Apr 12th, 1:50 PM

Monetary Policy in China: A Factor Augmented VAR Approach

Boniface Yemba
Marshall University, yemba@marshall.edu

Biyan Tang
University of Massachusetts at Dartmouth

Erick Kitenge
Central State University

Apr 12th, 1:50 PM

Monetary Policy in China: A Factor Augmented VAR Approach

Boniface Yemba
Marshall University, yemba@marshall.edu

Biyan Tang
University of Massachusetts at Dartmouth

Erick Kitenge
Central State University

Monetary Policy in China: A Factor Augmented VAR Approach

Boniface Yemba[4]
Biyan Tang [5]
Erick Kitenge [6]

Marshall University
Research Day

April 12, 2019

[4]Lewis College of Business, Marshall University, email:yemba@marshall.edu
[5]Department of Economics, University of Massachusetts Dartmouth, email: btang@umassd.edu
[6]Central State University, email:ekitenge@centralstate.edu

- Motivations
- Chinese Economy at a glance
- Divisia Monetary Aggregates
- Model
- Preliminary Results

Motivations

- Change in structure of the Chine economy since 2006-2007.
- Dong He and Honglin Wang (2012 CER): Dual truck interest rates (Bank deposit and lending rate)
- Qing He et al. (2013 CER): Open economy FAVAR
  - Repo rate, lending rate, and a market-based monetary stance have little impact on the economy when the exchange rate is more market-determined.
  - growth rates of total loan and money supply have impact on real economy and price when the exchange rate is not market-determined
- Fernald et al. (2014 JIMF): Closed economy FAVAR
  - Bank reserve requirement ratio and interest rate (benchmark rate) have impact on real economy and price
  - Lending and Money supply levels have little impact on Chinese economy

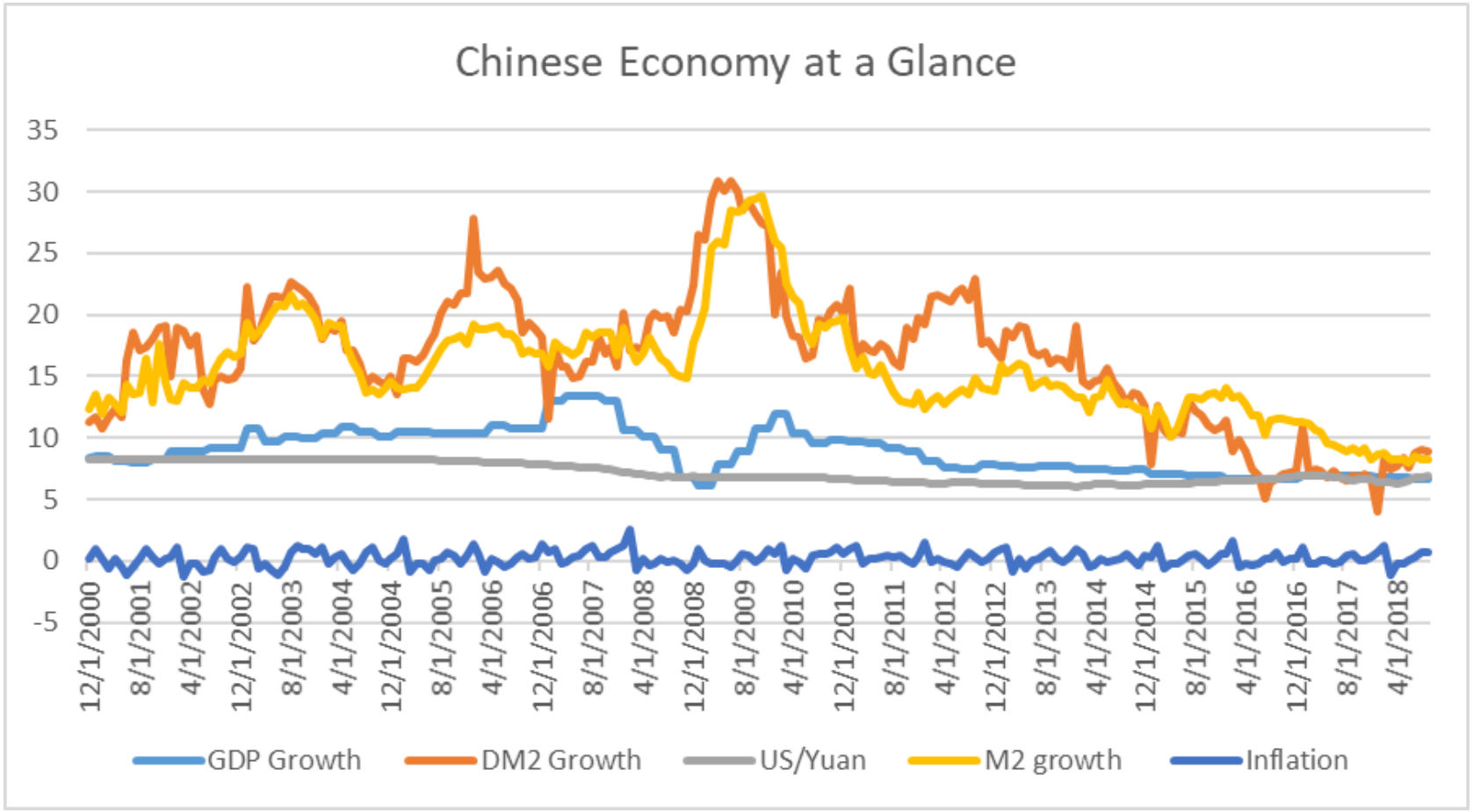
Motivations (cont.)

- Rongrong Sun (2015 JIMF): Two stage VAR
  - People's Bank of Chinese's operating procedures have evolved over time (2006)
  - Operating procedures are neither pure interest rate targeting nor pure reserves targeting, but a mixture.
  - Proposes a composite procedure: money market interest rate, excess reserve ratio and required reserve ratio
- Hongyi Chen et al. (2017 CER): A Qual VAR vs regular VAR
  - Transmission of monetary Policy impulses to the rest of the economy is similar to the transmission process in advanced economies (output growth and inflation)
- This paper proposes two policy instruments: Divisia Monetary Aggregates (composite instrument: money quantity and interest rates) and Change in exchange rate RMB/US Dollar (net exports as source of growth in China)
- We use three blocks FAVAR (rest of the world (USA), real economy activities, and Prices)

Motivations (cont.)

- Rongrong Sun (2015 JIMF): Two stage VAR
  - People's Bank of Chinese's operating procedures have evolved over time (2006)
  - Operating procedures are neither pure interest rate targeting nor pure reserves targeting, but a mixture.
  - Proposes a composite procedure: money market interest rate, excess reserve ratio and required reserve ratio
- Hongyi Chen et al. (2017 CER): A Qual VAR vs regular VAR
  - Transmission of monetary Policy impulses to the rest of the economy is similar to the transmission process in advanced economies (output growth and inflation)
- This paper proposes two policy instruments: Divisia Monetary Aggregates (composite instrument: money quantity and interest rates) and Change in exchange rate RMB/US Dollar (net exports as source of growth in China)
- We use three blocks FAVAR (rest of the world (USA), real economy activities, and Prices)

China Economy at a glance



Divisia Monetary Aggregates

- The alternative measure of money, Divisia Monetary Aggregate Index, proposed by William Barnett (1978, 1980), has the advantage over "simple sum" since it considers both the prices (foregone interest rates) and quantities of monetary assets' liquidity services (money aggregate).
- User Cost of monetary asset i is

$$\pi_{it} = \frac{P_t(R_t - r_{it})}{(1 + R_t)}$$

where R_t is the benchmark rate at time t, r_{it} is asset $i's$ own rate of return at time t, and P_t is the price index.

- The benchmark rate is the highest rate of return over the class of monetary assets.

FAVAR

- Following Boivin, Giannoni, and Stevanovic (2010), the state space representation of an extended FAVAR model is

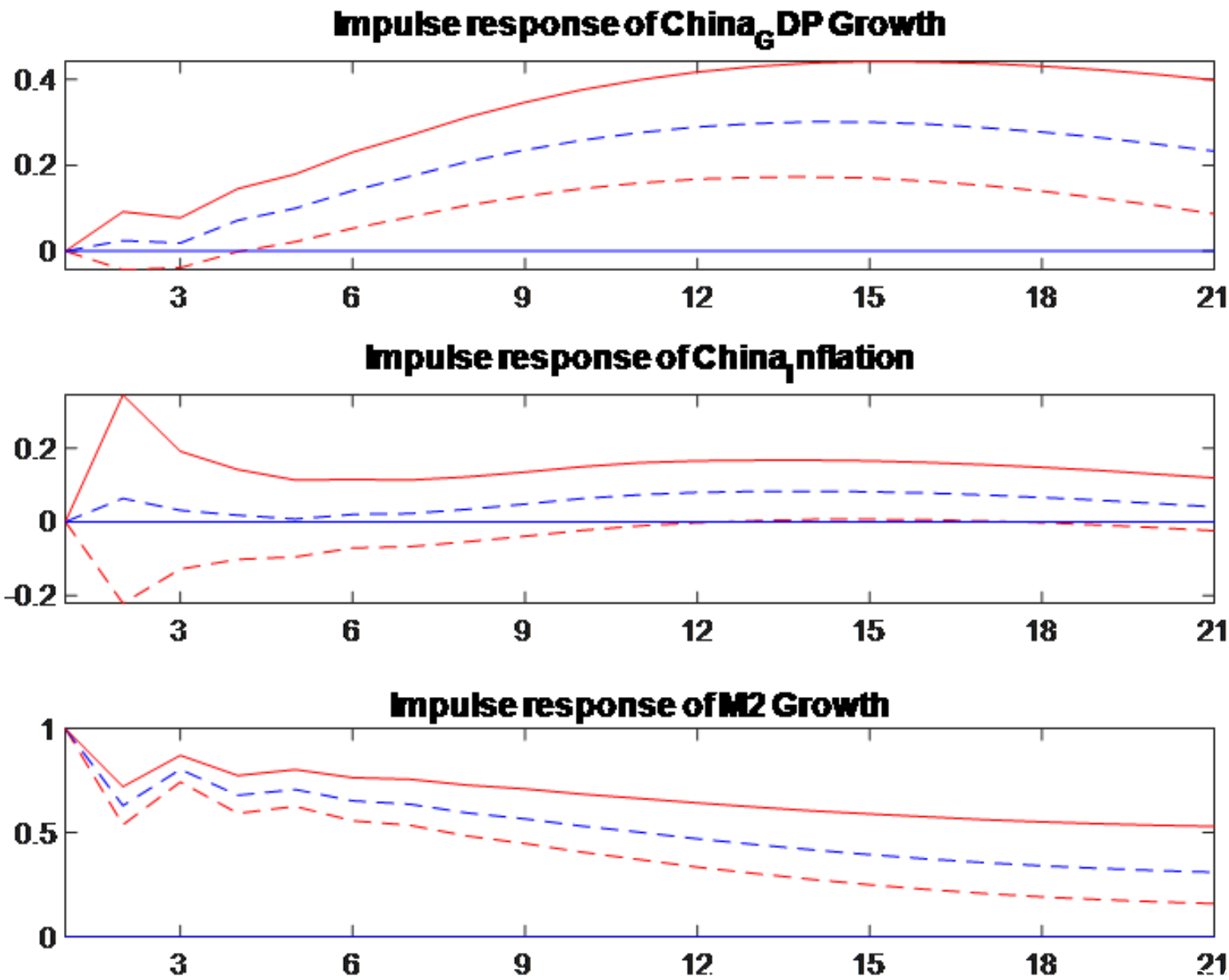
$$\begin{bmatrix} F_t \\ Y_t \end{bmatrix} = \Phi(L) \begin{bmatrix} F_{t-1} \\ Y_{t-1} \end{bmatrix} + \begin{bmatrix} e_t^* \\ e_t \end{bmatrix} \tag{1}$$

- F_t is unobserved variables while Y_t is observable in regular VAR

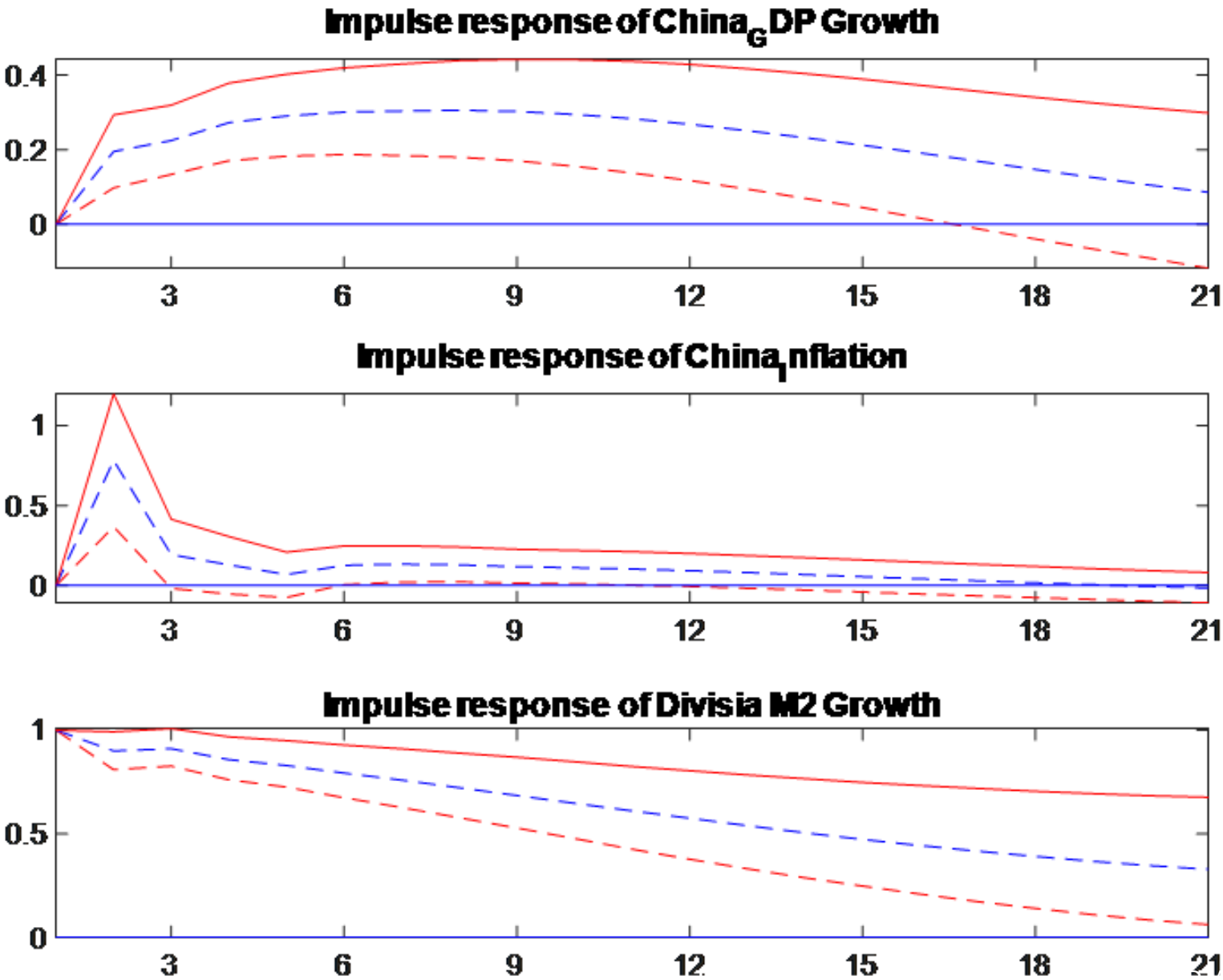
Data

- We use data at two frequencies, quarterly and monthly from December 2000 to April 2018.
- Y_t includes US GDP growth, US Inflation, US Fed Fund Rate, Chinese GDP Growth, Chinese Inflation, Policy Instrument
- F_t includes 118 time series
- We get data from St Louis Fred, IMF, and other sources

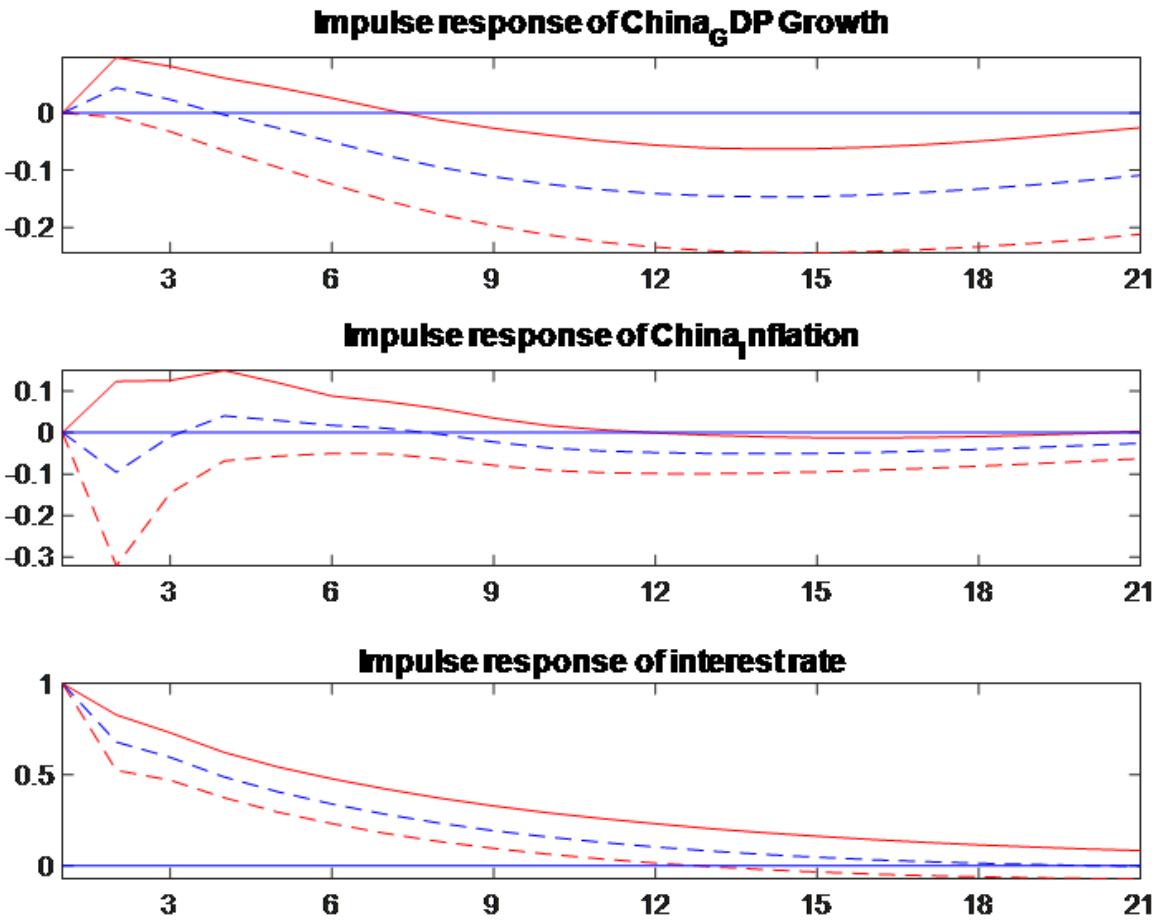
Results


Impulse response of China_GDP Growth
0.4
0.2
0
3
6
9
12
15
18
21
Impulse response of China_Inflation
0.2
0
-0.2
3
6
9
12
15
18
21
Impulse response of M2 Growth
1
0.5
0
3
6
9
12
15
18
21

Results

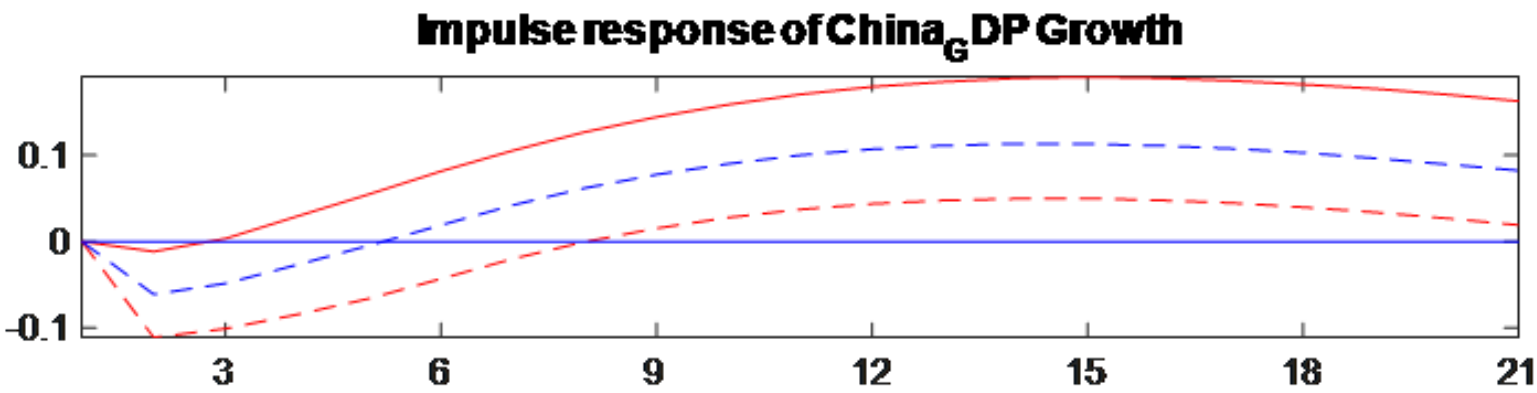

Impulse response of China_GDP Growth
0.4
0.2
0
3
6
9
12
15
18
21
Impulse response of China_Inflation
1
0.5
0
3
6
9
12
15
18
21
Impulse response of Divisia M2 Growth
1
0.5
0
3
6
9
12
15
18
21

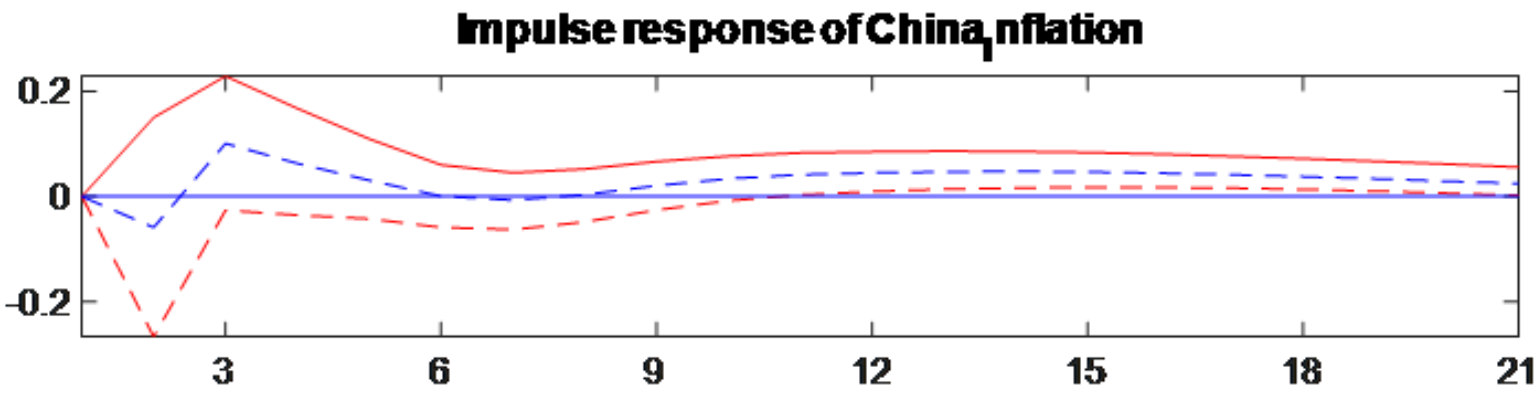
Results

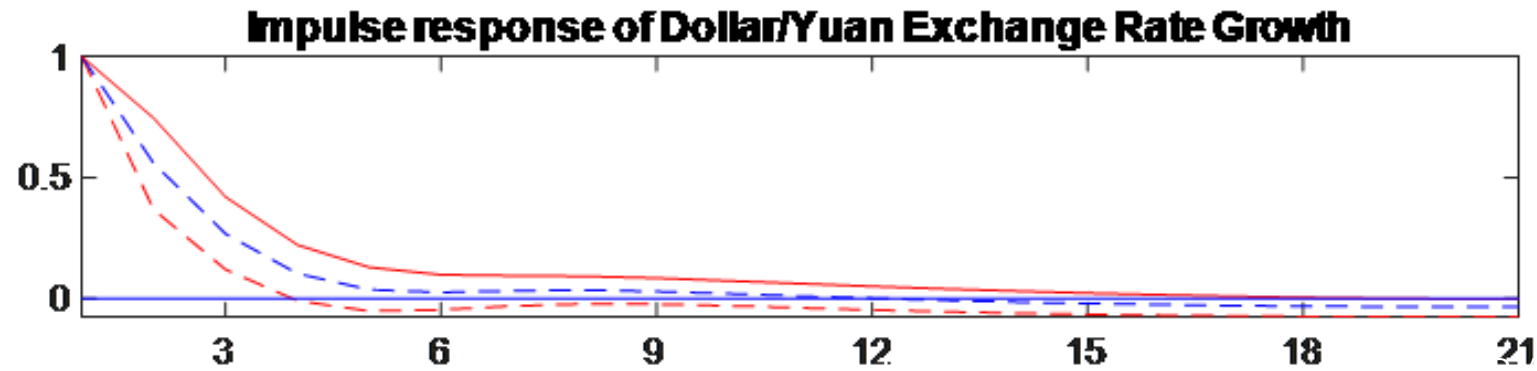


Rate.png

Results


Impulse response of China GDP Growth
0.1
0
-0.1
3
6
9
12
15
18
21


Impulse response of China Inflation
0.2
0
-0.2
3
6
9
12
15
18
21


Impulse response of Dollar/Yuan Exchange Rate Growth
1
0.5
0
3
6
9
12
15
18
21

Results

- Divisia M2 is the only instrument that performed better than others instruments (statistically and economically significant with delay)
- Growth Rate of RMB/USD has a significant impact on GDP growth(without delay) and inflation (with delay)
- Benchmark interest rate has a significant impact on both GDP growth and inflation with delay
- Simple sum M2 has only a significant impact on GDP growth.
- Further work: Extend the analysis by using a FAVAR model with structure change to take into account that the structure change in 2006-2007/

Thank you very much!!!