Crude Oil And Major Currencies

Time Magazine may have dubbed the 2000-2009 decade, "The Decade From Hell," but a better name might be the "The Decade of Unusual Intermarket Relationships."

How that magazine has managed to stay in operation with such dull copywriters is beyond us, but life is full of mysteries.

Some of these unusual intermarket relationships included, in no particular order, negative short-term interest rates, negative long-term swap spreads, negative breakeven rates of inflation, stocks falling while interest rates while being cut and rising when interest rates were rising, bonds rallying while the price of various commodities soared, the dollar firming when interest rates fell and the trade deficit soared, inflation remaining under control while the price of various commodities soared, gold plunging during times of financial crisis, etc. If the world's traders had to grapple with such, how could policymakers possibly have succeeded? Moreover, we did not even mention the ability of long-term U.S. interest rates to fall while the U.S. budget deficit reached stratospheric levels.

But just as no clothing fashion lasts forever, neither does any market fashion. We could see this last month (see "Currencies, Curves And Correlations," September 2010). Let's extend this analysis to the correlation of returns between total returns of the U.S. dollar into the six components of the dollar index, the euro, yen, Canadian dollar, British pound, Swiss franc and Swedish krona and the total return of crude oil futures. The motivation here, as it so often is, is to test the oft-asserted proposition "the dollar" either benefits from or is hurt by the rising or falling price of crude oil.

The total return of the dollar into the six components of the dollar index subsumes the combination of spot rate changes and interest rate spreads; it is a more realistic representation of what an investor will earn by expatriating funds than is the continuous spot rate. The total return on crude oil futures as calculated by Dow Jones-UBS includes the impact of roll yield as well as gains on the funds deposited in collateral against the futures position. It, too, is a continuous buy-and-hold strategy.

The charts below begin with the January 1999 advent of the euro. As currencies were trading well before that and crude oil futures were trading from 1983 onwards, we should mention in passing the correlations between the dollar index and crude oil between 1983 and 1998 inclusive were unimpressive and seldom entered into the realm of serious discussion. Most certainly, the pseudo-analysis heard in recent years, "crude oil rose/fell as the dollar fell/rose" was not part of the thought process of either crude oil traders or of currency traders.

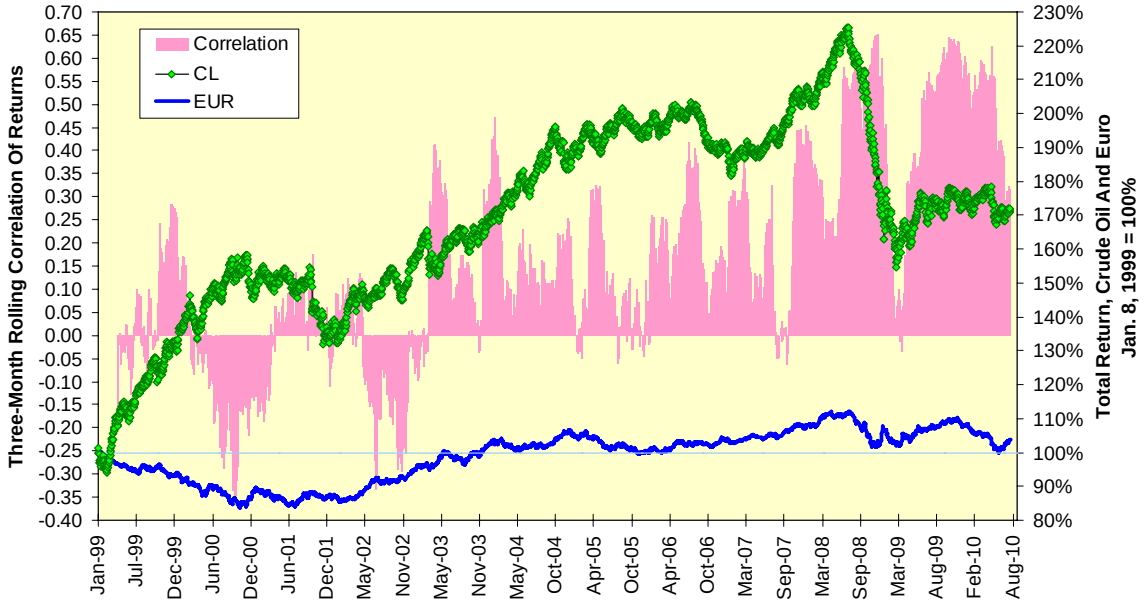
How did we get to that unhappy point? The starting point was the Federal Reserve's first War on Deflation, commencing in May 2003. The central bank's monetary largesse weakened the dollar on a supply/demand basis and stimulated demand for crude oil globally by shifting production from the U.S. to China. Thus a joint response to a common underlying factor looked like a causal relationship, and once this connection was established, it was impossible to break. It is rather like saying, "The jury will disregard that," while everyone present in the courtroom wonders, "How?"

The formats below are the same: The total return of the Dow Jones-UBS crude oil index is displayed in green and the total return on the carry of the USD into that currency is displayed in blue. The roseate columns are the rolling three-month correlation of returns.

Case Studies

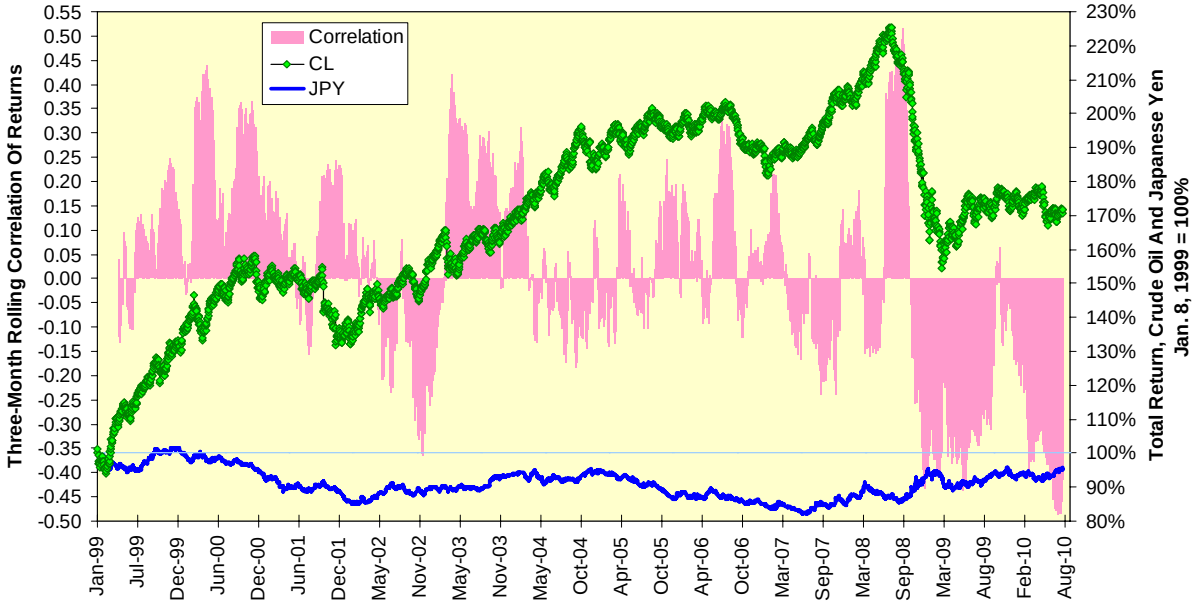
The May 6, 2003 declaration of war on deflation noted above really stands out in the case of the euro; here the correlation of returns shifts from a pattern of meaningless oscillation to a nearly continuous stretch of positive correlations culminating in the spectacular rise of crude oil into July 2008 and then again during the global monetary excess of October 2009. As the euro accounts for 57.6% of the dollar index, this post-May 2003 pattern accounts for the general sentiment.

Crude Oil And Euro Positively Correlated



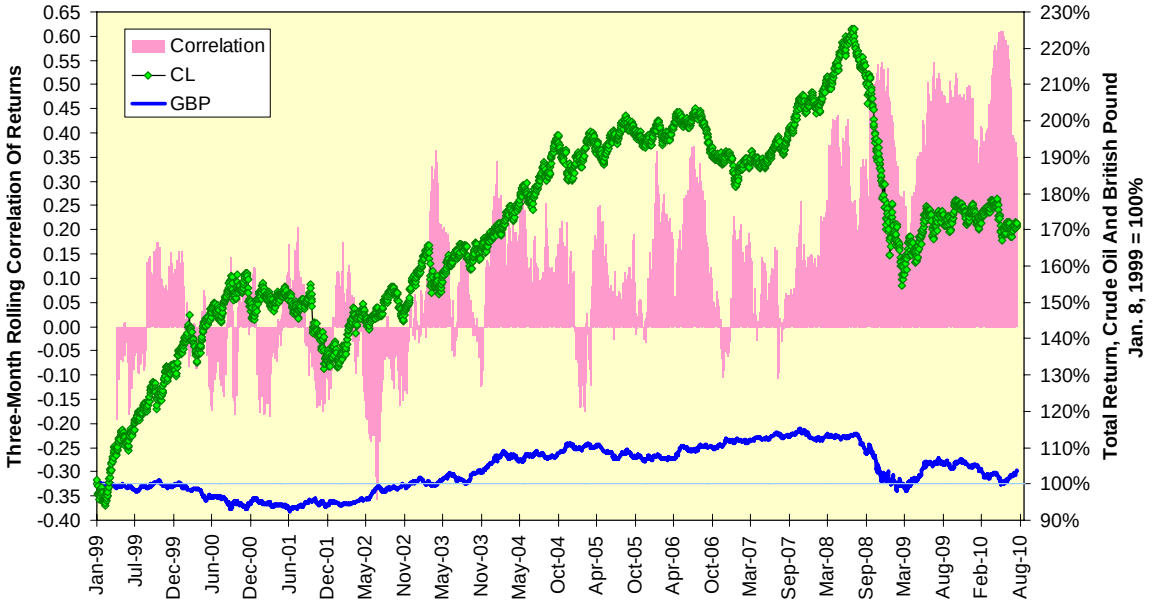
Next, let's shift to the Japanese yen, which has a 13.6% weight in the dollar index. This has a very different pattern than does the euro; here the May 2006 date is scarcely noticeable and the correlations oscillate in long stretches from positive to negative. A positive surge occurred during the financial crisis of late 2008 as crude oil collapsed and yen carry trades were unwound simultaneously, and then the correlations shifted to strongly negative levels in mid-2009. The yen often is a special case, and this is no exception: If someone approached the issue of the relationship between currencies and crude oil from a yen-first rather than a euro-first perspective, the issue would have been over and done with quickly.

Crude Oil And Japanese Yen Negatively Correlated



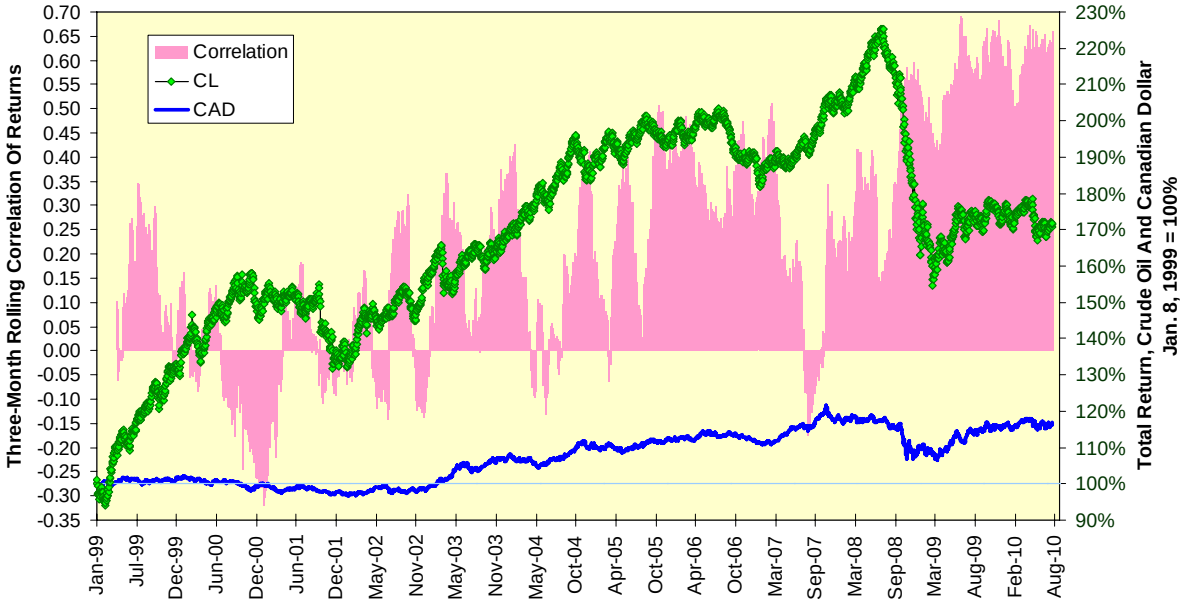
The British pound, which has an 11.9% weight in the dollar index, has a correlation history that looks like a variation on the euro's. Its correlation of returns against crude oil did not turn consistently positive until the financial crisis began in August 2007. This is when the Federal Reserve began its rate-cut adventure and the price of crude oil began its ten-month doubling adventure. Large sums of money strewn across the landscape can and do force changes in market behavior.

Crude Oil And British Pound Positively Correlated



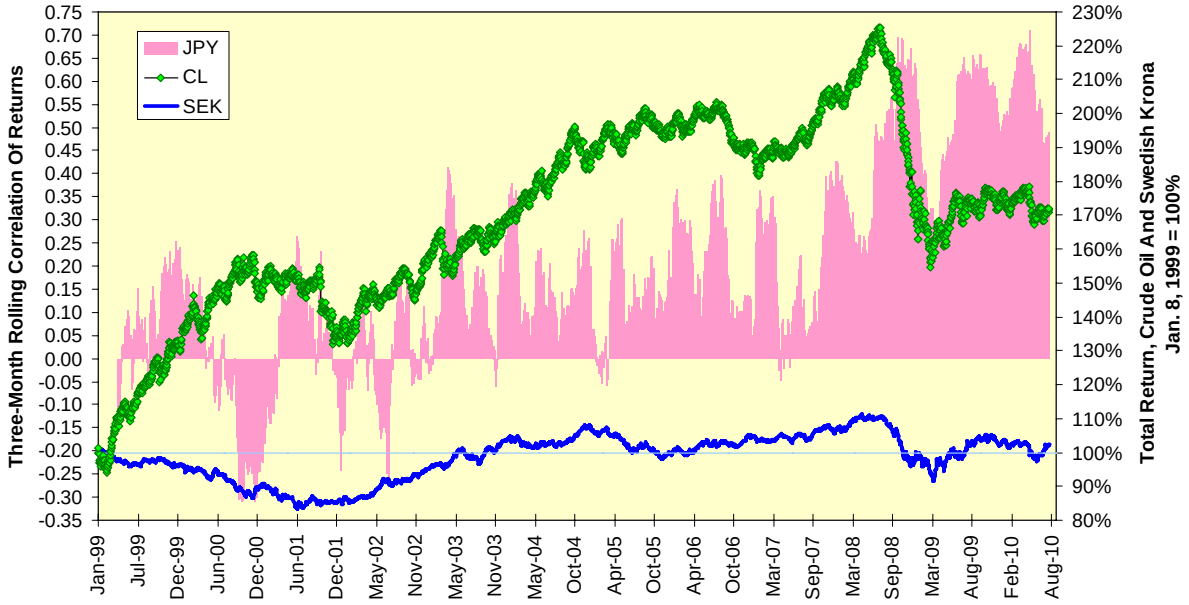
Of all the currencies, we should expect the Canadian dollar, which accounts for 9.1% of the dollar index, to have the strongest and most consistent correlations of returns against crude oil by virtue of Canada's large crude oil production base, and we are not disappointed. The only real exception here occurred when the CAD was weak against the dollar during 2000.

Crude Oil And Canadian Dollar Positively Correlated



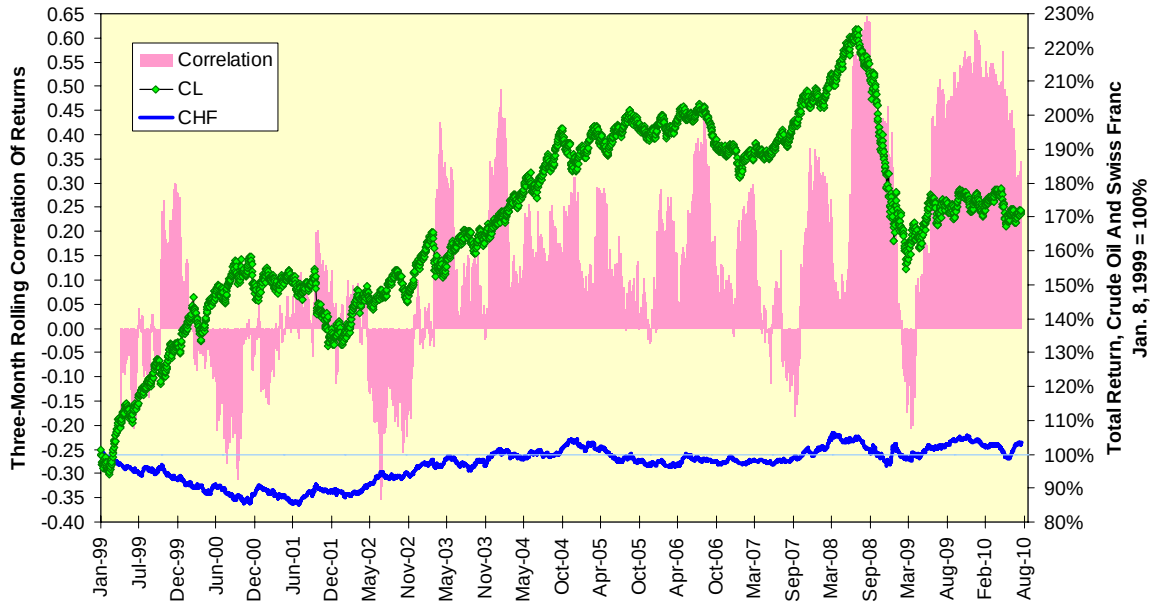
Finally we come to the two smallest components of the dollar index, the Swedish krona at 4.2% and the Swiss franc at 3.6%. Given the Swedish Riksbank's efforts to keep the SEK in a band against the EUR, we should expect to see the krona's correlation pattern resemble that of the euro, and once again we are not disappointed.

Crude Oil And Swedish Krona Positively Correlated



The franc is different (see "The Swiss Franc's Commodity Connection," October 2008). Switzerland is a money repository for crude oil exporters in Russia, North Africa and the Middle East; one writer recalls walking by the Geneva offices of the Arab Bank of Switzerland with a suppressed grin. The policy of "don't ask, don't tell" was not invented by the Clinton administration in response to gays serving in the U.S. military. This function has shifted the franc's correlation of returns away from the euro's in recent years.

Crude Oil And Swiss Franc Positively Correlated



We can summarize these relationships over in-sample log-log regressions of the return series:

Regression Synopses; ln(CLTR) = f(ln((CurrencyTR))

	Beta	Const	R-Squared	DW
EUR	2.637	5.964	0.518	0.0036
JPY	3.547	21.732	0.310	0.0039
GBP	3.605	10.793	0.687	0.0065
CAD	3.232	9.310	0.680	0.0050
SEK	2.893	7.116	0.496	0.0040
CHF	3.262	8.670	0.367	0.0036

The r^2 values for the EUR and JPY are not very impressive and are of the opposite in their betas. The small-weight SEK and CHF have insignificant r2's as well. Only the CAD has something approaching a consistent fit over time.

In all cases, however, the synopses are plagued by massive serial correlation in the residuals. This always indicates two things: First, the crude oil total return series is autoregressive or reliant on its own past values, and second, other explanatory variables are required. A stable Durbin-Watson statistic should be near 2.00; these DW statistics are all near zero.

We affirm the conclusion the perceived driving link between crude oil and "the dollar" is a short-term artifact and not a long-term fundamental relationship. Of all the unusual intermarket relationships over the last decade, this one may be the easiest to explain where it works and easiest to debunk in those cases, such as for the yen, where it does not.