A Model of the Twin Ds: Optimal Default and Devaluation

by Na, Schmitt-Grohe, Uribe and Yue

Discussion by Anastasios Karantounias,

Federal Reserve Bank of Atlanta

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- Quantitative study of the joint default and devaluation/capital controls properties. Analyze also pegging.

Discussion plan

- Overview of the model.

- Some thoughts about the setup.

- Some questions.

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- Government: Taxes holdings of external debt, chooses exchange rate policy, provides transfers and decides each period to honor or not the private agent's liability.

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- Debt holdings:

$$(1 - \tau_t^d) q_t^d = \beta E_t \frac{U'(c_{t+1}) A_{1,t+1}}{U'(c_t) A_{1t}}$$

Firms and downward wage rigidity

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- Labor market equilibrium

$$(h_t - \bar{h})(w_t - \gamma \frac{w_{t-1}}{\epsilon_t}) = 0$$

- If unemployment $h_t < \bar{h} \Rightarrow$ wages do not adjust enough downwards, $W_t = \gamma W_{t-1}$. If $W_t > \gamma W_{t-1} \Rightarrow h_t = \bar{h}$.

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- Due to the nominal rigidity, real wage can be above the full-employment real wage, $F'(\bar{h})$.

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- Foreign lender: prices the default risk.

$$q_t = \frac{Prob_t(\text{repayment at } t+1)}{1 + r^*}$$

Competitive equilibrium

- Given policy $\{\tau_t^d, \epsilon_t, I_t\}_{t=0}^{\infty}$: a price system $\{p_t, w_t, q_t\}$ and an allocation $\{c_t^T, c_t^N, h_t, d_{t+1}\}$ such that everybody maximizes and markets clear.

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- Optimal policy: choose $\{\tau_t^d, \epsilon_t, I_t\}_{t=0}^\infty$ to maximize utility of the household subject to conditions of the CE.

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- A model with centralized external borrowing delivers the same predictions as a model with the decentralized external borrowing, a government that can confiscate external payments as long as the government has free access to exchange rate policy and capital controls.

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- Choose capital controls as a *residual*:

$$1 - \tau_t^d = \beta(1 + r^*) \frac{E_t \frac{U_{T,t+1}}{U_{T,t}}}{Prob_t(\text{repayment})}$$

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- Is it possible to interpret the current setup as private agents borrowing from the government (at q_t^d) and government borrowing from abroad?

- Assume that $c_t^T \downarrow \Rightarrow$ demand for $c_t^N \downarrow \Rightarrow$ price p_t falls $\Rightarrow w_t/p_t \uparrow \Rightarrow$ demand for labor falls. To restore full employment need to reduce w_t by devaluing.

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- Devaluation+ Default.

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- Value of repayment

$$V^r(d, w_-, y) = \max_{c,h,d',w} U(A(c, F(h))) + \beta E_{y'|y} V(d', w, y')$$

subject to

$$c + d = y + q(d', w, y)d'$$
$$w = \frac{A_2(c, F(h))}{A_1(c, F(h))} F'(h)$$
$$w \geq \gamma w_-$$
$$h \leq \bar{h}$$

Comparison of debt choice

- With optimal devaluation

$$u'(A)A_1(c, F(\bar{h}))[\underbrace{\frac{\partial q(d', y)}{\partial d'}d' + q(d', y)}_{MR^{\mathrm{optimal}}}] = -\beta\frac{\partial}{\partial d'}E_{y'|y}V(d', y')$$

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- With pegging

$$\left[u'(A)A_1(c, F(h)) + \underbrace{\mu F'(h)\frac{\partial A_2/A_1}{\partial c}}_{+}\right] \times MR^{\text{pegging}} = -\beta \frac{\partial}{\partial d'}E_{y'|y}V(d', w, y')$$

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- Play around with the intertemporal and intratemporal substitutability in order to see how default/repayment regions change. For the current exercise marginal utility of tradeables does not depend on labor.

Optimal firm subsidies and currency pegging

- Subsidize purchases of labor by firms. Finance firm-subsidy by lump-sum taxes on consumer.

- After-subsidy wage: $(1 - \kappa)W$.

- Profits:

$$\Pi_t = P_t^N F(h_t) - (1 - \kappa_t)W_t h_t \Rightarrow F'(h_t) = (1 - \kappa_t)\frac{W_t}{P_t^N} = (1 - \kappa_t)\frac{w_t}{p_t}$$

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- Would be interesting to see $\{\tau_t^d, \kappa_t\}$ induced by the optimal default allocation.