

ISSUE 12 - DATE 19 August 2015

## TOPIC 12 - FACTORS THAT DETERMINE CURRENCY EXCHANGE RATE

### INTRODUCTION AND OBJECTIVE

Currency exchange rate affects an **operational entity** in many ways, and practically the overall economy in general. **Some sectors will benefit** while **others may be negatively affected** whenever domestic currency appreciates relative to another foreign currency. The converse is also true. **In the financing of major infrastructure in emerging markets, most often, the capex are financed by USD**, probably because the power plant is constructed by foreign corporations and requires payment in USD while the collection proceeds may be in the currency of emerging market. This may give rise to the risk of currency mismatch, resulting exchange currency risk. One way to minimize the exchange rate exposure is to **hedge** the currency by entering into a currency swap, but this may be costly as the pricing of the exchange rate has to take into consideration the duration of the loan which often banks are likely to price in risk premium for the long exposure taken. In this article, I intend to share **some common factors** that determines the currency exchange rate, which is **not meant** to be all inclusive. It serves as background knowledge to a reader to appreciate the implication of **various models** that are being used in determining the fair currency exchange rate.

In most instances there are few factors that **operate simultaneously** and hence for purpose of this article, **the factors are treated and discussed in isolation**, so that it easier to appreciate the effects of each factor discussed on the currency exchange rate. For illustration also, whenever, we talk about exchange rate, we are discussing the **relative strength of two currencies** which is normally quoted as **P/B**, meaning the price of one unit of **base currency "B"**, expressed in terms of **the price currency "P"**.

#### Example:-

RM 4 / USD means that the **price of the base currency in USD** is worth RM 4. If **USD strengthens** (i.e. RM weakens relative to USD), then, one **USD is now worth more than RM 4**. Conversely, **if USD weakens**, then **one USD is now worth lesser than RM 4**.

## MODELS THAT DETERMINES THE CURRENCY EXCHANGE RATE

### (i) PURCHASING POWER PARITY

This model is based on the idea that in the **long run**, prices of goods and services **are equivalent** regardless of denominations in the currencies. So, **if** a country is expected / forecasted to have higher inflation, than another, to offset the higher prices effects for a consumer, from a lower inflation, the currency of the country having higher inflation should expect to see a depreciation in the long run. Example:- **If country A, has higher inflation than country B**, meaning the prices in country A would be more expensive than country B. However, based on "concept of law of one price", **country B should see its currency appreciate in value relative to country A** and hence, people from country B is able to exchange for more currencies in country A, to offset the effects of the higher inflationary effect in country A. This effect works **in a long duration of time**, and hence we still observe the "**equivalence**" in pricing of goods / services after accounting for other transaction cost.

APPROACH	THEORY	MEANING	EFFECTS	PERIOD
1	PURCHASING POWER PARITY	Based on the concept that <b>differential in inflation rate</b> will offset the different prices in two different countries, with end result that the prices of the <b>same product shall be the same adjusted price after accounting for the exchange rate</b> . Meaning, in theory, exchange rate effects, will make the prices of a product to be the same in two different countries.	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">                     A COUNTRY <b>WITH HIGHER INFLATION</b> WILL RESULT IN <b>DEPRECIATION</b> IN ITS CURRENCY, LONG RUN. (RELATIVELY)                 </div> <div style="border: 1px solid black; padding: 5px;">                     A COUNTRY <b>WITH LOWER INFLATION</b> WILL RESULT IN <b>APPRECIATION</b> IN ITS CURRENCY, LONG RUN. (RELATIVELY)                 </div>	LONG RUN, 5 YEARS OR LONGER

Q - What is the implication from the Purchasing Power Parity concept?

Ans: We would expect that we have the **same** purchasing power regardless of countries **in the long run**, after accounting for exchange rates. This is a **theoretical concept**, and in reality we should expect some differences due to other imputed costs in a product or service. **In theory**, it means that **products shall cost the same, in two countries, after adjusting** for the currency exchange rate, but we know that differences arise, as this is only a pricing model.

(ii) **INTEREST RATE DIFFERENTIAL / UNCOVERED INTEREST RATE PARITY**

This model is based on the idea that in the short run, international funds will be attracted to currencies that offers higher interest rate differential between two countries based on its short term deposits. So, if a country is offering a higher short term deposit rate relative to another, its currency shall appreciate relative to another. If investors, invest in a currency offering a higher interest rate, and fund (borrow) with a currency that charges, a lower interest rate, this strategy of gaining the profits is known as carry trade. A carry trade results in a profitable position from the following sources:-

- (i) Gain earned from interest rate differential.
- (ii) Capital appreciation arising from the currency that offers the higher interest rate. However, if the currency that offers the higher interest rate depreciates, instead of appreciation but depreciate, than a carry trade shall result in a capital loss.

Example:-

In year 2003	In year 2008
<p>(i) Gain earned from interest rate differential between AUD and JPY. Interest rate (AUD) = 4.75% Interest rate (JPY) = 0.25% Gain = 4.25%</p>	<p>(i) Gain earned from interest rate differential between AUD and JPY. Interest rate (AUD) = 6.40% Interest rate (JPY) = 0.40% Gain = 6.00%</p>
<p>(ii) If AUD appreciates against JPY by 36%, than total gain earned was approximately 40.25%</p>	<p>(ii) If AUD depreciates against JPY by 27%, (i.e. effects of subprime loan defaults increases in US which cause global risk aversion), than total loss was approximately 21%</p>
<p>Strategy:-- (i) Borrow in JPY (Yen) to finance for investment in short term AUD deposit.</p> <p>Net Result:- (ii) If AUD continues to appreciates, carry trade results in gain. This is also known as "uncovered interest rate parity" that translates to a gain as carry trade works ( expectation of currency</p>	<p>Strategy:- (i) Borrow in JPY (Yen) to finance for investment in short term AUD deposit.</p> <p>Net Result:- (ii) If AUD depreciates despite the AUD offers higher short term deposit rate, relative to JPY, carry trader suffers overall loss.</p>

exchange rate) to the investor's expectation of short term interest rate movement.	
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APPROACH	THEORY	MEANING	EFFECTS	PERIOD
2	CARRY TRADE	Based on the concept that a country with higher interest rate relative to another, will have a stronger currency relative to another currency having a lower interest rate. This is executed by trader by borrowing in currency with low interest rate ( and then sells the currency in exchange for a currency with higher interest rate ) and invest / lend in currency with higher interest rate.	<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">           A COUNTRY WITH DECREASING SHORT TERM INTEREST RATE WILL RESULT IN DEPRECIATION IN ITS CURRENCY, SHORT RUN. (RELATIVELY)         </div> <div style="border: 1px solid black; padding: 5px;">           A COUNTRY WITH INCREASING SHORT TERM INTEREST RATE WILL RESULT IN APPRECIATION IN ITS CURRENCY, SHORT RUN. (RELATIVELY)         </div>	CARRY TRADE WORKS IN:- (i) A country's central bank's plan to continue to increase its interest rate, resulting in more inflow of funds into that country to capture the positive yield and further strengthening of its currency. (ii) Periods of low volatility - risk seeking behaviour

Q - Does that mean a country that offers a higher short term deposit rate will result in appreciation of its currency relative to other countries?

It actually depends.....

Ans: Generally, in short term, based on the concept of "uncovered interest rate parity" investors who subscribe to the strategy of "carry trade", an increase in short term deposit rate will cause the currency to appreciate. See example above in year 2003 above whereby, due to the higher interest rate in AUD, the AUD actually appreciated and investors who participated in carry trade profited from the interest rate differential and currency gain.

But, there is another opposite effect based on another model, the Net Capital Inflow / Outflow model discussed below. An increase in interest rate will actually cause a slowdown in the economy and cause outflow of funds from a country which translate to a depreciation of a country's currency relative to others.

This is just to illustrate some real life observation, e.g. that even though USD has been maintained at low levels for recent years, we saw its appreciation in certain times and depreciation in other times, as different reasoning come to play to cause the appreciation / depreciation which includes the combined effects of interest rate differential and effects on foreign capital flows.

### (iii) NET CAPITAL INFLOWS / OUTFLOWS

Generally, when there is **net capital inflows** into a country, due to foreign direct investments, the country's currency will **appreciate** and conversely, when there is **net capital outflows** from a country, the country's currency will **depreciate**. Often this factor is linked to other factors such as **governmental policies** and **perceived political stability** in a near / medium term for a country.

APPROACH	THEORY	MEANING	EFFECTS	PERIOD
3	CAPITAL FLOW	Positive capital inflow resulting from Foreign Direct Investment (FDI) has the effect of strengthening a country currency and capital outflow has the effect of weakening a country's currency.	<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">           A COUNTRY WITH NEGATIVE FDI WILL RESULT IN DEPRECIATION IN ITS CURRENCY, LONG RUN. (RELATIVELY)         </div> <div style="border: 1px solid black; padding: 5px;">           A COUNTRY WITH POSITIVE FDI WILL RESULT IN APPRECIATION IN ITS CURRENCY, LONG RUN. (RELATIVELY)         </div>	CAPITAL FLOW HAS THE EFFECT OF REVERSING the short term effects of interest rate. Example:- Lower interest rate, translate to lower inflation and a stimulus to domestic economy. It encourages positive FDI and may result in strengthening currency instead of weakening of currency as explained under carry trade above.

### (iv) CENTRAL BANK INTERVENTION

Generally, a central bank in a country may intervene if the currency of a particular country has deviated significantly from its trading band. Central bank may step in by selling foreign currency reserves and buying local domestic currency if domestic currency has depreciated significantly outside its trading band or conversely buying foreign currency reserves and selling domestic currency if domestic currency has appreciated significantly from its trading band.

Q - In maintaining a domestic currency within a trading band, a central bank can adopt a more "aggressive" strategy in the currency exchange market. What is the effect on the foreign currency reserve of a central bank by adopting such strategy?

- (i) The process of selling foreign currency reserves has the effect of reducing the foreign currency reserve of a central bank in defending its domestic currency.
- (ii) The process of buying foreign currency reserves has the effect of increasing the foreign currency reserve of a central bank in defending its domestic currency.

## KEY MESSAGE:-

- (i) Appreciate the implication that a country with **higher inflation** shall translate to a **depreciation** of its currency, based on the Purchasing Power Parity model. The converse is also true.
- (ii) Appreciate the implication that a country with **higher short term deposit rate** shall translate to **appreciation** of its currency, based on the Uncovered Interest Rate Parity model. The investment strategy to earn the interest rate differential and currency exchange gain is known as carry trade. The converse is also true.
- (iii) Appreciate the implication that a country with **higher short term deposit rate** shall translate to **depreciation** of its currency, **based on the expectation of slowdown in the economy which reduces net foreign capital inflow**. The converse is also true.
- (iv) Net foreign capital flows is also influenced by **other factors** that affects the investment climate in a country such as **governmental policies and political stability**.
- (v) Government intervention by the Central Bank, has the immediate effects on the currency exchange rate by buying / selling foreign currency reserves to cause depreciation / appreciation in domestic currency to maintain currency of a country in a trading band.

THANKS FOR READING.

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