Global Finance : PPP, IFE, IRP Project

JRL Consulting
Cross-Cultural Technology Management
E-Mail: tech@jrleeconsulting.com
Website: www.jrleeconsulting.com

Two countries (Canada and Japan) were selected for this exercise to calculate the expected change in currency rates with respect to the US dollar utilizing PPP, IRP and IFE
The Spot Rate and Forward Rate Tables were extracted on 07/31/08 from the Website of Ozforex.com the linkage is http://www.ozforex.com.au/cgi-bin/forwardRates.asp

		Direct Rate	
Japan/USD	Spot Rate	0.009265	
Japan/USD	Forward Rate		p value
	1 Month	0.00928126	0.17%
	2 Months	0.00929878	0.36%
	3 Months	0.00931463	0.53%
	6 Months	0.00936917	1.12%
	12 Months	0.009474	2.25%
Canada/USD	Spot Rate	0.976563	
Canada/USD	Forward Rate		p value
	1 Month	0.97600016	-0.06%
	2 Months	0.97577159	-0.08%
	3 Months	0.97521016	-0.14%
	6 Months	0.97491543	-0.17%
	12 Months	0.97338758	-0.33%

The P value (% of currency changes) calculated is based on the equation
Future Rate = Spot Rate $(1 + p)$

The interest Rate, Core Inflation values for USA, Japan and Canada were extracted from the Website of www.tradingeconomics.com, the linkage is http://www.tradingeconomics.com/Economics/Currency.aspx?symbol=JPY

Country	Currency	Interest Rate	Core Inflation
United States	USD	2.00%	5.00%
Euro Area	EUR	4.25%	4.00%
Japan	JPY	0.50%	2.00%
United Kingdom	GBP	5.00%	3.80%
Canada	CAD	3.00%	3.10%
Australia	AUD	7.25%	4.50%
New Zealand	NZD	8.00%	4.00%
Switzerland	CHF	1.90%	2.90%
China	CNY	2.52%	7.10%
Brazil	BRL	13.00%	6.06%
India	INR	6.00%	7.81%
Russia	RUB	11.00%	15.10%

From Forward Rate we learn that Japanese Yuan will appreciate against USD for about 2.25% in a year and Canadian Dollar will depreciate about 0.33% in a year. These values will be used to test the theory of PPP, IRP and IFE.

Purchasing Power Parity (PPP):

When a country's inflation rate rises relative to that of another country, decreased exports and increased imports depress the high-inflation country's currency. PPP theory attempts to quantity this inflation-exchange rate relationship.

We could use PPP to estimate the exchange rate effects

$e_f = (1 + l_h)/(1+l_f) - 1$

e_f : Change of % of exchange rate of foreign currency again USD (spot rate changes)

l_h : Inflation Rate of USA (Home country)

l_f : Inflation Rate of Japan or Canada (Foreign country)

Japanese Yuan:

e_f of Japanese Yuan $= (1 + 0.05)/(1+0.02) - 1 = 2.94\%$

PPP holds truth in this exercise by comparing 2.94% (estimated) to 2.25 % (1 year forward rate), it might take a longer time to adjust this trend from 2.25% to 2.94%.

Canadian Dollar:

e_f of Canadian Dollar $= (1 + 0.05)/(1+0.031) - 1 = 1.84\%$

PPP doesn't hold in Canadian Dollar case by comparing 1.84% to -0.33% (1 year forward rate)

International Fisher Effect (IFE):

IFE theory suggests that currencies with higher interest rates will depreciate because the higher nominal rates reflect higher expected inflation.

We could use IFE to estimate the exchange rate effects

$e_f = (1 + I_h)/(1+I_f) - 1$
e_f : Change of % of exchange rate of foreign currency again USD (spot rate changes)
I_h : Interest Rate of USA (Home country)
I_f : Interest Rate of Japan or Canada (Foreign country)

Japanese Yuan:

e_f of Japanese Yuan $= (1 + 0.02)/(1+0.005) - 1 = 1.49\%$

IFE holds truth in this exercise by comparing 1.49% (estimated) to 2.25 % (1 year forward rate), what interesting in this comparison is the forward rate for 6 month is 1.12%, so this estimation is in the range of the trend of exchange rate.

Canadian Dollar:

e_f of Canadian Dollar $= (1 + 0.02)/(1+0.03) - 1 = -0.97\%$

If we compare the IFE of -0.97% to the very small forward rate changes, range from (1-12 months) -0.06% to -0.33%, we might conclude that this IFE holds truth for this estimation. But since IFE is based on PPP, and PPP's estimation didn't hold truth for Canadian we need to conclude this IFE should not hold for Canadian Dollar.

Interest Rate Parity (IRP)

IRP applied the same formula as IFE

$p = (1 + I_h)/(1+I_f) - 1$

p : forward rate premium

I_h : Interest Rate of USA (Home country)

I_f : Interest Rate of Japan or Canada (Foreign country)

Japanese Yuan:

e_f of Japanese Yuan $= (1 + 0.02)/(1+0.005) - 1 = 1.49\%$

IRP holds truth in this exercise by comparing 1.49% (estimated) to 2.25 % (1 year forward rate), what interesting in this comparison is the forward rate for 6 month is 1.12%, so this estimation is in the range of the trend of exchange rate.

Canadian Dollar:

e_f of Canadian Dollar $= (1 + 0.02)/(1+0.03) - 1 = -0.97 \%$

The forward rate of 12 month is -0.33% comparing with -0.97% as estimated from IRP, IRP estimates a much high depreciation of Canadian Dollar than it could be in the future.