

# A Small Open Economy Model

## Assessing the Role of Monetary Policy in Egypt

### This Paper

- ▷ Context:
  - Economic reforms, including free floating of the EGP on November 3, 2016.
- ▷ Objective:
  - Build a SOE model of the Egyptian economy to understand its monetary policy transmission mechanisms.
- ▷ Question:
  - Can the interest rate be used to stabilize the business cycle in Egypt?

### Data

- ▷ Quarterly data, 2002q1 to 2017q2.
- ▷ Real GDP growth rate, inflation rate, monetary policy interest rate:
  - Central Bank of Egypt and International Financial Statistics.
- ▷ Real effective exchange rate:
  - Bruegel (138 trading partners).
- ▷ Capital flows availability (FDI and Portfolio):
  - EU28 (excl. Austria, Cyprus, Luxembourg and Belgium), USA, China, Saudi Arabia.
  - IFS and UNCTAD (for FDI 2001-2004).
- ▷ Trading partners' real GDP growth rate:
  - EU28, USA, ASEAN + China, Japan and Korea, Arab league (excl. Somalia, Tunisia, Libya, Syria and Qatar).
  - IFS and WDI, weighted using International Trade Centre database.

### Simultaneous Equations Approach

#### Model

$$y_t = \alpha_1 + \alpha_2 y_{t+1} + \alpha_3 y_{t-1} + \alpha_4 y_{t-1}^* + \alpha_5 capflows_{t-1} + \alpha_6 reer_{t-1} + \alpha_7 mpr_{t-1} + \varepsilon_t \quad (1)$$

$$mpr_t = \beta_1 + \beta_2 \pi_{t+1} + \beta_3 y_t + \beta_4 mpr_{t-1} + \beta_5 mpr_{t-2} + \mu_t \quad (2)$$

$$\pi_t = \gamma_1 + \gamma_2 \pi_{t+1} + \gamma_3 y_{t-1} + \gamma_4 reer_{t-1} + \gamma_5 \pi_{t-1} + \gamma_6 \pi_{t-2} + u_t \quad (3)$$

$$reer_t = \delta_1 + \delta_2 y_t + \delta_3 reer_{t-1} + \delta_4 reer_{t-2} + v_t \quad (4)$$

- ▷ Estimation method: Three-stage least squares.

#### Results

	$y_t$	$mpr_t$	$\pi_t$	$reer_t$
$y_{t+1}$	0.37*** (0.01)	$\pi_{t+1}$	0.03*** (0.01)	$y_t$
$y_{t-1}$	0.32*** (0.01)	$y_t$	-0.02** (0.01)	$y_{t-1}$
$y_{t-1}^*$	-0.33** (0.16)	$mpr_{t-1}$	1.58*** (0.09)	$reer_{t-1}$
$capflows_{t-1}$	-0.01 (0.01)	$mpr_{t-2}$	-0.61*** (0.01)	$\pi_{t-1}$
$reer_{t-1}$	-0.05** (0.02)			$\pi_{t-2}$
$mpr_{t-1}$	-1.03*** (0.37)			
constant	0.39*** (0.15)	0.00 (0.00)	0.07 (0.05)	0.15 (0.21)
Observations	58	58	58	58
R-squared	0.617	0.954	0.917	0.927
Chi-squared	100.38	1300.29	696.23	764.99
Estimation method	3SLS	3SLS	3SLS	3SLS

Note:  $y$ ,  $y^*$ ,  $\pi$  and  $mpr$  are in units,  $capflows$  and  $reer$  are in logarithm.  
An increase in the  $reer$  denotes an appreciation of the domestic currency.  
Standard errors in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

### Structural VAR Approach

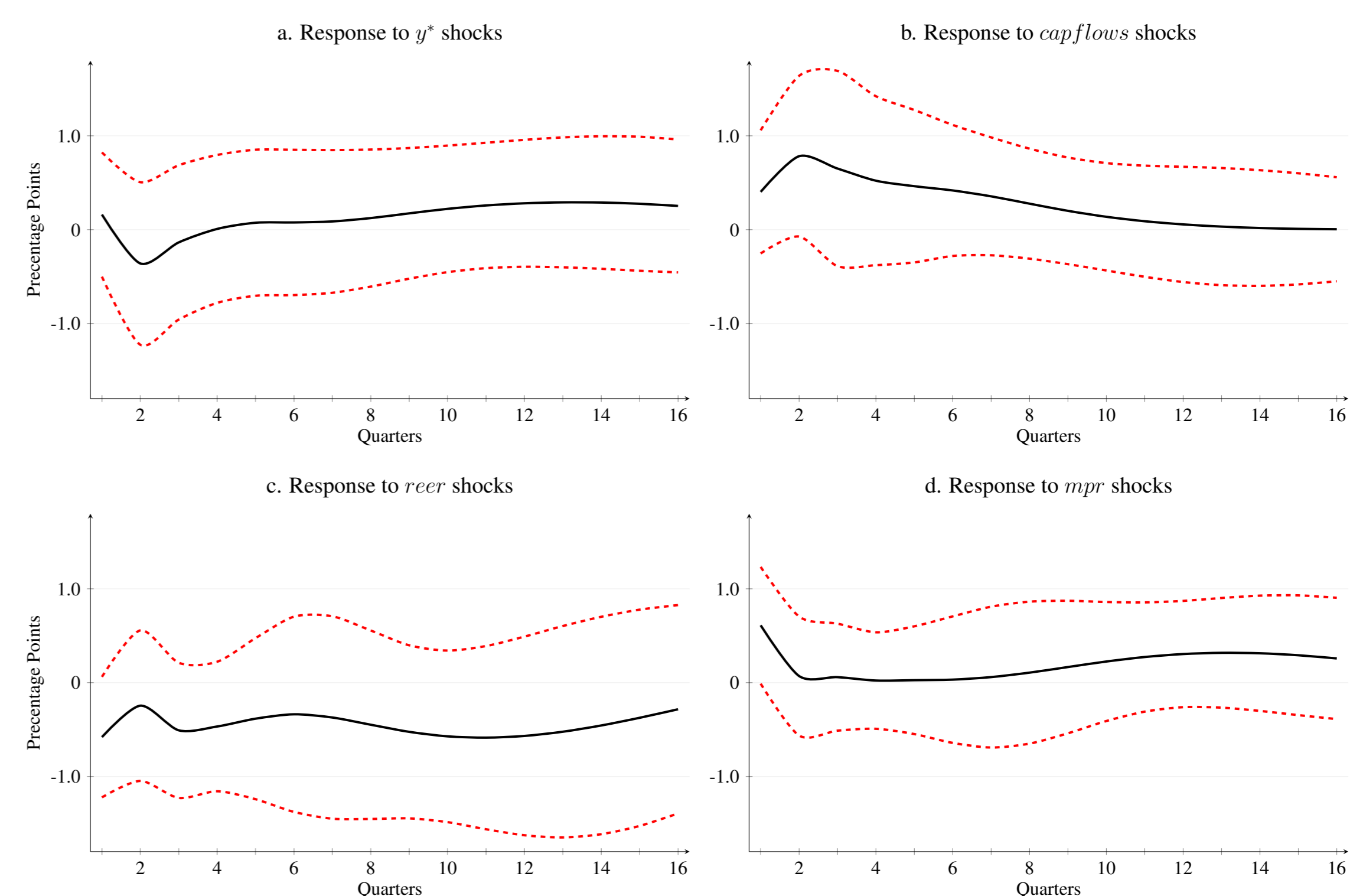
#### Model

- ▷ Identification strategy:
  - 6 equations, 2 lags.
  - Block exogeneity restriction, Choleski decomposition.

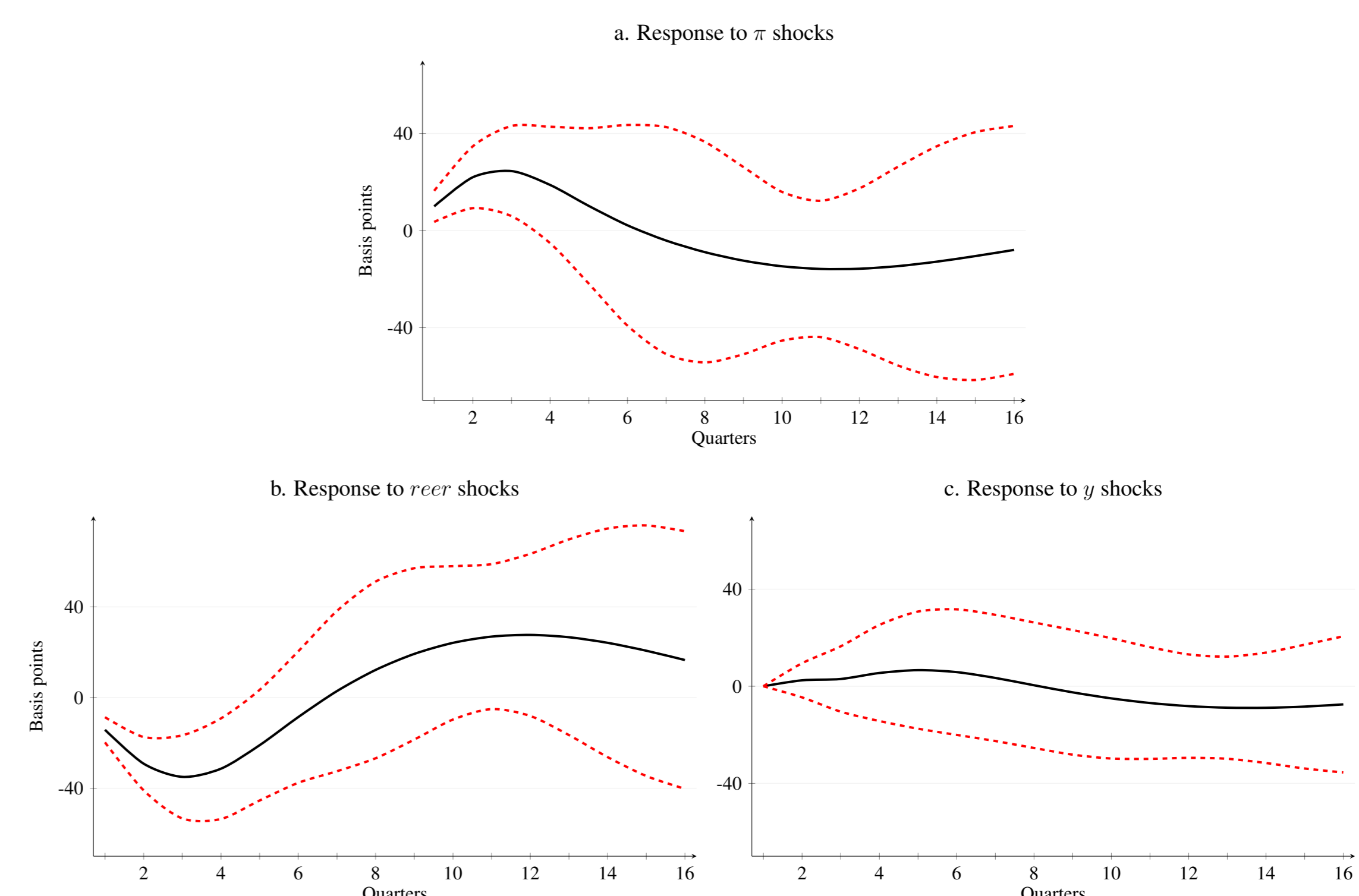
- ▷ Identifying assumptions:

1. Availability of capital flows reacts contemporaneously to the output of the trading partners, opposite is not true.
2. All domestic variables react contemporaneously to the international variables.
3. Monetary policy rate responds contemporaneously to the variables that can be observed in the short term, such as prices and the exchange rate, but not to activity.
4. Prices of goods respond contemporaneously to the variables that affect them directly, the international prices.
5. Real effective exchange rate responds contemporaneously to the variables that directly affect it, i.e. international and domestic prices of G&S.
6. Real GDP responds to all the other variables but can only affect them with a lag.

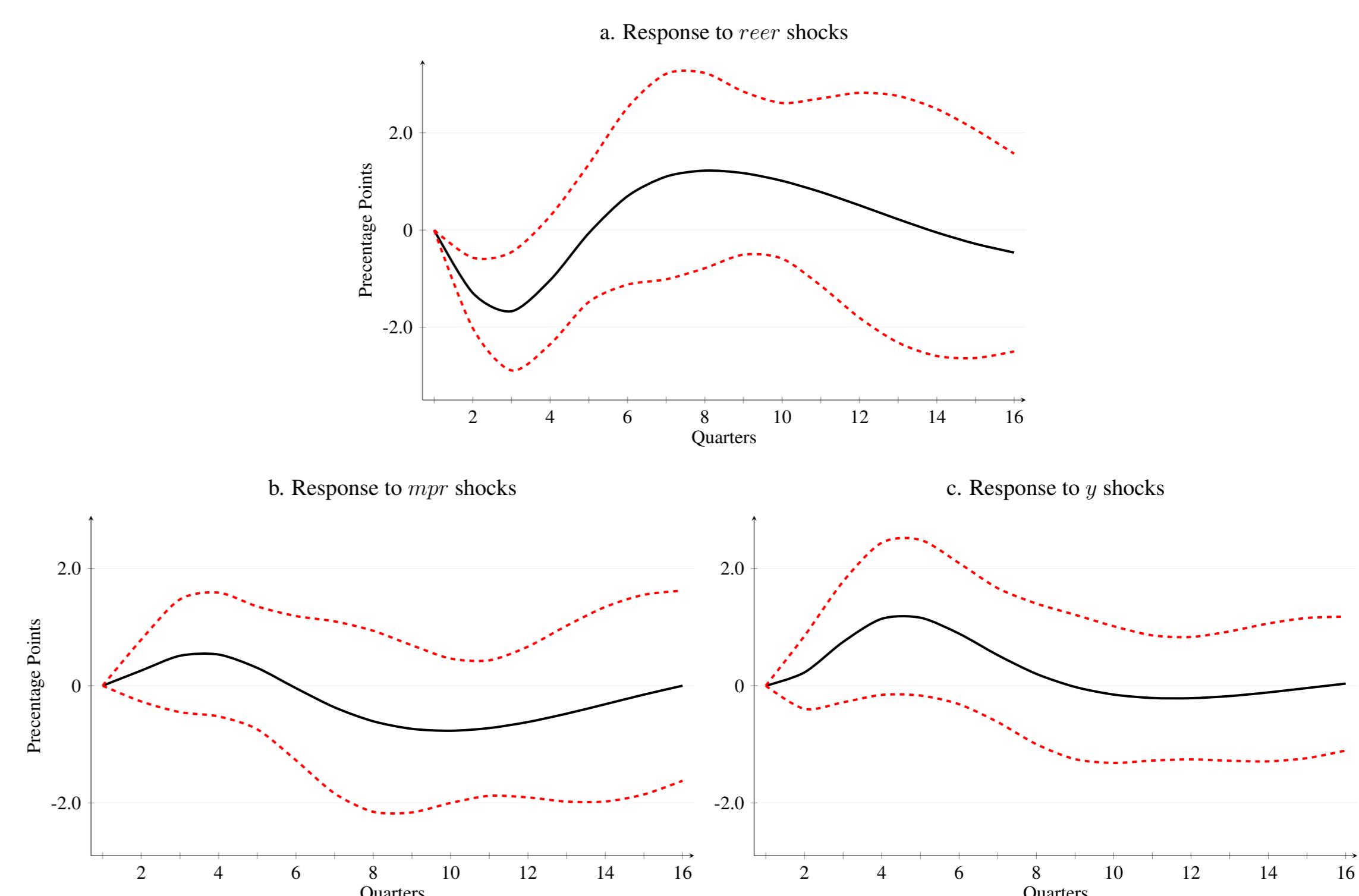
#### Real GDP Response



#### Monetary Policy Rate Response



#### Inflation Rate Response



### Main Results

- ▷ Fiscal policy is a key driver of the business cycle in Egypt.
- ▷ Real effective exchange rate, instead of interest rate, appears to be the main monetary policy transmission channel.
- ▷ Role of the external sector is ambiguous, evidences suggest that Egypt is only weakly dependent on the external sector.
- ▷ Monetary policy is procyclical over the period.