

Do Foreign Exchange Markets Still Trend?

Easy profits are over.

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Most modern financial markets are weak-form efficient—it is impossible to forecast future price changes using past price changes. For many years, however, the major spot currency exchange rates and the associated futures prices were anomalies that produced profits when trend-following rules were applied to them. See, for example, Dooley and Shafer [1984], Sweeney [1986], Levich and Thomas [1993], Neely, Weller, and Dittmar [1997], Chang and Osler [1999], Gencay [1999], LeBaron [1999], Olson [2004], and Schulmeister [2006].

Possibly as a result, currency traders are known to rely heavily on some form of technical analysis. In a survey of chief foreign exchange dealers in London, Taylor and Allen [1992] find that 90% of respondents use some form of technical analysis. A survey by Cheung and Chinn [2001] reveals that 30% of U.S. foreign exchange traders claim that technical trading best describes their overall trading style. Schulmeister [2006] concludes 30% to 40% of foreign exchange traders use technical analysis as their principal tool.

The widespread use of technical analysis calls into question the effectiveness of using trend-following models for currency trading. We would expect profits on over-used strategies to tend to fall regardless of the product or market in question.

With so many people using similar models, will these models continue to produce profits? How are trend-following rules faring in the foreign exchange market?

DATA AND METHODOLOGY

To address such questions, we collect futures settlement data on all the major currencies, from before 1975 to

mid-2006.¹ We use futures rather than spot data because changes in spot rates are only one component of the profit and loss on a currency trade. Because a foreign exchange trade involves two currencies—one bought and one sold—it is crucial in calculating profits to consider the interest received on the long currency and the funding cost of the short currency. Futures market prices do this automatically.

We divide our sample of major currency data into four parts: 1) the early data, representing the first 20 years of foreign exchange trend-following (1975–1994); 2) a comparison of trend-based trading profits in the late 1990s; 3) comments on the performance of trend-following rules since the late 1990s; and 4) comments based on the most recent data (2000 to mid-2006).

The data we use are the daily foreign exchange futures contract settlement prices on the near contract, spliced into a single series, extracted from Bloomberg.² All currency futures are traded on the Chicago Mercantile Exchange (CME).

We use three moving averages to produce trading signals (where a signal of +1 represents a long position in the currency and –1 a short position). The first compares the 5-day average with the 20-day average; the second compares the 1-day moving average with the 5-day moving average; and the last compares the 20-day average to the 200-day average in order to pick up long swings in exchange rates (see Engel and Hamilton [1990]). We buy when the short-term average is higher than the long-term average and hold the position until the signal changes. All trades occur at settlement prices, and care has been taken to assure that a purchase or sale cannot occur until the trading day following the production of a trading signal.³

EMPIRICAL RESULTS

The data for six individual currency futures contracts, as well as a portfolio of all six, are shown in Exhibit 1 for three subperiods, where returns in U.S. dollars are annualized and expressed in excess of the U.S. T-bill return so that they can be easily considered in the context of normal risk premiums. That is, a 3% return means T-bills plus 3 percentage points, or a total return of between 7% and 8% at today's rates.

We have assumed that the investor uses enough leverage to produce a volatility of returns of 12%, or the approximate volatility of the S&P 500, which produced an annualized return (in excess of the T-bill rate) of about 3% from the beginning of futures trading to the present. Volatility is computed as a standard deviation of the daily

EXHIBIT 1

Average Annual Excess Returns Over U.S. T-Bills

	1975-1994	1995-1999	2000-2006 ^(a)
Japanese Yen	13.94%	13.95%	-3.91%
Deutsche Mark/Euro	8.16%	-9.47%	3.76%
British Pound	7.46%	-14.79%	0.10%
Swiss Franc	6.20%	-1.36%	-0.08%
Canadian Dollar	3.28%	-2.06%	0.35%
Australian Dollar ^(b)	0.51%	0.15%	-2.09%
Portfolio	10.26%	-2.40%	-0.59%

Assuming 12% volatility of annual excess returns and moving average rules.

^aThrough June 2006.

^bAUD sample period begins in 1987.

returns multiplied by the square root of 250. For each currency, volatility is computed for each year and used to determine leverage next year; then volatility is reestimated on a rolling basis. Daily returns are the difference between the natural log of future prices multiplied by the signal varying between +1 and –1, depending on the values of the individual rules. The returns of a portfolio are an equally weighted average of all six currencies and are less volatile because of imperfect correlation among the six currencies.

The results for major dollar exchange rates and their portfolio are shown in Exhibit 1. As the data show, trend-following models performed very well until 1995. The equally weighted portfolio of currencies produced a return of 10.26% above T-bills. With volatility of 12%, the performance translates into an information ratio of 0.86.

Since 1995, profits for all currencies have declined, and more than half have been negative. These are results even poorer than could be expected from chance alone. The only currency with substantial profits following 1995 is the Japanese yen, and its profit vanished after 2000. Over 1995–2006, there were substantial profits for one period each in the yen and the euro, with small gains and losses for other currencies. Overall, looking at an equally weighted portfolio, the post-1995 performance of trend-following rules is poor. An equally weighted portfolio of currencies using trending rules lost money during 1995–1999 and again during 2000–2006.

What happened? One explanation could be that traders have adjusted to exchange rate trends, altering their strategies to reflect the popularity of trend-following. Profits may have vanished because traders, anticipating a trend, all try to initiate positions simultaneously, resulting

in a step function response to news in the currency rather than a smooth, trending response. In such a scenario, only the first and the quickest traders would make money.

Another explanation could be that the dumb money, which had never previously recognized exchange rate trends and had systematically lost money in these markets, finally got smart too. At any rate, in 1995-1999 and certainly by the post-2000 period, it was no longer possible to earn profits using simple moving-average trend-following trading rules in the major dollar currencies.⁴

We also examine the cross-exchange rates to see if a similar phenomenon of profit declines occurred. We wondered if, for example, the Japanese yen against the euro still allowed trend-trading profits, despite what was observed in the dollar exchange rate markets. The results we found are similar to the dollar exchange rate markets: early profits followed by lacklustre performance.

As an example, Exhibit 2 shows the results for the yen/euro cross-exchange rate (constructed by multiplication of the dollar futures prices). The results are similar to dollar exchange rates. Profits were substantial in the early days of trend-following, but have declined virtually to insignificance during the late 1990s and after 2000. In the case of the yen/euro cross-rate, the trading rules produced losses since 1995.

Of course, this is only one cross-exchange rate among many, but unfortunately this pattern—substantial early profits followed by a decline—is typical of the 15 different cross-exchange rates we examined. Our conclusion is that trend traders have little opportunity in major cross-exchange rate markets today.⁵

WHAT IS A TREND TRADER TO DO?

These empirical results suggest that it is unprofitable to use trend-trading in the major currencies today. Yet this conclusion has not stopped currency traders from using trend-following as a major weapon in their arsenal, perhaps only because it once produced superior returns, and they have not adapted to the current market environment. Our results seem to indicate that using a counter-trending model (one that assumes exchange rate changes will be reversed in subsequent periods) would be more effective today.

Perhaps the prevalence of trend-following models in most trading rooms suggests traders expect trend-following profits to return. In our judgment, this is unlikely to occur any time soon. Rather, the markets seem to have learned, and to have adapted to trend-following in the major currencies.

EXHIBIT 2

Average Annual Excess Returns of Yen/Euro over U.S. T-Bills

	1975-1994	1995-1999	2000-2006
Mean Return	9.60%	-9.42%	-3.63%
Volatility	14.90%	32.84%	8.31%
Information Ratio	0.64	-0.29	-0.44

As profits from trend-following in the major currencies and crosses have eroded, there remains another group of currencies where traders may still hope to apply trend-following techniques for profit. New currency futures contracts are developed every year on newly liquid currencies (the exotics).

We apply the basic moving-average cross-over rules to a collection of five exotic currency futures. The data on these contracts are again taken from Bloomberg. All contracts are traded on the CME. We apply the same three trend-following trading rules here as for the major currencies.

The results are shown in Exhibit 3. Trend-trading the Brazilian real produced profits in every year from 1999 to 2006. Yearly information ratios are generally higher than 1, and the overall information ratio was 1.26 (2000-2006). The real is by far the most profitable currency in our sample.

The Mexican peso produced a profit in only five of eight periods, but still produced a satisfying information ratio of 0.5 over the entire seven-and-a-half year period. Nevertheless, it is worth pointing out that peso trend following was unprofitable during 2006, which may indicate that this market is maturing.

Similar to the peso, the New Zealand dollar produced profits in five of eight periods. Over the entire sample, the simple trend-following rules yielded an information ratio of 0.74.

The South African rand produced profits in six of eight periods, with an information ratio of 0.76 for the entire period. Two of the last three periods, however, produced losses.

The Russian ruble produced profits in little more than half of the years we examined. Nevertheless, its overall information ratio over 2000-2006 was almost 1 (and it suffered losses in 2005, perhaps an ominous sign for the future).

During the entire period (2000 to mid-2006), each of the five exotic currencies produced a profit, although

EXHIBIT 3

Average Annual Excess Returns on Exotic Currencies over U.S. T-Bills

	2000-2006	1999	2000	2001	2002	2003	2004	2005	2006
Brazilian Real									
Mean of profits	26.60%	33.47%	14.39%	51.91%	21.59%	41.15%	13.33%	22.46%	15.58%
Volatility of profits	21.26%	23.86%	12.28%	27.54%	33.20%	20.76%	11.94%	16.26%	12.61%
Information ratio	1.26	1.40	1.17	1.89	0.65	1.98	1.12	1.38	1.24
Mexican Peso									
Mean of profits	3.62%	31.94%	0.51%	18.68%	-2.65%	1.98%	-2.64%	8.27%	-0.93%
Volatility of profits	7.28%	13.96%	9.61%	8.53%	6.34%	8.10%	6.11%	4.91%	5.11%
Information ratio	0.50	2.29	0.05	2.19	-0.42	0.24	-0.43	1.68	-0.18
New Zealand Dollar									
Mean of profits	7.31%	-1.86%	18.91%	-15.3%	29.05%	23.34%	0.10%	-12.7%	8.45%
Volatility of profits	9.91%	9.18%	10.78%	9.17%	10.76%	10.79%	11.20%	6.98%	7.44%
Information ratio	0.74	-0.20	1.75	-1.66	2.70	2.16	0.01	-1.81	1.14
South Africa Rand									
Mean of profits	16.97%	2.78%	15.19%	56.92%	13.66%	33.91%	-14.76%	-0.53%	12.96%
Volatility of profits	22.20%	7.16%	13.54%	40.56%	22.10%	21.82%	15.54%	10.13%	12.41%
Information ratio	0.76	0.39	1.12	1.40	0.62	1.55	-0.95	-0.05	1.04
Russian Ruble									
Mean of profits	6.10%		30.40%	-1.49%	-0.53%	12.57%	7.18%	-3.47%	2.99%
Volatility of profits	6.49%		16.61%	1.67%	1.59%	3.10%	3.74%	3.04%	6.48%
Information ratio	0.94		1.83	-0.89	-0.33	4.06	1.92	-1.14	0.46
An Equally Weighted Portfolio of Exotic Currencies									
Mean of profits	11.36%	14.04%	13.37%	19.44%	12.84%	20.83%	3.76%	-0.01%	1.39%
Volatility of profits	6.64%	5.79%	4.81%	7.91%	8.63%	7.74%	5.89%	4.85%	4.27%
Information ratio	1.71	2.43	2.78	2.46	1.49	2.69	0.64	-0.00	0.33

most experienced one or more years in which they lost money. One solution would be to construct a diversified portfolio. An equally weighted portfolio of the five exotic currencies produced a profit in every year but one, essentially broke even in the one not profitable year, and registered an information ratio of 1.71 for the entire period (2000 to mid-2006), a truly extraordinary figure. The only (minor) loss on the composite portfolio occurred during 2005. Still, toward the end of the period (2005 and 2006), the very high profits experienced in previous periods seemed to show softening, suggesting that these exotic currencies might soon become weak-form efficient.

To summarize the results for the exotic currencies, we again normalize the data, notionally applying leverage, to produce a volatility of 12% for each currency. The annualized returns that result are shown in Exhibit 4.

CONCLUSIONS

In the early years of floating exchange rates, the major currency rates versus the U.S. dollar trended, providing an extended opportunity for traders to use technical trend-following rules and to profit handsomely.

EXHIBIT 4

Average Annual Excess Returns on Exotic Currencies over U.S. T-Bills

	2000-2006
Brazilian Real	17.72%
Mexican Peso	4.83%
New Zealand Dollar	10.46%
South African Rand	15.65%
Russian Ruble	15.97%
Portfolio	21.36%

The data we present suggest that it took 20 years before trend-following profits were substantially eliminated in the major currencies. Park and Irwin [2005] present similar results in other futures market contracts.

Yet the poor prospects for profits have not deterred many foreign exchange traders from continuing technical analysis. Perhaps traders have come to use more

sophisticated technical models based on more complex relationships or applied at higher frequencies, minute-by-minute or second-by-second. Or perhaps astute traders have moved to the road less traveled, what we have called the exotic currencies.

It may take far less time for the exotics to become weak-form efficient. Indeed there is some evidence they are already responsible for lower returns from trend-trading than before, but the recent trading profits for exotic currencies are still attractive.

There remain some perplexing dilemmas. First, why did it take 20 years for profits on trend-following to be eliminated in the major dollar exchange rates? Second, and more relevant to practitioners, is how long we can expect the exotic currencies to continue to trend, now that the positive results of speculating in them have been documented and published.

ENDNOTES

¹Except for the Australian dollar, which began futures trading only in 1987.

²For the Japanese yen, for example, the Bloomberg symbol jy1 produces the yen near-futures series.

³This biases the results somewhat against the trading rules. Allowing same-day trading has no material effect on our results.

⁴We have also examined the data using 25 momentum rules. The results are broadly similar to the results for the moving-average rules: attractive profits before 1994, followed by a decline, with profitability of trend trading gone after 2000.

⁵The 15 possible cross-rates are Canadian dollar per British pound, Swiss franc per British pound, Euro per British pound, Japanese yen per British pound, Australian dollar per British pound, Swiss franc per Canadian dollar, euro per Canadian dollar, Japanese yen per Canadian dollar, and Australian dollar per Canadian dollar, euro per Swiss franc, Japanese yen per Swiss franc, Australian dollar per Swiss franc, euro per Japanese yen, Australian dollar per Japanese yen, Australian dollar per euro. They are calculated from the parity and condition by division of the original dollar prices, and represent every possible cross-rate that can be derived from the original dollar exchange rate series. They are not directly observed cross-rates.

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that proved exploitable by one group engaged in actual market transactions; the corporate sellers of new issues escaped paying a default risk premium. Among the five complementary rather than mutually exclusive factors identified here that may explain this anomaly are: unawareness of the underperformance of the OI segment; a focus on security selection; a lottery ticket effect; and the mirage of remedy based on yield. The discussion gets to the heart of the premise on which the high-yield investment concept was marketed at the dawn of its modern era in the late 1970s.

THE VOLATILITY EFFECT 102

DAVID C. BLITZ AND PIM VAN VLIET

There is empirical evidence that stocks with low historical volatility have high risk-adjusted returns, with annual alpha spreads of global low- versus high-volatility decile portfolios of 12 percentage points over 1986-2006. This volatility effect appears independently in U.S., European, and Japanese markets. It is similar in size to classic effects such as value, size, and momentum, and cannot be explained by implicit loadings on these well-known effects. These results indicate that equity investors overpay for risky stocks. Possible explanations include leverage restrictions, inefficient two-step investment processes, and behavioral biases of private investors. To exploit the volatility effect in practice, investors might include low-risk stocks as a separate asset class in the strategic asset allocation phase of the investment process.

DO FOREIGN EXCHANGE MARKETS STILL TREND? 114

KUNTARA PUKTHUANThONG-LE,
RICHARD M. LEVICH, AND LEE R. THOMAS III

Is it possible to trend-trade profitably in foreign currencies? Examination of both major currency futures contracts that have been trading since the 1970s and more recent contracts on exotic currencies that have begun to trade only in the past several years shows that the era of easy profits in major foreign currencies from simple trend-following strategies is over. Trend-trading in a currency may have been advantageous in the early years of a floating-rate regime, but markets have adapted so that profits from these simple trading strategies have vanished. Newly trading currencies do appear susceptible to trend-following trading strategies, and there may remain in this case some attractive profit opportunities.

HEDGE FUNDS

WHY DO HEDGE FUNDS STOP REPORTING PERFORMANCE? 119

ALEX GRECU, BURTON G. MALKIEL, AND
ATANU SAHA

It is well known that the disappearance of hedge funds from a database may cause biases in estimating investment returns on these funds, although there is no consensus on why hedge funds stop reporting to data-gathering services. Some studies have suggested that poor or failing funds stop reporting, while others claim that it is the better-performing funds that stop reporting because they no longer need to attract new capital. Analysis of the TASS database reveals that hedge fund returns become significantly poorer at the end of a fund's reporting life. Other analysis here applies survival time techniques to examine funds' time to failure and