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Conduct of Monetary Policy under Housing Market Imbalances

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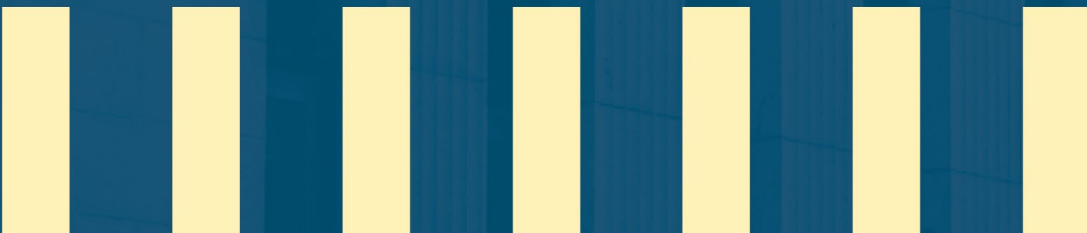
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Introduction

Over recent years, housing market imbalances have become a defining feature of the Canadian macroeconomic landscape. Following the post-pandemic surge in inflation, shelter costs emerged as a dominant and persistently high contributor to headline CPI. This persistence reflected elevated house prices, rapidly rising mortgage interest costs, and strong rent inflation, alongside long-standing supply constraints and high household leverage. These developments have intensified the debate over how monetary policy should respond to housing-driven inflation pressures that are only imperfectly aligned with broader demand conditions. A central question for policy frameworks is whether central banks should “look through” shelter inflation or instead incorporate housing costs directly into systematic policy rules.

The issue is further complicated by the role of housing as a key transmission channel for monetary policy. House prices respond strongly to interest rates and influence consumption, residential investment, and borrowing through wealth and collateral effects. Evidence that house price expectations are extrapolative suggests that housing cycles may be amplified, raising the risk that policy actions—or inactions—reinforce rather than stabilize housing dynamics. This note analyzes these issues using a general equilibrium model with extrapolative house price expectations.

Key takeaways:

- Monetary policy is **slightly more effective** on aggregate demand when **shelter inflation is included** in the interest rate decision rule.
- Monetary policy should **not look through shelter inflation when it is driven by housing demand shocks**. Looking through creates a more volatile economy especially when faced with extrapolative expectations.
 - There may also be financial stability considerations. Excluding shelter inflation from monetary policy rule during housing booms may worsen imbalances and should be approached with caution.
- There is a trade-off between output and inflation stabilization when the economy is hit by housing supply shocks. This trade-off suggests that **looking through housing supply shocks may be welfare-enhancing**.

Model Description

Nexus-EE is a two-agent New Keynesian DSGE model with patient lenders and impatient borrowers

- Patient household chooses consumption, housing, labor supply, investment in the business and housing sectors, saving in risk-free bonds, and loans to impatient households subject to their budget constraint.
- Impatient household chooses consumption, housing, labor supply, and borrowing subject to their budget constraint and a borrowing constraint. The borrowing constraint determines the size of the mortgage an agent can take out, based on the value of their house.

Supply of housing is endogenous with dedicated housing producing sector. Housing producers combine labor with capital and land to produce new houses. There is an adjustment cost on housing capital to reflect sticky construction (Equations 1.18 to 1.23).

There is a fraction of patient and impatient households who follow an econometric autoregressive rule (AR1) to form their expectations about future house prices based on previous realizations of house prices (Equation 1.42). These extrapolative agents also update the intensity of their extrapolation over time (Equation 1.43). The gain parameter therein governs how sensitive their expectations are to recent forecast errors — a higher gain means agents put more weight on recent trends, making their expectations more reactive to short-term fluctuations.¹

The deviation from rational house price expectations is novel compared to the standard New Keynesian DSGE model with housing. Expectations affect price formation via aggregate demand. During housing booms, households with extrapolative expectations develop higher expectations for future house prices, which leads them to consume more housing and take on more debt.

Introducing Shelter Inflation into Nexus-EE

Mortgage interest costs are defined using the mortgage rate and household debt from borrowers in the model. We assume a gradual pass-through from policy rates to mortgage rates, reflecting frictions in bank pricing and 'rate-hold' commitments, which prevent the rates on new originations from adjusting instantaneously to policy changes. To maintain model parsimony, all mortgages are assumed to be variable-rate. To

¹ See [Duprey, Terajima and Yang \(2024\)](#) for a detailed discussion on the introduction of extrapolative expectations into Nexus-EE.

reconcile this assumption with the prevalence of fixed-rate mortgages in reality, we introduce a gradual adjustment for the stock of debt used in MIC calculations; this ensures that interest costs do not overreact to policy rate changes:

- $MIC = \text{effective mortgage rate} * \text{effective debt stock}$

Rent follows its lag and its long-run equilibrium, rent_star , which reflects a no-arbitrage condition between rental income and returns on alternative assets. While the model does not feature explicit frictions, the persistence in rent dynamics — captured through lagged autoregressive terms — can be interpreted as a reduced-form representation of market rigidities. In equilibrium, rent_star ensures that investors are indifferent between renting out properties and selling them to invest in financial markets:

- $\text{Rent_star} = \text{policy rate} * \text{the value of house}$

Shelter inflation is introduced as the weighted average of house price, MIC, and rental inflation where the weights are calibrated according to those in CPI basket:

- $\pi_t^{\text{shelter}} = \alpha_1 \pi_t^{\text{ph}} + \alpha_2 \pi_t^{\text{MIC}} + (1 - \alpha_1 - \alpha_2) \pi_t^{\text{rent}}$

Two types of Taylor rules are analyzed: with headline inflation, π_t^{headline} , including shelter, and inflation excluding shelter components, π_t^C .

- $r_t = \rho r_{t-1} + (1 - \rho)(r_{ss} + \phi_\pi \pi_t + \phi_y \hat{y}_t)$

$$\text{where } \pi_t = \begin{cases} \pi_t^C \\ \pi_t^{\text{headline}} = \alpha \pi_t^{\text{shelter}} + (1 - \alpha) \pi_t^C \end{cases}$$

Results

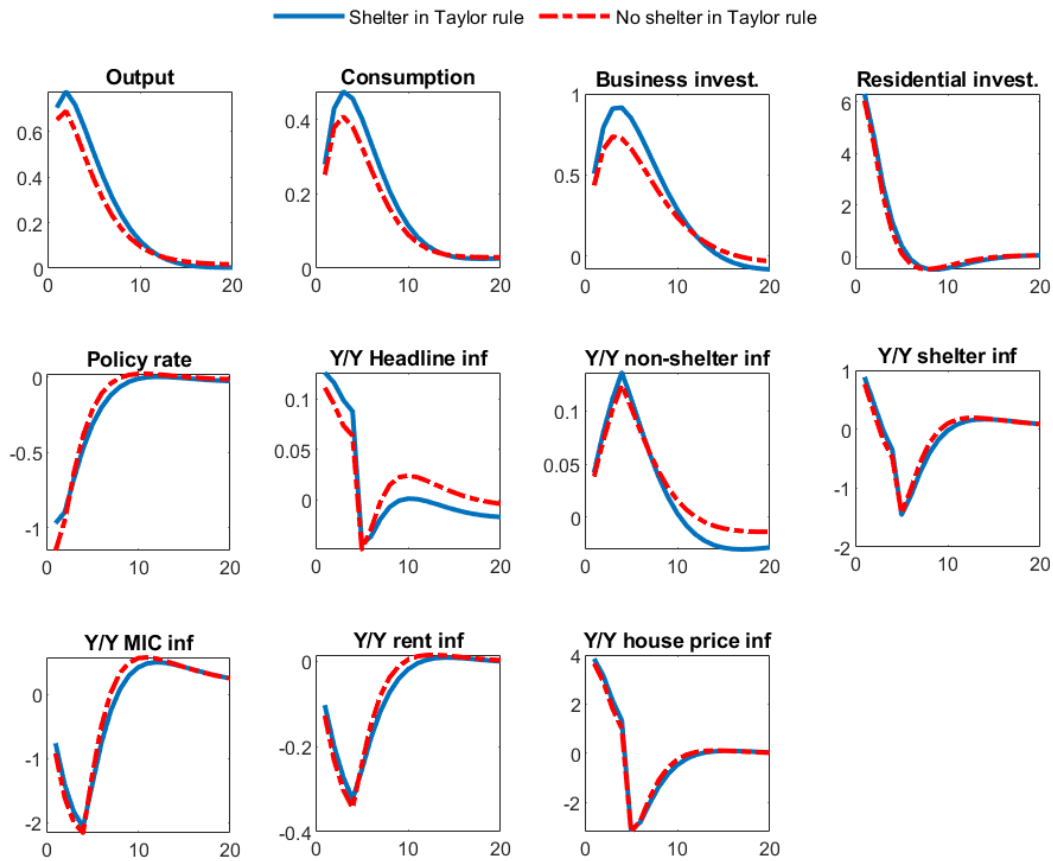
We first start with how monetary policy transmits to shelter components as well as standard macro variables, and then discuss the conduct of monetary policy as a response to housing demand shock, housing supply shock and a rental price shock.

Monetary policy shock

We start by considering a shock to the Taylor rule that reduces the annualized policy rate by 100 basis points. As expected, the shock is expansionary, raising aggregate demand components—namely consumption, business investment, and residential investment. The resulting increase in output generates inflationary pressures in non-shelter components of CPI. The magnitudes of these responses are broadly in line with estimates in empirical literature.²

² See for instance [Champagne and Sekkel \(2018\)](#).

Chart 1: Impulse responses to a monetary policy shock



Note: The x-axis shows quarters. Responses are expressed as percent deviations for quantities and percentage point deviations for inflation and policy rates (annualized).

A 100 bps (annualized) interest rate cut in the model generates markedly different dynamics for shelter and non-shelter inflation, regardless of whether shelter inflation is included in the Taylor rule. Non-shelter inflation rises in line with standard New Keynesian predictions, while shelter inflation declines over the first year and only turns positive after about two years. The brief initial increase in shelter inflation is mechanical, reflecting a sharp surge in house prices that immediately begin converging back to their steady state.

The negative shelter inflation over the first two years is driven mainly by MIC inflation. MIC inflation falls mechanically in response to lower interest rates. Rental inflation also declines, as rents are sensitive to policy rates and, in this case, the direct effect of lower rates dominates the offsetting impact from higher house prices. However, the response

of rental inflation is modest and does not materially drive shelter inflation following a monetary policy shock.³

Monetary policy is slightly more stimulative for aggregate demand when shelter inflation is included in the policy rule. Output rises more in this case because reacting to falling shelter prices leads the policy rate to follow a somewhat lower path, and lower expected future rates provide additional support to consumption and investment. However, this effect largely reflects endogenous feedback from mortgage interest cost (MIC) inflation: reacting to MIC can generate a “policy amplification loop,” in which monetary easing reinforces housing dynamics rather than stabilizing underlying inflation pressures—highlighting the case for looking through MIC inflation.

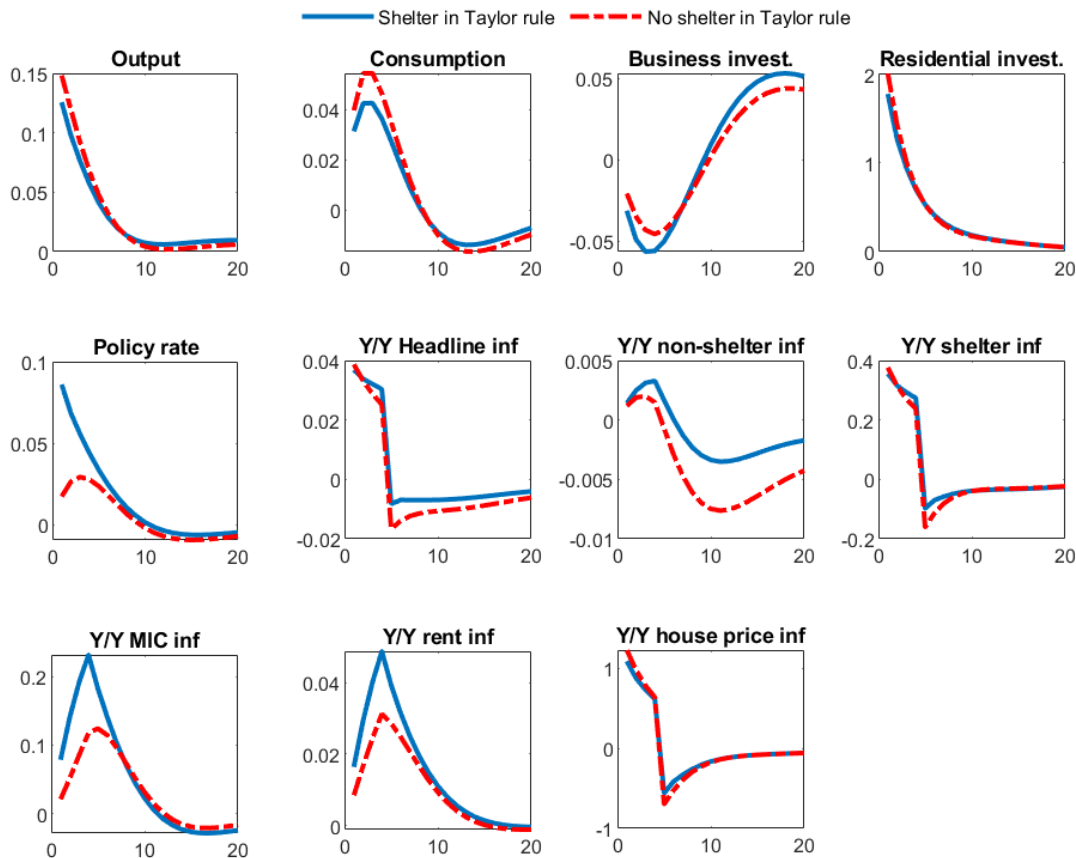
An important question is how much of the response of housing activity to monetary policy is driven by demand versus supply. While lower interest rates stimulate housing demand, they also reduce developers’ financing costs and can therefore affect supply conditions. To quantify the relative importance of these channels, we decompose the response of housing activity into demand and supply components using a counterfactual exercise described in the Appendix. We find that approximately 80 percent of the expansion reflects stronger housing demand, with the remaining 20 percent attributable to the supply-side cost channel.

Housing demand shock

We introduce a positive housing demand shock that raises house prices by 1 percent. The shock is expansionary for aggregate output, driven primarily by a strong increase in residential investment and, to a lesser extent, by higher consumption reflecting the rise in housing wealth (**Chart 2**). Business investment declines slightly on impact, mainly due to higher real interest rates. On the price side, the shock generates a temporary increase in inflation—particularly shelter-related inflation—prompting a monetary policy tightening that gradually offsets the initial expansion.

³ The opposite response of rental inflation is well documented for the U.S. (see [Abramson, Han and Llamas; 2025](#) and [Dias and Duarte 2019](#)), reflecting both the cost channel of monetary policy and demand rotation between homeownership and renting. In Canada, by contrast, the effect on rental inflation is relatively mild and statistically insignificant overall ([Rao and Wang; 2026](#)), though it becomes more pronounced during episodes of strong population growth ([Enkbold and Kabaca; 2026](#)).

Chart 2: Impulse responses to a housing demand shock



Note: The x-axis shows quarters. Responses are expressed as percent deviations for quantities and percentage point deviations for inflation and policy rates (annualized).

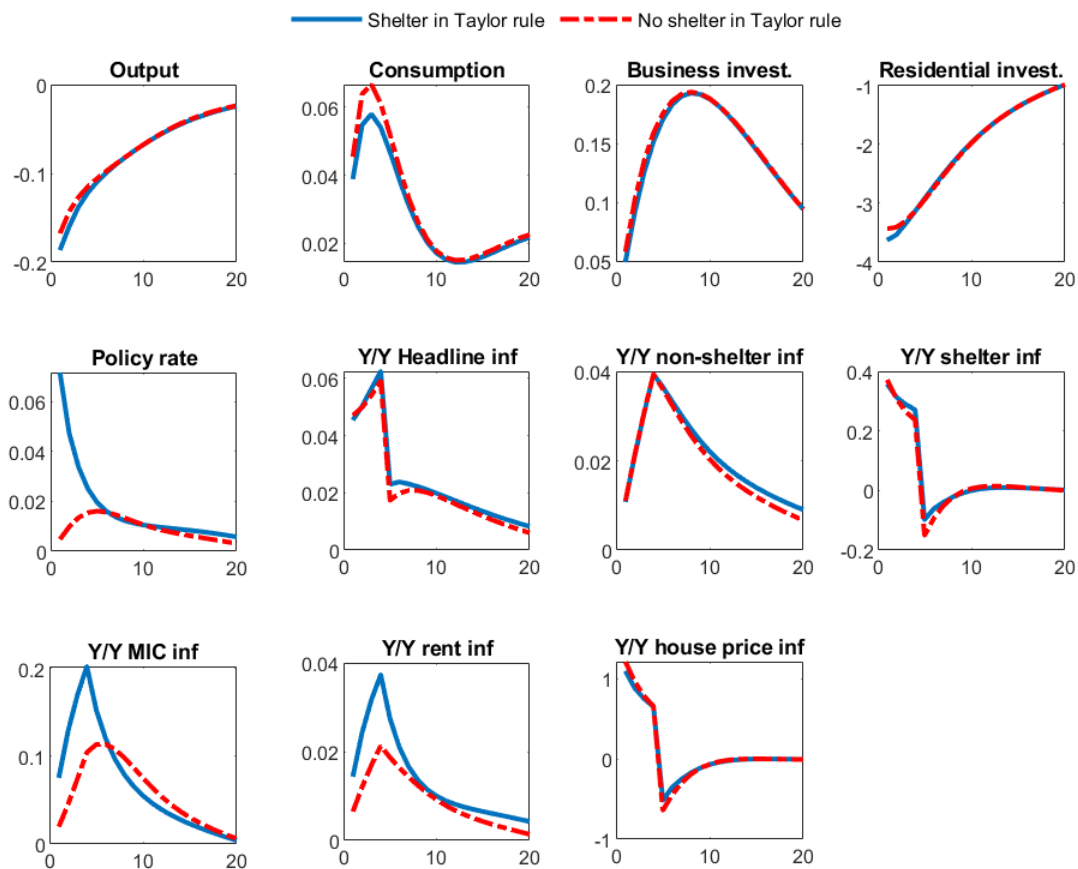
To assess the role of monetary policy in shaping these dynamics, we next compare outcomes under alternative Taylor-rule specifications. When monetary policy does not respond to shelter prices during a housing boom driven by housing preference shocks, the economy becomes noticeably more volatile (blue line). Both output and inflation exhibit larger fluctuations, suggesting that monetary policy should not “look through” shelter price movements when they originate from housing demand shocks.

In the short run, the muted policy response translates into a smaller increase in interest rates, which allows output and shelter inflation to rise more strongly in the case where shelter inflation is excluded from the Taylor rule. Over the medium term, however, the initially stronger increase in house prices is followed by a sharper subsequent decline. This reversal leads to a larger drop in shelter inflation, raises real interest rates, and triggers a second—albeit modest and delayed—downturn in consumption and output.

Housing supply shock

We introduce a negative housing supply shock that raises house prices by 1 percent. The shock is contractionary for output, reflecting a decline in residential investment (**Chart 3**). Because output falls, the policy rate responds less aggressively than in the case of demand-driven inflation shocks considered in the previous section, even though headline inflation increases by more. As a result, real interest rates decline, providing offsetting support to consumption and business investment

Chart 3: Impulse responses to a housing supply shock



Note: The x-axis shows quarters. Responses are expressed as percent deviations for quantities and percentage point deviations for inflation and policy rates (annualized).

This negative housing supply shock raises house prices more when monetary policy does not respond to shelter inflation. However, when policy reacts to shelter inflation, the resulting interest rate hikes lead to higher rents and MIC inflation. As a result, the overall impact on shelter inflation is minimal. This is especially evident when comparing

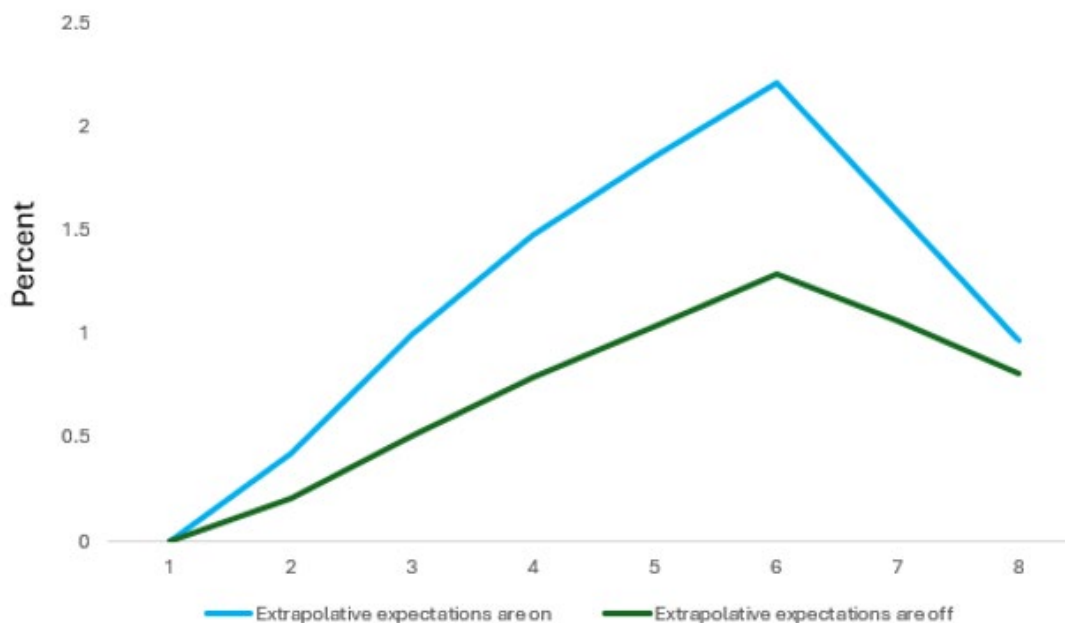
the area under the shelter inflation curves across specifications — indicating that responding to shelter does little to reduce cumulative shelter inflation.

As a result, monetary policy can only marginally mitigate the rise in headline inflation by responding to the shock. The cumulative effect — as measured by the area under the headline inflation curve — is nearly identical across different Taylor rule specifications. In contrast, reacting to the housing supply shock leads to a significantly larger decline in output. This trade-off suggests that looking through housing supply shocks may be welfare-enhancing.

Financial Stability Implications

We model a housing boom where house prices rise by 20% over eight quarters due to a housing demand shock. This persistent shock aims to capture the effects of extrapolative expectations during sustained house price inflation, unlike the one-time shock examined earlier.

Chart 4: Counterfactual difference in house price gap



Note: Each curve represents the difference between the model with a Taylor rule that excludes shelter inflation, and the model with a Taylor rule that includes shelter inflation.

We begin by comparing the difference between the Taylor rule that excludes shelter inflation and the Taylor rule that includes shelter inflation when extrapolative expectations are off, as shown by the green line. This represents our rational

expectations baseline. As anticipated, the house price gap increases more significantly when monetary policy does not account for shelter inflation in the Taylor rule even under rational expectations.

When extrapolative expectations are active, excluding shelter inflation from the Taylor rule has even more serious consequences. During housing booms, shelter prices respond more strongly (blue line) and omitting them from the policy rule leads to a sharper rise in house prices. This amplifies financial stability risks, especially when price dynamics are partly driven by past increases in house prices. These results suggest that excluding shelter inflation from monetary policy considerations during housing booms may worsen imbalances and should be approached with caution.

Conclusions

We analyze the conduct of monetary policy under housing market imbalances through the lenses of Nexus-EE model. We find that monetary policy should not look through shelter prices when driven by housing demand shocks and especially when extrapolative expectations are at play.

Looking through shelter prices may be welfare-enhancing when they are driven by temporary supply shocks (e.g., higher construction costs). But under persistent shocks, the risk of de-anchoring inflation expectations rises. Thus, looking through should be approached with caution.

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Appendix

This appendix presents a set of analytical exercises used to disentangle the channels through which monetary policy affects housing activity in the model. In the main text, expansionary monetary policy is shown to have strong effects on residential investment and house prices, raising the question of how much of these responses reflect shifts in housing demand and expectations versus changes in supply conditions operating through developers' financing costs. The appendix provides an extension to the model in the main text for addressing this question.

We proceed in two complementary steps that differ in their equilibrium assumptions. First, we conduct a **partial-equilibrium decomposition** in which house prices are held fixed at their steady-state level. By abstracting from price movements and buyer behaviour, this exercise isolates the direct effect of lower financing costs on developers' construction decisions and allows us to quantify the contribution of the supply-side cost channel to the response of residential investment following a monetary policy shock.

Second, we assess the importance of the supply channel in **general equilibrium**, where house prices, expectations, and demand respond endogenously to monetary policy. This is done by comparing the baseline model, which includes the working-capital channel, with an alternative specification in which this channel is shut down entirely. Together, these exercises show that while financing costs do affect housing supply, supply-side cost effects remain quantitatively secondary to demand-driven mechanisms operating through house prices and expectations. This finding helps discipline the interpretation of the housing responses documented in the main text and supports the conclusion that monetary policy should be cautious about "looking through" shelter inflation when housing dynamics are demand-driven.

For the extension of the model, we incorporate a financing cost channel into the model by assuming that housing producers face working capital requirements.⁴ Construction firms must finance a portion of their factor inputs prior to receiving sales revenue, including wage bills, capital equipment, permits, and land-related costs. This assumption modifies factor demand equations in the construction sector. For example, labor demand equation is modified to:

⁴ [Rabanal \(2007\)](#) estimates an NK model allowing the cost channel and finds no evidence supporting the presence of that in US and euro area. [Choi, et al. \(2022\)](#) look at a broad set of countries and industries and found that relative prices in industries that are highly reliant on working capital decreased (or stayed flat) following a monetary contraction—exactly the opposite of what a strong cost channel would predict. Using micro-data, [Rababah \(2024\)](#) finds a weak cost channel arguing that firms use internal cash reserves to finance production rather than loans, which insulates their marginal costs from interest rate fluctuations.

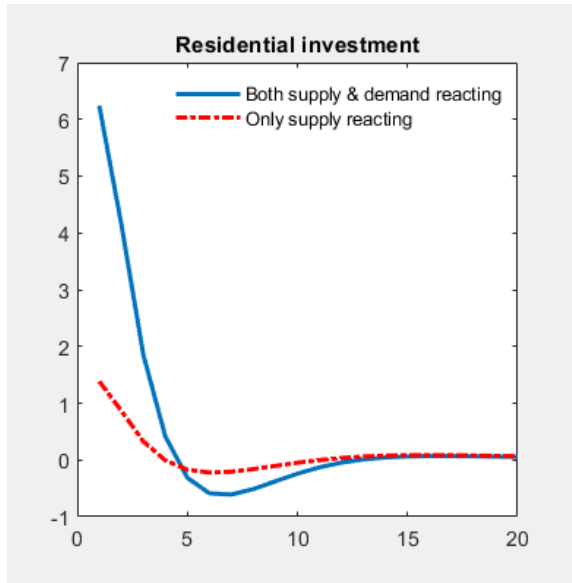
$$\underbrace{\alpha}_{\text{Labor Share in Housing Production}} \cdot \underbrace{(p_t^H \cdot IH_t)}_{\text{Total Housing Revenue}} = \underbrace{[1 + \phi(R_t - \bar{R})]}_{\text{Working Capital Interest Wedge}} \cdot \underbrace{(w_{h,t} \cdot n_{h,t})}_{\text{Wage Bill Payments}}$$

where α denotes the labor share in the construction production function and ϕ denotes the working capital requirement parameter. We calibrate ϕ using CMHC data on construction time from permit issuance to completion, combined with additional Staff calculations on permit delays, to estimate total construction duration. CMHC provides construction timelines by dwelling type, ranging from single-family homes to apartments. We aggregate across dwelling types using value-weighted measures that account for both the number and value of units. The implied average construction time is approximately seven quarters from start to completion.

If all construction costs were paid upfront, this would imply $\phi = 7$ in the quarterly model. A more realistic assumption is that wages are paid continuously and approximately linearly over the construction period. Under this assumption, the average dollar of labor cost is financed for half of the total duration, implying $\phi = 7/2 = 3.5$. For wage bill we set $\phi = 3.5$, while, for other factors (capital and land), we set it to seven.

To isolate this mechanism from demand-driven price dynamics and to assess the quantitative importance of developers' financing costs for monetary policy transmission, we next consider a partial-equilibrium counterfactual where house prices are held constant. By assuming a perfectly elastic demand curve, we strip away the impact of buyer behavior and shifting expectations, allowing us to observe how the monetary policy shock affects the developer's supply decisions in isolation.

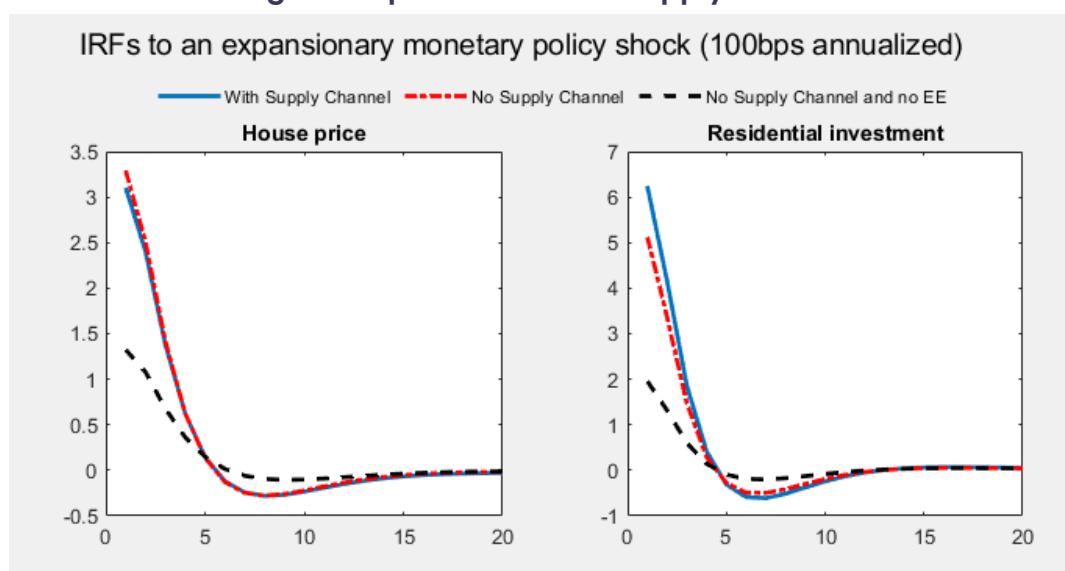
Chart 5: Decomposing the housing activity between supply and demand



Note: The x-axis shows quarters. The response is expressed as percent deviations.

Model simulations suggest that a 100-basis-point easing shock boosts housing supply by 1.4 % through reduced financing costs, while the total general-equilibrium response—incorporating both supply and demand channels—shows an increase in residential investment of 6.2 % (**chart 5**). This decomposition implies that approximately 20% of the increase in new construction following a rate cut is driven by the supply-side cost channel, while the remaining 80% is attributed to stronger housing demand. Thus, while demand remains the primary driver of residential investment, the working capital requirements of developers represent a meaningful transition mechanism for monetary policy in the housing sector.

Chart 6: Assessing the Importance of the Supply Channel



Note: The x-axis shows quarters. The response is expressed as percent deviations.

While this partial-equilibrium exercise isolates the supply channel mechanically, it does not capture how supply-side effects interact with endogenous house prices and expectations in general equilibrium. To isolate the cost channel from the demand channel, we compare the baseline model, which includes the calibrated working-capital channel, with an alternative specification that shuts it down by setting $\phi = 0$. **(chart 6)** With the working-capital channel, expansionary monetary policy boosts housing supply, as well as demand, which partly dampens house price increases. Without it, residential investment rises less and house prices rise more. However, these differences are quantitatively modest relative to the demand-side mechanisms emphasised in the main text: the supply channel explains less than 20% of the investment response and less than 10% of the price response. By contrast, shutting down one of the demand channels in the model—namely, extrapolative expectations—changes the responses much more substantially. Overall, this suggests that the supply channel is modest relative to the demand channels.