BANK OF CANADA
BANQUE DU CANADA

Staff analytical paper / Document analytique du personnel—2026-35

Last updated: August 20, 2026

How Do Interest Rates Spur the Housing Market: Exploring Nonlinear Effects

Benjamin Strauss
Canadian Economic Analysis Department
Bank of Canada
bstraus@bankofcanada.ca

Stéphane Surprenant
Canadian Economic Analysis Department
Bank of Canada
ssurprenant@bankofcanada.ca

Kerem Tuzcuoglu
Canadian Economic Analysis Department
Bank of Canada

DOI: https://doi.org/10.34989/sap-2026-35 | ISSN 3110-9195

Acknowledgements

We would like to thank all the participants in the Monetary Policy Framework Renewal housing workstream for helpful discussions. We would also like to thank Corinne Luu, Fares Bounajm, Charles Gaa, Thibaut Duprey, Erik Ens and Yaz Terajima for helpful comments and discussions.

Abstract

In this note we examine how monetary policy affects housing demand, supply and prices in Canada, and whether these effects vary with labour market conditions. Using state-dependent local projections identified with narrative monetary policy shocks, we find that lower interest rates have larger effects when unemployment is low. Easing boosts resales quickly, raises housing starts with a delay, and increases house prices persistently. Because demand tends to respond more strongly than supply, monetary policy appears unable to alleviate housing affordability pressures and may instead intensify them when labour market conditions are strong.

Topics: monetary policy, housing, nonlinear local projections
JEL codes: E52, R31, C32

Résumé

Cette note examine comment la politique monétaire agit sur la demande, l'offre et les prix des logements au Canada, et si ces effets varient selon les conditions du marché du travail. À l'aide de projections locales dépendantes de l'état de l'économie, identifiées à partir de chocs narratifs de politique monétaire, nous constatons qu'une baisse des taux d'intérêt a des effets plus marqués lorsque le chômage est faible. L'assouplissement monétaire stimule rapidement les reventes, accroît les mises en chantier avec un décalage et augmente durablement les prix des logements. Comme la demande réagit davantage que l'offre, la politique monétaire semble être incapable d'atténuer les pressions sur l'abordabilité du logement.

Sujets : politique monétaire, logement, projections locales non linéaires
Codes JEL : E52, R31, C32

Introduction

Housing has been at the forefront of Canadians' minds in recent years as supply-demand imbalances have contributed to affordability challenges in many parts of the country. Moreover, understanding the impacts of monetary policy on supply and demand within the housing market is important for the Bank to sustainably achieve its inflation target. However, interest rate changes affect both supply and demand; for example, lower rates reduce both mortgage rates (and therefore the cost of owning a home) and financing costs for builders.

Accounting for potential nonlinearities is important for assessing how monetary policy affects supply-demand mismatches and affordability. Recent research suggests that the transmission of interest rate changes to housing can depend on several features of the economic environment. Horváth (2026) shows that monetary policy effects can vary with housing-market stress, while Dieckelmann et al. (2025) emphasize that the sensitivity of house prices to interest rates depends on the level of interest rates themselves. Biljanovska et al. (2025) instead focus on housing overvaluation, showing that monetary policy has stronger effects when house prices are high relative to rents. These papers suggest that the housing effects of monetary policy can vary with housing-market imbalances, valuation pressures and the level of interest rates.

In this note, we investigate labour market conditions as another potential source of nonlinearity. The effects of easing monetary policy may be weaker when unemployment is high, reflecting factors such as lower confidence, lower income, heightened precautionary saving or a reduced ability to meet mortgage qualification requirements.

Using a local projection approach with monetary policy shocks, we find that interest rates affect housing demand more than housing supply and that important nonlinearities shape the transmission of monetary policy to the housing market. We focus on the relationship with the unemployment rate, which suggests that higher unemployment rates reduce the impacts of monetary policy cuts on the housing market. Insofar as monetary policy influences housing demand more strongly than housing supply, it has a limited ability to address housing affordability. This conclusion holds even more strongly when unemployment is low.

Methodology

Local Projections

Local projections (Dufour and Renault, 1998; Jordà, 2005) are commonly used to quantify the impact of monetary policy shocks. The method also offers a convenient way to allow the shocks to have nonlinear effects. Our state-dependent model is given by

$$y_{t+h} - y_{t-1} = \alpha_h + \beta_{1,h}\epsilon_t^{MP} + \beta_{2,h}1\{\tilde{u}_{t-1} \geq 0.78\}\epsilon_t^{MP} + \sum_{j=1}^{4} \boldsymbol{\gamma}_{\boldsymbol{h,j}}' \boldsymbol{x}_{\boldsymbol{t-j}} + \sum_{j=1}^{48} \lambda_{j,h}\, \epsilon_{t-j}^{MP} + \nu_{h,t+h}$$

where $\tilde{u}_t = u_t - u_t^*$ is the unemployment rate gap, ϵ_t^{MP} is the narrative monetary policy shock series from Champagne and Sekkel (2018) and $\boldsymbol{x_t}$ contains control variables.[1,2] This measure of monetary policy shock isolates the unpredictable component of the intended changes in the target policy rate for each meeting of the Governing Council of the Bank of Canada using information such as real-time data vintages and Bank forecasts.[3]

Following Fortin-Gagnon, Leroux, Stevanovic and Surprenant (2022), the control variables include the growth rate of real GDP, the CPI inflation rate, the monthly growth rate of the target variable, as well as four latent factors estimated by principal components on the CAN-MD database introduced in that paper.[4,5] These variables are intended to capture broad macroeconomic and financial conditions in Canada, so that any systematic component of monetary policy that may remain in the narrative proxy is purged. We also included many lags of the narrative proxy, much like Champagne and Sekkel (2018) originally did, to mitigate issues related to its serial correlation. Our controls are extended to include regional or provincial CPI inflation and unemployment rates when we target regional housing market variables to capture possible regional variations in business cycle conditions.

---

1 This specification recovers the same impulse responses as when working directly in levels, but it is more efficient in a wide variety of contexts (Piger and Stockwell, 2025).

2 While high-frequency proxies are now available for Canada (Sekkel, Stern and Zhang, 2025), they are only available starting in the late 1990s which does not leave sufficiently many periods with high unemployment.

3 Champagne and Sekkel (2018) essentially follow the methodology of Romer and Romer (2004) with some minor differences. The updated shock series is available for our whole sample starting in January 1981 and ending in December 2019.

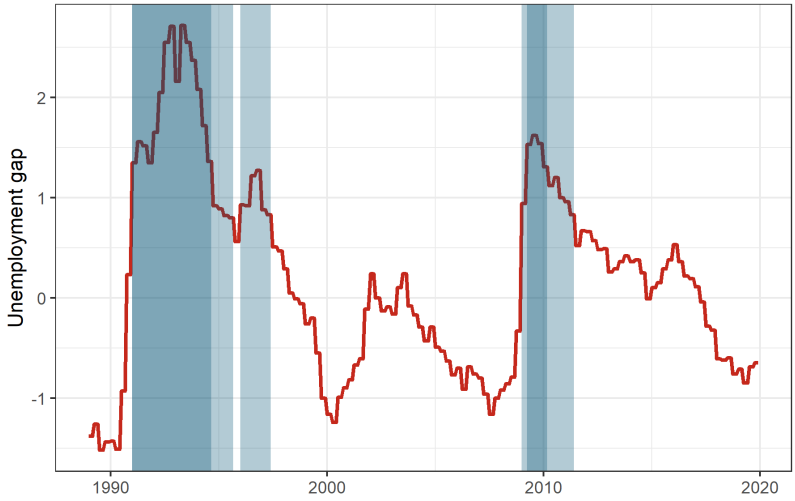
4 This has become a common strategy to mitigate problems such as price puzzles in monetary SVARs since Bernanke, Boivin and Eliasz (2005).

5 As in Fortin-Gagnon, Leroux, Stevanovic and Surprenant (2022), we extracted the factors from the Canadian panel (i.e., using only the national-level data) after transforming the data to make it stationary. Missing values are handled using the EM algorithm of Stock and Watson (2002a, b).

In this paper, we focus our attention on regimes based on labour market conditions and define a high unemployment rate regime as a period in which the unemployment rate gap, $\tilde{u}_t = u_t - u_t^*$, exceeds a threshold of 0.78%. Current estimates imply that this threshold corresponds to a roughly 7% unemployment rate. We calibrated this threshold to capture three episodes of high unemployment, as can be seen in **Chart 1**. The unemployment rate gap is available beginning in January 1989. However, in Appendix B, we show that our results are robust to using a smooth transition model instead of a threshold model. Smooth transition treats belonging to a regime as a matter of degree which alleviates concerns that an arbitrary choice of threshold is driving our results by marginally excluding some periods from one regime or another.

To better understand how monetary policy shocks can affect supply and demand in the housing market in different ways, we apply our local projections framework to three different housing market-related variables: resales (proxy for demand), housing starts (proxy for supply) and average prices.[6] Each of these variables is available at a monthly frequency beginning no later than 1988. For additional information on the data series we use, please see Appendix A.

Chart 1: High unemployment regimes



Note: The shaded areas represent the discrete regimes under the 0.78% and 1.3% thresholds.

Our nonlinear projection model is intended to approximate an otherwise unknown form of nonlinearities involving labour market conditions. Goncalves, Herrera, Kilian and Pesavento (2024) showed that this approach consistently only identifies the average effect of a 'small' shock conditional on the state of the economy. Their simulation evidence

[6] Anenberg & Ringo (2022) find that demand explains virtually all variation in resales.

suggests that even a shock of one standard deviation may yield noticeable bias in the magnitude of impulse responses. In light of this concern, throughout this paper we report results for a shock size of 25 basis points which corresponds to about 0.93 standard deviations of the narrative policy shock over January 1989 to December 2019. We would also caution against extrapolating the effects we estimated to larger shocks or reading too much into the precise magnitudes of the point estimates.

The results in this note are broadly consistent across various robustness checks including a smoothed unemployment threshold, alternative supply variables, and across different regions of Canada. More details around these alternative specifications can be found in Appendix B.

Results

For all variables, the impact of a monetary policy shock is larger when the unemployment rate is low. Although this result is purely empirical, there are several plausible mechanisms as to why this might be the case.

1. Precautionary savings: The purchase of a home requires a large outlay of cash and often is associated with consumers taking on large amounts of debt. When the unemployment rate is high, consumers may look through lower-than-expected interest rates because they prefer to maintain elevated savings buffers in case of job loss or because broader economic fears are more pronounced in such periods.
2. Tighter credit conditions: Financial institutions are likely to tighten lending when the labour market is poor. This will inhibit both consumers and businesses from accessing credit and thus taking advantage of the lower-than-expected interest rates.
3. Inability to qualify for a mortgage: Mortgages often require an ongoing income stream and when a larger share of the labour force is unemployed this restricts the number of individuals who will qualify for a mortgage.

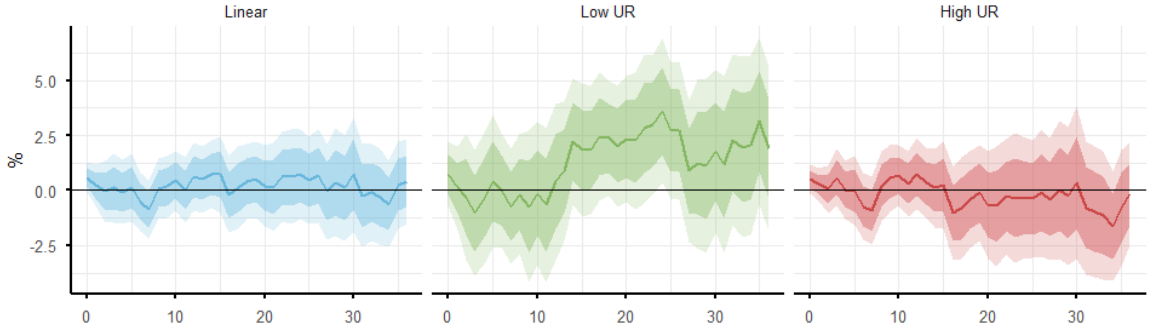
The impact on the resales market is seen soon after the cut

In general, when the Bank of Canada lowers its policy rate, the first movement in the housing market is an increase in demand. This is intuitive because the supply of housing is inelastic in the short run (adding supply requires planning, permitting, and building before it is added to the housing stock); but demand can respond quickly. **Chart 2** shows how in the immediate aftermath of a negative monetary policy shock there is a surge in the number of resales. However, this effect is temporary, and the larger effects appear 18-24 months after the shock. This medium-term boost is entirely driven by the effect

when the unemployment rate is low. When the unemployment rate is high there is effectively no change in demand coming from a monetary policy shock.

Chart 2: Resales respond most quickly to a negative monetary policy shock

Change in the level of resales following a 25 bp negative monetary policy shock



Starts respond significantly but with a delay

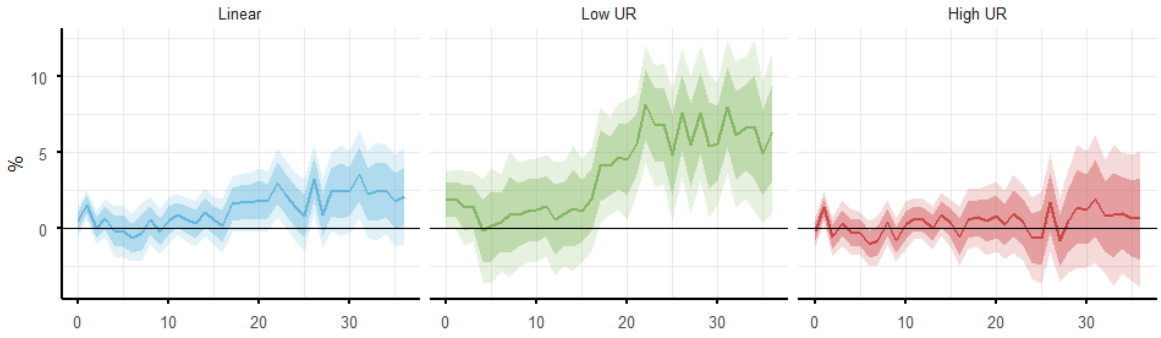
A negative monetary policy shock provides a boost to housing starts beginning around two years after the shock occurs (**Chart 3**). The fact that a negative shock boosts supply is intuitive. Cheaper financing can increase the demand for housing, putting upward pressure on prices and boosting pre-sales while also lowering financing costs for builders. Both can contribute to an increase in starts. The delay of two years is also reasonable as it takes time to plan and get permits for new builds, and this timeline can be especially lengthy for multiple unit buildings.

The response of housing starts is stronger when the unemployment rate is low. This is consistent with stronger demand conditions in periods of low unemployment, when household income prospects and buyer confidence are typically more favourable. Builders, investors, and potential homeowners may therefore expect higher sales prices in the future, leading to a stronger response of starts.

The limited reaction to monetary policy shocks when the unemployment rate is high suggests that, when an increase in supply is desired (when there is an existing imbalance with more demand than supply for housing), monetary policy is not the most appropriate tool to resolve this imbalance. Even when the unemployment rate is low, the boost to supply is likely related to future expected increases in demand, which lessens its ability to reduce imbalances.

Chart 3: Starts respond signficantly when the unemployment rate is low

Change in the level of starts following a 25 bp negative monetary policy shock

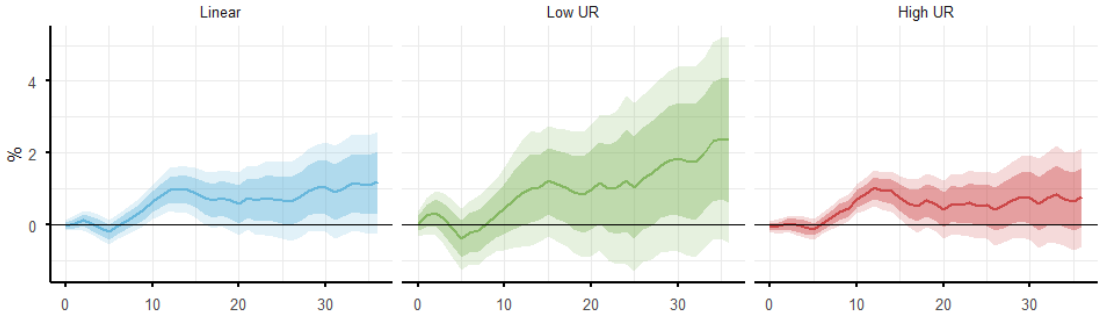


Prices respond positively in all states of the world

The impact of monetary policy on house prices is long-lasting under all states of the world. However, the increases in prices are much larger when unemployment is low, suggesting that, despite the larger supply response, the demand effect dominates after a negative shock (**Chart 4**). When unemployment is high, the price effect is much more muted. Overall, this suggests that lower interest rates are less likely to lead to a large increase in house prices when the unemployment rate is high.

Chart 4: Prices change minimally when unemployment is high

Change in the level of average prices following a 25 bp negative monetary policy shock



Conclusion

Understanding how monetary policy affects housing supply and demand is important for assessing its effects on house prices. A key finding is that negative monetary policy shocks induce price increases and these price increases are more significant when the unemployment rate is low. Specifically, while monetary policy cuts can generate an increase in housing supply, these effects are dominated by the increase in demand in all specifications of the model. This indicates that, in the context of a supply shortage, other strategies to increase supply may be more effective at reducing supply-demand

imbalances. Overall, monetary policy shocks impact the housing market, especially when the unemployment rate is low, but they do not improve supply imbalances.

Appendix A: Data

Table 1: Data Summary

	Time Horizon	Source	Type
Housing Starts (units)	January 1981 – December 2019	CMHC	Response
Housing Completions (units)	January 1981 – December 2019	CMHC	Response
Housing Resales (units)	January 1988 – December 2019	CREA	Response
Average House Prices ($)	January 1988 – December 2019	CREA	Response
Total CPI	January 1981 – December 2019	Statistics Canada	Control
Real GDP	January 1981 – December 2019	Statistics Canada	Control
Canadian Economy PCA	January 1981 – December 2019	Fortin-Gagnon, Leroux, Stevanovic and Surprenant (2022)	Control
Unemployment Rate Gap	January 1989 – December 2019	RAMM Variant	Regime
Monetary Policy Shocks	April 1981 – December 2019	Champagne & Sekkel (2018)	Shock

Table 2: Regional data construction

	Transformation
Unemployment level (persons) [UL]	Sum
Population (persons) [POP]	Sum
Labour force (persons) [LF]	Sum
Permits (units)	Sum
Housing starts (all) (units)	Sum
Housing starts (singles) (units)	Sum
Housing starts (multi) (units)	Sum
Completions (units)	Sum
Resales (units) [R]	Sum
Inventories (units)	Sum
Unemployment rate (%)	$100(LF/UL)$
Average housing price ($) [HP]	$HP = \sum_{i=1}^{K} HP_i R_i \Big/ \left(\sum_{i=1}^{K} R_i\right)$
Consumer price index (index) [P]	$P = \sum_{i=1}^{K} P_i POP_i \Big/ \left(\sum_{i=1}^{K} POP_i\right)$

Appendix B: Robustness

Smooth Transition

We follow Tenreyro and Thwaites (2016) and allow regimes to be fuzzy by using a smooth transition function version of our baseline model, i.e.

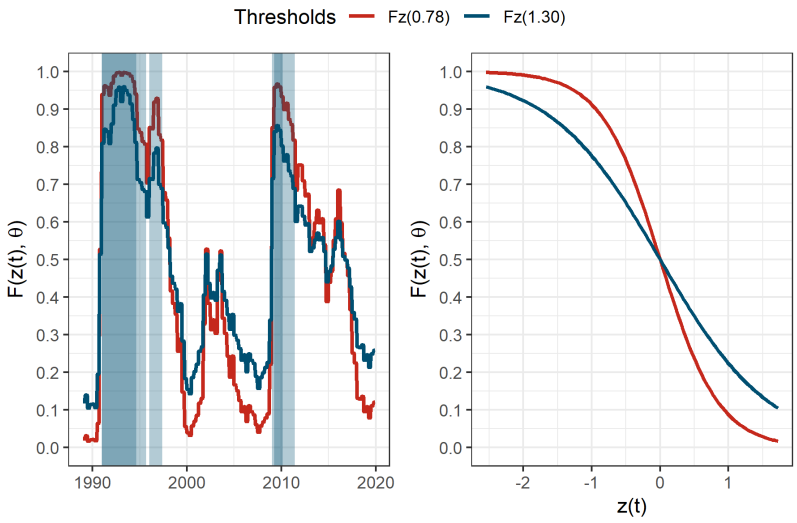
$$y_{t+h} - y_{t-1} = \alpha_h + \beta_{1,h}\big(1 - \mathrm{F}(\mathrm{z}_{t-1}, \theta)\big)\epsilon_t^{MP} + \beta_{2,h}\mathrm{F}(\mathrm{z}_{t-1}, \theta)\epsilon_t^{MP} + \sum_{j=1}^{4} \boldsymbol{\gamma}'_{\boldsymbol{h,j}} \boldsymbol{x}_{\boldsymbol{t-j}} + \sum_{j=1}^{48} \lambda_{j,h}\, \epsilon_{t-j}^{MP} + \nu_{h,t+h}$$

where $\mathrm{F}(\mathrm{z}, \theta) = exp(-z\theta)/\big(1 + exp(-z\theta)\big)$ is the logistic transition function and $\mathrm{z}_t = -(du_t - \hat{\mu}_{du})/\hat{\sigma}_{du}$ is a standardized version of the output gap which has been signed so that high unemployment rates (i.e., $u_t \gg u_t^*$) imply $\mathrm{F}(\mathrm{z}, \theta) \simeq 1$ for $\theta > 0$.

Following common practice (e.g., Auerbach and Gorodnichenko, 2013; Tenreyro and Thwaites, 2016; Ramey and Zubairy, 2018), we calibrate the parameter θ. This is partly motivated by the difficulty of reliably estimating this parameter in small samples, as well as by our intention to ensure that results are comparable between the smooth transition and threshold specifications. When we evaluate the impulse responses under the smooth transition specification, we must choose a value for z (so, given θ, this implies choosing a value for $F(\mathrm{z}, \theta)$) and we opted to tie that choice to the threshold we used in our baseline

model. We arbitrarily set $F(\bar{z},\theta) = 0.8$ as the point that will correspond to the high unemployment regime[7] where $\bar{z} = -(0.78 - \hat{\mu}_{du})/\hat{\sigma}_{du}$ is the value of the regime variable at the value of the threshold used in our baseline model. Inverting this function, we obtain a value for the parameter $\theta = log(0.8/0.2)(-1/\bar{z}) \simeq 2.342$. This ensures that we get IRFs that are conceptually similar to those we use in the threshold model with the crucial difference that the smooth transition model always treats the economy as partially in both regimes (**Charts A1-A5**). This allows all data points to be informative in the estimation of both $\beta_{1,h}$ and $\beta_{2,h}$.

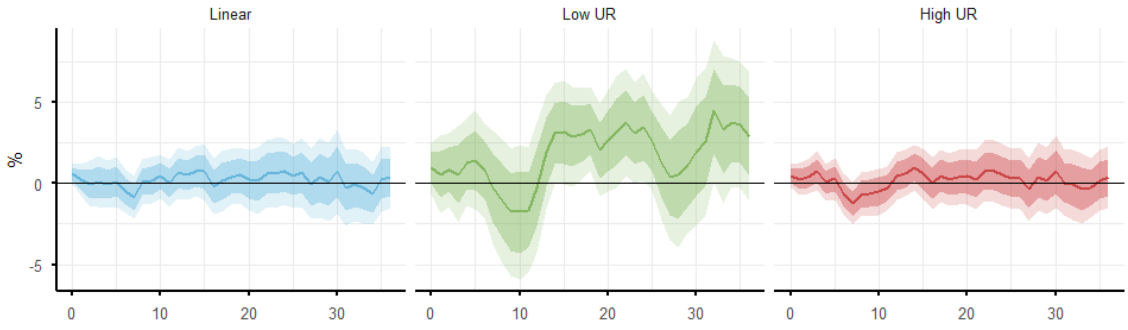
Chart A1: Fuzzy unemployment regimes under smooth transitions



Note: The shaded areas represent the discrete regimes under the 0.78% and 1.3% thresholds.

Chart A2: Resales respond most quickly to a negative monetary policy shock

Change in the level of resales following a 25 bp negative monetary policy shock



7 Similarly, the low unemployment regime will be $F(\bar{z},\theta) = 0.2$.

Chart A3: Starts respond signficantly when the unemployment rate is low

Change in the level of starts following a 25 bp negative monetary policy shock

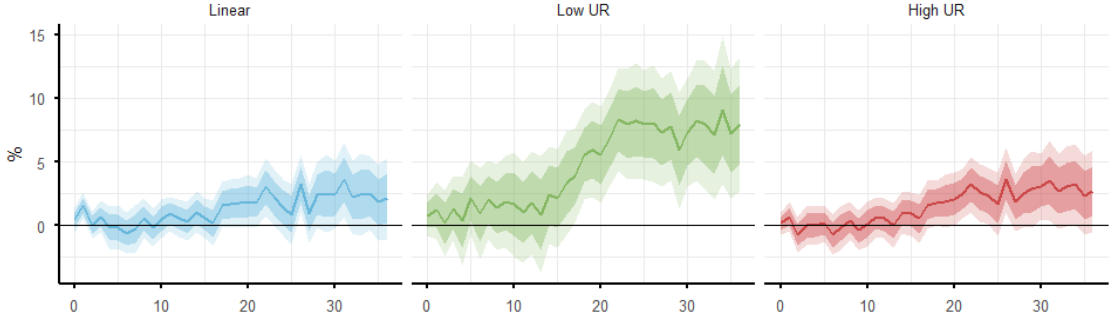
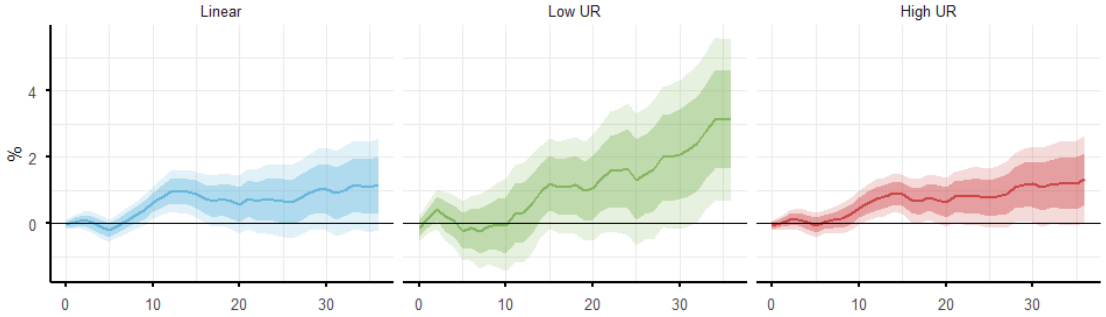


Chart A4: Prices change minimally when unemployment is high

Change in the level of average prices following a 25 bp negative monetary policy shock

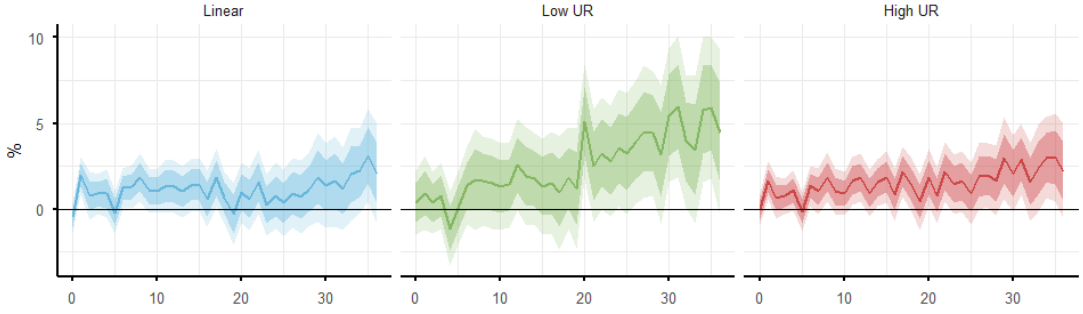


Alternative Supply Variables

Although housing starts are a commonly cited indicator of housing supply, another important measure is the number of completions. Completions represent a more direct measure of supply as they indicate new homes that are then absorbed by the market. The results when using completions are qualitatively similar to those from starts with the exception that the impact from completions takes even longer to materialize (**Chart A5**). This is intuitive since completions lag starts due to construction time.

Chart A5: Completions respond after a long delay

Change in the level of average prices following a 25 bp negative monetary policy shock



Regional Analysis

Although the Canadian housing market comprises many distinct regional markets which can have their own drivers of supply and demand, the pattern of more effective monetary policy transmission when the national unemployment rate is low is consistent across almost all regions. The impacts are outlined in **Charts A6-A8**.

Chart A6: Regional Resales

Change in the level of average prices following a 25 bp negative monetary policy shock

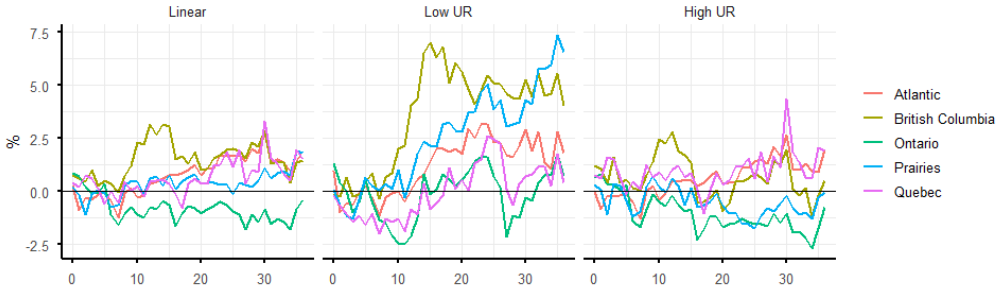


Chart A7: Regional Starts

Change in the level of average prices following a 25 bp negative monetary policy shock

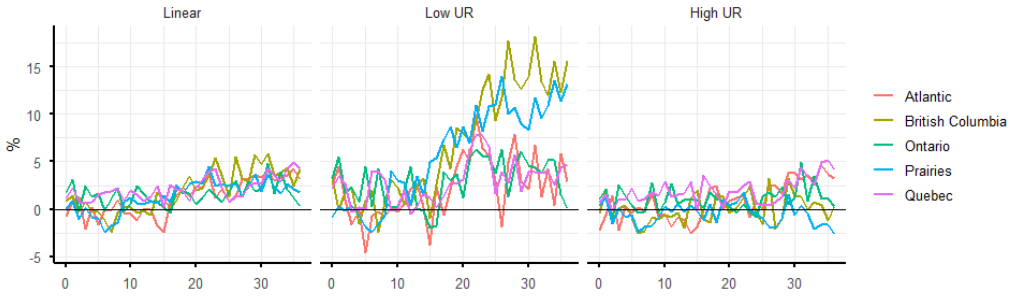
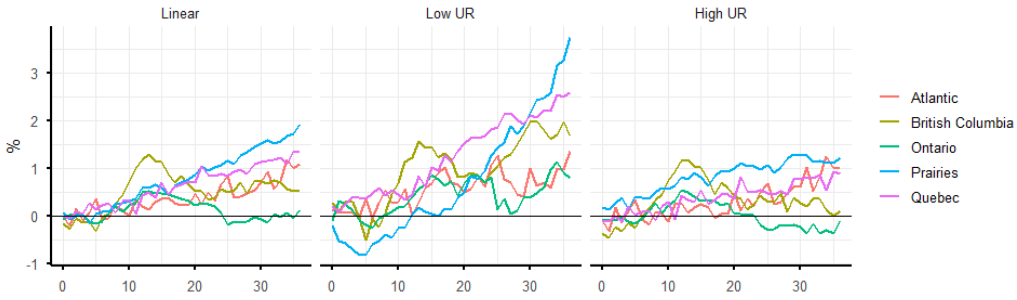


Chart A8: Regional Prices

Change in the level of average prices following a 25 bp negative monetary policy shock



References

Anenberg, Elliot, and Daniel Ringo (2022). "Volatility in Home Sales and Prices: Supply or Demand?," Finance and Economics Discussion Series 2022-041. Washington: Board of Governors of the Federal Reserve System.

Auerbach, Alan J. and Yuriy Gorodnichenko. (2013). "Fiscal Multipliers in Recession and Expansion." In Alberto Alesina and Francesco Giavazzi (Eds.), *Fiscal Policy after the Financial Crisis* (p. 63-98). University of Chicago Press.

Bernanke, Ben S., Jean Boivin and Piotr Eliasz. (2005). "Measuring the Effect of Monetary Policy: A Factor-Augmented Vector Autoregressive (FAVAR) Approach," *The Quarterly Journal of Economics*, vol. 120(1), p. 387-422.

Biljanovska, Nina, Eduardo Espuny Diaz, Amir Kermani and Rui C. Mano. (2025). "Monetary Policy and Housing Overvaluation," IMF Working Paper WP/25/207. Washington: International Monetary Fund.

Champagne, Julien and Rodrigo Sekkel. (2018). "Changes in Monetary Regimes and the Identification of Monetary Policy Shocks: Narrative Evidence from Canada," *Journal of Monetary Economics*, vol. 99, p. 72-87.

Dieckelmann, Daniel, Hannah S. Hempell, Barbara Jarmulska, Jan Hannes Lang, and Marek Rusnák. (2025). "House Prices and Ultra-Low Interest Rates: Exploring the Nonlinear Nexus," *Empirical Economics*, vol. 68, p. 1001-1037.

Dufour, Jean-Marie and Eric Renault. (1998). "Short Run and Long Run Causality in Time Series: Theory," *Econometrica*, vol. 66(5), p. 1099-1125.

Fortin-Gagnon, Olivier, Maxime Leroux, Dalibor Stevanovic and Stéphane Surprenant. (2022). "A Large Canadian Database for Macroeconomic Analysis," *Canadian Journal of Economics*, vol. 55(4), p. 1799-1833.

Goncalves, Sylvia, Ana Maria Herrera, Lutz Kilian and Elena Pesavento. (2024). "State-Dependent Local Projections," *Journal of Econometrics*, vol. 244(2), p. 105702.

Horváth, Peter. (2026). "Nonlinear Transmission of Monetary Policy and Housing Market Imbalances: Evidence from a Factor-Augmented Threshold VAR Analysis," *The Manchester School*, vol. 94, p. 341-349.

Jordà, Oscar. (2005). "Estimation and Inference of Impulse Responses by Local Projections," *The American Economic Review*, vol. 95(1), p. 161-182.

Piger, Jeremy and Thomas Stockwell. (2025). “Differences from Differencing: Should Local Projections with Observed Shocks be Estimated in Levels or Differences?,” *Journal of Applied Econometrics*, vol 40(7), p. 759-787.

Ramey, Valerie A. and Sarah Zubairy. (2018). “Government Spending Multipliers in Good Times and in Bad: Evidence from US Historical Data,” *Journal of Political Economy*, vol. 126(2), p. 451-902.

Romer, Christina D. and David H. Romer. (2004). “A New Measure of Monetary Shocks: Derivation and Implications,” *The American Economic Review*, vol. 94(4), p. 1055-1084.

Sekkel, Rodrigo, Henry Stern and Zu Zhang. (2025). “Money Talks: How Foreign Domestic Monetary Policy Communication Influences Financial Markets,” Staff Working Paper 2025-33. Ottawa: Bank of Canada.

Stock, James H. and Mark M. Watson. (2002a). “Macroeconomic Forecasting Using Diffusion Indexes,” *Journal of Business and Economic Statistics*, vol. 20(2), p. 147-162.

Stock, James H. and Mark M. Watson. (2002b). “Forecasting Using Principal Components from a Large Number of Predictors,” *Journal of the American Statistical Association*, vol. 97, p. 1167-1179.

Tenreyro, Silvana and Gregory Thwaites. (2016). “Pushing on a String: US Monetary Policy Is Less Powerful in Recessions,” *American Economic Journal: Macroeconomics*, vol. 8(4), p. 43-74.