House Price Responses to Monetary Policy Surprises: Evidence from the U.S. Listings Data

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House price responses to monetary policy shocks

- A gradual response of house prices to changes in interest rates, 2-year or longer lag (Williams, 2015)
- In contrast to an almost-immediate response of financial assets (Bernanke and Kuttner, 2005)
  - Broadly attributed to inefficiencies in real estate markets, search costs, transaction and carrying costs, tax considerations
  - But housing transactions are highly intermediated and new info should spread fast

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In this paper:

- Revisit the question of how house prices respond to monetary policy shocks
- Relevant for discussion on "long and variable lags of monetary policy"

What we do

- Use daily data on property listings and sales in the US, 2001-2019
- Distinguish between listing prices and sale prices
- Estimate house price responses to high-frequency measures of monetary policy shocks in weeks following FOMC announcements

What we find

New evidence of a much faster house price response to monetary policy shocks:

1. Prices of new listings respond promptly and significantly
   - Fall by 1% within 2-3 weeks after an exogenous 0.25 ppt increase in 30Y fixed mtg rate

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3. Prices in zip codes with lower average household incomes are more sensitive to interest rate surprises than those in high-income zip codes

Data and construction of house price indexes

High-frequency property-level house price data

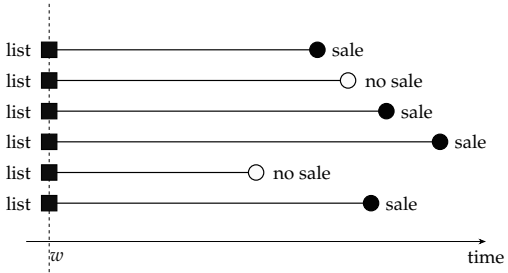
We use CoreLogic Multiple Listing Service dataset

- Daily property-level data on property listings and sales
- For 43 U.S. states and DC, 2001-2019
- Variables for each listed property:
  - list price and date
  - sales price and date
  - address
  - characteristics of the property (property type, number of bedrooms and bathrooms, year built, size of the living area, etc.)
- We focus on the listings of single-family homes and apartments
  - Exclude: rentals, land parcels, mobile homes or commercial properties
- Our sample after restrictions and deduplication: 60m obs, 96k listings/week

Data on house prices

- Our analysis requires a high-frequency measure of price of a housing unit
- The property-level MLS data contain:
  - List price and date of a property
  - If the property sells—the sale price and date
- We construct weekly house price indexes for $\sim$ 10K zip codes using hedonic regressions

Timing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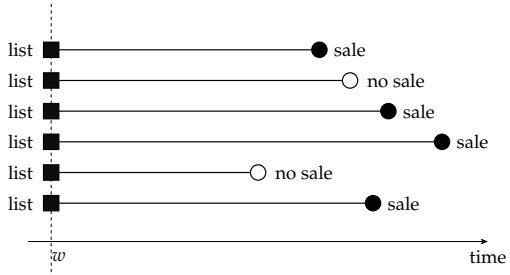
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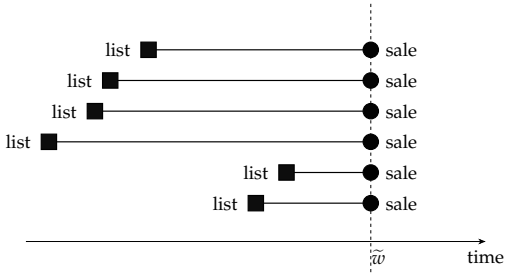
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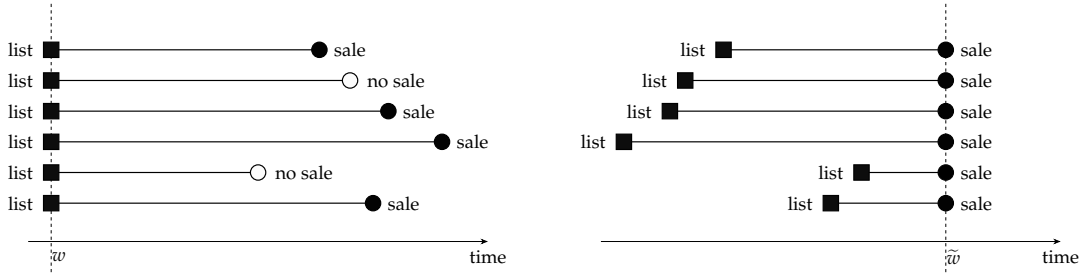


- For each zip code and week, we can sort properties to construct:
  - list price index by list week (w)
  - sale price index by sale date ($\widetilde{w}$)
  - sale price index by list week (w)
  - time-on-the-market index by list week (w)

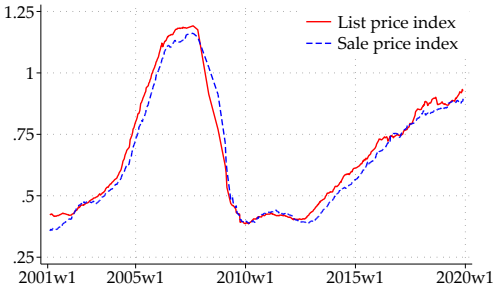
CONSTRUCTION OF HOUSE PRICE INDICES

- Estimate zip-code-specific weekly index $p_{l,t}$ as a week-t fixed effect from the property-level regression for zip code l:

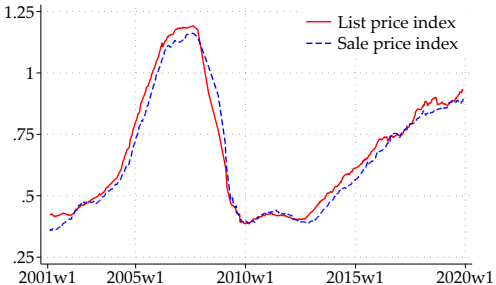
$$\ln \phi_{il,t} = p_{l,t} + \gamma_l X_{il} + \tau_{l,woy} + \varepsilon_{il,t},$$

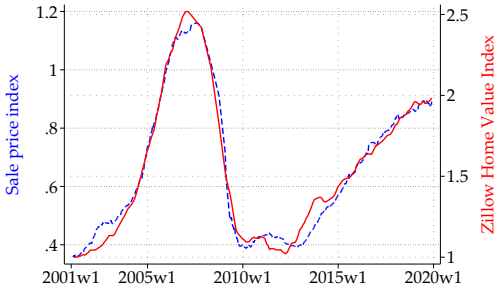
  - $\phi_{il,t}$ is the real list price of property i in zip code l listed in week t
  - $\mathbb{X}_{il,t}$ is a set of housing characteristics of i (construction year, number of bedrooms, classification of land-use, size)
  - $\tau_{l,woy}$ is the week-of-year effect (seasonality)
  - $\varepsilon_{il,t}$ is the error term

House price indices for zip code 90011



House price indices for zip code 90011





Estimation approach

Identifying the effect of MP on house prices

We employ two approaches of identifying the effect of MP on house prices:

1. Local projections of house prices on identified MP surprises (Jordà, 2005)

2. Local projections of house prices on MP policy-induced changes in interest rates (Ramey, 2016, Stock and Watson, 2018)
   - This method allows to capture a (potentially) richer impact of MP shocks on house prices via policy-induced changes in interest rates

1. Local projections of house prices on MP shocks

- Estimate the zip-code-level panel regression of the effect of shock S_t in t on the change in the house price index between t and $t+h$, for $h = 0, ..., H$:

$$\ln P_{l,t+h} - \ln P_{l,t-1} = \beta^{(h)} S_t + \sum_{q=1}^{52} \theta_q^{(h)} (\ln P_{l,t-q} - \ln P_{l,t-q-1}) + \chi_l^{(h)} + \varepsilon_{l,t}^{(h)}$$

- The coefficient estimates of $\beta^{(h)}$ for $h = 0, ..., H$ trace out the impulse response of house price index to the monetary surprise

2. Local projections of house prices on int. rate, instrumented by MP shocks

Stage 1 Projection of interest rate i_t on MP shock S_t in t

Stage 2 Local projection of house prices on interest rate $\hat{i}_t$ projection from Stage 1

$$\ln P_{l,t+h} - \ln P_{l,t-1} = \beta^{(h)} \hat{i}_t + \sum_{q=1}^{52} \theta_q^{(h)} (\ln P_{l,t-q} - \ln P_{l,t-q-1}) + \mu^{(h)} (i_{t-1} - i_{t-13}) + \chi_l^{(h)} + \text{Add. Controls}_{l,t}^{(h)} + \varepsilon_{l,t}^{(h)}$$

Add. controls: local and national economic and financial conditions à la Bauer and Swanson (2022)

MEASURES OF HIGH-FREQUENCY MON. POLICY SURPRISES

- Distinguish between shocks to current and future rates, Swanson (2021):
  - Fed funds rate
  - Fed's forward guidance
  - Large-Scale Asset Purchases

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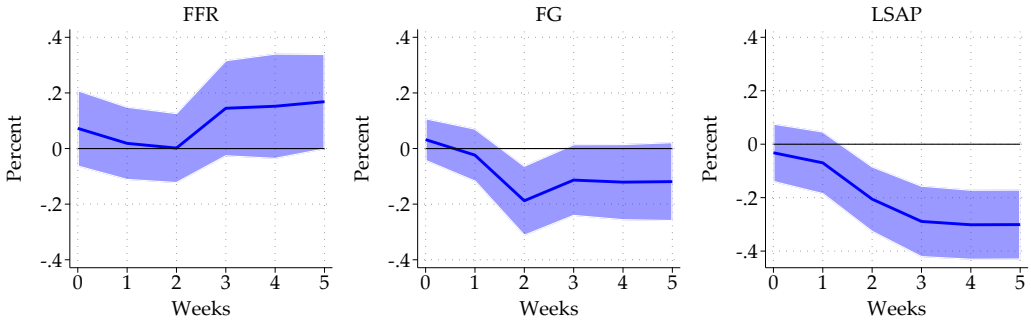
- Measures that conflate shocks to current and future rates:
  - Nakamura and Steinsson (2018)
    - the policy news shock; series from Acosta and Saia (2022)
  - Bauer and Swanson (2022)
    - use a range of Federal funds futures and Eurodollar futures; add info from the Fed Chair's speeches and purge their measure of the component predicted by macroeconomic and financial data preceding the policy announcements

House price responses to MP shocks

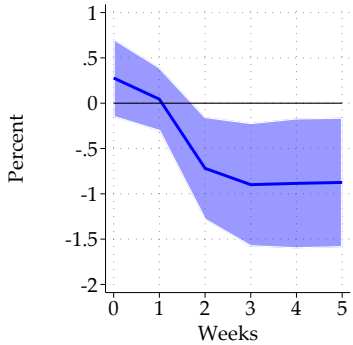
House prices response to contract. MP surprises



Note: LP responses of the list price index to 1 st. dev. of contract. Swanson (2021) shocks, 2001-2019. 95% conf. intervals.

- Fall by 0.2-0.3% within 2-3 weeks after contr. shock to future rates
- No response after contr. shock to current rate
- Similar responses for sale prices sorted by list date, but not sale date

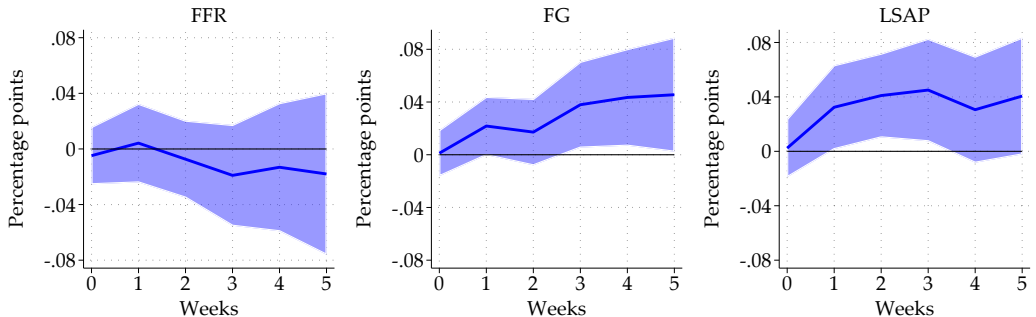
House prices response to +0.25 pp surprise in rate



Note: LP-IV responses of the list price index to +0.25 change in 30Y FRM rate instrumented by Swanson (2021) shocks, 2001-2019. 95% conf. intervals

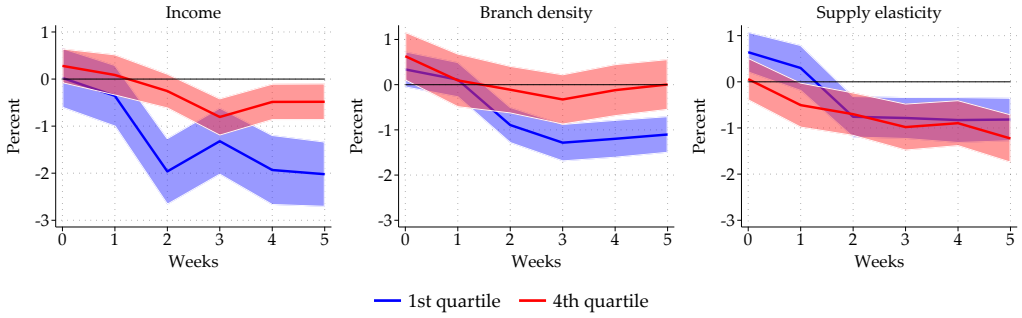
- Fall 0.7% in week 2 and close to 1% in week 3 after the announcement
- The magnitude of the response is comparable to responses of stock prices on the day of the announcement, around 1% (Bernanke and Kuttner, 2005).

Mortgage rate response to contr. MP surprise



Note: Mortgage rate is the mean weekly 30Y FRM rate in the US, from the Primary Mortgage Market Survey. Add. controls: 4 lags of the weekly change in the dependent variable.

Heterogeneity of the response across zip codes



Note: Responses of the list price index to a +0.25 pp increase in the mean weekly 30Y FRM rate estimated by LP-IV with Swanson (2021) factors as instruments. Responses are estimated separately for top and bottom quartile of the distribution across zip codes. 95 % CI

- More responsive zip codes: lower incomes (lower home values), less bank competition, not much for supply elasticity

Summary of results

- Contractionary monetary policy surprises to future rates lower house prices within two weeks after the shock
- Significant heterogeneity in responses based on differences in characteristics of locations, supporting role of financial constraints and commercial bank market power.

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