Housing Supply and Elasticities

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Research Question & Motivation

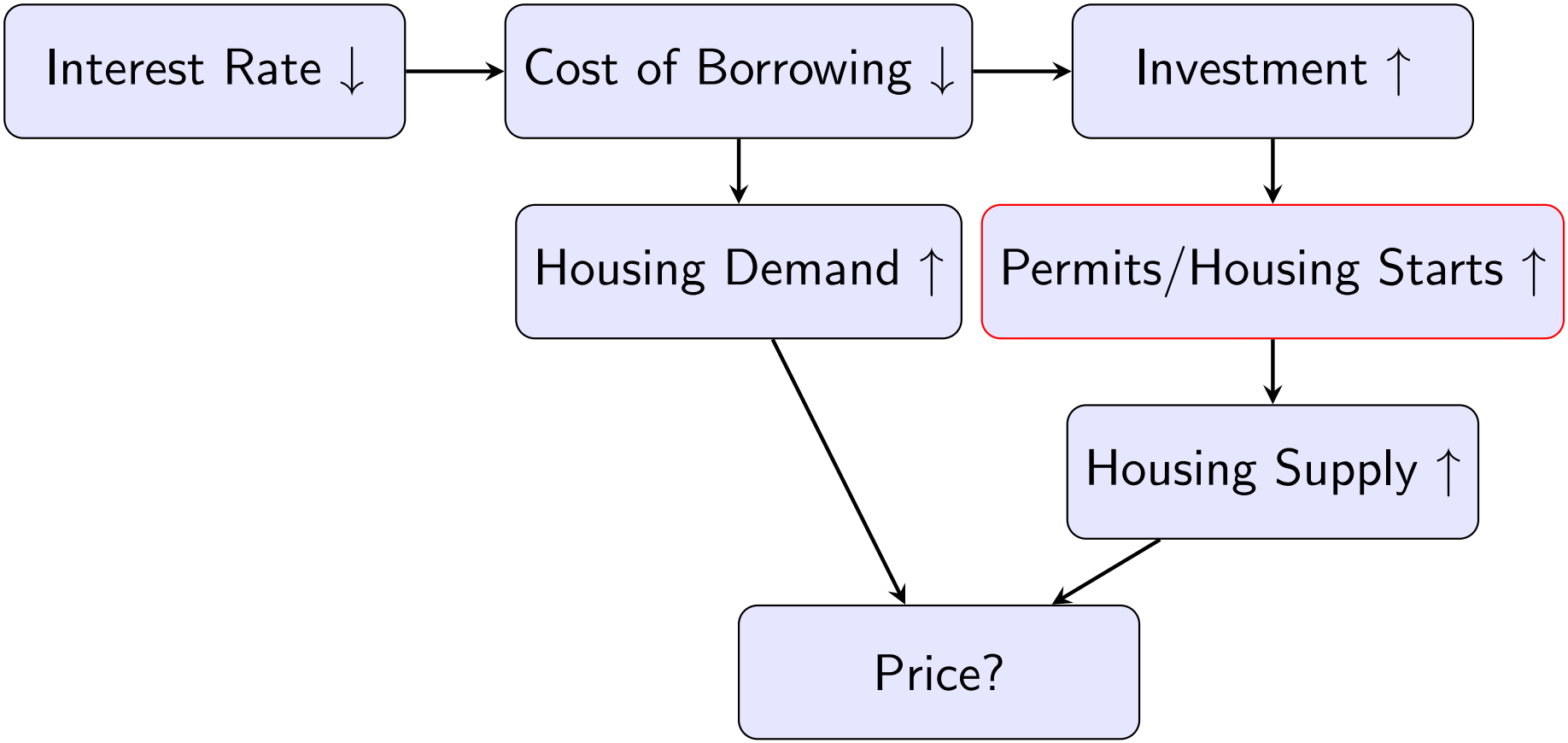
Question

Do higher housing supply elasticities cause housing supply to respond more strongly to monetary policy changes? Do these changes in supply then assist in moderating house price changes?

Motivation

- Strong precedence for analyzing housing supply using elasticities in the literature
- Lack of consensus in regards to the impact of monetary policy

Motivation in Theory



Motivation - Through The Data

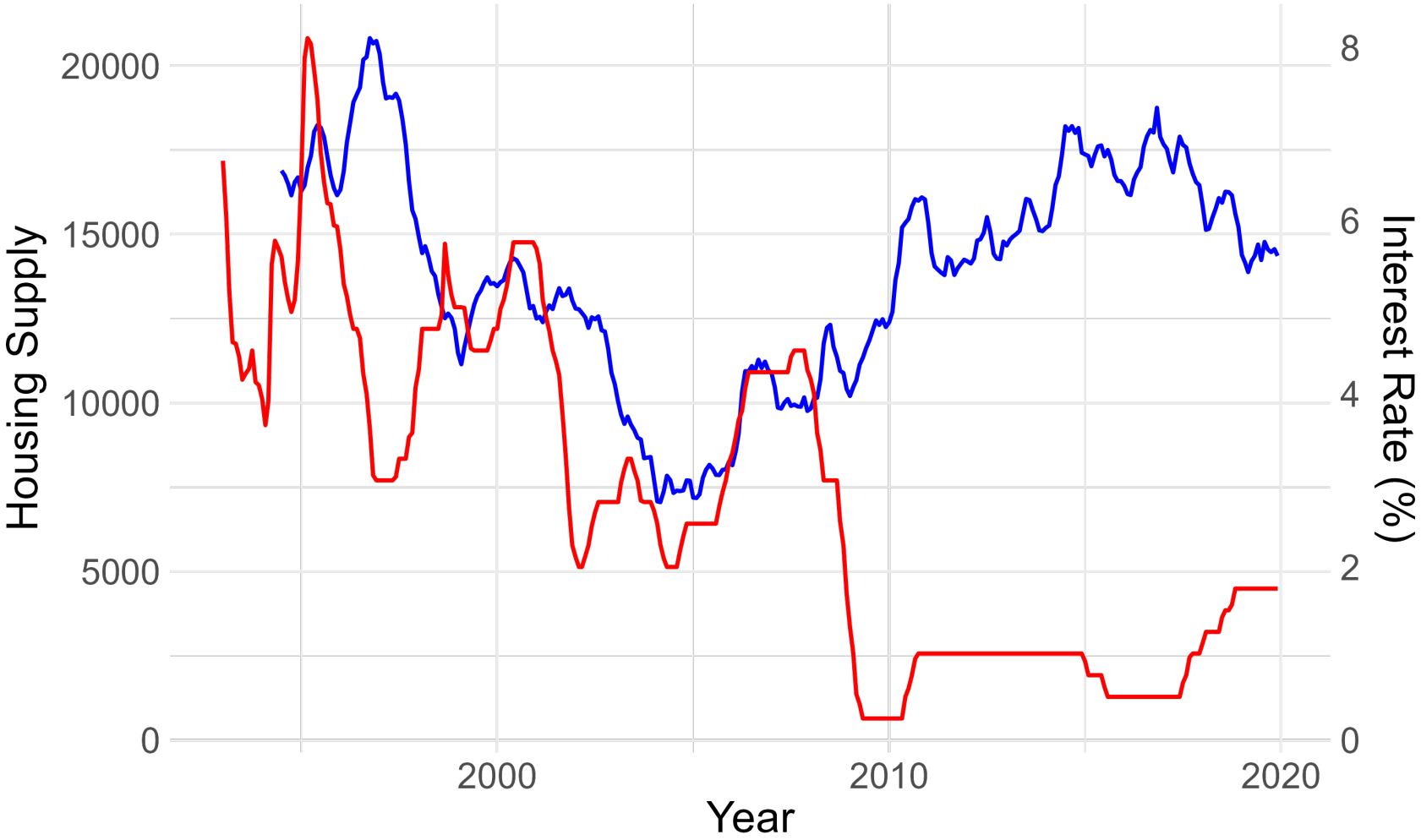


Figure: 18-Month Lagged Housing Supply & Interest Rate

Data Availability

- Statistics Canada Data
- 26 Census Metropolitan Areas (CMA's)
- Years: 1992-01-01 - 2019-12-01

Method - Step 1

Compute housing elasticities using a log-log regression:

$$log(HousingSupply_{ij}) = \beta_{1i} * log(HousePrice_{ij}) + \epsilon_{ij}$$

With i = city, j = year.

Preliminary Results

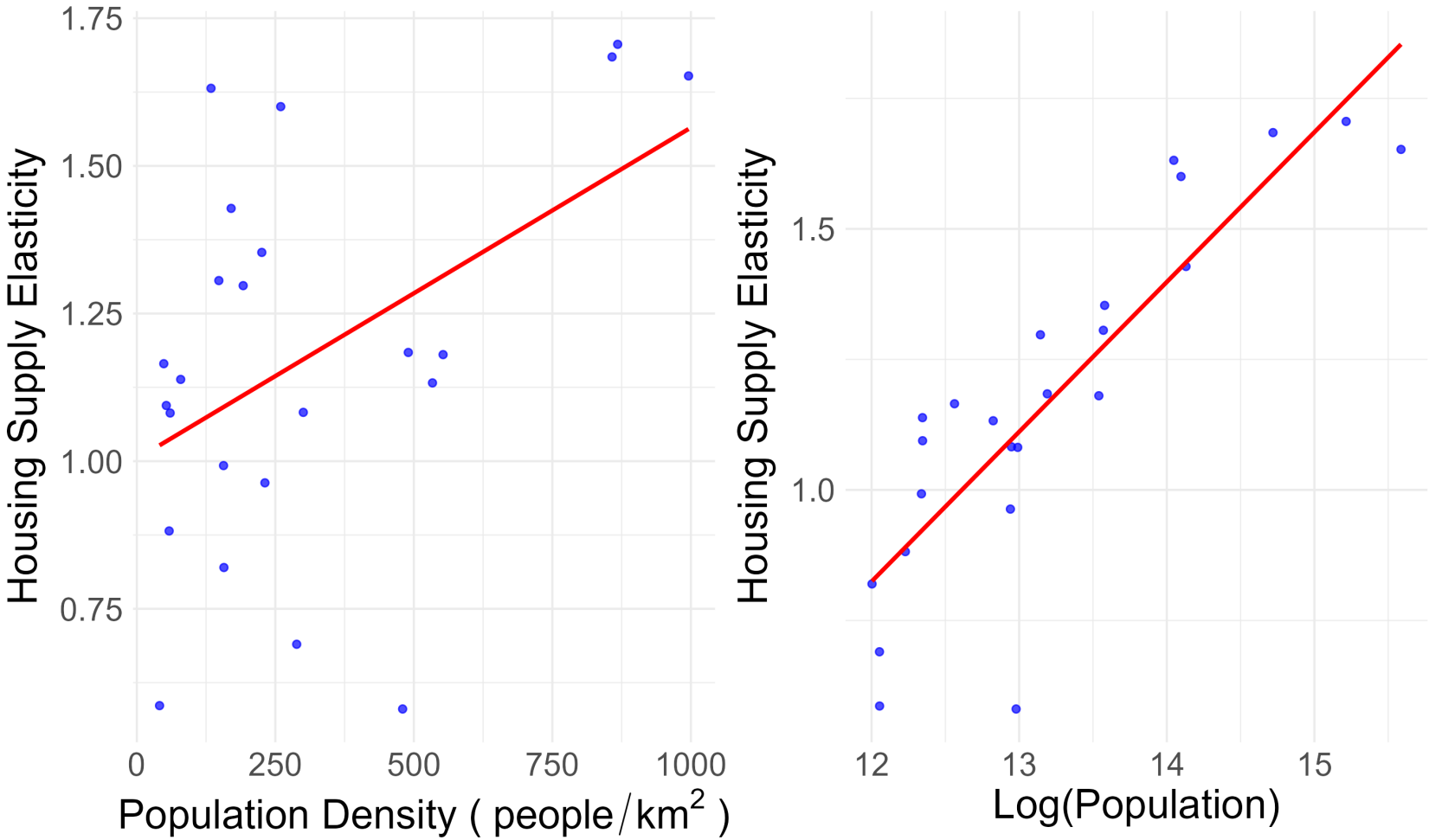


Figure: Relationship Between Housing Supply Elasticity & Population Density (Left) and Logged Population (Right)

Method - Step 2

- Structural Vector Auto Regression (SVAR) model & Cholesky Decomposition

$$A_0 = \begin{bmatrix} 1 & 0 & 0 & 0 \\ a_{21} & 1 & 0 & 0 \\ a_{31} & a_{32} & 1 & 0 \\ a_{41} & a_{42} & a_{43} & 1 \end{bmatrix}$$

1. Housing Supply
2. Producer Price Index
3. Policy Rate
4. House Prices

Results

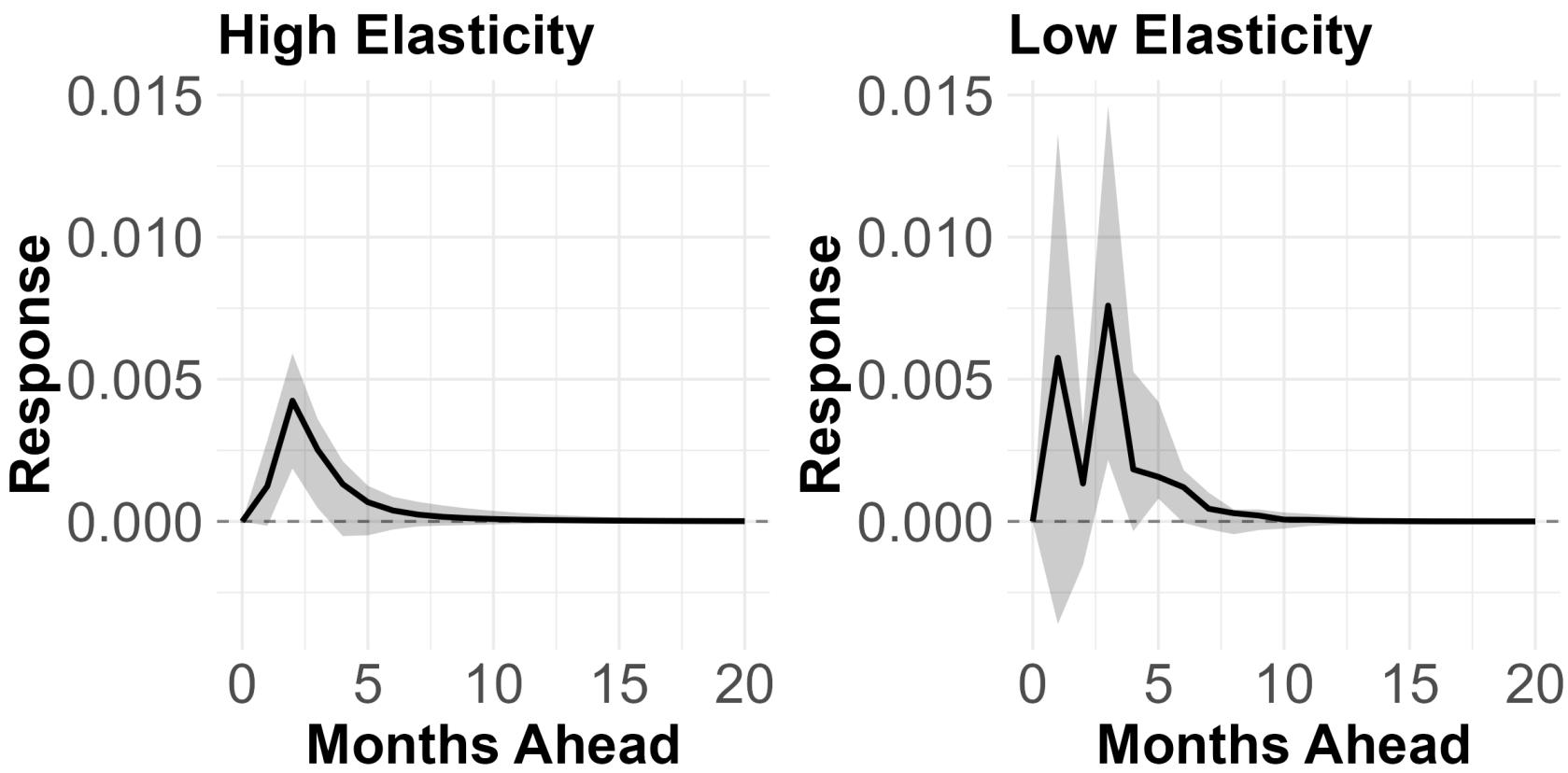


Figure: Impulse Response Functions: Policy Rate → Housing Supply

Results

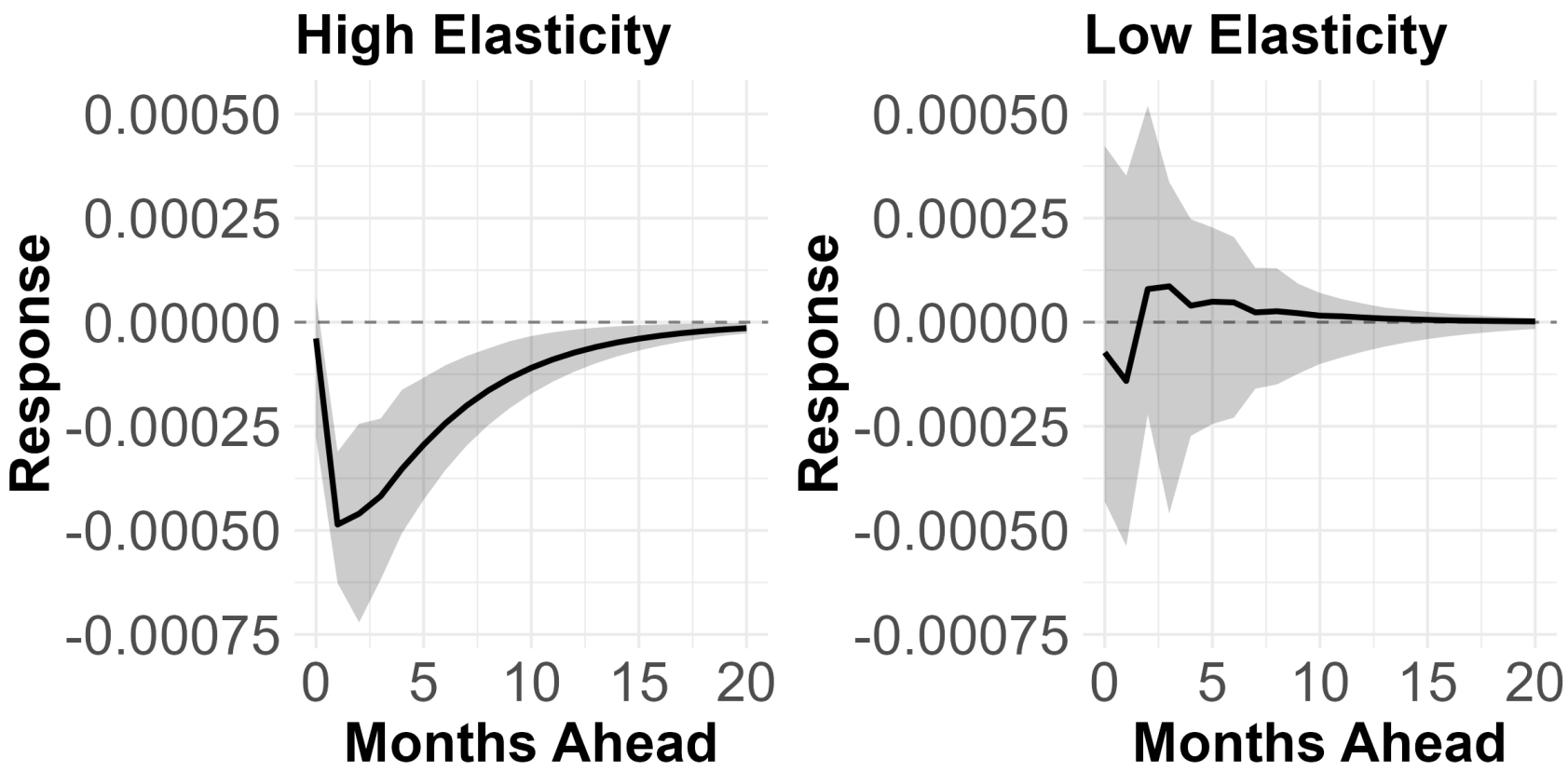


Figure: Impulse Response Functions: Housing Supply → Housing Prices

Discussion

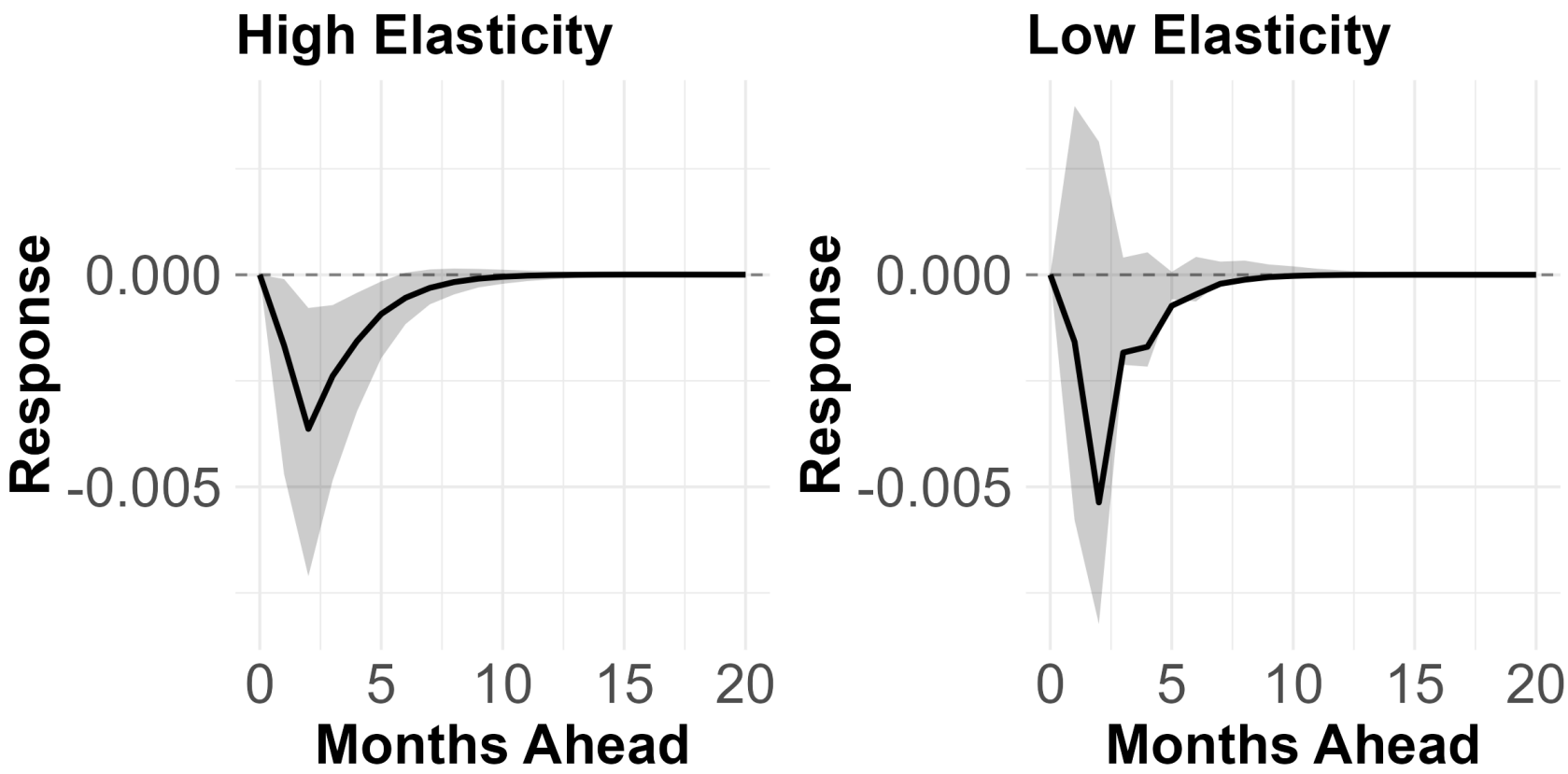


Figure: Impulse Response Functions: Policy Rate → Lagged Housing Supply

Conclusion

- Neither the high nor low elasticity groups produce statistically significant results in considering the impact of an interest rate change on housing supply.

- Housing supply in the high elasticity group has a negative and statistically significant impact on prices.

Thank You!

Questions?

Appendix 1 - Elasticity Groupings

Low Elasticity Cities	**High Elasticity Cities**
Oshawa (0.58)	Saskatoon (1.17)
Sudbury (0.59)	Hamilton (1.18)
Saint John (0.66)	Kitchener-Waterloo (1.18)
Guelph (0.69)	Ottawa-Gatineau (1.29)
Trois Rivières (0.82)	London (1.3)
St. John's (0.88)	Winnipeg (1.31)
Windsor (0.96)	Quebec (1.35)
Sherbrooke (0.99)	Calgary (1.6)
Halifax (1.08)	Edmonton (1.63)
St. Catharines-Niagara (1.08)	Toronto (1.65)
Regina (1.09)	Vancouver (1.68)
Victoria (1.13)	Montreal (1.71)
Kelowna (1.14)	

Table: Cities Grouped by Housing Supply Elasticity (Median = 1.14)

Appendix 2 - Average Housing Supply Rate of Change