A stylised model of debt, growth and interest rates: an application to Iceland

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Theory

Good solution (G)

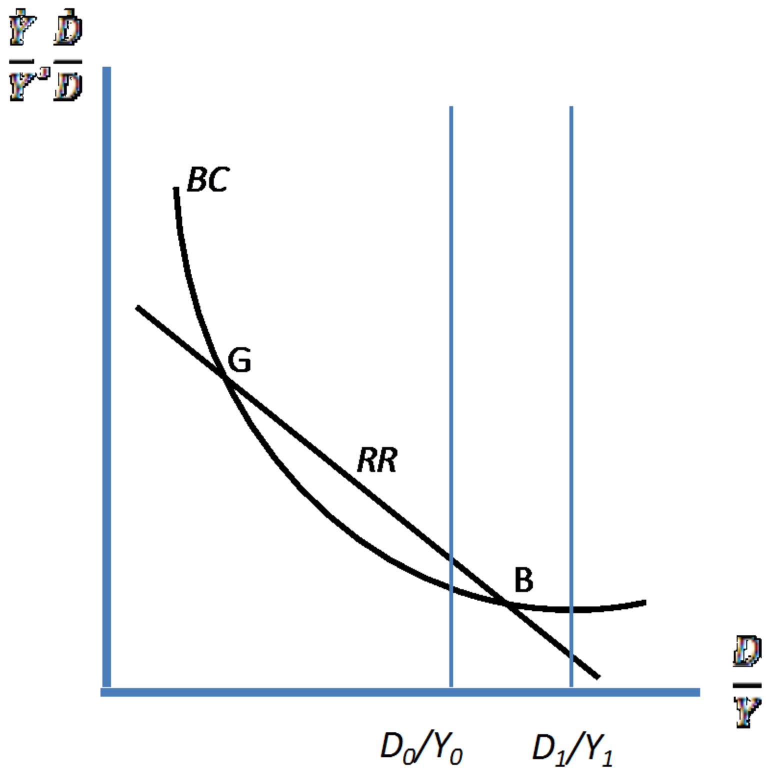
- stable or falling debt and deficits
- growing output, low interest rates

Bad solution (B)

- high and increasing debt and deficits
- falling output and confidence, soaring interest rates

Theory

The PSV Model



Systemic risk premium

Reinhart-Rogoff (RR)

$$\frac{\dot{Y}}{Y} = a - b\frac{D}{Y} \qquad (1a)$$

$$\frac{\dot{Y}}{Y} = a - b\frac{D}{Y} - fr + gp \qquad (1b)$$

Budget Constraint (BC)

$$\dot{D} = rD + pY \qquad (2a)$$

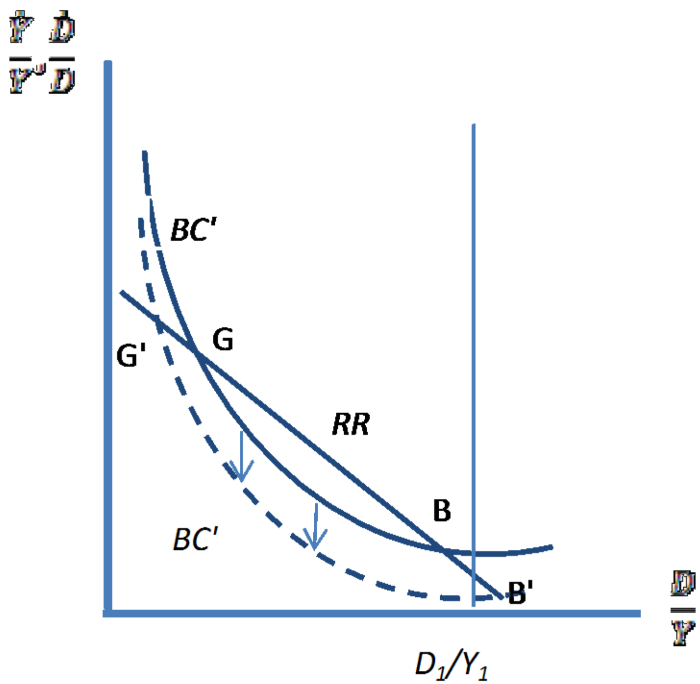
$$\frac{\dot{D}}{D} = r + \frac{p}{D/Y} \qquad (2b)$$

Yield

$$r = h + c\left(\frac{\dot{D}}{D} - \frac{\dot{Y}}{Y}\right) \qquad (3)$$

Impact of capital controls

The PSV Model



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<u>Yield</u>

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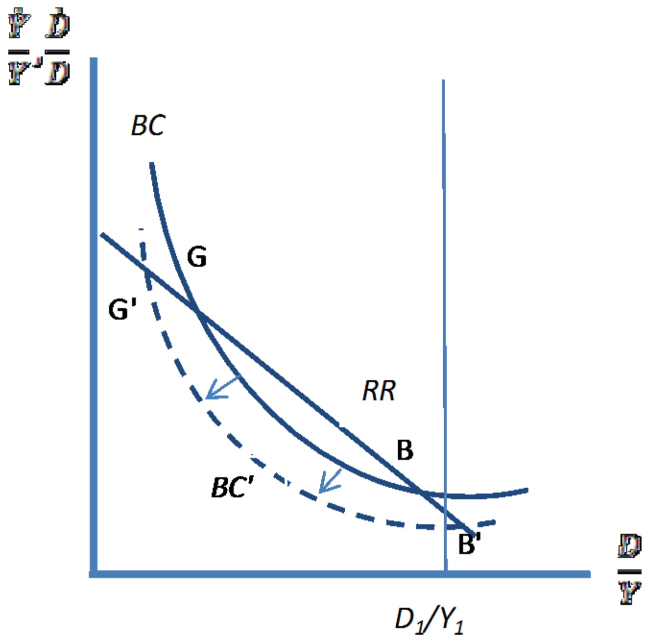
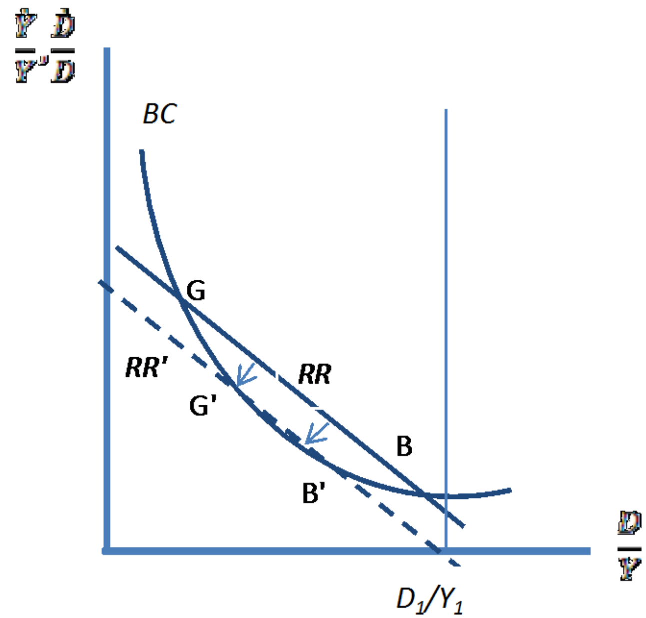
Impact of fiscal policy

The PSV Model





Budget Constraint (BC)

Reinhart-Rogoff (RR)

$$\frac{\dot{D}}{D} = r + \frac{p}{D/Y} \qquad (2b)$$

$$\frac{\dot{Y}}{Y} = a - b\frac{D}{Y} - fr + gp \qquad (1b)$$

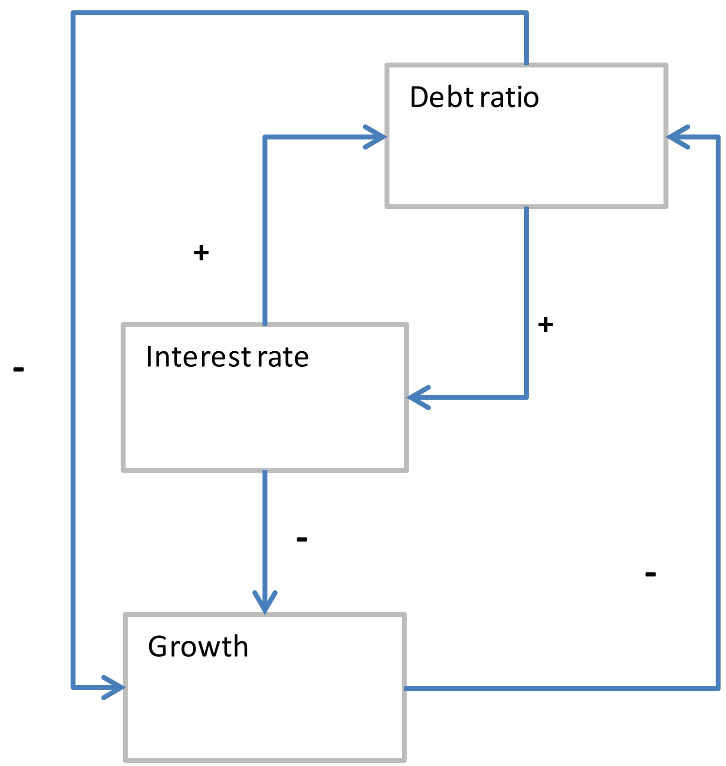
Estimation results

Table 3. **Model parameters**

	Whole sample pre-crisis	"Euro area south" crisis
a	0.028	0.012
b_1	-0.013	-0.013
b_2	0.026	0.026
c	0.063	0.166
f	0.216	0.216
g	0.060	0.060
h	0.027	0.046

Note: In the calibrated model fractions are not expressed as percentages, meaning that intercepts of the estimated growth and interest-rate equations are divided by 100.

Dynamics

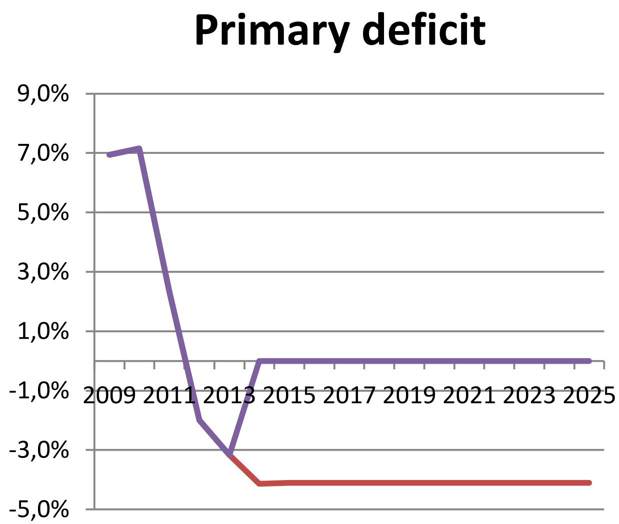


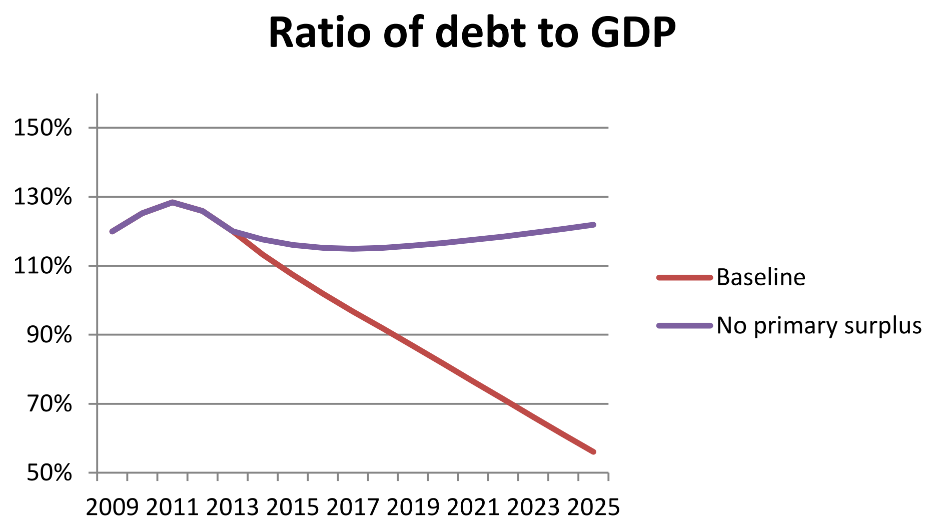
Baseline scenario

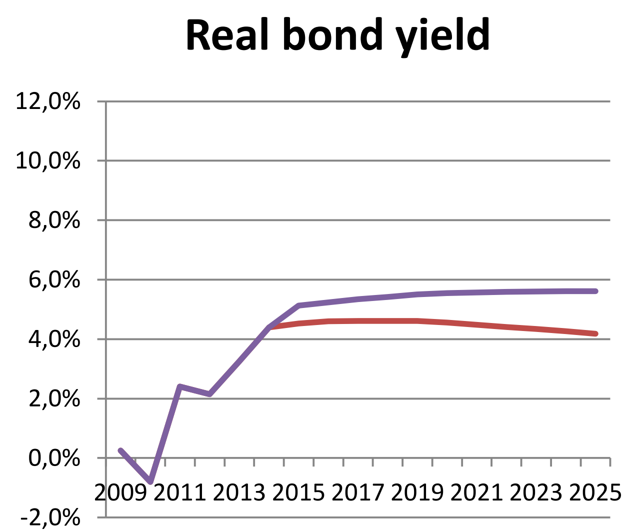
- Replicates actual developments and OECD projections for 2009-14, model-based projection for 2015-25 (constant add factors at 2014 levels).
- Lifting of capital controls on 1 Jan 2014: Iceland to behave like “euro area periphery country” (exposed to capital flight), *c* and *h* higher.
- Primary deficit as a per cent of GDP from *Economic Outlook* database for 2009-14 and kept constant at its 2014 level in 2015-2025 (crucial for fiscal sustainability).

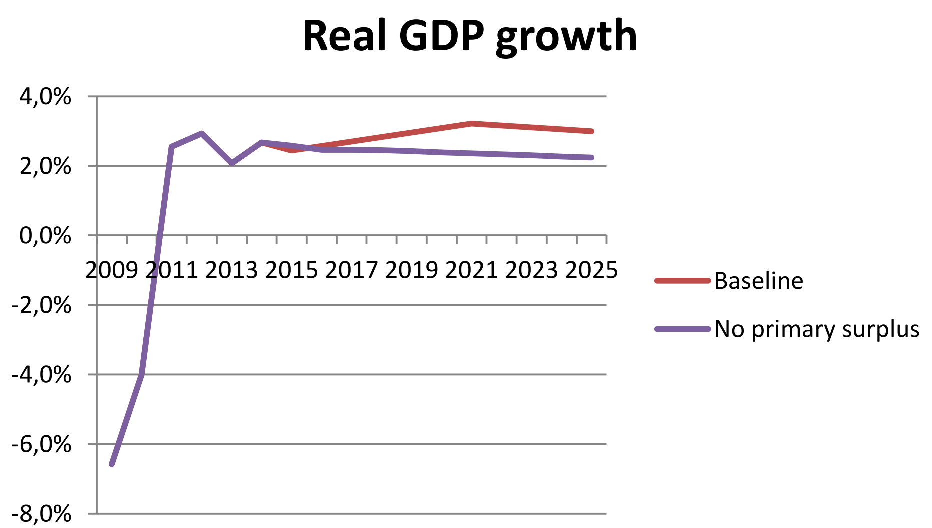
Simulation results

The PSV Model









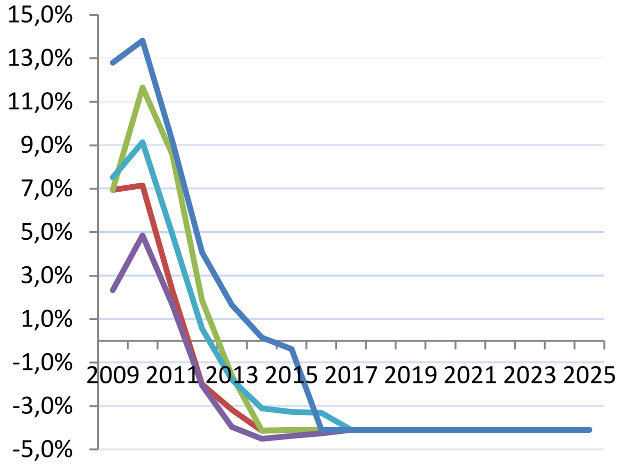
Alternative scenarios

1. ***Going for Growth***: More active counter-cyclical fiscal policy path in the period 2009-13, primary position returning to baseline in 2014 and beyond. Capital controls lifted in 2014 (c and h higher).
2. ***Tough Medicine***: Tighter fiscal policy without imposition of capital controls (c and h lower).
3. ***Private to Public***: Primary deficit deteriorates considerably in 2009-2013 due to up-front redemption of Icesave deposits, but no domestic demand stimulus.
4. ***The Full Monty***: Much higher primary deficit due to bank bail-out Irish style, of which one-third represents demand stimulus.

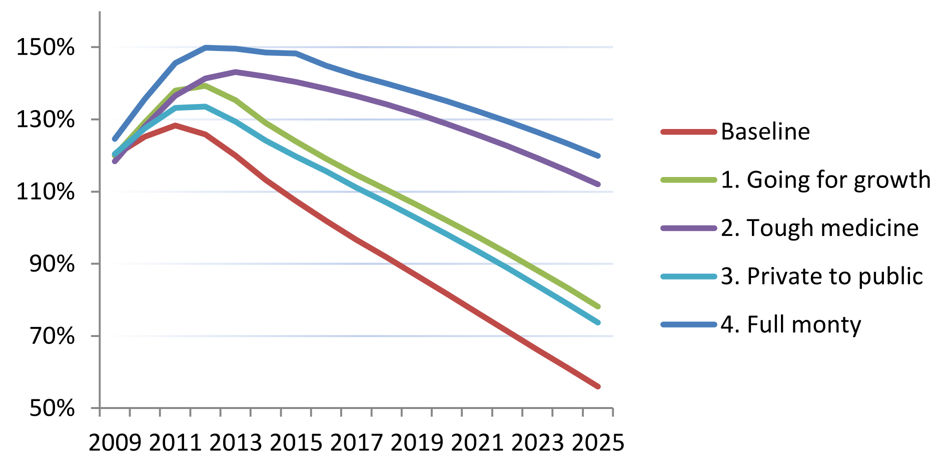
Simulation results

The PSV Model

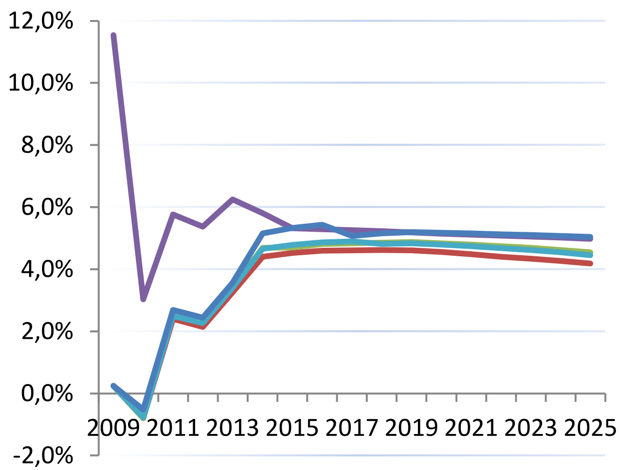
Primary deficit



Ratio of debt to GDP



Real bond yield



Real GDP growth