Comments on "The Signaling Effects of Fiscal Announcements" by Melosi, Morita, and Zanetti
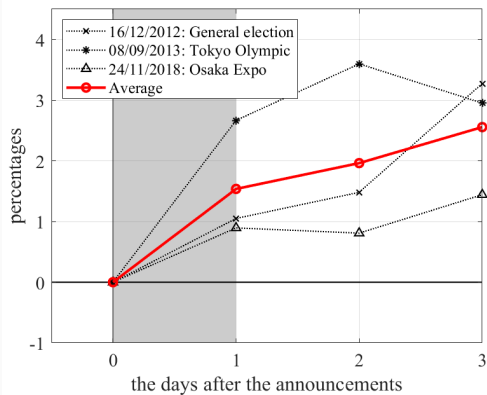
Tomoyuki Nakajima
University of Tokyo

3rd TWID International Finance Conference
July 28, 2022

▶ nice and interesting paper!

▶ Q: Stock prices reacted differently to the announcements of fiscal stimulus packages, sometimes positively and sometimes negatively. Why?

▶ A: It is due to the difference in the (relative) amount of information conveyed by those announcements (signaling effects).

▶ empirical evidence and theoretical model.

Figure 1: Response of stock prices to fiscal announcements

(a) Exogenous fiscal spending

Legend:
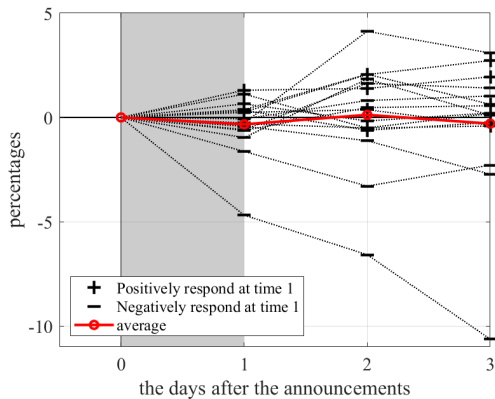- 16/12/2012: General election
- 08/09/2013: Tokyo Olympic
- 24/11/2018: Osaka Expo
- Average

x-axis: the days after the announcements
y-axis: percentages

(b) Supplementary budgets

Legend:
- Positively respond at time 1
- Negatively respond at time 1
- average

x-axis: the days after the announcements
y-axis: percentages
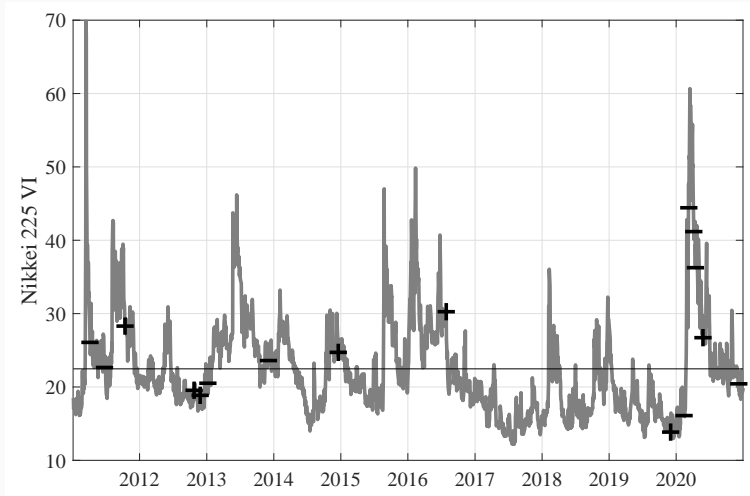
Nikkei VI: a daily measure of the expected volatility of stock prices

Estimation

▶ cumulative response of stock prices to fiscal announcements at horizon h:

$$\sum_{j=0}^{h} \Delta s_{t+j} = \alpha_h \mathbb{I} \left\{ A_t^{\text{final}} \right\} + \beta_h \mathbb{I} \left\{ A_t^{\text{final}} \right\} \times VI_t + Z_{t-1}\gamma' + \delta_h + e_{t+h}$$

where Δs_t = change in stock prices at t; $\mathbb{I} \left\{ A_t^{\text{final}} \right\}$ = indicator variable associated with the fiscal announcements.

▶ Benchmark specification:

  ▶ $\alpha = 0.002$ (insifnificant);

  ▶ $\beta = -0.660$ (significant at 5% level).

Theory: 2-period NK model

▶ aggregate productivity in period 2:

$$a_2 = a_1 + u, \quad u \sim N(0, \sigma_u^2)$$

▶ The govt receives a signal about a_t:

$$\tilde{a}_t = a_t + v, \quad v \sim N(0, \sigma_v^2)$$

▶ The govt's signal is conveyed to the private sector through its fiscal policy:

$$g_t/g_{ss} = \left(e^{\tilde{a}_t}\right)^{\psi}$$

▶ posterior beliefs on a_2:

$$a_2|g_2 \sim N(\hat{a}_2, \hat{\sigma}^2)$$

$$\hat{a}_2 = E_1\left(a_2 \mid g_2\right) = \frac{\hat{\sigma}^2}{\sigma_u^2}a_1 + \frac{\hat{\sigma}^2}{\sigma_v^2}\tilde{a}_2, \quad \text{and} \quad \hat{\sigma}^2 = \left(\frac{1}{\sigma_u^2} + \frac{1}{\sigma_v^2}\right)^{-1}.$$

Response of stock prices to the announcement of govt spending for period 2

▶ **Proposition 2.**

$$\hat{D}_2 = \frac{1}{\Psi} \left\{ \kappa^{\text{No Signal}} + \kappa^{\text{Signal}} \right\} \hat{g}_2$$

$$\hat{Q} = \frac{\beta}{1+\beta} \hat{D}_2$$

where

$$\Psi = \{\alpha + (1-\alpha)\varepsilon\}\{(1-\theta)(1-\alpha)(1-\zeta) + \alpha\gamma\} > 0$$

$$\kappa^{\text{No Signal}} = \gamma\theta\{(1-\alpha)(1-\zeta)\varepsilon + \alpha\} > 0$$

$$\kappa^{\text{Signal}} = [(1-\theta)(1-\zeta)\{\alpha + (1-\alpha)\varepsilon\} + \gamma\{(\varepsilon-1)\alpha - \varepsilon(1-\zeta)\}] \cdot \frac{\omega}{(1+\omega)\psi} \gtreqless 0$$

where

$$\omega \equiv \frac{\sigma_u^2}{\sigma_v^2}$$

Comment 1: Effects of *VI* on stock prices

▶ cumulative response of stock prices to fiscal announcements:

$$\sum_{j=0}^{h} \Delta s_{t+j} = \alpha_h \mathbb{I} \left\{ A_t^{\text{final}} \right\} + \beta_h \mathbb{I} \left\{ A_t^{\text{final}} \right\} \times VI_t + Z_{t-1} \gamma' + \delta_h + e_{t+h}$$

▶ Why VI_t is not included in the RHS?

▶ The estimate of $\beta_h < 0$ might be due to the fact that VI_t has a negative effect on Δs_{t+j}.

Comment 2: Compositions of fiscal packages

▶ The effects of a fiscal package is likely to depend on its content, rather than its size per se.

▶ First, how much is transfers, as opposed to purchases of goods and services?

  ▶ In the model, only purchases are considered.

  ▶ The actual fiscal packages contain transfers, with varying fractions.

▶ Second, a fiscal package can have a negative effect on stock prices, without signaling effects.

  ▶ e.g., reallocation of resources from productive sectors to non-productive ones.

  ▶ The differences in the response of stock prices to fiscal announcements may be due to the differences in their "quality" in this sense.

Comment 3: Fiscal policy rule

▶ crucial to know the exact way of how a fiscal stimulus package is determined.

▶ estimated equation:

$$\tilde{g}_t = \psi \hat{x}_t + \sum_{i=1}^{p} \rho_i \tilde{g}_{t-i} + c + u_t$$

where $\tilde{g}_t$ and $\tilde{x}_t$ are detrended series of govt purchases and TFP.

▶ This may not tell us how fiscal stimulus packages are determined.

  ▶ g_t is the annual amount of total govt spending/govt consump/public investment from the National Account.

▶ Are the values of $\omega = \sigma_u^2/\sigma_v^2$ required to explain the data reasonable?