Exchange Rates

Arbitrage

- CIP → covered interest rate parity
- UIP → uncovered interest rate parity

} important formulas

Assume you have $100 to invest

↳ should I save in USD or not?

factors

① interest rate → 2% for USD
↳ 3% for pesos

② Value of currency

Riskless arbitrage

. Futures contract: fixes the value of an asset for some time in the future

ex: currency = 2 pesos/$

↳ future could be 2.5 pesos/$ → we expect the peso to depreciate

→ a way to eliminate the foreign exchange risk

Exchange Rates

USD = 100

$i^{US} = 1\%$

$i^{f} = 3\%$

$E_{\$/f} = 1.1$

$F_{\$/f} = 1.2$

In dollars:

1 yr = $100(1.01) = \$101$

In Mex:

1 yr = $\left(\frac{100}{1.1}\right)(1.03) \cdot 1.2 = \$112.389$

(100/1.1 = pesos today; 1.03 = pesos @ end of year; ·1.2 = dollars I get back)

In general, the formula will be:

in $: $\$100(1+i^{US})$

in f: $\left(\frac{100}{E_{\$/f}}\right)(1+i^{f}) \cdot F_{\$/f}$

$$\Rightarrow \boxed{1+i^{US} = \frac{(1+i^{f})F_{\$/f}}{E_{\$/f}}}$$ (CIP)

holds well in practice

in general: we are good in low-risk scenarios

U.I.P

this happens when you don't sign a futures contract
↳ rather you use an expectation ($E_t U$)

$$\frac{(1+i^{us})}{(1+i^{f})} = \frac{E^{e}_{\$/£}}{E_{\$/£}}$$

approx UIP:
$i^{us} \simeq i^{f}$ + expected depreciation
↳ $E^{e}_{\$/£} - E_{\$/£}$ (dollar depreciation)
$\frac{E^{e}_{\$/£} - E_{\$/£}}{E_{\$/£}}$ (percent change / currency change)
or $\therefore \Delta E^{e}_{\$/£}$

if C.I.P & U.I.P both hold, it must be
that $E^{e}_{\$/£} = F_{\$/£}$

↳ this means the forward premium = expected depreciation

$$\frac{F_{\$/£} - E_{\$/£}}{E_{\$/£}} = \frac{E^{e}_{\$/£} - E_{\$/£}}{E_{\$/£}}$$

forward premium

expected depreciation