

A Portfolio Balance Model of the Risk Premium (corrected 5/4)

Define the risk premium as the additional return necessary to induce the holding of a particular asset. This means one drops explicitly the uncovered interest rate parity condition. Hence:

$$rp_t \equiv i_t^{US} - i_t^{Eu} - \Delta s_{t+1}^e \quad (1)$$

where depreciation expected between time t and $t+1$, based on time t information, is expressed as:

$$\Delta s_{t+1}^e \equiv \varepsilon_t(s_{t+1}) - s_t \quad (2)$$

Notice that if UIP holds, then the risk premium, rp , is zero. What determines the risk premium?

Arbitrarily define x as the share of wealth allocated to \$ assets.

$$x = \alpha + \beta rp \quad (3)$$

Rearranging and assuming asset supply equals asset demand,

$$rp = -\beta^{-1}\alpha + \beta^{-1}x \quad (4)$$

One then obtains the following diagram:

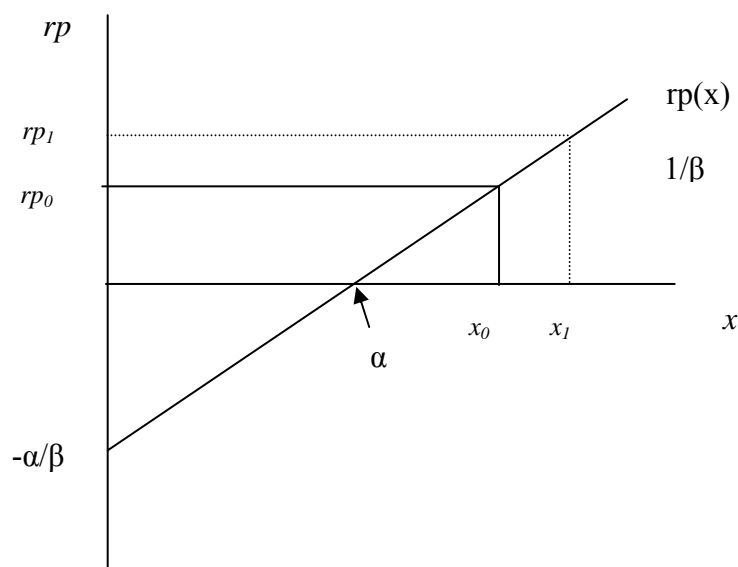


Figure 1: The exchange risk premium and asset shares

If $x=\alpha$, then the risk premium is zero. However, if $x=x_0 > \alpha$ then in some sense, the interest rates on US assets must be higher in order to compensate individuals for the fact that they are holding greater amounts of US assets than they would like (consistent with no risk premium). What does α equal? In a mean-variance framework (familiar to those of you who know the capital asset pricing model, or CAPM, for stock returns), α is a function of ~~the degree of risk aversion~~ variability of the risk premium, and the extent to which ~~real~~ **relative** returns (i.e., **the risk premium**) on US assets are correlated with the dollar returns ~~on Euro-area assets~~.

What about the slope? When the slope is flat, then $\beta^1 = 0$, and $\beta = 4$, and assets are perfectly substitutable. Graphically, this means that with perfect substitutability, there is a zero slope and intercept to this curve, and hence always a zero risk premium.

Notice if the share of US government debt rises to x_1 , then the risk premium must rise. The extent of the rise depends upon the increase in US government debt share *and* the slope of the curve; the steeper the curve (i.e., the less substitutable the government debt stocks or the more risk averse investors are), the larger the increase in the risk premium.