Discussion of "The Demand for Government Debt"

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Discussed by Zhiyu Fu
WashU Olin

Overview

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- This discussion: clarifying assumptions behind methodologies

Main Result 1: Who Absorbs the New Supply?

- Estimate the "marginal responses" by each sector:
  - The Fang, Hardy, and Lewis (2022) methodology

$$\frac{H_t^{s,j} - H_{t-1}^{s,j}}{D_{t-1}^j} = \alpha^{s,j} + \beta^{s,j} \frac{D_t^j - D_{t-1}^j}{D_{t-1}^j} + \varepsilon_t^{s,j},$$

VARIABLES	(1) CB	(2) ROW	(3) PF	(4) IF	(5) Banks	(6) SLG	(7) MMF	(8) HH	(9) IC	(10) Other
Pre-QE * Pct. Ch. Gov. Debt	0.01	0.22***	0.10***	0.01*	0.17***	0.04	0.09***	0.18***	0.04***	0.13***
	(0.02)	(0.06)	(0.03)	(0.01)	(0.06)	(0.03)	(0.03)	(0.03)	(0.01)	(0.02)
QE * Pct. Ch. Gov. Debt	0.08**	0.31***	0.15***	0.07***	0.10***	-0.02*	0.06	0.17**	0.02***	0.06***
	(0.04)	(0.05)	(0.06)	(0.01)	(0.02)	(0.01)	(0.06)	(0.07)	(0.00)	(0.01)
Post-Covid * Pct. Ch. Gov. Debt	0.45***	0.07***	0.01	-0.00	0.08***	0.05***	0.35***	-0.10***	0.01***	0.08***
	(0.04)	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)	(0.02)	(0.02)	(0.00)	(0.00)
Observations	283	283	283	283	283	283	283	283	283	283
R-squared	0.39	0.33	0.18	0.13	0.23	0.06	0.42	0.14	0.31	0.18

Comment 1: The Linear Assumption

- The coefficient β captures the linear, contemporaneous response at the quarterly (yearly) frequency

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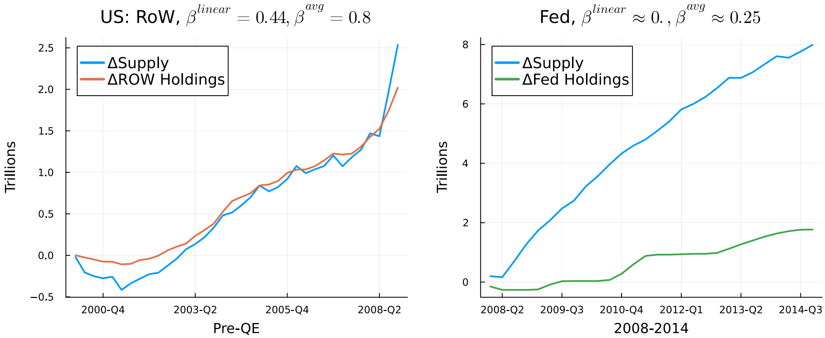
  - When they differ, it informs us the applicability of the linear model

(Cherry-picked) Differences between Linear Estimates vs. Average Estimates



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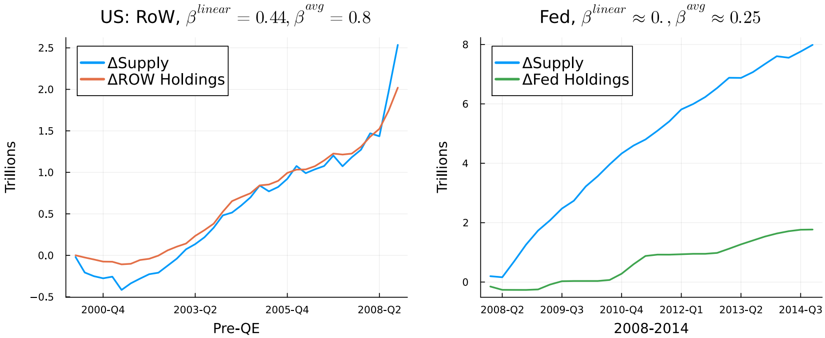

- RoW: Absorbs 80% of new Treasury issuance before 2008, vs. 0.4 from the linear estimate
- Fed: Absorbs 25% of new Treasury issuance between 08-15, but the linear response is close to zero for this sample

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    - e.g., the QT counterfactuals the authors discuss in the later sections
  - Not suitable for long-term debt sustainability analysis

Result 2: Estimates of Demand Elasticity for Treasury

- Estimate the demand elasticity β_1^s in:

$$\log\left(H_t^s\right) - \log\left(H(0)_t^s\right) = \alpha^s + \beta_1^s Y_t^8 + \beta_2^{s'} \mathbf{X_t} + t + t^2 + \eta_t^s.$$

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  - Potentially issues: monetary policy shock directly affects the latent demand

The Identification Assumptions

- Assume the supply is fixed. Consider the following model for demand:

$$\Delta q_{i,t} = -\zeta_i \Delta p_t + \lambda_i \times mp_t + \varepsilon_{i,t},$$

$$\Delta q_{S,t} \equiv \sum S_i \Delta q_{i,t} = 0 \implies \Delta p_t = \frac{1}{\zeta_S} \left(\lambda_S mp_t + \varepsilon_{S,t} \right)$$

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- But it is a linear transformation of mp_{15min}! The same critique still applies.
- The correct identification assumption is not that other sectors react *slowly*, but that they do not react $(\lambda_{i,mp} = 0)$.

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- Add inelastic supply to the framework above:

$$\left.\begin{aligned} \Delta q_{i,t} &= -\zeta_i \Delta p_t + \varepsilon_{i,t} \\ \Delta p_t &= \tfrac{1}{\zeta_S}\left(\varepsilon_{S,t} - u_t^{supply}\right) \end{aligned}\right\} \implies \Delta q_{i,t} = \frac{\zeta_i}{\zeta_S} u_t^{supply} - \frac{\zeta_i}{\zeta_S}\varepsilon_{S,t} + u_{i,t}$$

The marginal absorber exercise can be viewed as a reduced-form regression for the underlying linear demand model.

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- Good job!

References

References

Fang, Xiang, Bryan Hardy, and Karen K. Lewis (May 2022). ***Who Holds Sovereign Debt and Why It Matters.*** doi: 10.3386/w30087. National Bureau of Economic Research: 30087. url: https://www.nber.org/papers/w30087 (visited on 11/11/2023). Pre-published.