University of Zurich[UZH]

Department of Economics

The Bullionist Controversy

Quantitative Economic History - Applications
Spring Term 2018

Name
Field of Study
Semester
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Matriculation Number

1 Introduction

some text: The data can be found in Section 3

2 Method

We estimate a vector autoregressive (VAR) model

$$\mathbf{y}_t = \mathbf{c} + \sum_{j=1}^{p} \mathbf{A}_j \mathbf{y}_{t-j} + \mathbf{u}_t;\ t = 1, 2, \ldots, T, \tag{1}$$

where $\mathbf{y}_t$ is a 2×1 vector containing output growth and inflation.[1] To identify supply and demand shocks, we use the implications of a simple AS-AD model and apply the Blanchard-Quah decomposition (Blanchard and Quah, 1989). Solving the identification problem requires to find the impact matrix $\mathbf{S}$, which links the structural shocks in $\boldsymbol{\epsilon}_t$ to the reduced form residuals in $\mathbf{u}_t$:

$$\mathbf{u}_t = \mathbf{S}\boldsymbol{\epsilon}_t. \tag{2}$$

The moving-average representation of the reduced-form VAR in equation (1) is

$$\mathbf{y}_t = \mathbf{B}(L)\mathbf{u}_t, \tag{3}$$

and for the structural model, we have

$$\mathbf{y}_t = \mathbf{C}(L)\boldsymbol{\epsilon}_t. \tag{4}$$

Because of equation (2),

$$\begin{aligned} \mathbf{B}(L)\mathbf{u}_t =& \mathbf{C}(L)\boldsymbol{\epsilon}_t; \\ \mathbf{B}(L)\mathbf{S}\boldsymbol{\epsilon}_t =& \mathbf{C}(L)\boldsymbol{\epsilon}_t; \\ \mathbf{B}(L)\mathbf{S} =& \mathbf{C}(L). \end{aligned} \tag{5}$$

[1] See e.g. Favero (2001, Chapter 6).

The relationship between the long-run multipliers is

$$\mathbf{B}(1)\mathbf{S} = \mathbf{C}(1). \tag{6}$$

Therefore, to find $\mathbf{S} = \mathbf{B}(1)^{-1}\mathbf{C}(1)$, we need $\mathbf{C}(1)$.

Pre- and postmultiplying the variance-covariance matrix $\mathbf{\Sigma}$ of the reduced form residuals $\mathbf{u}_t$ with $\mathbf{B}(1)$ and its transpose gives

$$\begin{aligned}\mathbf{B}(1)\mathbf{\Sigma}\mathbf{B}(1)' =& \mathbf{C}(1)\mathbf{S}^{-1}\mathbf{\Sigma}(\mathbf{S}')^{-1}\mathbf{C}(1)' = \\ =& \mathbf{C}(1)\mathbf{S}^{-1}\mathbf{S}\mathbf{S}'(\mathbf{S}')^{-1}\mathbf{C}(1)' = \\ =& \mathbf{C}(1)\mathbf{C}(1)'.\end{aligned} \tag{7}$$

If we assume a lower-triangular structure for $\mathbf{C}(1)$,[2] we can use the Cholesky decomposition of $\mathbf{B}(1)\mathbf{\Sigma}\mathbf{B}(1)'$ to recover $\mathbf{C}(1)$.

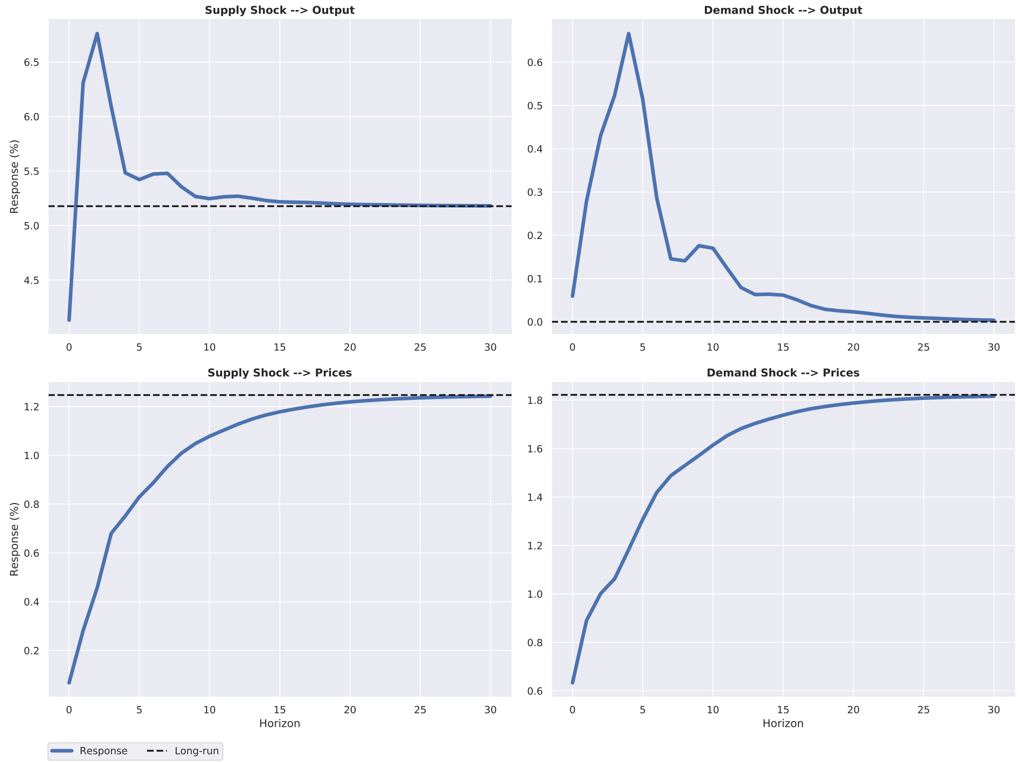
3 The Data

- Price index:
  - 1700-1823: Schumpeter (1938), in Mitchell and Deane (1971, p. 468-469)
  - 1823-1913: Mitchell (2003, p. 863-864)
- Industrial production: Crafts and Harley (1992, p. 725-727)

[2] Output is only affected by supply shocks, while the price level reacts to both demand and supply shocks.

4 Results

Figure 1: Impulse Responses



To be discussed.

References

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