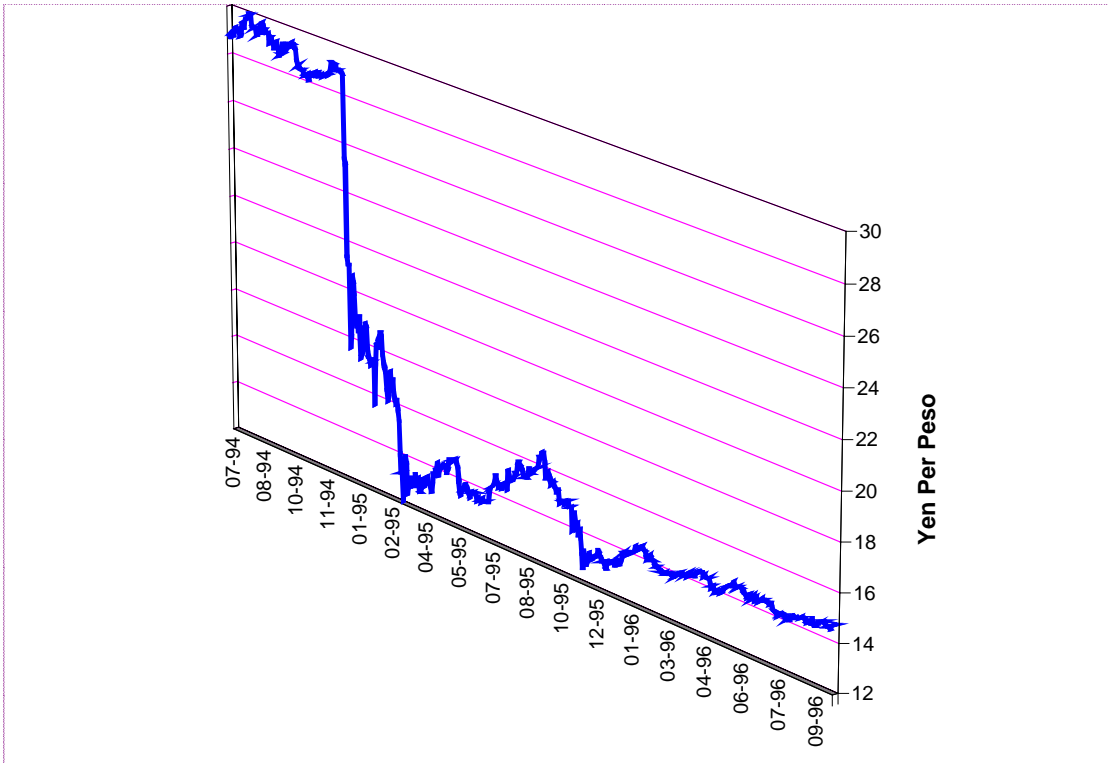


South Of The Border With The Rising Sun

On the surface, Mexico and Japan appear to have little in common other than their ability to keep American protectionists busy. However, they respectively are the second and third largest trading partners of the U.S. Mexico increasingly is the beneficiary of Japanese investment in plants along the U.S. border whose exports are eligible for favorable treatment under NAFTA.

Much of this investment by Japan is motivated by exchange rate considerations. The yen has appreciated over 70% relative to the peso since the December 1994 devaluation, as shown in the graph below.



A Japanese exporter in Mexico is the proud owner of peso-denominated assets, such as land, services and supplies, and accounts receivable, and probably has a large number of yen-denominated liabilities, such as salaries, capital, licensing fees, and profits that must be repatriated. Therefore, this firm is naturally long the peso and short the yen.

The gods of yield curves have made certain that this is not a simple hedging problem. The formula for determining the value of a foreign currency futures contract on the Chicago Mercantile Exchange's International Monetary Market (IMM) is:

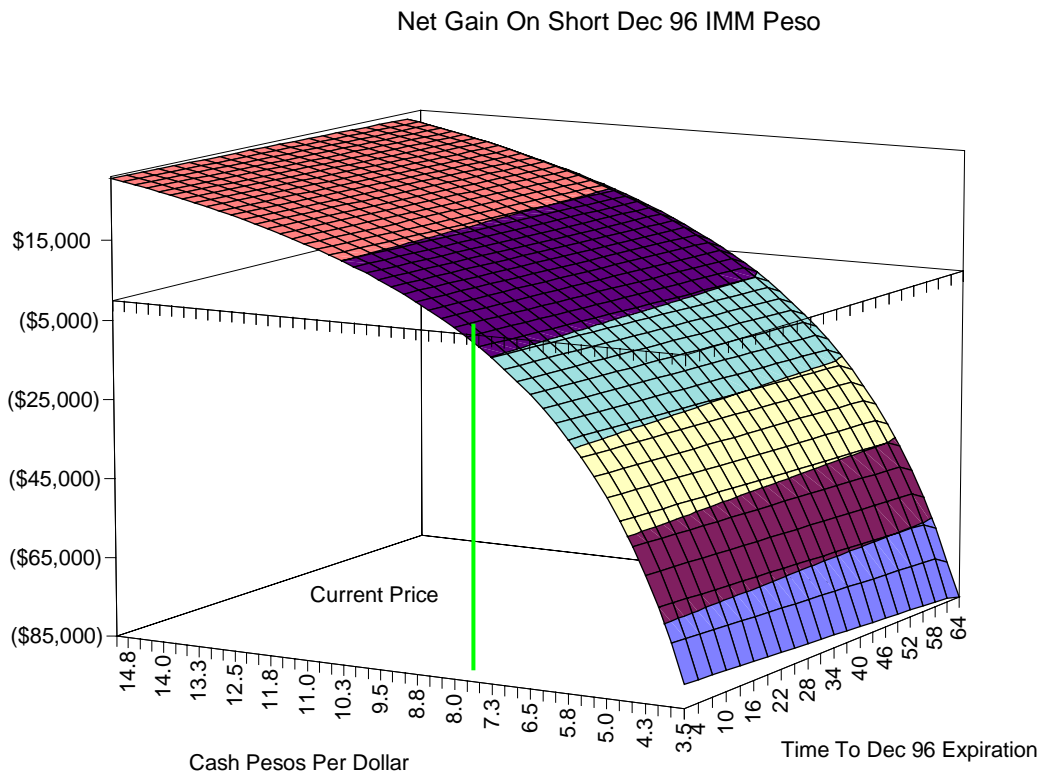
$$\text{Future} = 1 / [\text{Spot} * (1 + R_{\text{US}} * \text{days}/360) / (1 + R_{\text{for}} * \text{days}/360)]$$

where R_{US} represents the U.S. Treasury Bill rate and R_{for} represents the foreign T-bill equivalent rate. So long as Mexican interest rates are greater than U.S. rates, the futures price for the peso will be substantially below the spot price. This discount increases with the interest rate differential (see "Peso Possibilities," *Futures*, November 1995). It also disappears as the expiration of the futures approaches. Therefore, a naive hedge of forward peso receipts by selling futures forward will incur a loss equivalent to the difference between the two interest rates times the face amount hedged; interest rate differentials at the time of writing, October 4, 1996, are on the order of 20.6%.

If selling the peso forward is an expensive proposition, buying the yen forward is no bargain either (see "A Matter Of No Small Interest," *Futures*, September 1996). Since Euroyen rates are scraping along at 0.70%, a forward purchase of the yen will cost [5.0% - 0.7%], or about 4.3%. To paraphrase the late Sen. Everett Dirksen, 4.3% here and 20.6% there, and pretty soon you're talking about real money.

Defeating The Yield Curves

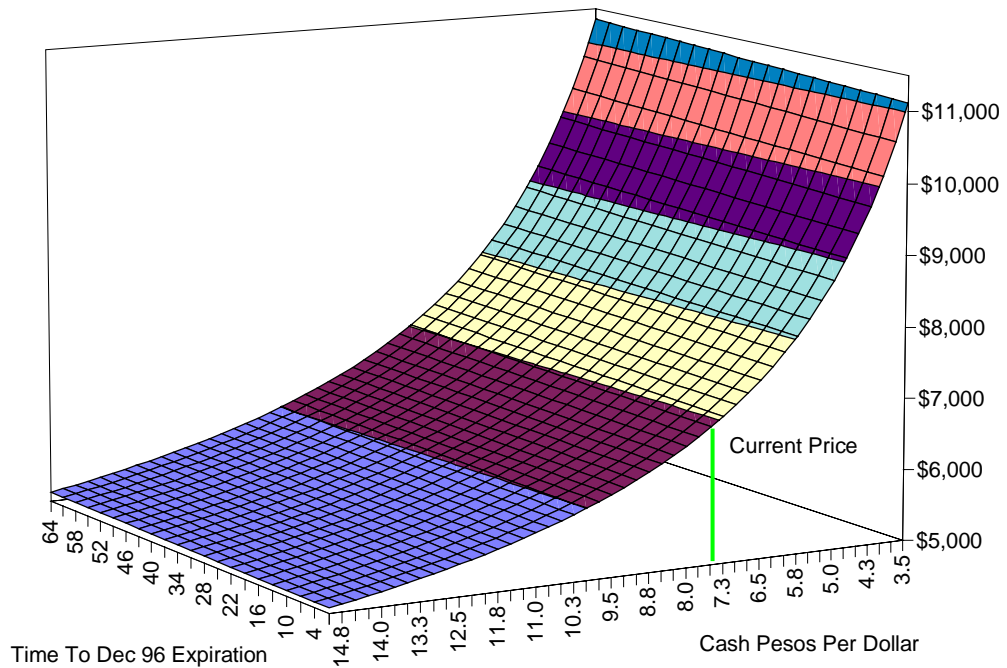
The graph below depicts the net profit profile of a short December 1996 IMM peso contract across the dimensions of cash market peso price and time left on the December futures. The curvature of the surface reflects the difficulty of selling futures forward: the gain on the cash peso halving in value to 15 per dollar is about 30% of the loss of the peso more than doubling in value to 3.5 per dollar.



However, the opposite holds true as well. By buying a more distant peso contract, such as the March 1997, we are lending at the March 1997 interest rate differential, about 22.3% in early October. The profit profile of this trade is roughly the inverse of the short December trade.

Since the Mexican yield curve is both positively-sloping and more positively-sloping than the U.S. yield curve, you are lending at a higher rate by buying the March 1997 future than you are borrowing by selling the December 1996 future. Thus a profit can be expected from buying the March 1997 future while selling the December 1996 future. The results of this trade are depicted below.

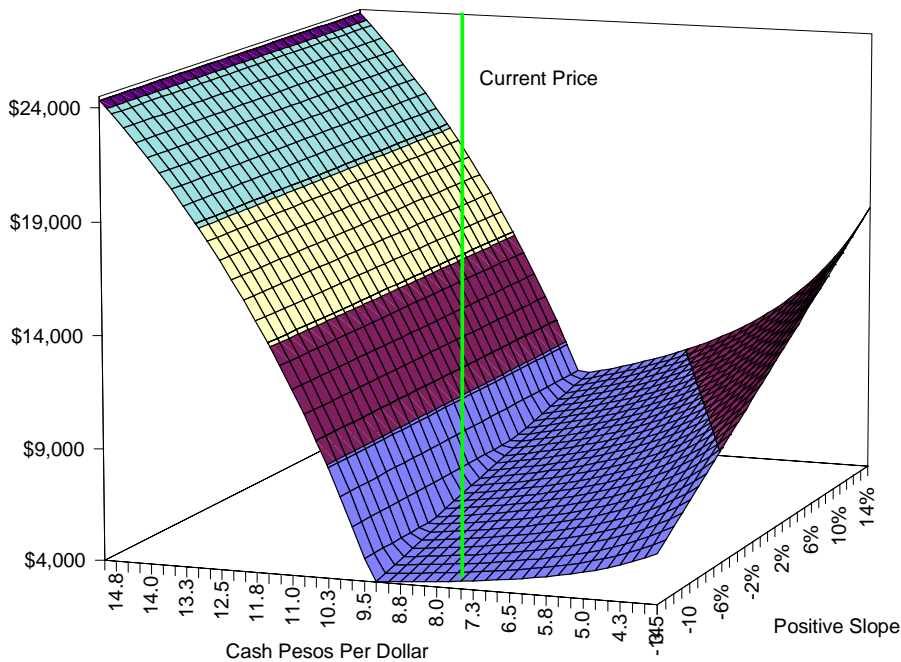
Net Gain On Short Dec 96 / Long Mar 97 IMM Peso



There must be a risk to the trade in order to eliminate the apparent “free lunch,” and that risk is yield-curve inversion. Inverted yield curves occur when monetary policy is strict and expectations are for a subsequent loosening. This describes the crisis situation that would occur following a devaluation of the peso. Therefore, the risks of a weaker peso and the risk to the trade above of a yield curve inversion are linked sequentially. Protection against this risk is warranted.

Given the history of the peso, devaluation against the dollar will not be a smooth and continuous process, but catastrophic. Complete protection against this event would be prohibitively expensive and is unnecessary. A December .110000 put would provide protection at exchange rates greater than (1/.11, or 9.09 pesos per dollar) at expiration in exchange for a premium on the order of \$250 per 500,000 pesos. The combined profit profile of this put option financed by the futures spread described above is shown in the graph below.

Net Gain On Futures Spread Plus Dec .11 Put



The sensitivity of the entire trade to yield curve inversion is surprisingly small: the drop in futures price level causes the put option to increase in value in pace with the loss in the futures spread. The effect at expiration is shown below across the dimensions of price and change in the positive slope of the current Mexican yield curve (negative changes are movements toward inversion).

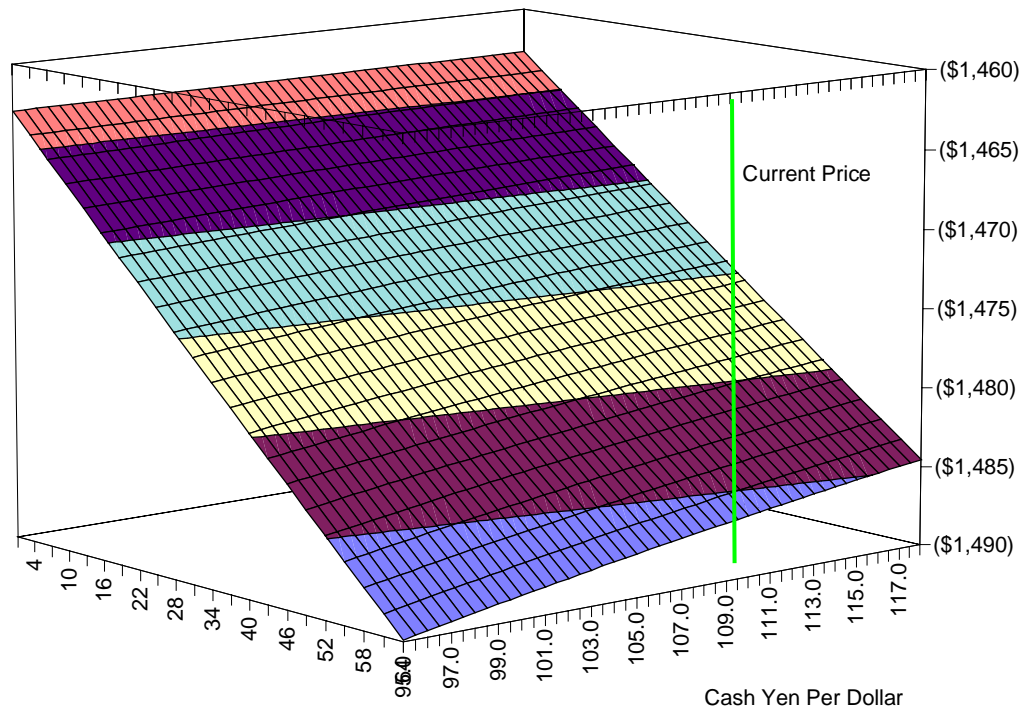
By lending at higher forward Cetes rates and borrowing at lower nearby Cetes rates, we can generate financial profits sufficient to purchase out-of-the-money put options to protect the downside of the peso/dollar exchange rate. While the futures spread is subject to yield curve risk, inversion helps the long put option. The entire position benefits from an increase in positive slope along the Mexican yield curve.

Crossing The Ocean

The situation is the opposite for buying the yen forward, so the trade would be buy the December 1996 future and sell the March 1997 future. This trade allows us to borrow at the lower December Euroyen rate of .58% and lend at the higher March rate of .69%, a differential of 11 basis points. However, this .11% differential represents a forward lending rate of $(1.0069^2 / 1.0058) - 1$, or .80%. In other words, the lending rate available between December and March is greater than the rate between October and March.

The return on the opposite futures trade for the yen, long December / short March, is shown below across the dimensions of the yen-dollar exchange rate and time remaining to December expiration. Unlike the peso trade, which looked like a perpetual winner, this trade loses across the spectrum shown below.

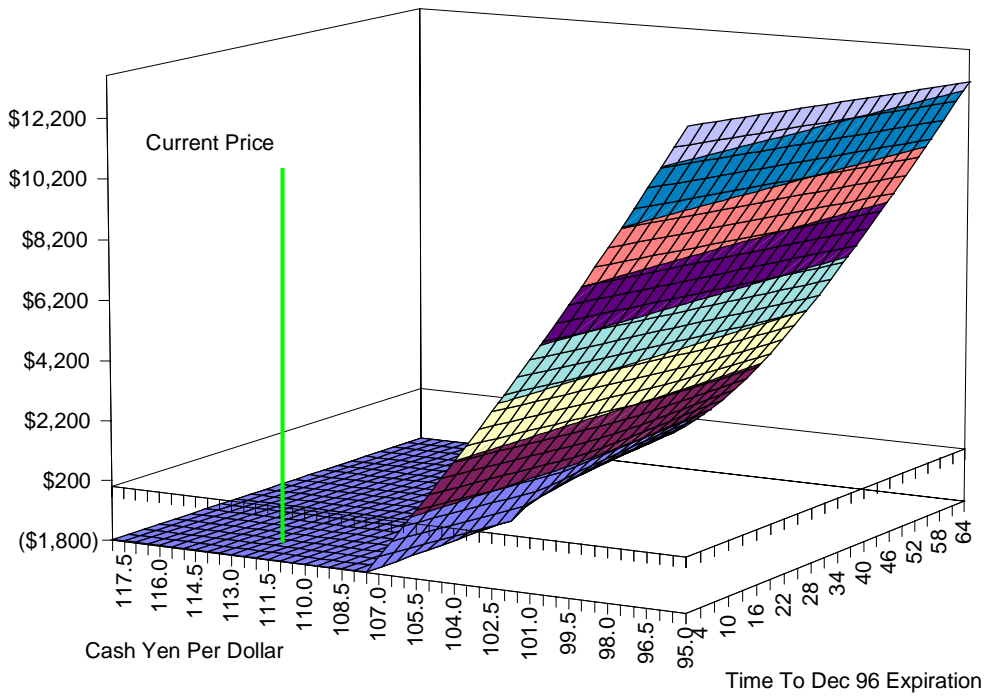
Net Gain On Long Dec 96 / Short Mar IMM Yen



Time To Dec 96 Expiration

The risk in the yen trade is the simultaneous disappearance of the positive forward lending rate along with an increase in overall Japanese interest rates. Since this surge in interest rates would strengthen the yen, we must do the opposite of what we did in the peso and buy a yen call. Once again, the history of the yen-dollar rate is opposite of the peso-dollar rate; the rallies of the yen have been spectacular. An out-of-the-money call, the December .9300, will suffice. The gain on this combination across the dimensions of time to expiration and the yen-dollar rate is depicted below; since the potential range of yield curve inversion and forward rates is so much smaller for the yen that for the peso, the sensitivity of this trade to that factor will not be depicted.

Net Gain On Long Dec / Short Mar IMM Yen Plus Dec .9300 Call



The combination of these two future spreads plus shielding options allows a holder of pesos to hedge his exposure into yen without paying either the Mexican or Japanese interest rate penalties. By using the dollar-denominated IMM futures as an intermediary, rather than the direct peso-yen forward market, we place ourselves in a position to capture not only peso-yen moves, but both peso-dollar and yen-dollar moves as well.