Interest Rate Parity Theories: Covered (CIP)

Operating Mode
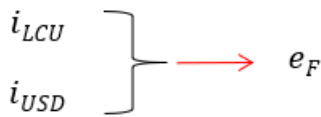
$$i_{LCU}$$
$$i_{USD}$$
$$\longrightarrow\ e_F$$

$$\textit{Quotation of exchange rate:}$$
$$\textit{Price (direct) quotation of Home}$$
$$(e.g.)$$

$$e_{\frac{LCU}{USD}} = 2 \iff 2\,LCU = 1\,USD$$

Home (LCU)   **Foreign (USD)**

t1   Money $\xrightarrow{\frac{1}{e}}$ Money

i_{LCU} i_{USD}

t2 $\boxed{Money = Money}$ $\xleftarrow{e_F}$ Money
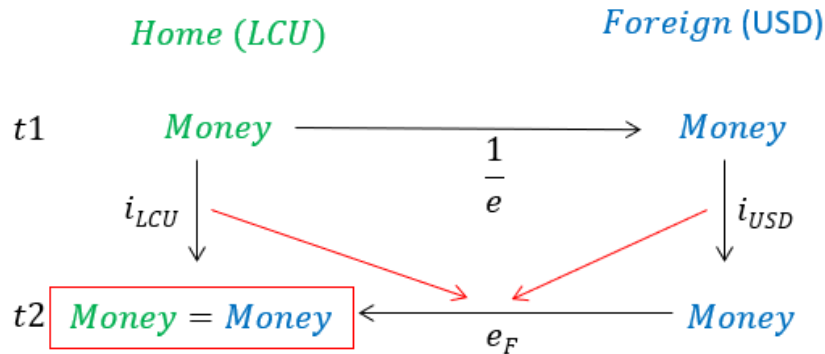
Core Functions

CIP: long:
$$Money_{LCU} \times (1 + i_{LCU}) = Money_{LCU} \times \frac{1}{e_{\frac{LCU}{USD}}} \times (1 + i_{USD}) \times e_{F\,\frac{LCU}{USD}}$$

CIP: short:
$$(1 + i_{LCU}) = (1 + i_{USD}) \times \frac{e_F}{e} \iff e_F = \frac{(1 + i_{LCU})}{(1 + i_{USD})} \times e$$

Swap rate:
$$s = \frac{e_F}{e} - 1$$

Variables and Symbols

LCU	Local Currency Unit (Home)	e	Exchange rate (spot rate)
USD	US-Dollar (Foreign)	e_F	Exchange rate (forward rate)
i	Interest rate	s	Swap rate

Relevance

In the covered interest rate parity (CIP), the forward rate is determined by the interest rate ratio. Since the forward rate eliminates the exchange rate risk, this ratio is covered = secured.

The close connection between interest rates and exchange rates is illustrated. In efficient markets, no permanent arbitrage should be possible, i.e. it should apply: domestic investment = foreign investment (interest rate parity).

The swap rate is the ratio of forward over spot rate and can also be interpreted as an expected rate of change of the spot rate.

Limitations

The exchange rate is influenced by a variety of determinants, in particular price levels and inflation rates are to be mentioned (see purchasing power parity theories).

In fixed exchange rate regimes, the central bank can prevent the market-driven exchange rate change (for a certain time).

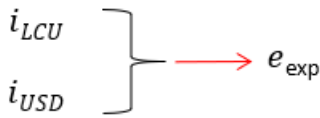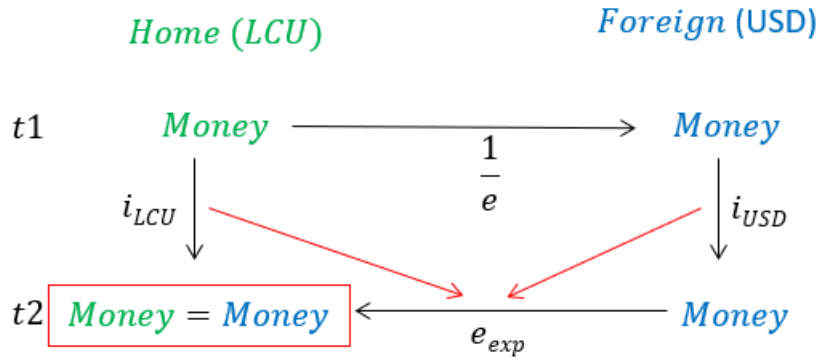# Interest Rate Parity Theories: Uncovered (UIP)

Operating Mode

$$i_{LCU}$$
$$i_{USD}$$
$$\longrightarrow e_{exp}$$

Quotation of exchange rate:
Price (direct) quotation of Home
(e.g.)

$$e_{\frac{LCU}{USD}} = 2 \Leftrightarrow 2\ LCU = 1\ USD$$

Home (LCU)   *Foreign (USD)*

$t1$ *Money* $\xrightarrow{\quad \frac{1}{e} \quad}$ *Money*

$i_{LCU} \downarrow$ $i_{USD} \downarrow$

$t2$ *Money = Money* $\xleftarrow{\quad e_{exp} \quad}$ *Money*

Core Functions

UIP: long:

$$Money_{LCU} \times (1 + i_{LCU}) = Money_{LCU} \times \frac{1}{e_{\frac{LCU}{USD}}} \times (1 + i_{USD}) \times e_{exp\ \frac{LCU}{USD}}$$

UIP: short:

$$(1 + i_{LCU}) = (1 + i_{USD}) \times \frac{e_{exp}}{e} \Leftrightarrow e_{exp} = \frac{(1 + i_{LCU})}{(1 + i_{USD})} \times e$$

Expected rate of change:

$$\dot{e}_{exp} = \frac{e_{exp}}{e} - 1$$

Variables and Symbols

LCU	Local Currency Unit (Home)	e	Exchange rate (spot rate)
USD	US-Dollar (Foreign)	e_{exp}	Expected exchange rate (spot rate)
i	Interest rate	$\dot{e}_{exp}$	Expected rate of change of the exchange rate (spot rate)

Relevance

In the uncovered interest rate parity (UIP), the expected spot rate is determined by the interest rate ratio. Since an expected spot rate (for the future) does not eliminate the exchange rate risk, this ratio is uncovered = unsecured.

The expected rate of change reflects the ratio of expected (future) spot rate over current spot rate.

The reversed causality is also analytically interesting: If a devaluation is expected from the market, the devaluation candidate must offer a higher interest rate to keep capital in the domestic market (widely observable).

Limitations

The exchange rate is influenced by a variety of determinants, in particular also price levels and inflation rates are to be mentioned (see purchasing power parity theories).

In fixed exchange rate regimes, the central bank can prevent the market-driven exchange rate change (for a certain time).