

Discussion of:
A Diagnostic TANK Model for the Housing Market

Discussant: Luis Herrera

Discussion

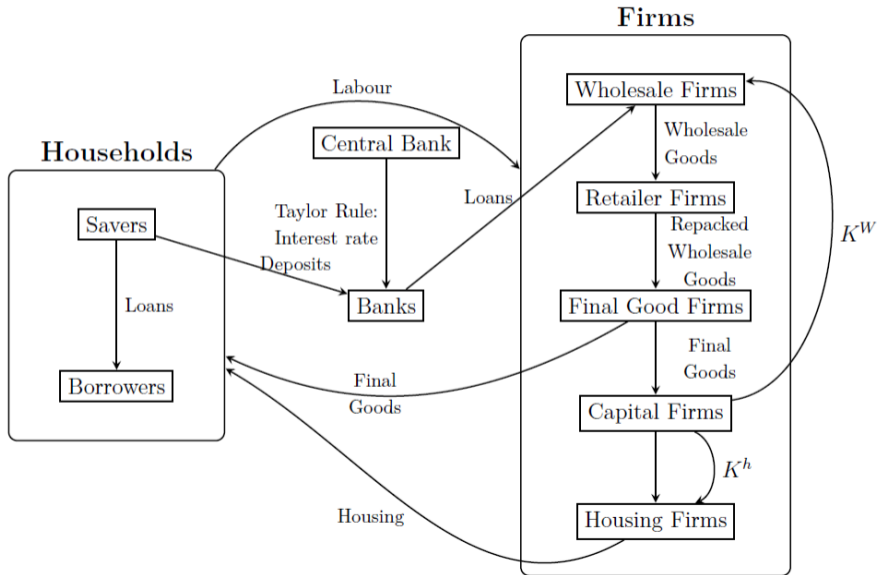
December 2025

- The paper consider **Diagnostic Expectations (DE)** into a **Two-Agent New Keynesian (TANK)** model with **housing** and a **banking** sector.
- Using Sequential Monte Carlo estimation on U.S. data (1984Q1–2019Q4), the paper argues that **expectations** account for a sizable share of housing market volatility.
- Main takeaway: DE allow the model to match house price and residential investment volatility with **smaller preference-shock innovations** (roughly one-half to one-third of the RE benchmark) and a **higher marginal likelihood** than the RE model.

Why this paper matters

- DSGE models are not able to reconcile fluctuations of housing market with the overall business cycle. Explaining this without implausibly large preference shocks is a challenge for DSGE models with housing.
- DE provide a **micro-founded** departure from RE that can capture **boom–bust patterns** and overreaction/reversal dynamics observed in asset markets.
- Considering this type of **expectation formation expectations** can refine the mechanisms operating in the model that relates business cycle with real estate cycles.

Model with RE and DE



- Model
- Estimation and model fit
- IRFs and shock transmission

(i) Financial intermediation between savers and borrowers

- In the current setup, the bank intermediates between savers and firms. **Why no between households?**
- Allowing mortgages to be intermediated by banks, would amplify the effect of housing shocks and bounded rationality can reinforce this amplification (Herrera and Vazquez 2025).

(ii) Housing supply side: adjustment frictions

- The housing production block is **very flexible** (no explicit adjustment costs to vary new housing). This can dampen price volatility.
- Suggestion: add **investment adjustment costs** or **time-to-build** in construction to match supply rigidity.

(iii) Why Diagnostic Expectations?

Data augmentation with expectations

- Include **survey expectations** (e.g., SPF macro expectations, or house price expectation surveys) as additional observables.
- This can discipline the **diagnostic parameter** and the **memory weights**, improving identification.

Model comparison beyond marginal data density

- The comparison of the second moments shows a very similar results for several variables but a significant improvement for housing prices and residential investment.
- The MDDs are **quite similar** across RE vs. DE (Q1). It would help to report **RMSE by observable** to provide **variable-level fit**.

Shock size vs. transmission

- A housing preference shock has not a data counterpart. Whether the preference shock variance is 0.05 or 0.10 is **secondary**. What matters is the **transmission and comovement** it generates.
- In the historical variance decomposition, **housing shocks still look weakly connected to GDP**. This analysis would benefit from a RE-DE comparison.

Bring IRFs to the data

- Estimate a **DSGE-VAR** and compare **empirical IRFs** to each model's IRFs to see which expectation mechanism tracks the data best (Del Negro et al. 2007)

- Strong and timely question: **Can expectation formation, not oversized shocks, explain housing volatility?**
- The paper makes a very interesting contribution by exploring the effects of relaxing the bounded rationality assumption.

Thank you!