

# Online supplement to "Identifying Global and National Output and Fiscal Policy Shocks Using a GVAR"

Alexander Chudik      M. Hashem Pesaran      Kamiar Mohaddes

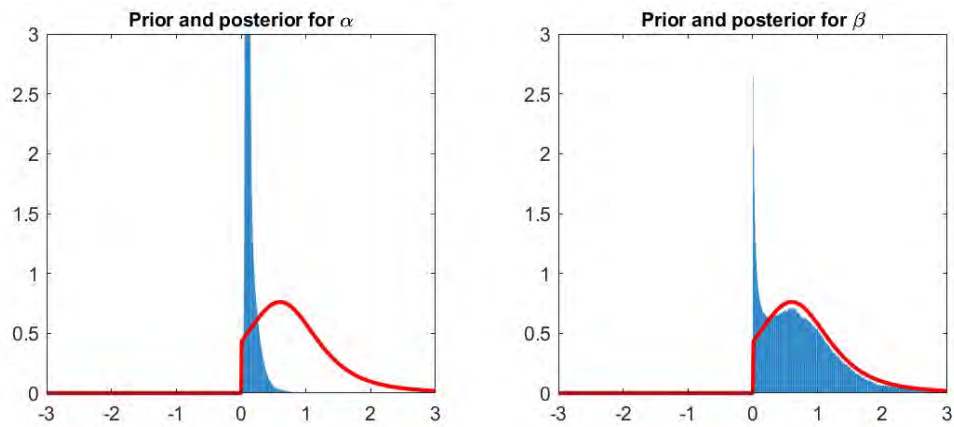
December 2018

This online supplement is organized in two sections. Section **S1** presents figures for the prior and posterior distributions of country-specific parameters  $\alpha_i$  and  $\beta_i$ , for  $i = 1, 2, \dots, N$ , and summary measures of posterior distribution of the effects of technology and fiscal policy shocks. Section **S2** provides figures for the comparison of the effects of national technology and fiscal policy shocks in models with and without global shocks.

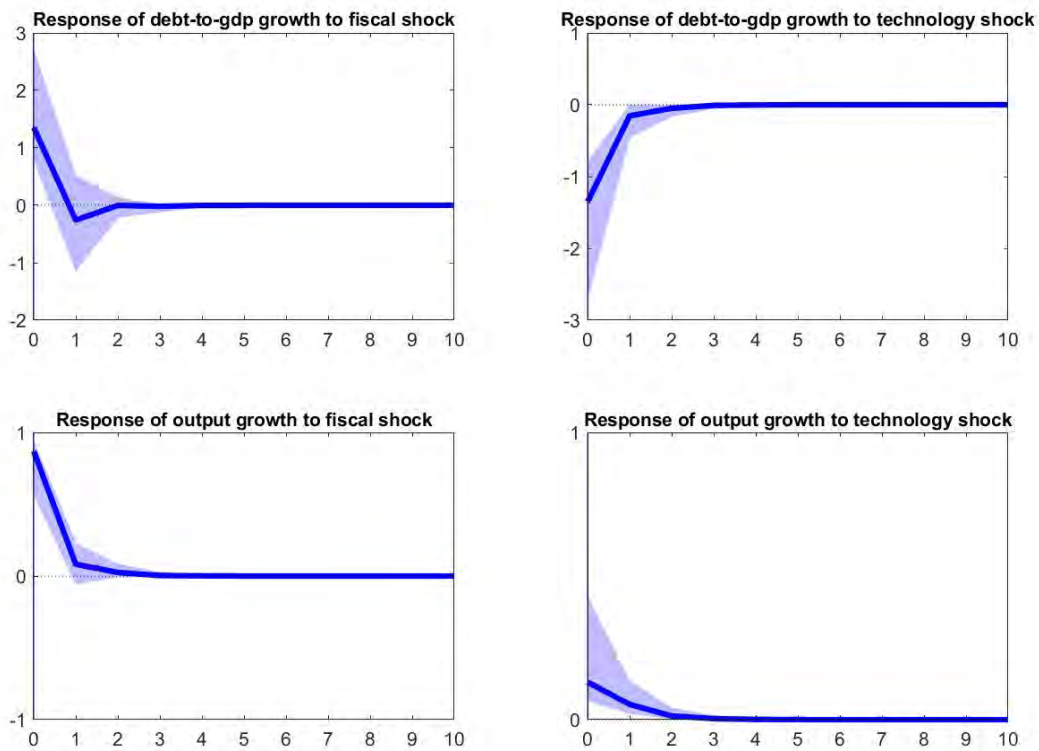
# S1 The prior and posterior distributions of parameters $\alpha$ and $\beta$ , and summary measures of posterior distribution of the effects of technology and fiscal policy shocks

Figure S1: Posterior distributions of parameters  $\alpha$  and  $\beta$ , and the effects of 1 percent technology and fiscal policy shocks for Argentina

Posterior distributions of parameters  $\alpha$  and  $\beta$

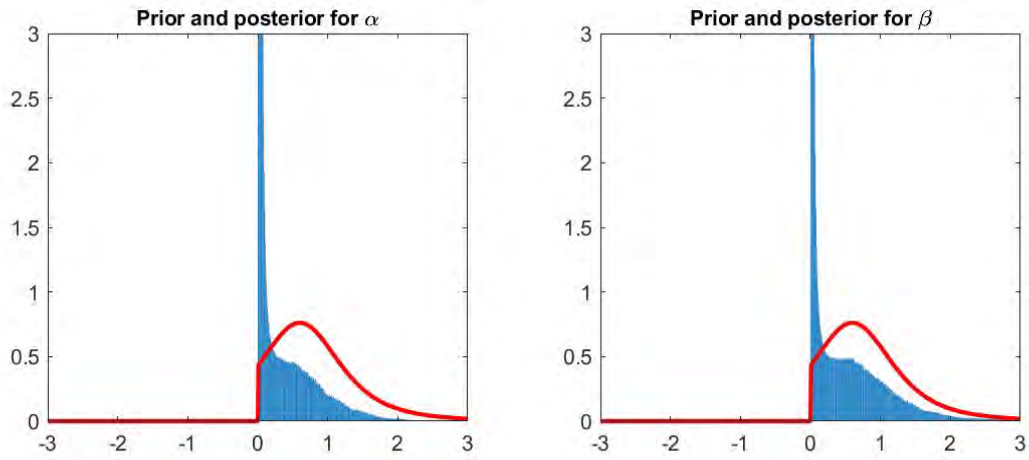


Posterior median (solid line) and 80 percent credible sets for the effects of 1 percent technology and fiscal policy shocks

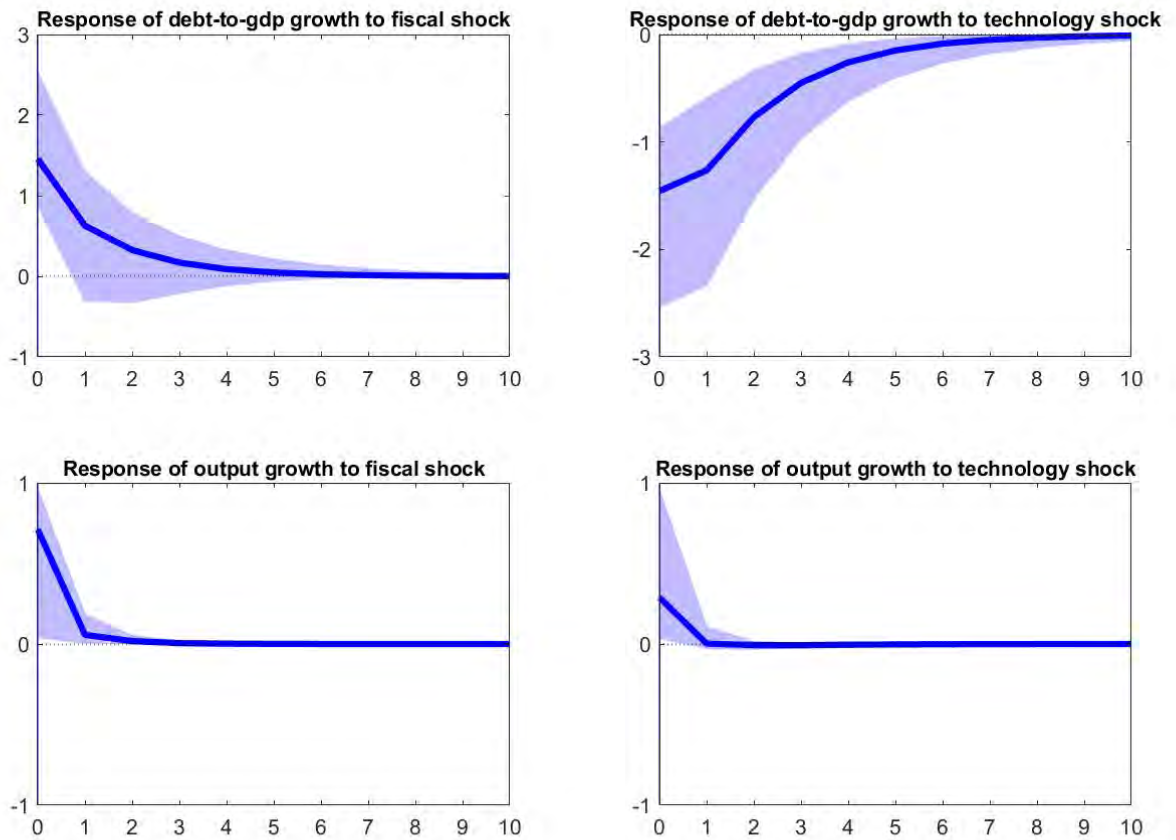


**Figure S2: Posterior distributions of parameters  $\alpha$  and  $\beta$ , and the effects of 1 percent technology and fiscal policy shocks for Australia**

Posterior distributions of parameters  $\alpha$  and  $\beta$

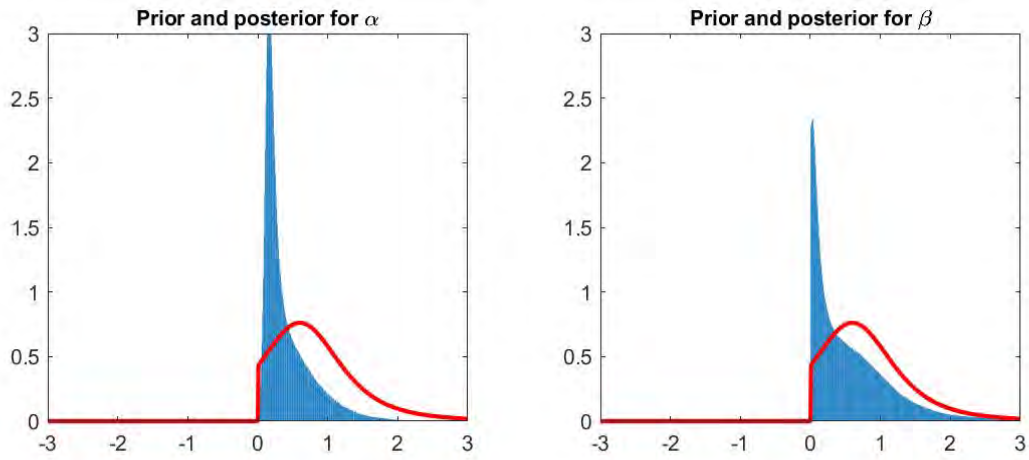


Posterior median (solid line) and 80 percent credible sets for the effects of 1 percent technology and fiscal policy shocks

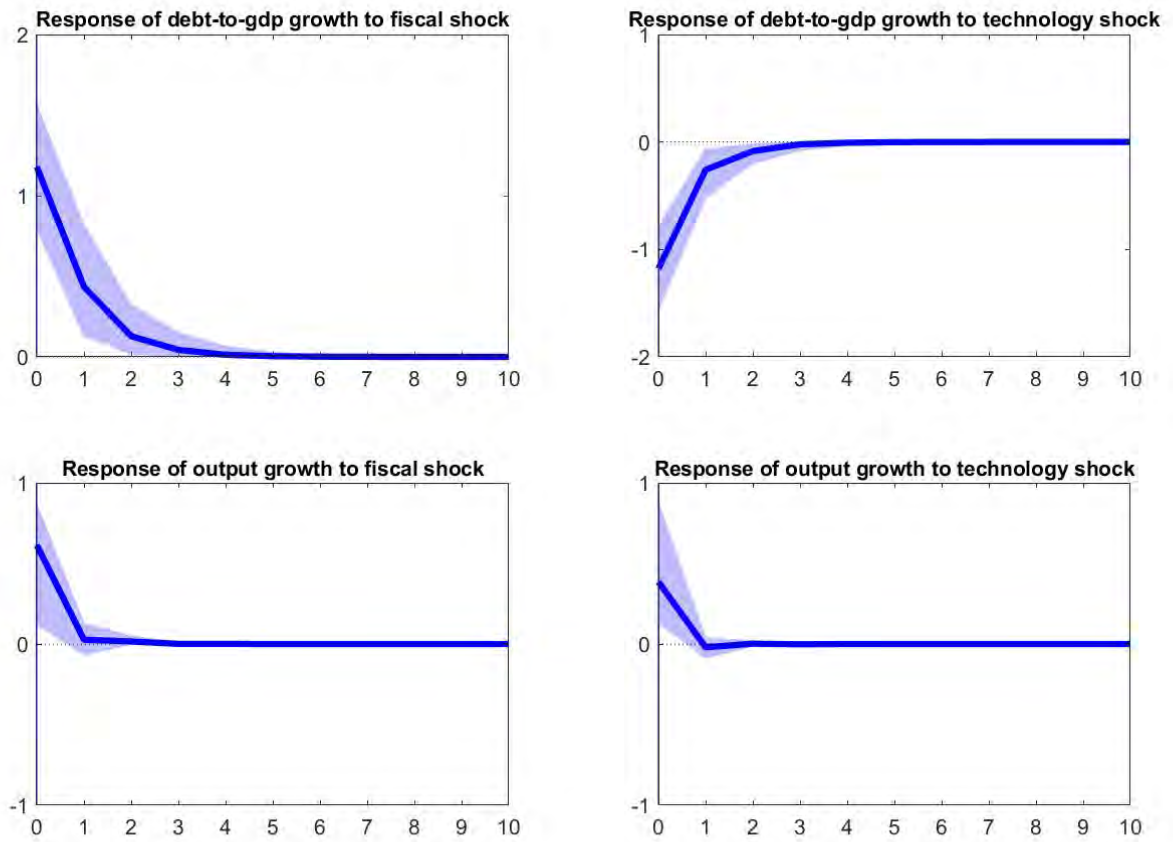


**Figure S3: Posterior distributions of parameters  $\alpha$  and  $\beta$ , and the effects of 1 percent technology and fiscal policy shocks for Austria**

Posterior distributions of parameters  $\alpha$  and  $\beta$

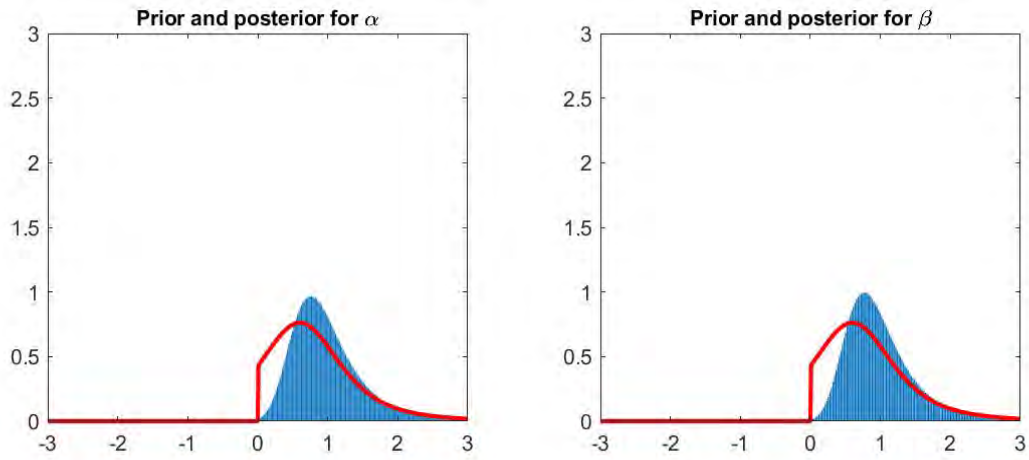


Posterior median (solid line) and 80 percent credible sets for the effects of 1 percent technology and fiscal policy shocks

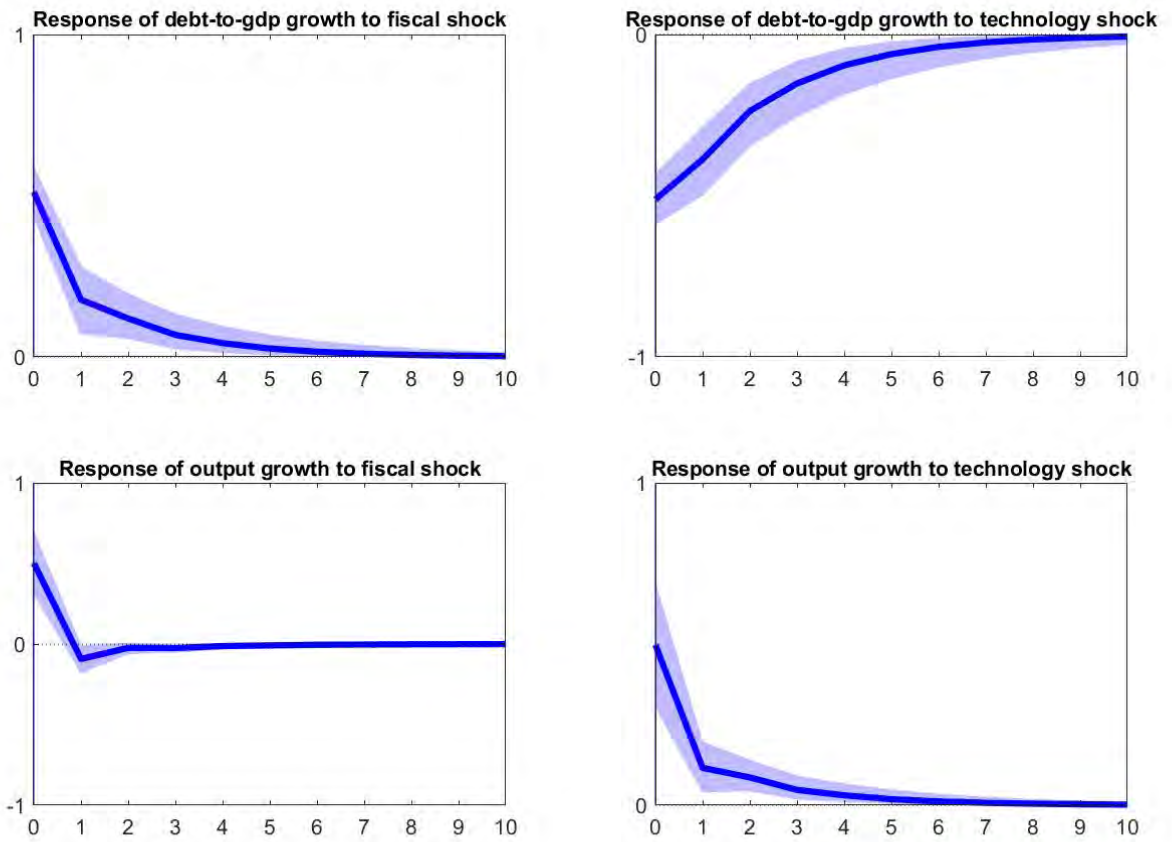


**Figure S4: Posterior distributions of parameters  $\alpha$  and  $\beta$ , and the effects of 1 percent technology and fiscal policy shocks for Belgium**

Posterior distributions of parameters  $\alpha$  and  $\beta$

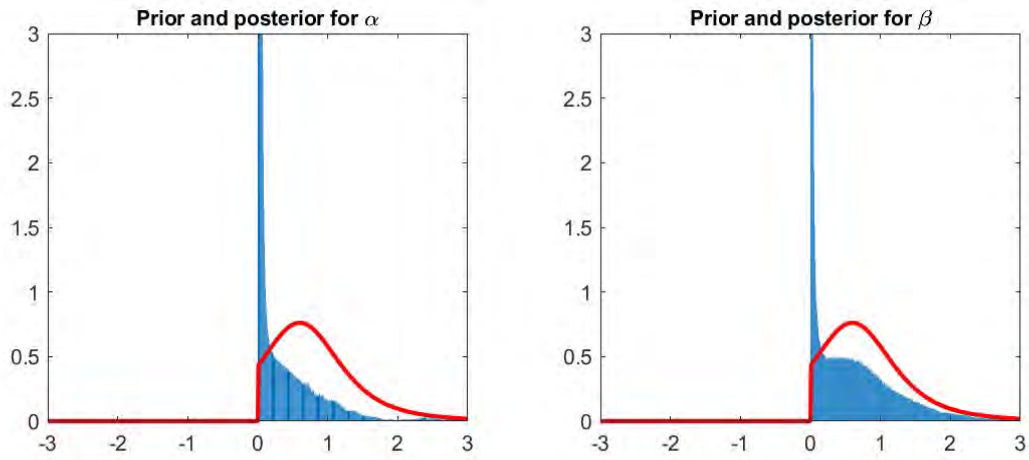


Posterior median (solid line) and 80 percent credible sets for the effects of 1 percent technology and fiscal policy shocks

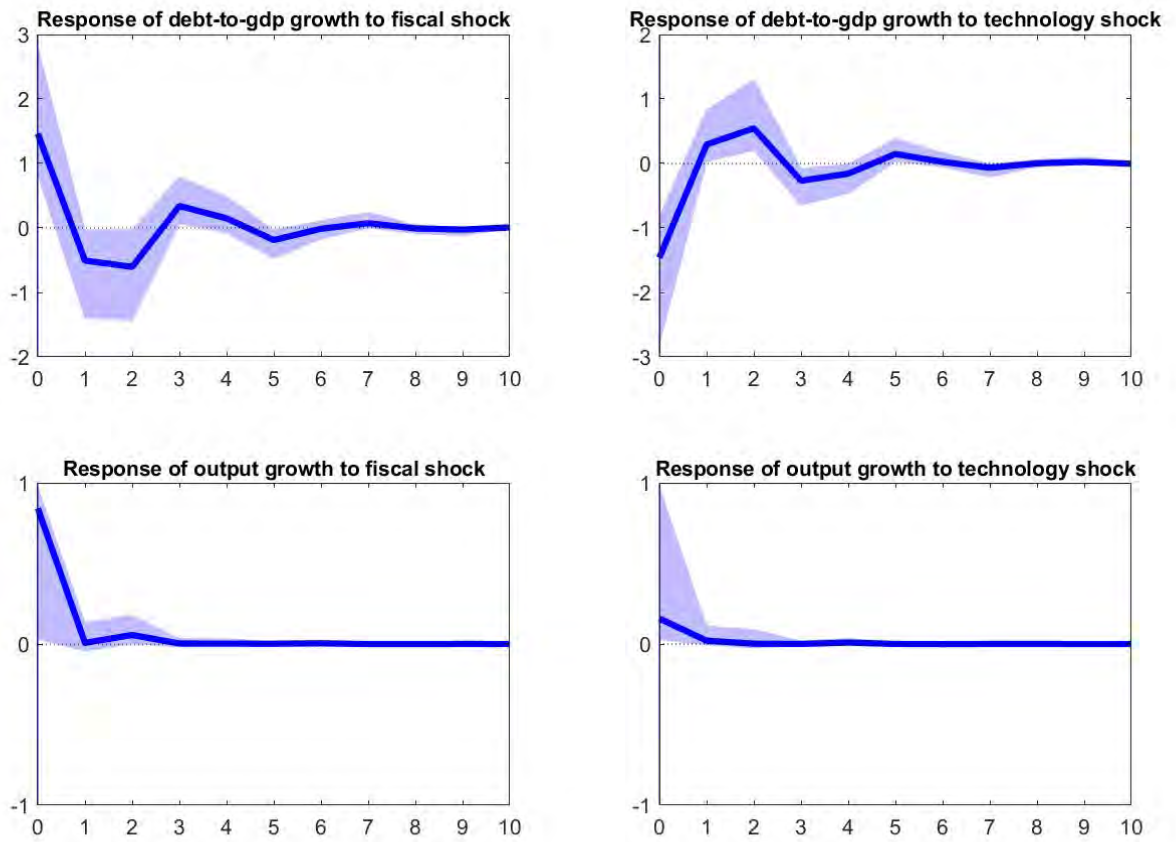


**Figure S5: Posterior distributions of parameters  $\alpha$  and  $\beta$ , and the effects of 1 percent technology and fiscal policy shocks for Brazil**

Posterior distributions of parameters  $\alpha$  and  $\beta$

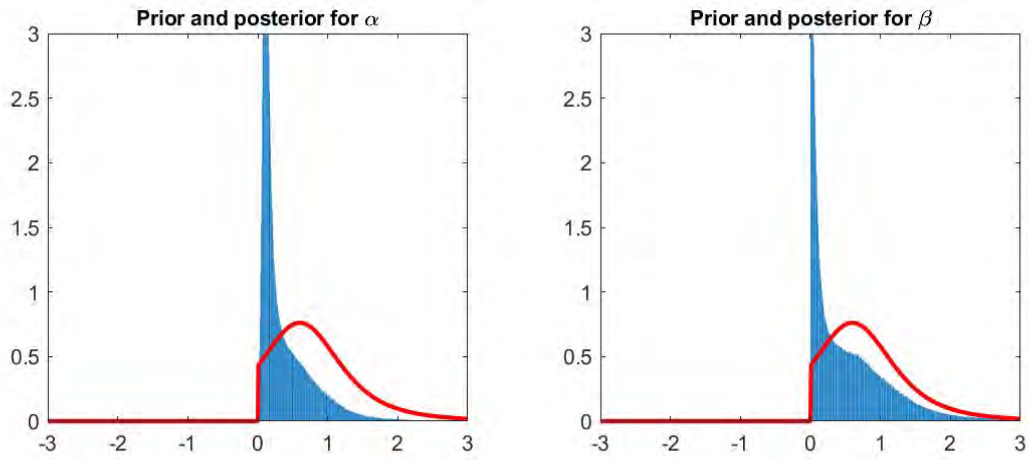


Posterior median (solid line) and 80 percent credible sets for the effects of 1 percent technology and fiscal policy shocks

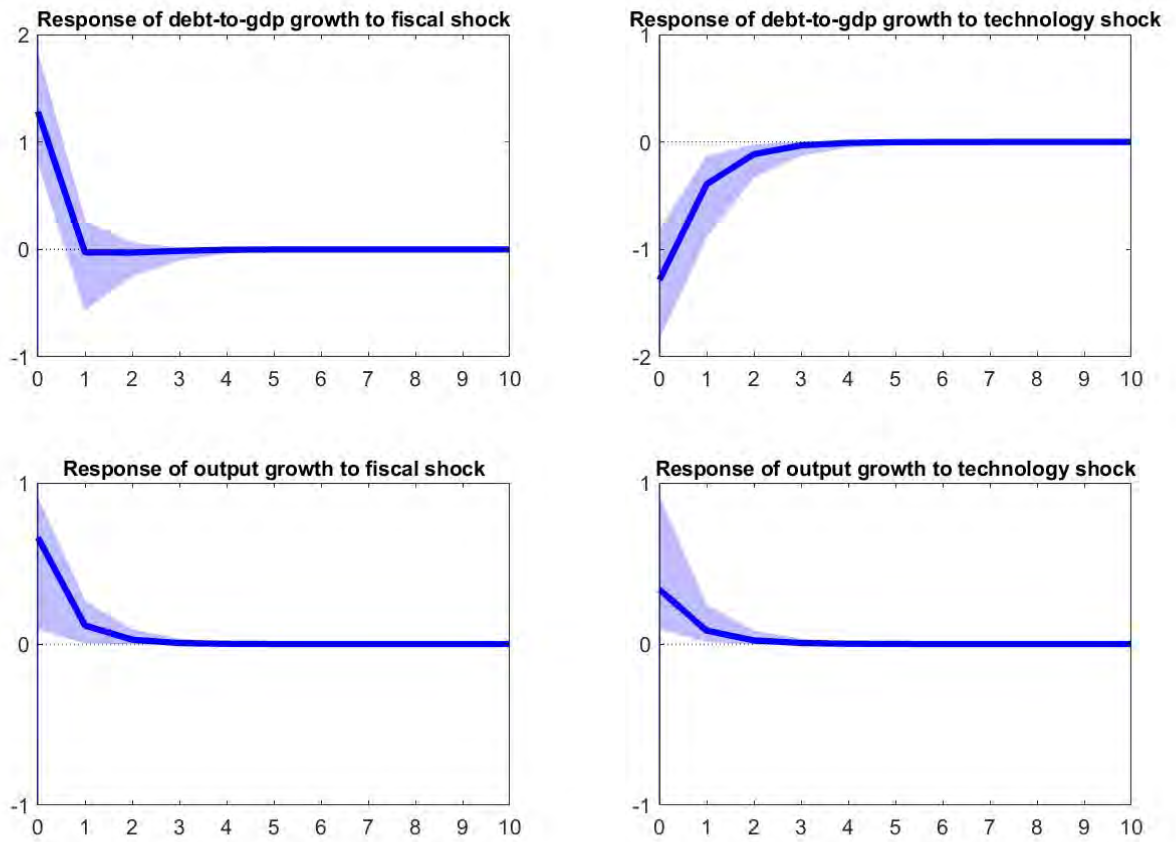


**Figure S6: Posterior distributions of parameters  $\alpha$  and  $\beta$ , and the effects of 1 percent technology and fiscal policy shocks for Canada**

Posterior distributions of parameters  $\alpha$  and  $\beta$

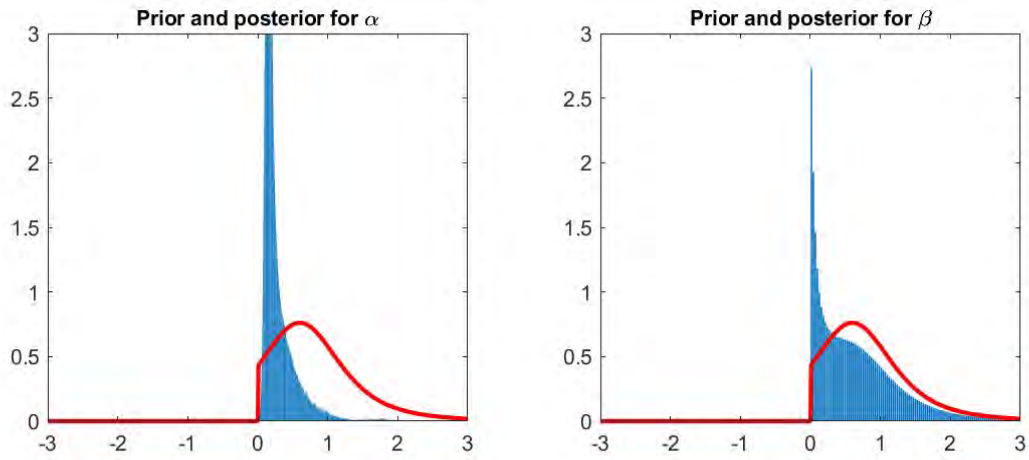


Posterior median (solid line) and 80 percent credible sets for the effects of 1 percent technology and fiscal policy shocks

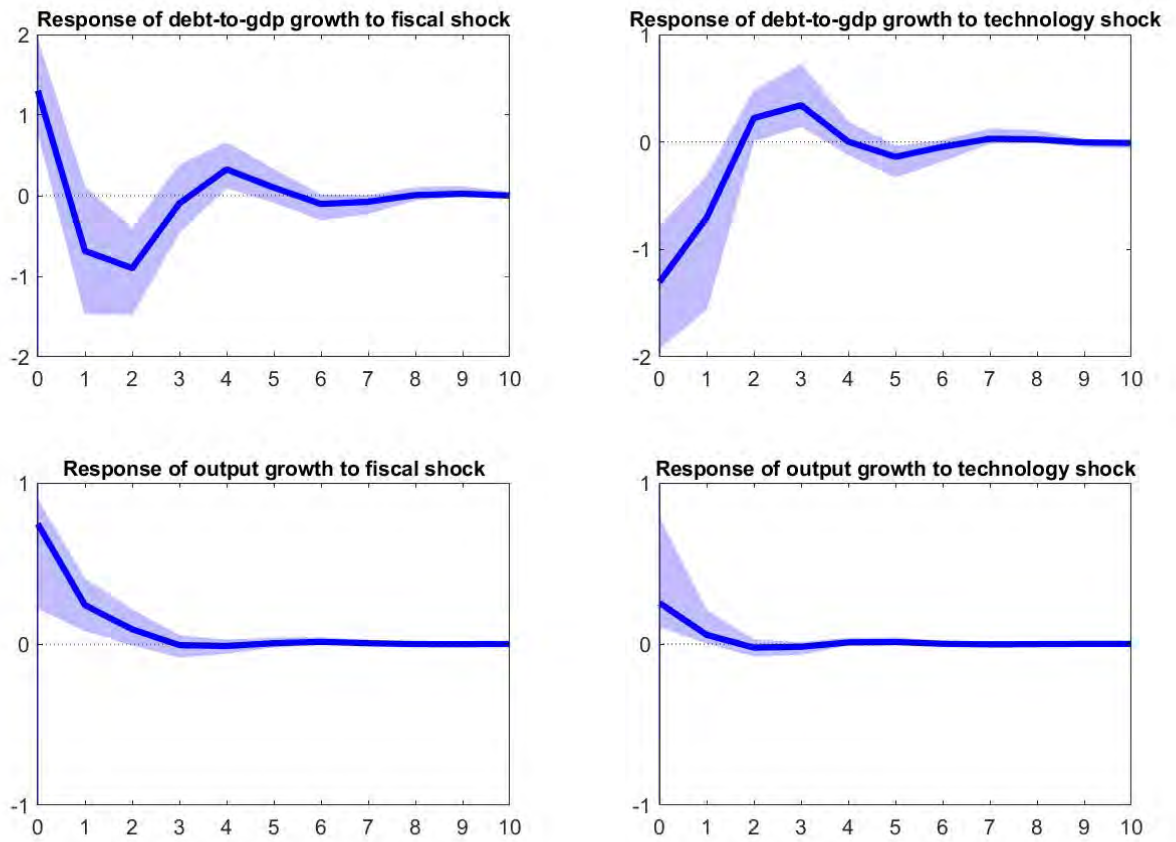


**Figure S7: Posterior distributions of parameters  $\alpha$  and  $\beta$ , and the effects of 1 percent technology and fiscal policy shocks for Chile**

Posterior distributions of parameters  $\alpha$  and  $\beta$



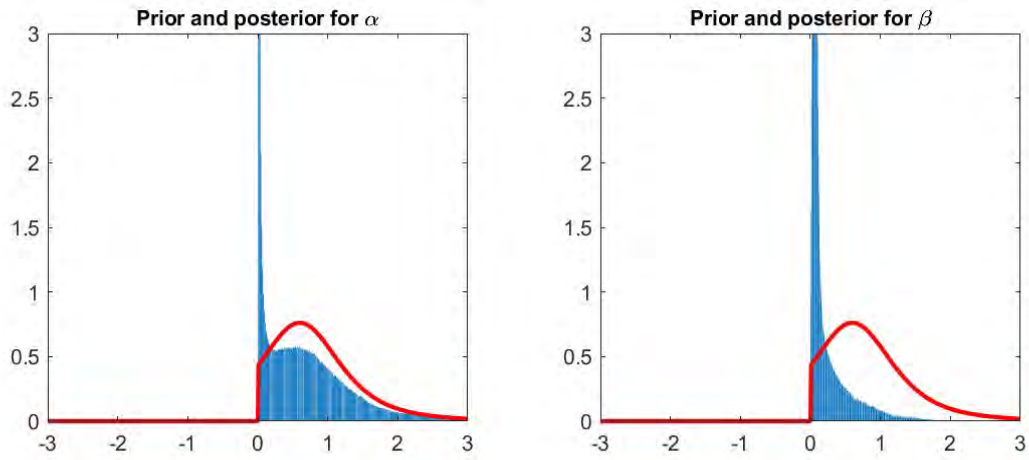
Posterior median (solid line) and 80 percent credible sets for the effects of 1 percent technology and fiscal policy shocks



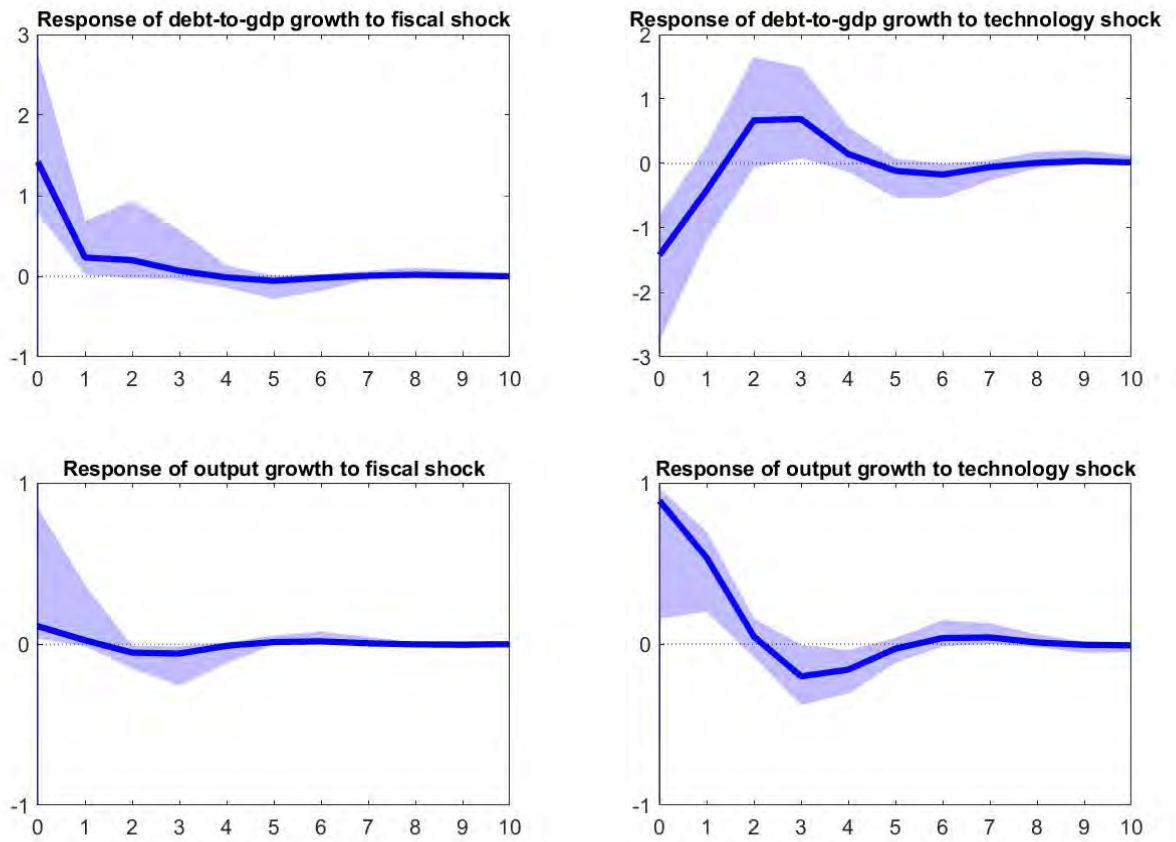


**Figure S8: Posterior distributions of parameters  $\alpha$  and  $\beta$ , and the effects of 1 percent technology and fiscal policy shocks for China**

Posterior distributions of parameters  $\alpha$  and  $\beta$

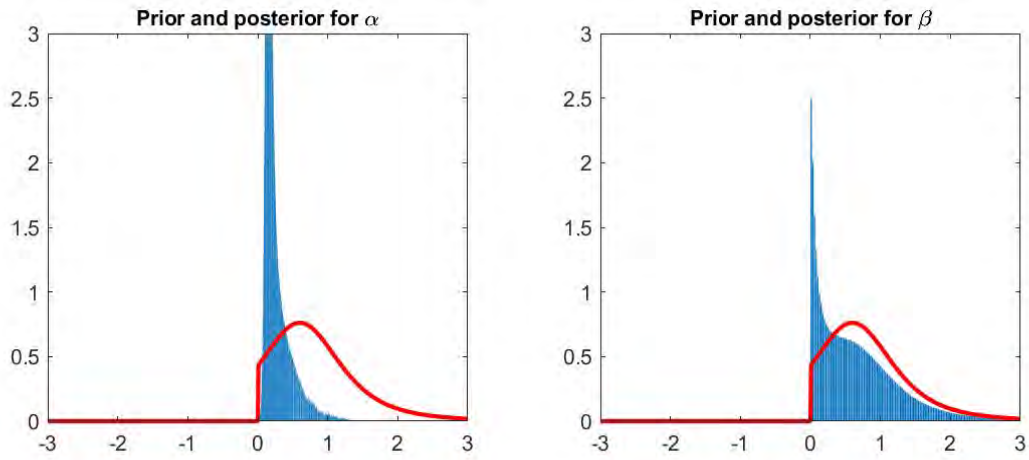


Posterior median (solid line) and 80 percent credible sets for the effects of 1 percent technology and fiscal policy shocks

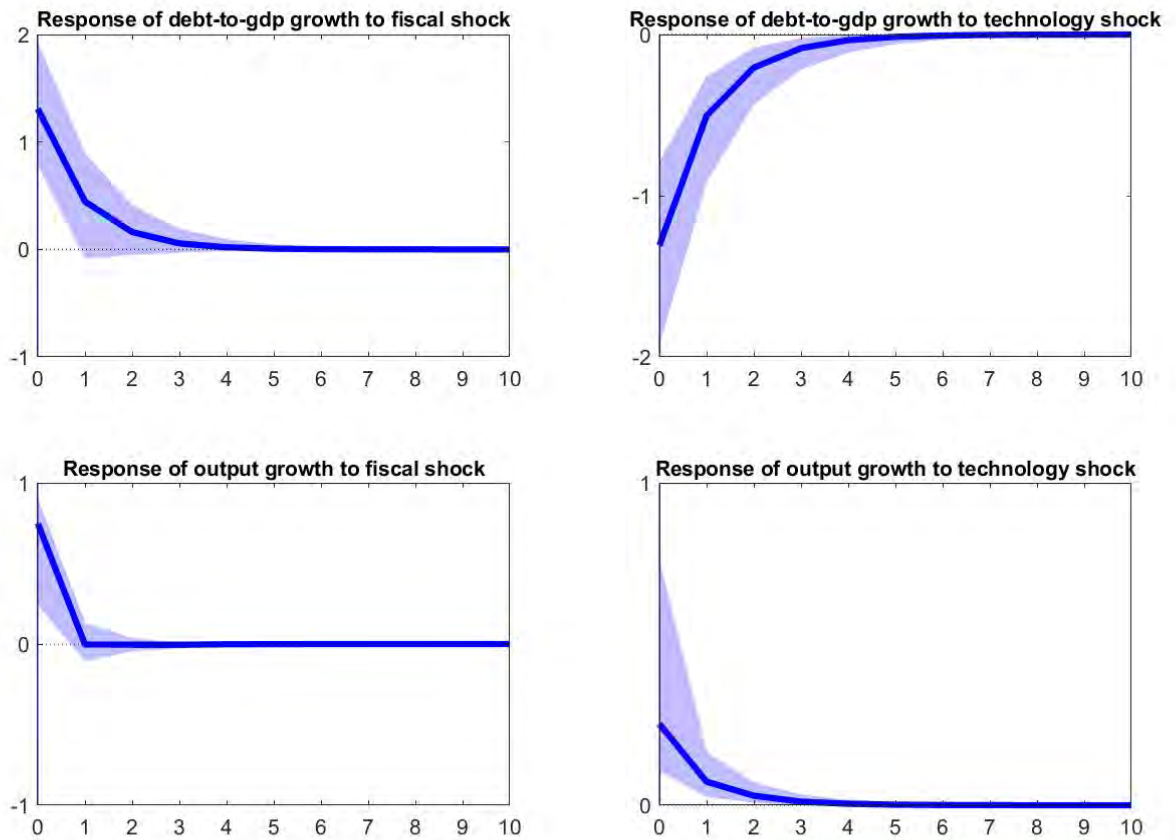


**Figure S9: Posterior distributions of parameters  $\alpha$  and  $\beta$ , and the effects of 1 percent technology and fiscal policy shocks for Ecuador**

Posterior distributions of parameters  $\alpha$  and  $\beta$

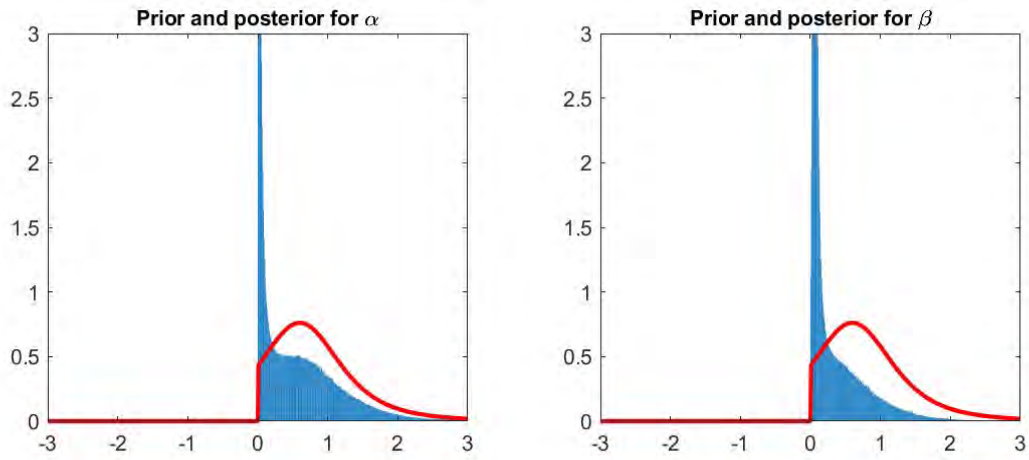


Posterior median (solid line) and 80 percent credible sets for the effects of 1 percent technology and fiscal policy shocks

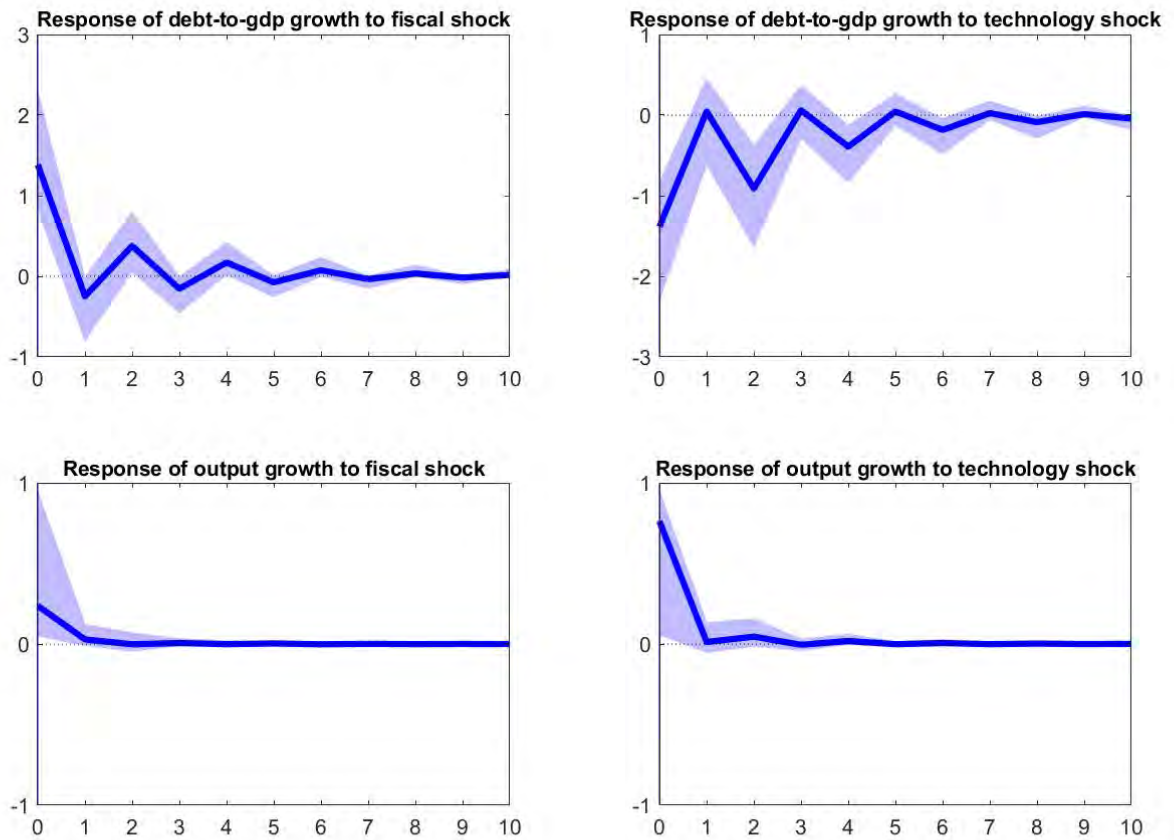


**Figure S10: Posterior distributions of parameters  $\alpha$  and  $\beta$ , and the effects of 1 percent technology and fiscal policy shocks for Egypt**

Posterior distributions of parameters  $\alpha$  and  $\beta$

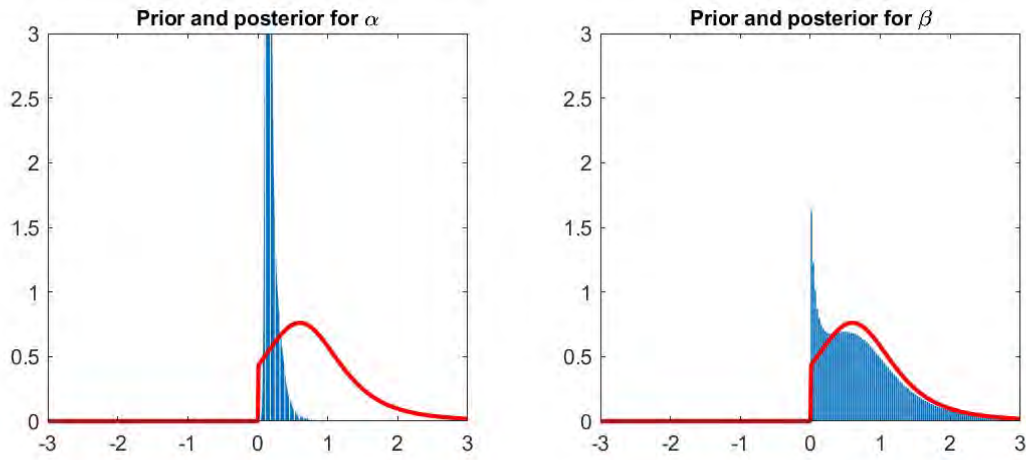


Posterior median (solid line) and 80 percent credible sets for the effects of 1 percent technology and fiscal policy shocks

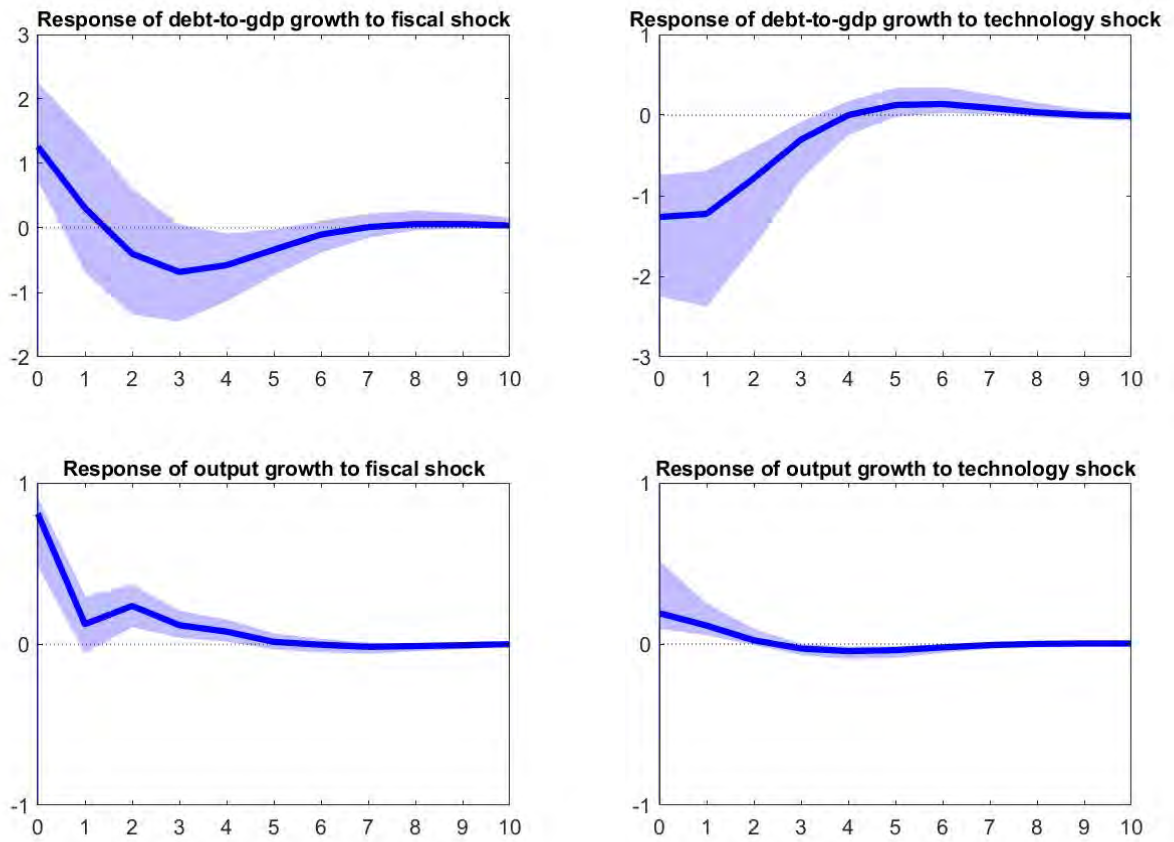


**Figure S11: Posterior distributions of parameters  $\alpha$  and  $\beta$ , and the effects of 1 percent technology and fiscal policy shocks for Finland**

Posterior distributions of parameters  $\alpha$  and  $\beta$

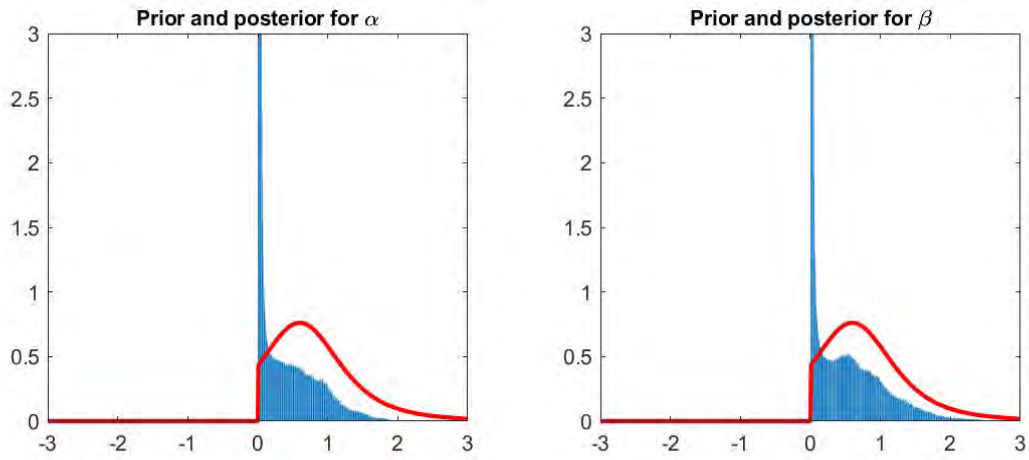


Posterior median (solid line) and 80 percent credible sets for the effects of 1 percent technology and fiscal policy shocks

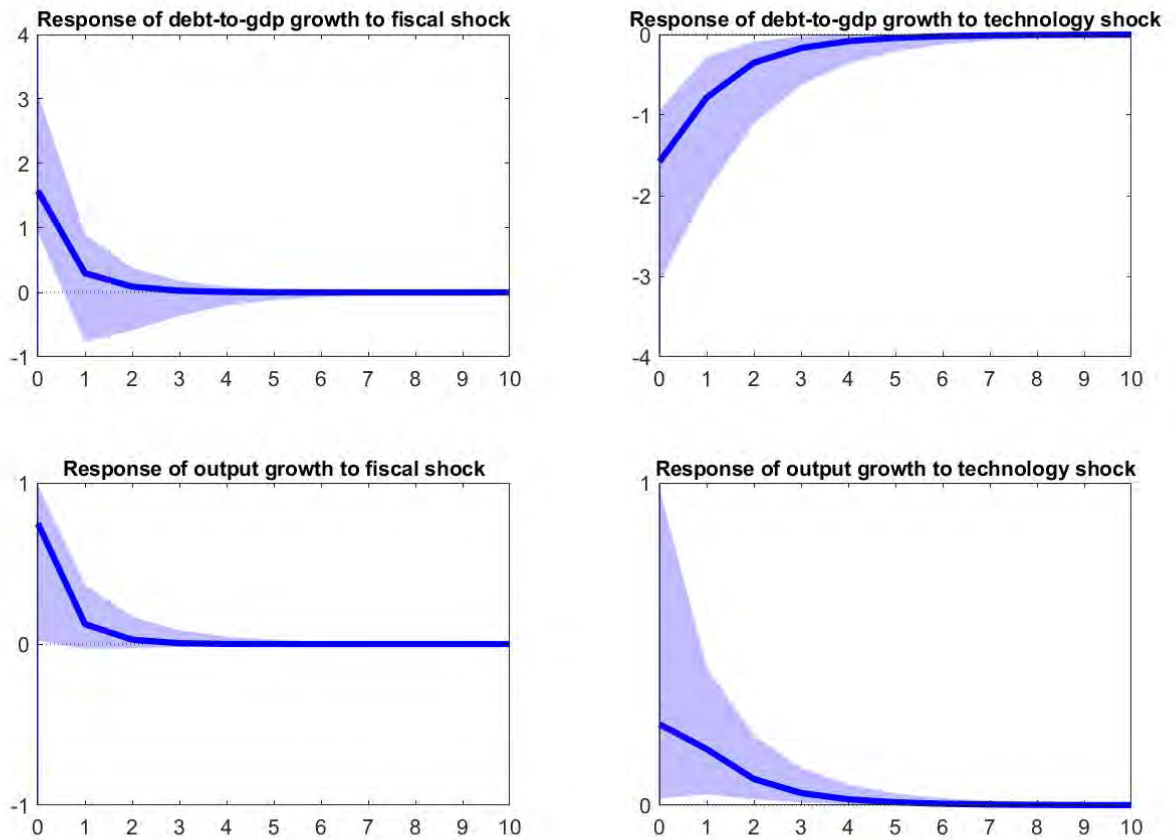


**Figure S12: Posterior distributions of parameters  $\alpha$  and  $\beta$ , and the effects of 1 percent technology and fiscal policy shocks for France**

Posterior distributions of parameters  $\alpha$  and  $\beta$

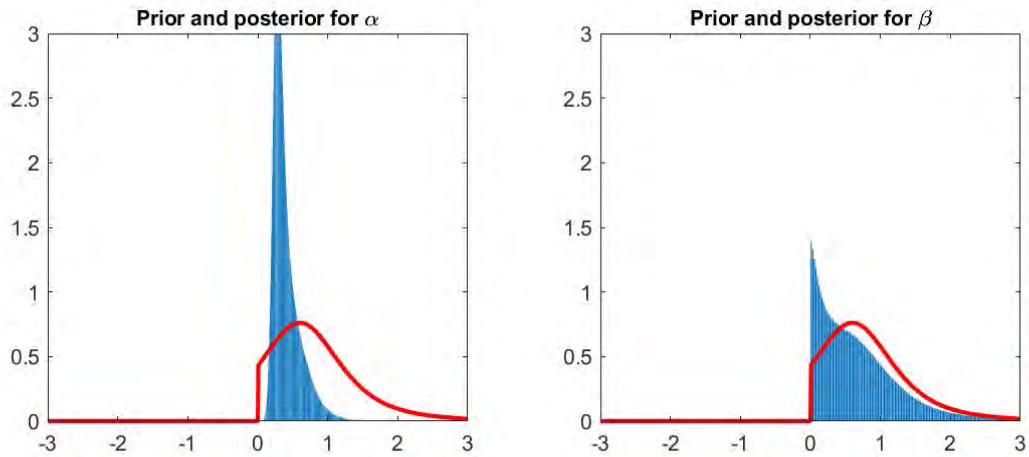


Posterior median (solid line) and 80 percent credible sets for the effects of 1 percent technology and fiscal policy shocks

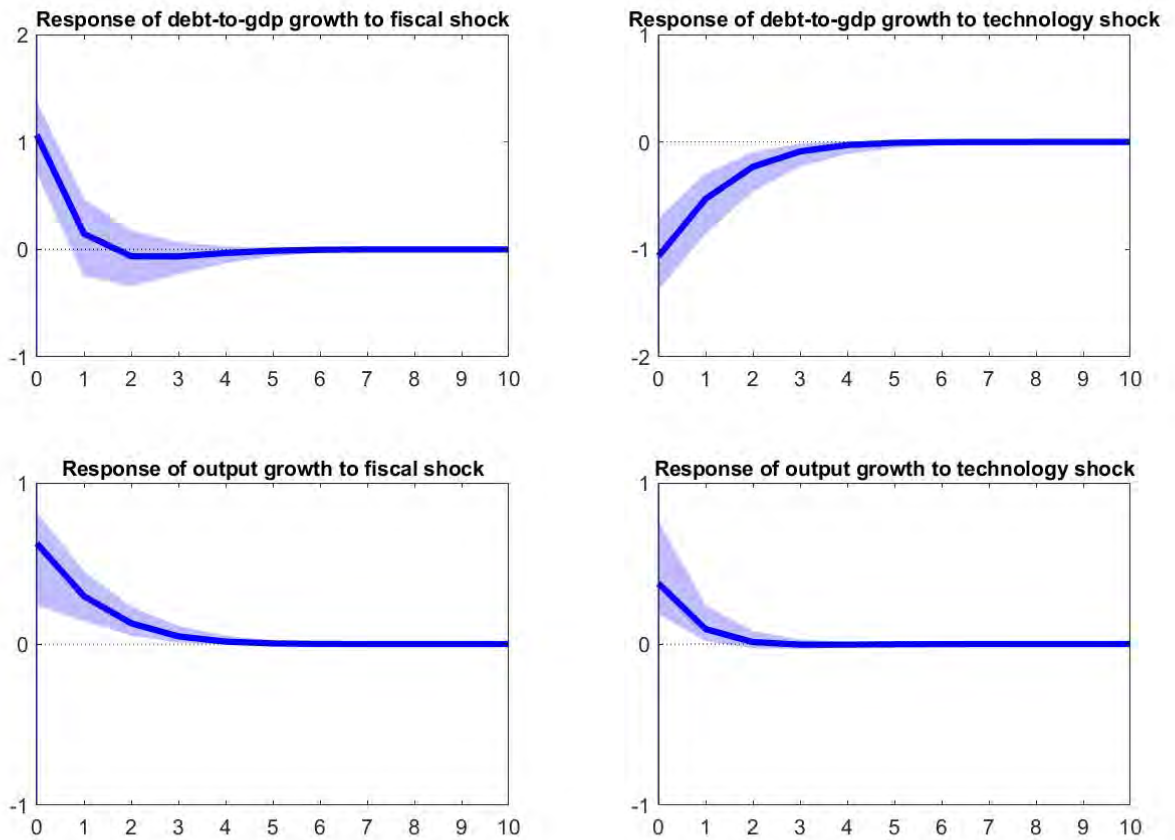


**Figure S13: Posterior distributions of parameters  $\alpha$  and  $\beta$ , and the effects of 1 percent technology and fiscal policy shocks for Germany**

Posterior distributions of parameters  $\alpha$  and  $\beta$

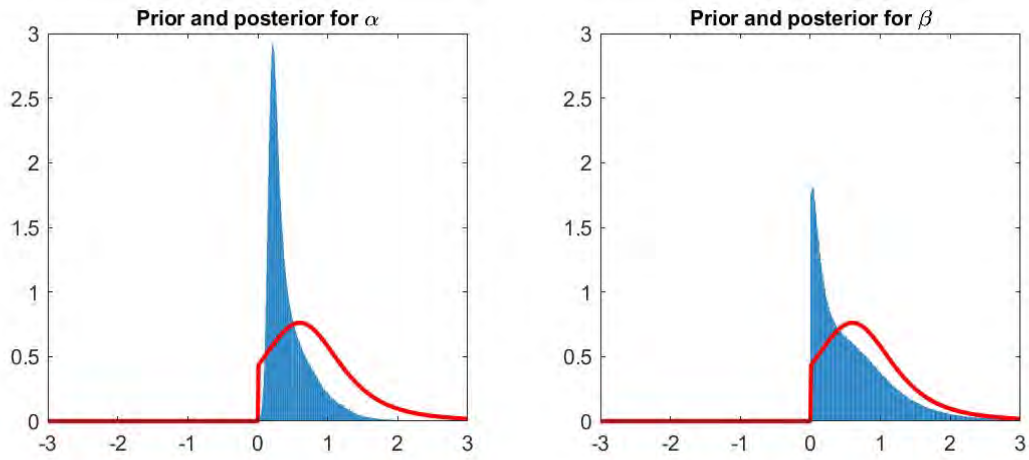


Posterior median (solid line) and 80 percent credible sets for the effects of 1 percent technology and fiscal policy shocks

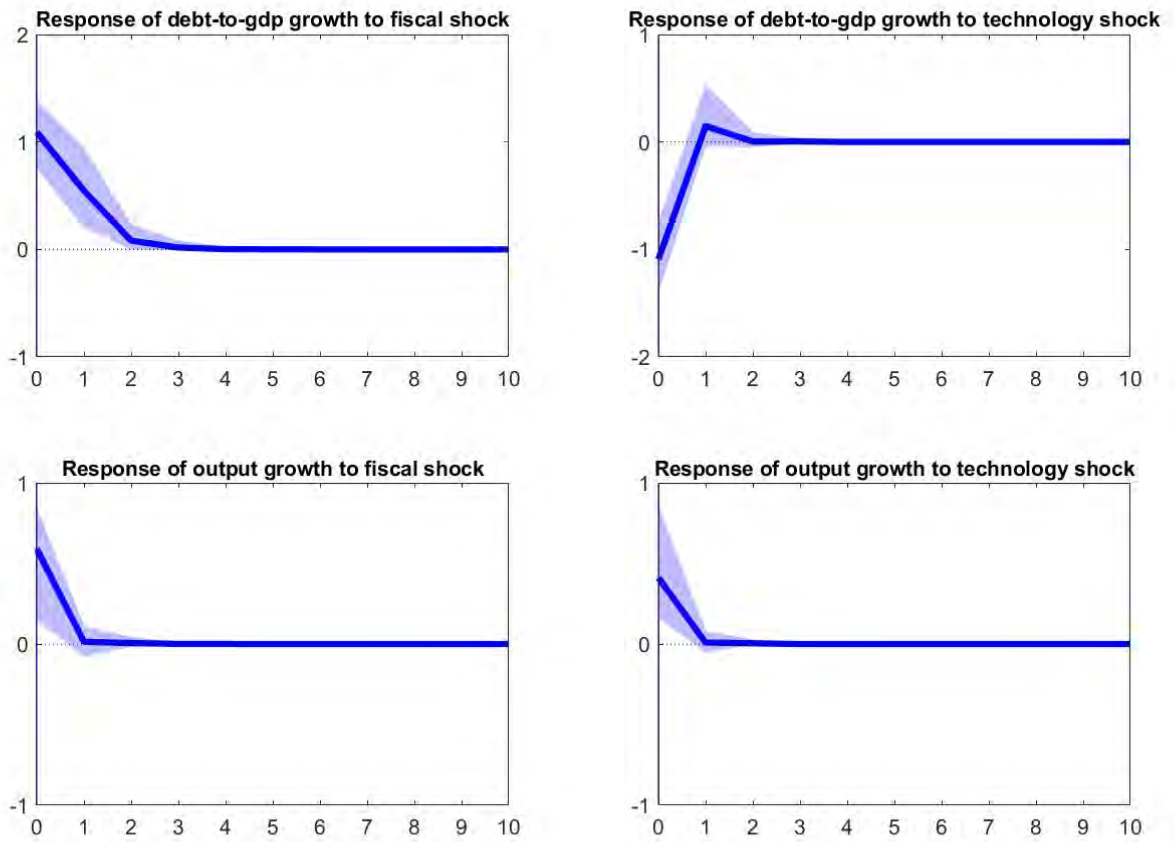


**Figure S14: Posterior distributions of parameters  $\alpha$  and  $\beta$ , and the effects of 1 percent technology and fiscal policy shocks for India**

Posterior distributions of parameters  $\alpha$  and  $\beta$

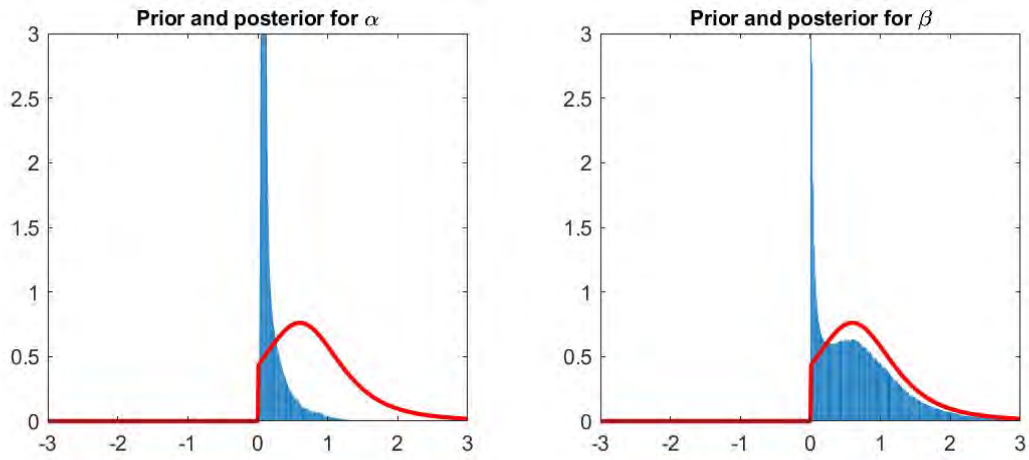


Posterior median (solid line) and 80 percent credible sets for the effects of 1 percent technology and fiscal policy shocks

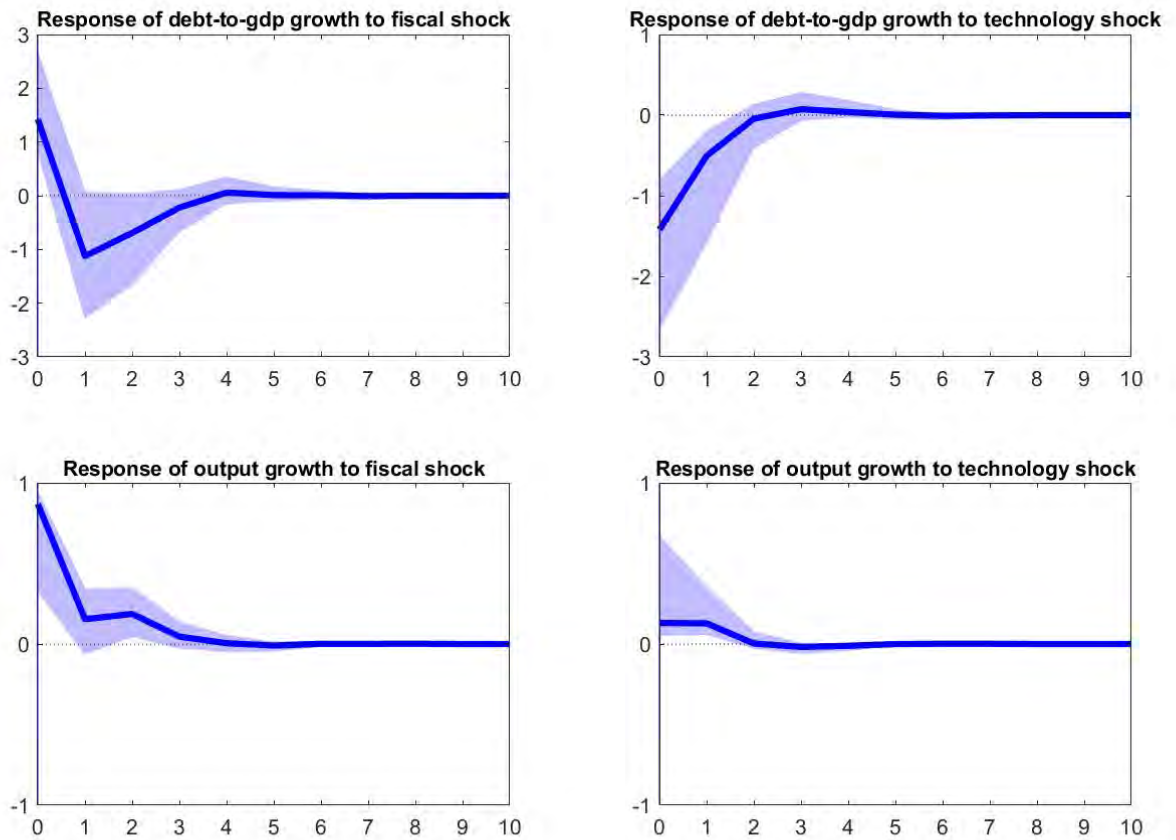


**Figure S15: Posterior distributions of parameters  $\alpha$  and  $\beta$ , and the effects of 1 percent technology and fiscal policy shocks for Indonesia**

Posterior distributions of parameters  $\alpha$  and  $\beta$



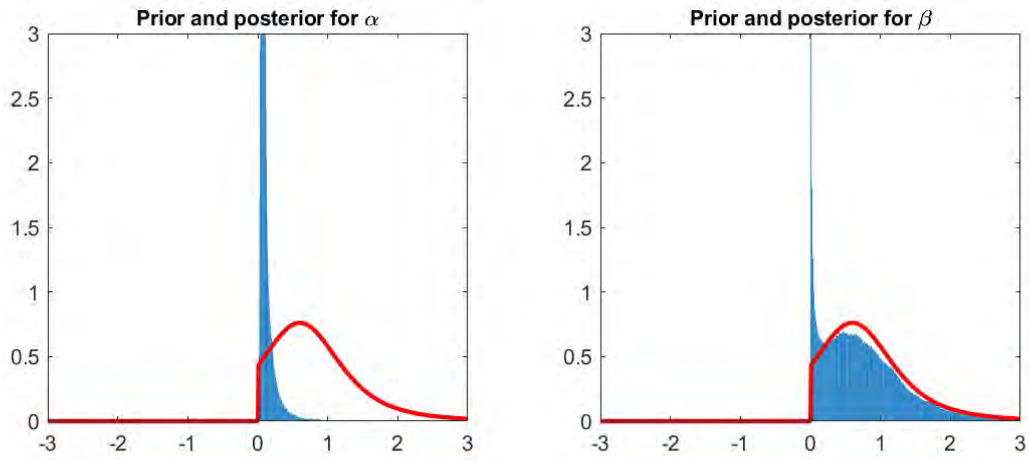
Posterior median (solid line) and 80 percent credible sets for the effects of 1 percent technology and fiscal policy shocks



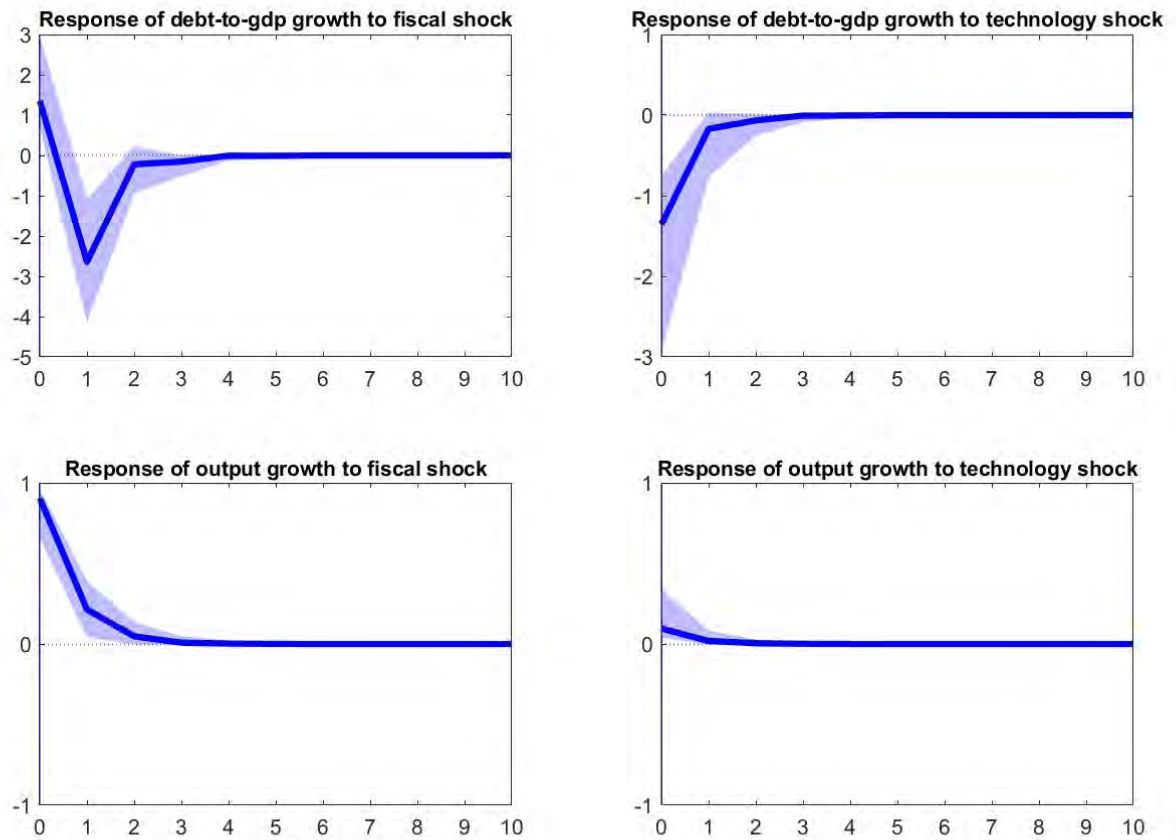


**Figure S16: Posterior distributions of parameters  $\alpha$  and  $\beta$ , and the effects of 1 percent technology and fiscal policy shocks for Iran**

Posterior distributions of parameters  $\alpha$  and  $\beta$

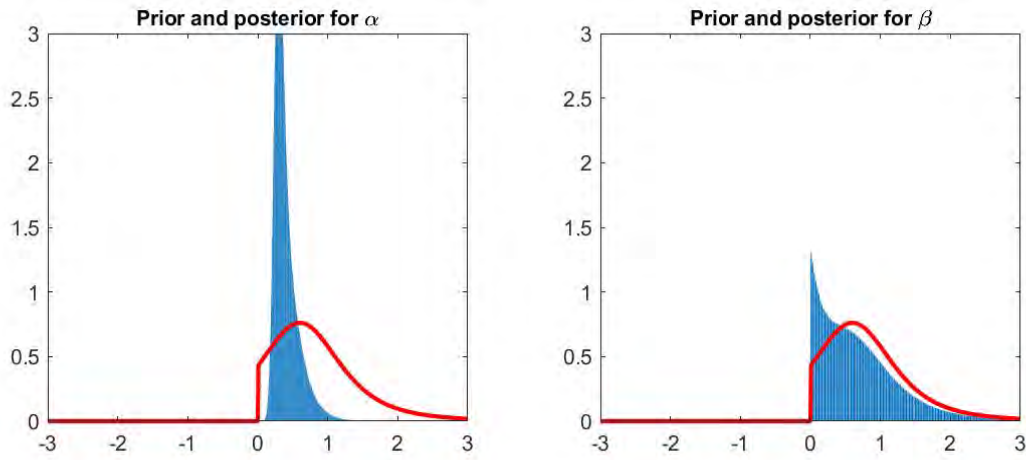


Posterior median (solid line) and 80 percent credible sets for the effects of 1 percent technology and fiscal policy shocks

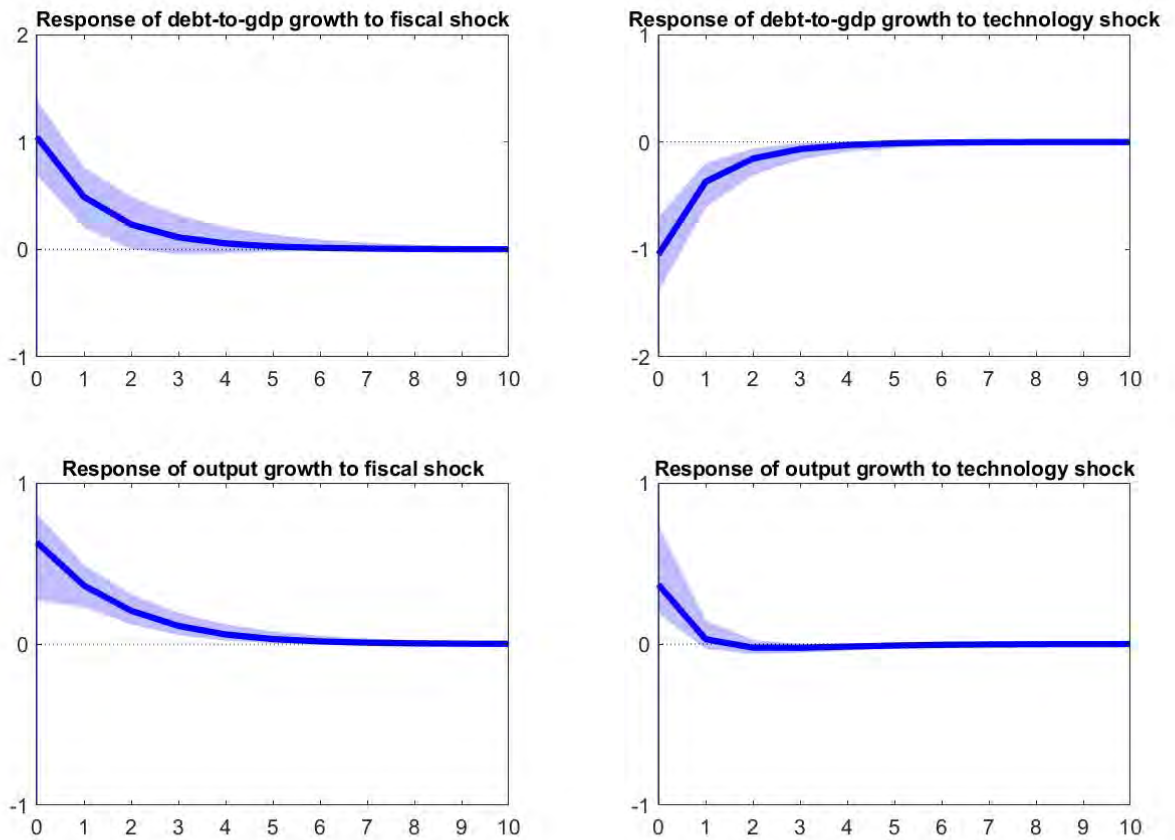


**Figure S17: Posterior distributions of parameters  $\alpha$  and  $\beta$ , and the effects of 1 percent technology and fiscal policy shocks for Italy**

Posterior distributions of parameters  $\alpha$  and  $\beta$

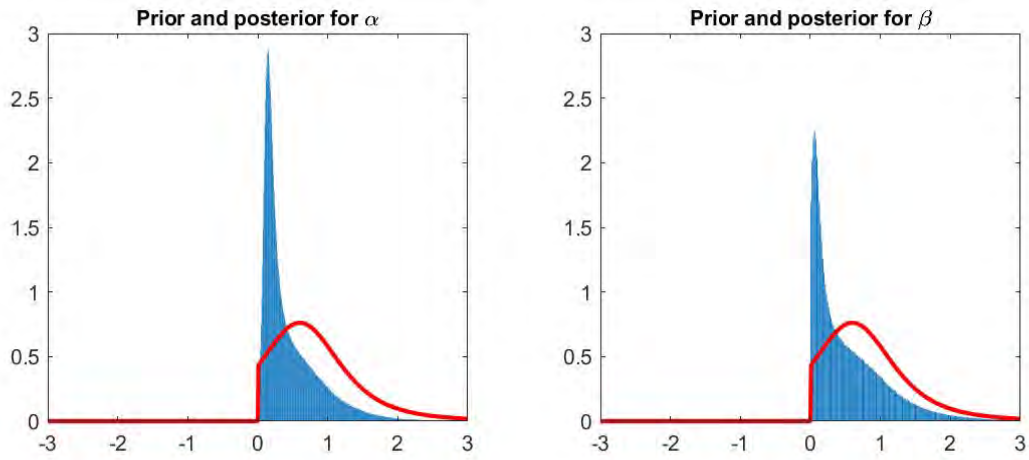


Posterior median (solid line) and 80 percent credible sets for the effects of 1 percent technology and fiscal policy shocks

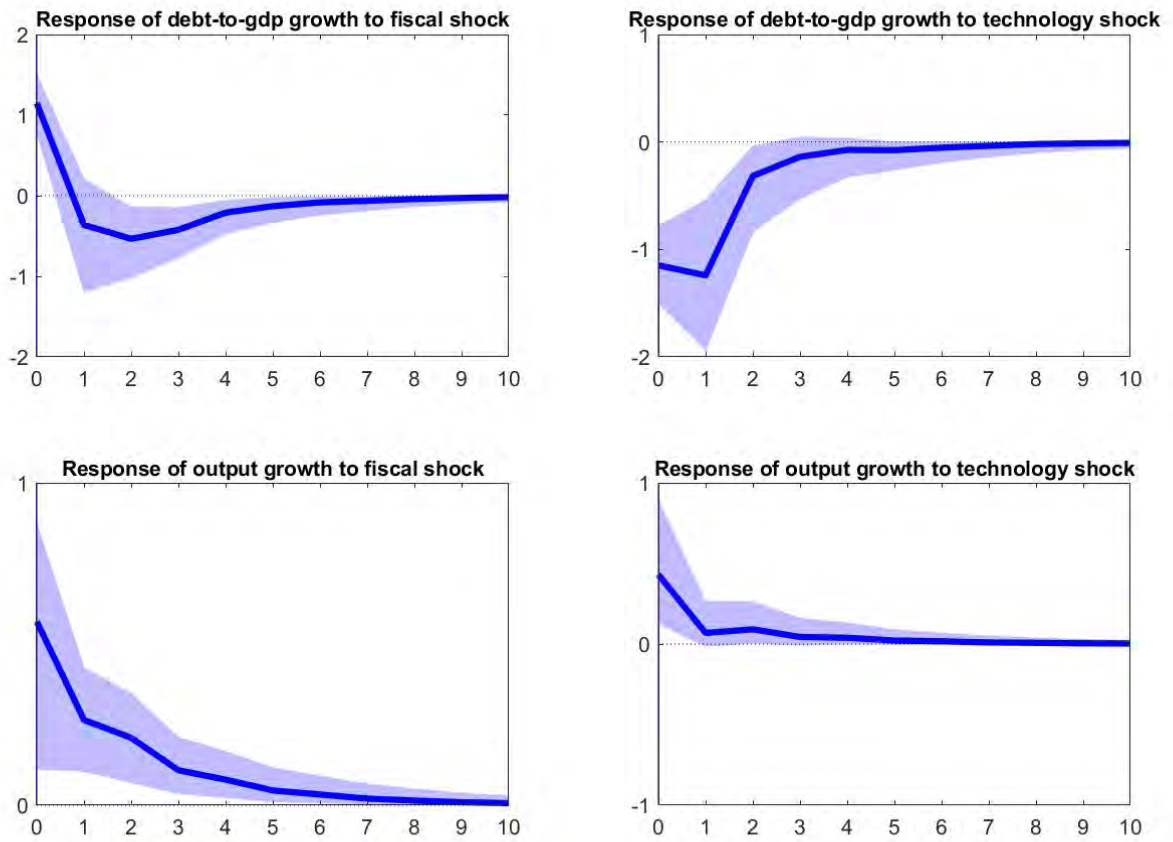


**Figure S18: Posterior distributions of parameters  $\alpha$  and  $\beta$ , and the effects of 1 percent technology and fiscal policy shocks for Japan**

Posterior distributions of parameters  $\alpha$  and  $\beta$

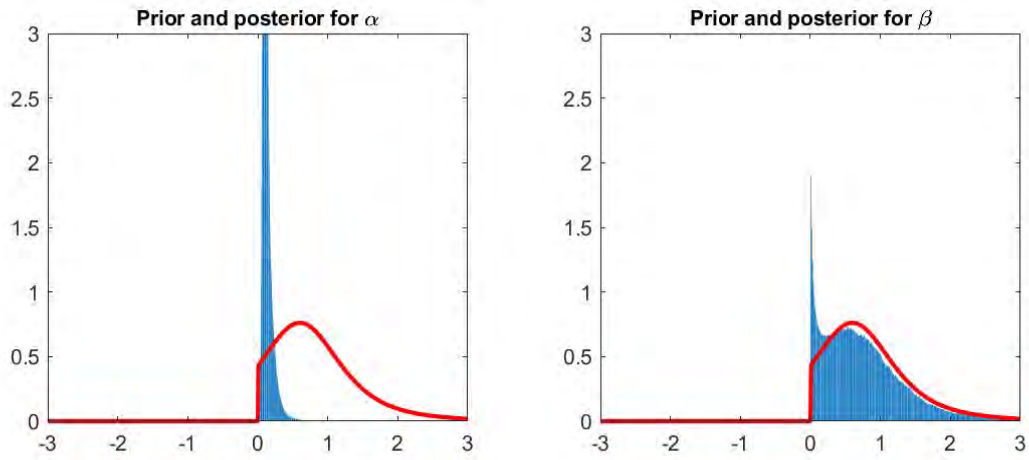


Posterior median (solid line) and 80 percent credible sets for the effects of 1 percent technology and fiscal policy shocks

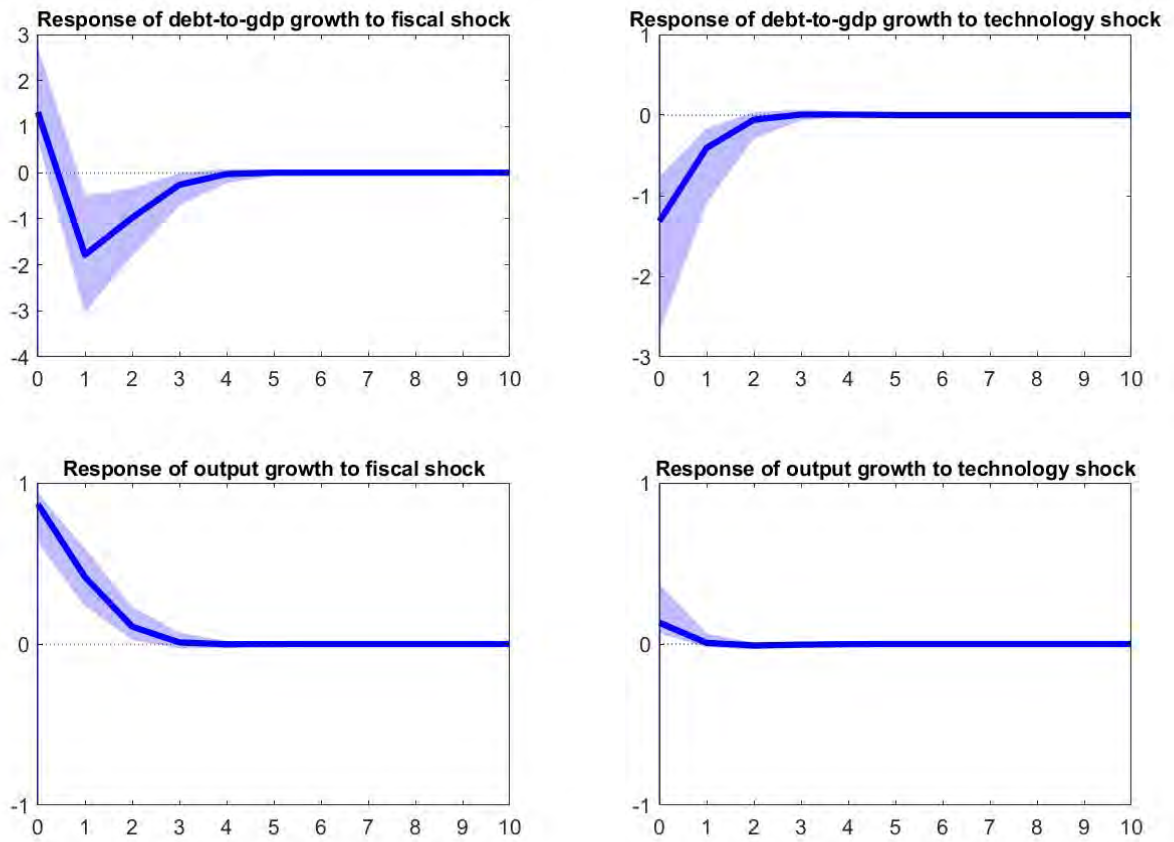


**Figure S19: Posterior distributions of parameters  $\alpha$  and  $\beta$ , and the effects of 1 percent technology and fiscal policy shocks for Korea**

Posterior distributions of parameters  $\alpha$  and  $\beta$

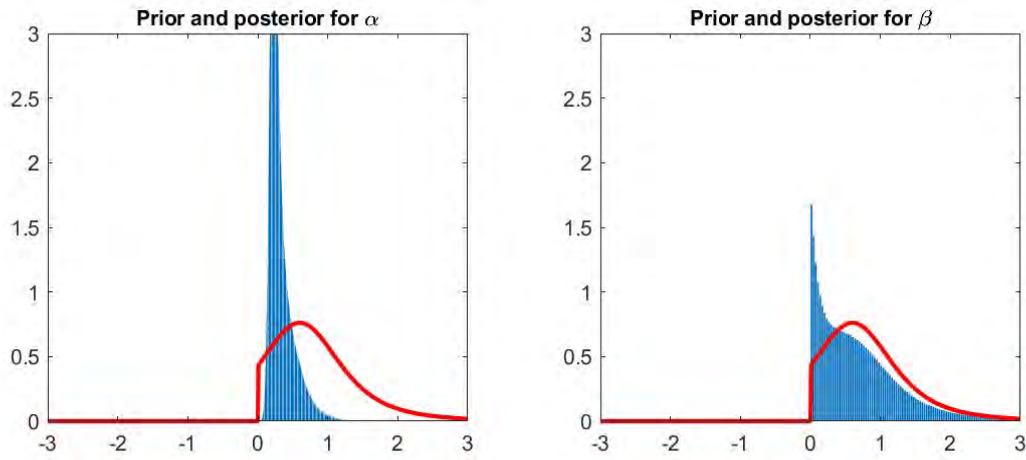


Posterior median (solid line) and 80 percent credible sets for the effects of 1 percent technology and fiscal policy shocks

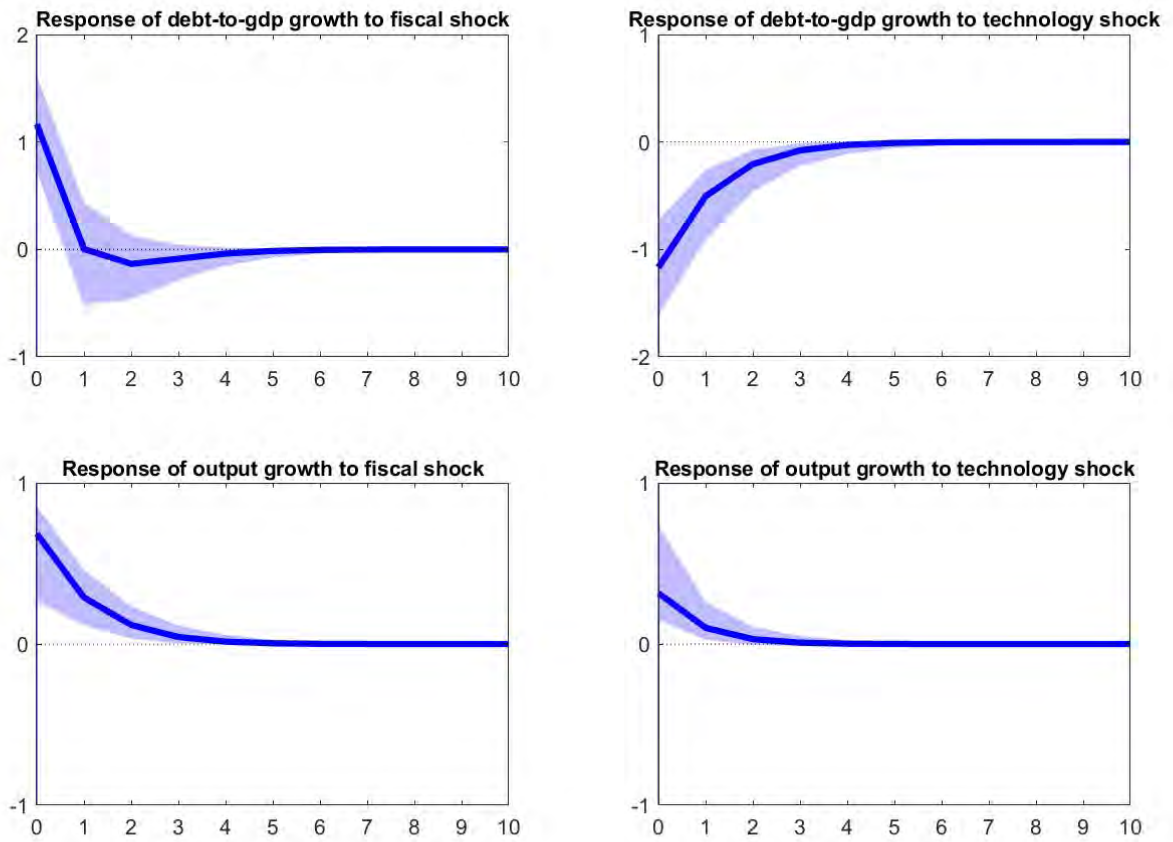


**Figure S20: Posterior distributions of parameters  $\alpha$  and  $\beta$ , and the effects of 1 percent technology and fiscal policy shocks for Malaysia**

Posterior distributions of parameters  $\alpha$  and  $\beta$

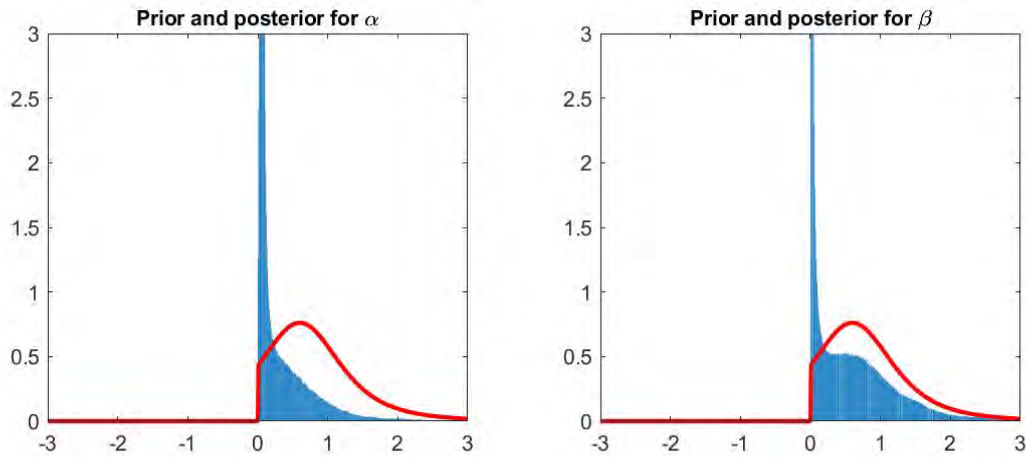


Posterior median (solid line) and 80 percent credible sets for the effects of 1 percent technology and fiscal policy shocks

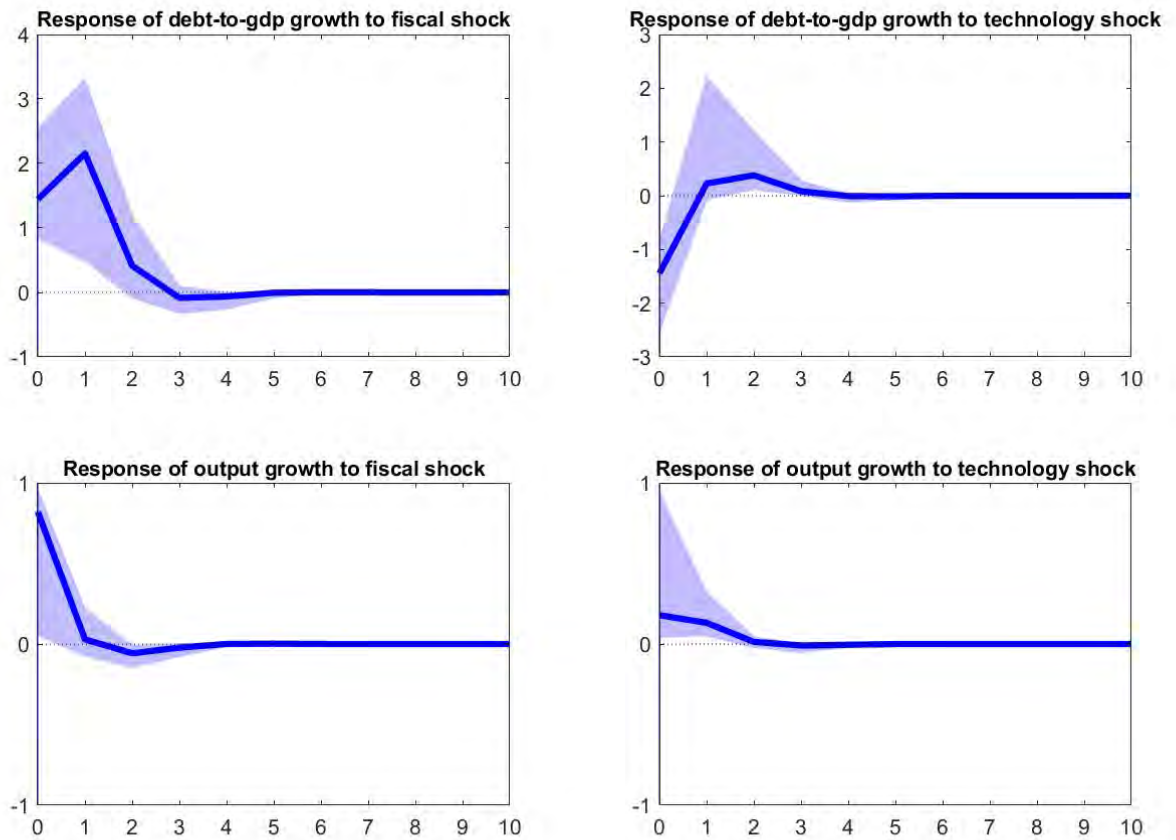


**Figure S21: Posterior distributions of parameters  $\alpha$  and  $\beta$ , and the effects of 1 percent technology and fiscal policy shocks for Mexico**

Posterior distributions of parameters  $\alpha$  and  $\beta$

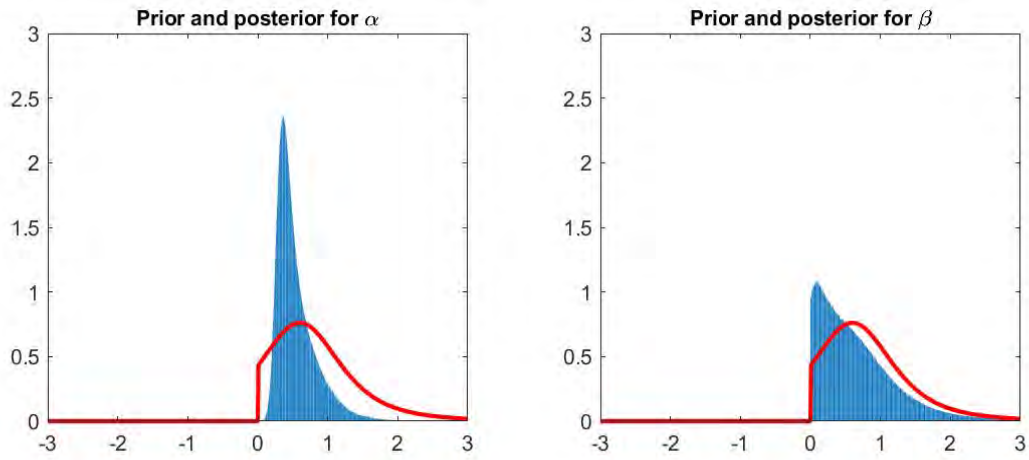


Posterior median (solid line) and 80 percent credible sets for the effects of 1 percent technology and fiscal policy shocks

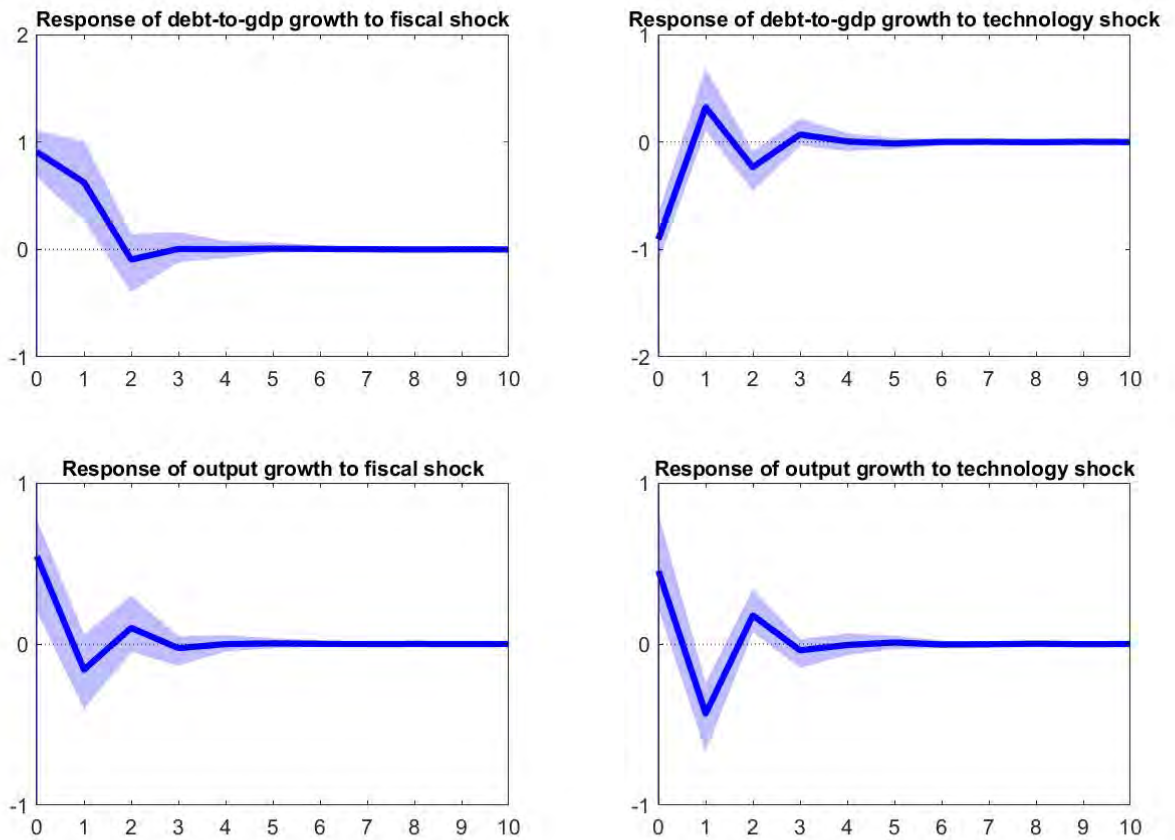


**Figure S22: Posterior distributions of parameters  $\alpha$  and  $\beta$ , and the effects of 1 percent technology and fiscal policy shocks for Morocco**

Posterior distributions of parameters  $\alpha$  and  $\beta$

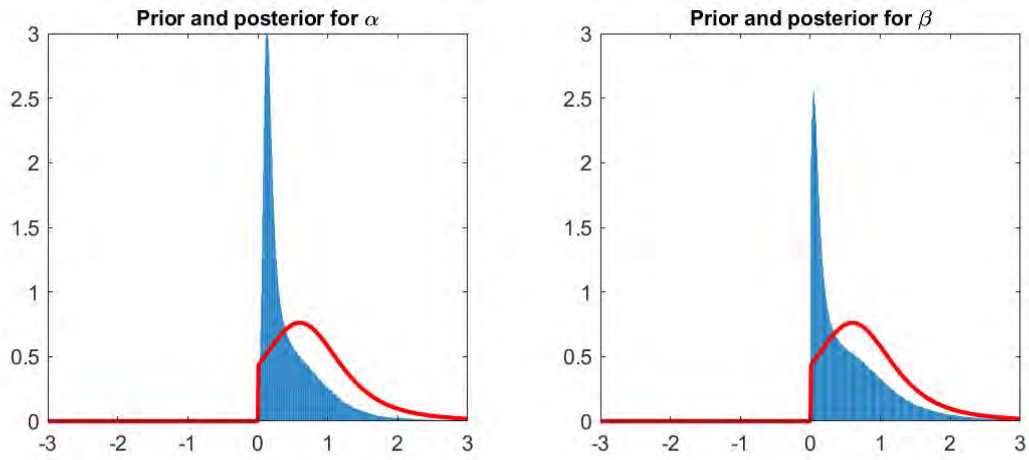


Posterior median (solid line) and 80 percent credible sets for the effects of 1 percent technology and fiscal policy shocks

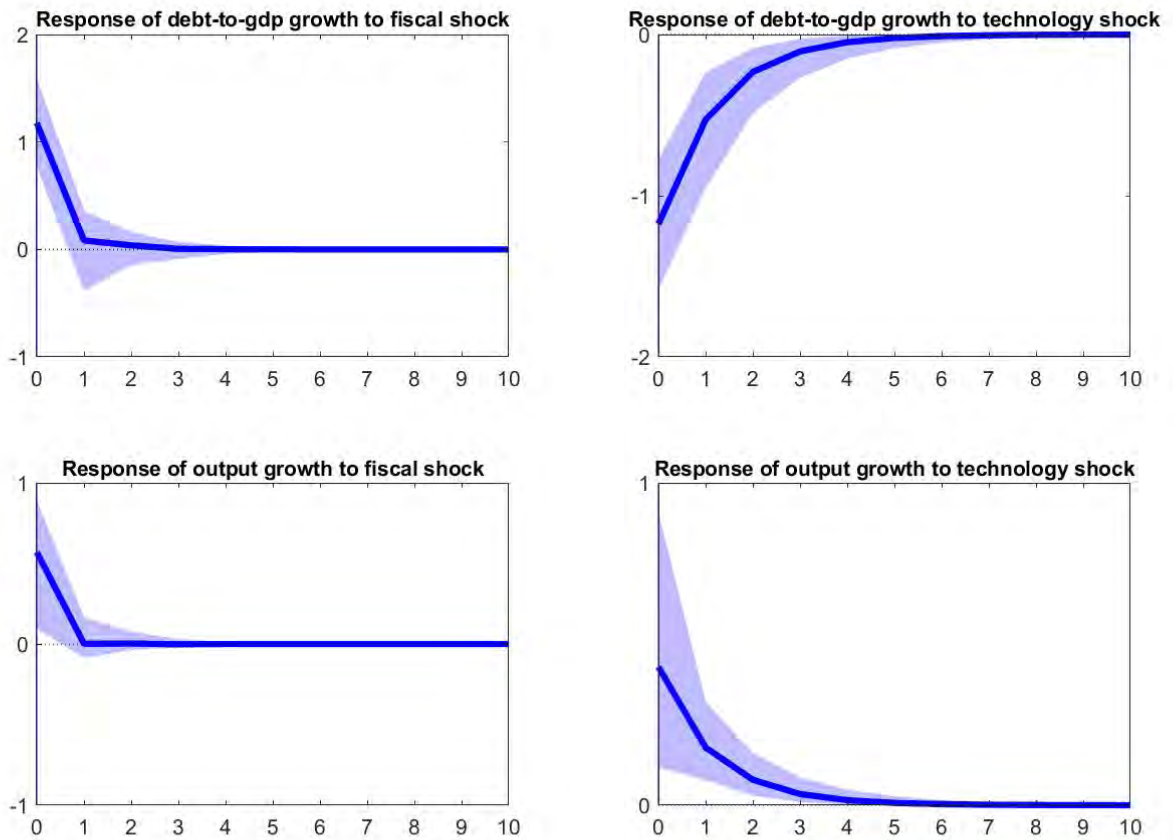


**Figure S23: Posterior distributions of parameters  $\alpha$  and  $\beta$ , and the effects of 1 percent technology and fiscal policy shocks for Netherlands**

Posterior distributions of parameters  $\alpha$  and  $\beta$



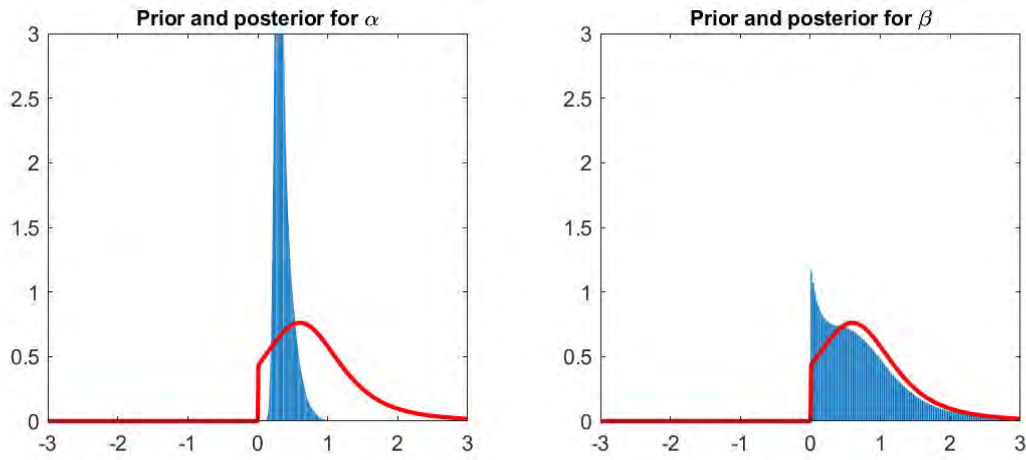
Posterior median (solid line) and 80 percent credible sets for the effects of 1 percent technology and fiscal policy shocks



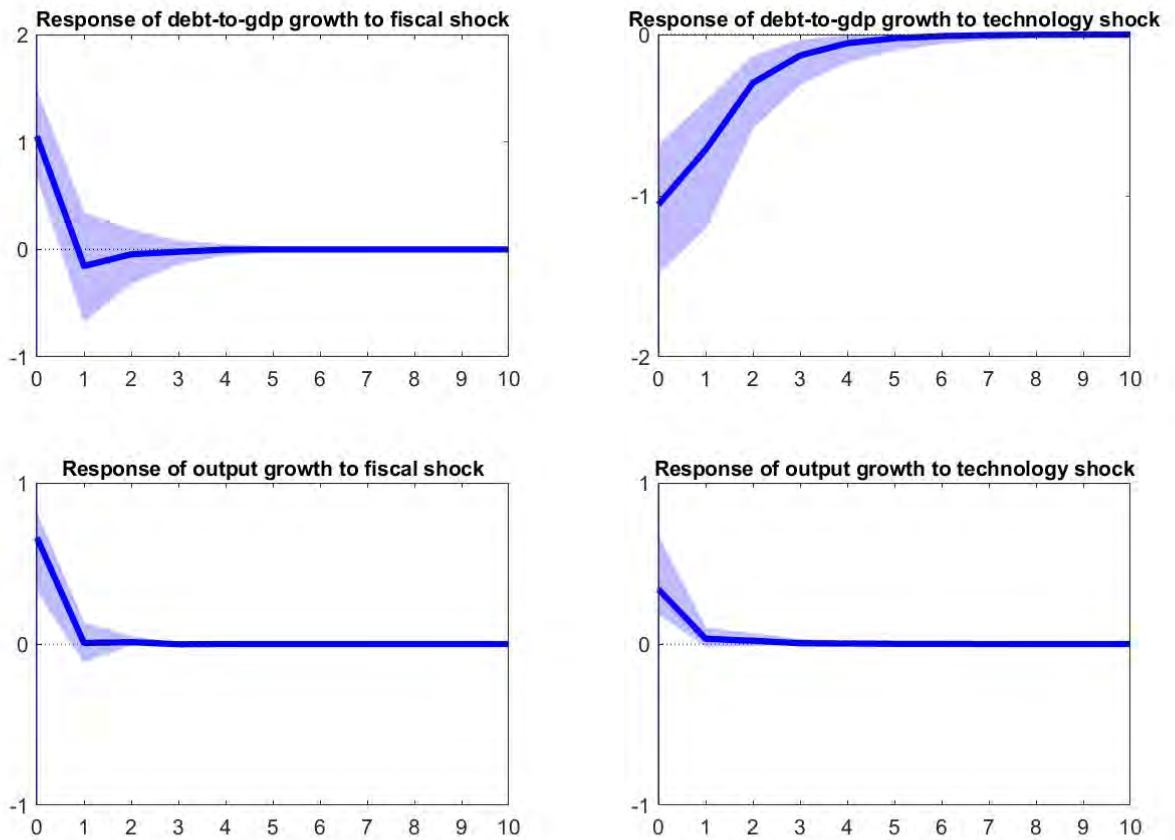


**Figure S24: Posterior distributions of parameters  $\alpha$  and  $\beta$ , and the effects of 1 percent technology and fiscal policy shocks for New Zealand**

Posterior distributions of parameters  $\alpha$  and  $\beta$

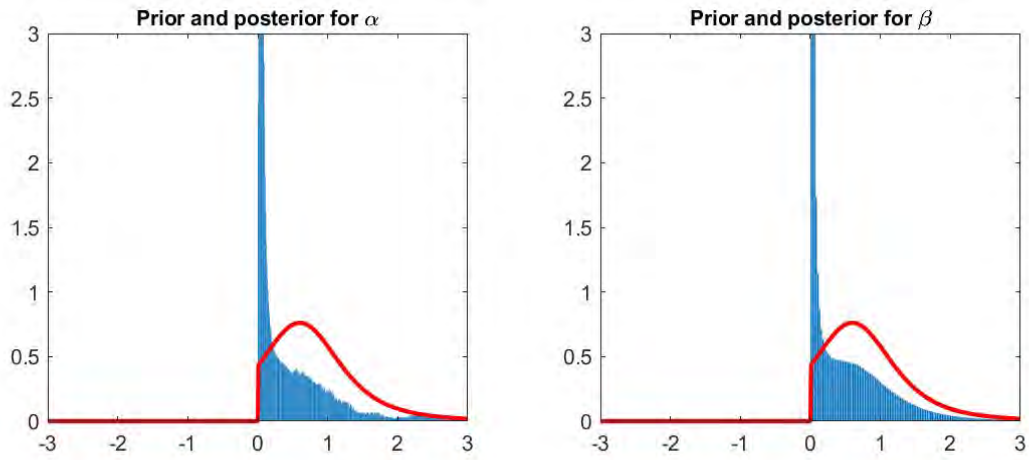


Posterior median (solid line) and 80 percent credible sets for the effects of 1 percent technology and fiscal policy shocks

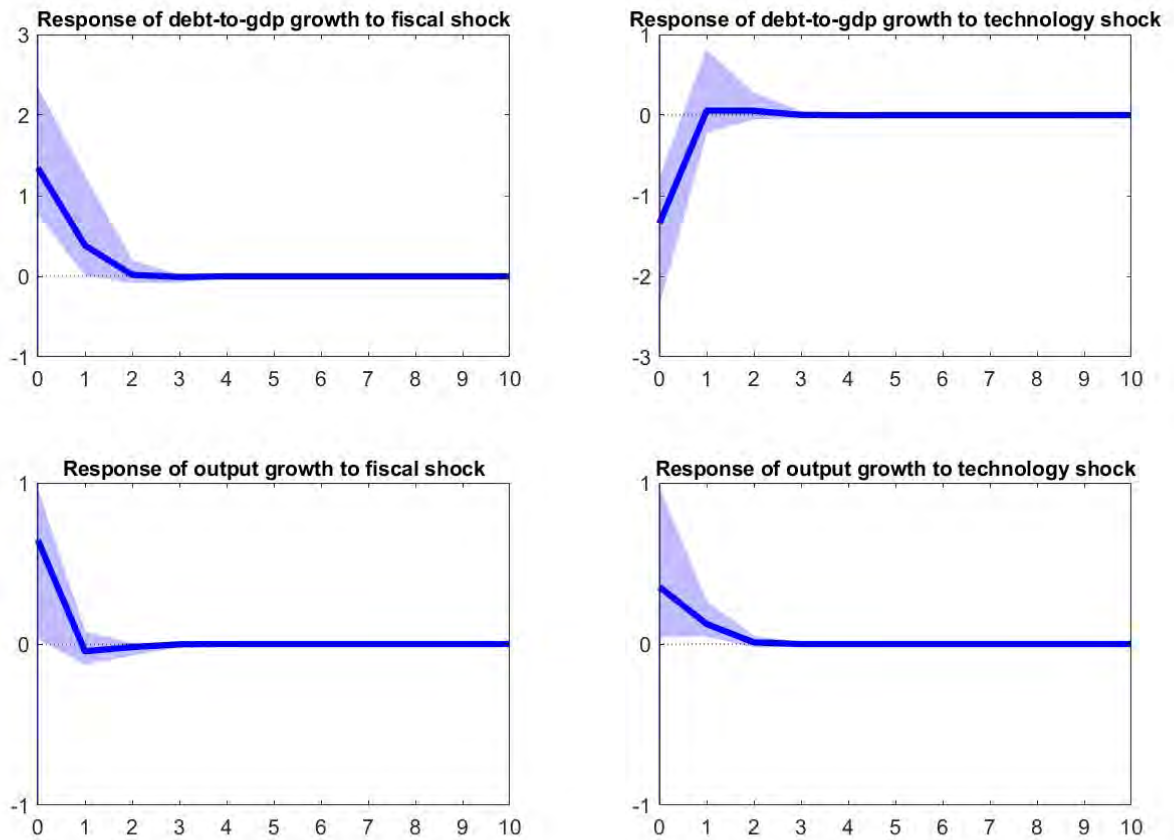


**Figure S25: Posterior distributions of parameters  $\alpha$  and  $\beta$ , and the effects of 1 percent technology and fiscal policy shocks for Nigeria**

Posterior distributions of parameters  $\alpha$  and  $\beta$

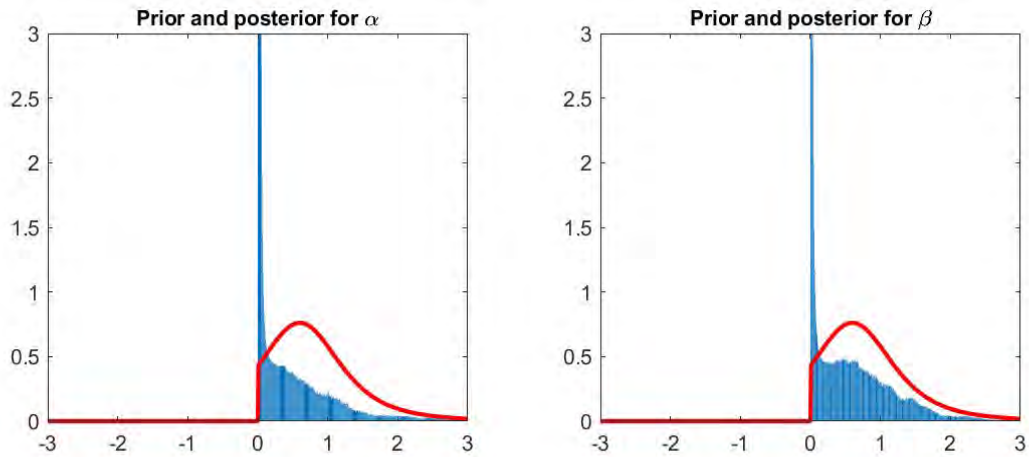


Posterior median (solid line) and 80 percent credible sets for the effects of 1 percent technology and fiscal policy shocks

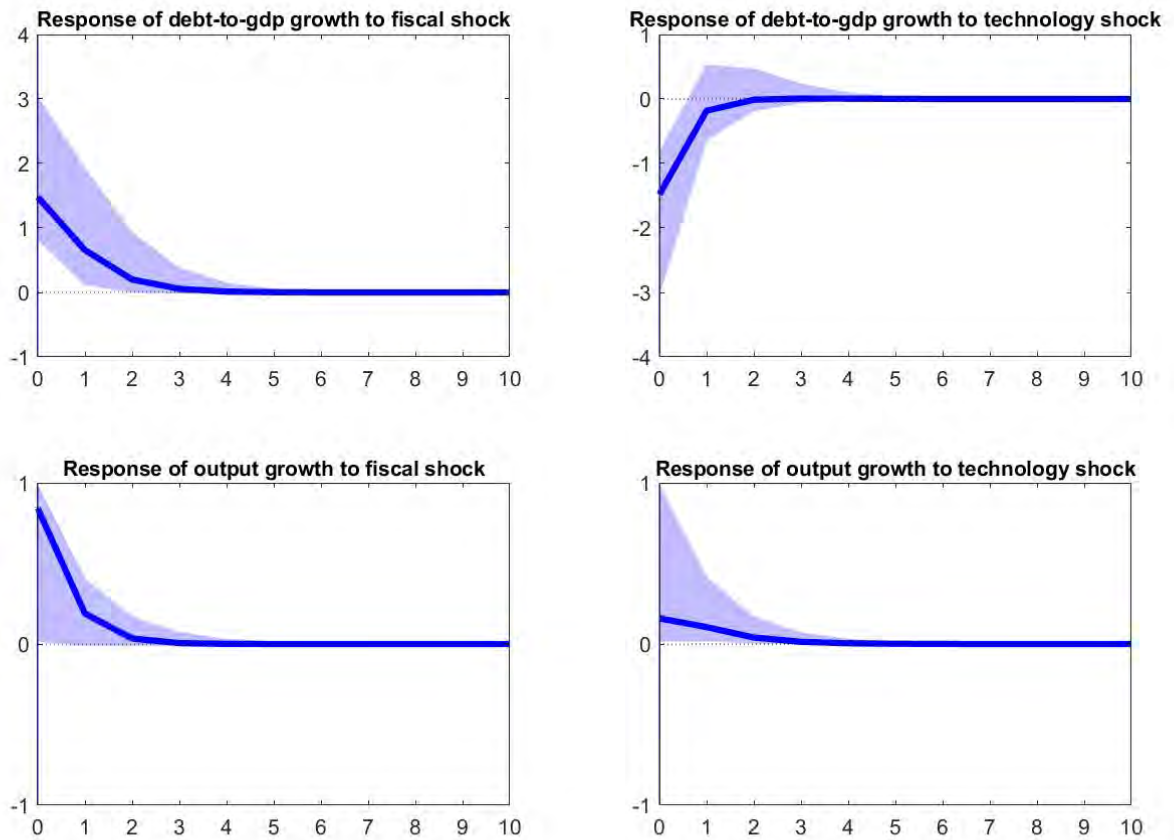


**Figure S26: Posterior distributions of parameters  $\alpha$  and  $\beta$ , and the effects of 1 percent technology and fiscal policy shocks for Norway**

Posterior distributions of parameters  $\alpha$  and  $\beta$

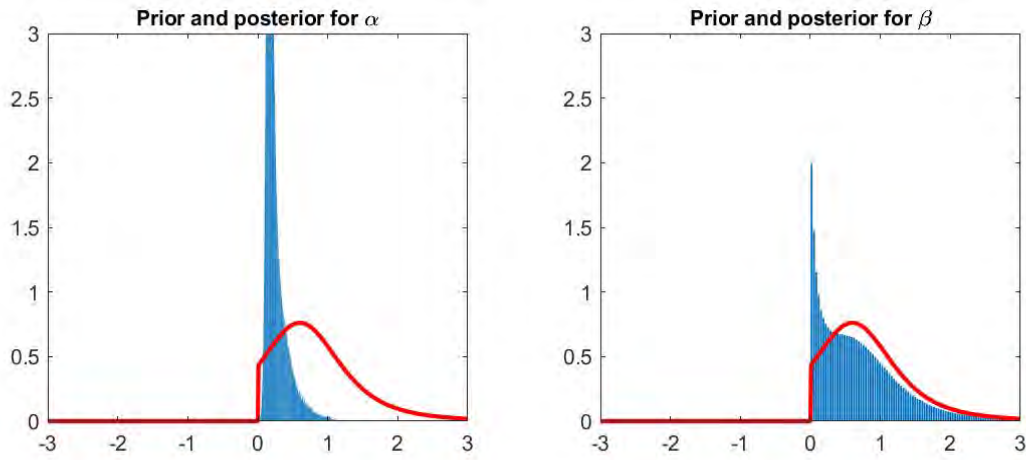


Posterior median (solid line) and 80 percent credible sets for the effects of 1 percent technology and fiscal policy shocks

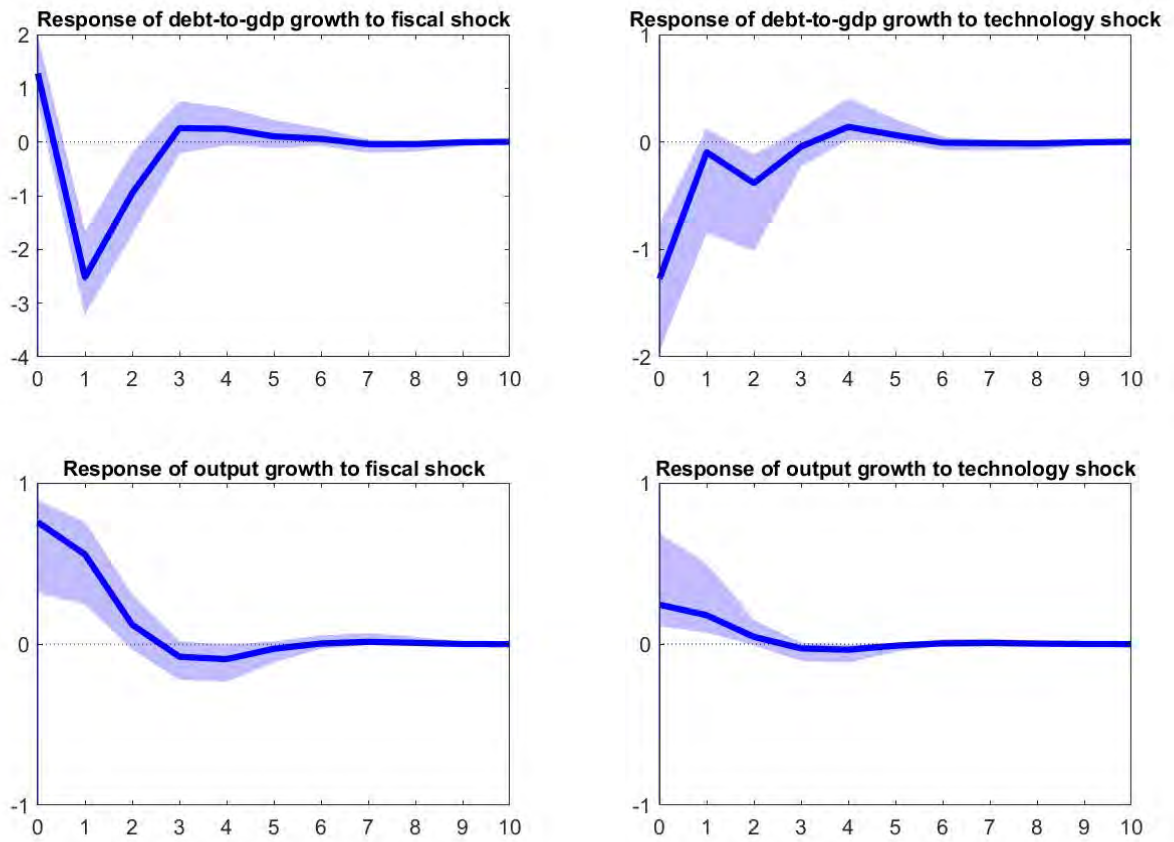


**Figure S27: Posterior distributions of parameters  $\alpha$  and  $\beta$ , and the effects of 1 percent technology and fiscal policy shocks for Peru**

Posterior distributions of parameters  $\alpha$  and  $\beta$

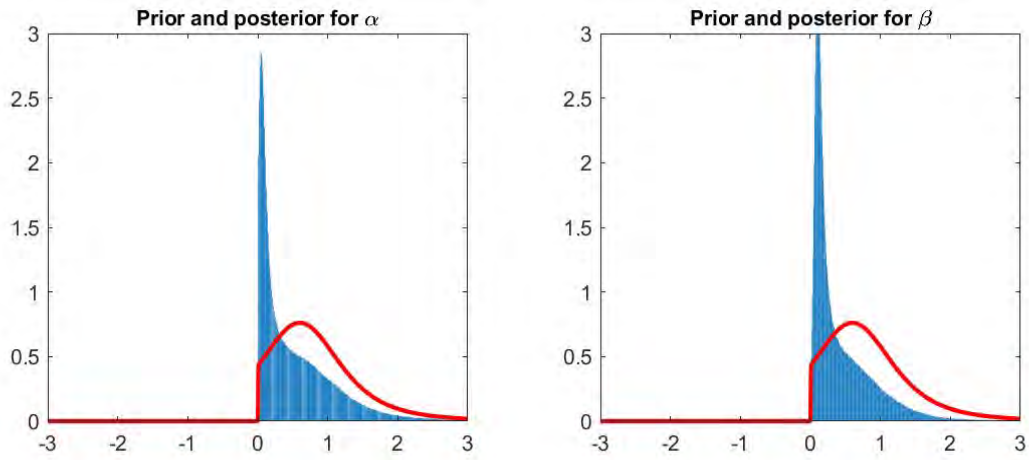


Posterior median (solid line) and 80 percent credible sets for the effects of 1 percent technology and fiscal policy shocks

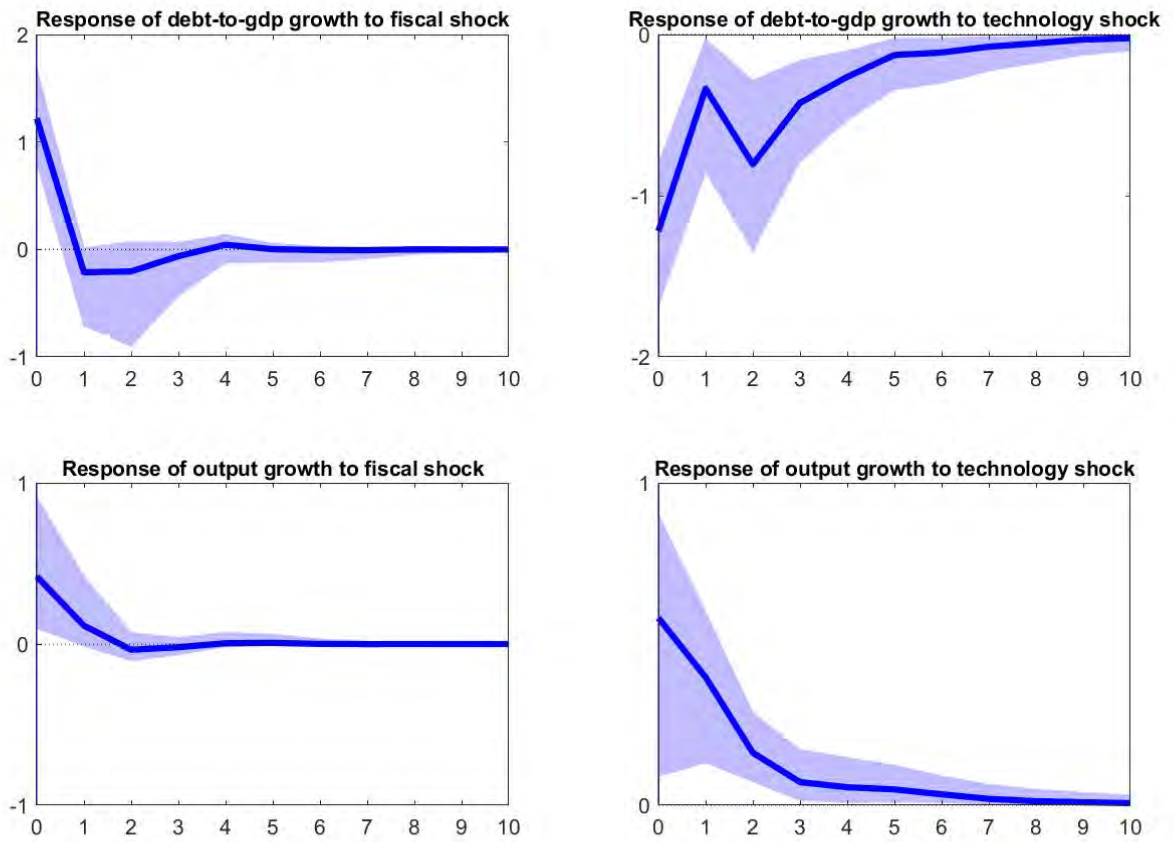


**Figure S28: Posterior distributions of parameters  $\alpha$  and  $\beta$ , and the effects of 1 percent technology and fiscal policy shocks for Philippines**

Posterior distributions of parameters  $\alpha$  and  $\beta$

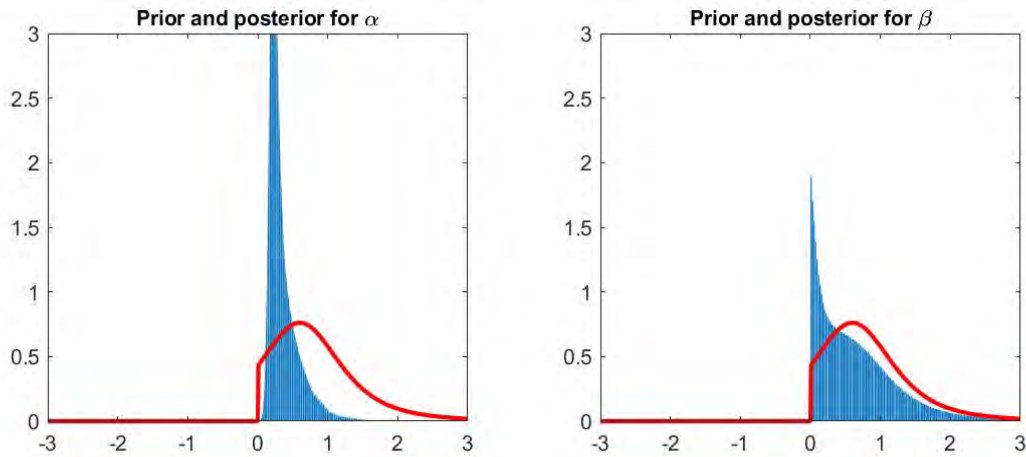


Posterior median (solid line) and 80 percent credible sets for the effects of 1 percent technology and fiscal policy shocks

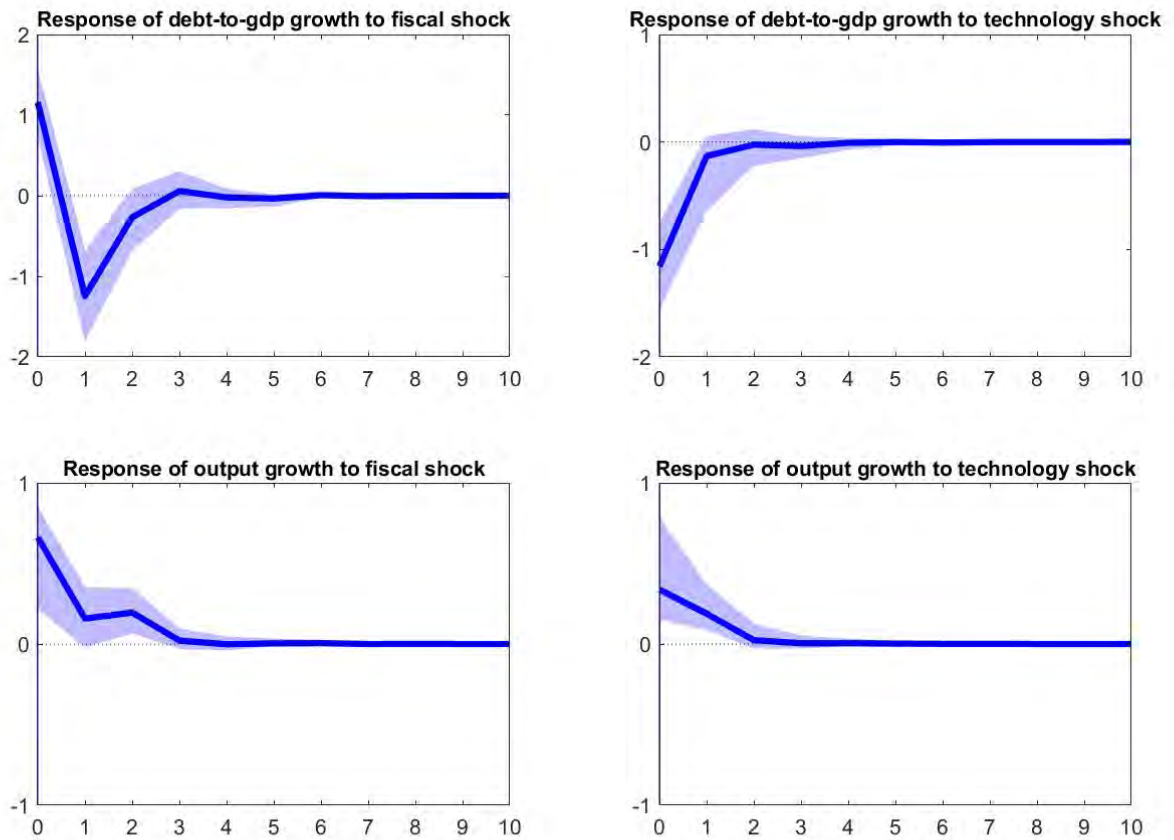


**Figure S29: Posterior distributions of parameters  $\alpha$  and  $\beta$ , and the effects of 1 percent technology and fiscal policy shocks for Singapore**

Posterior distributions of parameters  $\alpha$  and  $\beta$

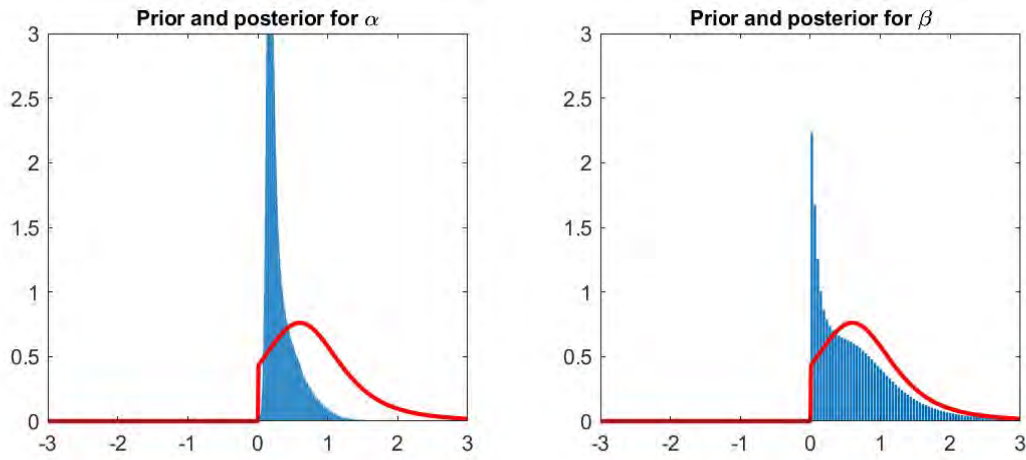


Posterior median (solid line) and 80 percent credible sets for the effects of 1 percent technology and fiscal policy shocks

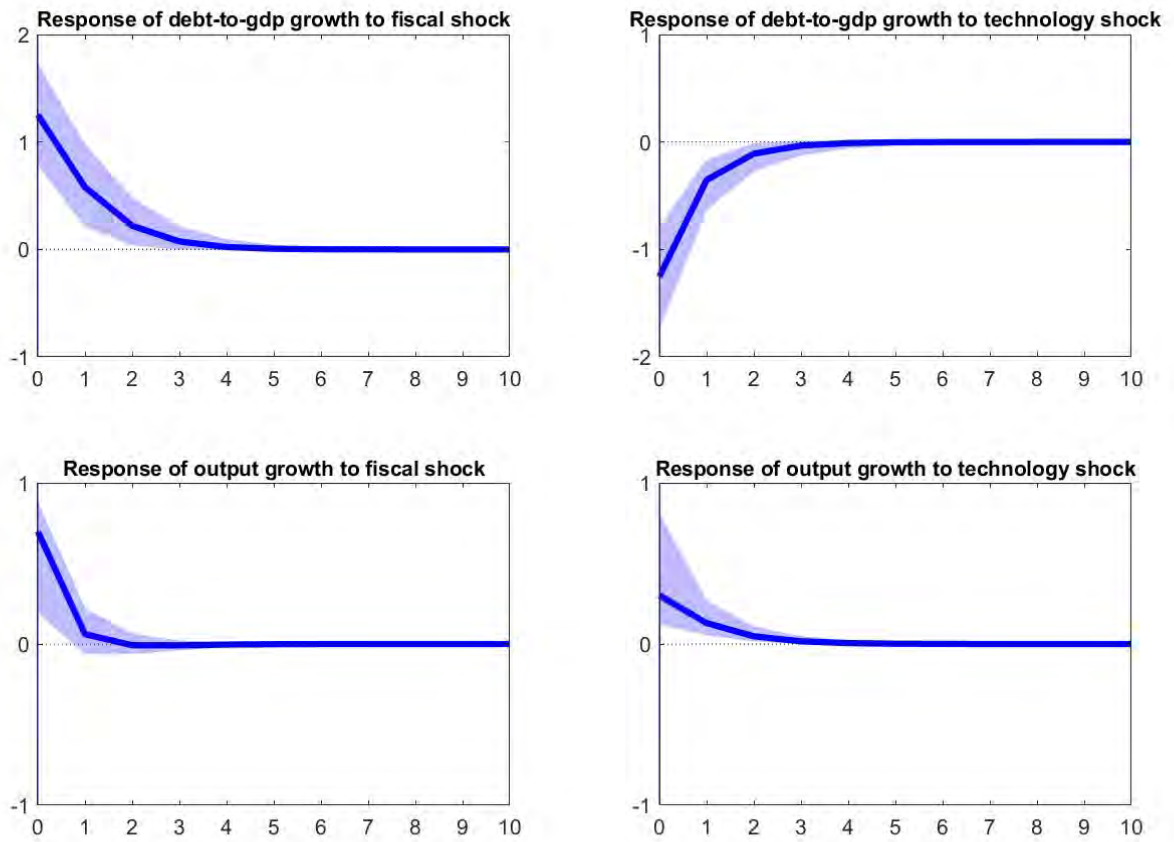


**Figure S30: Posterior distributions of parameters  $\alpha$  and  $\beta$ , and the effects of 1 percent technology and fiscal policy shocks for South Africa**

Posterior distributions of parameters  $\alpha$  and  $\beta$

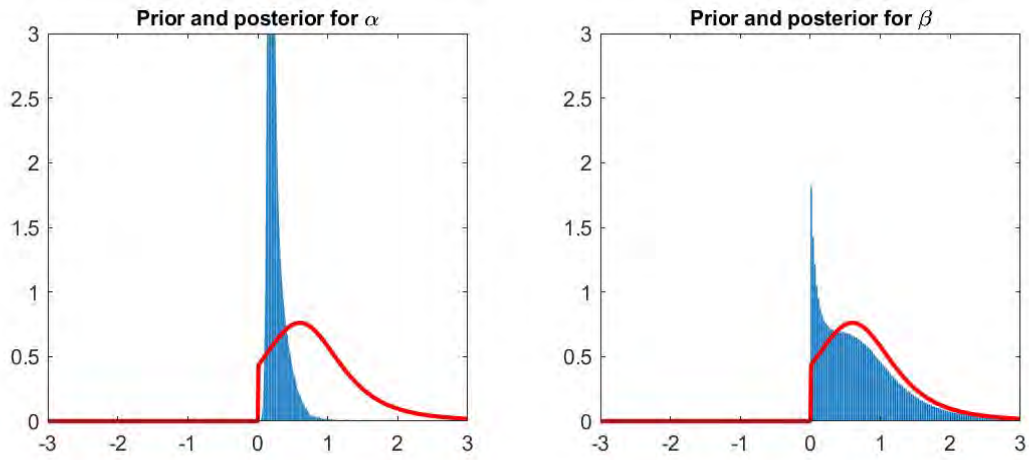


Posterior median (solid line) and 80 percent credible sets for the effects of 1 percent technology and fiscal policy shocks

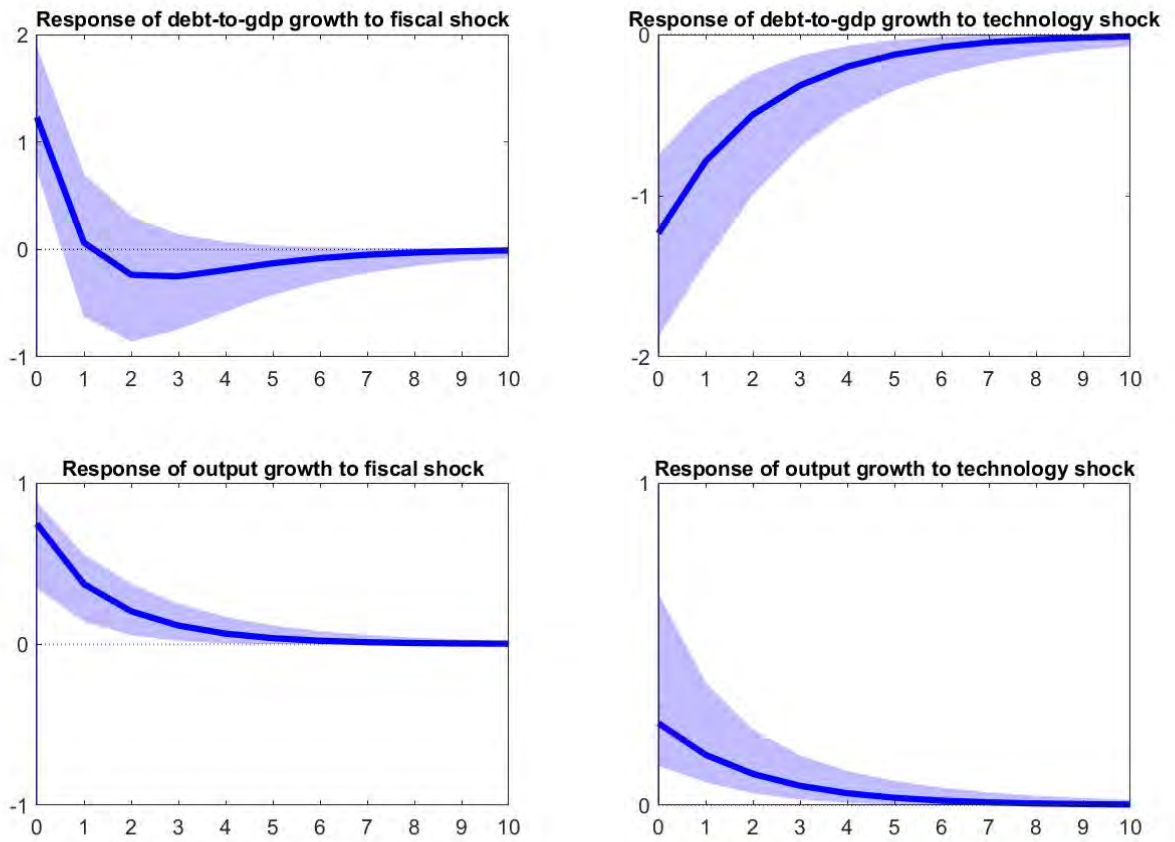


**Figure S31: Posterior distributions of parameters  $\alpha$  and  $\beta$ , and the effects of 1 percent technology and fiscal policy shocks for Spain**

Posterior distributions of parameters  $\alpha$  and  $\beta$



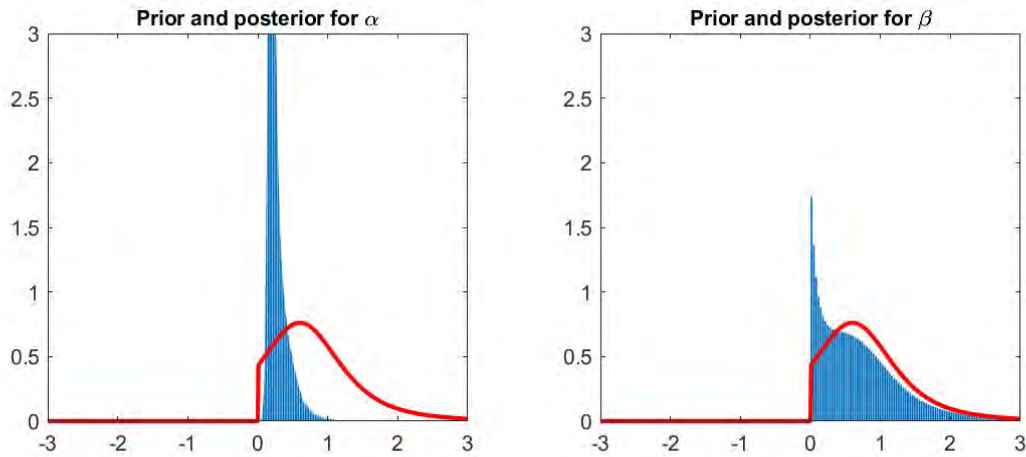
Posterior median (solid line) and 80 percent credible sets for the effects of 1 percent technology and fiscal policy shocks



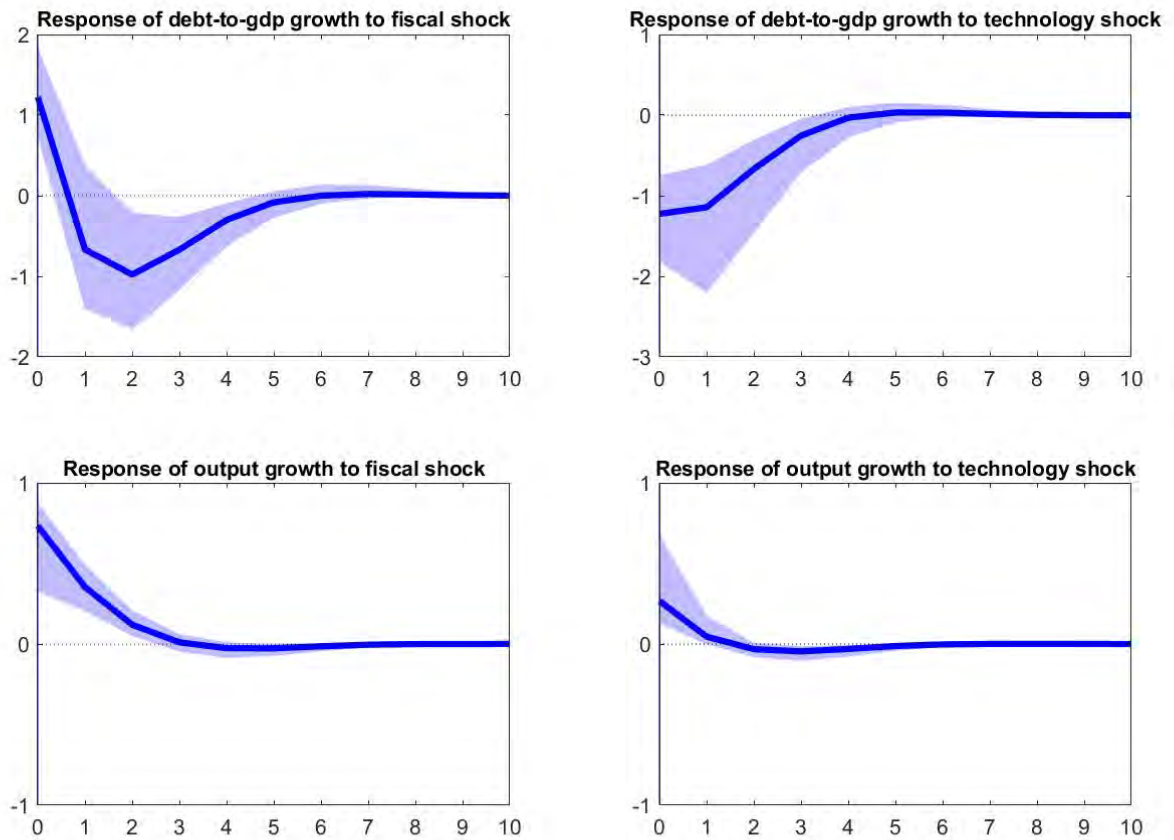


**Figure S32: Posterior distributions of parameters  $\alpha$  and  $\beta$ , and the effects of 1 percent technology and fiscal policy shocks for Sweden**

Posterior distributions of parameters  $\alpha$  and  $\beta$

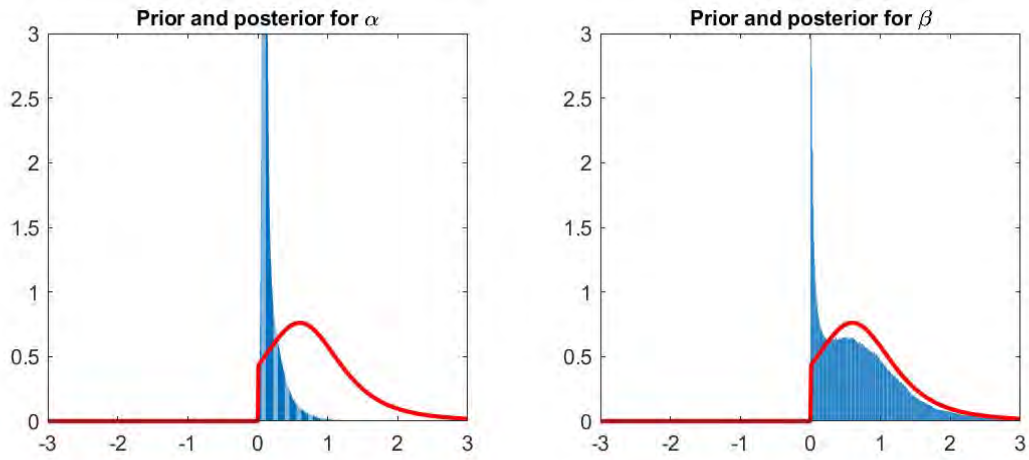


Posterior median (solid line) and 80 percent credible sets for the effects of 1 percent technology and fiscal policy shocks

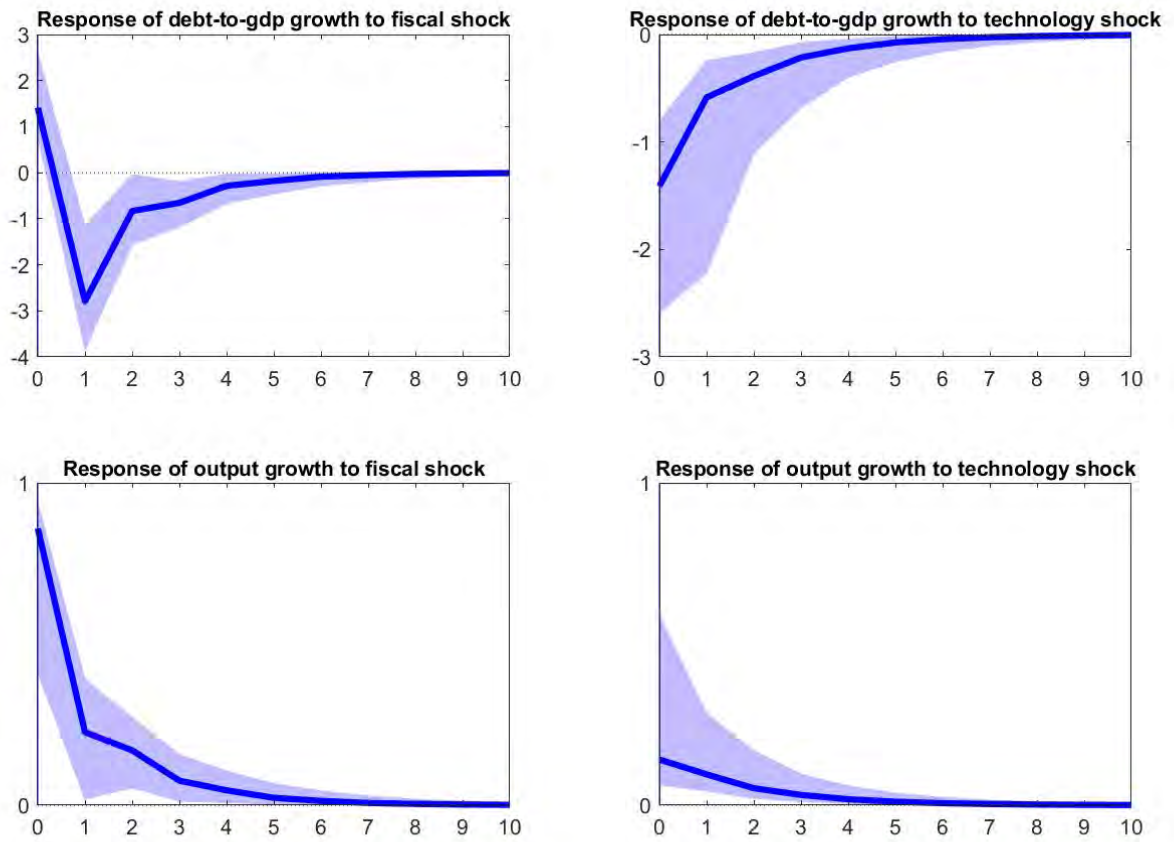


**Figure S33: Posterior distributions of parameters  $\alpha$  and  $\beta$ , and the effects of 1 percent technology and fiscal policy shocks for Switzerland**

Posterior distributions of parameters  $\alpha$  and  $\beta$

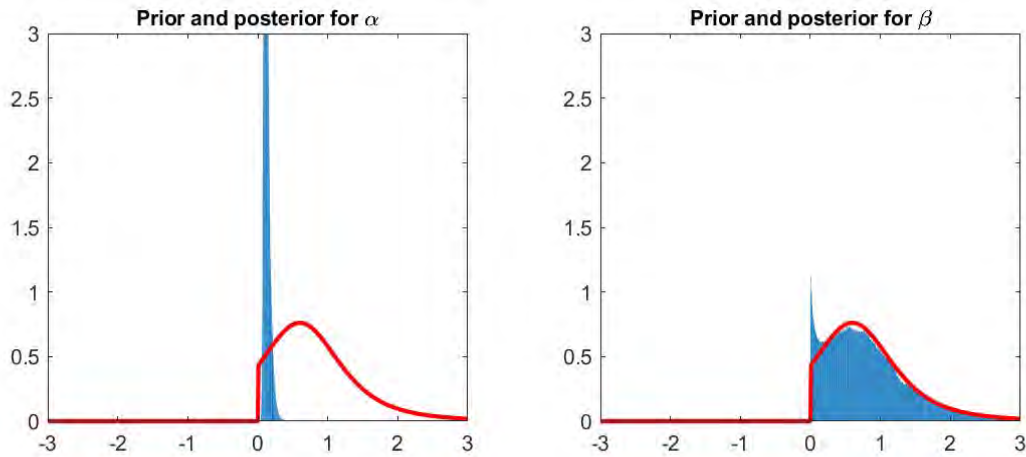


Posterior median (solid line) and 80 percent credible sets for the effects of 1 percent technology and fiscal policy shocks

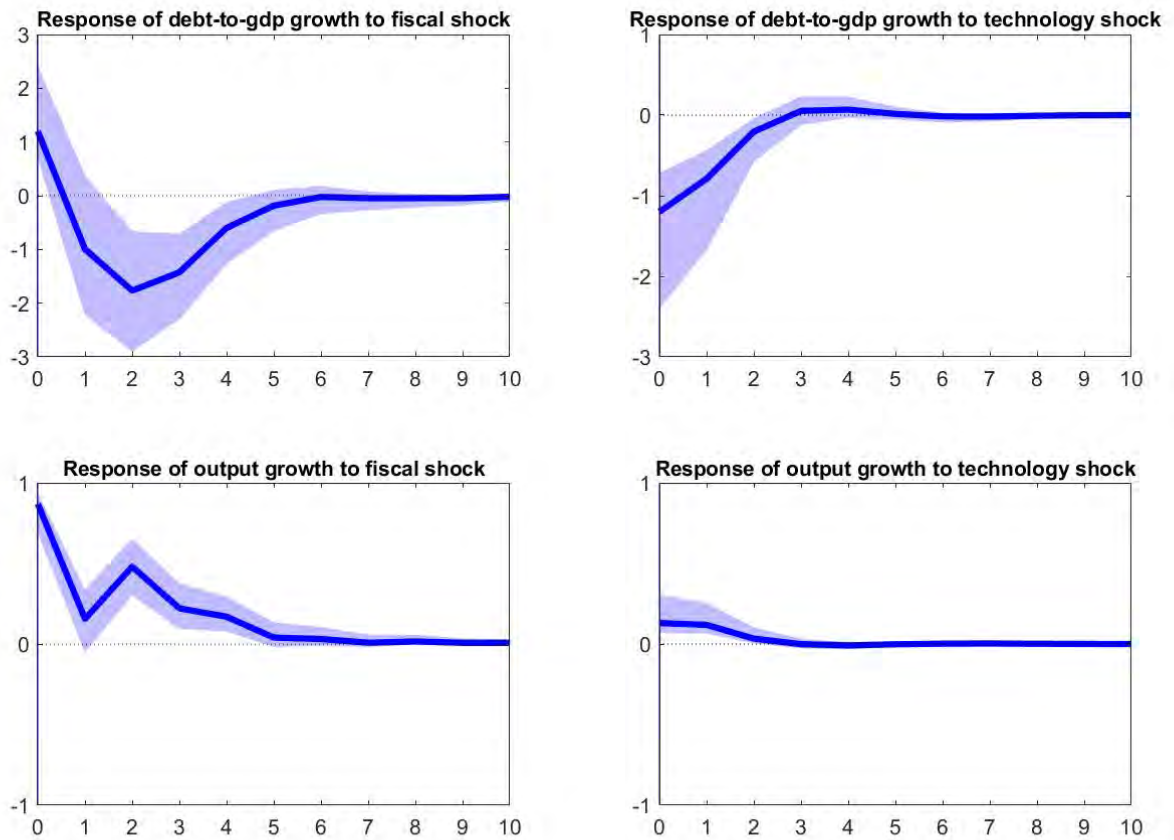


**Figure S34: Posterior distributions of parameters  $\alpha$  and  $\beta$ , and the effects of 1 percent technology and fiscal policy shocks for Thailand**

Posterior distributions of parameters  $\alpha$  and  $\beta$

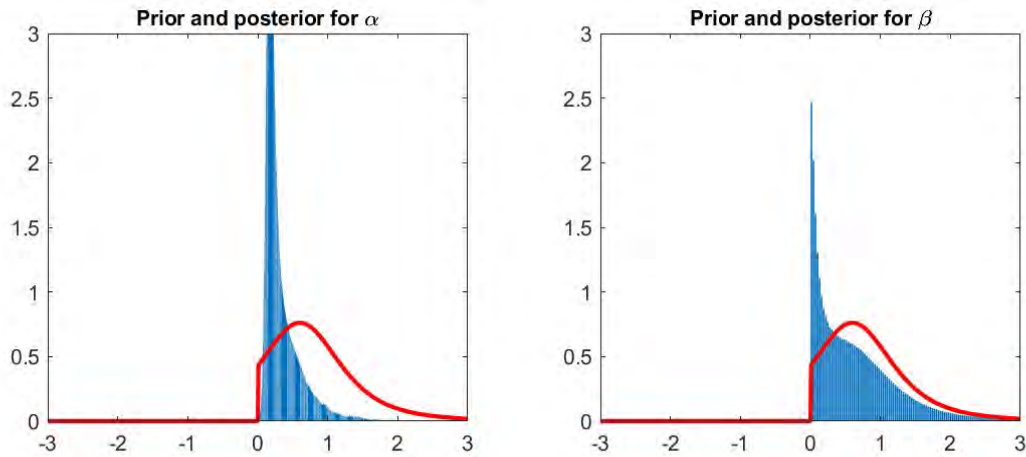


Posterior median (solid line) and 80 percent credible sets for the effects of 1 percent technology and fiscal policy shocks

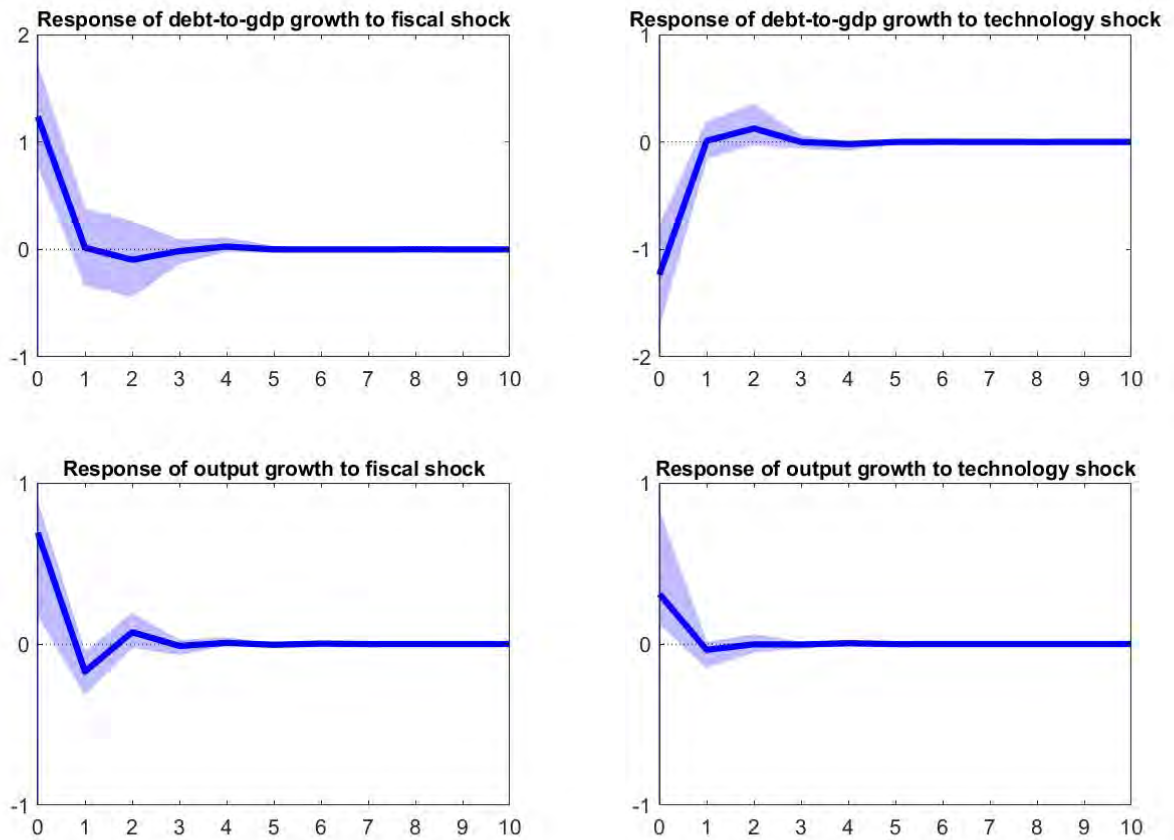


**Figure S35: Posterior distributions of parameters  $\alpha$  and  $\beta$ , and the effects of 1 percent technology and fiscal policy shocks for Tunisia**

Posterior distributions of parameters  $\alpha$  and  $\beta$

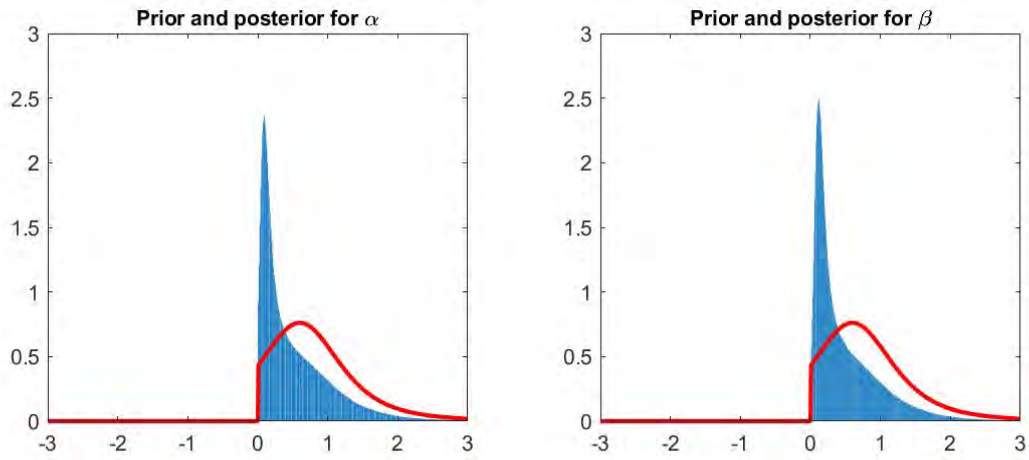


Posterior median (solid line) and 80 percent credible sets for the effects of 1 percent technology and fiscal policy shocks

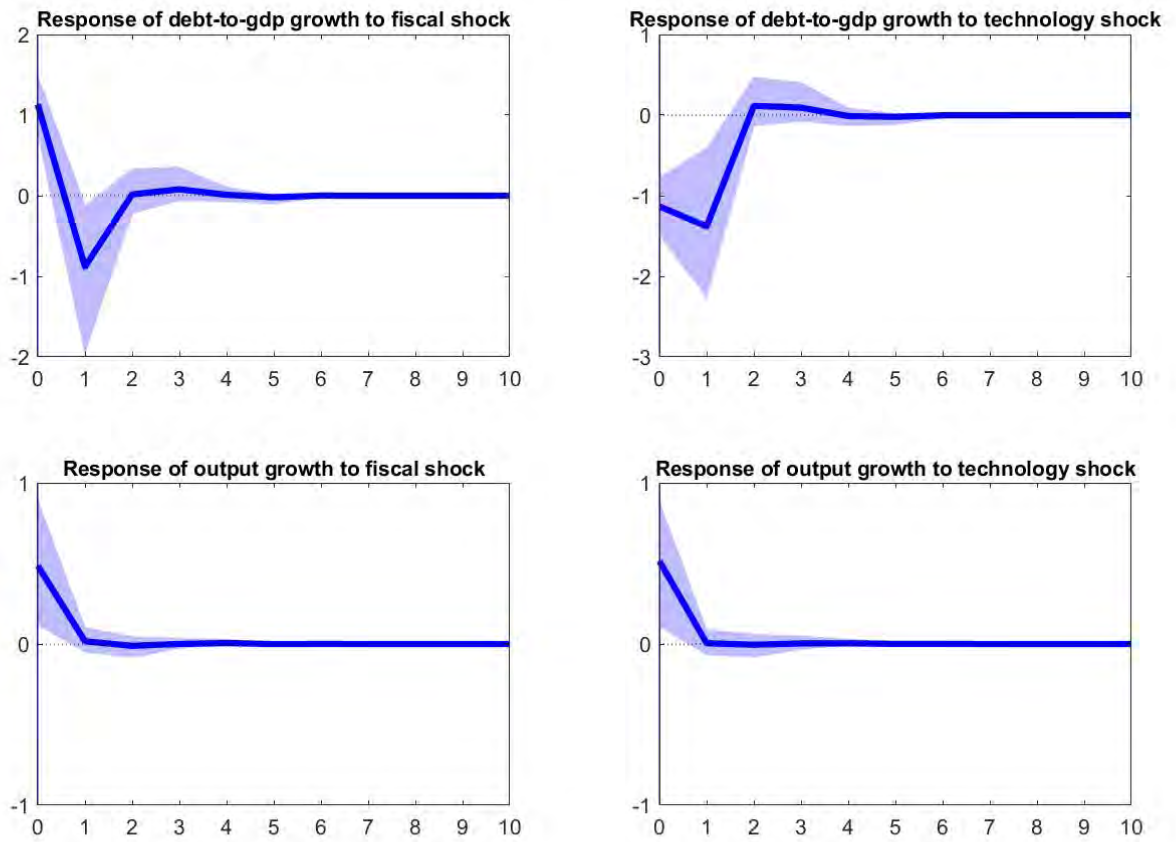


**Figure S36: Posterior distributions of parameters  $\alpha$  and  $\beta$ , and the effects of 1 percent technology and fiscal policy shocks for Turkey**

Posterior distributions of parameters  $\alpha$  and  $\beta$

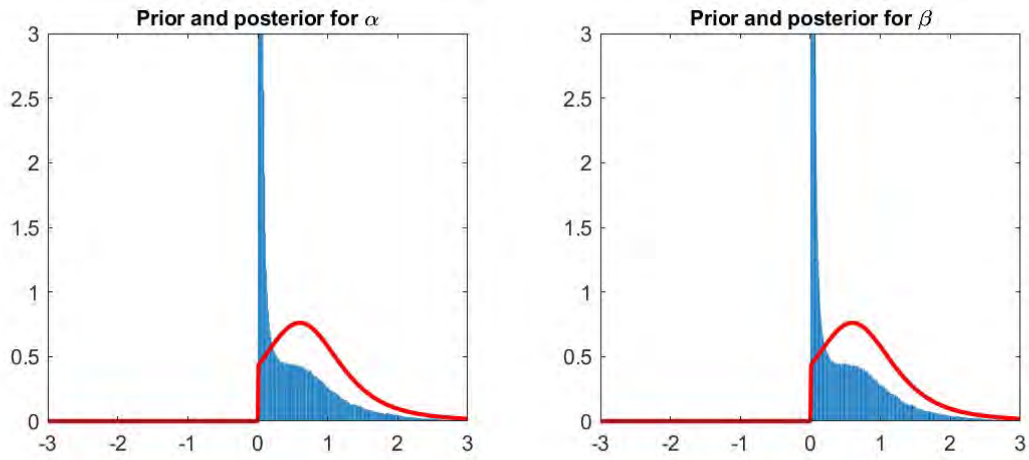


Posterior median (solid line) and 80 percent credible sets for the effects of 1 percent technology and fiscal policy shocks

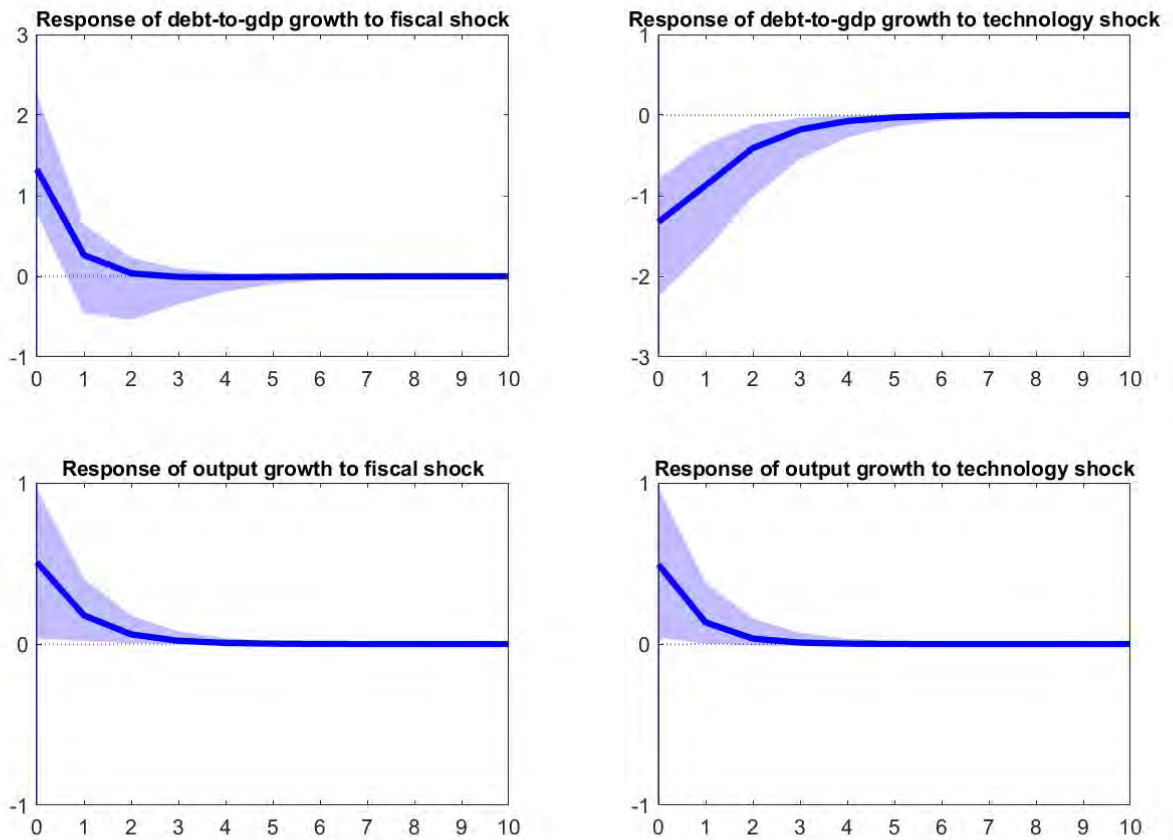


**Figure S37: Posterior distributions of parameters  $\alpha$  and  $\beta$ , and the effects of 1 percent technology and fiscal policy shocks for UK**

Posterior distributions of parameters  $\alpha$  and  $\beta$

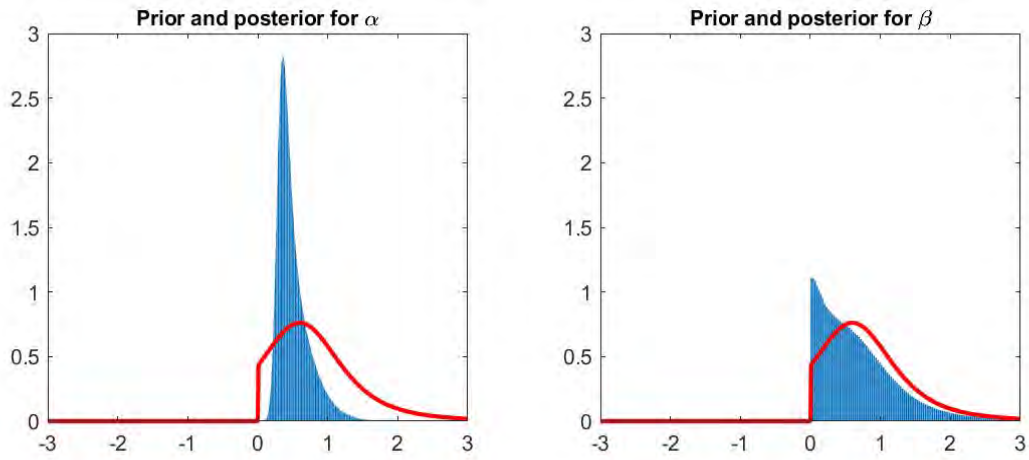


Posterior median (solid line) and 80 percent credible sets for the effects of 1 percent technology and fiscal policy shocks

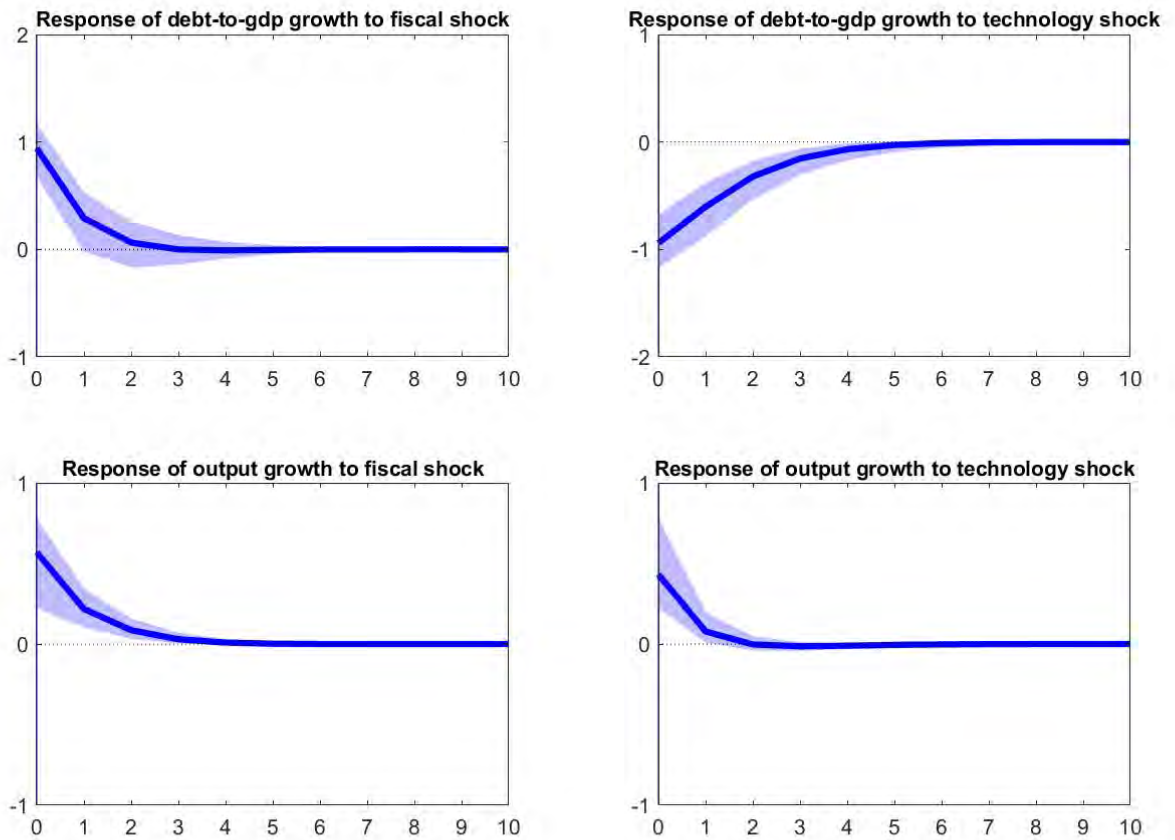


**Figure S38: Posterior distributions of parameters  $\alpha$  and  $\beta$ , and the effects of 1 percent technology and fiscal policy shocks for USA**

Posterior distributions of parameters  $\alpha$  and  $\beta$

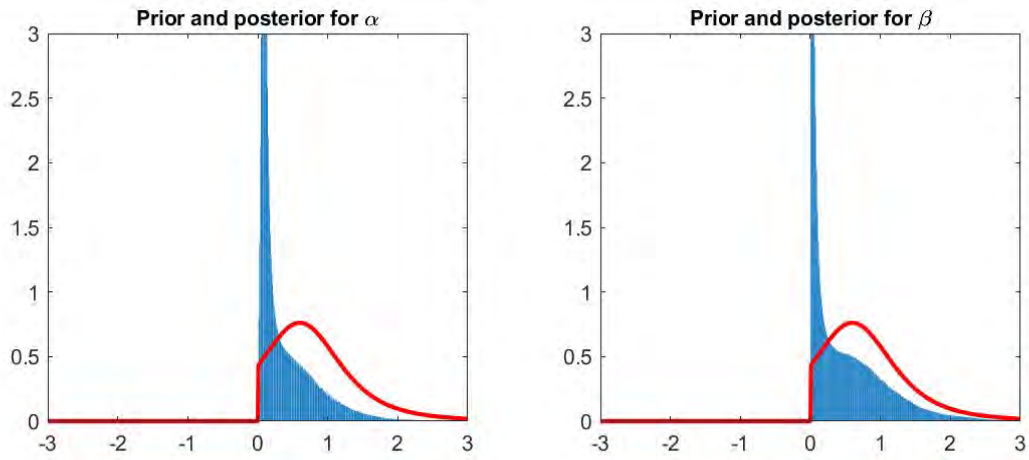


Posterior median (solid line) and 80 percent credible sets for the effects of 1 percent technology and fiscal policy shocks

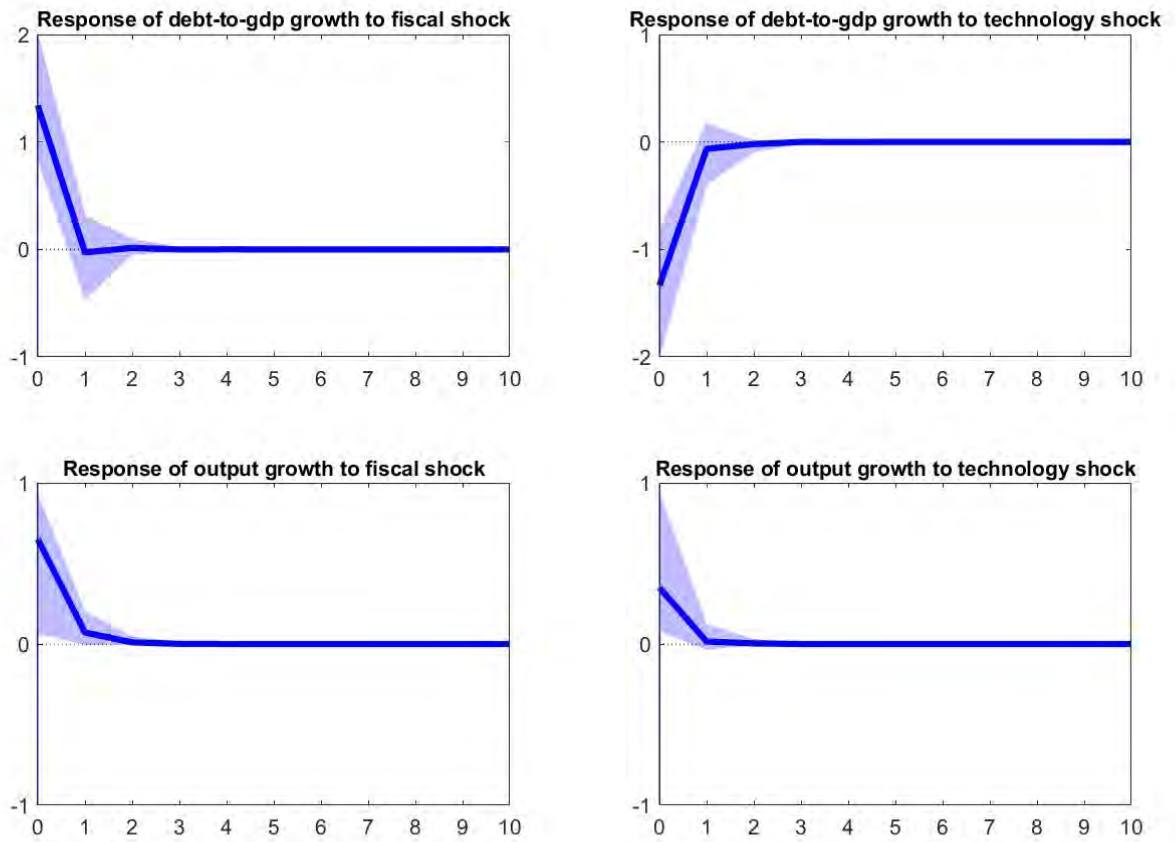


**Figure S39: Posterior distributions of parameters  $\alpha$  and  $\beta$ , and the effects of 1 percent technology and fiscal policy shocks for Venezuela**

Posterior distributions of parameters  $\alpha$  and  $\beta$



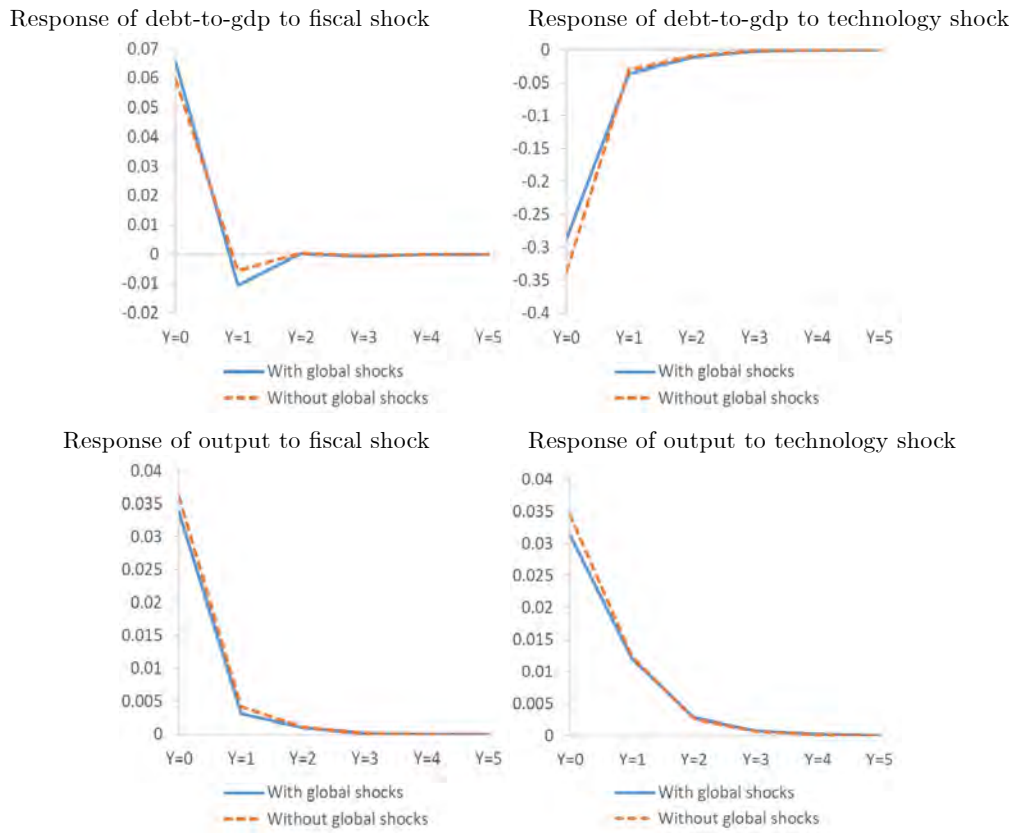
Posterior median (solid line) and 80 percent credible sets for the effects of 1 percent technology and fiscal policy shocks



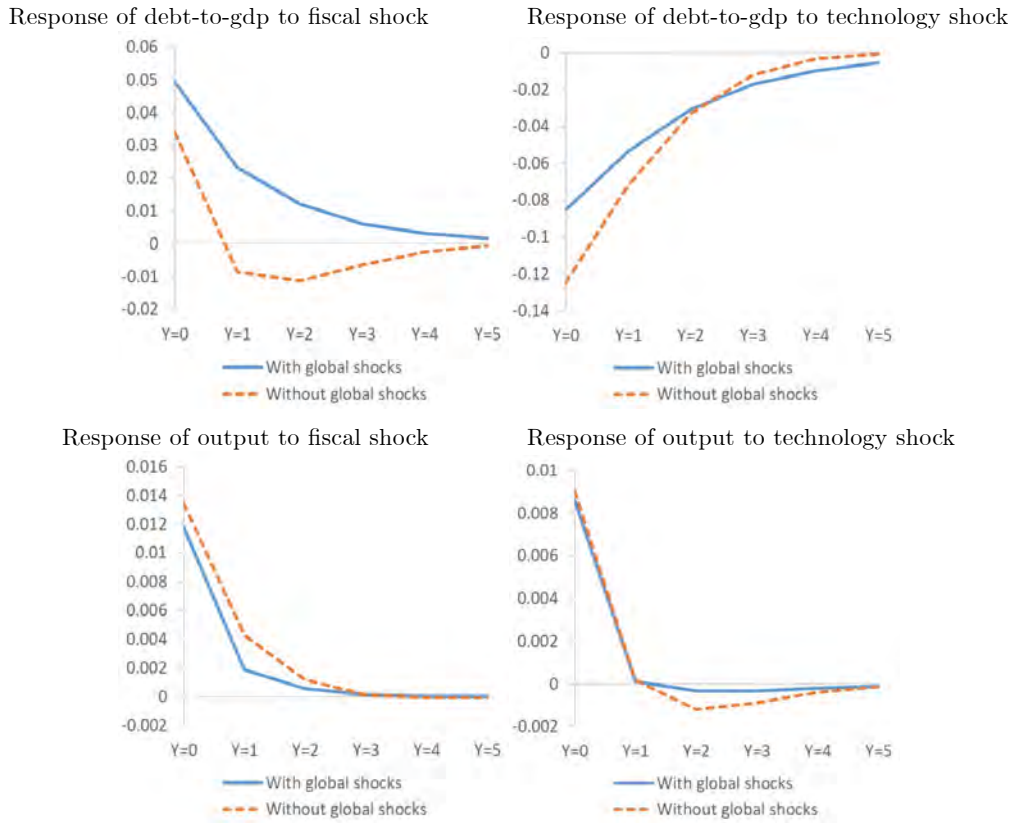


## S2 Effects of national technology and fiscal policy shocks in models with and without global shocks

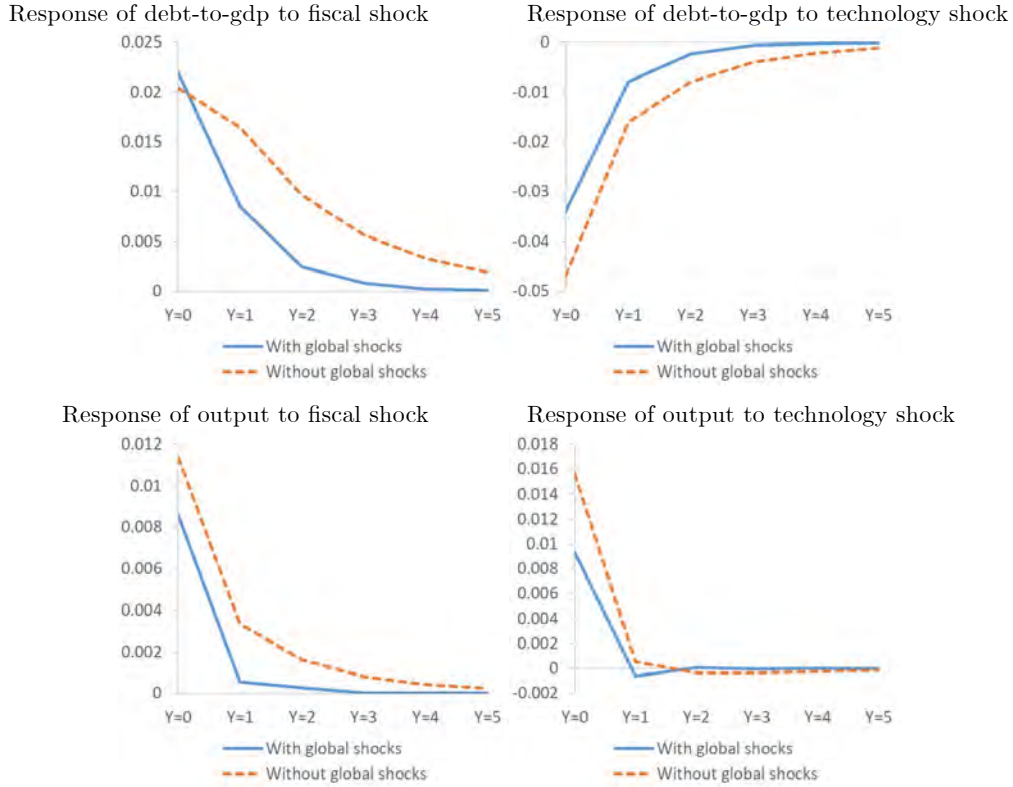
Figure S40: IRFs for Argentina in models with and without global shocks (median of posterior distribution)



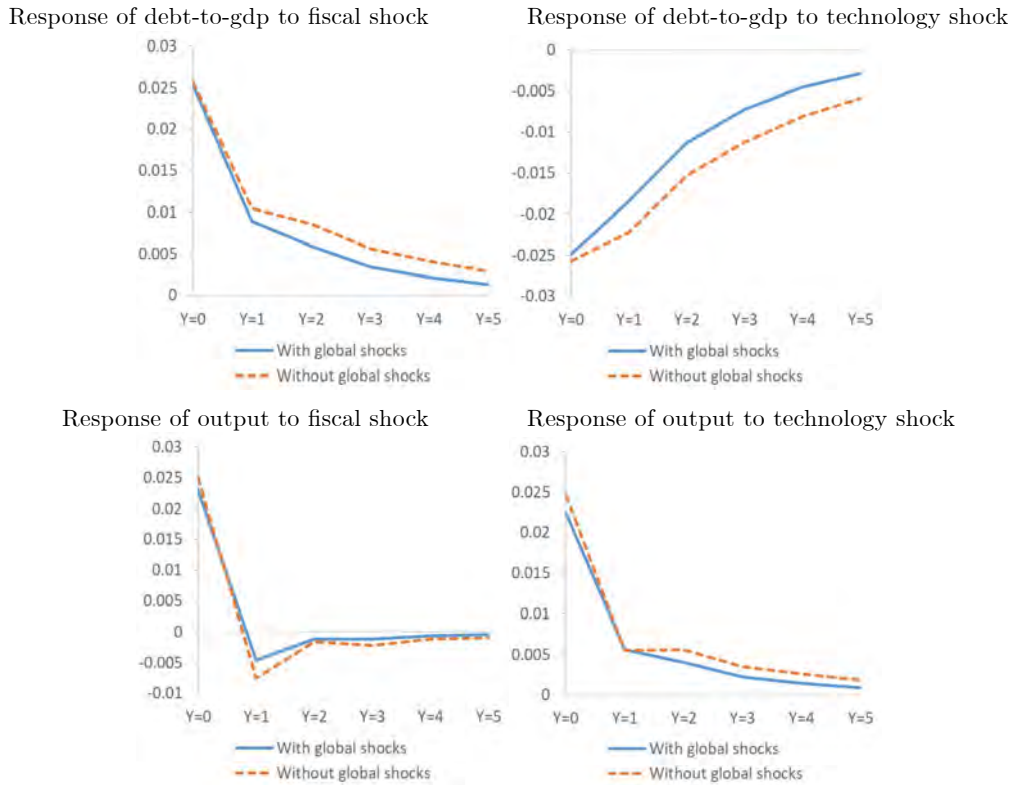
**Figure S41: IRFs for Australia in models with and without global shocks (median of posterior distribution)**



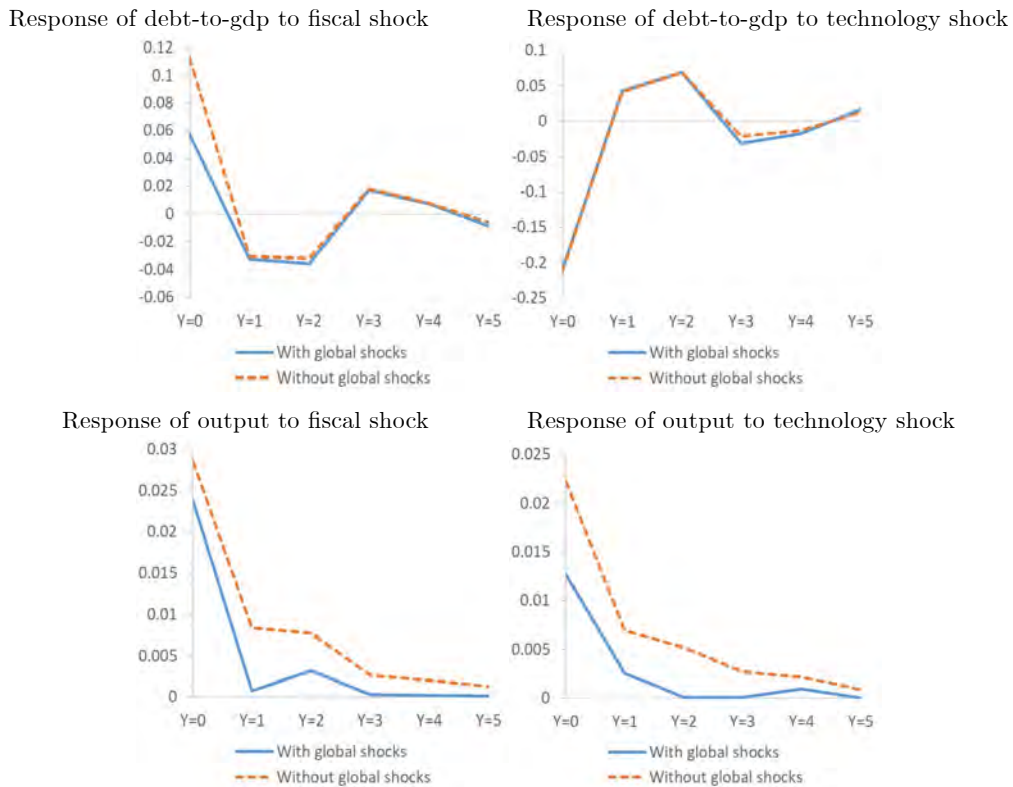
**Figure S42: IRFs for Austria in models with and without global shocks (median of posterior distribution)**



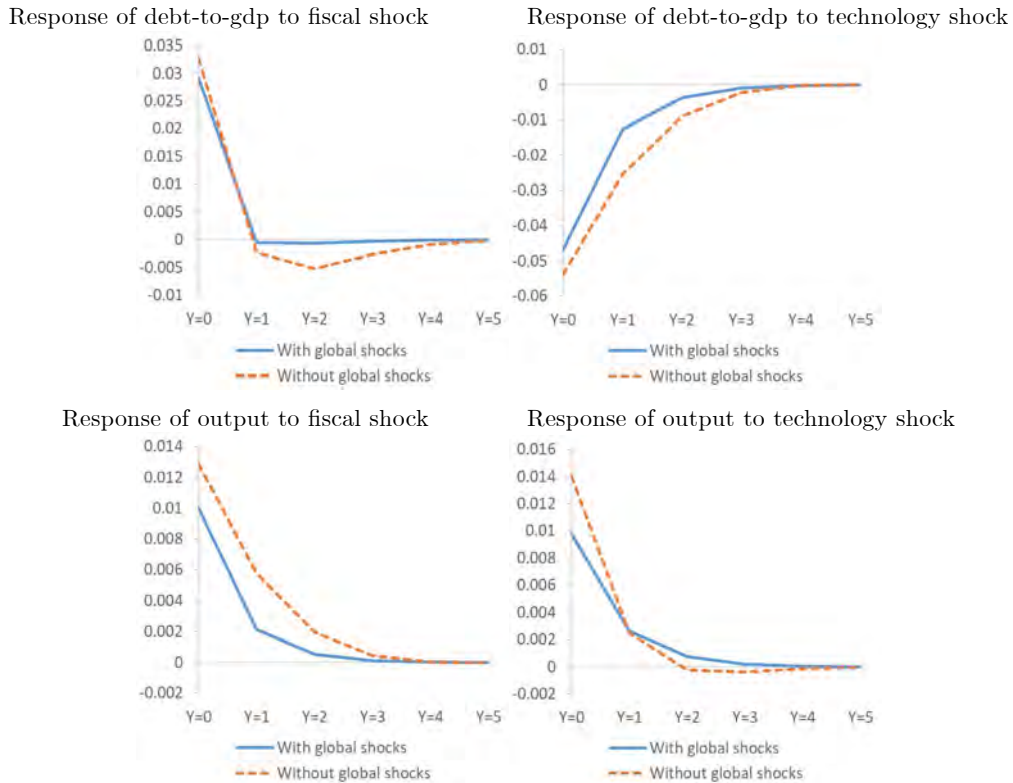
**Figure S43: IRFs for Belgium in models with and without global shocks (median of posterior distribution)**



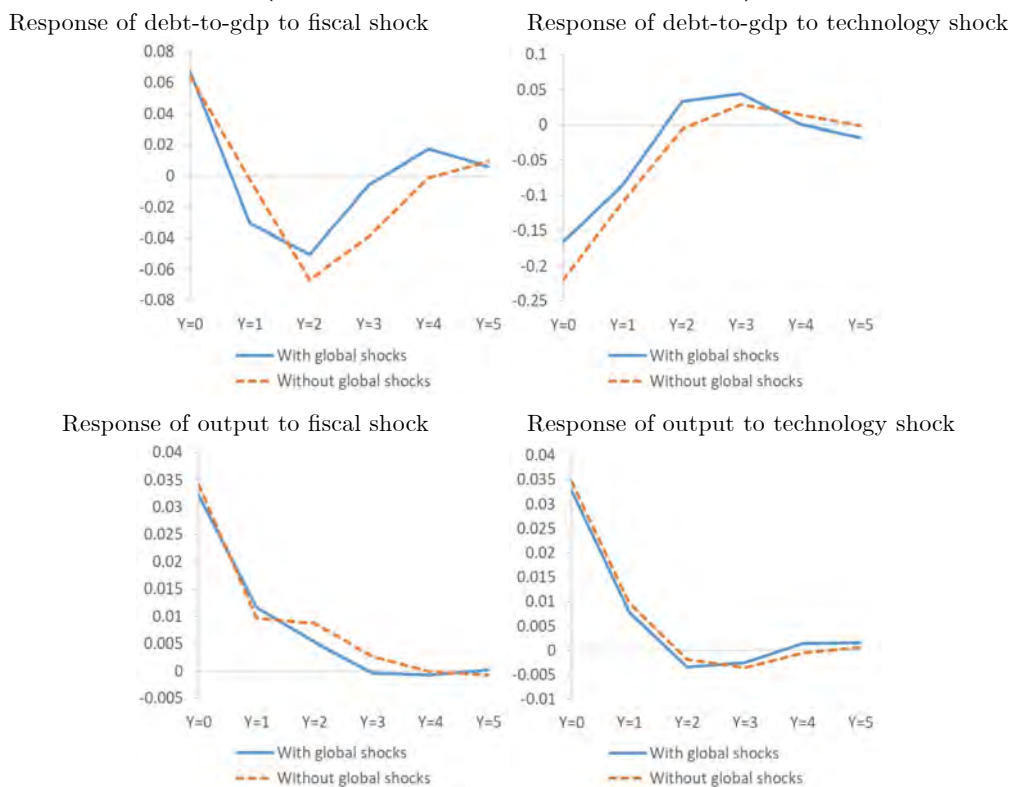
**Figure S44: IRFs for Brazil in models with and without global shocks (median of posterior distribution)**



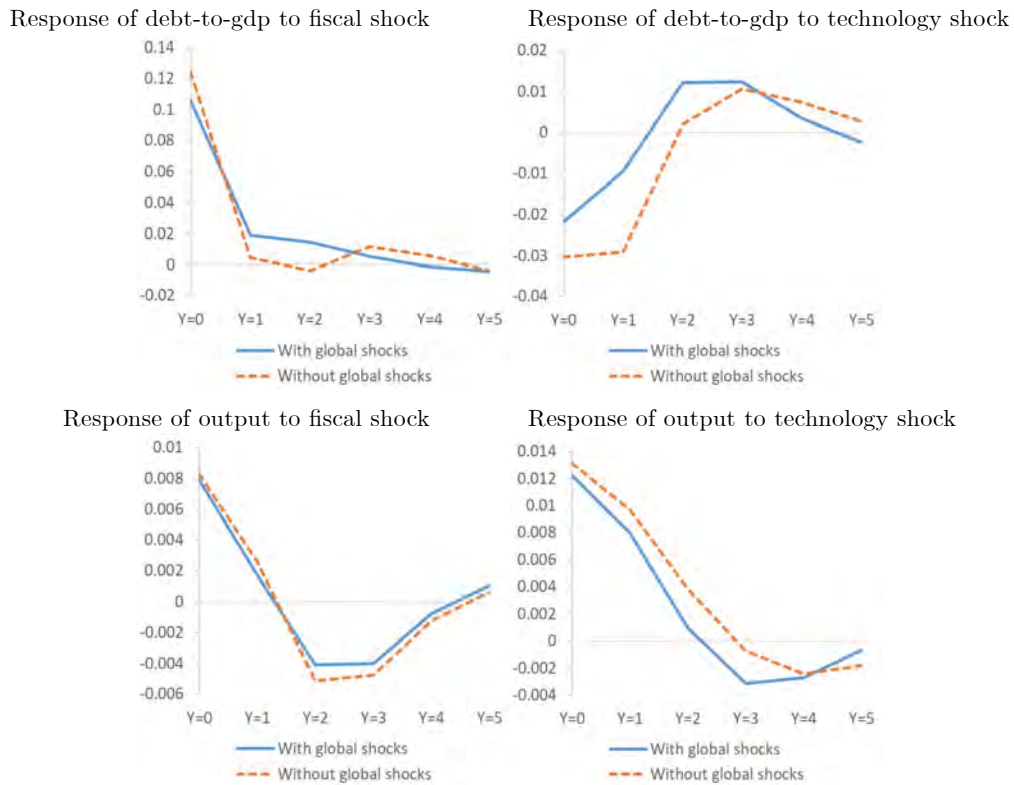
**Figure S45: IRFs for Canada in models with and without global shocks (median of posterior distribution)**



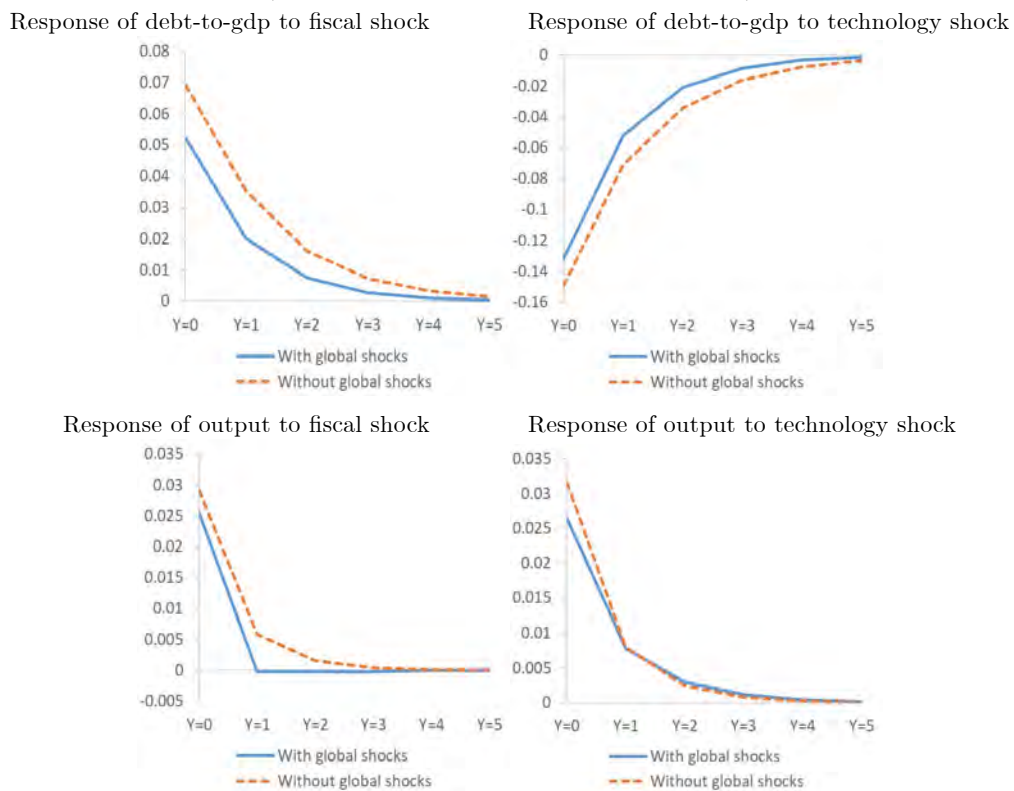
**Figure S46: IRFs for Chile in models with and without global shocks (median of posterior distribution)**



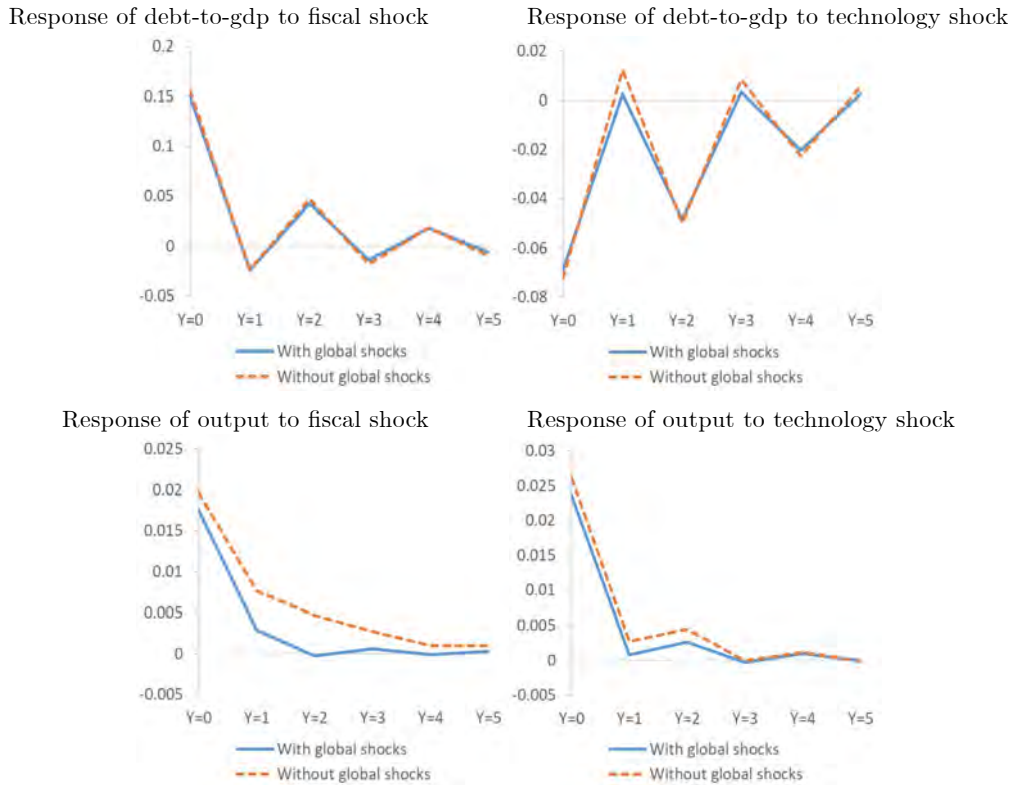
**Figure S47: IRFs for China in models with and without global shocks (median of posterior distribution)**



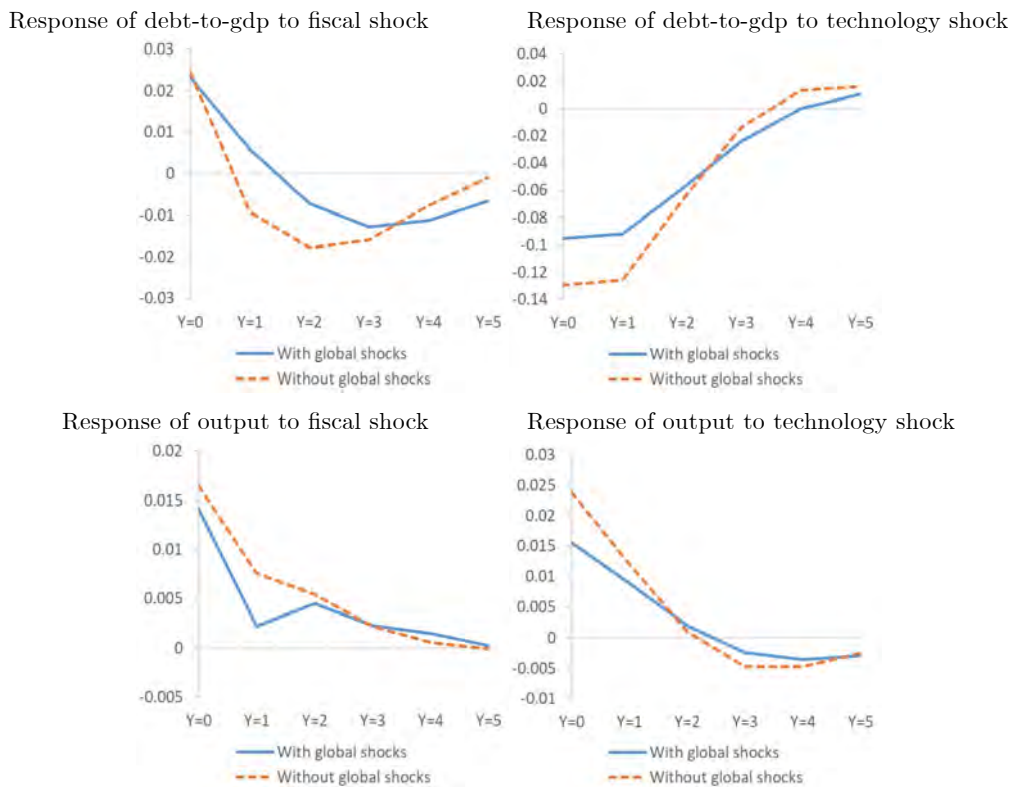
**Figure S48: IRFs for Ecuador in models with and without global shocks (median of posterior distribution)**



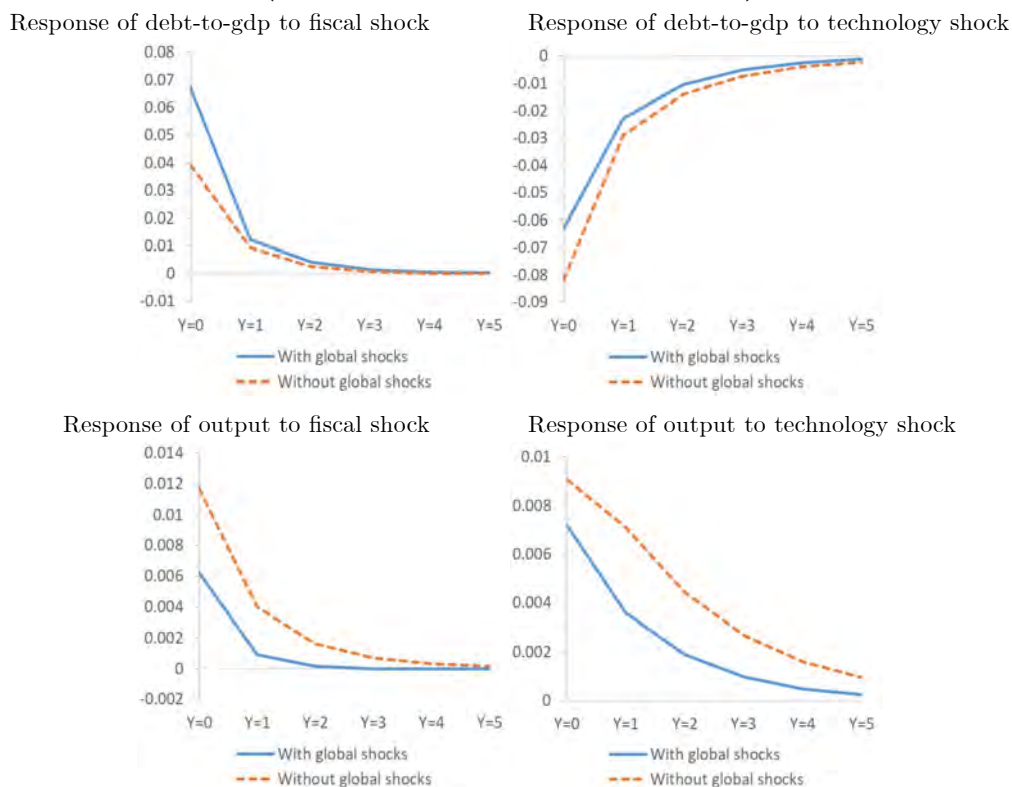
**Figure S49: IRFs for Egypt in models with and without global shocks (median of posterior distribution)**



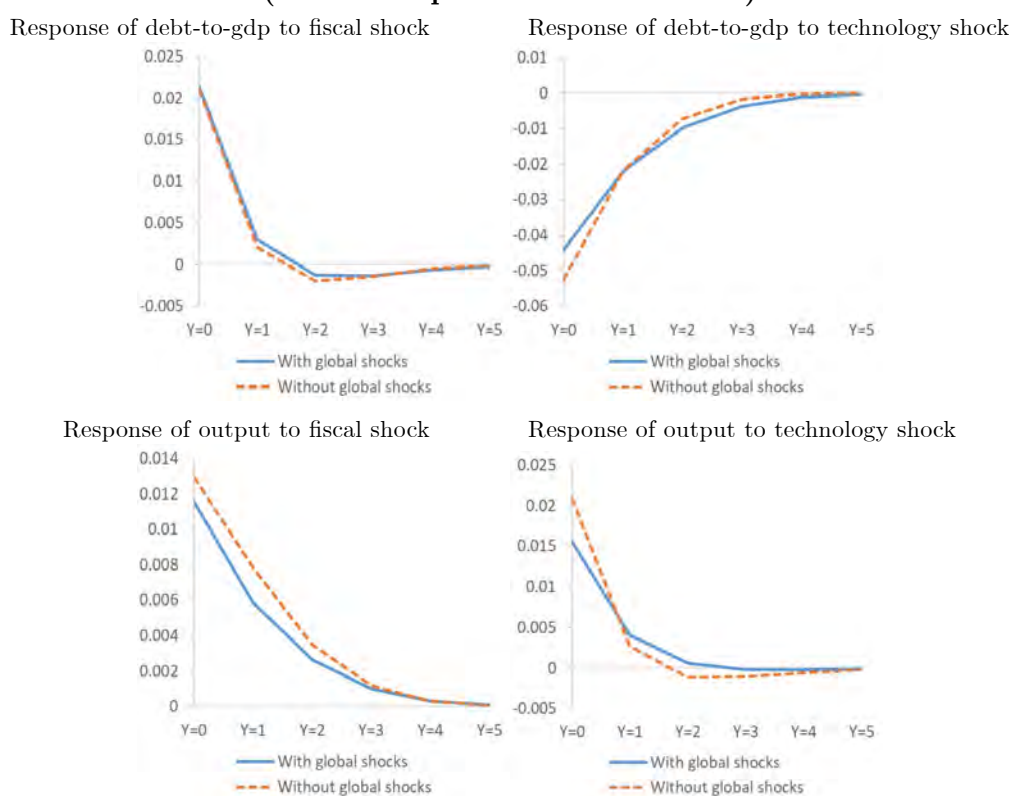
**Figure S50: IRFs for Finland in models with and without global shocks (median of posterior distribution)**



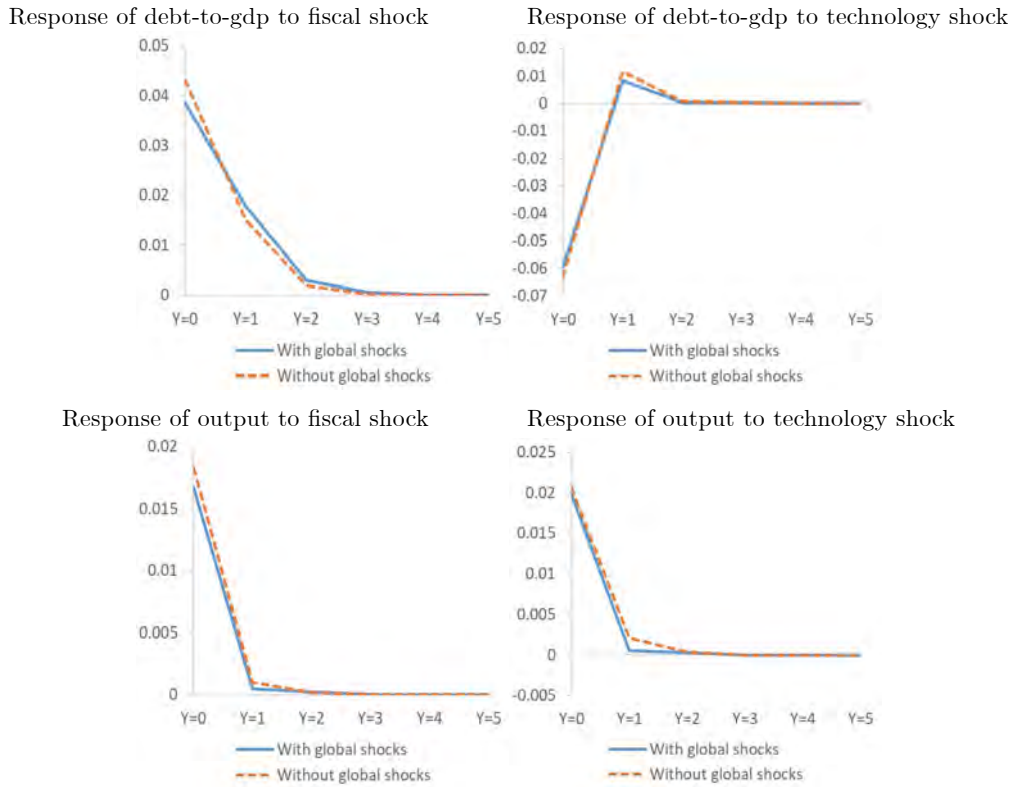
**Figure S51: IRFs for France in models with and without global shocks (median of posterior distribution)**



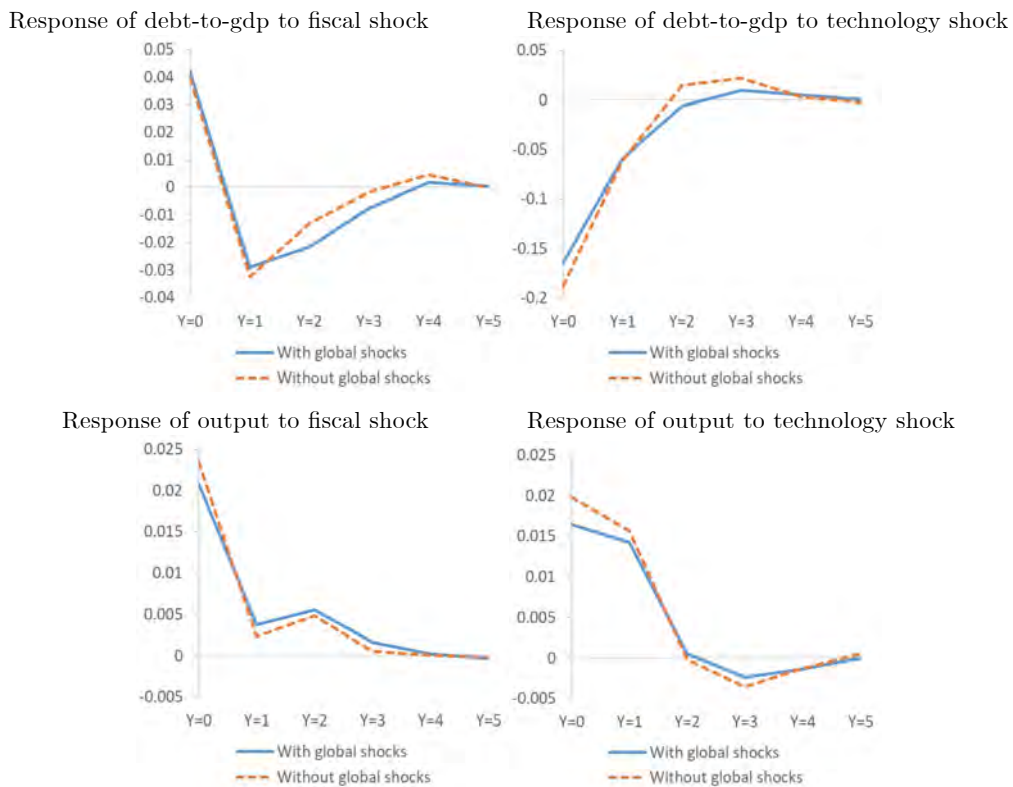
**Figure S52: IRFs for Germany in models with and without global shocks (median of posterior distribution)**



**Figure S53: IRFs for India in models with and without global shocks (median of posterior distribution)**

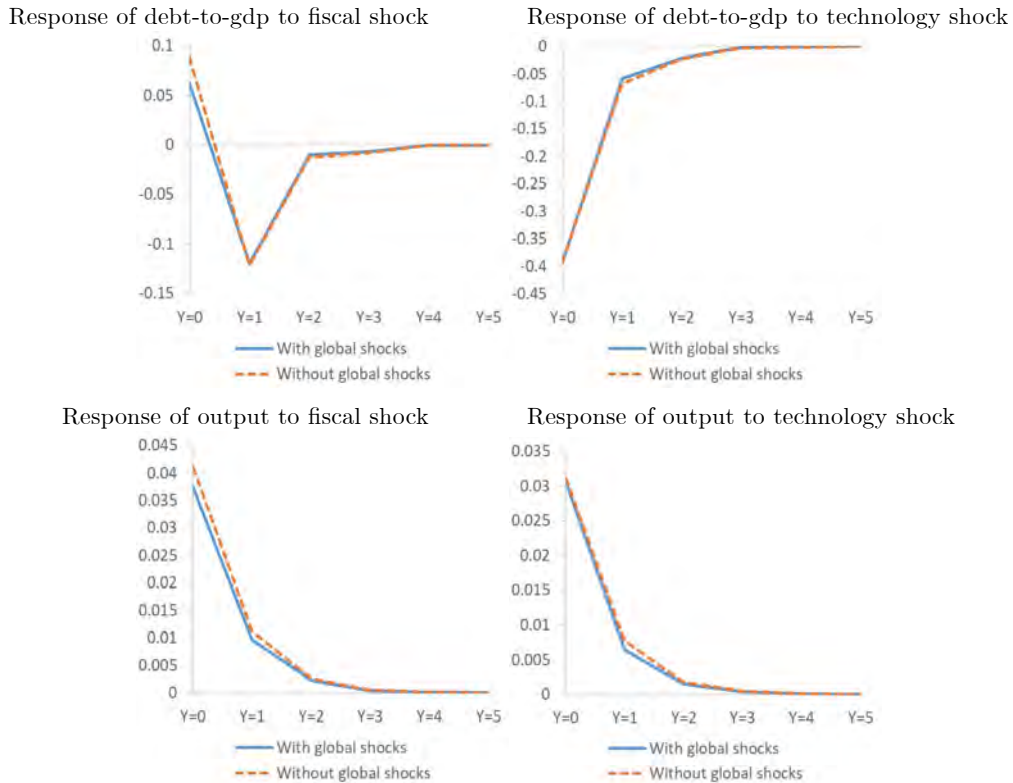


**Figure S54: IRFs for Indonesia in models with and without global shocks (median of posterior distribution)**

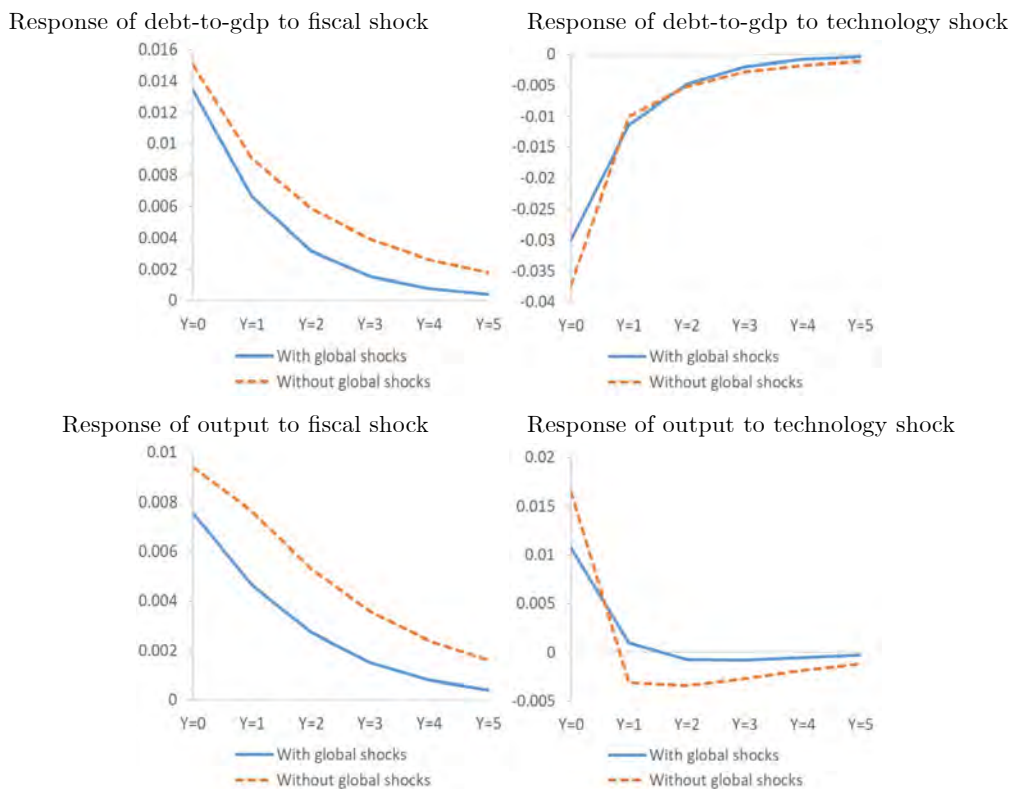




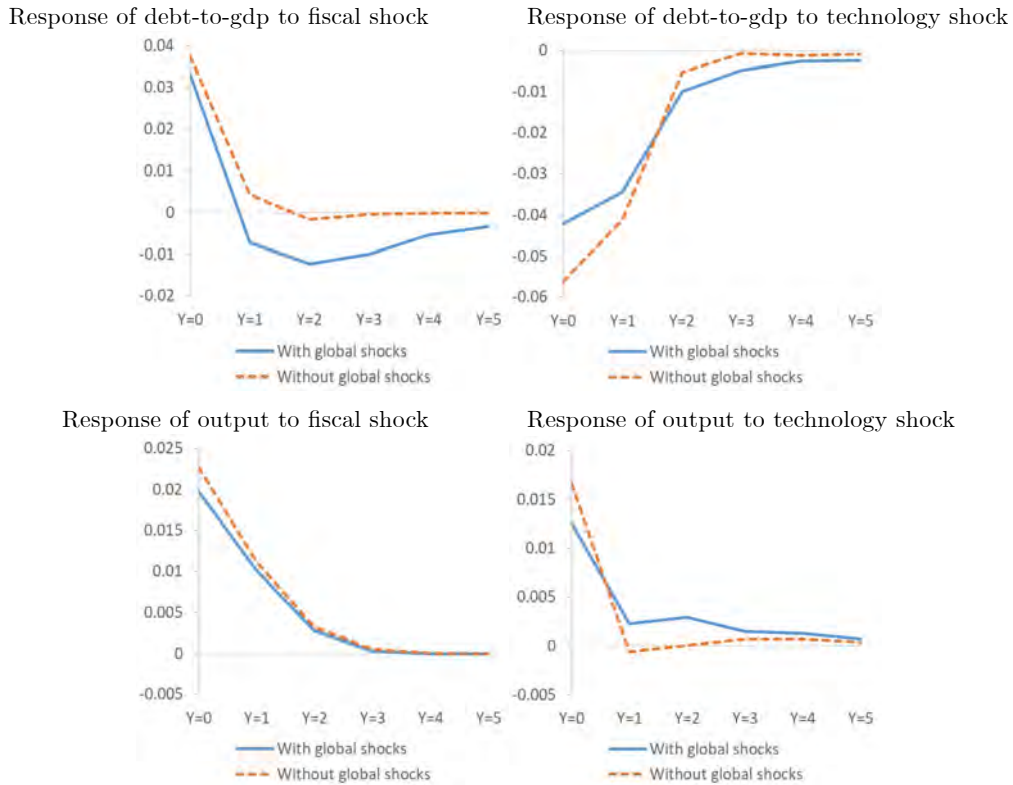
**Figure S55: IRFs for Iran in models with and without global shocks (median of posterior distribution)**



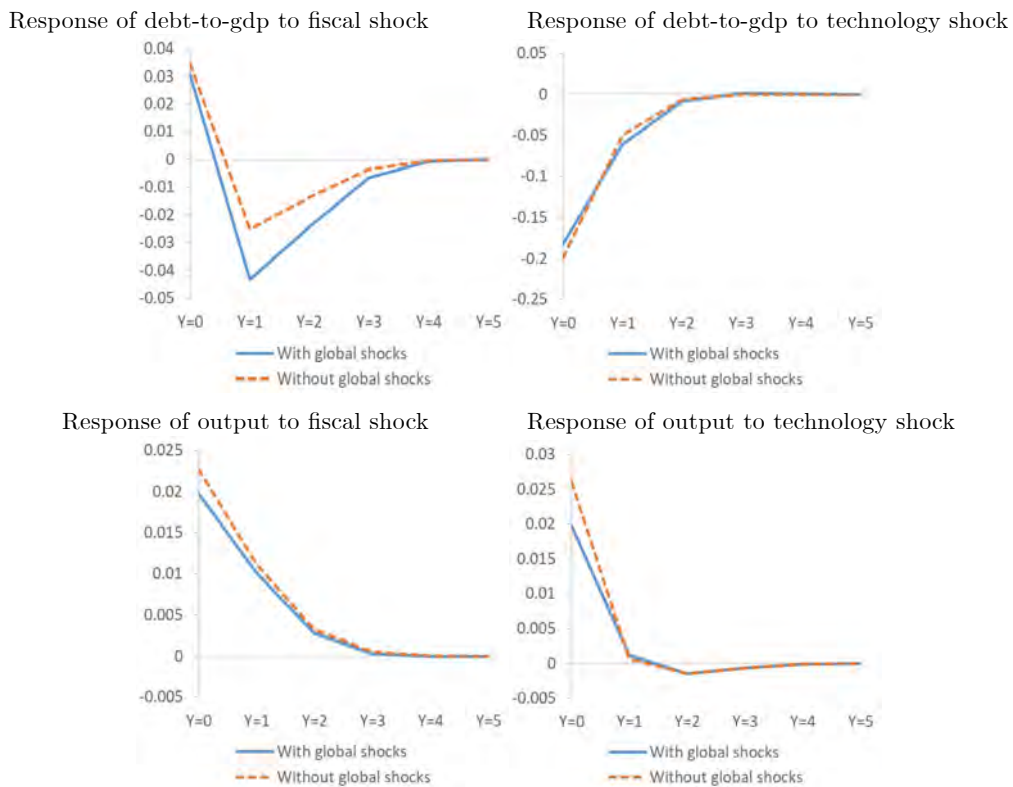
**Figure S56: IRFs for Italy in models with and without global shocks (median of posterior distribution)**



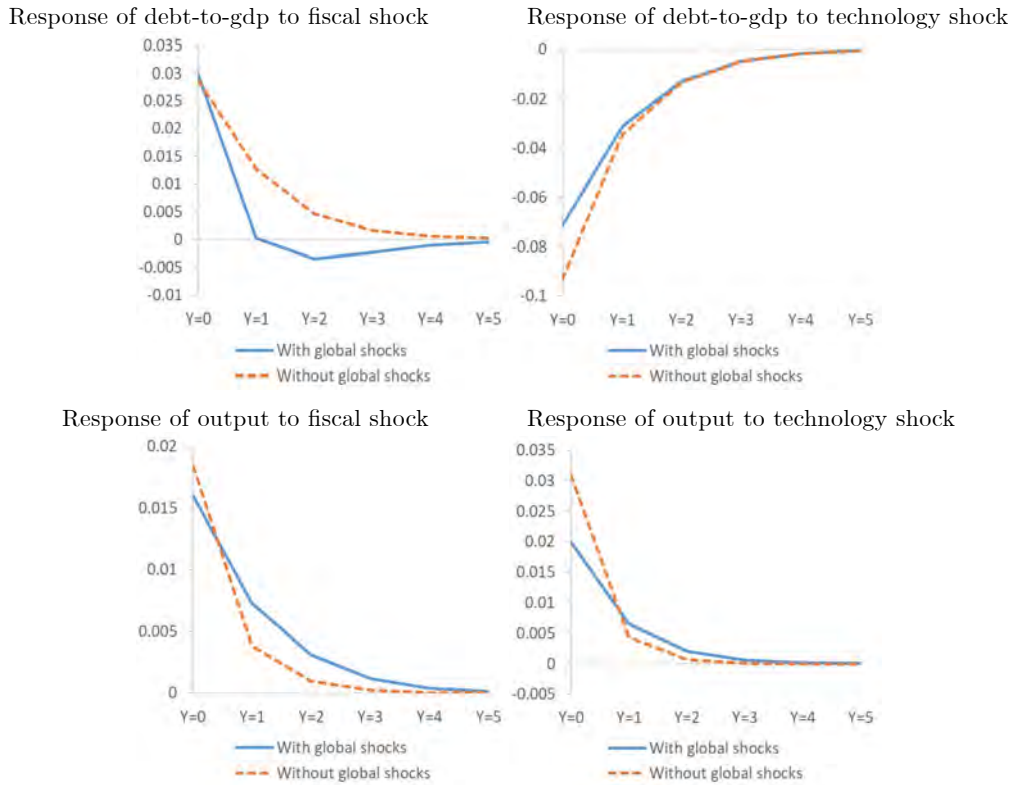
**Figure S57: IRFs for Japan in models with and without global shocks (median of posterior distribution)**



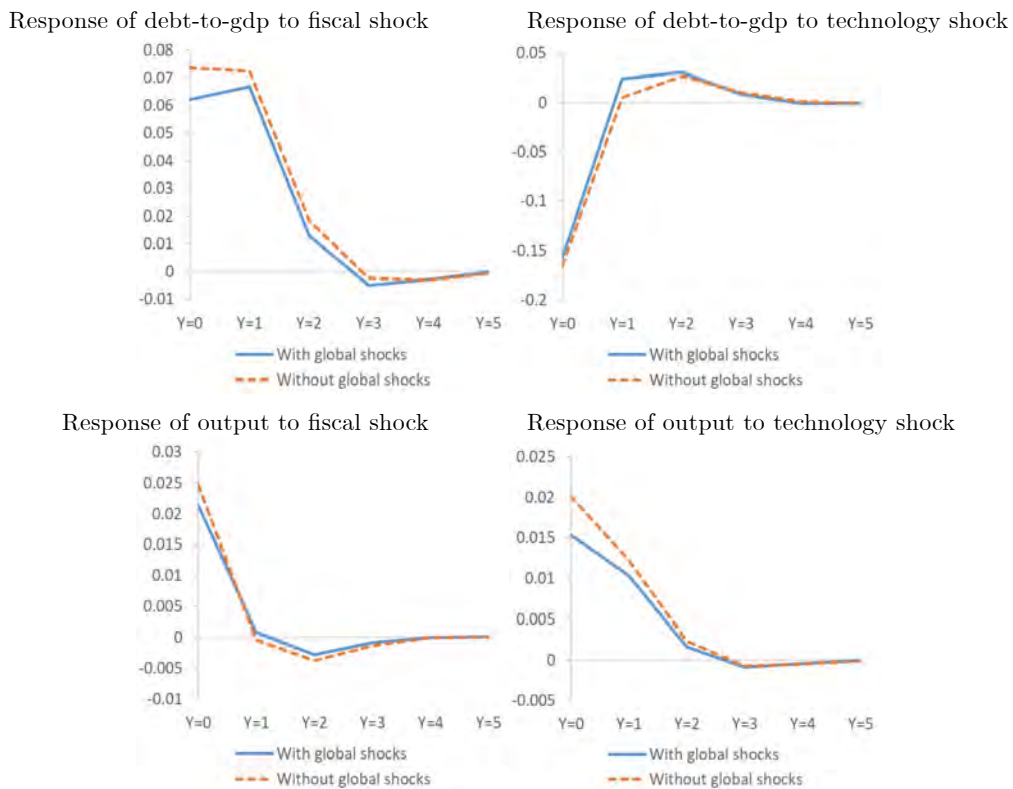
**Figure S58: IRFs for Korea in models with and without global shocks (median of posterior distribution)**



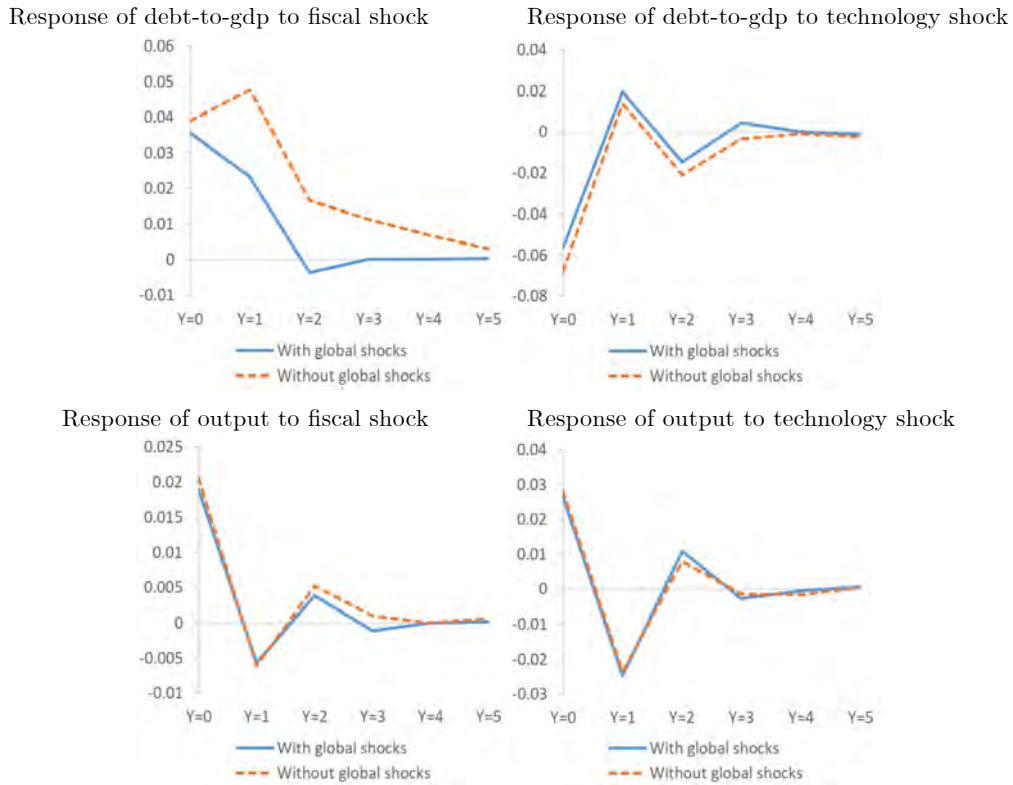
**Figure S59: IRFs for Malaysia in models with and without global shocks (median of posterior distribution)**



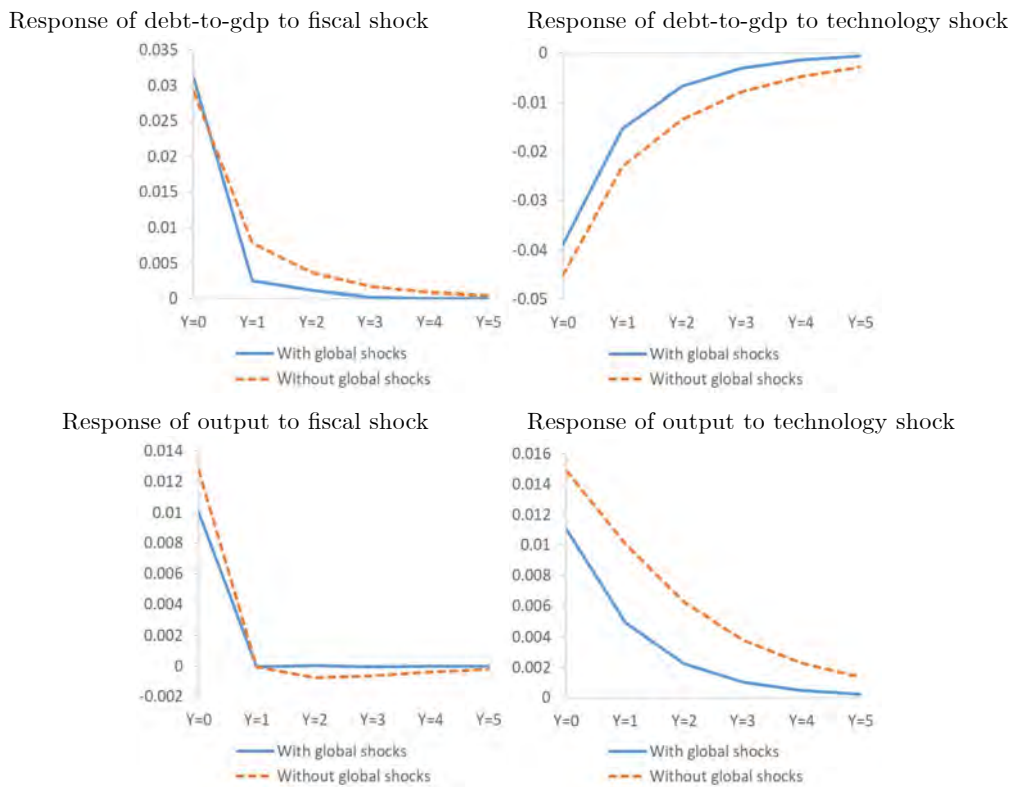
**Figure S60: IRFs for Mexico in models with and without global shocks (median of posterior distribution)**



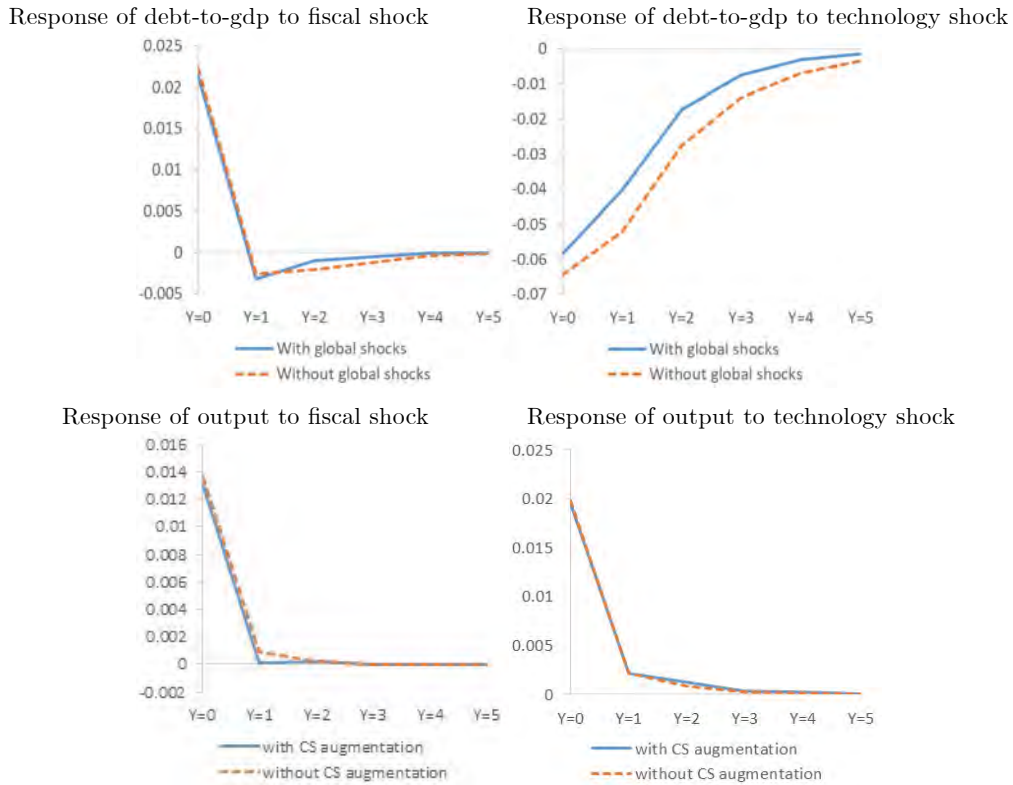
**Figure S61: IRFs for Morocco in models with and without global shocks (median of posterior distribution)**



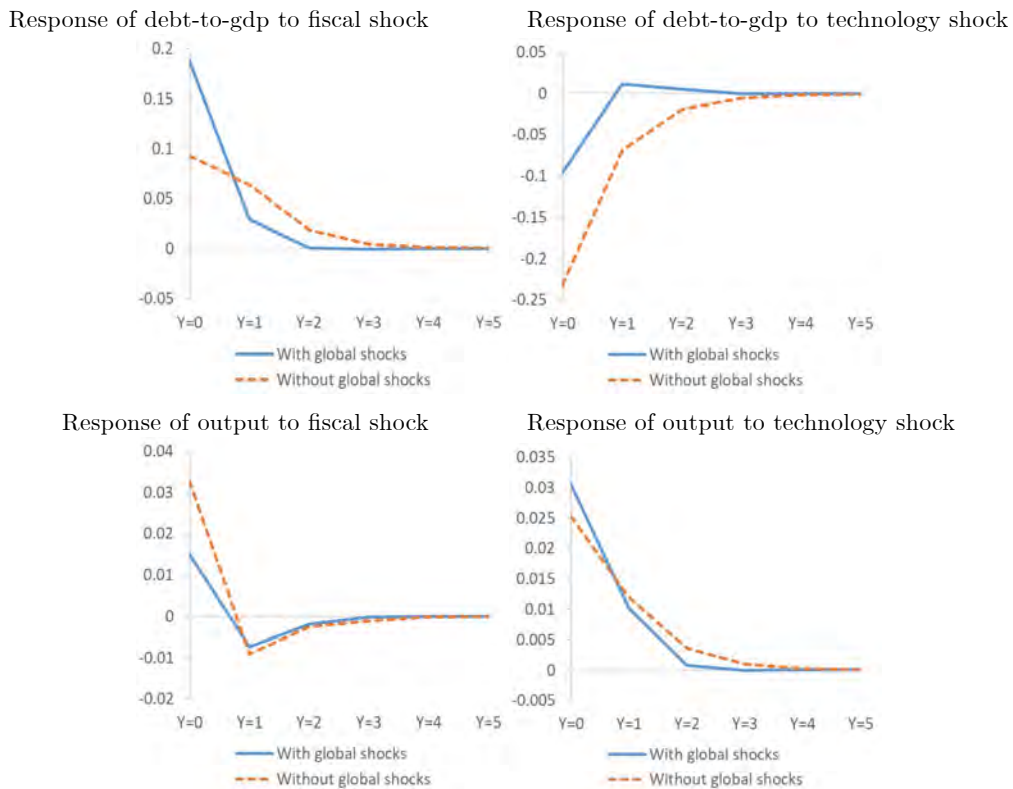
**Figure S62: IRFs for Netherlands in models with and without global shocks (median of posterior distribution)**



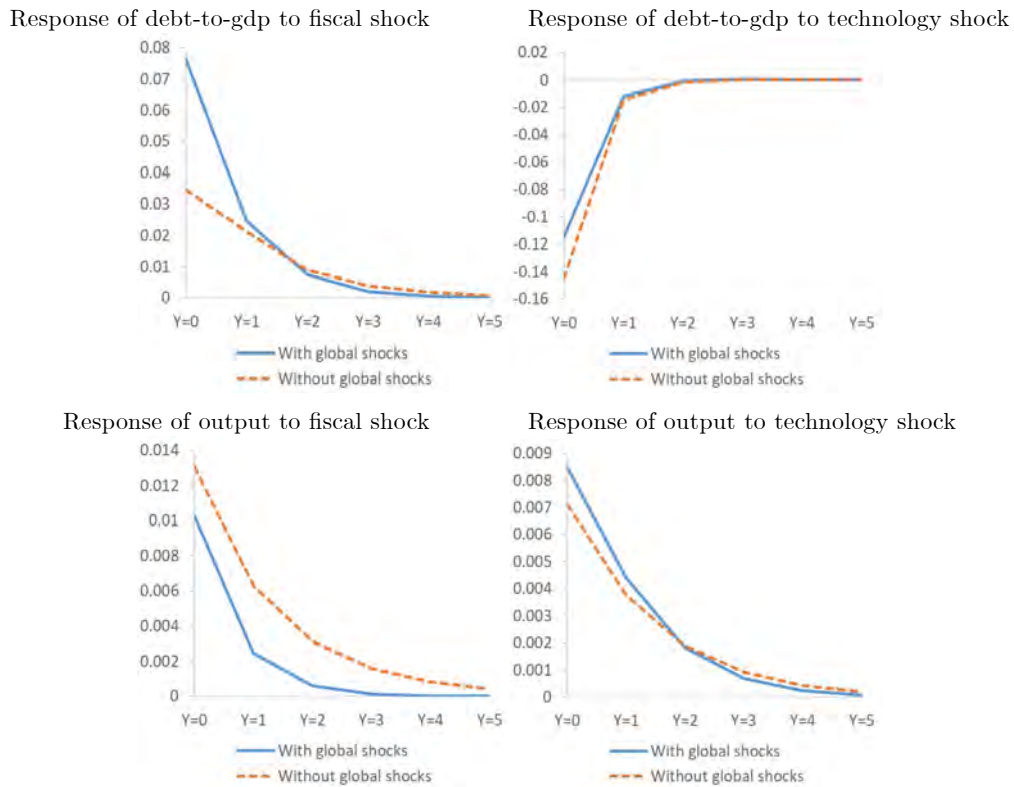
**Figure S63: IRFs for New Zealand in models with and without global shocks (median of posterior distribution)**



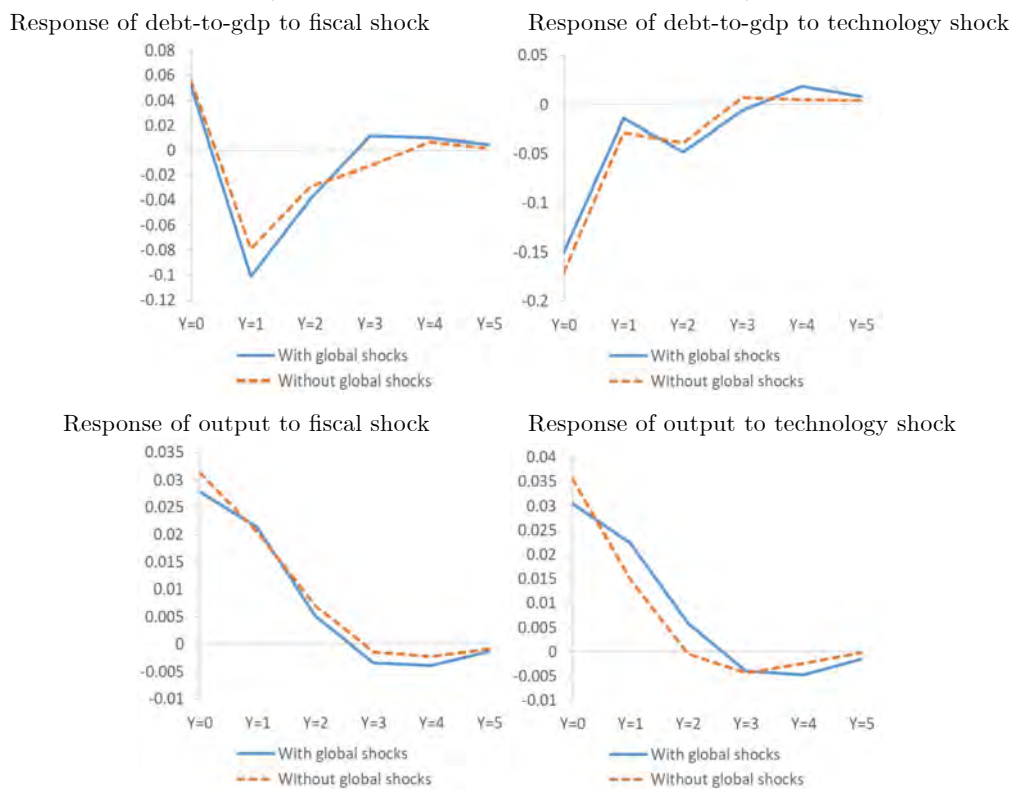
**Figure S64: IRFs for Nigeria in models with and without global shocks (median of posterior distribution)**



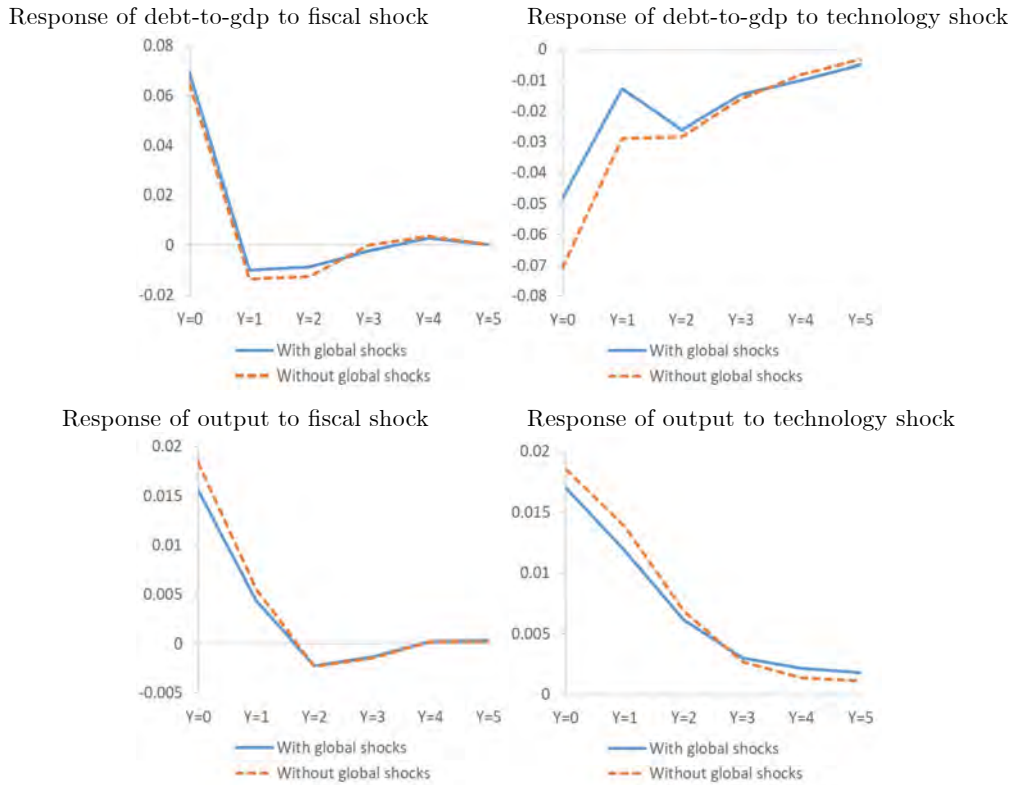
**Figure S65: IRFs for Norway in models with and without global shocks (median of posterior distribution)**



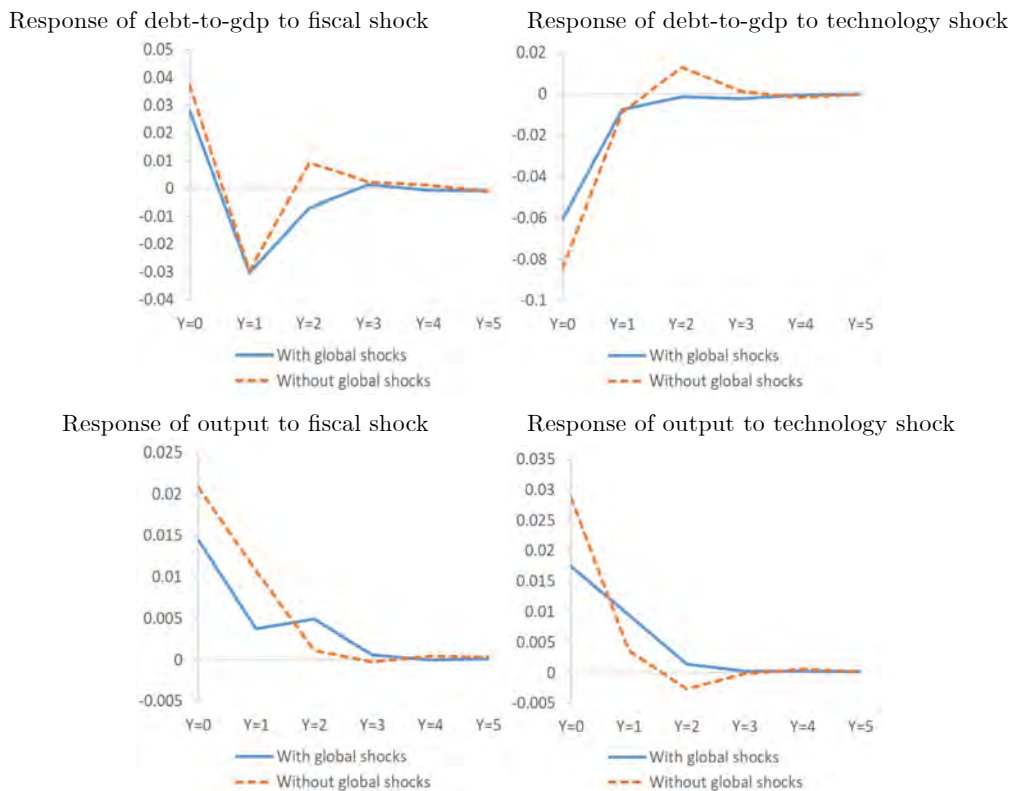
**Figure S66: IRFs for Peru in models with and without global shocks (median of posterior distribution)**



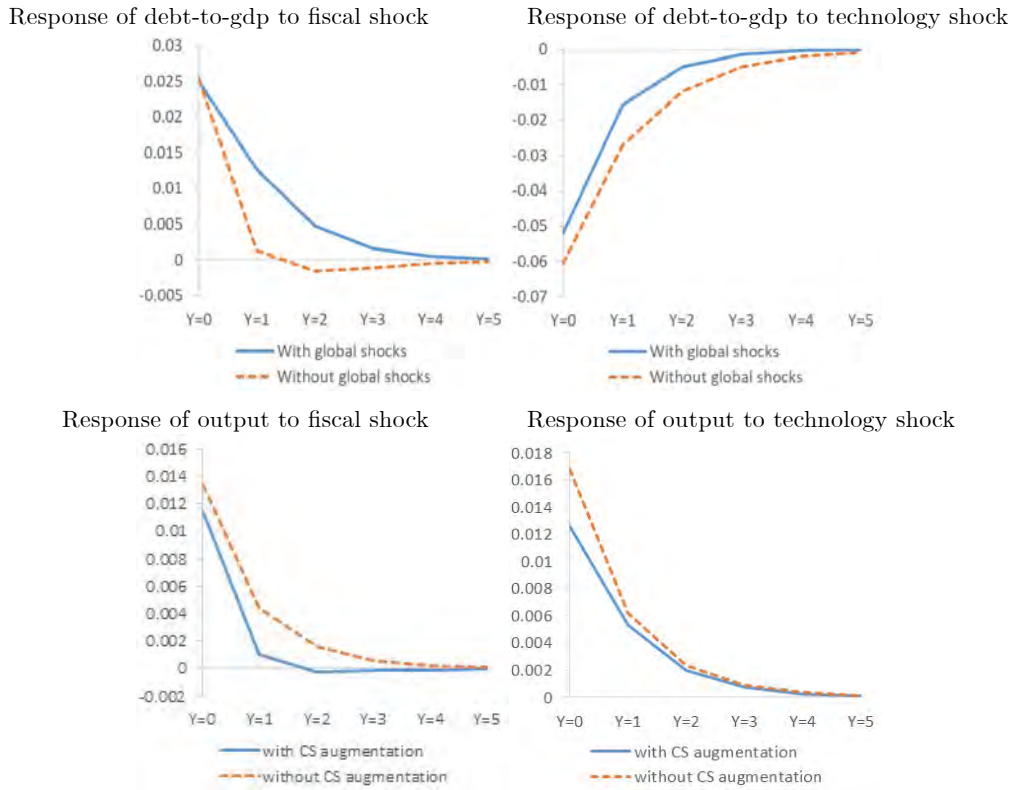
**Figure S67: IRFs for Philippines in models with and without CS augmentation (median of posterior distribution)**



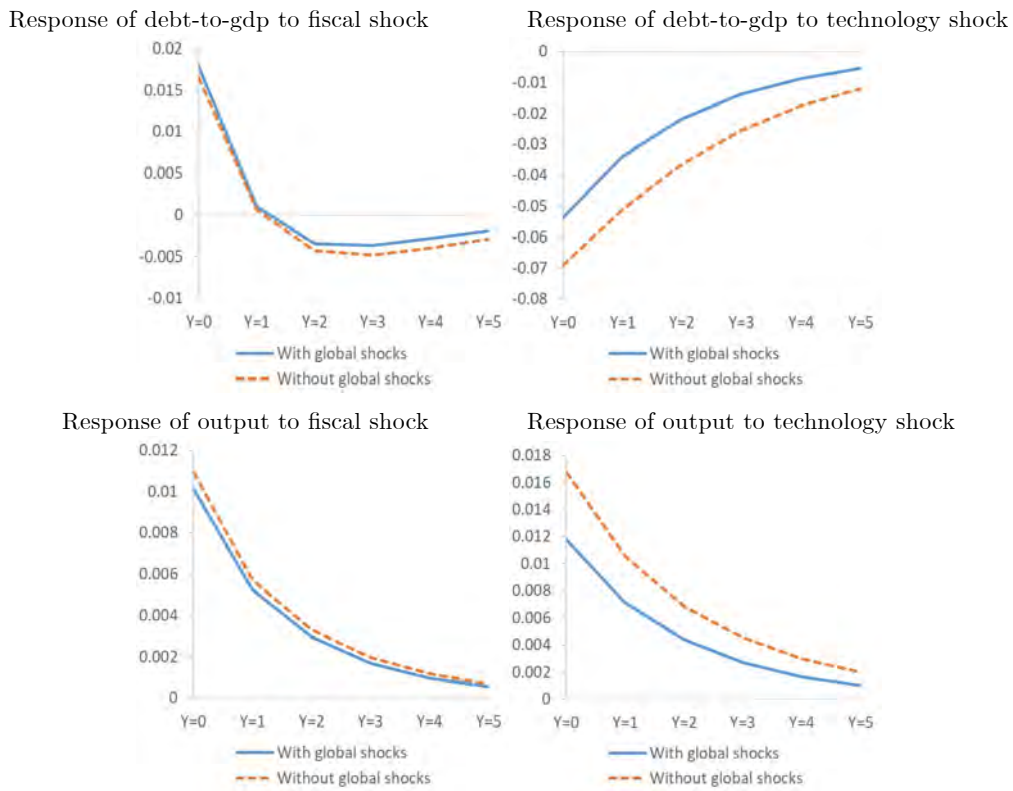
**Figure S68 IRFs for Singapore in models with and without global shocks (median of posterior distribution)**



**Figure S69: IRFs for South Africa in models with and without global shocks (median of posterior distribution)**

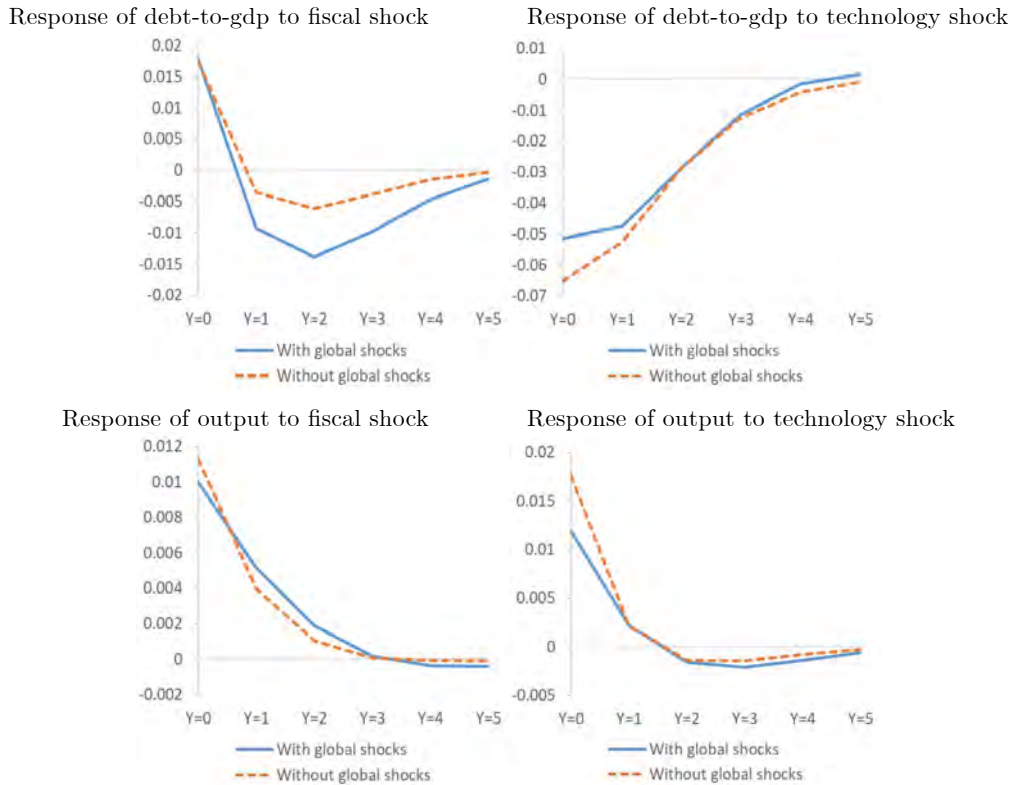


**Figure S70: IRFs for Spain in models with and without global shocks (median of posterior distribution)**

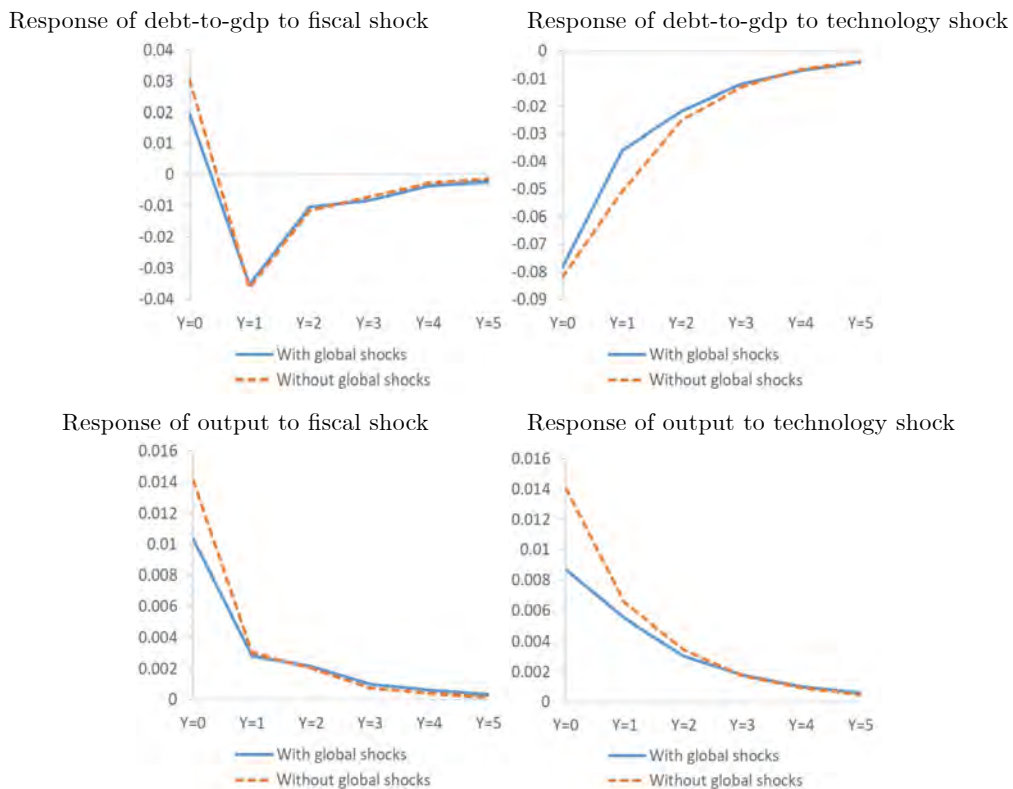




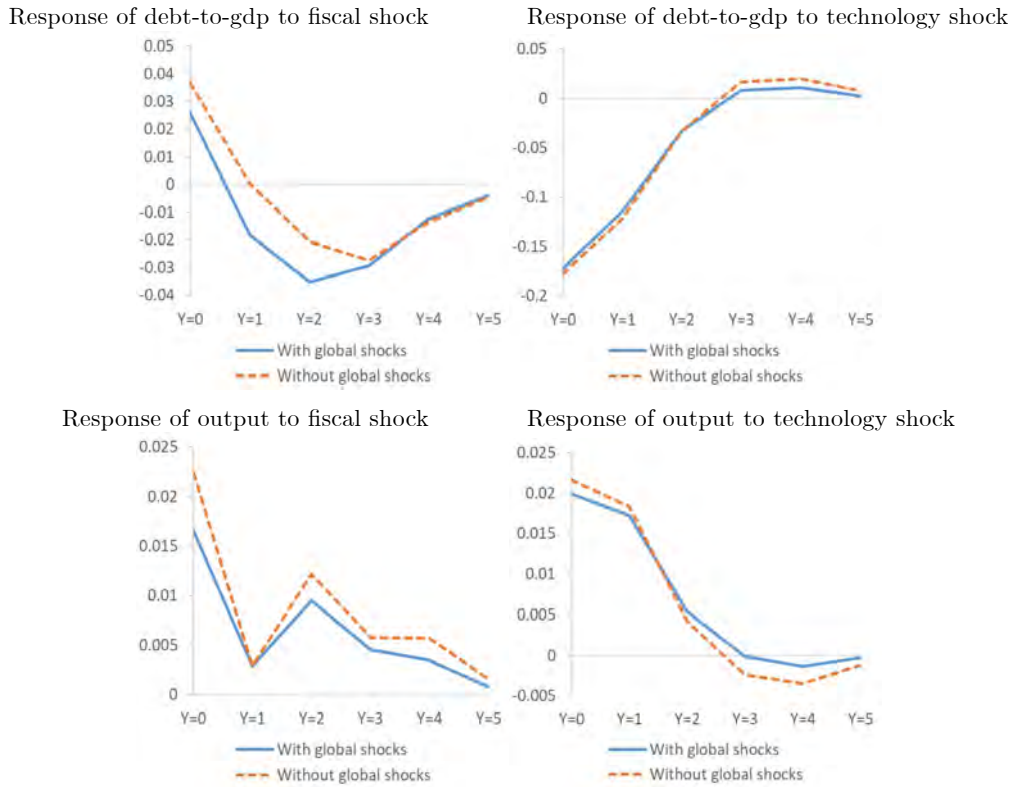
**Figure S71: IRFs for Sweden in models with and without global shocks (median of posterior distribution)**



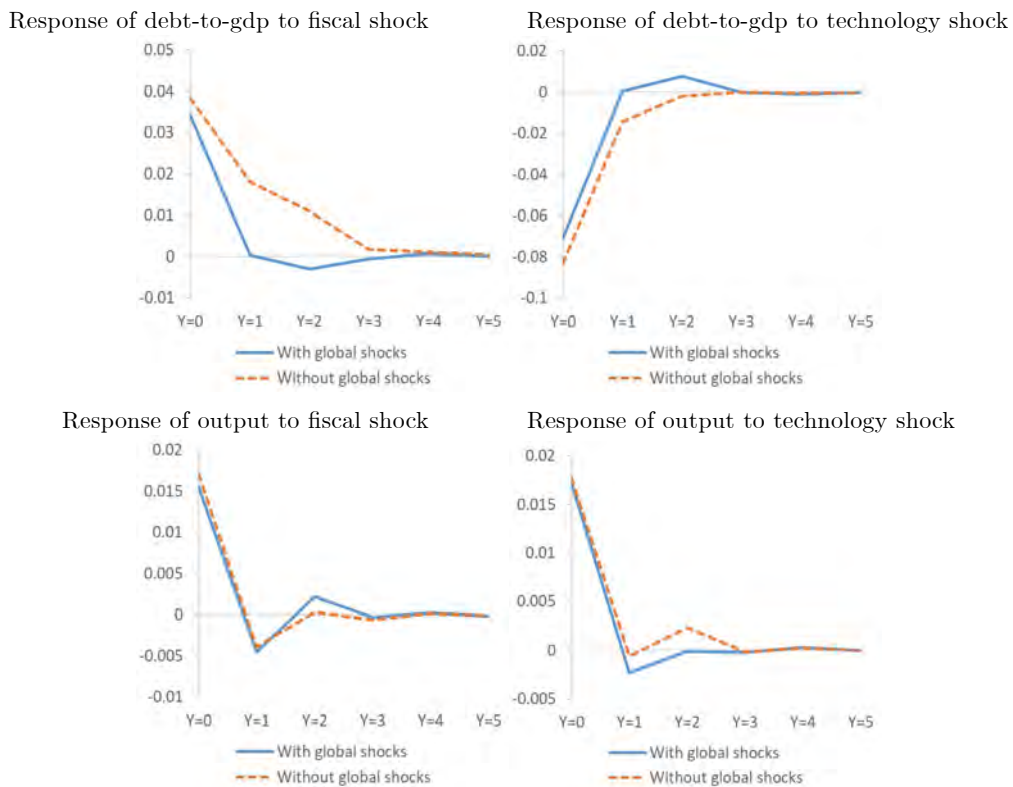
**Figure S72: IRFs for Switzerland in models with and without global shocks (median of posterior distribution)**



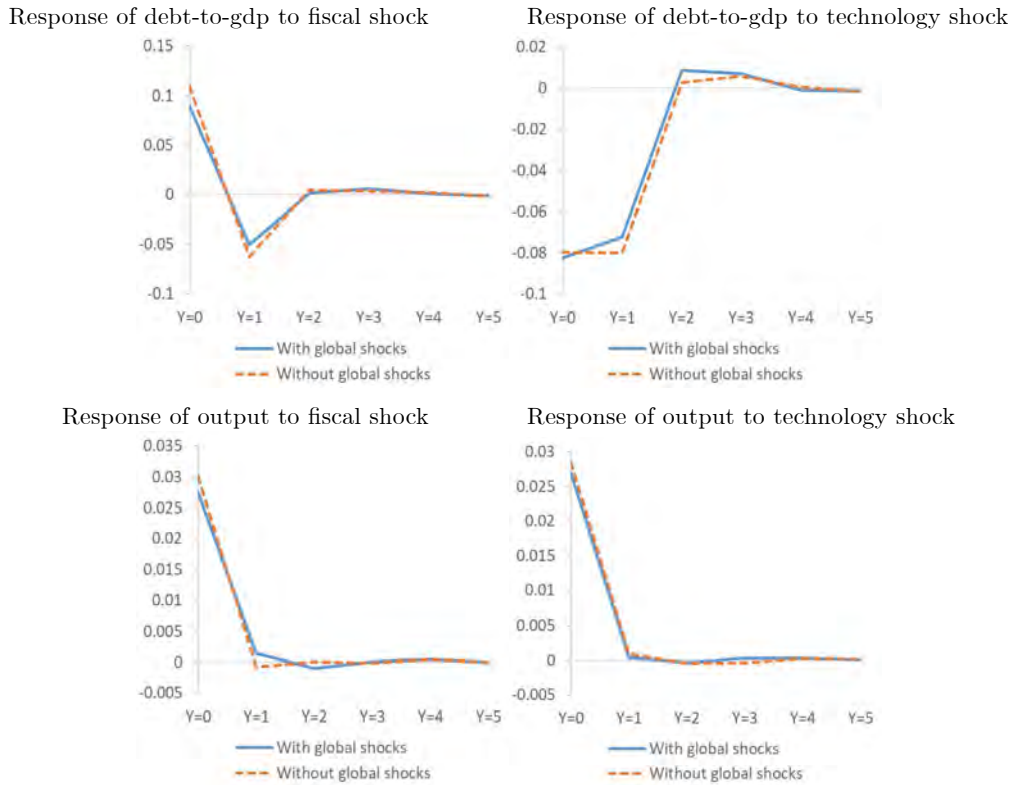
**Figure S73: IRFs for Thailand in models with and without global shocks (median of posterior distribution)**



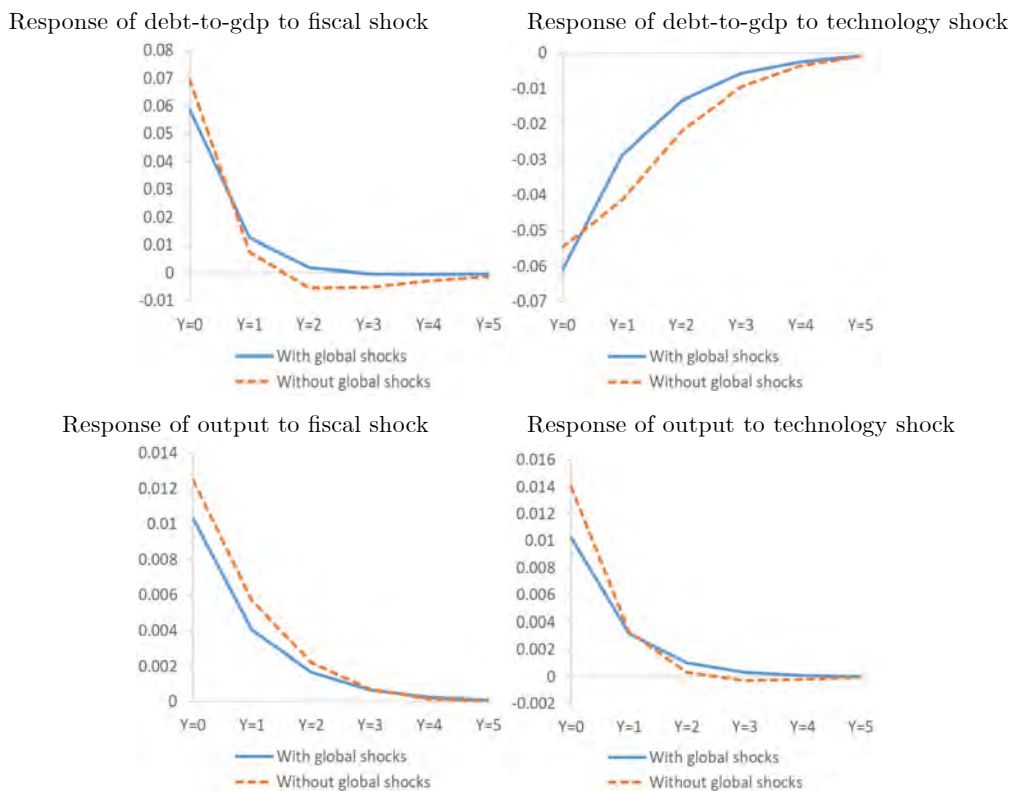
**Figure S74: IRFs for Tunisia in models with and without global shocks (median of posterior distribution)**



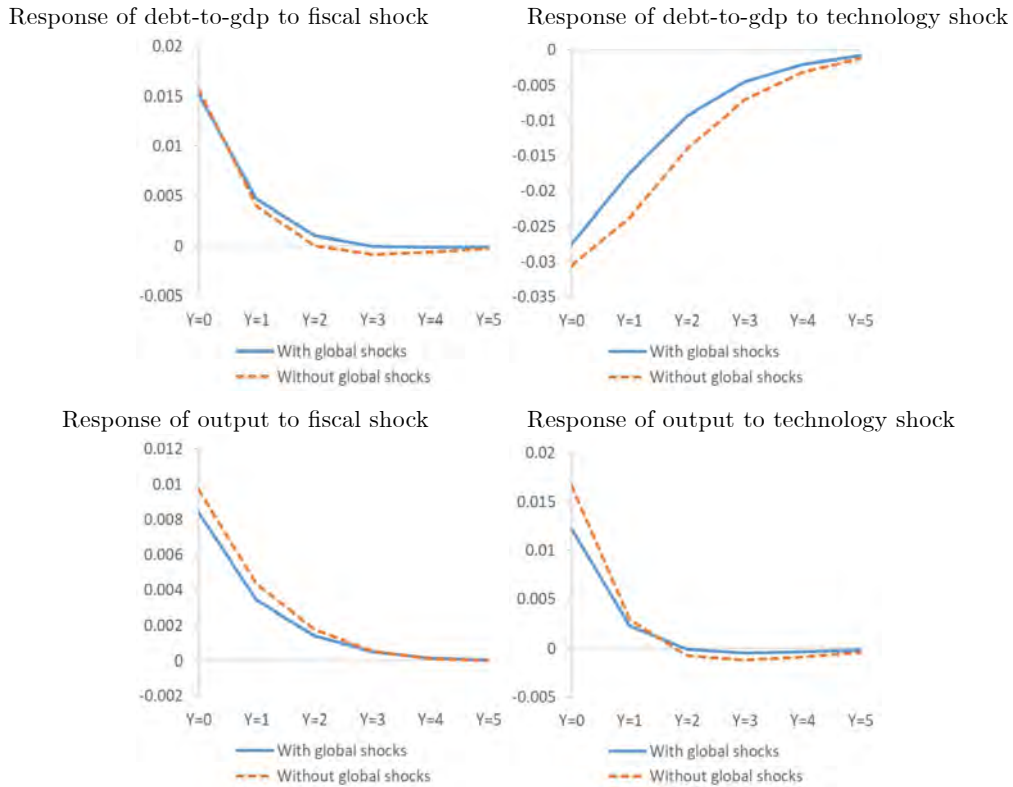
**Figure S75: IRFs for Turkey in models with and without global shocks (median of posterior distribution)**



**Figure S76: IRFs for UK in models with and without global shocks (median of posterior distribution)**



**Figure S77: IRFs for USA in models with and without global shocks (median of posterior distribution)**



**Figure S78: IRFs for Venezuela in models with and without global shocks (median of posterior distribution)**

