other construction sectors or outside construction altogether. This data also does not account for the movement of skilled workers into the residential construction industry from other industries. Such trends may offset the relative decrease in skill suggested by Chart 36. Thus, this data does not conclusively show the stream of new registrants to be a factor in residential construction but hints towards it. Finally, we should expect to see a positive impact on productivity in the next five years as the gap between the new wave of registrations and their expected date of certification closes.

CSLS interviews with industry experts found out that overall apprenticeship programs are not geared toward the skill demands of the residential construction industry and there is room for improvement in the design of these programs.

Immigration

The role of immigration in aggregate labour productivity remains contested. Gu, Hou and Picot (2020) find positive productivity effects from immigrant hiring—especially in knowledge-intensive firms and over longer horizons—whereas Sargent (2024) contends that the recent surge
in immigration, dominated by non-permanent residents (NPRs), has weighed on Canada's productivity by diluting capital per worker and lowering average skill levels.

For residential construction, however, most evidence points to the need for more targeted immigration. The Conference Board of Canada (2023) estimates an annual shortfall of roughly 12,000 workers in the sector and notes that current economic-class streams rarely select core trade occupations such as construction-trades helpers and labourers—suggesting that reserving even a small quota for these roles would help ease persistent vacancies. A Desjardins Economic Studies brief (2024) similarly reports that immigrants and NPRs remain under-represented in residential construction and concludes that NPR inflows would need to triple to bring their share of the construction workforce up to the national average.

CSLS Industry interviews echo the same sentiment. Despite IRCC's new targeted permanent-residency draws for trade occupations, experts report that the system still struggles to attract and retain residential-construction workers.

Table 19: Invitations to Apply Issued to Candidates Qualifying Category-Based Selection (CBS), June 28 - Dec 31, 2023

CBS Type	Invitations to Apply Issued	Percentage of Total
Healthcare	5,600	21.7
STEM	6,400	24.7
French Speakers	8,700	33.6
Agriculture	1,000	3.9
Trades	2,500	9.7
Transport	1,670	6.5
Total	25,870	100

Note: June 28, 2023, is the first CBS express entry round that occurred
Source: Table 42, https://www.canada.ca/en/immigration-refugees-citizenship/corporate/publications-manuals/express-entry-year-end-report-2023.html#tbl39

Problems include the absence of reliable tracking of immigrants entering the sector, selection criteria that miss its specific occupational needs, a tendency for newcomers to shift into non-residential construction or other industries after arrival, and hurdles in having foreign credentials recognized. According to Table 23, trade occupations made up only 9.7 per cent of the category-based invitations to apply (2,500 invitations) in 2023.[39] This was far less than other categories such as French Speakers (33.6 per cent), STEM (24.7 per cent) and Healthcare (21.7 per cent).

According to Government of Canada (2024) census analysis, immigrants account for nearly 41 per cent of all architects, 40 per cent of all civil engineers, 23 per cent of all urban and land use planners, and 24 per cent of all construction managers.

Immigrants could support a growing need for skilled workers in the construction sector. Currently, immigrants account for:

- 20 per cent of roofers and shinglers
- 16 per cent of all electricians
- 15 per cent of all carpenters
- 14 per cent of all plumbers

[39] An Invitation to Apply (ITA) is a formal invitation issued by Immigration, Refugees and Citizenship Canada (IRCC) to individuals who have a strong profile in the Express Entry pool, signaling they can now apply for permanent residency.

- 12 per cent of steamfitters, pipefitters and sprinkler system installers

In a recent development, the government of Canada announced that thousands of undocumented construction workers will be able to apply for legal status in Canada under a new immigration pathway to combat Canada's housing crisis and fill severe labour shortages in the construction sector.[40]

Management Practices

While the external environment has shaped the makeup of the residential construction industry, the way that business is coordinated within the industry also has an impact on productivity. The makeup of the construction workforce is a factor that affects productivity. Workers' skills and experience have a positive impact on performance, but an aging workforce may diminish productivity, given the physical nature of work in the construction sector. Additionally, management related factors can influence productivity. Ineffective organization in construction can lead to misallocation of resources which cause delays and increases in idle time.

Worker motivation also has a role to play when considering productivity factors on the worksite. Hewage & Ruwanpura (2006) suggest that a lack of motivation leads to less effort on the worksite, which decreases labour productivity. If proper incentives are not in place for workers to believe that an increase in effort will lead to an increase in compensation, then productivity will suffer. Misalignment between the preferred management styles of supervisors and workers may also cause frictions that decrease productivity.

In their survey of North American construction firms, Royal Institution of Chartered Surveyors (2024) find that the most important factors affecting productivity were site supervision and coordination, availability of skilled workers, and scheduling, sequencing, and coordination, according to industry stakeholders. Many of these factors, such as worker motivation and scheduling are qualitative, and lack a proper dataset to determine whether they have increased in prevalence over time.

Our interviews with industry experts shed further light on how management practices shape productivity. A key point concerned technology adoption: it must be anchored to specific outcomes and integrated into existing workflows, yet many project managers lack the

[40] For more details see: https://www.ctvnews.ca/politics/article/thousands-of-undocumented-construction-workers-to-get-legal-status-in-canada/

expertise to do so, and MBA programmes rarely cover manufacturing-style management. Although private trainers and consultants offer project-management solutions, their tools are seldom tailored to small firms. Experts also observed that recent project-management software makes it easier to track several jobs at once, but managers still need to intervene directly on each project, limiting automation and keeping productivity gains modest.

F. The Role of Construction Regulation

Housing policy and regulations play an important role in the residential construction sector. One of the key observations made earlier in this report was the decline in real output in residential construction in the 2019-2024 period and the slow long-run growth in the sector's real output in the 2000-2019 period. In this section we explore the possibility that construction regulations (specifically changes to these regulations) could be an explanatory factor in understanding residential construction productivity in Canada.

Laberge (2024) finds that even with a record-high 650,000 construction workers in 2023, Canada's housing production of 240,267 units was below the potential of over 400,000 homes per year.[41] The discrepancy in housing starts production relative to population across Canadian cities hints that regulation plays a significant role in whether building activity can accelerate — especially municipal regulation including permit delivery, regulations around how many storeys and units a building can contain and development charges.

In the rest of this section, we examine how various specific aspects of the residential construction regulatory environment can affect this sector's productivity landscape.

Land-use Zoning

Many American studies have focused on the labour productivity growth and level implications of zoning laws for the residential construction sector.

D'Amico et al. (2023) formalize and evaluate the hypothesis that land-use regulation reduces the average size of home builders, which limits their ability to reap returns from scale and their incentives to invest in technology. The study finds that more regulated metropolitan areas have smaller and less productive firms and under the assumption that one half of the link between size and productivity is causal, America's residential

[41] This projection was made by the author utilizing the highest productivity of the residential construction industry over the period of 1997 – 2023, which was recorded in 2002.

construction firms would be 91 per cent more productive if their size distribution matched that of manufacturing.

In a related study, Glaeser and Ward (2009) study the minimum lot size and other land use controls in the Greater Boston area and associate them with reductions in new construction activity. These regulations are also associated with higher prices when contemporary density and demographics are not used, but not when we add this control are present. Current density levels appear to be too low to maximize local land values.

Gyourko and Krimmel (2021) find that that zoning taxes are especially burdensome in large US coastal markets and that price impacts in the big west coast markets now are the largest in the nation. This finding is consistent with the older study by Katz and Rosen (1987) investigating the effects of local land-use regulations on house prices in the San Francisco Bay Area.

In a literature survey, Gyourko and Molloy (2015) find that regulation appears to raise house prices, reduce construction, reduce the elasticity of housing supply, and alter urban form. However, a study by Jackson (2016) finds that while land use regulation is found to significantly reduce residential development in Californian cities, controlling for unobserved heterogeneity using city and year (two-way) fixed effects notably reduces the magnitude of the estimates (an average of 4 per cent). Of the regulations measured, those categorized as zoning and general controls have the strongest effects. The partial effects of individual regulations show that while some significantly reduce development, others have a large positive impact. The increase in developments have a positive impact on the real output produced in the residential construction sector, which in turn positively impacts the sector's labour productivity growth.

Preliminary analysis from the CMHC's municipal land and regulation survey (CMHC, 2023) shows that higher overall land use regulation seems to be associated with lower housing affordability across Canadian municipalities. [42] The study finds that Greater Toronto and Greater Vancouver have the highest Municipal Land Use and Regulation Index scores (100 and 98 respectively) and stand out sharply relative to other regions in Canada. Meanwhile, Atlantic provinces, Québec and the Prairies are much less regulated, and have 23 per cent

[42] The Municipal Land Use and Regulation Index captures the degree of land use regulation in a given city. Higher values indicate more regulation, and smaller values represent less regulation. For ease of interpretation, these values have been normalized relative to the Greater Toronto Area (100).

to 34 per cent less land use regulation than the Greater Toronto Area. Greater Toronto and Greater Vancouver have the highest house price to income ratios (9.25 and 14.19 respectively) and were therefore the least affordable. While this study focuses on housing affordability, it is plausible that rising home prices also stem from higher construction costs driven by slowing labour-productivity growth in residential construction, as more skilled workers are diverted to navigating increasingly complex regulations instead of performing core building tasks or management of construction projects.

While this section hints that stricter zoning laws can lead to potential productivity growth loss in residential construction, it is not clear to what extent changes in these local laws have contributed to the long-term stagnation of labour productivity growth or the recent decline in this variable in the residential construction sector. We call on further research to investigate the micro-level variations in local zoning laws to shed more light on their potential role in residential construction productivity.

Project Approval Times and Costs

Greater Toronto and Greater Vancouver have the longest approval times in Canada, which are almost 4 times as long as regions with more affordable housing. Crucially, the CMHC (2023) finds that among the surveyed land use regulations, the time it takes to approve new projects (the "Approval Delay Index") is the most important survey factor explaining differences in housing affordability across regions and followed by “Developers Restriction Index” consisting of fees, environmental assessments and mandated criteria. Interestingly, the “Density Restriction Index” has the weakest association with affordability differences in Canadian municipalities.

This is consistent with the notion that the issuance of permits is significantly delayed, it may cause construction work to be halted prematurely, which may in turn cause the production process to be organized in a less efficient manner than if all necessary permits were granted on time. Therefore, it is conceivable that project timeline delays created by late building permits may negatively affect productivity (Johnson and Babu, 2018).

Bray (2024) used Word Bank data to show that Canada ranks well behind most other OECD countries when it comes to the time needed to obtain necessary construction permits and only ranks better than Slovak republic. A study conducted by Altus Group on behalf of the Canadian Home Builders Association (CHBA, 2022) revealed that the biggest delays occur in Toronto. Shortage of staffing and outdated processes are two of the factors that have

contributed to a backlog that has grown from 21 months in 2020 to a weighted average approval time of 32 months in 2022. In a separate study by Altus Group on projects in cities across Canada that found that it now takes 25 to 30 per cent longer to build an equivalent project as compared to five to six years ago.

It is therefore conceivable that long project approval delays and associated costs may have contributed to the fall in labour productivity growth in residential construction in recent years by inhibiting the growth of output, misallocation of industry's productive resources and creating bottlenecks in construction processes.

Project Complexity and Evolving Standards

Building codes establish the minimum safety standards for structures within a jurisdiction, originally focusing on protecting occupants. Over time, their scope has expanded beyond structural integrity to encompass regulations that promote overall health and well-being. These now include provisions for ventilation, natural light access, physical accessibility, and energy efficiency (Dreessen, 2023).

Chart 37 shows that energy efficiency, measured as delivered-energy intensity per square metre, has improved markedly since 2000.[43] Energy intensity fell from 0.92 GJ per m^2 in 2000 to 0.64 GJ per m^2 in 2022, a drop of 30 per cent, or 1.6 per cent per year on average.

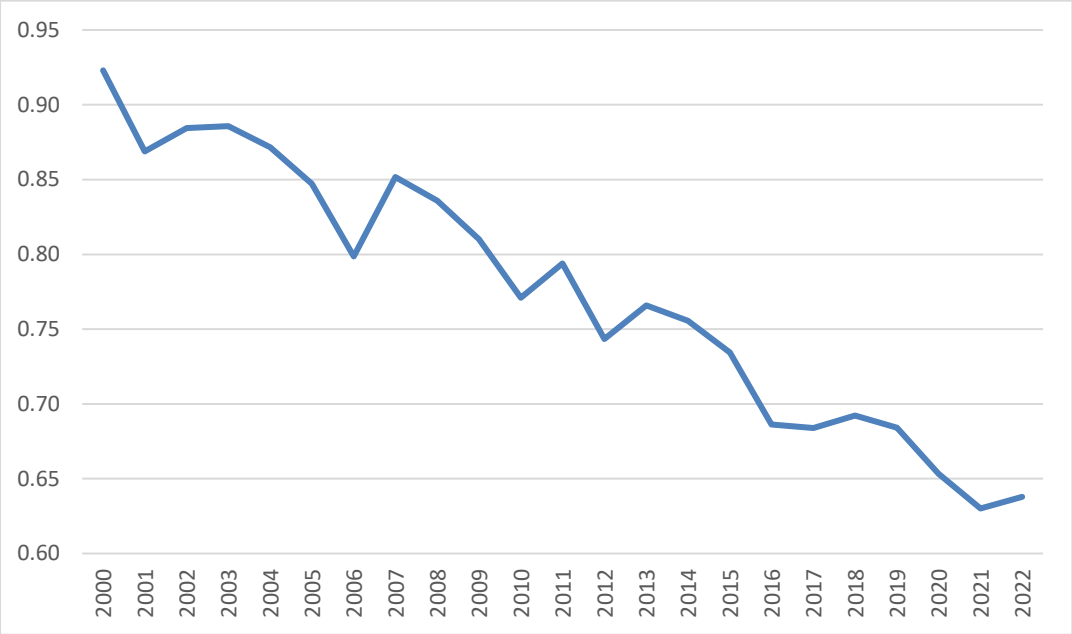
The pace of improvement clearly accelerated after 2008 and has been fastest in the most recent years with 2019-2022 recording a 2 per cent per year decline followed by 1.9 per cent per year in 2008-2019 compared to the 1.1 per cent per year in 2000-2008.

Space-heating remains the dominant end-use, but its intensity declined by one-third and its share of total delivered energy edged down from 64 per cent to 60 per cent. Water-heating intensity also fell (down from 0.17 to 0.12 GJ/m^2), keeping its share roughly stable at 18-19 per cent. Appliance and lighting intensities improved more slowly, so their combined share

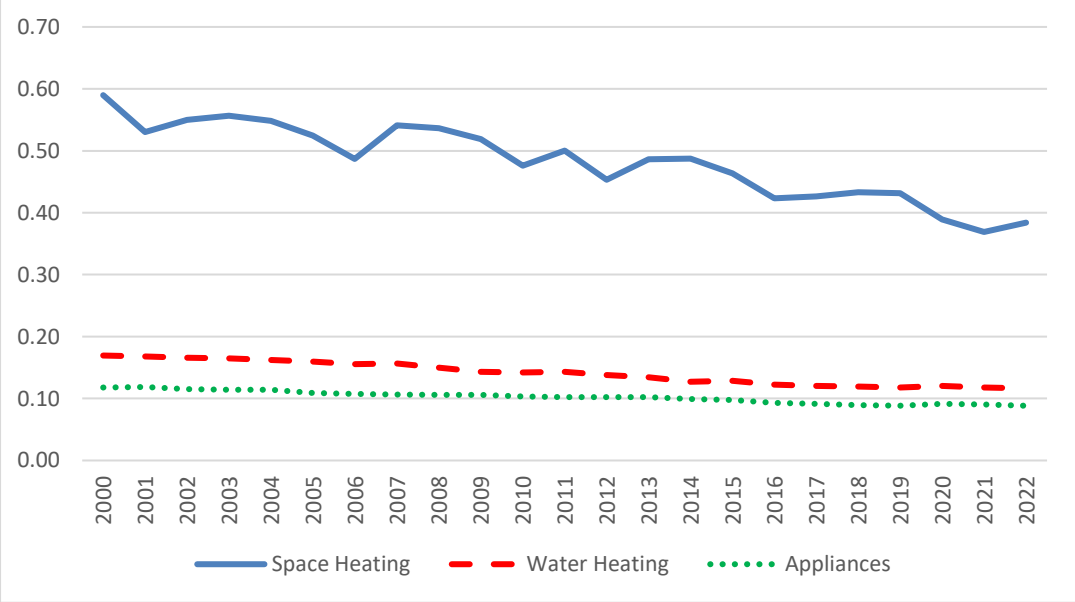
[43] Caveats on using NRCan energy-intensity data as an efficiency metric:
(i) Figures are not weather-normalised; a cold winter can raise kWh per m^2 even if intrinsic efficiency improves.
(ii) Values reflect occupant behaviour and occupancy levels as well as building-shell performance.
(iii) The series covers delivered energy only; shifts from gas/oil to electricity alter intensity without necessarily changing useful energy needs.
(iv) Numbers are stock averages—gains in new builds can be diluted by the large legacy stock.
(v) Floor area is "heated floor space"; comparisons should use the same definition to avoid denominator drift.

Chart 37: Secondary Energy Use and GHG Emissions by End-Use, Residential Sector, Canada, 2000-2024

Panel A: Energy Intensity (GJ/m²)



Panel B: Energy Intensity for Space heating, Water heating, Appliances. lightening and Cooling (PJ/m²)



Source: Natural Resources Canada, Comprehensive Energy Use Database
https://oee.nrcan.gc.ca/corporate/statistics/neud/dpa/showTable.cfm?type=CP&sector=res&juris=ca&year=2022&rn=2&page=0

crept up from 17 per cent to 20 per cent, while space-cooling remains a very small slice (about 1 per cent) despite higher absolute use in hotter summers.

These shifts underline how tighter building-envelope codes and furnace efficiencies have delivered the bulk of energy savings, while plug loads and lighting now make up a larger fraction of the remaining opportunity.

While building codes have been updated to enhance safety and energy efficiency, these changes can also impact labour productivity levels in residential construction along the following domains:

1- Increased Construction Time Due to Stricter Energy Efficiency Standards

Research indicates that achieving higher steps of the BC Energy Step Code may involve construction cost premiums, suggesting additional labour and time investments. For instance,
meeting the requirements of Step 4 could add approximately $4,215 per unit in a six-story apartment building (Metrics Research Report, 2017).

2- Higher Compliance Costs and Administrative Burden

Builders and contractors face increased administrative tasks, such as detailed documentation and multiple inspections, leading to project delays. A study by Martin and Mckay (2022) emphasizes the need for more transparent and efficient building code review processes in Ontario to mitigate these challenges.

3- Labour Shortages Due to New Skill Requirements

The adoption of advanced building techniques, such as those required for net-zero energy homes, necessitates specialized training. This increase demand for specialized labour can lead to labour shortages and slow project completion. (Spiegel, 2008).

4- Material Shortages and Increased Costs Due to New Code Requirements

The implementation of new energy efficiency standards has led to increased demand for specific materials, such as high-performance insulation. This heightened demand can result in material shortages and elevated costs, causing construction delays. The BC Energy Step Code requires enhanced energy-saving measures, which can lead to increased demand for certain materials and potential supply challenges.

5- Delays in Provincial Adoption of National Codes

The most recent edition of the National Building Code of Canada (NBC) took several years to finalize. Although labeled the 2020 edition, it was not published until March 2022, and provinces have required additional time for its adoption. This means that builders must navigate varying codes across jurisdictions, leading to inefficiencies and potential delays.

Wall (2024) notes that "it takes more people to build a house today, each bringing a more specialised skill set, than it did 30 years ago." Interviews conducted by the Centre for the Study of Living Standards (CSLS) echo this view, stressing that rising quality expectations—especially for energy efficiency—and increasingly complex design requirements are acting as persistent drags on labour-productivity growth in residential construction. It is therefore conceivable that the implementation of changes to building codes may have contributed to the fall in labour productivity growth in residential construction in the 2019-2024 period due to the factors above.

Canada's fragmented regulatory landscape (differing building codes, licensing rules, development charges across jurisdictions) prevents builders from operating efficiently at scale. Firms cannot easily replicate best practices across provinces due to varying codes and standards. CSLS interviews offered a telling example: a mid-sized builder with a strong track record in Alberta planned to launch a multi-family project in Ottawa but withdrew after facing licence and warranty fees of roughly $50,000 per unit. This was despite the firm's proven reputation and its existing Alberta licences. Instead, it pivoted to a purpose-built-rental project elsewhere and exited the Ottawa market altogether.

VIII: Policy Avenues for Boosting Residential Construction Supply and Productivity Growth[44]

This section outlines existing policies and joint public-private initiatives aimed at boosting residential-construction productivity—and, by extension, improving housing affordability in Canada—before proposing enhancements and new measures that could help reignite productivity growth across the sector. It begins by exploring the adoption of best-practice technologies and the promotion of technological innovation, then moves to a discussion about supporting prefabrication and modular building, followed by examination of the role of improving financing and reducing development costs and taxes, demand-side (home-buying) subsidies, and finally regulatory reform and immigration policies that target labour-supply shortages.

A. Adoption of Best practice Technologies and Promoting Technological Innovation

As mentioned, slow technological growth evidenced by the low trend labour productivity growth, and adoption of existing best practice technologies has been a significant drag on the labour productivity growth of the broader construction industry, as well as residential construction. As the report by Barbosa et al. (2017) finds in their survey of construction sector stakeholders challenges associated with the on-site execution of projects, including inconsistent use of best practices across all sites, projects, and staff, as well as difficulty finding and developing talented project managers mare the residential construction sector globally. The report reveals that many stakeholders had difficulty accessing and utilizing concrete data to assess project performance—and the performance of project managers—instead relying on anecdotal evidence about how challenging a project was.

As noted by Barbosa et al. (2017), the residential construction industry continues to lag behind other sectors in adopting digital tools, advanced materials, and modern construction techniques. However, emerging innovations have the potential to significantly boost both efficiency and effectiveness. Key areas of transformation include digital technologies, next-generation materials, and automation. For instance, technologies like 5-D building information modeling (BIM) and advanced analytics are gaining traction. The authors found that over 44 percent of respondents had already adopted some form of digital technology, with that number expected to rise to 70 percent within three years.

[44] This section relies heavily on the insights gathered from CSLS interviews with residential construction sector researchers, industry experts and stakeholders. The author is deeply grateful for all these insights.

Despite this momentum, stakeholders identified ongoing challenges in realizing the full value of these tools. One major issue is the lack of consistency in digital modeling: there is often no unified digital twin (i.e. reproducible digital version of a project). Instead, models are shared with suppliers who may modify or optimize elements without updating the original model. This disconnect results in gaps between plans and actual builds, limiting opportunities to optimize supply chains, streamline workflows, and enhance lifecycle management.

To manage innovation despite limited R&D budgets, companies are increasingly relying on pilot projects to test new technologies while mitigating risk. In some leading examples, owners and contractors are combining resources to address capital limitations. The Cross rail Innovate portal in the UK is one such model for collaborative innovation.

Insights from CSLS interviews with residential construction experts reinforce that smart resource allocation and disciplined project management are crucial for turning new technologies into productivity gains. Partnerships in which builders and technology firms co-design solutions—so that digital tools integrate smoothly with both upstream planning and downstream site operations—emerged as the most effective way to embed innovation on the ground. Training project managers who can fluently integrate new technologies into existing workflows is essential, yet current college and university programmes rarely provide the depth of digital-construction training needed to meet that demand. Another insight from these interviews is the growing potential of technologies such as artificial intelligence, on-site robotics and 3-D printing to reshape the design phase. Their uptake, however, is hindered by high up-front costs and by the industry's subcontract-heavy structure, which makes it difficult to integrate such innovations across all project partners.

Related to technological adoption, several interviewees pointed to structural barriers within the industry. Many small firms experiment with new construction methods and technologies through limited pilot projects yet lack incentives—or resources—to scale those innovations across municipalities or markets. Larger firms, by contrast, are comfortable with their established business models and are reluctant to adopt technologies that could disrupt familiar delivery schedules.

Barbosa et al. (2017) stress that technology alone is not enough to solve the industry's productivity problems. A widespread cultural shift—alongside strong systems, processes, and buy-in from on-the-ground teams—is essential for meaningful progress.

The authors posit that to effectively transform on-site execution; project owners need to drive change across three core areas: management systems, technical systems, and organizational mindsets. While four key practices are widely recognized in the industry, they remain inconsistently applied:

First, a disciplined planning process is essential to delivering projects on time and within budget. Such gains in projects costs and operational smoothness of residential construction projects will inevitably lead to boosts in labour productivity growth in the sector. Second, teams should establish clear key performance indicators (KPIs) and regularly track them in performance meetings. Importantly, traditional KPIs should be paired with forward-looking metrics to detect and minimize potential deviations early. Third, project mobilization can be significantly improved by completing all necessary prework—such as permits and approvals—before breaking ground. Finally, reducing waste and variability on-site requires detailed coordination across trades and the adoption of lean construction principles.

Table 20: Policy Avenues to Incentivize Adoption of Best Practice Technologies for Residential Construction and Promoting Technological Innovation

Level of Government	Incentive Type	Description	Targeted Practice/Technology
Federal	Tax Credits for Tech Adoption	Provide tax credits for investments in integrated planning tools, project management software, and lean training.	Rigorous planning processes; Lean principles; Integrated planning tools
	Innovation Grants & R&D Funding	Fund pilot projects or R&D in digital project control systems and advanced scheduling tools.	Forward-looking KPIs; Integrated project management systems
	Accelerated Capital Cost Allowance (ACCA)	Allow faster depreciation for capital spent on productivity-enhancing tech.	Prefabrication equipment; Digital construction tools
Provincial	Training Subsidies	Subsidize workforce training in lean construction, KPI systems, and digital tools integration.	Lean principles; KPI adoption; Technical systems
	Fast-Track Permitting	Prioritize permitting for projects that adopt certified best-practice planning and coordination processes.	Early project mobilization; Prework completion; Integrated planning
Municipal	Density Bonuses or Zoning Flexibility	Offer additional density or height allowances for projects incorporating modern planning and management tools.	Holistic planning and coordination; Lean and efficient on-site processes
	Rebates on Development Charges	Reduce development fees for builders implementing recognized best practices or tech solutions.	Integrated management systems; Early mobilization; Reduced waste
All Levels	Public Recognition Programs	Launch awards or certification programs recognizing exemplary use of planning, coordination, and productivity tech.	Culture/mindset change; Broader industry adoption

Source: CSLS compilation

In the Canadian context, several initiatives have been pursued that have implemented some of these recommendations:

1- As part of the new national Platform to Decarbonize the Construction Sector at Scale, led by the Construction Research Centre, the National Research Council of Canada (NRC) has developed the Construction Sector Digitalization and Productivity Challenge program. This program will support new solutions to increase

innovation potential and productivity in the construction sector using digital technology. These solutions will help empower construction professionals to innovate and choose fit-for-purpose, low-carbon building solutions as well as advance Canada's construction sector by implementing building information management across the value chain and reduce construction times through the use of modular construction.[45]

2- A report by Vancouver Regional Construction Association (2018) emphasizes the importance of establishing clear key performance indicators (KPIs) to measure and enhance project performance. This initiative underscores the need for regular tracking and the use of forward-looking metrics to detect and minimize potential deviations early in construction projects. The report proposes that "to start, the KPIs should be drawn from government statistics where possible supplemented by short surveys. Over time and on the strength of positive uptake by industry, greater reliance may be placed on surveys."
3- Through the Regional Homebuilding Innovation Initiative (RHII) the Government of Canada is investing $50 million over two years, starting in 2024-2025, to support local innovative housing solutions across the country. The program is open to plans that promote investment in innovation, demonstration, and commercialization that accelerates homes; Scaling existing manufacturers that produce panelized construction and inputs such as the construction of prefabricated drywall, trusses, cement, windows, and doors, etc.; and developing industry tools that accelerate construction innovation through the improvement and adoption of off-site construction technologies and practices.

Some potential avenues for more policy incentives to promote adoption of best practice technologies in residential construction include are listed in Table 24.

B. Support prefabrication and modular building

As discussed earlier, prefabrication and modular buildings can offer a promising avenue for increasing the labour productivity growth of the residential construction.[46] In recent years,

[45] For more details see: https://nrc.canada.ca/en/research-development/research-collaboration/programs/construction-digitalization-productivity-challenge-program
[46] As discussed earlier some of the productivity gains associated with increasing modular and prefabricated building may not be captured in residential construction and instead fall under manufacturing. However, from an

Canada has introduced several policy initiatives to promote modular and prefabricated construction:

- The RHII invests $50 million over two years to support local innovative housing solutions, including designing and upscaling modular homes.
- Rapid Housing Initiative (RHI): Launched in 2020, explicitly encourages the use of modular housing to accelerate construction timelines. Funds have supported hundreds of modular builds across the country, especially for affordable and supportive housing.
- Construction Sector Digitalization and Productivity Challenge program: led by the Construction Research Centre, the National Research Council of Canada (NRC) performs R&D to encourage greater environmental and productivity benefits from modular low-carbon solutions.

  At the provincial level:
- British Columbia has invested $291 million to build over 2,000 modular supportive housing units since 2023 as part of Rapid Response to Homelessness action plan.
- Infrastructure Ontario employed modular construction as part of its accelerated building program to deliver long-term care homes in 2020.
- The Alberta government has supported modular classroom procurement and encouraged local manufacturing (Abaeian, 2020).

  At the Municipal level:
- As part of the Housing TO 2020-2030 Action Plan, the City of Toronto committed to creating 1,000 new modular homes in Toronto.
- The city of Vancouver developed city-owned land for modular units with expedited approval timelines in 2020

Despite these steps and policy initiatives to support modular construction, many barriers preclude modular and prefabricated construction from being more widely adopted. Construction Specification Canada (2025) finds that multi-residential modular construction only accounts for approximately six per cent of residential construction in Canada. According to this report, multi-residential modular construction costs around 10 per cent more than traditional projects and is perceived as riskier by construction stakeholders. The authors note three main barriers to modular construction due to cost prohibition:

affordability perspective, total labour productivity that accounts for all labour input that goes into building homes across industries is more relevant. Modular construction can certainly increase total labour productivity and therefore help housing affordability.

- Modular-building manufacturers are currently focused on single-family housing with higher margins and lower volumes. This in turn disincentivizes investment to increase their production capacity and efficiency due to a lack of economies of scale. Second, the experience acquired throughout the production chain during a modular project is not taken advantage of, so opportunities to reduce the costs of subsequent projects are lost.
- Legal responsibilities are poorly defined for modular construction project as a result, manufacturers, general contractors, and subcontractors will increase their bids to cover their risks due to legal uncertainties in case of warranty claims.
- Architects, engineers, general contractors, and subcontractors lack modular construction experience, which in turn increases costs beyond traditional construction. In many cases, the stakeholders involved do not fully understand the scope of work to be carried out onsite. This leads to them substantially increasing the safety margins in their bids because they cannot accurately estimate the time and materials required.

Modular Building Institute (MBI) (2024) mentions that local municipalities and their building inspectors can create bottlenecks and red tape for modular construction projects. As noted by Bleasby (2024), the lack of familiarity with modular systems among municipal staff often leads to delays in approvals and inspections. Zoning requirements may also prove inflexible for modular construction, especially concerning the placement of additional structures. For instance, some regulations require infill homes to be located at the rear of the lot, limiting development options and complicating the delivery of prefabricated structures (Small Housing BC, 2024).

Distances between the manufacturing facility and the project site can create supply chain procurement and delivery challenges. Canada has relatively few large-scale modular manufacturing facilities, which limits the industry's ability to scale up production to meet housing demands.

According to the Modular Building Institute (2025), unlike traditional construction, modular projects typically require significant upfront capital, as manufacturers must procure the full range of materials early in the production process. Lenders commonly disburse funds in stages, tied to visible on-site progress. However, with a substantial portion of the modular work occurring off-site in a factory setting, many lenders are hesitant to release funds based on factory progress alone. Concerns have also been raised regarding the security of loans

during the prefabrication phase. It is not reasonable to expect modular manufacturers to bear the financial burden of material and production costs well into the later stages of project delivery.

Although modular and prefabricated construction can boost overall labour productivity—and, in turn, improve housing affordability—our interviews with practitioners and industry experts suggest these gains have clear limits.

- **Capacity constraints.** Canadian factory capacity is modest, and modular/prefab methods consistently account for only 10-15 per cent of new housing starts.
- **Logistical costs.** Because of Canada's vast geography, transportation and insurance expenses rise steeply once modules travel more than about 200 kilometres from the plant, eroding time and cost advantages.
- **Risk concentration.** Builders must absorb most project risk up front and still meet stringent environmental and design codes; unlike conventional builds, subcontracting offers little scope for sharing those liabilities.
- **Regulatory friction.** Interprovincial and municipal code differences further slow adoption by forcing plants to re-tool or re-certify for each jurisdiction.

Even with these constraints, modular construction remains a cost-effective option for remote or hard-to-serve regions, where on-site labour is scarce and flying in tradespeople is prohibitively expensive. Meanwhile, several experts interviewed by CSLS highlighted panelization as a practical "middle-of-the-road" solution: prefabricated wall and floor panels are easier to ship, require less specialised on-site assembly, and are already delivering measurable productivity gains. Widespread adoption of panalization can bridge the gap and boost efficiency while full modular systems continue to mature and become more cost competitive.

Three recent articles underscore both the promise and the limits of prefabricated construction in addressing Canada's housing affordability crisis. Penner (2025) highlights the work of Intelligent City, a Metro Vancouver firm using industrial robotics and mass-timber modular systems to manufacture housing components with greater precision and speed. The company is currently delivering units for a project in Toronto's Etobicoke district, and sees its automated, off-site approach as a scalable model for tackling productivity shortfalls in traditional building. Robotics reduce weather-related delays and offer consistent quality, aligning with federal housing targets like Modular BC's goal to build 25 per cent of new homes offsite by 2030. However, the model still faces hurdles such as

misaligned zoning rules, slow permitting, and high land costs that limit cost savings for end users.

The second article by Hassan (2025) explores broader efforts to expand modular housing, citing real-world examples like the conversion of a Toronto church into affordable housing and a rapid-delivery project by Assembly Corp., which completed 20 units in just months. The author notes that advocates argue that modular methods can reduce shelter use and lower timelines, especially for non-profits and supportive housing. But scaling remains difficult: Canada has just 5–10 factories capable of large-scale modular output, and the workforce remains limited. Regulatory inconsistency between cities and provinces adds risk and deters investment. Experts emphasize the need for a coordinated national strategy—with long-term procurement plans, capital funding, and harmonized codes—to fully realize prefab's potential. The author cautions that without systemic reform, most modular projects remain one-off pilots rather than mainstream solutions. Cartier (2025) explores the federal government's push for prefabricated housing, led by Prime Minister Mark Carney's plan to use CMHC-backed loans and a new agency, Build Canada, to help modular construction make up 25 per cent of new builds by 2030. The article mentions that promising in theory, the strategy faces major obstacles: mismatched provincial building codes, permitting delays, and inflexible factory operations that require steady demand and large upfront investment. Labour shortages, red tape, and the risk of factory inefficiency from buyer customization further limit scalability. From author's perspective, though modular housing could improve affordability and productivity, especially with government support to harmonize codes and subsidize output, its success depends on overcoming persistent regulatory and economic barriers. Without these reforms, the initiative risks repeating past failures of prefab housing during downturns and becoming yet another unfulfilled policy experiment.

Several potential policy initiatives that can bolster the production and construction of modular and prefabricated buildings are presented in Table 25.

C. Improved financing and reducing development costs and taxes

Builders need upfront funding for land, materials, labor, and permitting. Without efficient financing—especially tailored for modular or off-site construction—projects are delayed or downsized. Access to patient, flexible capital improves workflow continuity, labour scheduling, and project completion times.

Furthermore, development charges and fees influence project scope and reduce financial viability, leading to project deferrals or redesigns that may reduce density or scale, undercutting economies of scale and labour productivity. When taxes or charges vary by jurisdiction, or are subject to political risk mid-project, developers build contingencies into their budgets. This drives up costs and delays decisions. Stable, transparent systems reduce friction and increase investment in higher efficiency building practices.

CMHC (2022) lays out the several costs — like land and construction — associated with producing new housing, some of which are the fees levied by governments. The collection and administration of such fees introduce 2 main challenges:

Table 21: Policy Avenues to Support Prefabrication and Modular Building

Barrier	Federal	Provincial / Territorial	Municipal
Fragmented building codes and approvals	• Expand National Building Code (NBC) to include modular-specific provisions	• Align provincial codes and inspection standards with NBC modular provisions	• Adopt pre-approved modular plans
	• Fund interprovincial code harmonization efforts	• Establish provincial certification of modular components	• Train local inspectors in modular systems
			• Accept off-site inspections from certified plants
Inflexible zoning and land use regulations	• Use CMHC funding (e.g. HAF, RHI) to encourage zoning reform for modular builds	• Require municipalities to enable modular zoning in housing supply action plans	• Amend local zoning bylaws to allow modular by-right in more zones
			• Relax setback/height limits for modular infill
Limited factory capacity	• Offer accelerated capital cost allowance (CCA) for modular plant investment	• Provide capital grants or low-interest loans for modular facility expansion	• Lease city-owned industrial land to modular

	• Launch funding streams under Strategic Innovation Fund (ISED) or Affordable Housing Innovation Fund (CMHC)		manufacturers at reduced rates
Financing and appraisal challenges	• Work with CMHC and financial regulators to create modular-specific loan products	• Develop provincial financing guarantees for modular housing	• Partner with local credit unions/lenders on modular pilot financing
	• Expand CMHC insurance products to cover factory-stage modular risk	• Promote lender education on modular valuation	• Advocate for revised appraisal guidelines for modular
Skilled labour shortages and training gaps	• Fund modular construction curricula at national polytechnics and colleges	• Support modular-related trades/apprenticeship programs	• Partner with modular firms and schools on local training programs
	• Expand federal labour mobility programs to include modular skills	• Create regional training centres linked to modular clusters	• Incentivize hiring through local job boards or workforce grants
Transportation and logistics bottlenecks	• Streamline federal permitting for oversized modular freight	• Harmonize provincial oversize/overweight transport rules	• Plan urban delivery access routes for large modules
	• Invest in highway infrastructure improvements to support large loads	• Create modular delivery corridors and logistics hubs	• Support staging areas near development sites

Source: CSLS compilation

- These fees add a direct cost to the production of housing.
- Government fees may add complexity and uncertainty to the development process as construction timelines hinge upon the successful collection of fees.

The report classifies these development fees into 6 main categories:

- Taxes
- Warranty fees
- Municipal fees
- Development charges[47]
- Density payments[48]
- Permit fees[49]

The various levels of government in Canada have significant powers to reduce development costs through their policy tools. In this section we first highlight some of the existing policies that alleviate development costs and then provide some policy solutions that will target lowering construction costs.
In Budget 2024, a comprehensive suite of measures was introduced to improve housing affordability, including:

- The Affordable Housing and Groceries Act, which is making it less expensive to build new homes by removing the GST on new purpose-built rental housing projects.
- Over $40 billion through the Apartment Construction Loan Program, which is providing low-cost financing to build more than 101,000 new rental homes across Canada.
- Over $14 billion through the Affordable Housing Fund to build 60,000 new affordable homes and repair 240,000 additional homes.
- Unlocking $20 billion in new financing to build 30,000 more rental apartments per year by increasing the annual limit for Canada Mortgage Bonds from $40 billion to up to $60 billion.

In addition, The Government of Canada provided a 100 per cent rebate of the Goods and Services Tax (GST), or the federal portion of the Harmonized Sales Tax (HST), on new purpose-built rental housing (PBRH). The Apartment Construction Loan Program provides

[47] Development Cost Levies are fees that may be assessed at the regional level to contribute to capital costs for infrastructure (e.g., sewage treatment plant expansion) necessary to accommodate growth.

[48] Density payments relate to the amount of density permitted on the site and are designed to raise revenue for community amenities (e.g., swimming pools, parks, etc.). They vary widely by municipality and even neighbourhoods

[49] Permit fees cover administrative costs associated with issuing building, development, and occupancy permits, among others.

low-cost funding to eligible borrowers with loans ranging from a minimum of $1,000,000 up to 100 per cent of the cost of the residential component of a project.

At the provincial level, the governments of Ontario, Nova Scotia and Newfoundland and Labrador have announced that they will mirror the federal PBRH rebate and provide a 100 per cent rebate of the provincial portion of HST in those provinces. The government of Prince Edward Island announced that it too would generally mirror the federal PBRH rebate and provide a 100 per cent rebate of the provincial component of HST, subject to a maximum rebate per unit and a reduced rebate rate for projects that reach completion after 2028.

Ontario's "More Homes for Everyone Plan" announced in 2022 called for requiring municipalities to make reports on development charges available to the public – such as by posting them to their website. The plan also proposed that municipalities review their community benefits charge bylaws at least once every five years. The Cutting Red Tape to Build More Homes Act, 2024, reduced the timeframe of the development freeze period from two years to 18 months may encourage developers to more quickly obtain a building permit and get shovels in the ground. [50]

The British Columbia government proposed changes to the fees that municipalities levy on homebuilding and reduce the reliance on Community Amenity Contributions (CACs).[51] Specifically, in their place, the government introduced Amenity Cost Charges (ACCs), which municipalities can only apply to developments that are directly connected to specific local amenities—such as a new library built in the same neighbourhood. A key difference from CACs is that ACCs will be transparent and set in advance, with no room for negotiation, allowing builders to know the cost before deciding to move forward with a project.

Alberta has amended Municipal Government Act to allow for more flexible funding arrangements for infrastructure, aiming to reduce upfront costs for developers. In 2021, the

[50] Through the More Homes, More Choice Act, 2019, development charges were set (i.e., frozen/locked) when a site plan application (or zoning application if no site plan application was made) is submitted to the municipality. Once the application is approved, a time limit of two years applied to the frozen development charges.

[51] These are fees homebuilders pay in the form of cash or "in kind" payments for local amenities or facilities such as community centres, below-market housing and public art (Filipowicz, 2024).

province updated Off-site Levies Regulation to provide clearer guidance on levies, helping developers anticipate costs more accurately.

CMHC (2022) proposed the following policy initiatives to increase development and labour productivity growth in residential construction through lowering development fees and taxes to which can be worth investigating:

- Increasing certainty around the number, timing, and magnitude of government fees could improve housing affordability by decreasing other development costs, such as those for construction (e.g., labour, equipment) and financing.
- Eliminating density payments payable upon spot rezoning. These payments can be subject to negotiation, which introduces complexity and uncertainty. The amount levied is often linked to the change in the value of the site pending rezoning or additional density being permitted on a site.
- Eliminating some steps of the development process, such as spot rezoning, would decrease the time and cost of delivering new housing. For example, in areas with an Official Community Plan, sites could be pre-zoned to permit the density and typologies consistent with the plan.

In the report "The State of DCs in Ontario" Keleher Planning & Economic Consulting Inc. (2025) the following policy proposals are made to significantly re-orient how development costs are calculated and imposed:

- Clarifying, standardizing and enhancing local service policies to promote consistency and cut down on the need for negotiation
- Improving transparency and disclosure of Benefits to Existing (BTE) estimates and calculations, and exploring opportunities for greater standardization
- Merging certain service categories to increase flexibility for both developers and municipalities
- Move water and sewer development costs away from existing 'up-front' payment model to a debt-financed,
  long-term rate-repayment model imposed only on new growth.
- Adjusting how land costs are included in DC rate calculations, including:
  - Eliminating land from level of service 'cap' calculations (similar to how land for parks is already excluded),

- Only allow actual 'incurred' land costs to be funded by DCs, rather than the current model of projecting future land acquisition needs (and land values) 10-25 years into the future, estimates which are prone to overestimation.

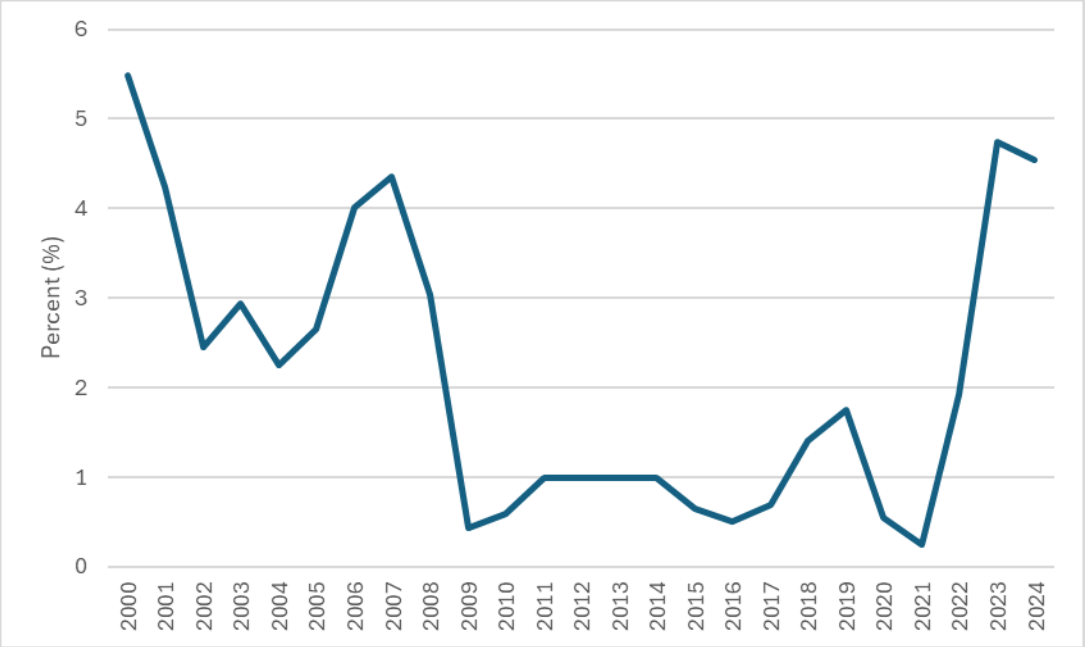
D. Demand-side (Homebuying) Subsidies

An important dimension of the housing market is demand, which directly influences output in the residential construction sector—an equilibrium variable—and can help drive labour productivity growth. When demand-side subsidies increase or stabilize housing demand, developers gain confidence to build. This reduces stop-and-start construction cycles, which are highly disruptive to labour efficiency. A steady project pipeline enables more predictable labour scheduling, less idle time, and better productivity. Also, when structured carefully, demand subsidies can incentivize demand for more efficient, scalable forms of housing. Mid- and high-density developments allow for greater labour specialization, economies of scale, and faster construction per unit.

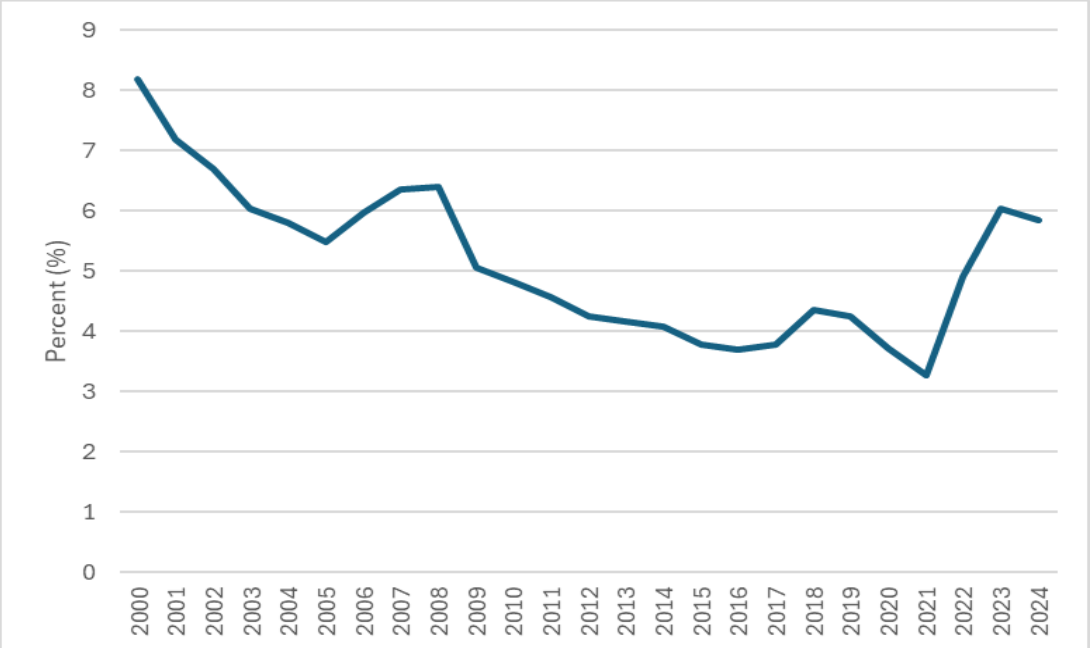
Younglai (2025) details a sharp slowdown in Canada's housing construction sector in the last year, which has resulted in over 100,000 job losses and threatens the country's ability to meet long-term housing affordability goals. According to the article, preconstruction sales have plummeted by up to 70 per cent in some cities, discouraging developers from launching new projects and affecting a wide range of players, including builders, developers, designers, visual content firms, and real estate brokerages. There are also major concerns about productivity and workforce capacity. Some firms have reported layoffs of up to 75 per cent, raising alarms about the loss of specialized expertise. Industry leaders warn that skilled professionals leaving the sector now may not return, weakening Canada's capacity to scale construction when the market eventually recovers. Developers such as Mattamy Homes and Polygon Realty have confirmed significant slowdowns in starts and sales, pointing to both regulatory delays and economic uncertainty as critical barriers. The author notes that the downturn is broad-based across regions and housing types. Condo preconstruction sales saw steep declines in Ottawa (-70.4 per cent), Montreal (-62.5 per cent), and Calgary (-55.4 per cent), while single-family home sales dropped sharply in Hamilton (-80.3 per cent), Kitchener/Waterloo (-59.5 per cent), and Toronto (-55.3 per cent). CSLS interviews with industry leaders also underscore how sharply higher interest rates have affected the construction sector. Developers worry that the post-2022 interest rate surge (Chart 38) hurts them on two fronts:

Chart 38: Interest Rates, 2000 – 2024

Panel A: Average Annual Policy Interest Rate



Panel B: Average Annual 5-Year Fixed Mortgage Rate



Note: Annual averages policy rates are based on the average fo available daily rates. Annual average mortgage rate is based on average of monthly data

Source: Statistics Canada Table: 34-10-0145-01 and Table: 10-10-0139-01

- *Weaker presale demand*. Higher mortgage costs make would-be buyers hesitant, and many projects cannot break ground until a set share of units is presold.
- *Costlier financing*. Rising rates directly inflate borrowing costs, limiting builders' capacity to raise capital for land acquisition, construction, and productivity-boosting investments such as new equipment or modular-plant partnerships.

Together, softer demand and tighter credit conditions make it harder for developers to launch projects and to fund the productivity upgrades Canada's housing sector urgently needs. However, lowering interest rates purely to stimulate new supply can backfire: cheaper borrowing often increases demand faster than builders can respond, driving prices upward—as happened in the pandemic-era housing surge of 2020–2021.

To support demand, the Government of Canada has introduced several initiatives aimed at first-time homebuyers. The First-Time Home Buyer Incentive, launched in 2024, offers a shared-equity mortgage of 5 or 10 percent of the home's purchase price, with the government sharing in both gains and losses in property value, capped at 8 percent annually. Additionally, the Home Buyers' Plan (HBP) allows individuals to withdraw up to $60,000 from their RRSPs tax-free, with an extended repayment period of three years. New mortgage rules now permit lenders to offer up to 30-year terms for first-time buyers purchasing newly built homes. The Canada Mortgage and Housing Corporation has also introduced the Home Start product, applicable to all newly constructed housing types, including manufactured homes. Lastly, the Tax-Free First Home Savings Account allows Canadians to contribute up to $8,000 annually, to a maximum of $40,000, toward a first home purchase—further supporting affordability and access to homeownership.
Table 26 provides some policy recommendations regarding the policy tools at disposal of the various levels of government to boost the demand for housing.

Table 22: Policy Avenues to Boost Housing Demand

Level of Government	Policy Tool	Description	Potential Implementation
Federal	Expanded First-Time Home Buyer Incentive	Increase the shared-equity stake or eligibility ceiling.	Broaden to include resale homes and raise income limits to expand reach.
	Housing Mobility Grants	Provide financial support for families relocating to job-rich or high-productivity areas.	Tie subsidies to interprovincial migration or moves to transit-connected developments.
	Interest Rate Buy-Down Program	Government pays part of mortgage interest to lower monthly payments.	Target buyers during high-interest rate cycles or for specific housing types (e.g., infill).
	Rental Assistance Expansion (Canada Housing Benefit)	Increase monthly direct-to-tenant subsidies.	Scale up benefit amount and expand eligibility beyond existing low-income thresholds.
Provincial/Territorial	First-Time Buyer Land Transfer Tax Rebate	Reduce or refund land transfer tax for first-time buyers.	Expand maximum rebate value or make fully refundable for homes under a price cap.
	Provincial Housing Savings Match Program	Match resident contributions to FHSA or other housing savings accounts.	Tier match rate by income, e.g., 2:1 for low-income savers.
	Rent Affordability Tax Credit	Refundable credit for households paying high rent-to-income ratios.	Automatically apply through tax filings using CRA and provincial data.
Municipal	Property Tax Deferral for First-Time Buyers or Renters	Allow deferral of municipal property taxes for a fixed number of years.	Limit to buyers under a price threshold and include repayment plan.
	Key Worker Rental Voucher Programs	Offer rental vouchers to teachers, nurses, and other essential workers.	Partner with local employers and housing providers to administer.
	Transit-Oriented Housing Incentives	Provide subsidies for buyers/renters near public transit.	Combine with density bonuses and fast-tracked permitting for new units.

Source: CSLS compilation

E. Regulation reform

Altus Group (2025) report highlights the importance of regulations on residential construction output. The development application process adds additional costs to the construction process, of which include:

- Residential property taxes paid on vacant, underutilized land.
- Financing and/or opportunity costs of holding land vacant, or underutilized.
- Cost escalation. Accounting for inflation, the cost of constructing a home will be more expensive in four years-time than it is today.

Barbosa et al. (2017) highlight how regulatory complexity often undermines productivity in infrastructure and construction. As one roundtable participant remarked, “Rules and regulations are the scar tissue of past transgressions—eventually, they limit what you can do.”

Nontechnical risks, such as political and regulatory uncertainties, are frequently identified as key contributors to poor project outcomes, sometimes even more than technical challenges. To address this, both government bodies and private-sector firms should implement strong nontechnical risk management frameworks to proactively mitigate these risks.

In addition, zoning bylaws, density restrictions, parking requirements, and lot size rules can either accelerate or choke development. Rigid or outdated land use policies limit builders’ ability to adapt to market demand, often forcing construction onto costlier or more distant parcels of land. This increases labour and logistics inefficiencies.

Governments have a crucial role to play in shaping a more effective regulatory environment. This includes simplifying permitting and approval processes, promoting transparency in costs and project performance, and reducing informal practices and corruption.

Canada has introduced a suite of regulatory reforms across federal, provincial, and municipal levels aimed at boosting residential construction labour productivity by removing bottlenecks and modernizing approval systems.

At the federal level, the Red Seal Program supports harmonized certification across provinces, enhancing the mobility of skilled tradespeople, which is crucial for filling regional labour gaps.[52]

Further, the establishment of the Canadian Board for Harmonized Construction Codes (CBHCC) in 2022 marked a major move toward creating consistency in code development and implementation across the country—simplifying compliance for builders and developers operating in multiple jurisdictions.

Laberge (2025) notes that according to new modeling by CMHC, "the elimination of interprovincial trade barriers in Canada may incentivize more than 30,000 housing starts annually, pushing the total annual number close to 280,000 starts over time. This is a meaningful step towards fixing Canada's housing supply gap. It represents close to 15 per cent of the additional housing supply needed annually over the next decade to return to pre-pandemic affordability levels, as recently estimated by CMHC."

At the provincial level, reforms have focused on aligning local codes and approvals with national standards and increasing the efficiency of permitting processes. For instance, Ontario's 2024 Building Code, coming into force in 2025, is aligned with the National Building Code to create a more uniform regulatory landscape. British Columbia's Development Approvals Process Review (DAPR) seeks to accelerate housing delivery by improving the transparency and efficiency of local planning and development approvals. In Ontario, the Streamline Development Approval Fund (SDAF) offers municipalities financial support to upgrade their development review and permitting systems—reducing administrative delays that hamper productivity on residential construction projects.[53]

Municipal governments have also played a critical role in adopting digital solutions and zoning reforms to ease construction timelines. The City of Vancouver has implemented an online permitting system known as ePlans, which enables digital plan submission, review,

[52] The Red Seal Program, formally known as the Interprovincial Standards Red Seal Program, is a program that sets common standards to assess the skills of tradespeople across Canada. Industry is heavily involved in developing the national standard for each trade. It is a partnership between the federal government and provinces and territories, which are responsible for apprenticeship training and trade certification in their jurisdictions. For more information visit: https://www.red-seal.ca/eng/about/pr.4gr.1m.shtml

[53]Residential Construction Council of Ontario (RESCON) and others in the construction industry have backed initiatives to digitize and streamline the development approval process in Ontario. Currently, the system is disjointed, with different platforms used across municipalities, leading to inefficiencies and delays in project approvals. Accelerating this process would benefit both builders and homebuyers.

and tracking, significantly shortening the permit cycle. Toronto's as-of-right garden suites policy allows homeowners to build additional housing units on residential lots without going through a rezoning process, facilitating quicker, small-scale infill development. Similarly, British Columbia's catalogue of standardized housing designs, compatible with the 2024 BC Building Code, allows builders to use pre-approved plans, expediting the permitting process and reducing design costs. Collectively, these regulatory changes can help address labour productivity challenges by cutting down project delays, increasing worker efficiency by reducing the time employees have to comply with labour intensive design requirements, and encouraging the adoption of time-saving building methods.

Calgary and Edmonton may offer additional valuable lessons on how reducing red tape can drive a surge in homebuilding. Edmonton streamlined its housing approval process by scrapping outdated rules and introducing a city-wide zoning bylaw that permits row houses and small apartment buildings in most residential neighbourhoods—without requiring special approvals. Calgary also took steps to support a wider range of housing types across communities. Both cities now stand out for their swift approval timelines and relatively low taxes on new housing.

Easing single-family zoning and approval processes—for example permitting multiplexes across nearly 70 per cent of Toronto's residential land—has been strongly endorsed by city council reforms. Doing so could unlock substantial housing supply within existing neighborhoods (City of Toronto, 2023; Ontario Legislature, 2022).

Higher-density options—such as smaller homes, townhouses, and semi-detached units—not only take up less space but are also less expensive to build due to lower material and resource demands.

Regulatory reform plays a key role in accelerating construction timelines. In Ontario, it can take developers more than nine months to secure approvals for apartment buildings, while in British Columbia, the process can drag on for up to two years.

Furthermore, delays in the building process carry steep costs, ranging from opportunity costs and rising interest rates to taxes on vacant land, loan carrying costs, and soaring prices for labour and materials. These expenses are often passed on to buyers and renters. Add to that the time and money spent on testing, meetings, and paperwork just to get

Table 23: Policy Avenues for Regulation Reform in Residential Construction

Level of Government	Policy Idea	Description	Productivity Impact
Federal	National Fast-Track Code for Innovation	Create an optional code stream for modular, prefab, and 3D-printed homes, enabling faster approval and reduced compliance paperwork.	Accelerates adoption of high-productivity building technologies across jurisdictions.
	Portable Construction Credentials Act	Legislate automatic recognition of construction credentials across provinces.	Improves labour mobility, reduces delays in onboarding skilled workers.
	Off-Site Construction Tax Credit	Offer tax incentives to builders that use modular or panelized methods.	Encourages efficient production methods that reduce on-site labour needs.
Provincial/Territorial	Code Sandbox Zones	Designate areas where innovative materials or methods can be piloted with regulatory waivers.	Promotes experimentation that can lead to scalable productivity breakthroughs.
	Provincial Permitting Ombudsman	Establish an independent office to audit and expedite slow municipal permitting systems.	Identifies bottlenecks and ensures timely construction project launches.
	Universal Trade Licensing Portal	One-stop digital portal for trades credentialing, background checks, and job placement.	Speeds up workforce onboarding and reduces administrative time for builders.
Municipal	Guaranteed Permitting Timelines	Legally enforce maximum approval timelines for building permits (e.g., 30 days).	Reduces costly construction delays and allows for better project scheduling.
	AI-Based Permit Review Systems	Implement AI tools for automated plan checking and code compliance.	Cuts permit review times and reduces staff workload.
	Pre-Zoned High-Density Corridors	Pre-zone land along transit lines for high-density housing without additional public hearings.	Reduces need for site-specific rezoning, enabling faster starts.

Source: CSLS compilation

approvals. Making the system more efficient would reduce these burdens and help bring more housing to market faster.

Table 27 presents a list of policy initiatives that could be strengthened or implemented to enhance the regulatory framework governing residential construction in support of higher labour productivity growth in the sector.

F. Immigration policies targeting labour supply shortages

Canada has implemented a range of immigration policies to address critical labour shortages in the residential construction sector which can boost the overall productivity of the sector through reducing skill shortages and bottlenecks. At the federal level, a major initiative introduced in March 2025 allows up to 6,000 out-of-status construction workers to apply for permanent residency, aiming to regularize undocumented labour while addressing the skilled worker deficit.

While the Express Entry system now gives priority to applicants with experience in key construction trades such as carpentry or electrical work, it has done little to relieve the sector's immediate labour shortage. As noted in Section XI, current immigration programmes and monitoring mechanisms do not reliably align incoming workers with industry needs. A first, practical step would be to increase trade-occupation draws, tighten follow-up on entrants' actual job placements, and involve construction firms directly in the selection process so that new arrivals match vacancies more closely.

Additionally, changes to the Temporary Foreign Worker Program (TFWP) now allow construction workers on temporary permits to study in apprenticeship programs without requiring a separate study permit, supporting skill development while on the job. A new tripartite advisory council—comprising government, industry, and labour representatives—has also been formed to assess construction workforce needs and guide further immigration and employment reforms.

At the provincial level, targeted pathways further complement these federal efforts. Nova Scotia's Critical Construction Worker Pilot under its Provincial Nominee Program (PNP) facilitates permanent residency for workers with job offers in essential construction occupations. British Columbia also leverages its PNP to attract and retain skilled construction workers, streamlining immigration for those with confirmed employment. Together, these programs aim to align immigration with regional labour needs, strengthen

workforce availability in construction, and help meet Canada's urgent housing supply goals. Table 28 summarizes policy recommendations related to immigration policy and its impacts on residential construction labour shortages.

G. Enhancing capacity utilization and supply chain management

According to Barbosa et al. (2017), the construction industry ranks among the least advanced sectors in terms of procurement sophistication, highlighting significant potential for improvement. Adopting best practices from other industries, alongside innovative, digitally enabled methods, could enhance reliability and predictability. For example, digitizing procurement and supply chain workflows can support more advanced logistics coordination and enable just-in-time delivery.

At a broader level, stakeholders across the construction ecosystem—including owners, contractors, and suppliers—are beginning to draw lessons from sectors like automotive and aerospace, particularly in developing longer-term partnerships with suppliers and subcontractors.

This is more important than ever given the supply chain uncertainties introduced by exogenous factors such as the Covid pandemic and tariffs-induced global trade disruptions.

In many industrial sectors, the so-called Final Investment Decision (FID) is often symbolic, as substantial investments—such as in long-lead-time materials—are made well before the formal FID. To address this, supplier development initiatives that apply lean supply chain principles can reduce lead times, reinforce the credibility of FID, and help mitigate the risk of materials becoming obsolete.

Innovations such as Bridgit Resource Management Software Construction resource planning software migration allows for the automation of administrative processes, which can help reduce errors, minimize costs, and provide more time for operations

Table 24: Policy Recommendations for Immigration Planning Supporting Residential Construction Productivity Growth

Level of Government	Policy Tool	Description	Potential Enhancements
Federal	Express Entry – Skilled Trades Category	Fast-track permanent residency for trades (e.g., carpenters, electricians).	Increase frequency of construction-targeted draws and lower eligibility thresholds.
	Permanent Residency Pathway for Out-of-Status Construction Workers	Regularizes undocumented workers in the construction industry.	Expand program nationally and increase cap beyond 6,000 workers.
	Temporary Foreign Worker Program (TFWP)	Allows employers to hire temporary construction workers.	Create construction-specific streams with easier processes for employers.
	Apprenticeship Access for TFWs	Allows temporary workers to study in trade programs without study permit.	Promote uptake and provide subsidies for employers sponsoring apprentices.
	Credential Recognition Support	Funds training and certification for internationally trained workers.	Fast-track assessment for construction-related occupations.
Provincial/Territorial	Provincial Nominee Program (PNP)	Provinces nominate skilled workers to address local needs.	Create construction-targeted streams with accelerated processing.
	Bridge Training & Work Experience Programs	Help newcomers gain Canadian credentials and job experience.	Target programs for specific residential construction trades.
Municipal	Municipal Nominee Program	Would allow cities to nominate immigrants based on labour gaps.	Pilot in housing-crisis municipalities with construction skill focus.

	Settlement Programs for Tradespeople	Tailored settlement services for immigrant construction workers.	Partner with unions, colleges for on-site orientation and support.
	Local Employer Consortia	Municipalities support employer groups to coordinate immigration hiring.	Streamline group LMIA applications and match skilled immigrants to local jobs.

Source: CSLS compilation

management to put out fires and perform tasks to help increase productivity. Construction resource management software can be used to:

- Track resource availability
- Reallocate resources in response to project changes
- Track utilization rates to avoid under utilization or overworking your teams
- Ensure project teams have the right skills and experience
- Optimize resource time, effort, and cost
- Identify and resolve resource conflicts
- Forecasting future staffing requirements

H. Boosting workforce training and education

As noted by Barbosa et al. (2017) report, achieving meaningful change in the construction sector requires targeted investment in workforce development, especially as the industry faces significant demographic transitions. Expanding apprenticeship programs can help equip frontline workers with both foundational skills and training in emerging technologies, which could reduce the industry's vulnerability to seasonal and cyclical fluctuations and lead to a more stable workforce.

Canada has implemented various policies to enhance workforce training and education in the residential construction sector:

At the federal level, the government has invested in training programs for internationally trained professionals to address skilled trades shortages in construction. Additionally, significant funding has been allocated to workforce development agreements, supporting training and skills development across the country. Budget 2024 invested $50 million over two years in the Foreign Credential Recognition Program, focusing on sectors like

residential construction to accelerate the integration of skilled trades workers. This builds on Budget 2022 investments of $115 million over five years, starting in 2022–2023, and $30 million ongoing for the Program. By supporting internationally trained tradespeople in the Foreign Credential Recognition (FCR) process, the Government of Canada is helping to build a diverse and qualified workforce that meets the growing demands of this essential sector. [54]

In Ontario, the Specialist High Skills Major (SHSM) – Construction program enables high school students to acquire sector-focused knowledge and skills before entering apprenticeship training or post-secondary education. The province also mandates specific health and safety training for construction workers, including working at heights and hazard awareness programs. In British Columbia, initiatives like TradeUpBC provide specialized training opportunities for tradespeople, while organizations such as the BC Construction Safety Alliance offer certification programs like SiteReadyBC and Traffic Control Person training. Furthermore, the reintroduction of mandatory skilled trades certification through SkilledTradesBC aims to ensure a competent and qualified workforce in the construction industry.

Table 29 outlines several policy directives that multiple levels of government can pursue to enhance residential construction workforce training and education.

[54] The FCR Program supports the labour market integration of internationally trained professionals by providing funding to provinces and territories, regulatory authorities and other organizations to make FCR processes faster and more efficient; providing loans and support services to help skilled newcomers through the FCR process; and providing employment supports (such as work placements, wage subsidies, training, mentoring and coaching) to help skilled newcomers gain Canadian work experience in their field of study.

Table 25: Policy Avenues for Boosting Residential Construction Workforce Training and Education

Level of Government	Policy Idea	Description	Productivity Impact
Federal	National Microcredential Fund for Construction Trades	Create a federal fund for the rapid development and rollout of modular, stackable microcredentials in key construction areas.	Enables rapid upskilling in targeted high-demand areas like HVAC, framing, or green building.
	Immigrant Skills Recognition Fast-Track Program	Implement a nationwide system to fast-track the recognition and upgrading of international construction credentials.	Speeds up labour market integration and fills key skill gaps with qualified newcomers.
	Mobile Training Units for Remote Areas	Deploy mobile training trailers equipped with tools, trainers, and digital curricula to rural and northern communities.	Delivers training to areas that are otherwise cut off from traditional programs, expanding the workforce.
Provincial/Territorial	Skilled Trades Co-op Program for High Schools	Introduce province-funded co-op programs to allow high school students to gain hands-on experience with local contractors.	Increases early exposure and builds future trades capacity while reducing entry friction.
	Digital Learning Credits for Construction Workers	Offer education vouchers or online course credits to active construction workers to upgrade digital and green building skills.	Boosts skill relevance and adaptability, supporting a lifelong learning culture in construction.
	Mandatory Modular Construction Curriculum	Require provincial trade schools to incorporate modular/prefabrication-focused coursework in all construction programs.	Aligns curricula with evolving industry standards, improving worker efficiency and job readiness.
Municipal	Municipal Construction Skills Bootcamps	Launch city-funded intensive bootcamp-style training programs aligned with local housing development timelines.	Quickly produces work-ready talent timed to project launches, especially in tight markets.
	Local Trade School and Builder Partnerships	Formalize partnerships between city governments and trade schools to develop employer-led curriculum and placements.	Ensures employers shape the pipeline of future workers and improves job placement outcomes.
	Youth Construction Corps Program	Create paid summer work programs for youth aged 16–20 in partnership with local	Builds long-term interest in construction careers, strengthening the future labour pipeline.

		homebuilders to spark early career interest.	

Source: CSLS compilation

I. Strengthening Infrastructure and coordination with land use planning

Infrastructure and land use planning are fundamental enablers of residential construction productivity growth. Their relationship with construction productivity is both direct and systemic, influencing everything from project timelines and costs to the efficiency of labour deployment and housing supply outcomes.

Roads, transit, water, sewer, and energy infrastructure determine whether land is "shovel-ready" for residential development. Without adequate infrastructure, even well-zoned land cannot be efficiently developed. This leads to project delays, fragmented construction timelines, and higher input costs—all of which erode productivity.

When land use planning and infrastructure investments are aligned—especially with long-term housing needs in mind—projects move forward faster and with fewer revisions. Poor coordination often means retrofitting infrastructure after construction begins, which slows progress and raises costs.

Canada has implemented several policies at the federal, provincial, and municipal levels to strengthen infrastructure and land use planning, aiming to boost residential construction productivity. The federal government launched the Canada Housing Infrastructure Fund, allocating C$6 billion to accelerate the construction and upgrading of housing-related infrastructure. Approximately one-fifth of this fund is designated for municipalities to support critical infrastructure needs. Additionally, the government introduced a Public Lands for Homes Plan, which involves leasing underutilized public lands to developers for affordable housing projects. This plan includes creating a public land bank and mapping tool to facilitate the identification and use of public lands for housing development.

In Ontario, the Community Planning Permit System (CPPS) streamlines development approvals by combining zoning, site plan, and minor variance processes into a single application. This system aims to expedite housing projects and provide flexibility in land use planning. British Columbia has been modernizing its land use planning framework in partnership with First Nations and local governments, focusing on sustainable resource management and community development.

Table 30: Policy Avenues for Strengthening Infrastructure and Coordination with Land Use Planning

Level of Government	Policy Idea	Description	Productivity Impact
Federal	National Infrastructure Coordination Council	Establish a council to align infrastructure projects with housing development needs across provinces and territories.	Ensures timely infrastructure support for new housing projects, reducing delays.
Provincial/Territorial	Integrated Land Use and Transportation Plans	Develop comprehensive plans that coordinate land use with transportation infrastructure to support residential growth.	Promotes efficient land development and reduces commuting times.
Municipal	Digital Zoning and Permitting Platforms	Implement online platforms for zoning information and permit applications to streamline approval processes.	Accelerates development timelines and reduces administrative burdens for builders.

Source: CSLS compilation

Municipalities across Canada are implementing policies to encourage residential development. For example, some cities have adopted zoning reforms to allow for higher-density housing and reduced parking requirements near transit hubs, facilitating more efficient land use and supporting increased housing supply.

To further enhance infrastructure and land use planning for residential construction labour productivity growth, a suite of policy ideas is presented in Table 30.

IX: Conclusion and Future Research

Labour productivity growth in residential construction is a key factor in addressing Canada's acute housing affordability crisis. Increasing productivity in this sector would reduce unit labour costs, ultimately leading to lower housing prices for homebuyers. In fact, the report finds that improvements in residential construction labour productivity after 2019 would have saved up to an estimated $6–7.7 billion in new housing costs. This would have accounted for 15-20 per cent of the rise in new housing prices from 2019 to 2024, saving homebuyers $24,000-$31,000 extra in housing prices in 2024.

This report provides a comprehensive analysis of residential construction labour productivity growth in Canada over the past quarter century. It highlights two key findings:

1. Residential construction had a poor productivity performance in the 2000-2024 period declining at a rate of 0.4 per cent per year. This industry experienced slower-than-average productivity growth compared to other industries between 2000 and 2019 (broken down to 2000-2008 and 2008-2019 sub-periods).

2. Labour productivity in the sector declined 3.8 per cent per year between 2019 and 2024.

The post-2019 decline is particularly puzzling, driven by the increase in employment (3.7 per cent per year) and total hours worked (3.9 per cent per year) in the sector and a simultaneous drop in real output (-0.1 per cent per year). Drawing on Canadian and international evidence, as well as a detailed examination of available data, this report explores potential explanations for these trends. We find that:

- Structural factors—such as technological adoption, and market structure—contribute to the long-term sluggish productivity growth in the sector.
- Cyclical factors—including labour shortages, declining capacity utilization, and weaker capital investment—help explain the short-term productivity decline after 2019.
- Compositional factors appear to play a limited role, though the rising share of multi-dwelling construction could positively impact future productivity growth.

The role of construction regulations in residential construction labour productivity is not entirely clear. Given the recent impetus for more development in Canada, and some of the recent changes to building codes and zoning laws, it is entirely conceivable that existing and new building construction regulations have had a negative impact on residential construction productivity growth in recent years. However, the variation in regulatory stringency across municipalities and provinces makes it difficult to draw firm conclusions. Future research should adopt a more micro-level approach to assess the productivity implications of these regulations.

The analysis further identifies a range of policy levers that can support productivity and affordability. These include:

- **Technology and process modernization**: Incentivizing digital tools, Building Information Modelling (BIM), and project-management software can reduce delays and improve coordination.
- **Industrialized construction**: Scaling up modular and panelized construction methods requires harmonizing codes and expanding factory capacity.
- **Labour force strategies**: Addressing shortages through targeted immigration, credential recognition, and apprenticeship completion incentives will help close persistent skill gaps.
- **Regulatory streamlining**: Implementing standardized permitting timelines across provinces and municipalities, digital approvals, and pre-zoning transit corridors can cut approval durations and reduce uncertainty.
- **Cost and financing supports**: Reducing development charges and expanding CMHC loan programs can reduce project risk and maintain builder activity through downturns.
- **Demand stabilization**: Policies to smooth demand cycles—such as first-time buyer supports or rental subsidies—can keep housing pipelines active and protect workforce capacity.

These tools offer a path to unlocking greater productivity and reducing housing costs—if implemented in a coordinated and sustained fashion.

Finally, the report identifies several unresolved questions and data limitations that future research should address to strengthen both diagnosis and prescription. Key areas for investigation include:

1. **Statistical Measurement of Output and Productivity**
    - How are residential construction outputs currently classified—particularly the division between new builds and renovations?
    - What accounts for the growing discrepancy between housing starts and measured real output growth for residential construction in Statistics Canada data?
    - Can improved work-in-progress measures be developed to better reflect partially completed homes in output statistics?
    - Are the price deflators used in estimating real construction output sufficiently precise, especially across regions and building types? Do they capture quality adjustments for output measurement?

2. **Labour Input Classification**
    - As construction workers frequently move between residential, commercial, and engineering sub-sectors within a year, how does this affect productivity measurement? Can Statistics Canada's methods better account for worker mobility across sub-sectors?

3. **Capital and Total Factor Productivity (TFP)**
    - Data is needed on capital stock used in production by residential construction to
      develop TFP estimates for the sector. This would clarify how much inefficiency stems from technology, management practices, or investment shortfalls.

4. **Cost and Affordability Impacts of Modular and Prefabricated Housing**
    - Is modular construction consistently more cost-effective than conventional methods when lifecycle costs, logistical limits, and permitting delays are accounted for?
    - What types of housing (e.g., mid-rise rentals, remote housing) offer the greatest productivity returns from prefab?

5. **Rental Housing and Affordability**
    - With rental starts now outpacing other types of housing construction, what are the long-term implications for housing affordability, tenure mix, and price stability?

6. **International Benchmarks and Sectoral Comparison**
    - We call for collection of internationally comparable data for the residential construction sector to allow for international benchmarking.
    - Over the last quarter century, U.S. total residential productivity (−0.43 per cent a year, 2000–2023) and Canada's residential productivity (−0.4 per cent, 2000–2024) are remarkably similar in magnitude. But they got there by very different paths: the U.S. saw a steep early-2000s decline (−1.64 per cent) followed by modest gains (0.2–0.3 per cent per year post-2008), whereas Canada experienced a modest pre-2019 rise (1.5 per cent per year in 2008–2019) but a sharp drop since 2019 (−3.8 per cent per year). This contrast in trajectories—especially the post 2019 period-warrants deeper investigation

into measurement, mix, and post-2019 shocks among other likely explanations.

7. **The Likely Role of sub-contractors**
    - An important question for further study is how the industry's heavy reliance on subcontracting affects productivity. CSLS interviews reveal that most firms monitor progress through delivery deadlines rather than by collecting detailed hours-worked or output data. What does this imply for measured labour productivity?

Answering these questions will require more detailed, disaggregated data and targeted micro-level studies. However, doing so is critical to crafting effective policy. With productivity now clearly established as a central driver of housing affordability, improving measurement, diagnosis, and international benchmarking should be key priorities for the next stage of research.

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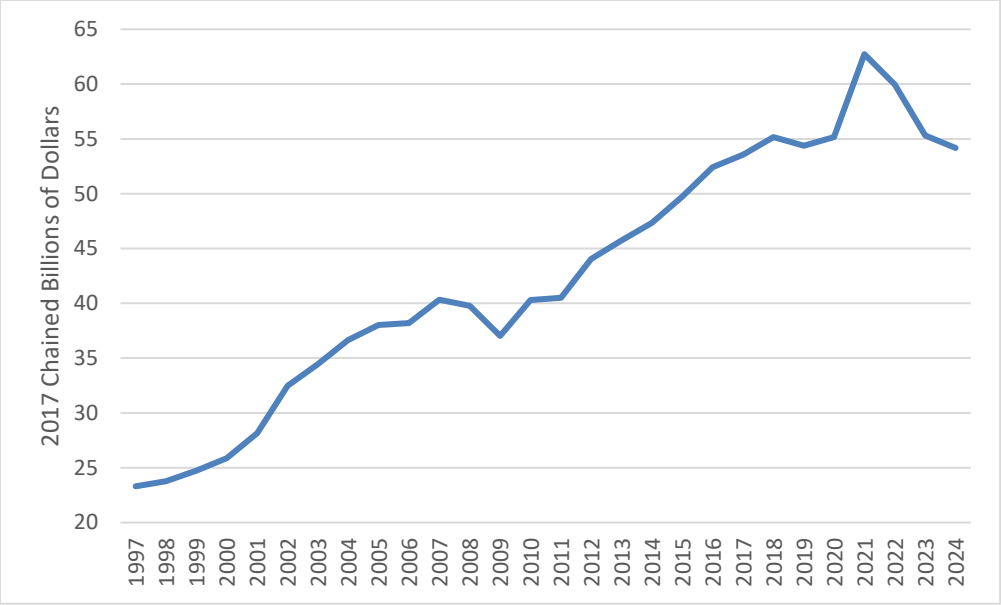
Appendices

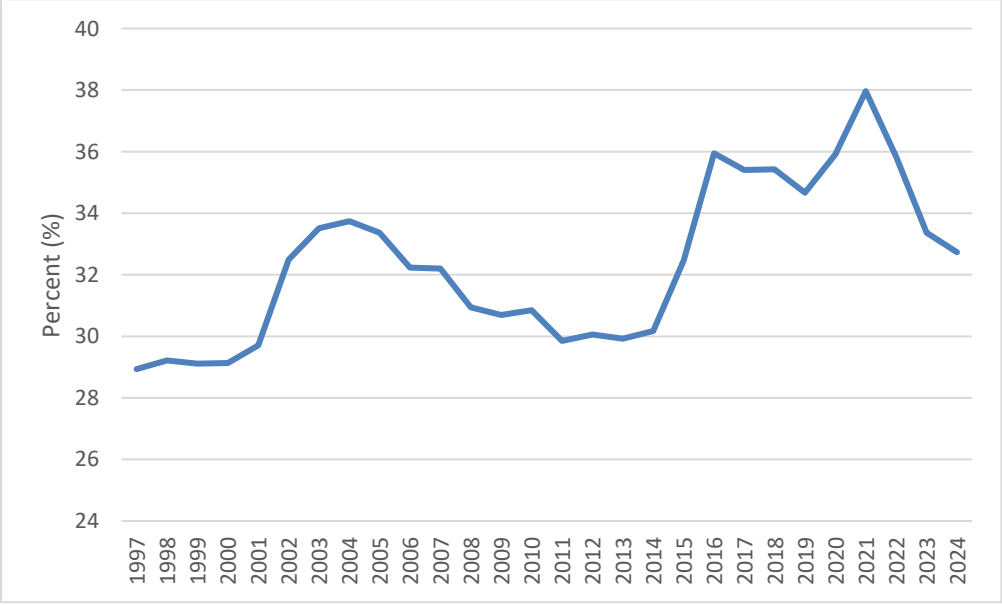
Appendix Charts

Chart A1: Real Output in the Residential Construction Sector, 1997-2024

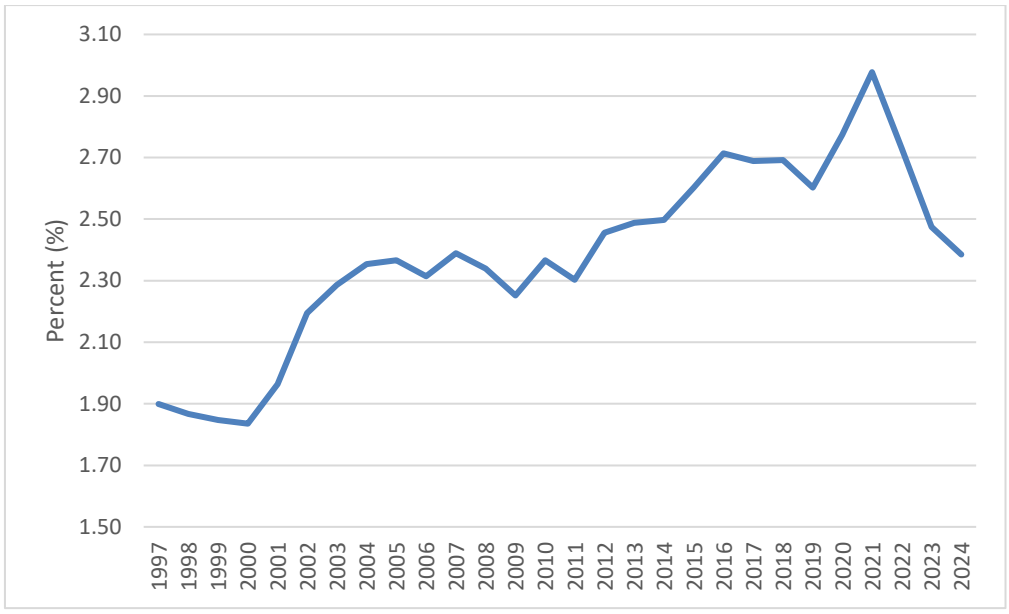
Panel A: Residential Construction Output (chained 2017 dollars)



Panel B: Residential Construction as a Share of Total Construction



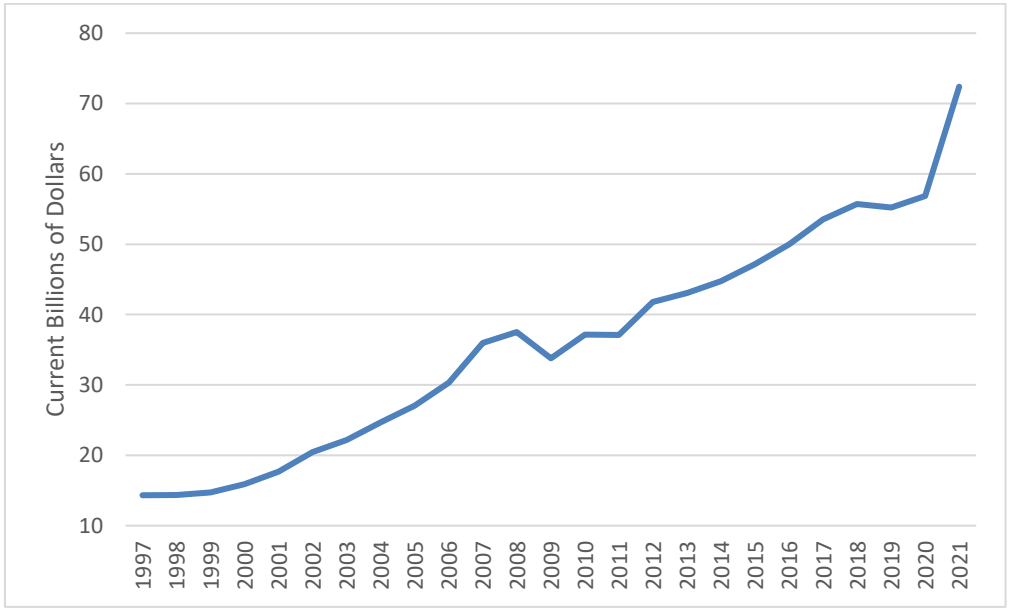
Panel C: Residential Construction as a Share of Total Economy



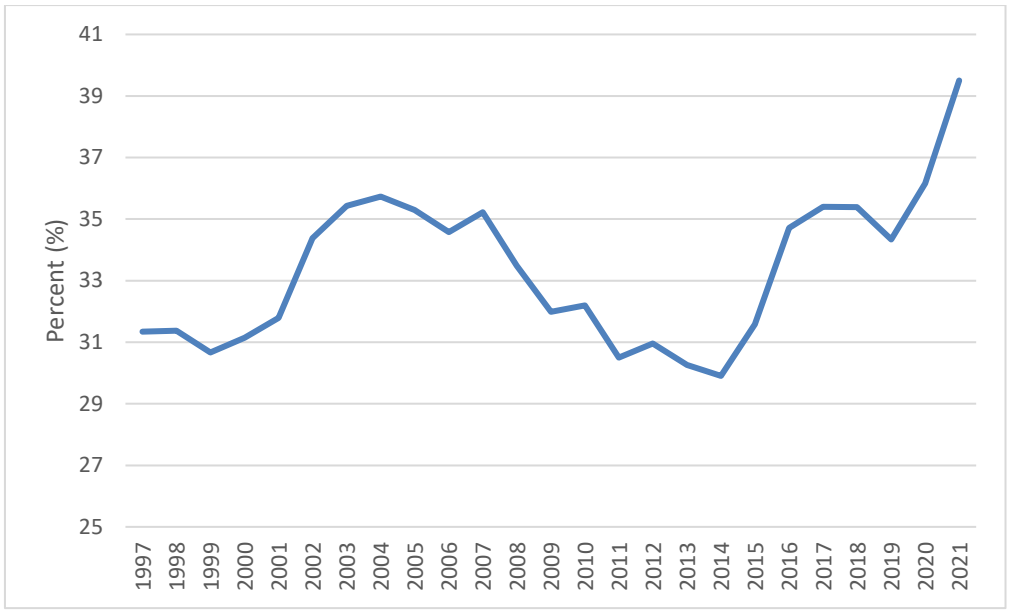
Source: Statistics Canada 36-10-0480-01

Chart A2: Nominal Output in the Residential Construction Sector 1997-2021

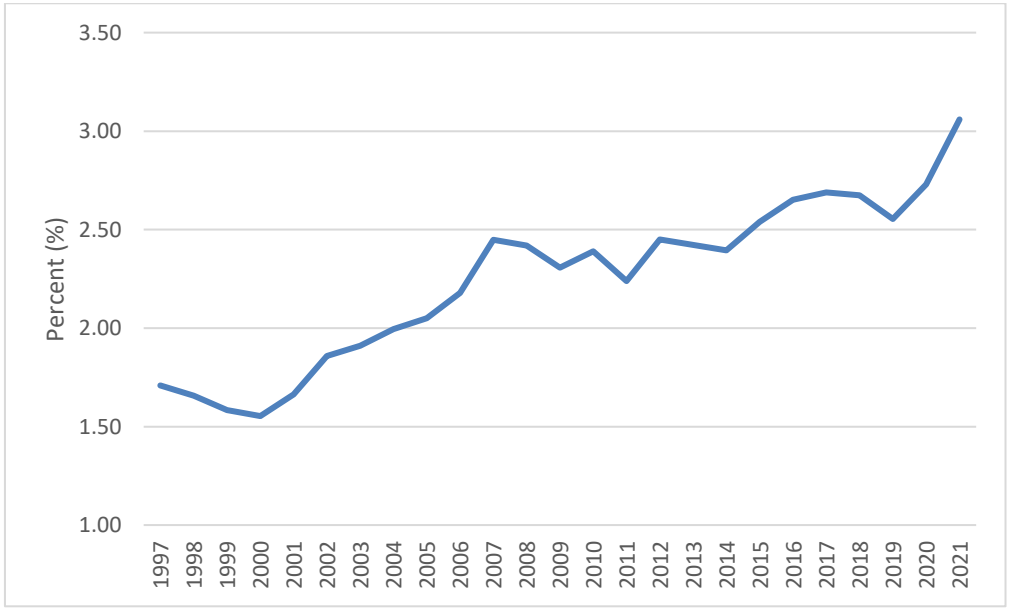
Panel A: Residential Construction Output (Current Dollars)



Panel B: Residential Construction as a Share of Total Construction



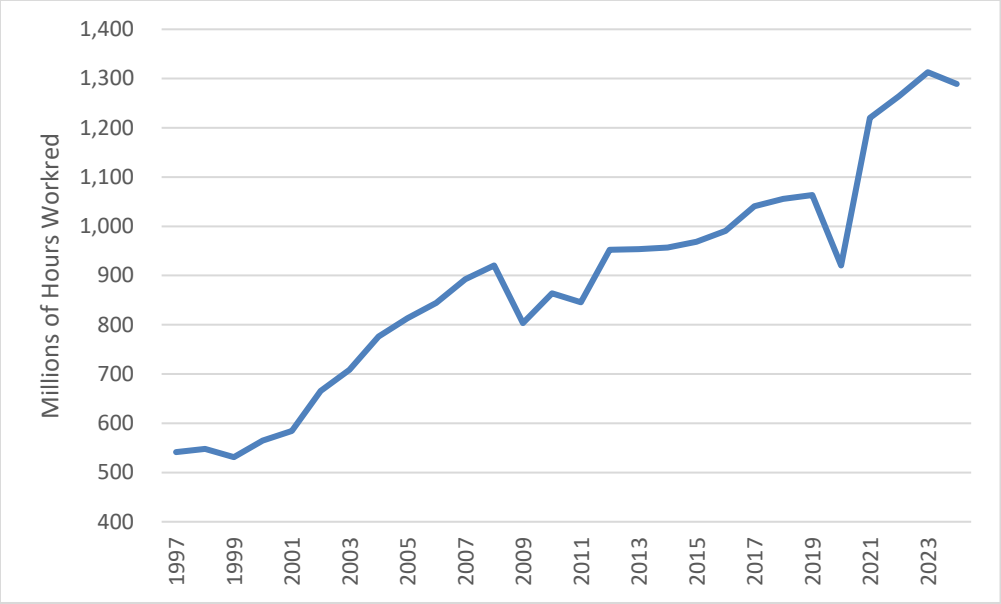
Panel C: Residential Construction as a Share of Total Economy



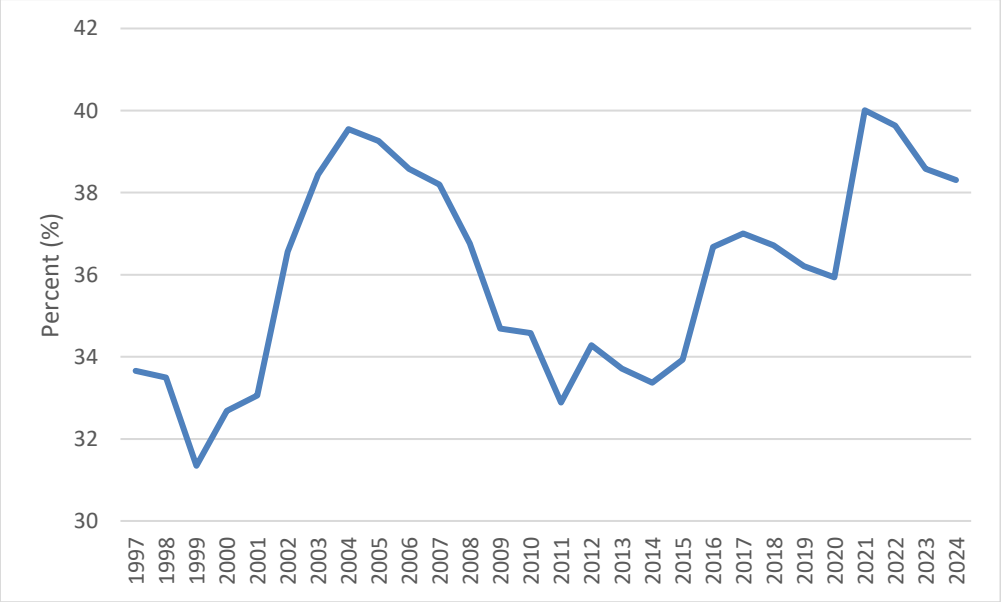
Source: Statistics Canada 36-10-0480-01

Chart A3: Hours Worked in the Residential Construction Sector, 1997-2024

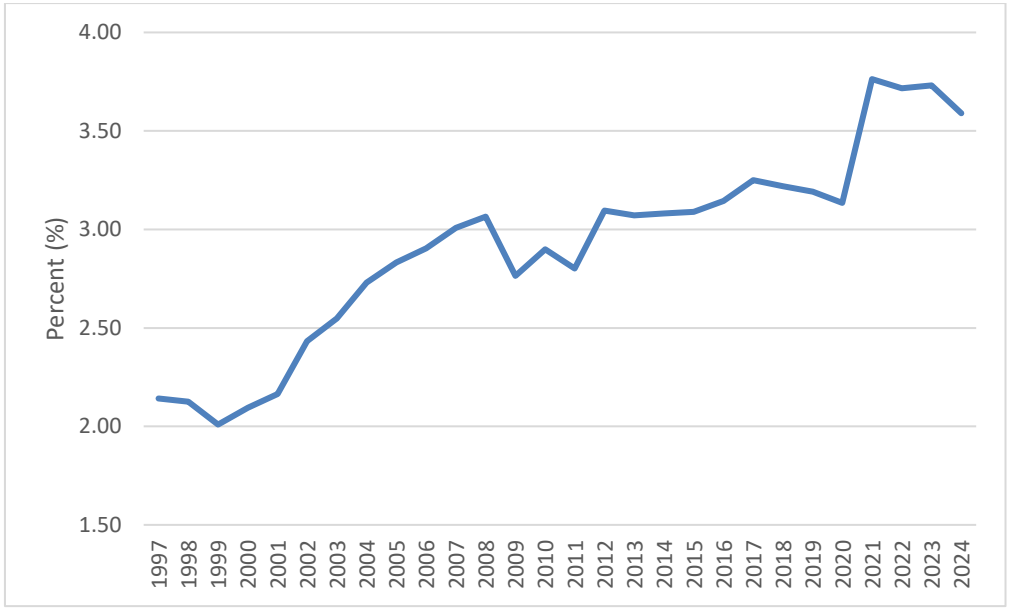
Panel A: Residential Construction Hours Worked (millions)



Panel B: Residential Construction as a Share of Total Construction



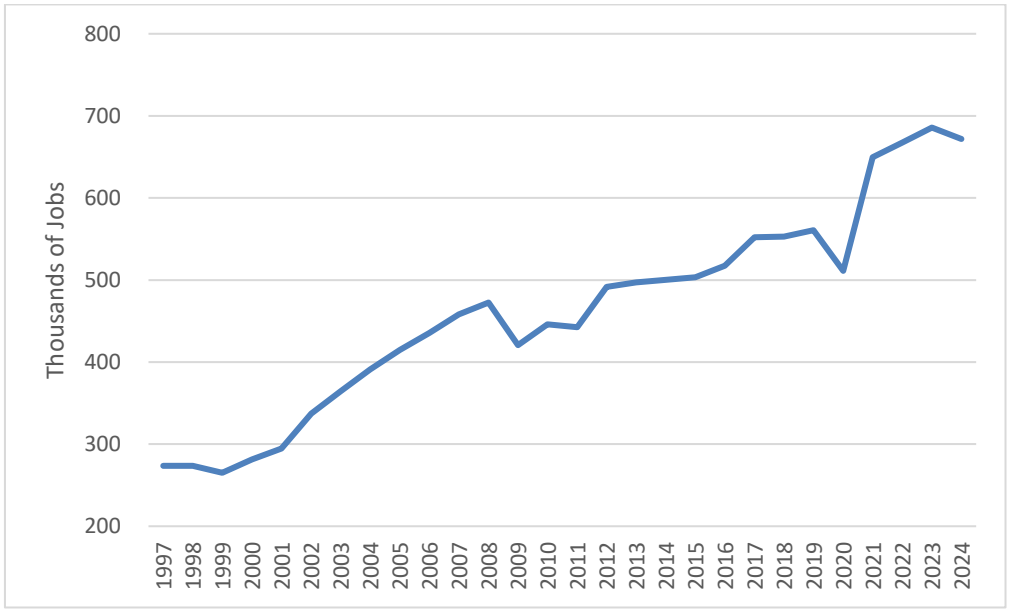
Panel C: Residential Construction as a Share of Total Economy



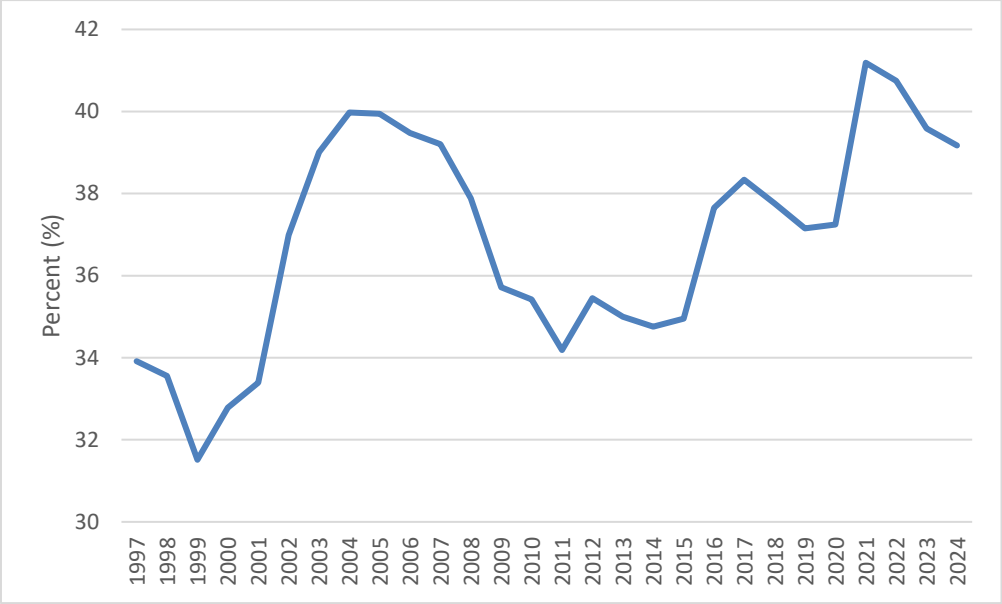
Source: Statistics Canada 36-10-0480-01

Chart A4: Total Jobs in the Residential Construction Sector, 1997-2024

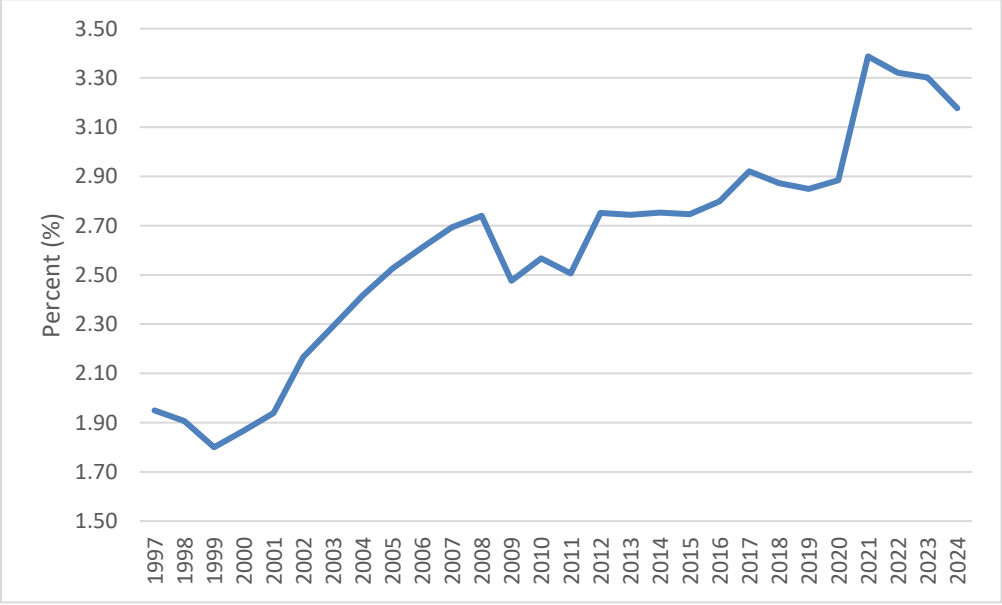
Panel A: Residential Construction Jobs (thousands)



Panel B: Residential Construction as a Share of Total Construction



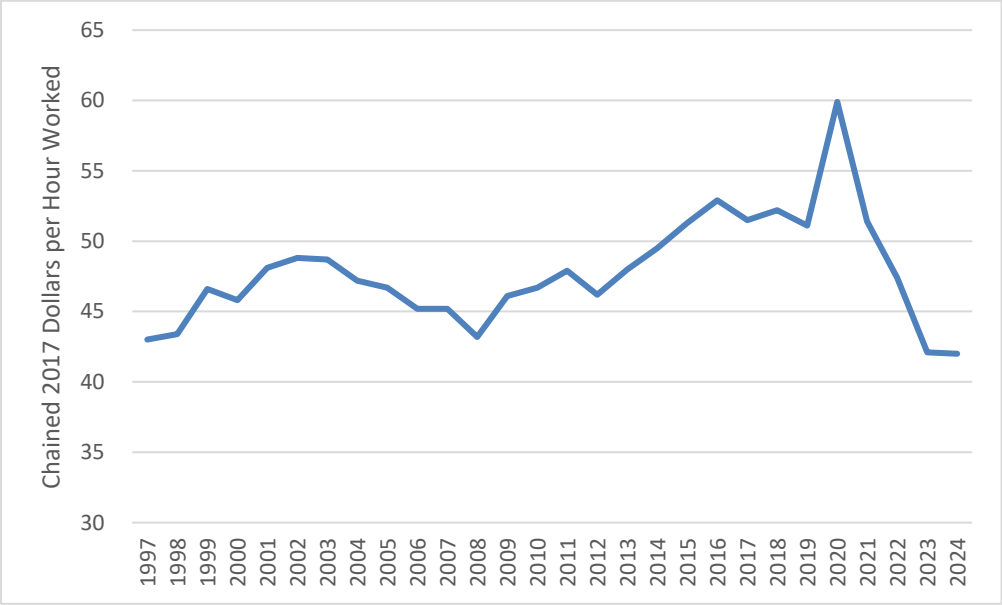
Panel C: Residential Construction as a Share of Total Economy



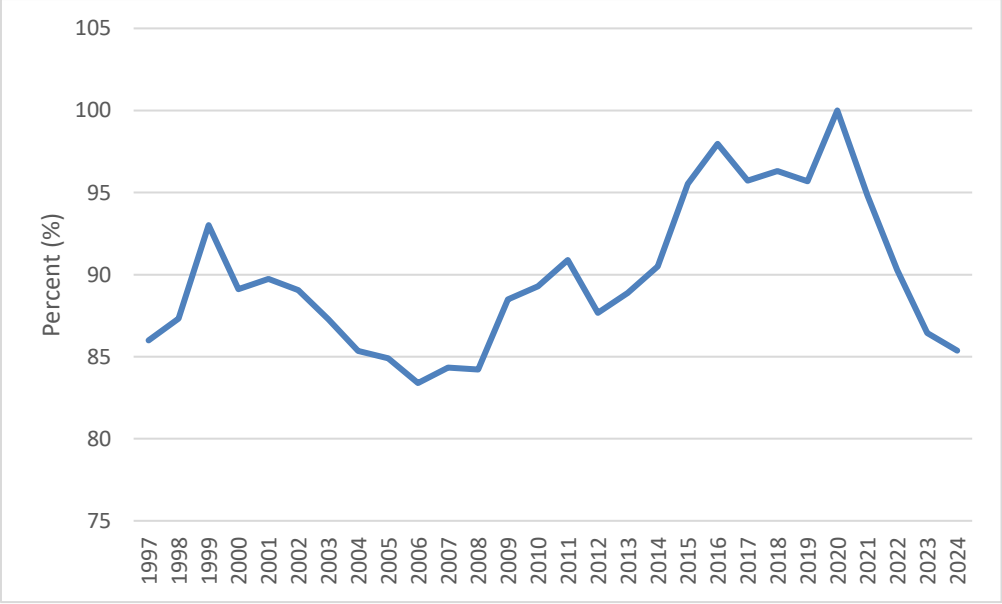
Source: Statistics Canada 36-10-0480-01

Chart A5: Real Value-Added Labour Productivity in Residential Construction, 1997-2024

Panel A: Residential Construction Labour Productivity (output in chained 2017 dollars / hours worked)

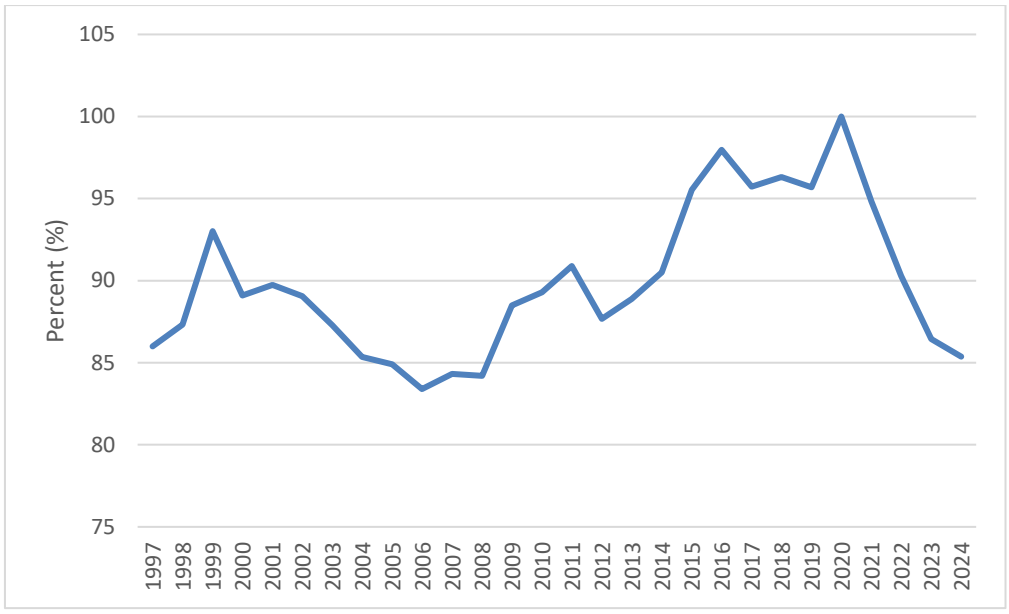


Panel B: Residential Construction as a Share of Total Construction



Source: Statistics Canada 36-10-0480-01

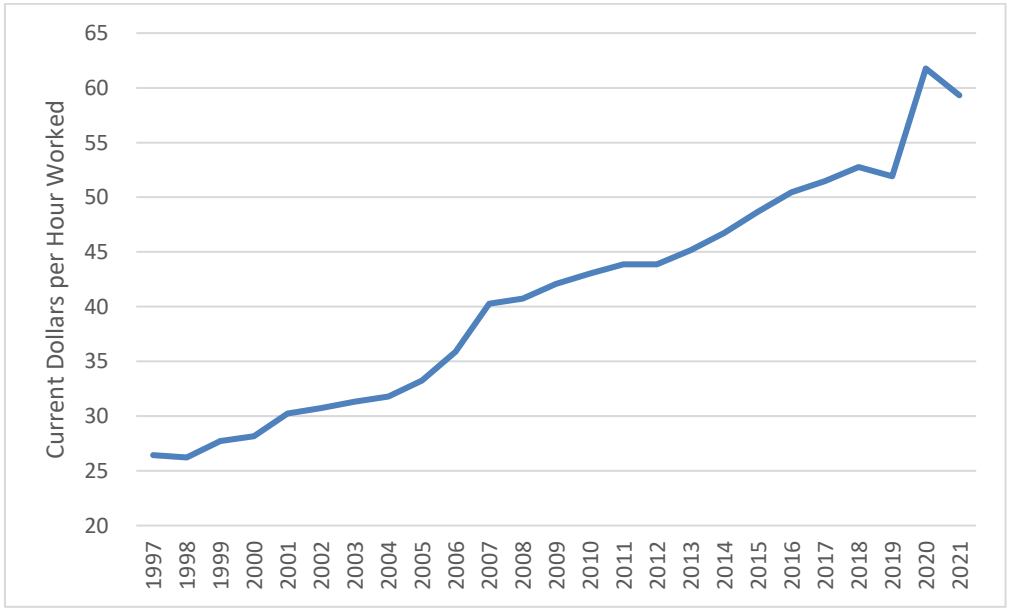
Panel C: Residential Construction as a Share of Total Economy



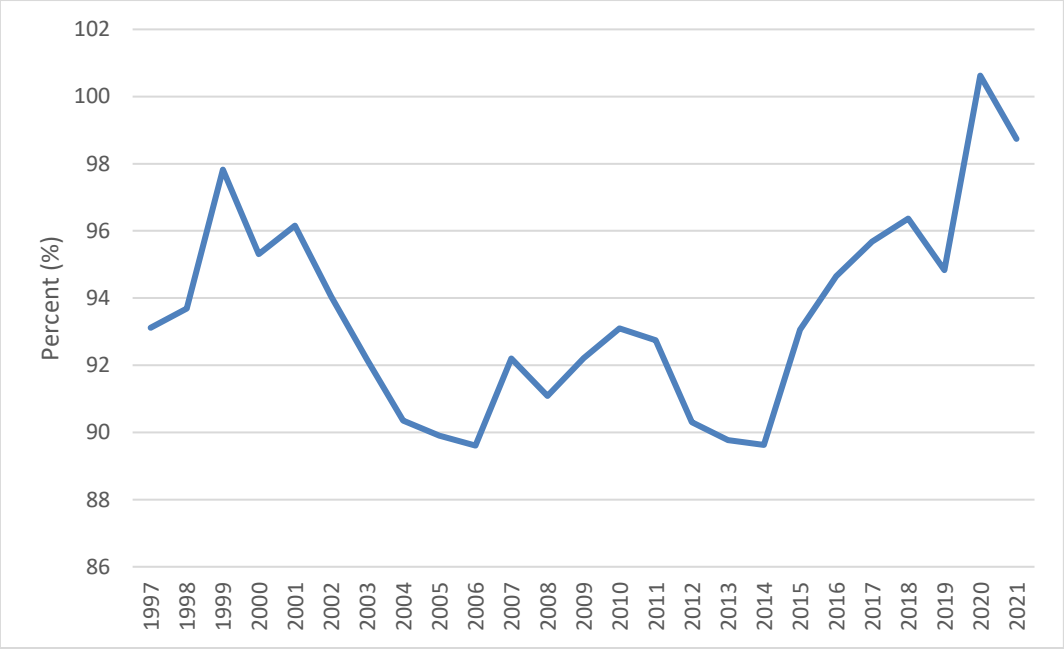
Source: Statistics Canada 36-10-0480-01

Chart A6: Nominal Labour Productivity in Residential Construction, 1997-2021

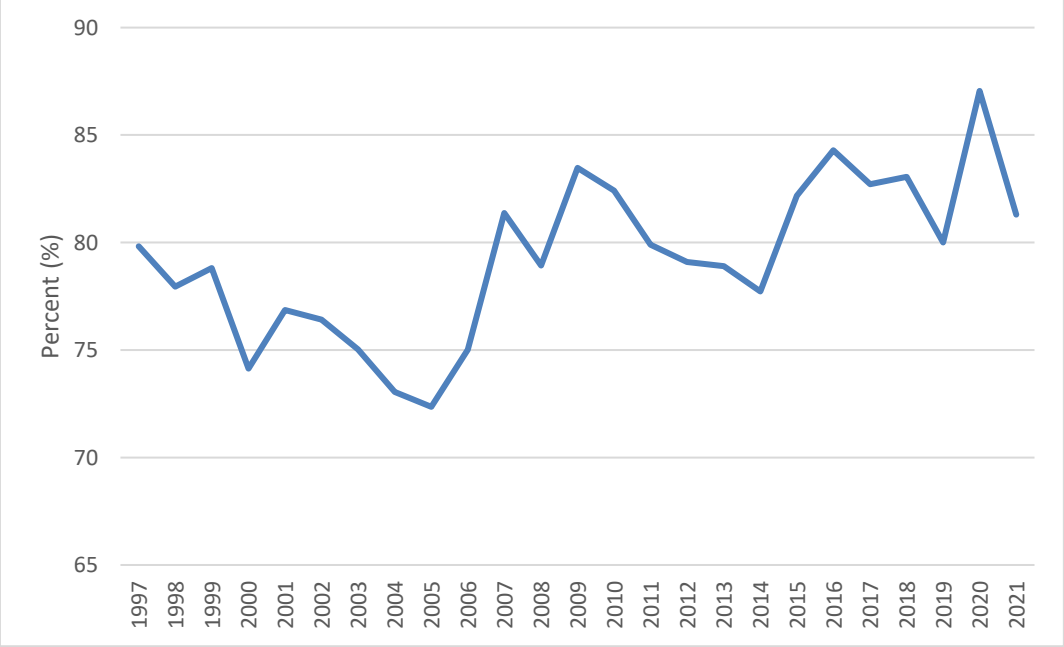
Panel A: Residential Construction Labour Productivity (nominal output / hours worked)



Panel B: Residential Construction as a Share of Total Construction



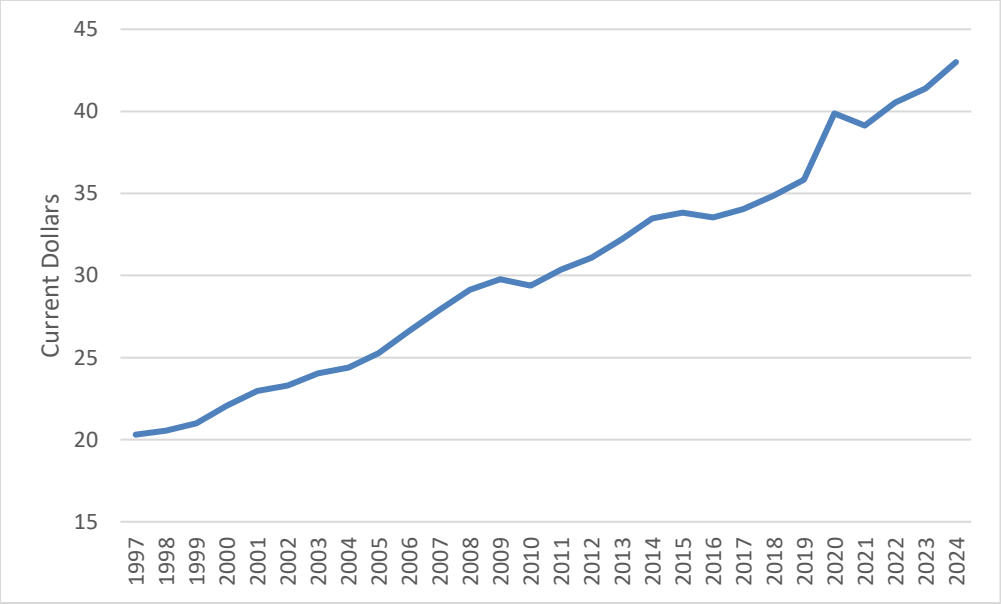
Panel C: Residential Construction as a Share of Total Economy



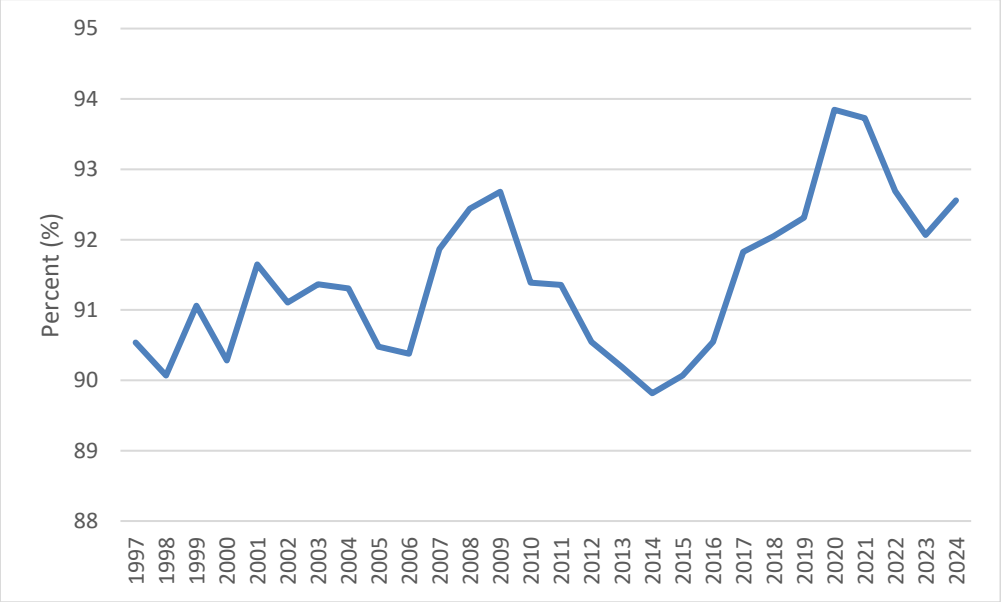
Source: Statistics Canada 36-10-0480-01

Chart A7: Average Hourly Compensation for Residential Construction, 1997-2024

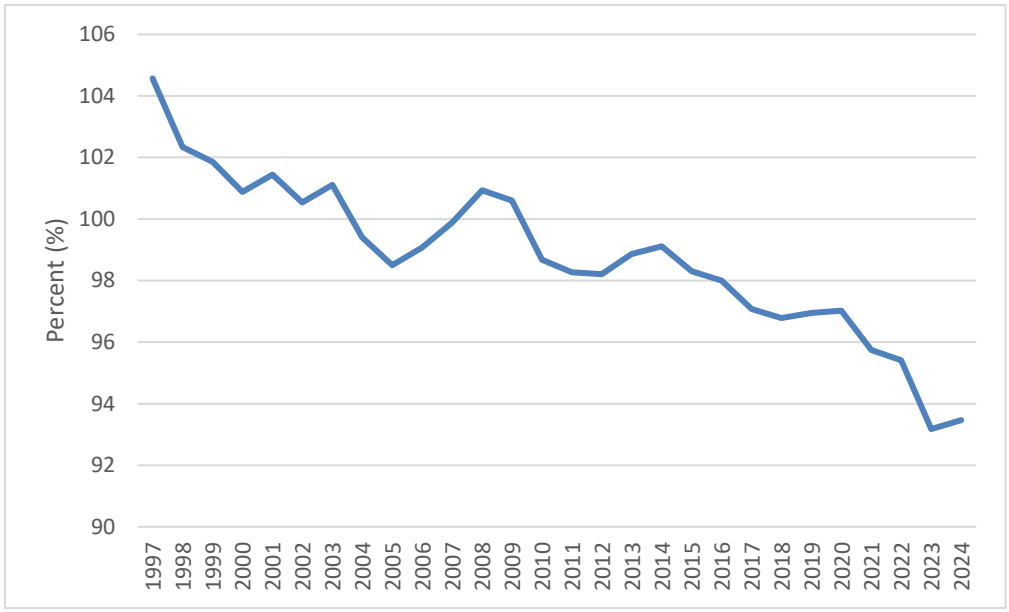
Panel A: Residential Construction Average Hourly Compensation (current dollars)



Panel B: Residential Construction as a Share of Total Construction



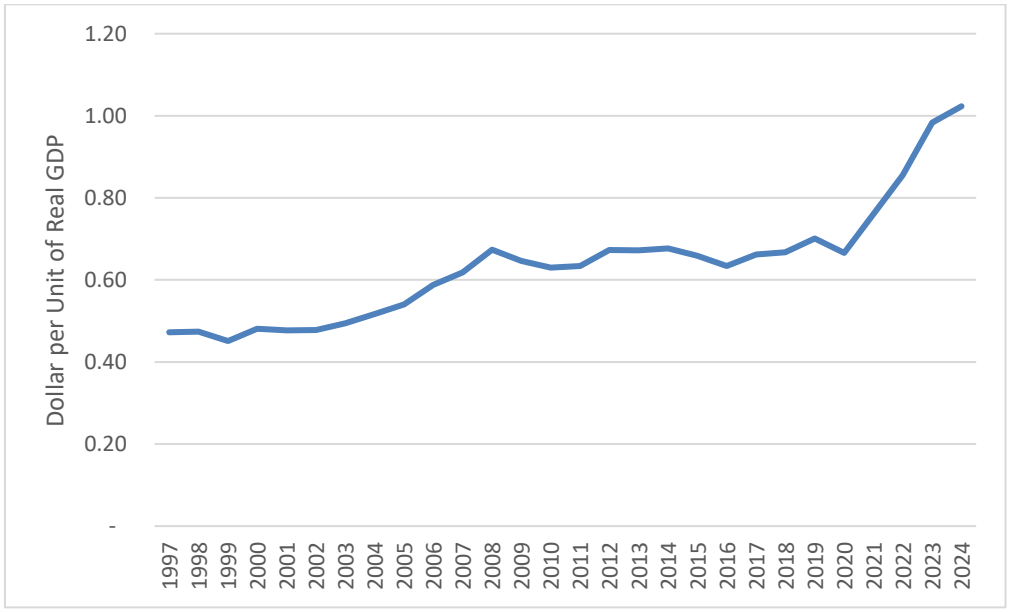
Panel C: Residential Construction as a Share of Total Economy



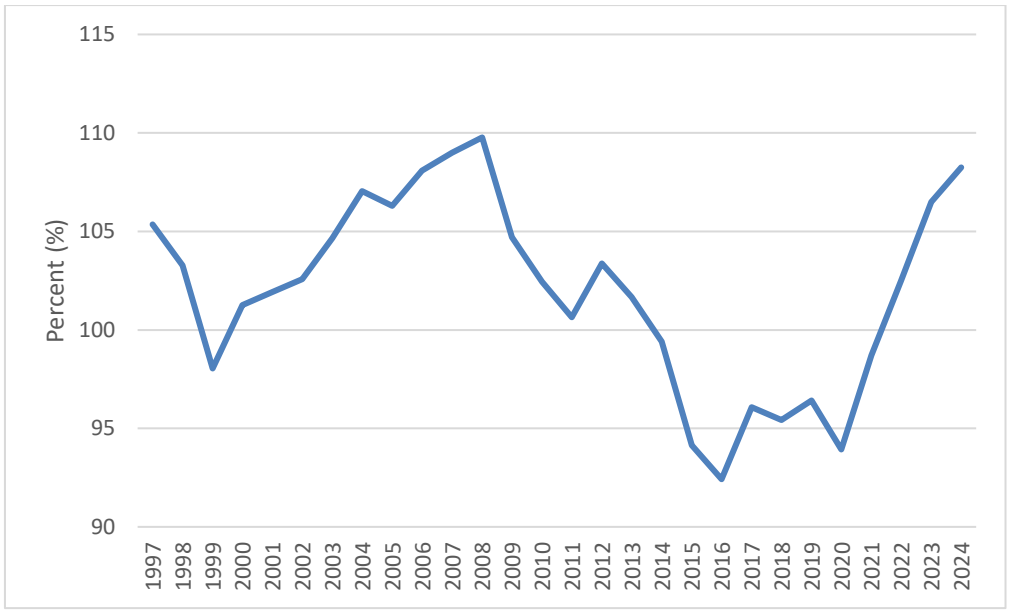
Source: Statistics Canada 36-10-0480-01

Chart A8: Residential Construction Unit Labour, 1997-2024

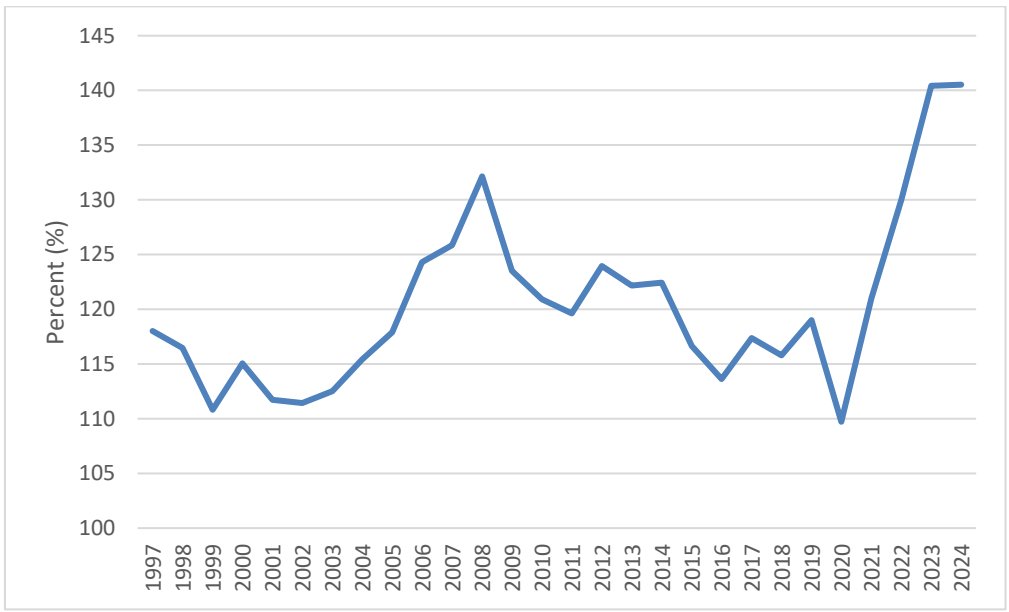
Panel A: Cost Unit Labour Cost in Residential Construction (total labour compensation / real output)



Panel B: Residential Construction as a Share of Total Construction



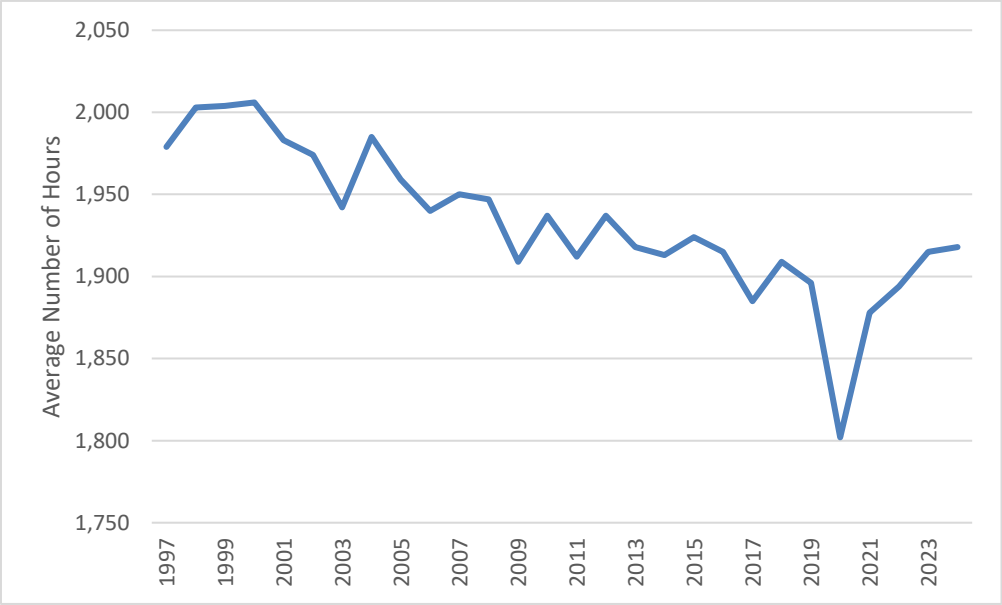
Panel C: Residential Construction as a Share of Total Economy



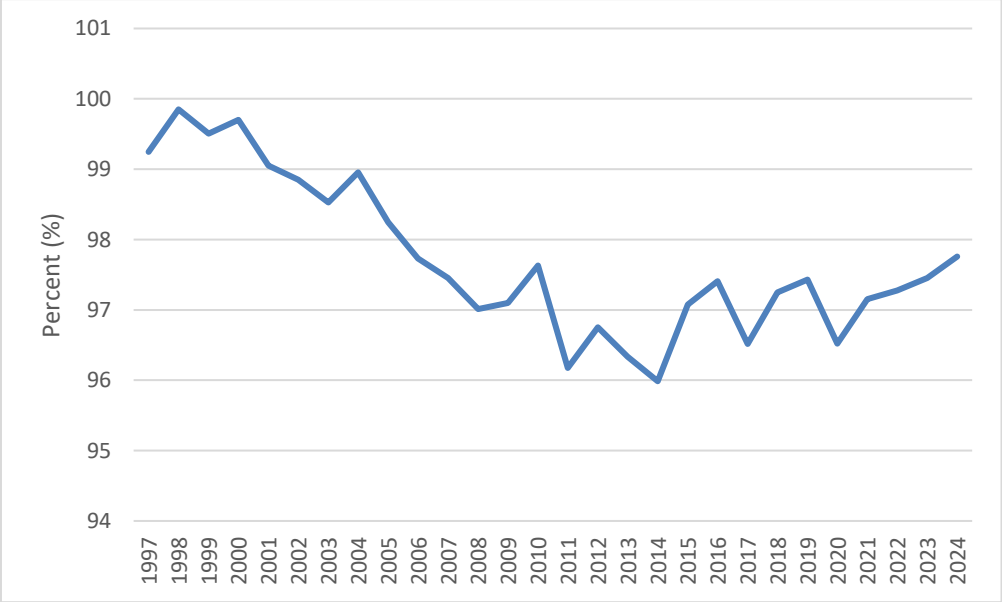
Source: Statistics Canada 36-10-0480-01

Chart A9: Annual Average Number of Hours Worked for all Jobs in Residential Construction, 1997-2024

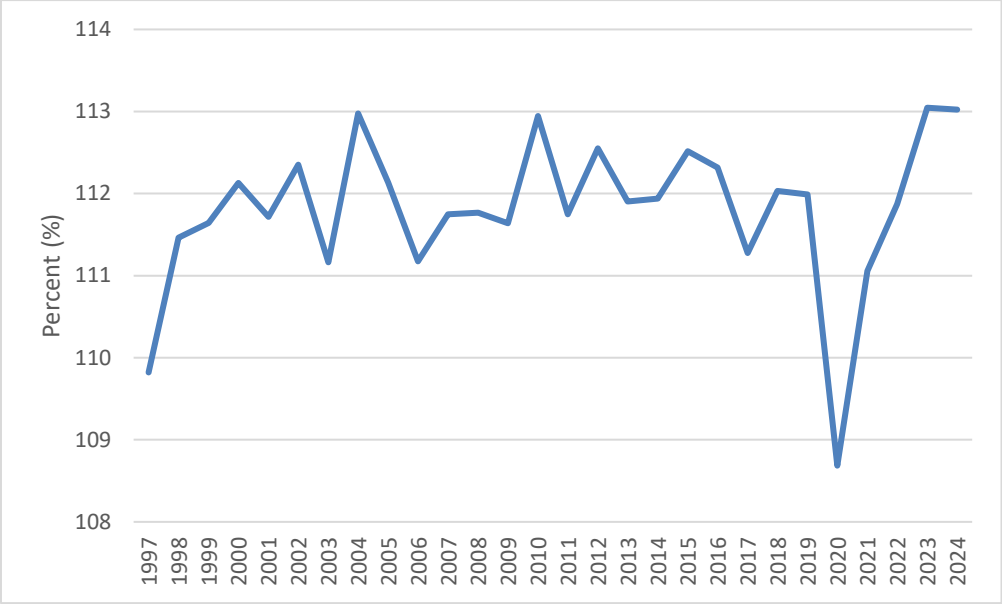
Panel A: Residential Construction Average Annual Hours Worked



Panel B: Residential Construction as a Share of Total Construction



Panel C: Residential Construction as a Share of Total Economy



Source: Statistics Canada 36-10-0480-01

Appendix Tables

Table A1: Growth Rates of Productivity Related Variables in Total Economy, Construction, and Construction Sub-Sectors, 2000-2024

Panel A: Total Economy

Variables	2000-2024	2000-2008	2008-2019	2019-2021	2019-2024	2021-2024
Labour Productivity	0.79	0.99	0.93	1.82	0.16	-0.93
Hours Worked	1.20	1.37	0.94	-1.34	1.51	3.45
Real Value Added	2.00	2.36	1.89	0.40	1.67	2.53
Hourly Compensation	3.15	3.53	2.27	5.16	4.47	4.02
Unit Labour Cost	2.34	2.52	1.32	3.34	4.33	4.99

Panel B: Construction

Variables	2000-2024	2000-2008	2008-2019	2019-2021	2019-2024	2021-2024
Labour Productivity	-0.18	-0.02	0.37	0.75	-1.62	-3.17
Hours Worked	2.82	4.75	1.46	1.90	2.76	3.33
Real Value Added	2.63	4.73	1.83	2.62	1.07	0.05
Hourly Compensation	2.71	3.23	1.91	3.70	3.65	3.62
Unit Labour Cost	2.91	3.26	1.55	2.98	5.39	7.02

Panel C: Residential Construction

Variables	2000-2024	2000-2008	2008-2019	2019-2021	2019-2024	2021-2024
Labour Productivity	-0.36	-0.73	1.54	0.29	-3.85	-6.51
Hours Worked	3.50	6.30	1.32	7.12	3.92	1.84
Real Value Added	3.12	5.52	2.88	7.40	-0.08	-4.78
Hourly Compensation	2.82	3.53	1.90	4.50	3.71	3.18

Unit Labour Cost	3.19	4.31	0.36	4.19	7.85	10.36

Panel D: Non-Residential Construction

Variables	2000-2024	2000-2008	2008-2019	2019-2021	2019-2024	2021-2024
Labour Productivity	-0.72	-0.97	0.22	0.20	-2.38	-4.06
Hours Worked	1.46	1.85	0.61	-3.45	2.69	6.99
Real Value Added	0.72	0.86	0.84	-3.31	0.24	2.68
Hourly Compensation	2.62	3.07	1.70	4.47	3.91	3.54
Unit Labour Cost	3.37	4.08	1.48	4.29	6.45	7.92

Panel E: Engineering Construction

Variables	2000-2024	2000-2008	2008-2019	2019-2021	2019-2024	2021-2024
Labour Productivity	-0.14	-0.09	-0.96	2.57	1.61	0.97
Hours Worked	2.99	7.08	1.01	-3.19	0.97	3.84
Real Value Added	2.84	7.00	0.04	-0.77	2.57	4.86
Hourly Compensation	3.02	3.78	2.23	3.26	3.56	3.75
Unit Labour Cost	3.17	3.86	3.23	0.70	1.92	2.74

Panel F: Repair Construction

Variables	2000-2024	2000-2008	2008-2019	2019-2021	2019-2024	2021-2024
Labour Productivity	0.74	1.15	1.29	0.86	-1.10	-2.39
Hours Worked	2.72	2.08	3.02	3.08	3.09	3.09
Real Value Added	3.48	3.25	4.36	3.88	1.93	0.65
Hourly Compensation	2.41	2.32	1.76	4.07	3.99	3.93
Unit Labour Cost	1.66	1.17	0.46	3.23	5.16	6.48

Panel G: Other Construction Activities

Variables	2000-2024	2000-2008	2008-2019	2019-2021	2019-2024	2021-2024
Labour Productivity	4.88	10.47	1.71	8.13	3.27	0.15
Hours Worked	1.45	2.53	2.88	-8.56	-3.27	0.42
Real Value Added	6.41	13.27	4.64	-1.13	-0.11	0.58
Hourly Compensation	3.50	4.95	2.63	4.57	3.11	2.14
Unit Labour Cost	-1.33	-4.99	0.90	-3.40	-0.20	1.99

Table A2: Growth in Construction Labour Productivity for EU Member States from 2000 to 2024 (Compound Average Annual Growth Rates)

Country	2000-2024	2000-2008	2008-2019	2019-2024
European Union - 27 countries	-0.53	-0.87	0.20	-1.59
Belgium	0.58	1.90	0.57	-1.47
Bulgaria	-0.19	-2.98	1.94	-0.28
Czechia	0.05	1.71	1.09	-4.74
Denmark	-0.43	0.36	0.99	-4.68
Germany	-0.99	-0.72	-0.05	-3.46
Estonia	2.46	1.34	5.26	-1.73
Ireland	-0.11	0.52	0.20	-1.80
Greece	-0.81	-0.02	-3.51	4.05
Spain	0.02	-0.89	1.53	-1.80
France	-1.16	-0.72	-0.79	-2.65
Croatia	1.96	3.98	-0.49	4.23
Italy	-0.60	-1.88	-1.03	2.47
Cyprus	-0.60	1.82	-0.54	-4.47
Latvia	2.28	4.49	2.02	-0.58
Lithuania	3.85	7.84	2.22	1.25
Luxembourg	-1.41	-0.19	1.20	-8.72
Hungary	0.03	-1.22	2.48	-3.22

Malta	0.09	-3.22	4.29	-3.52
Netherlands	0.49	1.50	0.54	-1.22
Austria	-1.86	0.25	-2.15	-4.51
Poland	0.63	-4.40	4.81	-0.12
Portugal	-0.14	0.17	0.16	-1.28
Romania	1.79	10.57	-3.19	-0.40
Slovenia	0.60	1.24	-0.43	1.89
Slovakia	1.11	3.24	-0.89	2.20
Finland	-0.46	-0.50	-0.02	-1.35
Sweden	0.05	-0.06	-0.23	0.83
Iceland	0.20	-2.56	1.92	0.93
Norway	-0.59	-0.78	-0.19	-1.17
Switzerland	0.10	-0.18	0.49	-0.31

Source: Eurostat. Labour productivity and unit labour costs at industry level https://doi.org/10.2908/NAMA_10_LP_A21.

Table A3: Growth in Construction Labour Productivity for OECD Member States from 2000 to 2023 (Compound Average Annual Growth Rates)

Country	2000-2023	2000-2008	2008-2019	2019-2023
OECD (Unweighted Average)	0.32	0.44	0.60	-0.39
Austria	-1.79	0.25	-2.15	-4.19
Belgium	0.54	1.90	0.57	-1.64
Canada	-0.24	-0.02	0.45	-2.09
Costa Rica	1.77	3.82	-0.14	2.78
Czechia	0.09	1.71	1.09	-4.57
Denmark	0.78	0.36	0.99	0.97
Estonia	2.97	1.34	5.26	0.64
Finland	-0.58	-0.50	-0.02	-1.94
France	-1.18	-0.72	-0.79	-2.74
Germany	-0.87	-0.72	-0.05	-2.90
Greece	-0.52	-0.02	-3.51	5.55
Hungary	0.14	-1.19	2.26	-2.29

Iceland	0.08	-2.56	1.89	0.43
Ireland	-0.22	0.52	0.19	-2.27
Italy	-0.57	-1.88	-1.03	2.61
Latvia	2.37	4.49	2.02	-0.16
Lithuania	3.69	7.86	2.21	0.50
Luxembourg	-0.58	-0.19	1.18	-4.94
Netherlands	0.69	1.50	0.54	-0.27
Norway	-0.52	-0.78	-0.19	-0.84
Poland	0.89	-4.40	4.81	1.11
Portugal	0.05	0.16	0.33	-0.76
Slovak Republic	1.06	3.24	-0.89	1.96
Slovenia	0.69	1.23	-0.43	2.30
Spain	0.12	-0.89	1.53	-1.35
Sweden	-0.06	-0.06	-0.24	0.34
United Kingdom	-0.10	-2.68	0.27	3.30

Source: OECD Productivity by industry Database

Table A4: Residential Construction Productivity Growth Decomposition, Canadian Provinces, 2000-2008

Region	Within-Province (1)	Reallocation level (2)	Reallocation growth (3)	Summed Effect (4 = 1+ 2+3)
Canada	-0.63	-0.30	-0.13	-1.06
Newfoundland and Labrador	0.01	0.00	0.00	0.01
Prince Edward Island	0.01	0.01	0.00	0.01
Nova Scotia	-0.06	0.00	0.00	-0.06
New Brunswick	0.01	0.03	-0.01	0.03
Quebec	-0.09	-0.02	0.00	-0.10
Ontario	-0.08	-0.26	-0.05	-0.40
Manitoba	-0.03	0.00	0.00	-0.03
Saskatchewan	-0.09	0.08	-0.06	-0.07
Alberta	-0.23	0.03	-0.03	-0.23
British Columbia	-0.07	-0.17	0.01	-0.23

Source: CSLS calculation

Table A5: Residential Construction Productivity Growth Decomposition, Canadian Provinces, 2008-2019

Region	Within-Province (1)	Reallocation level (2)	Reallocation growth (3)	Summed Effect (4 = 1+ 2+3)
Canada	1.47	0.17	-0.17	1.47
Newfoundland and Labrador	0.01	0.00	0.00	0.01
Prince Edward Island	0.00	0.00	-0.01	-0.01
Nova Scotia	0.01	-0.01	-0.01	-0.01
New Brunswick	0.01	0.01	0.00	0.03
Quebec	0.38	0.03	0.00	0.41
Ontario	0.02	0.16	-0.10	0.07
Manitoba	0.02	-0.01	-0.01	0.01
Saskatchewan	0.01	-0.01	0.01	0.00
Alberta	0.37	0.00	-0.03	0.34
British Columbia	0.63	0.03	-0.03	0.63

Source: CSLS calculations

Table A6: Residential Construction Productivity Growth Decomposition, Canadian Provinces, 2019-2023

Region	Within-Province (1)	Reallocation level (2)	Reallocation growth (3)	Summed Effect (4 = 1+ 2+3)
Canada	-4.74	0.18	-0.16	-4.72
Newfoundland and Labrador	-0.04	0.00	0.00	-0.04
Prince Edward Island	0.01	0.01	-0.01	0.01
Nova Scotia	0.02	0.02	-0.01	0.04
New Brunswick	-0.03	-0.03	0.01	-0.05
Quebec	-0.94	0.05	0.00	-0.89
Ontario	-1.96	0.00	0.00	-1.96
Manitoba	-0.08	0.03	-0.01	-0.06
Saskatchewan	-0.01	0.00	-0.01	-0.02
Alberta	-1.05	0.10	-0.13	-1.08
British Columbia	-0.66	0.00	0.00	-0.66

Source: CSLS calculations

Table A7: Construction and Total Economy Capital Stock, 2000-2023

Panel A: Capital Stock Components (millions of 2017 chained dollars) and Capital-Labour Ratio (chained 2017 dollars)

Construction	2000	2008	2019	2023
Total Non-Residential Capital Stock	21,041	29,526	35,846	39,917
Non-Residential Buildings	7,066	8,332	10,386	11,548
Engineering Construction	33	19	9	7
Machinery and Equipment	13,605	20,752	24,691	27,416
Intellectual Property Products	361	365	753	961
Total Number of Jobs	858,425	1,247,775	1,509,405	1,732,295
Capital-Labour Ratio	24,511	23,663	23,748	23,043
All Industries				
Total Non-Residential Capital Stock	1,582,538	2,014,445	2,534,236	2,604,900
Non-Residential Buildings	493,946	542,011	627,605	642,968
Engineering Construction	642,602	846,940	1,262,608	1,302,835
Machinery and Equipment	299,328	400,313	400,981	397,969
Intellectual Property Products	149,653	227,117	243,044	262,019
Total Number of Jobs	15,065,465	17,249,955	19,678,055	20,772,775
Capital-Labour Ratio	105,044	116,780	128,785	125,400

Panel B: Growth Rates

Construction	2000	2008	2019	2023
Total Non-Residential Capital Stock	2.70	4.33	1.78	2.17
Non-Residential Buildings	2.07	2.08	2.02	2.14
Engineering Construction	-6.26	-6.67	-6.57	-4.90
Machinery and Equipment	2.96	5.42	1.59	2.12
Intellectual Property Products	4.16	0.14	6.80	5.00
Total Number of Jobs	2.97	4.79	1.75	2.79
Capital-Labour Ratio	-0.26	-0.44	0.03	-0.60
All Industries				
Total Non-Residential Capital Stock	2.10	3.06	2.11	0.55
Non-Residential Buildings	1.10	1.17	1.34	0.48
Engineering Construction	2.99	3.51	3.70	0.63
Machinery and Equipment	1.19	3.70	0.02	-0.15
Intellectual Property Products	2.36	5.35	0.62	1.51
Total Number of Jobs	1.35	1.71	1.20	1.09
Capital-Labour Ratio	0.74	1.33	0.89	-0.53

Source: Statistics Canada Tables 36-10-0096-01 (Capital Stock) and 36-10-0480-10 (Employment)

Appendix A: All Other Wood Product Manufacturing NAICS Codes Definitions

32199 - All other wood product manufacturing
This industry comprises establishments, not classified to any other industry, primarily engaged in manufacturing wood products.

321991 - Manufactured (mobile) home manufacturing (US)
This Canadian industry comprises establishments primarily engaged in manufacturing mobile homes and non-residential mobile buildings. These units are portable structures built on a chassis equipped with wheels, but not designed for multiple or continuous movement, and are designed to be connected to sewage and water utilities.

Illustrative example(s):
non-residential building, manufacturing

Exclusion(s):

Manufacturing motor homes or recreational travel trailers (See 336215 Motor home, travel trailer and camper manufacturing)

321992 - Prefabricated wood building manufacturing (US)
This Canadian industry comprises establishments primarily engaged in manufacturing prefabricated or pre-cut wood buildings, sections and panels.

Illustrative example(s)

- buildings, prefabricated or pre-cut, wood frame, manufacturing
- cottages, prefabricated, wood frame, manufacturing
- houses, prefabricated (except mobile homes), wood frame, manufacturing
- log cabins, prefabricated wood, manufacturing
- modular buildings, prefabricated, wood frame, manufacturing
- panels for prefabricated wood buildings, manufacturing

Inclusion(s):

buildings that are made away from the construction site, either in sections, complete units, or in components for on-site erection

manufacturing log cabins and log houses
Exclusion(s):

- constructing wood frame buildings on site (See 23 Construction)
- manufacturing prefabricated or manufactured mobile homes or houses (See 321991 Manufactured (mobile) home manufacturing)

321999 - All other miscellaneous wood product manufacturing (US)
This Canadian industry comprises establishments, not classified to any other Canadian industry, primarily engaged in manufacturing wood products.

Illustrative example(s):

- bowls, wood, turned and shaped, manufacturing
- burnt wood articles, manufacturing
- clothes-drying frames, wood, manufacturing
- clothespins, wood, manufacturing
- cork products (except gaskets), manufacturing
- fencing, prefabricated sections, wood, manufacturing
- handles (e.g., broom, brush, mop, hand tool), wood, manufacturing
- kiln drying of lumber
- kitchenware (e.g., utensils, rolling pins), wood, manufacturing
- poles (e.g., clothesline, flag, tent), wood, manufacturing
- toothpicks, wood, manufacturing

Exclusion(s):
manufacturing cork gaskets (See 339990 All other miscellaneous manufacturing)

Appendix B: List of Residential Construction Practitioners Interviewed for CSLS Project for CMHC on Residential Construction Productivity

1) June 3, 2025, Kevin Lee, President, Canadian Home Builders Association, Ottawa, Ontario

2) June 9, 2025, Nick Gefucia, Senior Vice President, EllisDon Community Builders, Mississauga, Ontario

3) June 25, 2025, Jason Burggraff, President, Ottawa Home Builders Association, Ottawa, Ontario

4) July 7, 2005. Steven Parkes (and colleagues), President. Tamarack Houses, Ottawa, Ontario

5) July 14, 2005, Jayson Myers, Chief Executive Officer, Next Generation Manufacturing Canada (NGEN), Guelph. Ontario