Valuation Effects in Small Open Economies: Inspecting the Mechanism

(Preliminary and incomplete)

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Motivation

According to **Gourinchas and Rey (2014)**

- The current account does not -by definition- incorporate fluctuations in the value of existing assets and liabilities, the two measures differ from one another in theory by the cumulated value of capital gains and losses on the country's external position.
- Therefore, the current account represents an increasingly imperfect measure of the change in a country's net foreign asset position.
- The relative importance of these "valuation effects" is particularly high for advanced economies, but increasingly so too for **emerging** ones.

Motivation

- The growing empirical importance of these valuation effects requires that we look more closely at the determinants of international portfolios.
- Over a given period, the fluctuations in the valuation effect can easily dominate the current account balance (Lane and Milesi-Ferretti, 2001).
- The latter also reflects changes in the market value of claims and liabilities underlying a country's net position, including **exchange rate movements**.

Motivation

- Large and heterogeneous leveraged portfolios open the door to potentially important wealth transfers across countries when asset prices and exchange rate fluctuate.
- These capital gains and losses are bound to affect the external asset positions of countries.
- **Valuation effects**, which are capital gains and losses on gross external assets and liabilities, account for an important and increasing part of the dynamics of the net foreign asset positions of countries.

My goal

- Build a “baby model” to pin down the valuation effect by using standard DSGE machinery.
- Key results: second moments **do** matter.

The model

A representative household maximizes

$$E_0 \left\{ \sum_{t=0}^{\infty} \theta_t u\left(C_t\right) \right\}$$

subject to

$$\underbrace{C_t}_{\text{consumption}} + \underbrace{B_{t+1}}_{\text{domestic}} + \underbrace{B^*_{t+1}}_{\text{foreign}} \leq \underbrace{R_t}_{\log\sim(0,\sigma_r^2)} B_t + \underbrace{R^*_t}_{\log\sim(0,\sigma_r^2)} B^*_t + \underbrace{Y_t}_{\log\sim\left(0,\sigma_y^2\right)}, \forall t.$$

- $\theta_{t+1} = \omega \bar{C}_t^{-\eta} \theta_t$, $\bar{C}_t$: average consumption, $\forall t$.
- $\Omega \equiv E_t \begin{bmatrix} r_{t+1}^2 & r_{t+1} r_{t+1}^* & r_{t+1} y_{t+1} \\ & r_{t+1}^{*2} & r_{t+1}^* y_{t+1} \\ & & y_{t+1}^2 \end{bmatrix} = \begin{bmatrix} \sigma_r^2 & \sigma_{r,r^*} & \sigma_{r,y} \\ & \sigma_{r^*}^2 & \sigma_{r^*,y} \\ & & \sigma_y^2 \end{bmatrix}, \forall t.$

Equilibrium characterization

$$E_t \left[u' \left(C_{t+1} \right) R_{t+1} \right] = E_t \left[u' \left(C_{t+1} \right) R^*_{t+1} \right], \qquad \text{(portfolio)}$$

$$u' \left(C_t \right) = \omega \bar{C}_t^{-\eta} E_t \left[u' \left(C_{t+1} \right) R_{t+1} \right], \qquad \text{(Euler)}$$

$$C_t + A_{t+1} = R_t A_t + \left(R^*_t - R_t \right) B^*_t + Y_t, \qquad \text{(budget)}$$

$$C_t = \bar{C}_t, \forall t. \qquad \text{(consistency)}$$

Solution method

1. Solve as usual (steady state, log-linear,...).
2. Make the steady state portfolio $\frac{B^*}{\beta Y}$ to fulfill the portfolio condition ("second order").

Step 1: approximate solution

After defining $a_t := \frac{A_t - A}{Y}$ and $x_t := \frac{X_t - X}{X}$ for any other variable, it is easy to show that

$$a_{t+1} = \beta \left(1 - \frac{\eta}{\rho}\right) \left[y_t + \frac{1}{\beta} a_t + \frac{A}{\beta Y} r_t + \frac{B^*}{\beta Y} \left(r_t^* - r_t\right)\right]$$

and

$$\frac{C}{Y} c_t = \left[1 - \beta \left(1 - \frac{\eta}{\rho}\right)\right] \left[y_t + \frac{1}{\beta} a_t + \frac{A}{\beta Y} r_t + \frac{B^*}{\beta Y} \left(r_t^* - r_t\right)\right].$$

Step 2: portfolio condition

It is easy to show that

$$\frac{B^*}{\beta Y} = \frac{\frac{A}{\beta Y}\left(\sigma_r^2 - \sigma_{r^*,r}\right) + \left(\sigma_{r,y} - \sigma_{r^*,y}\right)}{\sigma_{r^*}^2 - 2\sigma_{r^*,r} + \sigma_r^2}.$$

Implications

We can decompose

$$a_{t+1} - a_t = y_t - \frac{C}{Y} c_t + \left(\frac{1}{\beta} - 1\right) a_t + \left(\frac{A}{\beta Y} - \frac{B^*}{\beta Y}\right) r_t + \frac{B^*}{\beta Y} r_t^*$$

where

$$\frac{B^*}{\beta Y} = \frac{\frac{A}{\beta Y}\left(\sigma_r^2 - \sigma_{r^*,r}\right) + \left(\sigma_{r,y} - \sigma_{r^*,y}\right)}{\sigma_{r^*}^2 - 2\sigma_{r^*,r} + \sigma_r^2}.$$

Why does this work?

Recall that

$$B_{t+1} \quad : \quad \underbrace{-u'\left(C_t\right)}_{\text{cost}} + \underbrace{\beta E_t\left[u'\left(C_{t+1}\right)R_{t+1}\right]}_{\text{expected benefit}} = 0$$

$$B^*_{t+1} \quad : \quad \underbrace{-u'\left(C_t\right)}_{\text{cost}} + \underbrace{\beta E_t\left[u'\left(C_{t+1}\right)R^*_{t+1}\right]}_{\text{expected benefit}} = 0$$

Therefore, B_{t+1} and B^*_{t+1} are two competing ways to transfer resources into the future.

- If $E_t\left[u'\left(C_{t+1}\right)R_{t+1}\right] > E_t\left[u'\left(C_{t+1}\right)R^*_{t+1}\right]$ then $B_{t+1}\uparrow$ and $B^*_{t+1}\downarrow$.
- If $E_t\left[u'\left(C_{t+1}\right)R_{t+1}\right] < E_t\left[u'\left(C_{t+1}\right)R^*_{t+1}\right]$ then $B_{t+1}\downarrow$ and $B^*_{t+1}\uparrow$.
- In equilibrium: $E_t\left[u'\left(C_{t+1}\right)R_{t+1}\right] = E_t\left[u'\left(C_{t+1}\right)R^*_{t+1}\right]$

Comparative statics

It is easy to show that

$$\frac{\partial\left(\frac{B^*}{\beta Y}\right)}{\partial\left(\sigma_{r,y}\right)}=\frac{1}{\sigma_{r^*}^2-2\sigma_{r^*,r}+\sigma_r^2}>0$$

and

$$\frac{\partial\left(\frac{B^*}{\beta Y}\right)}{\partial\left(\sigma_{r^*,y}\right)}=-\frac{1}{\sigma_{r^*}^2-2\sigma_{r^*,r}+\sigma_r^2}<0.$$

What is the intuition behind?

- *Ceteris paribus*, a higher $\sigma_{r,y}$ makes the domestic asset a worse hedge against income flucutations, then the demand for the foreign asset is higher.
- *Ceteris paribus*, a higher $\sigma_{r^*,y}$ makes the foreign asset a worse hedge against income flucutations, then the demand for it lower.

Conclusions

- A simple model can be used to pin down the valuation effect, with quantitative implications.
- Such approach is scalable.
- Main goal: embed this approach into a NK-DSGE model.

Thanks!