

CIRP Calculations

Say the fed funds rate is 2% and the US risk premium is zero.

- a) if the \$ forward discount is 1% what is the Eurozone policy rate?

The trick is to ensure consistency across interest rates and the exchange rate regarding the base and the counter; it's easy to mess up if you are not careful (believe me, I fall into the trap many times!). Also remember if one currency has a forward discount then, by definition, the other currency has a forward premium. In this case, the dollar's $FPREM = -1\%$ but that means that the euro's $FPREM = +1\%$.

For example, if we take the base as US\$ then i_p is the US fed funds rate, i_p^f is the euro policy rate (what we are trying to solve for) and $FPREM$ is the **\$ forward discount (-1%)**

$$i_p = i_p^f - (e^e - e) = i_p^f - FPREM \Rightarrow i_p^f = i_p + FPREM = 2\% + (-1\%) = 1\%$$

But if the base is the € then i_p is the euro policy rate (what we are trying to solve for), i_p^f is the fed funds rate and $FPREM$ is the **€ forward premium (+1%)**

$$i_p = i_p^f - (e^e - e) = i_p^f - FPREM = 2\% - (+1\%) = 1\%$$

In conclusion, the right answer is 1% whichever base you choose.

- b) if the EMU market rate is 100bp higher than in the US what is the implied EMU risk premium?

Assuming a US\$ base,

$$i = i^f - (e^e - e) - (\rho^f - \rho) \Rightarrow$$

$$\rho^f = i^f - (e^e - e) - (i - \rho) = (i^f - i) - \Delta e + \rho \Rightarrow$$

$$\rho^f = 1\% - (-1\%) + 0\% = 2\%$$

Interest Rates & the US\$

Assuming a floating exchange rate environment, how could the following scenarios be rationalised?

- Fed raises interest rates by 25bp and the US\$ falls
- Fed raises interest rates by 25bp and the US\$ does not react
- Congress boosts fiscal spending and the US\$ falls
- The US\$ rises on news that a post-Brexit UK economy is recovering strongly

a) There are several possibilities.

- the Fed's rate hike might be less than had previously expected (and priced into bonds and the currency)
- other countries may have increased their (risk-free) policy rates by even more
- markets might take the view that the Fed that tighter monetary policy will tip the economy into a deflationary recession, leading to sharp downward revisions in future policy rates (and thus expected values of exchange rates going forward)

b) The Fed's rate hike might have been fully anticipated. Alternatively, the Fed rate hike's impact on the US\$ might have been neutralised if all other major central banks have increased their interest rates by the same amount. Another possibility is that the rate hike is simply compensation for a temporary rise in inflation so markets take the view that nothing "real" has changed.

c) Markets take the view that the fiscal expansion is irresponsible and unsustainable. As such the risk premium on dollar assets increases, leading to downward revisions of growth and real interest rates, in turn depressing the expected long-run real exchange rate. Alternatively, the fiscal expansion might be in the context of other bad economic news that lead to downward revisions in future domestic interest rates.

d) Markets might view the UK news as likely to encourage other EU countries to "go-it-alone", heightening the risk premium attached to European assets and undermining long-run euro prospects.

US Economic News & the US\$

Is upbeat news on the US economy good or bad for the US\$?

There is no clearcut right answer since a great deal will depend on circumstances, especially variations in risk appetite.

In a **risk-on** environment (when global capital is happy to take additional risk to seek extra returns) then positive news for the US economy could encourage more risk-taking in emerging markets (EMEs). The global economy now appears “safe”, so capital flows to EMEs rise and the US\$ weakens.

However, in a **risk-off** environment (when global capital flows are edgy about risk) then the prospect of higher US interest rates – as the Fed reacts to strong data with fed funds target rate increases - will prove to be the dominant factor. Not only will higher US interest rates increase demand for dollar-denominated assets but investors might fret about the negative impact of Fed tightening on the world economy, thus encouraging “safe haven” flows out of vulnerable foreign markets into US dollar.

Further, we need to assess how upbeat the news is since this could determine the type of risk attitudes adopted (they are not necessarily exogenous). Extremely positive news on the US economy would tend to promote **risk-on** attitudes. However, only moderately good news (and especially if it falls short of much rosier expectations) might well support **risk-off** investment decisions.

Again, we see here the danger of assuming *ceteris paribus*. When circumstances change a spot exchange rate can be pushed and pulled in a variety of directions depending on a wide range of factors.

Also note that if news has been preannounced then markets will have already priced in the relevant information. Don't Assume a Fed Action Will Move the Market Bob Shiller article for NY Times, Dec 2015

Risk Shocks

Model simulations for a floating exchange rate regime suggest that a risk premium shock triggers changes in the spot exchange rate. However, the interest rate parity condition states that

$$i = i^f - \Delta e - \theta \Rightarrow$$

$$i = i^f - [E_t(e_{t+1}) - e_t] - (\rho^f - \rho)^f \Rightarrow$$

$$e_t = (i - \rho) - (i^f - \rho^f) + E_t(e_{t+1}) \Rightarrow$$

$$e_t = i_p - i_p^f + E_t(e_{t+1})$$

So if the domestic risk premium ρ changes but policy rates are unmoved why should the spot exchange rate be affected at all?

Because other things do not remain equal! Look again at the [simulation](#) of higher domestic risk. There will be an impact on the domestic economy that, in turn, will affect domestic inflation and the output gap. Through the Taylor Rule the central bank will change policy rates and so the spot exchange rate will react. Given our assumption of rational expectations and perfect forward markets then investors will see this coming and so $E_t(e_{t+1})$ changes as soon as the shock occurs. Recall the slides on “Geeky IRP Maths” that confirm the importance of expectations of future policy stances.