University of Zurich, Dept. of Economics
International Macroeconomics
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Final Problemset FS2021

1. The net foreign asset position NA of a country is defined as

$$NA_t = A_t - L_t$$

where A denotes foreign assets and L foreign liabilities and t indexes time. In what follows, assume that A, L and NA are expressed in terms of the country's home currency. The net foreign asset position over time evolves according to

$$NA_{t+1} = \left(1 + r_{t+1}^{NA}\right) NA_t + NX_{t+1}$$

where $r_{t+1}^{NA} = \frac{r_{t+1}^{A} A_t - r_{t+1}^{L} L_t}{NA_t}$ $(NA_t \neq 0)$ is the return on the country's net foreign asset position, r_{t+1}^{A} is the return on the asset side of the country's balance sheet and r_{t+1}^{L} the return on the liability side. NX_{t+1} stands for the country's net exports.

(a) Consider two countries, country 1 with foreign assets of $A^1 = 100$ and foreign liabilities of $L^1 = 100$ and country 2 with foreign asssets $A^2 = 1000$ and $L^2 = 1000$. Assume that both countries have GDP of $GDP^1 = GDP^2 = 100$ and that both countries hold all their liabilities denominated in domestic currency and all their foreign assets denominated in foreign currency. What is the effect of a 10 percent appreciation of both countries' currencies on their respective net foreign asset positions expressed as a fraction of GDP.

(b) Many economic models assume that a country's current account is identical to the change in a country's net foreign asset position. What does your answer to (a) imply for the realism of this assumption as financial globalization has increased international gross asset positions relative to GDP (i.e. the ratio $\frac{A+L}{GDP}$). In your answer, distinguish between the short-run and the long-run.

(c) In the lecture, we derived that the basic pricing equation (BPE)

$$\boldsymbol{E}_t \left(M_{t+1}(1 + r_{t+1}^{k}) \right) = 1$$

holds for any asset or portfolio with return r_{t+1}^{k}, where M_{t+1} is the stochastic discount factor of the world average investor and $\boldsymbol{E}_t\,(.)$ the expectations operator. Use the BPE to show that

$$\boldsymbol{E}_t\left(\Delta NA_{t+1}\right) = \boldsymbol{E}_t(NX_{t+1}) + r_t^f NA_t - \frac{cov_t\left(M_{t+1}, (1 + r_{t+1}^{NA}) NA_t\right)}{\boldsymbol{E}_t\left(M_{t+1}\right)} \qquad (1)$$

where r_t^f is the world risk-free rate and $\Delta NA_{t+1} = NA_{t+1} - NA_t$ is the change in the net foreign asset position. Provide an economic intuition for (1).