Procyclical Fiscal Policy in Developing Countries: Truth or Fiction?

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University of Maryland

IEA Meetings

June 2008
What do we know (or don’t know)?

- Abundant “evidence” that fiscal policy is procyclical in developing countries

KRV plot

Really??

Problems with existing “evidence”:

- Correlations do not imply causality
- Regression-based analysis plagued with endogeneity problems

Rigobon’s critique (Jaimovich and Panizza (2007))

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Empirical models

A contemporaneous fiscal rule
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5. A simple VAR
Model 1: A contemporaneous fiscal rule (I)

- Model:

\[
g_t = \beta y_t + \epsilon_t, \quad (1)
\]
\[
y_t = \phi g_t + \mu_t, \quad (2)
\]

where \( \beta \geq 0, \phi \geq 0, E \mu_t \epsilon_t = 0, |\beta \phi| < 1 \).
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Covariance:

\[ \text{Cov}(y_t g_t) = \frac{1}{(1 - \phi \beta)^2} (\phi \sigma^2_{\varepsilon} + \beta \sigma^2_{\mu}). \]
Model 1: A contemporaneous fiscal rule (1)

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- Clearly, equation (1) cannot be estimated by OLS. We will use IV (2SLS and GMM)
Policymaker’s problem:

\[
\min_{\beta} \text{Var}(y_t) = \min_{\beta} \frac{\sigma^2_{\theta}}{(1 - \phi \beta)^2},
\]

where \( \theta_t \equiv \phi \varepsilon_t + \mu_t, \sigma^2_{\theta} = \phi^2 \sigma^2_{\varepsilon} + \sigma^2_{\mu} \).
Model 1: Optimal fiscal policy

- Policymaker’s problem:

\[ \min_{\beta} \text{Var}(y_t) = \min_{\beta} \frac{\sigma_{\theta}^2}{(1 - \phi \beta)^2}, \]

where \( \theta_t \equiv \phi \varepsilon_t + \mu_t, \sigma_{\theta}^2 = \phi^2 \sigma_{\varepsilon}^2 + \sigma_{\mu}^2. \)

- Optimal policy is to be countercyclical:

\[ \lim_{\beta \to -1/\phi} \text{Var}(y_t) = \frac{\sigma_{\theta}^2}{4} \]
### Stylized facts

**Dependent Variable:** Change in Log Real Government Spending Variable

**Independent Variable:** Change in Log Real GDP

<table>
<thead>
<tr>
<th></th>
<th>Developing Countries</th>
<th>High-Income Countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government Spending</td>
<td>0.51 ***</td>
<td>-0.05</td>
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<tr>
<td>(0.13)</td>
<td>(0.37)</td>
<td></td>
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<tr>
<td>Government Consumption</td>
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<td>0.11 ***</td>
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<tr>
<td>(0.06)</td>
<td>(0.03)</td>
<td></td>
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<tr>
<td>n (Spend.)</td>
<td>1286</td>
<td>852</td>
</tr>
<tr>
<td>n (Consum.)</td>
<td>1598</td>
<td>1946</td>
</tr>
</tbody>
</table>

Standard errors in parenthesis, *, **, *** denote significance at 10, 5, and 1 percent level, respectively.
## OLS and IV estimates

**Dependent Variable:** Change in Real Government Consumption  
**Instrumented Variable:** Change in Real GDP  
**Instruments:** 4 lags of Weighted GDP Growth of Trading Partners

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<tr>
<td><strong>IV</strong></td>
<td>0.39</td>
<td>-0.13</td>
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<tr>
<td></td>
<td>(0.31)</td>
<td>(0.15)</td>
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<td>[4.36]</td>
<td>[10.06]</td>
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<tr>
<td></td>
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F stat in square brackets. The critical value for Stock and Yogo week instruments test is 11.59.
### GMM estimates

**Dependent Variable--Change in Log Real Government Consumption**

**Instrumented Variable: Change in Real GDP**

**Instruments:** 4 lags of Weighted GDP Growth of Trading Partners and of the Real Interest Rate on 6-month U.S. Treasuries

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<td><strong>GMM</strong></td>
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<tr>
<td></td>
<td>0.61 **</td>
<td>-0.11</td>
</tr>
<tr>
<td></td>
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<td>(0.12)</td>
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Truth of fiction?  
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VAR: Impulse responses

- Identification: $g$ responds with a one-quarter lag to $y$
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Developing countries

- A shock to GDP leads to a significant response in government consumption \( \text{VAR1} \)
VAR: Impulse responses

- Identification: $g$ responds with a one-quarter lag to $y$

- Developing countries
  - A shock to GDP leads to a significant response in government consumption \( \text{VAR1} \)
  - A shock to $g$ leads to a significant response in output \( \text{VAR2} \)
VAR: Impulse responses

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  - A shock to GDP leads to a significant response in government consumption
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- High income countries
  - A shock to GDP leads to a delayed but significant response in government consumption
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  - A shock to GDP leads to a delayed but significant response in government consumption
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Conclusions

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- Interestingly enough, we also find evidence that high-income countries are procyclical.
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- Overwhelming evidence that in developing countries the business cycle indeed causes procyclical government consumption.

- Interestingly enough, we also find evidence that high-income countries are procyclical.

- We also find that increases in government consumption are expansionary in developing countries (the “when-it-rains-it-pours” phenomenon).
Developing countries: Response of $g$ to GDP shock

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Developing countries: Response of GDP to government consumption shock
High income countries: Response of $g$ to GDP shock

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High income countries: Response of GDP to $g$ shock

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