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

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This online supplement is organized in three sections. Section S1 presents figures for the prior and posterior distributions of country-specific parameters $\alpha_i$ and $\beta_i$, for $i = 1, 2, ..., N$, 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. Section S3 presents findings for global shocks robustness to an alternative choice of weights to construct cross-section averages.
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
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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

![Graphs showing posterior distributions and responses](image-url)
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
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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

Response of debt-to-gdp growth to fiscal shock

Response of output growth to fiscal shock

Response of debt-to-gdp growth to technology shock

Response of output growth to technology shock
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 distributions of parameters $\alpha$ and $\beta$](image1)

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

![Posterior median and credible sets](image2)
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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
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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
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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
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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
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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
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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
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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
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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
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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
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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
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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
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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
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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
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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
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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
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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
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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
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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
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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 $\beta$

![Graphs showing prior and posterior distributions for $\alpha$ and $\beta$.]

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

![Graphs showing the response of debt-to-GDP growth and output growth to fiscal and technology shocks.]

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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
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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)

- Response of debt-to-GDP to fiscal shock
- Response of debt-to-GDP to technology shock

- Response of output to fiscal shock
- Response of output to technology shock
Figure S41: IRFs for Australia in models with and without global shocks (median of posterior distribution)

- Response of debt-to-GDP to fiscal shock
- Response of output to fiscal shock

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

- Response of debt-to-GDP to fiscal shock
- Response of output to fiscal shock
Figure S43: IRFs for Belgium in models with and without global shocks (median of posterior distribution)

- Response of debt-to-GDP to fiscal shock
- Response of debt-to-GDP to technology shock

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

- Response of debt-to-GDP to fiscal shock
- Response of debt-to-GDP to technology shock

Response of output to fiscal shock
Response of output to technology shock
**Figure S45: IRFs for Canada in models with and without global shocks**  
* (median of posterior distribution)  
Response of debt-to-GDP to fiscal shock  
Response of debt-to-GDP to technology shock  
Response of output to fiscal shock  
Response of output to technology shock

**Figure S46: IRFs for Chile in models with and without global shocks**  
* (median of posterior distribution)  
Response of debt-to-GDP to fiscal shock  
Response of debt-to-GDP to technology shock  
Response of output to fiscal shock  
Response of output to technology shock
Figure S47: IRFs for China in models with and without global shocks
(median of posterior distribution)

Response of debt-to-GDP to fiscal shock

Response of output to fiscal shock

Response of debt-to-GDP to technology shock

Response of output to technology shock

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

Response of debt-to-GDP to fiscal shock

Response of output to fiscal shock

Response of debt-to-GDP to technology shock

Response of output to technology shock
Figure S49: IRFs for Egypt in models with and without global shocks (median of posterior distribution)
Response of debt-to-GDP to fiscal shock  Response of debt-to-GDP to technology shock

Figure S50: IRFs for Finland in models with and without global shocks (median of posterior distribution)
Response of debt-to-GDP to fiscal shock  Response of debt-to-GDP to technology shock
Response of output to fiscal shock  Response of output to technology shock
Figure S51: IRFs for France in models with and without global shocks
(median of posterior distribution)

Response of debt-to-GDP to fiscal shock
Response of debt-to-GDP to technology shock

Response of output to fiscal shock
Response of output to technology shock

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

Response of debt-to-GDP to fiscal shock
Response of debt-to-GDP to technology shock

Response of output to fiscal shock
Response of output to technology shock
Figure S53: IRFs for India in models with and without global shocks (median of posterior distribution)

Response of debt-to-GDP to fiscal shock

Response of debt-to-GDP to technology shock

Response of output to fiscal shock

Response of output to technology shock

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

Response of debt-to-GDP to fiscal shock

Response of debt-to-GDP to technology shock

Response of output to fiscal shock

Response of output to technology shock
Figure S55: IRFs for Iran in models with and without global shocks  
(median of posterior distribution)

Response of debt-to-GDP to fiscal shock  
Response of debt-to-GDP to technology shock

Response of output to fiscal shock  
Response of output to technology shock

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

Response of debt-to-GDP to fiscal shock  
Response of debt-to-GDP to technology shock

Response of output to fiscal shock  
Response of output to technology shock
Figure S57: IRFs for Japan in models with and without global shocks
(median of posterior distribution)

Response of debt-to-GDP to fiscal shock | Response of debt-to-GDP to technology shock

Response of output to fiscal shock | Response of output to technology shock

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

Response of debt-to-GDP to fiscal shock | Response of debt-to-GDP to technology shock

Response of output to fiscal shock | Response of output to technology shock
Figure S59: IRFs for Malaysia in models with and without global shocks
(median of posterior distribution)

Response of debt-to-GDP to fiscal shock
Response of debt-to-GDP to technology shock

Response of output to fiscal shock
Response of output to technology shock

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

Response of debt-to-GDP to fiscal shock
Response of debt-to-GDP to technology shock

Response of output to fiscal shock
Response of output to technology shock
Figure S61: IRFs for Morocco in models with and without global shocks (median of posterior distribution)

- Response of debt-to-GDP to fiscal shock
- Response of debt-to-GDP to technology shock

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

- Response of debt-to-GDP to fiscal shock
- Response of debt-to-GDP to technology shock

- Response of output to fiscal shock
- Response of output to technology shock
Figure S63: IRFs for New Zealand in models with and without global shocks (median of posterior distribution)

Response of debt-to-GDP to fiscal shock
Response of debt-to-GDP to technology shock

Response of output to fiscal shock
Response of output to technology shock

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

Response of debt-to-GDP to fiscal shock
Response of debt-to-GDP to technology shock

Response of output to fiscal shock
Response of output to technology shock
Figure S65: IRFs for Norway in models with and without global shocks  
(median of posterior distribution)

<table>
<thead>
<tr>
<th>Response of debt-to-GDP to fiscal shock</th>
<th>Response of debt-to-GDP to technology shock</th>
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Figure S66: IRFs for Peru in models with and without global shocks  
(median of posterior distribution)

<table>
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<th>Response of debt-to-GDP to fiscal shock</th>
<th>Response of debt-to-GDP to technology shock</th>
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Response of output to fiscal shock  
Response of output to technology shock
Figure S67: IRFs for Philippines in models with and without CS augmentation (median of posterior distribution)

Response of debt-to-GDP to fiscal shock  vs  Response of debt-to-GDP to technology shock

Response of output to fiscal shock  vs  Response of output to technology shock

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

Response of debt-to-GDP to fiscal shock  vs  Response of debt-to-GDP to technology shock

Response of output to fiscal shock  vs  Response of output to technology shock
Figure S69: IRFs for South Africa in models with and without global shocks (median of posterior distribution)

- Response of debt-to-GDP to fiscal shock
- Response of debt-to-GDP to technology shock
- Response of output to fiscal shock
- Response of output to technology shock

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

- Response of debt-to-GDP to fiscal shock
- Response of debt-to-GDP to technology shock
- Response of output to fiscal shock
- Response of output to technology shock
Figure S71: IRFs for Sweden in models with and without global shocks
(median of posterior distribution)

Response of debt-to-GDP to fiscal shock
Response of debt-to-GDP to technology shock

Response of output to fiscal shock
Response of output to technology shock

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

Response of debt-to-GDP to fiscal shock
Response of debt-to-GDP to technology shock

Response of output to fiscal shock
Response of output to technology shock
Figure S73: IRFs for Thailand in models with and without global shocks
(median of posterior distribution)

- Response of debt-to-GDP to fiscal shock
- Response of debt-to-GDP to technology shock

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

- Response of debt-to-GDP to fiscal shock
- Response of debt-to-GDP to technology shock
Figure S75: IRFs for Turkey in models with and without global shocks (median of posterior distribution)

Response of debt-to-GDP to fiscal shock

Response of debt-to-GDP to technology shock

Response of output to fiscal shock

Response of output to technology shock

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

Response of debt-to-GDP to fiscal shock

Response of debt-to-GDP to technology shock

Response of output to fiscal shock

Response of output to technology shock
Figure S77: IRFs for USA in models with and without global shocks (median of posterior distribution)

Response of debt-to-GDP to fiscal shock  
Response of debt-to-GDP to technology shock

Response of output to fiscal shock  
Response of output to technology shock

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

Response of debt-to-GDP to fiscal shock  
Response of debt-to-GDP to technology shock

Response of output to fiscal shock  
Response of output to technology shock
S3  Sensitivity of global shocks estimates to equal weights

Figure S79: Estimated global shocks

Global output shock

Global debt shock
Figure S80: Impulse response function for the effects of global shocks (median across countries)

Positive one s.e. global output shock

Positive one s.e. global debt shock

Notes: The plots in this figure show impulse responses of identified global shocks using the triangular ordering given by (12)-(13). Medians (across countries) are reported.
Figure S81: Contemporaneous effects of global shocks on output

A. Contemporaneous effect of global output shock on output

B. Contemporaneous effect of global debt shock on output
Figure S82: Contemporaneous effects of global shocks on debt-to-GDP

A. Contemporaneous effect of global output shock on debt-to-GDP

B. Contemporaneous effect of global debt shock on debt-to-GDP