Currency Traders Need To Get Cross

"Neither a borrower nor a lender be," Shakespeare had Polonius counsel in *Hamlet*. The Bard was talking out of a cocked hat if he intended this advice to apply for currency traders: All foreign exchange contracts are simply borrowing in one currency and lending in the other.

Short-term interest rates and currencies form one system. The key relationship is derived from Fisher's Law, which states nominal interest rates are real interest rates plus expected inflation:

$$R_n = R_r + \varepsilon$$

Parenthetically, Professor Irving Fisher of Yale University, the alma mater of both John Kerry and George Bush, suffered a fate all too common for great economists when they dabble in financial markets: He got clocked. On October 17, 1929, he stated "stocks have reached what looks like a permanently high plateau." A mere twelve days later came what is still known as Black Tuesday, with its 12% loss in the Dow Jones Industrials.

One of the implications of Fisher's Law is there can be only one real rate of interest at any given maturity worldwide; otherwise, arbitrageurs would borrow in the lower rate currency and lend in the higher rate until such point when the two rates would be equal. The wide variation of nominal interest rates across both currencies and maturities is due, therefore, to different inflationary expectations both within a given currency as evidenced by the shape of its yield curve and across currency pairs as evidenced by simple rate differentials.

In the more than three decades since the advent of currency futures, traders have tried to model exchange rates on macroeconomic fundamentals such as trade and capital flows or on political pressures such as those applied regularly on Japan and China by American politicians with only limited degrees of success. Traders frustrated by these models turned to technical trading systems wherein each currency is treated as a separate entity. These can be wildly profitable during those strong currency trends such as the euro's 2002-2003 rally, and endlessly frustrating at other times.

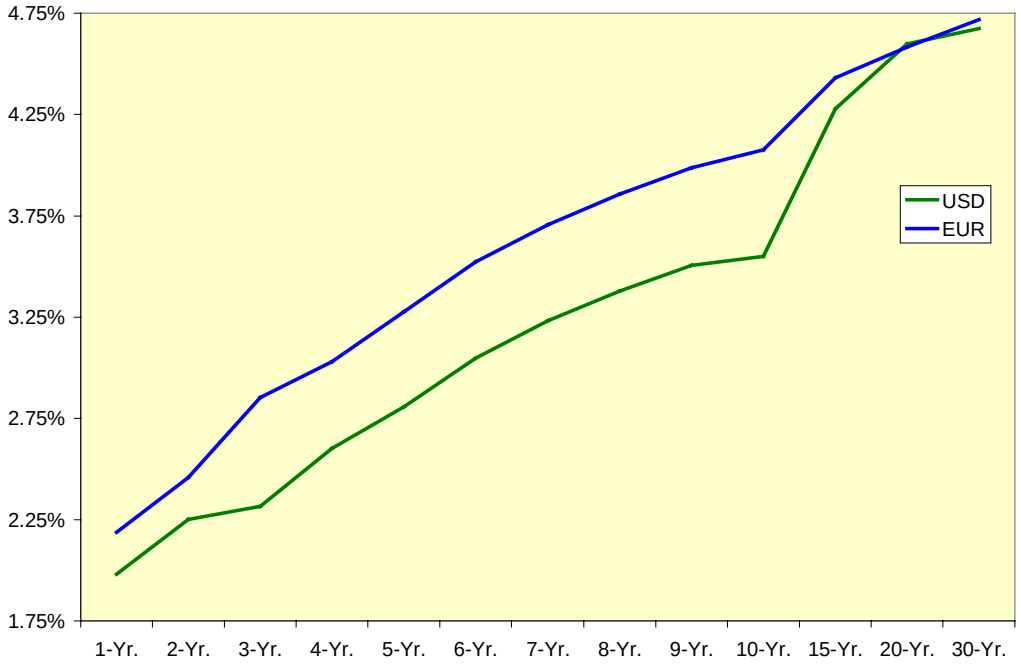
Another approach is suggested: Treat global currencies and short-term interest rates as the linked system they are in fact. A portfolio of currency cross rates can be modeled as a function of pairs of yield curves. The yield curve pairs generate individual cross-rate trades, and the positions from these trades can be netted out into a stable set of remarkably few trades.

First, let's take a detour into yield curves and then to their forward rate structures.

Yield Curves

The best place from which to infer inflationary expectations and changes in monetary policy in any given currency is the yield curve or the pattern of interest rates over maturities. Yield curves, like people, come in a variety of shapes and sizes. The most common shape in developed economies is the normal, or positively sloped, curve in which longer maturity bonds yield more than do shorter maturity bonds. A snapshot of the term interest rate structure for both the U.S. dollar and the euro illustrates a positively sloped yield curve.

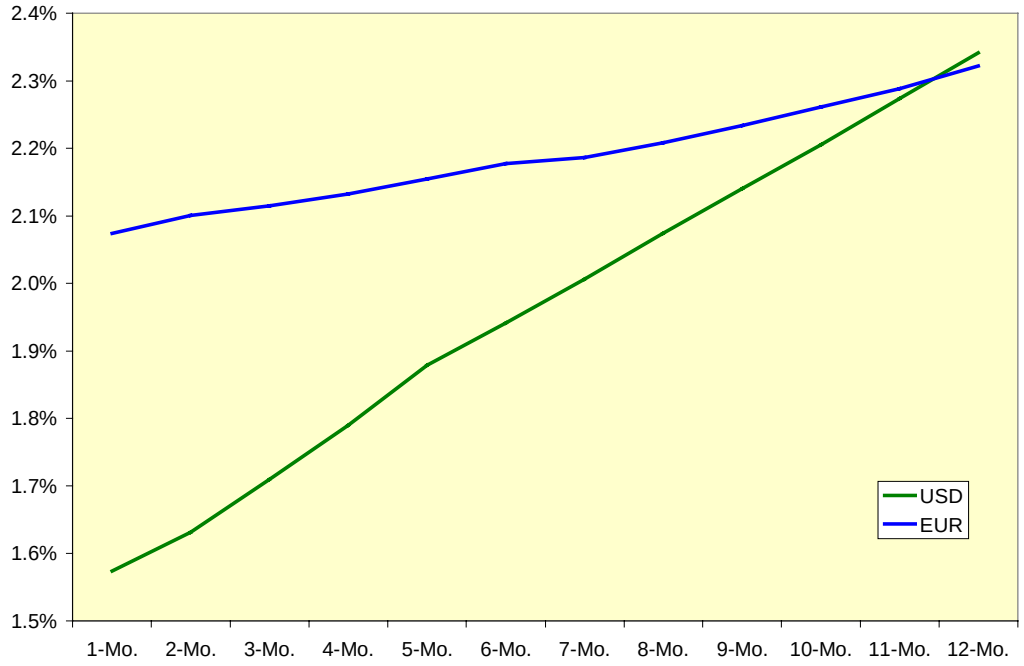
Chart 1: Comparative Yield Curves
August 6, 2004



A yield curve such as this is interpreted as bond investors seeking yield protection against future inflation and as the market in general expecting a strengthening economy. It also reflects an expectation of a non-hostile central bank; should that condition obtain, it would be reasonable to expect an inverted yield curve, one where short-term rates exceed long-term rates. Inverted yield curves reflect expectations for lower inflation and slower growth if not outright recession.

While long-dated currency swaps exist for commercial hedgers, they are of little interest to active traders. The real action in currency futures lies within the one-year bound of the money market curves. Here we have to use measures such as LIBOR rates, as opposed to government bond rates, to get a feel for comparative interest rate pressures. A snapshot of the LIBOR curves for the U.S. dollar and the euro shows just how different both the level and the shape of the two markets can be.

Chart 2
Comparative LIBOR Rates Aug. 6, 2004



Forward Rates

If we look at these two curves together, are there any summary statistics we can use for trading purposes? Yes, and they are derived from the forward rates embedded in the curves. A forward rate between six and nine months, for example, is the fixed rate at which you could borrow today for the three-month period beginning six months from now. This is a real-world investing problem faced every day by those who know they will have funds arriving or bills due at a given point in time.

How do you fix that rate today? You could sell a nine-month Eurodollar future, which is borrowing at the nine-month rate, and buy a six-month Eurodollar future, which is lending back or un-borrowing at the six-month rate. If the six- and nine-month rates are 1.941% and 2.140%, respectively, the forward rate will be:

$$FR_{6-9} = \left[\frac{(1+.0214)^{.75}}{(1+.01941)^{.5}}\right]^4 - 1$$

This number works out to 2.5392%, which is greater than either the six-month or the nine-month rate. Why would anyone want to pay this rate premium? The answer is insurance: The borrower has fixed a rate and is now protected against future rate increases. The greater the demand for fixing borrowing costs in anticipation, the steeper the yield curve will become. And the steeper the yield curve, the greater the ratio of the forward rate to the horizon rate, here the nine-month rate, will be.

It is this ratio, to be referred to as the forward rate ratio, or FRR, that will provide us with the single summary measure we need. The greater the FRR is, the steeper the yield curve will be. Monetary policy in this currency is looser, and the anticipation for higher interest rates and inflation is greater. The opposite holds for a smaller FRR. Here the yield curve is flatter in reflection of a tighter monetary policy in that currency, and expectations for interest rates and inflation are lower.

A quick glance at the comparative LIBOR curves confirms a steeper money market yield curve for the dollar than for the euro. We can quantify this observation by saying the FRR between six- and nine months for the dollar is 1.1865, while the FRR for the euro is only 1.0511. All else held equal, this FRR comparison supports the euro against the dollar.

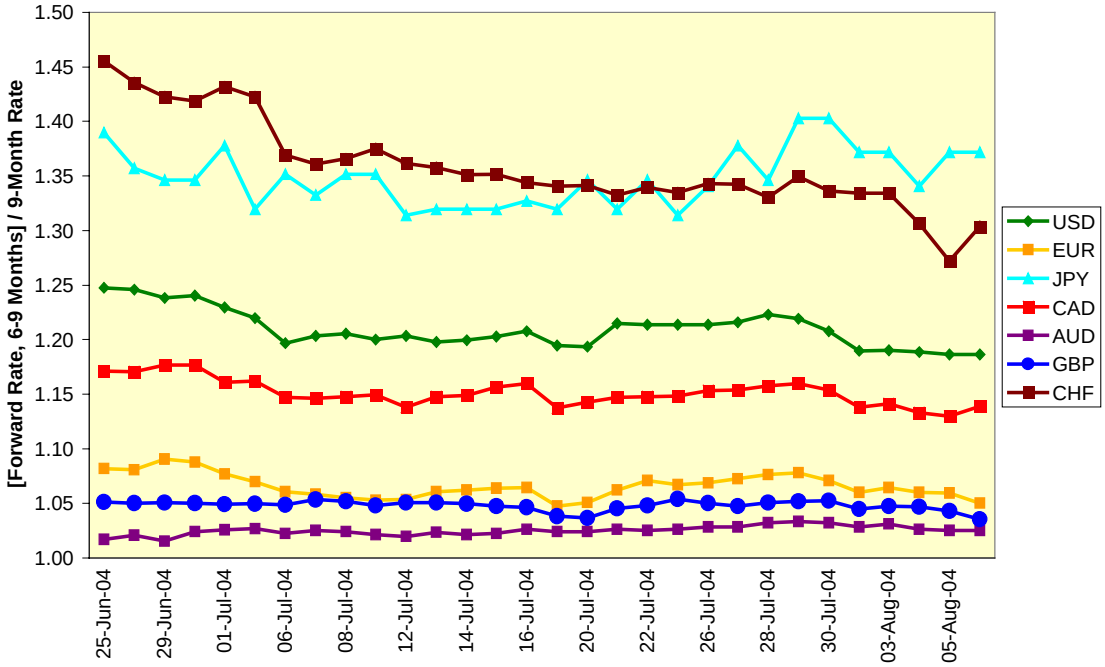
The Trend Is Your Friend

As anyone who has traded Eurodollars or Euribor would confirm, short-term interest rate markets are amongst the trendiest in the world of futures; indeed, it is this attribute that produces those wonderful and persistent currency trends mentioned above. If the short rates at given maturities trend, should not the various FRRs? The observed answer is yes; once a yield curve steepening or flattening trade gets going, it can keep going for a long period of time.

A snapshot of the FRR series for seven major currencies below for a 30-day period is instructive. The standard interbank conventions for currencies are used instead of the more familiar futures market symbols in recognition of the different market:

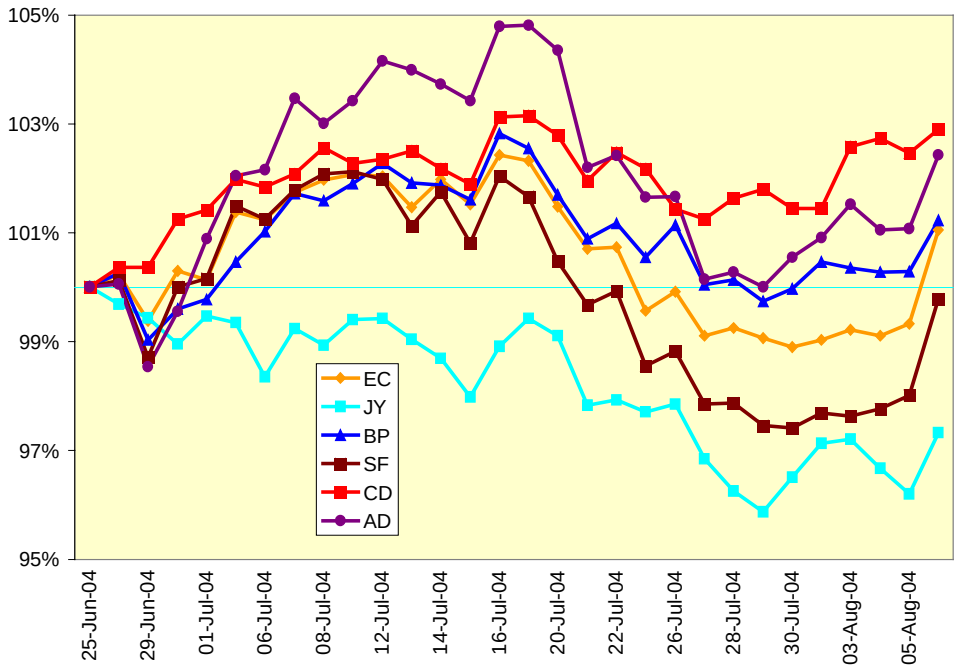
USD – U.S. dollar
EUR - Euro
JPY - Japanese yen
CAD – Canadian dollar
AUD – Australian dollar
GBP - British pound
CHF - Swiss franc

Chart 3: Steepness of LIBOR Curves Over Time



The flat and declining FRR series for the euro and the British pound coincide with their currencies' firmness over this interval; the opposite is true for the Japanese yen. The movement of the six major IMM currency futures indexed to their values from thirty days ago overlays neatly to these FRR trends.

Chart 4: Currency Future Relative Movement Over Time



Putting It All Together

We now have arrived at a point where we can take each of the FRR series and compare them not only to their common pairs, such as dollar/euro or euro/yen, but to all pairs in the system as a way of ranking currencies in a relative strength matrix. Stated simply, if currencies and interest rates form an integrated system, then why not analyze all possible combinations of key currencies and their underlying yield curve structures simultaneously?

This is done within the Simons Research daily foreign exchange letter's Cross-Rate Matrix, a snapshot of which is provided below. The matrix is read much like a mileage table on a road map: A row is read across to a column for a cross-rate signal. In the table below, the Japanese yen is rated as a sell against both the dollar and the euro. In addition, the euro, Canadian dollar, Australian dollar and Swiss franc all are rated as buys against the yen.

The net result is a portfolio consisting of a six short Japanese yen against single long positions in the other five non-U.S. dollar currencies. If, for example, the yen had been rated as a buy against, say, the Swiss franc, the net short position in the yen would have dropped to four contracts and the Swiss franc would have had a net short position of one contract.

All of these positions can be traded through the traditional Chicago Mercantile Exchange currency futures of a given currency's exchange rate against the U.S. dollar. These contracts tend to have far greater liquidity than do the CME's cross-rate contracts, and the analytic and position construction methodologies provide the same net effect as would be achieved by trading cross-rate contracts. Ironically, this trading of cross-rates through the U.S. dollar is a throwback to the early days of currency trading when even interbank crosses were traded through the dollar as opposed to, for example, a direct yen/British pound cross.

Technical Data Bank: Cross-Rate Matrix

Long or Short	Against Column Currency						
Row Currency	USD	EC	JY	CD	AD	BP	SF
USD							
EUR	None						
JPY	Short	Short					
CAD	None	None	Long				
AUD	None	None	Long	None			
GBP	None	None	Long	None	None		
CHF	None	None	Long	None	None	None	

	EC	JY	CD	AD	BP	SF
Net Portfolio, Sep 04:	1	-6	1	1	1	1
Previous Portfolio:	0	0	0	0	0	0
Required Trades:	1	-6	1	1	1	1

Yes, Shakespeare did have it all wrong. Each and every one of us has to be both a borrower and a lender, not only at different points in our lives but often at different maturities simultaneously, as is the case for someone with both a savings account and a mortgage. Currency traders are both borrowers and lenders on a global basis. Once you view the currency markets in this light and approach the problem on an integrated portfolio basis as well as on the more familiar technical basis for a single currency, new opportunities open.