A comparison of German, Swiss and Polish fiscal rules

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Fiscal policy and fiscal rules

- Rules are formal, mathematical mechanisms shaping fiscal policy
- They get more and more popular, see eg. IMF(2007) & IMF(2012)
- Empirical assesment of their effectiveness is difficult:
  - short time series
  - endogeneity
- Empirical research points out positive correlation between rules and lower deficits,
  - see eg. Nerlich & Reuter (2016), Holm-Hadulla et al. (2012)
- Causal impact on fiscal policy is also positive,
  - see Grembi et al. (2016) and Guerguil et al. (2017)
- An alternative is to use theoretical (simulational) framework,
  - see eg. Landon & Smith (2017)

The Swiss fiscal rule

The main equation govering the rule's behavior is:

$$\overline{G}_{t+1} = E_t[k_{t+1}] \cdot E_t[R_{t+1}], \quad \text{with } E_t[k_{t+1}] = \frac{E_t[Y^*_{t+1}]}{E_t[Y_{t+1}]},$$

- Y^* is the trend output calculated with the modified HP-filter on a 24-observation window
- The modification of the HP-filter means applying different values to first and last observations

The German fiscal rule

The structural budget must be ‘nearly’ balanced:
maximum structural deficit cannot exceed 0.35% of GDP

$$\overbrace{E_t[R_{t+1}] - \bar{G}_{t+1}}^{\text{max deficit}} = \underbrace{-0.0035 \cdot E_t[Y_{t+1}]}_{\text{max structural deficit}} + \overbrace{E_t[\epsilon_{t+1}] \cdot (E_t[Y_{t+1}] - E_t[Y^*_{t+1}])}^{\text{cyclical component}}$$

- ϵ_{t+1} is the semi-elasticity of the budget wrt the output gap
- Y^*_{t+1} is the trend calculated with the EU Commission production function method

The Polish fiscal rule

The rule is summarized by the following equation:

$$\bar{G}_{t+1} = G_t \cdot E_t[\Pi^*_{t+1}] \cdot (Y^*_{t+1} + c_{t+1}),$$

where:

- G_t is the current expenditure
- Π^*_{t+1} is the NBP inflation target
- Y^*_{t+1} is the medium-term real GDP growth
- c_{t+1} is a correction term

$$Y^*_{t+1} = \left(\frac{E_t(Y_{t+1})}{Y_{t-7}}\right)^{\frac{1}{8}}.$$

The Polish fiscal rule

The compensation account accumulates deficit deviations from the level of 1% of GDP:

$$CA_t = CA_{t-1} + \frac{R_t - G_t}{Y_t} + 0.01.$$

Corrections c are equal to -0.02, -0.015, 0 or 0.015 depending on:

- debt to GDP ratio
- compensation account state
- business cycle phase
- deficit to GDP ratio

Conceptual framework

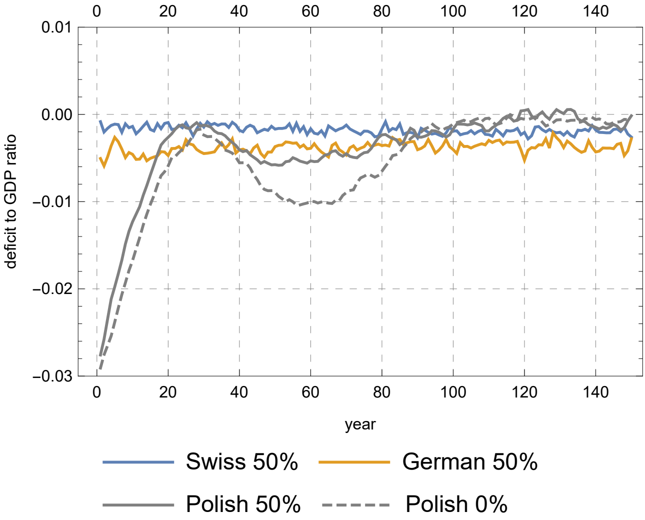
- A reduced-form VAR model based on US empirical data 1960-2015 with GDP (Y), government expenditures (G) and government revenues (R)

$$V_t = \beta_0 + \beta_1 \cdot V_{t-1} + \beta_2 \cdot V_{t-2} + \beta_3 \cdot X_t + e_t \ ,$$

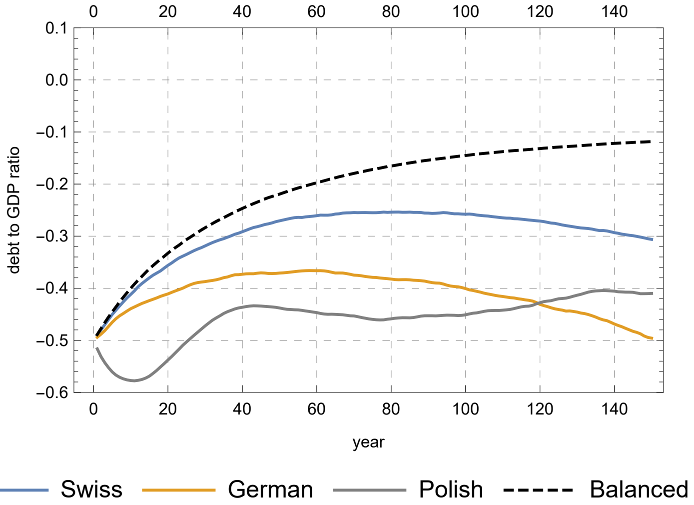
- Fiscal rules are applied to VAR-created series to get expenditure limits: $\overline{G}_{t+1} = F(Y_t, G_t, R_t, Y_{t-1}, G_{t-1}, R_{t-1}, \ldots)$
- Government expenditure $\overline{G}_{t+1}$ substitutes the value G_{t+1} projected by the VAR
- Together with VAR-generated R_{t+1} and Y_{t+1} we get a new state of the economy

$$\begin{bmatrix} Y_t \\ G_t \\ R_t \end{bmatrix} \Rightarrow \begin{bmatrix} Y_{t+1} \\ \overline{G}_{t+1} = F(\cdot) \\ R_{t+1} \end{bmatrix}$$

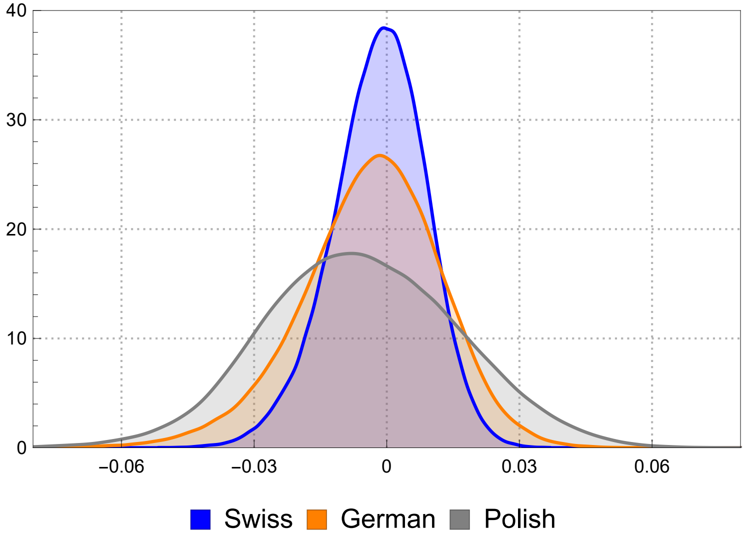
Simulation results: average deficit paths



Simulation results: average debt paths



Simulation results: deficit volatility



Simulation results: procyclicality

The procyclicality is assessed in the following regression (see Alesina et al. (2008)):

$$\Delta \frac{G_t}{Y_t} = \beta_0 + \beta_1 \cdot \Delta \frac{Y_t - Y_t^*}{Y_t} + \epsilon_t,$$

The procyclicality metrics for average paths (0% initial debt):

Statistic	Polish	Swiss	German
metric β_1	-0.198	-0.302	-0.356
p-value	0.000	0.000	0.000
R^2	0.561	0.200	0.207

Conclusions

- All rules are anticyclical
- The Swiss and German rules are similar and conservative wrt deficits
- All rules prevent debt explosion in the short run
- The Polish rule stabilizes debt levels also in the long run
- The Polish rule leaves some room for randomness

Thank you for your attention!