Risk Factors in Currency Markets

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Outline

- Value in Other Asset Classes
 - Value Strategy in Foreign Exchange
 - Currency Portfolios
- 2 Lustig, Roussanov, and Verdelhan (2011)
 - Building of Currency Portfolios

Value Strategy in Foreign Exchange

- Value in essence buys assets with high yields (or low prices) and sells assets with low yields (or high prices).
- In equities, the strategy is called value-growth investing.

Note: The same strategy of buying high-yielding assets and selling low-yielding assets works in many other asset classes, but goes by different names.

Carry

In foreign exchange, the value strategy is called carry. This strategy goes long currencies with high interest rates and shorts currencies with low interest rates.



Currency Portfolios

Focus on investments in forward and spot currency markets.

Note: Forward currency markets exist for only <u>a limited set</u> of currencies and for short time periods.

- Forward currency markets, however, offer two distinct advantages:
 - Carry trade is easy to implement in these markets and data on bid-ask spreads for forward currency markets are readily available.
 - 2 Forward contracts are subject to minimal default and counter-party risk. Compared to foreign fixed moome
- Consider monthly foreign currency excess returns from the perspective of a U.S. investor.
- Consider currency portfolios that include developed and emerging market countries for which forward contracts are traded

> Expected rate of return = 0

Ft known at time t

current time t

But we don't know STHI

+1 7 Ez 5711

risk-tree risky

Notation

LOG (RXtII) = ELSTII - STII => EILOG(RXTII)]= E (STII)-E(STII)=0

Shortcomma: But actually they're quire large! / Ignore MSK.

> Expectation Hypothesis not true -

• s denotes the log of the spot exchange rate, in units of foreign currency

per U.S. dollar. St = 69 St • f denotes the log of the forward exchange rate, in units of foreign time +)

- currency per U.S. dollar. ti = log Ft \bullet \Rightarrow an increase in s means an appreciation of the home currency.

70 can buy foreign

Ghosh (2019)

• The log excess return on buying a foreign currency in the forward market and then selling it in the spot market after one month is

of toreign currency

log forward discount change in spot rate rate of depreciation

I don't have to pay anything to enter the forward market) at lower price > expect spot rate to increase in the future

> expect foreign to depreciate > < ≥ > < ≥ > ≥ Asset Management

Strategy:

Borrow domestic currency, Lend foreign currency.

using forward contracts to Cover exchange rate (F1).

$$\frac{Ft}{5t} = \frac{Hi^{\frac{3}{2}}}{Hit}$$

Covered Interest Rate Parity (CIP)

NO Arbitrage

- In normal conditions, forward rates satisfy the covered interest rate parity condition.
- \bullet \Rightarrow the forward discount is equal to the interest rate differential (i_t^* and i denote the foreign and domestic <u>nominal</u> risk-free rates over the maturity of the contract)

$$f_t - s_t \approx i_t^* - i_t)$$

- The CIP holds at daily and lower frequencies (Akram, Rime, and Sarno (2008))
- ⇒ the log currency excess return equals approximately the interest rate differential less the rate of depreciation

$$rx_{t+1} \approx i_t^* - i_t - \Delta s_{t+1}$$

bc. log x=x
when x is close to 1



Data

- Daily spot and forward exchange rates in U.S. dollars.
- End-of-month series from November 1983 to December 2009 (data collected by Barclays and Reuters).
- At most 35 different currencies, spanning developed and emerging economies.
- The Euro starts in January 1999 ⇒ exclude euro area countries after this date and keep only the euro series.
- Delete some observations from sample based on large failures of CIP.

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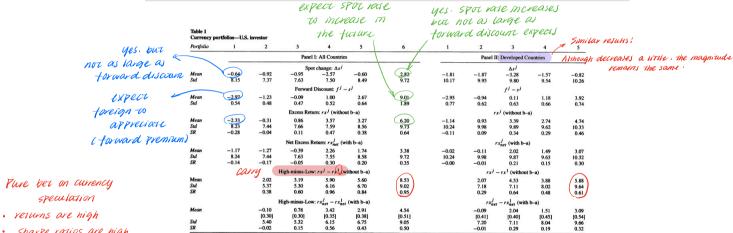


Sorting Currencies

- At the end of each period t, allocate all currencies to 6 portfolios on the basis of their forward discounts f - s observed at the end of t.
- Portfolios are rebalanced at the end of every month.
- They are ranked from low to high interest rate.
- Portfolio 1 contains currencies with lowest interest rate or smallest forward discounts; Portfolio 6 contains currencies with highest interest rate or largest forward discounts.
- The log currency excess return for portfolio *j* is the average of the log currency excess returns in each portfolio *j*.

differential

Properties of Currency Portfolios



sharpe ratios are high

even compared to US equity marker

b-a bid-ask spread

(Transaction cost)

Properties of Currency Portfolios cont'd

The model performs on nomial interest rates. But we can see that nominal interest rate Table 1 relies on real interest rate. Unot driven by inflation) Continued Portfolio Panel I: All Countries Panel II: Developed Countries Real Interest Rate Differential: r - r $r^j - r$ 3.78 0.76 1.27 3.01 Mean Std -1.81-0.13 -1.110.20 0.62 0.56 0.62 0.71 0.57 0.65 0.77 0.78 0.60 0.28 0.35 0.42 0.14 0.14 0.36 0.10 Trades/currency 0.20 0.34 0.41 0.44

- A U.S. investor with access to forward currency markets can generate large returns with annualized Sharpe ratios that are comparable to those in the U.S. stock market.
- Similar results are obtained on a smaller sample of developed countries. UNCL driven by emerging marker)

 The results contradict the standard UIP condition that the average rate of depreciation of currencies in portfolio j should equal the average

When the no-arbitrage condition is satisfied without the use of a torward contract to hedge against exposure to exchange race risk.

1+ 17 = EV(SUI) (H1+)

Uncovered Interest Rose Parity

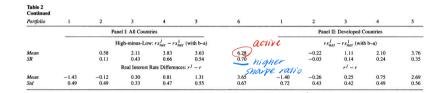
forward discount on these currencies.

Average vs Current Interest Rate Differences

Risk Fremium on investing in currencies with currently high prierest rate (not those with high interest rate on average)

Portfolio	1	2	3	4	5	6	1	2	3	4	5	
	Panel I: All Countries					Panel II: Developed Countries						
					Sorts on Mea	n Forward Discounts (Half Sample)						
	Excess Return: rx ^j (without b-a)						rx ^j (without b-a)					
Mean	-2.28	-0.69	0.09	1.14	1.74	3.06	-2.94	-0.61	2.01	1.44	1.86	
SR	-0.24	-0.18	0.01	0.15	0.18	0.26	-0.28	-0.06	0.24	0.15	0.21	
	Net Excess Return: rx_{net}^{j} (with b-a)						rx_{net}^{j} (with b-a)					
Mean	-1.52	-1.21	-0.67	0.45	0.67	1.31	-1.94	-1.42	1.18	0.26	0.48	
Std	9.45	3.78	7.32	7.75	9.95	11.88	10.41	10.32	8.37	9.49	9.02	
SR	-0.16	-0.32	-0.09	0.06	0.07	0.11	-0.19	-0.14	0.14	0.03	0.05	
	High-minus-Low: $rx_{net}^{j} - rx_{net}^{1}$ (with b-a)					_ 70	Passive idon't rx net - rx net (with b-a)					
Mean		0.32	0.86	1.97	2.19	2,83	ebalance	0.51	3.11	2.20	2.42	
SR		0.04	0.10	0.23	0.25	0.23	200000100	0.05	0.25	0.20	0.21	
	Real Interest Rate Differences: $r^j - r$								$r^j - r$			
Mean	-0.96	0.52	-0.23	0.61	0.92	2.43	-1.16	-0.68	0.48	0.27	1.56	
Std	0.44	0.60	0.49	0.43	0.55	0.49	0.73	0.42	0.44	0.47	0.45	
					nts (Half Sample)							
	Excess Return: rx^j (without b-a)						rx ^j (without b-a)					
Mean	-3.83	-1.36	0.22	1.99	2.22	6.33	-2.25	-0.53	0.91	1.94	3.90	
SR	-0.50	-0.20	0.03	0.32	0.29	0.67	-0.24	-0.06	0.10	0.22	0.37	
	Net Excess Return: rx_{net}^{j} (with b-a)						rx_{net}^{j} (with b-a)					
Mean	-2.81	-2.23	-0.70	1.02	0.81	3.46	-1.26	-1.48	-0.15	0.84	2.50	
SR	-0.37	-0.33	-0.10	0.16	0.11	0.37	-0.13	-0.16	-0.02	0.10	0.24	

Average vs Current Interest Rate Differences cont'd



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