

Reserve Accumulation with a Private IIP*

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September 2020

Abstract

JEL Classification F32, F34, F41

Keywords International reserves, sovereign default, macroeconomic stabilization, fixed exchange rates, inflation targeting.

*The views expressed herein are those of the authors and should not be attributed to the IMF, its Executive Board, or its management.

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1. MODEL WITH GOVERNMENT BORROWING ONLY

1.1 Model summary

Government choices Main problem in repayment

$$\begin{aligned} V^R(b, a, \mathbf{s}) &= \max_{b', a', c_T, h} u(c_T, F(h)) + \beta \mathbb{E} [\mathcal{V}(b', a', \mathbf{s}')] \\ \text{subject to } c_T + q_a a' + \kappa b &= a + y_T(\mathbf{s}) + q_b(b', a', \mathbf{s})(b' - (1 - \delta)b) \\ h &\leq \mathcal{H}(c_T, \bar{w}) \end{aligned} \quad (1)$$

Main problem in default

$$\begin{aligned} V^D(b, a, \mathbf{s}) &= \max_{a', c_T, h} u(c_T, F(h)) + \beta \mathbb{E} [\theta \mathcal{V}(b, a', \mathbf{s}') + (1 - \theta) V^D(b, a', \mathbf{s})] \\ \text{subject to } c_T + q_a a' &= a + \mathcal{D}(y_T(\mathbf{s})) \\ h &\leq \mathcal{H}(c_T, \bar{w}) \end{aligned} \quad (2)$$

Extreme value preference-for-default shocks yield default probabilities

$$\mathcal{P}(b, a, \mathbf{s}) = \frac{\exp(V^D((1 - \bar{h})b, a, \mathbf{s})/\sigma^V)}{\exp(V^D((1 - \bar{h})b, a, \mathbf{s})/\sigma^V) + \exp(V^R(b, a, \mathbf{s})/\sigma^V)} \quad (3)$$

Finally, the value of entering a period with access to markets (and hence an option to default) is

$$\mathcal{V}(b, a, \mathbf{s}) = (1 - \mathcal{P}(b, a, \mathbf{s})) V^R(b, a, \mathbf{s}) + \mathcal{P}(b, a, \mathbf{s}) V^D((1 - \bar{h})b, a, \mathbf{s}) \quad (4)$$

Foreigners, debt prices Stochastic discount factor

$$m(\mathbf{s}, \mathbf{s}') = \exp(-r - \nu(\psi \epsilon' + 0.5 \psi^2 \sigma_\epsilon^2)) \quad \epsilon' = \log(y') - \rho \log(y) - (1 - \rho) \mu_y \quad (5)$$

$$q_a = \exp(-r) \quad (6)$$

$$q_b(b', a', \mathbf{s}) = \mathbb{E} [m(\mathbf{s}, \mathbf{s}') (\mathbb{1}_{\mathcal{D}'}(1 - \bar{h})q_b(b', a', \mathbf{s}') + (1 - \mathbb{1}_{\mathcal{D}'}) (\kappa + (1 - \delta)q_b(b', a', \mathbf{s}')))] \quad (7)$$

Private economy Preferences

$$u(c_T, c_N) = \left[\varpi_N c_N^{-\eta} + \varpi_T c_T^{-\eta} \right]^{-\frac{1}{\eta}} \quad (8)$$

for $\varpi_N + \varpi_T = 1$.

Production and default costs

$$y_N(h, \mathbb{1}_{\mathcal{D}}) = (1 - \Delta \mathbb{1}_{\mathcal{D}}) h^\alpha \quad \mathcal{D}(y) = (1 - \Delta) y \quad (9)$$

Wage rigidities

$$h \leq \mathcal{H}(c_T, \bar{w}, \mathbb{1}_{\mathcal{D}}) \quad \mathcal{H}(c_T, \bar{w}, \mathbb{1}_{\mathcal{D}}) = \left(\frac{\varpi_N}{\varpi_T} (1 - \Delta \mathbb{1}_{\mathcal{D}}) \frac{\alpha}{\bar{w}} \right)^{\frac{1}{1+\alpha\eta}} c_T^{\frac{1+\eta}{1+\alpha\eta}} \quad (10)$$

1.2 Model results

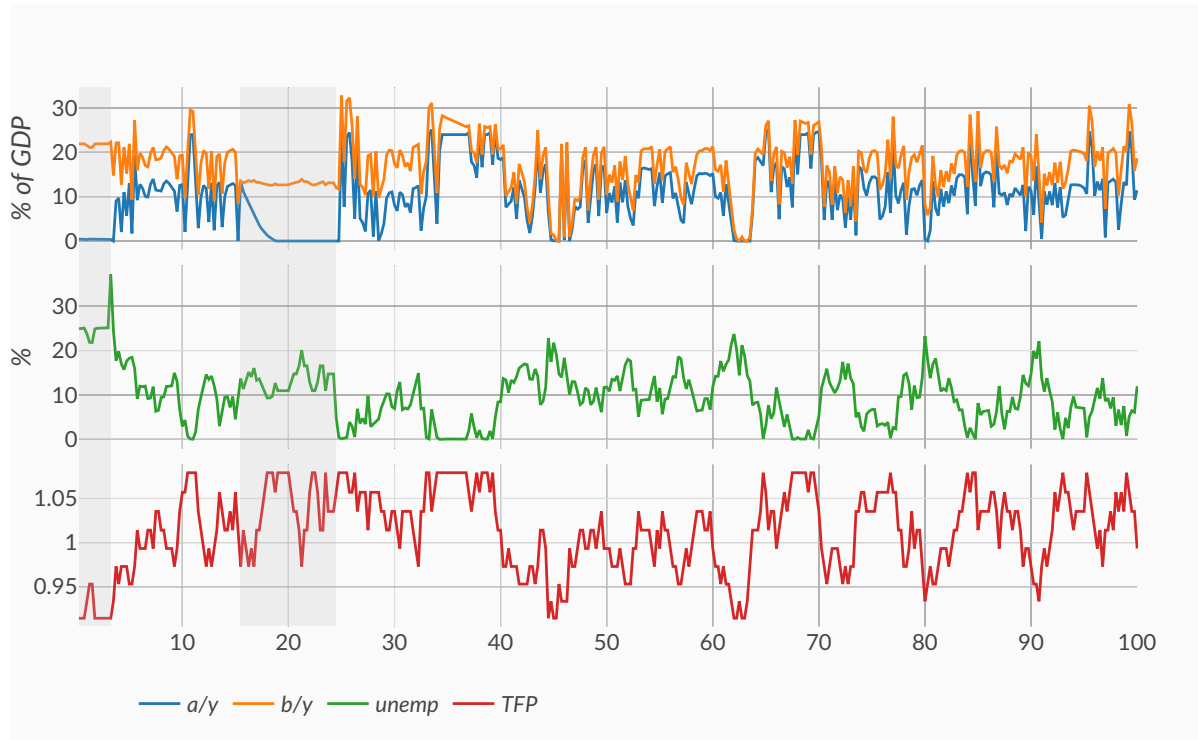


FIGURE 1: A SIMULATED PATH

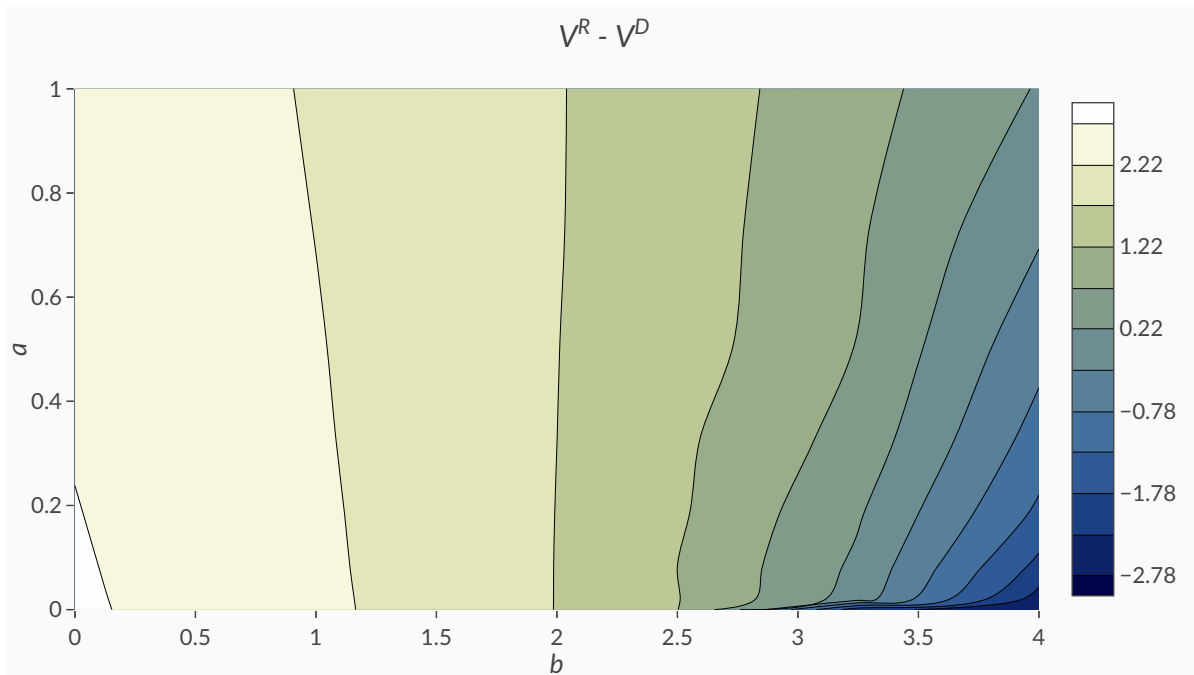


FIGURE 2: DEFAULT INCENTIVES

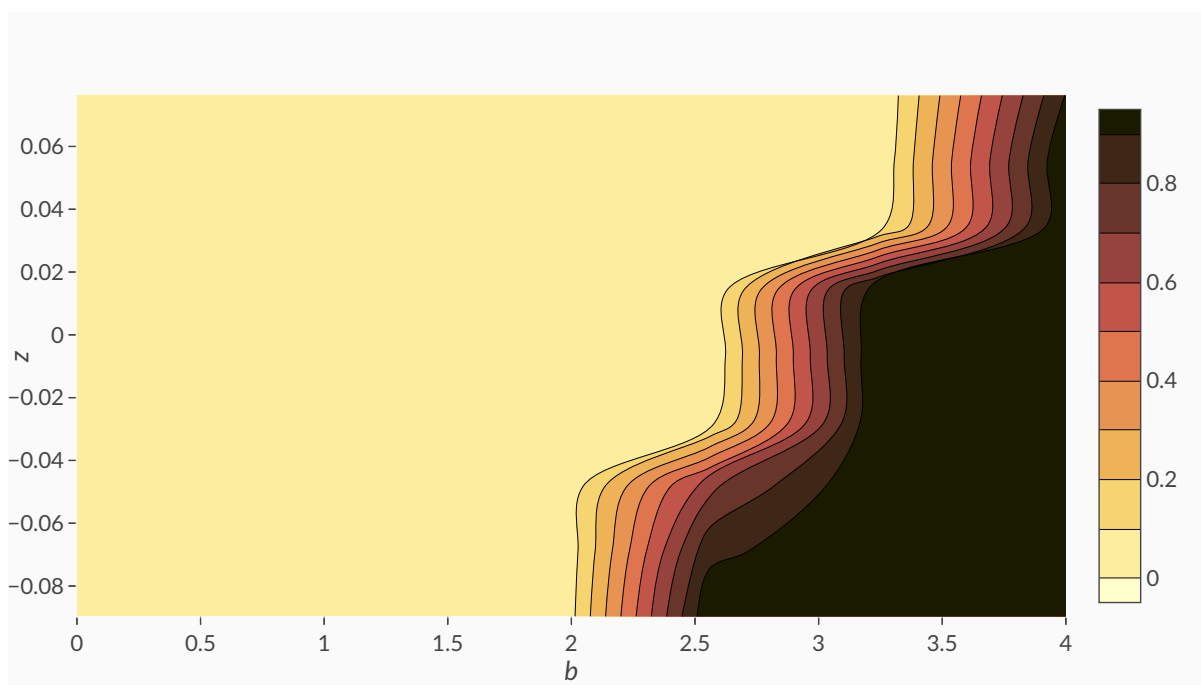


FIGURE 3: DEFAULT PROBABILITY