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Do Professional Currency Managers Beat the Benchmark?

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Investigation of an index of returns on professionally managed currency funds and a subset of returns from 34 individual currency fund managers finds that over the 1990–2006 period, currency fund managers earned excess returns averaging 25 bps per month. The study examines the relationship of these returns to four factors that represent the returns from distinct styles of currency trading—carry, trend, value, and volatility. The four factors explain a substantial portion of the variability in index returns. The study's approach modifies the definition of alpha returns to only that portion of excess returns not explained by the four factors. The impact of this change on measured alpha is substantial, but some currency fund managers still generate alpha returns.

Since the 1990s, the notion of currency as an asset class has gained a wider following. Inspired, perhaps, by numerous studies reporting profitability in various types of currency-trading strategies, many investment consultants have promoted currency products as a potential source of alpha.[1] Taking as one measure the funds in the Barclay Currency Traders Index (BCTI), we note that, as **Figure 1** shows, the number grew from 44 in 1993 to 106 in 2006. Figure 1 also shows that returns on the BCTI (an equally weighted composite of managed programs that trade in currency futures and forwards) were in the healthy double-digit range until the mid-1990s, but those returns have diminished over time, especially since 2004.

If currency is an asset class, we should be able to identify a set of factors that correlate with managers' realized returns from currency investment. In this article, we report our examination of the extent to which currency managers' returns correlate with four factors that are intended to represent feasible benchmark returns from distinct styles of currency trading—namely, carry, trend, value, and volatility.

Explaining Currency Index Returns

Until recently, a proposal to model speculative currency returns in anything like the framework applied in the equity markets was nearly unthinkable. A few stylized macroeconomic models developed conditions in which a forward currency risk premium could exist.[2] Yet, a prominent theme in academic studies was that currency returns are not forecastable, so expected returns are zero.[3] Some studies, however, documented that various currency-trading strategies have been profitable and also that these returns are weakly correlated with those of other asset classes (e.g., equities, bonds, and real estate), making currency desirable as a "zero beta" asset for traditional institutional investors.[4]

Although currency-trading returns may be unrelated to equity market returns, they may be related to other factors. Anson (2008) argued that there is a continuum between beta and alpha. In Anson's view, different types of beta exist; they range from the classic beta of the capital asset pricing model to betas that reflect systematic exposure to other defined aspects of the market. What passes for "alpha" may, indeed, be simply systematic exposure to some other style factor.

Nevertheless, currency investing does not neatly fit into equity market paradigms. The currency market is a long–short market, where going long one currency by necessity means going short another currency. A currency investor might borrow GBP1 million to finance an investment in USD2 million. In principle, currency investing requires no net investment and there is no natural "market portfolio" to track, which makes the concept of beta seem inappropriate for currencies.

With the realization that there are different types of beta, however, and that investment returns may be systematically related to well-defined factors, the concept of currency betas gains logic.

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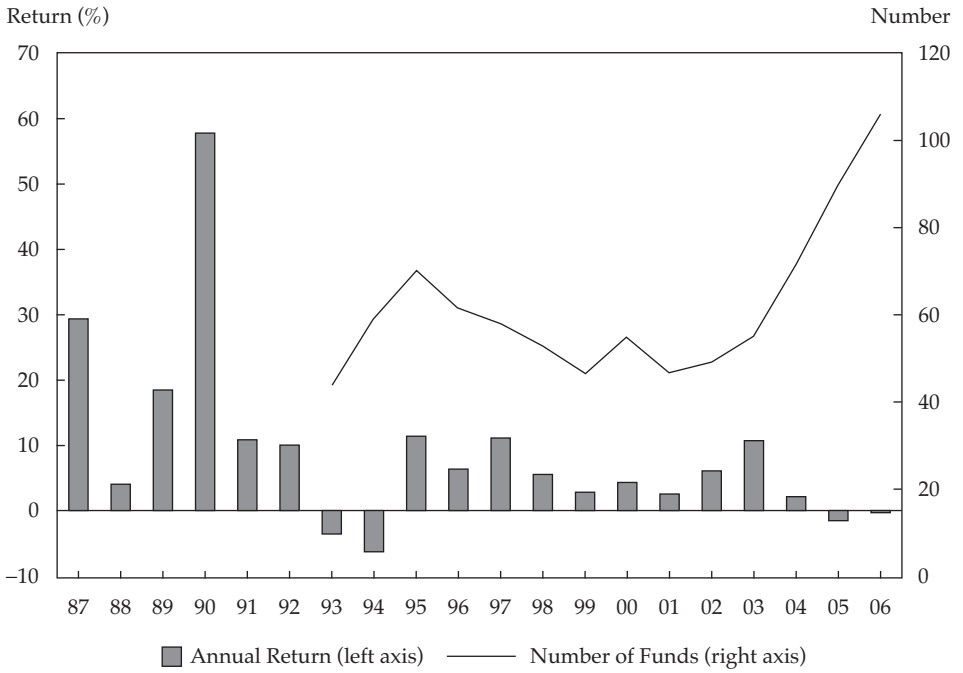
Figure 1. Annualized Returns and Number of Funds for the Barclay Currency Traders Index



Sources: Monthly returns and numbers of funds were provided courtesy of Barclay Hedge. Annual returns are available at www.barclaygrp.com.

Earlier research examined the degree to which hedge fund returns can be explained or replicated by using various style or market factors.[5] These studies used equity market and bond market factors to examine hedge funds in general. In our study, we focused exclusively on currency hedge funds. Building on the earlier hedge fund research and using several well-known currency-trading strategies, we analyzed four potential factors that could explain currency returns earned by professional managers. Once the factors were specified, we could then estimate what portion of currency-trading profits is a result of exposure to these specific trading-style or risk factors and what portion is a result of skill or alpha.

Currency Returns, Factors, and Methodology

To measure the systematic components of currency returns (the betas) and isolate the portion attributable to skill, we used a standard factor model of the form

$$R_t = \alpha + \sum_i \beta_i F_{i,t} + \varepsilon_t, \quad (1)$$

where

R = excess return generated by the currency manager, defined as the total return, R_t^*, minus the periodic risk-free rate, $R_{F,t}$

α = measure of active manager skill

β = coefficient or factor loading that measures the sensitivity of the manager's returns to the factor

F = beta factor that requires a systematic risk premium in the market

ε = random error term

We considered four factors that proxy for types of trading strategies and exposures that currency managers would be likely to use. Our empirical proxies for these factors are based on data for the major currencies that make up the vast bulk of foreign exchange (FX) trading volume.[6]

Carry Factor. The so-called carry trade is a well-known strategy used by currency managers.[7] In a carry trade, the manager borrows the low-interest-rate currency (e.g., Japanese yen) and invests in a high-interest-rate currency (e.g., the New Zealand dollar). The risk is that the high-interest-rate currency will depreciate, and

possibly by more than the interest differential, which would result in a loss. As a proxy for the carry factor, we used the Citibank Beta1 G10 Carry Index (G10 Carry), which takes a long position in high-yielding currencies against being short in low-yielding currencies.[8]

Trend-Following Factor. Many currency managers rely on trend-following strategies in one or more of their many variations.[9] Many risks are inherent in trend following—for example, sudden reversals of trends or patterns, false signals, and excessive trading costs. As a proxy for the trend-following factor, we used the AFX Currency Management Index.[10] The AFX is based on research by Lequeux and Acar (1998) showing that an equally weighted portfolio constructed on the basis of three moving-average rules (32, 61, and 117 days) is a good proxy for a trend-following style among professional managers.

Value Factor. Currency managers with a long-term view may rely on a value benchmark to gauge when currencies are over- or undervalued. Purchasing power parity (PPP) in one of its many variants is a commonly used benchmark to represent a long-run equilibrium value.[11] Empirical evidence suggests that currencies often overshoot their PPP values in the short run and have a tendency to revert back toward PPP in the longer run.[12] One trading strategy, then, is to trade currencies that are substantially misaligned, with the expectation that they will move closer to PPP over time. The risks in this strategy include the possibility that the currency values may become still more misaligned, that rates will be slow to revert toward PPP, or that a currency's long-run real exchange rate has changed in a way that is consistent with a new PPP exchange rate. As a proxy for the value factor, we used Citibank Beta1 G10 Purchasing Power Parity Index (G10 PPP), which takes long positions in currencies that are more than 20 percent undervalued against short positions in currencies that are more than 20 percent overvalued.[13]

Volatility Factor. Yet another style of professional currency investment involves trading on currency volatility. Currency managers gain exposure to volatility risk simply by taking open currency positions, but they also gain such exposure by using options and other derivatives whose prices are sensitive to volatility. Managers are at risk if they are long (short) volatility when volatility declines (increases). As a proxy for currency volatility, we used the average of the one-month implied volatility for the EUR/USD exchange rate and for the USD/JPY exchange rate. These two currency pairs, which accounted for roughly 54 percent of currency-option trading in the Bank for International Settlements (BIS) surveys for 1995–2004, have the most liquid options in the FX market.[14]

Currency Index Returns

To investigate the relationship between currency traders' returns and our four factors, we collected monthly data on the BCTI for the period January 1990 through December 2006 (204 months).[15] Fortunately, our main equation, Equation 1, needed only four variables and our sample size was large enough to allow us to estimate these parameters with reasonable precision and to identify a significant relationship.

All funds represented in the BCTI are absolute-return programs. We used the one-month USD LIBID rate to proxy the risk-free return on the assets under management in these programs.[16] All funds in the BCTI report their data on a net basis, after deducting all management fees. Simple descriptive statistics on these variables for the full sample period and for two subperiods are presented in **Table 1**.

The mean monthly return on the BCTI over the 17-year period (Panel A) is 0.62 percent, or roughly 7.5 percent per year. The excess return on the BCTI is the monthly return minus the one-month USD LIBID rate. Therefore, the mean monthly excess return on the BCTI was only 0.25 percent, which is similar to the monthly returns on the G10 Carry (0.15 percent) and the AFX (0.21 percent). Returns on the G10 PPP were far smaller, only 0.03 percent per month. As expected, the carry factor exhibits negative skewness and the trend factor, positive skewness (because trend following is a strategy that behaves like a long volatility strategy, whereas carry trading behaves like a short volatility strategy). The value factor also shows slight negative skewness and positive kurtosis. Kurtosis for the BCTI is more pronounced than for any of the four factors. The volatility factor (representing the first difference in implied volatility rather than a return) has a negative mean, indicating that over the full sample period, volatility was, on average, declining.[17]

Mean excess returns on the BCTI were far higher per month in the first subperiod (Panel B) than in the second subperiod (Panel C). Similarly, kurtosis in the BCTI was far lower in the second subperiod than in the first. On the one hand, mean monthly returns on two of our factors, trend and volatility, were substantially lower in the second subperiod than in the first subperiod. On the other hand, mean monthly returns on the carry and value factors were higher in the second subperiod than in the first.

Table 1. Currency Returns and Currency Risk Factors: Descriptive Statistics

Measure	Currency Returns (BCTI)	Risk-Free Returns (USD LIBID)	Excess Returns (BCTI minus LIBID)	Carry Factor (Beta1 G10 Carry)	Trend Factor (AFX)	Value Factor (Beta1 G10 PPP)	Volatility Factor (FX Volatility)[a]
A. January 1990–December 2006 (N = 204)							
Mean monthly return (%)	0.62	0.37	0.25	0.15	0.21	0.03	–0.01
Standard deviation (%)	3.06	0.16	3.04	0.78	1.86	0.38	1.55
Skewness	1.60	–0.17	1.54	–1.05	0.84	–0.43	0.84
Kurtosis	4.76	–0.60	4.54	2.86	1.61	3.30	3.42
B. January 1990–December 2000 (N = 132)							
Mean monthly return (%)	0.80	0.44	0.36	0.13	0.31	0.02	0.02
Standard deviation (%)	3.58	0.11	3.55	0.90	2.01	0.45	1.76
Skewness	1.39	0.22	1.37	–1.01	0.83	–0.31	0.78
Kurtosis	3.15	0.06	3.07	1.98	1.63	2.03	2.76
C. January 2001–December 2006 (N = 72)							
Mean monthly return (%)	0.30	0.22	0.08	0.21	0.05	0.06	–0.08
Standard deviation (%)	1.76	0.13	1.78	0.51	1.57	0.21	1.11
Skewness	1.12	0.57	1.17	–0.19	0.65	–0.20	0.77
Kurtosis	1.53	–1.06	1.57	0.31	0.09	1.40	1.84

[a]The "return" for the volatility factor is, in fact, the first difference of the implied volatility rather than a return.

Table 2 shows the simple correlations between the BCTI returns and the four factors in the full sample period and two subperiods. The trend and carry factors have, essentially, no correlation, nor do the trend and value factors. Although the carry strategy has been far more profitable than the value strategy, the correlation between these two factors is fairly high; we estimate it to be 0.67 in the first subperiod and 0.54 in the second. Volatility appears to be weakly positively correlated with trend and somewhat negatively correlated with carry and value. Volatility appears to be a "friend of the trend" but may work to undermine carry trades (which seek to collect interest in a steady-FX environment) and value trades (which depend on currencies moving back toward long-run fundamental values).

Table 2. Correlations for Currency Returns and Currency Risk Factors

Measure	Excess Returns	Carry Factor	Trend Factor	Value Factor	Volatility Factor
A. 1990–2006 (N = 204)					
Excess returns	1				
Carry factor	0.092	1			
Trend factor	0.803	0.002	1		
Value factor	–0.068	0.655	–0.064	1	
Volatility factor	0.321	–0.320	0.389	–0.402	1
B. 1990–2000 (N = 132)					
Excess returns	1				
Carry factor	0.064	1			
Trend factor	0.811	–0.020	1		
Value factor	–0.053	0.672	–0.021	1	
Volatility factor	0.296	–0.344	0.380	–0.421	1
B. 2001–2006 (N = 72)					
Excess returns	1				
Carry factor	0.295	1			
Trend factor	0.829	0.114	1		
Value factor	–0.157	0.537	–0.262	1	
Volatility factor	0.466	–0.192	0.425	–0.294	1

To examine the relationship between overall currency returns and the explanatory factors, we regressed the excess monthly returns of the BCTI on all possible combinations of the four factors. We report the results for the most relevant combinations.

The results of the regression for the full sample period and six specifications are shown in **Table 3**. The R^2 for the first specification, when all the factors were used, is relatively high, indicating that the four factors accounted for roughly 66 percent of the variability in monthly excess returns over the entire sample period.[18]

The trend factor appears to be the most significant factor. The trend coefficient exceeds 1 and is highly significant in each of the specifications in which it was used as an explanatory variable. On average, the managers in the BCTI demonstrate an amplified movement relative to the trend factor. The trend factor alone (Specification 4 in Table 3) explains almost 65 percent of the variability of the excess returns of the BCTI. The carry coefficient in Specification 1 is also positive and significant. In Specification 1, the value coefficient is significant but negative, suggesting that managers in the BCTI held positions favoring a continuation of trend rather than mean reversion. In Specification 3, which omitted all but the carry factor, the carry coefficient drops substantially. This result is consistent with the fact that the carry and value factors are highly correlated (roughly 0.65) in our sample.

The volatility coefficient is not significant in Specification 1 of Table 3 for the full sample, but it is significant on a stand-alone basis in Specification 6. The positive volatility coefficient may be an indication that excess returns are higher in periods of rising volatility. According to surveys by the BIS, turnover in FX options expanded fivefold between 1995 and 2007 and the ratio of the turnover in currency options to the turnover in currency forwards more than tripled between the 2001 and 2007 surveys. Volatility, as we will show, could be playing a larger role in more recent years than in earlier years.

Finally, the intercept term in Specification 1 is –0.09 percent and not statistically significant, which implies that managers in the BCTI were not able to generate alpha returns. After accounting for our four systematic risk factors—carry, trend, value, and volatility—the first three of which reflect returns on naive currency-trading strategies, alpha was –9 bps per month, or about –1.1 percent per year over the 204-month period. So, although the overall excess return on the BCTI was 25 bps per month (see Table 1), all of that return and more (34 bps) can be attributed to the four explanatory factors.[19]

To test for stability of these relationships over time, we ran the regression for the two subperiods. These regression results are shown in **Table 4**. Our discussion focuses primarily on Specification 1, which includes all four factors.

The coefficient on the trend factor is significant in both subperiods in Specification 1 but is substantially higher in the 1990s than after 2000. In the first subperiod, 45 bps of monthly beta returns can be attributed to the trend factor, but after 2000, only 4 bps can. The coefficient on the carry factor, which is 0.75 in the first subperiod, increases to 1.04 in the

Table 3. Excess Currency Index Returns as a Function of Four Factors, 1990–2006
(*t*-statistics in parentheses)

Specification	Intercept	Carry	Trend (AFX)	Value (PPP)	Volatility	R^2
1	–0.0009	0.7029	1.2817	–1.0193	0.0421	0.6643
	(–0.7376)	(3.3034)	(17.4451)	(–2.2557)	(0.4371)	
2	–0.0009	0.6922	1.2947	–1.0702	—	0.6640
	(–0.7399)	(3.2815)	(19.3096)	(–2.4559)	—	
3	0.0020	0.3591	—	—	—	0.0085
	(0.9282)	(1.3203)	—	—	—	
4	–0.0002	—	1.3094	—	—	0.6456
	(–0.1937)	—	(19.1854)	—	—	
5	0.0027	—	—	–0.5466	—	0.0046
	(1.2860)	—	—	(–0.9730)	—	
6	0.0026	—	—	—	0.6282	0.1031
	(1.3175)	—	—	—	(4.8189)	

Note: Regression results for different specifications of Equation 1 are for the full sample period with N = 204 monthly observations.

Table 4. Excess Currency Index Returns as a Function of Four Factors, Subsample Periods
(*t*-statistics in parentheses)

Specification	Intercept	Carry	Trend (AFX)	Value (PPP)	Volatility	R^2
A. January 1990–December 2000 (132 monthly observations)						
1	–0.0016	0.7491	1.4490	–1.3834	–0.0478	0.6805
	(–0.8824)	(2.7838)	(14.9170)	(–2.4497)	(–0.3881)	
2	–0.0015	0.7590	1.4336	–1.3190	—	0.6801
	(–0.8766)	(2.8432)	(16.2381)	(–2.4517)	—	
3	0.0032	0.2532	—	—	—	0.0041
	(1.0377)	(0.7321)	—	—	—	
4	–0.0008	—	1.4329	—	—	0.6586
	(–0.4545)	—	(15.8370)	—	—	
5	0.0036	—	—	–0.4293	—	0.0029
	(1.1708)	—	—	(–0.6154)	—	
6	0.0034	—	—	—	0.6002	0.0878
	(1.1652)	—	—	—	(3.5393)	
B. January 2001–December 2006 (72 monthly observations)						
1	–0.0011	1.0367	0.7764	–0.6420	0.3352	0.7673
	(–1.0023)	(3.9942)	(9.7151)	(–1.0105)	(3.0939)	
2	–0.0010	0.8891	0.8785	–0.7692	—	0.7314
	(–0.8694)	(3.2840)	(11.3712)	(–1.1434)	—	
3	–0.0014	1.0256	—	—	—	0.0875
	(–0.6449)	(2.5911)	—	—	—	
4	0.0003	—	0.9390	—	—	0.6881
	(0.2606)	—	(12.4279)	—	—	
5	0.0016	—	—	–1.3202	—	0.0248
	(0.7363)	—	—	(–1.3369)	—	
6	0.0013	—	—	—	0.7461	0.2177
	(0.7054)	—	—	—	(4.4137)	

Note: Regression results for different specifications of Equation 1 are by subperiod.

second subperiod and is highly significant in both periods. In the first subperiod, 10 bps of monthly beta returns could be attributed to the carry factor, compared with 22 bps after 2000. These results imply that, on average, managers included in the BCTI increased their exposure to the carry factor and reduced their exposure to the trend factor in the post-2000 period. This finding is consistent with other evidence that returns to simple trend-following currency strategies declined in the late 1990s and beyond, leading currency managers to shift away from trend-following rules.[20] As Table 1 shows, volatility was rising in the first subperiod and falling in the second. If currency managers prefer to allocate risk toward carry exposure in a low-volatility environment, this preference might explain why carry was not significant on a stand-alone basis (Specification 3) in the 1990s but became highly significant after 2000.

The coefficient on the value factor in Specification 1 of Table 4 is negative and significant in the first subperiod, but the coefficient is smaller and insignificant in the second subperiod. The coefficient on the volatility factor is small, negative, and insignificant in the first subperiod (–0.05) but is substantially larger, positive, and significant in the second subperiod (0.34). This result is consistent with the fact noted previously that trading in currency derivatives increased sharply after 2001. Similarly, it is interesting that –3 bps of beta returns can be attributed to the volatility factor after 2000 (0.33 multiplied by average volatility of –0.08 percent). Volatility began declining after 2000 (Table 1), and our analysis suggests that declining volatility has reduced the excess returns earned by currency managers.

The intercept term, our indicator of alpha after accounting for other systematic risk factors, is –16 bps in the first subperiod. In the second subperiod, the intercept term is –11 bps. Thus, in both subperiods, most of the variability in returns on the BCTI can be attributed to our four explanatory factors, with nothing attributed (on average) to excess performance, alpha.

Thus, interestingly, despite opinions that recent years have been more challenging for active currency managers, our analysis shows that the average alpha return (as defined in Equation 1) was negative not only after 2000 but also in the 1990s. The average alpha we found is actually "higher" (less negative) after 2000 than in the 1990s. As Table 1 demonstrates, after 2000, a substantial decline occurred in the returns generated by the trend strategy. Thus, in the post-2000 period, beta returns have declined substantially whereas alpha returns have remained similar to what they were in the earlier period.

Studies of professional investment managers must be wary of the possible impact of survivorship and reporting biases. The number of funds in the BCTI grew from 44 in 1993 to 106 in 2006, but the index includes only those managers who entered the business, survived, and offered to supply their data to Barclay Hedge. Therefore, to check the validity of our style factors, we collected data on another index of professional currency managers, an index prepared by the Center for International Securities and Derivatives Markets.[21] Using monthly data for the CISDM equal-weighted currency index of commodity trading advisers for 2001–2006, we found the correlation between this index and the BCTI to be about 0.94. We regressed the CISDM index against the four factors and found overall results that are very similar to those reported in Panel B of Table 4 for the BCTI. The R^2 for the CISDM regression, at 77 percent, was nearly identical to the R^2 for Specification 1, and the same three factors (carry, trend, and volatility) were significant, with similar beta coefficients and a similar alpha.

Admittedly, the CISDM index is also subject to survivorship and reporting bias. Nevertheless, the results for the CISDM index verify that our four factors have explanatory power and are valid style factors.

Returns of Individual Currency Managers

Although our estimated alpha for the index is not significantly different from zero, this finding does not necessarily mean that the alpha for each and every manager is zero. We can use our methodology to estimate alphas for individual managers and shed some light on the issue of whether some managers generate alpha (according to our new definition), and we can provide some insights into how they may be doing so.

In addition to the performance data of the overall BCTI, we obtained data on the monthly performance of all 113 currency managers that made up the index as of the beginning of 2007.[22] As shown in Figure 1, the number of currency managers in the BCTI grew from 44 in 1993 to 106 in 2006. In this section, we examine the performance of the 34 currency managers in the index with a track record that spanned the 2001–06 period.

In our framework as presented in Equation 1, alpha returns for fund manager j, α_j, would be only that portion of excess returns that is not explained by the four factors, or

$$\hat{\alpha}_j = R_{j,t} - \sum_i \hat{\beta}_{i,j} F_{i,t}. \quad (2)$$

Annualized returns, excess returns, and standard deviation of excess returns for the 34 managers are shown in **Table 5**. We also report the annualized alpha return and the standard deviation of alpha returns (tracking error). The average excess annual return for the 34 managers is positive, and the amounts range from 0.80 percent to 22.98 percent. The volatility ranges from 0.94 percent to 39.21 percent.

This broad range of outcomes highlights a well-known aspect of currency management: The typical mandate for a funded currency manager is to "beat the risk-free rate," but variations in permitted leverage mean that risk–return profiles vary substantially for different clients. Therefore, to compare managers, relying on normalized values (such as information ratios) is preferable to using returns.

By definition, the information ratio, *IR*, is the ratio of excess returns to their standard deviation. If we assume that all returns are excess returns, then

$$IR_j = \frac{R_j}{\sigma(R_j)}, \quad (3)$$

where R_j is the annualized average excess return and $\alpha(R_j)$ is its annualized standard deviation.

Our results in Table 5 show that, as measured by the information ratio, these 34 currency managers have been performing well since 2001. The average *IR* is 0.47, and the *IR*s range from –1.99 to 1.67, with a median value of 0.45.

These results probably overstate the performance that could be expected from currency management, however, because of survivorship bias.[23] Moreover, the results may be misleading because the calculation of *IR* assumes that the risk-free return is the appropriate benchmark for returns and that R_j, the traditional measure of alpha for currency managers, is an appropriate measure of excess returns.

Using Equation 2 as an alternative definition of alpha, we have an alternative estimate of the information ratio:

$$IR^*_j = \frac{\alpha_j}{\sigma(\alpha_j)}. \quad (4)$$

Table 5. Performance of Individual Currency Managers, 2001–06

Manager	Average Annual Return	Excess Annual Return	Std. Dev.	*IR*	Annual Alpha	Tracking Error	*IR**
M1	22.0%	19.34%	14.71%	1.31	22.13%	14.57%	1.52
M2	6.4	3.70	8.62	0.74	–2.48	4.81	–0.52
M3	2.5	–0.16	3.00	–0.05	0.31	2.94	0.11
M4	5.7	2.98	5.16	0.58	2.91	4.68	0.62
M5	5.4	2.73	8.00	0.36	–4.19	6.24	–0.67
M6	10.7	8.00	22.51	0.36	–8.97	15.75	–0.57
M7	4.0	1.35	1.31	1.03	1.91	1.20	1.60
M8	7.2	4.53	3.77	1.20	6.16	3.44	1.79
M9	14.5	11.80	15.32	0.77	10.43	15.27	0.68
M10	6.5	3.78	6.96	0.54	3.08	6.94	0.44
M11	0.8	–1.87	0.94	–1.99	–1.86	0.92	–2.03
M12	1.4	–1.26	12.15	–0.10	0.57	11.26	0.05
M13	2.3	–0.37	13.83	–0.03	0.22	10.20	0.02
M14	8.1	5.42	29.34	0.18	13.08	27.09	0.48
M15	5.9	3.18	11.92	0.27	–0.26	9.63	–0.03
M16	7.7	5.04	6.39	0.79	2.67	5.90	0.45
M17	7.1	4.43	13.73	0.32	–7.39	11.09	–0.67
M18	2.2	–0.49	4.03	–0.12	–2.21	3.76	–0.59
M19	5.0	2.27	8.04	0.28	2.84	7.84	0.36
M20	6.2	3.52	39.21	0.09	3.27	23.87	0.14
M21	5.9	3.24	23.98	0.13	–5.01	15.87	–0.32
M22	8.0	5.31	8.88	0.60	–0.54	7.68	–0.07
M23	9.9	7.24	11.57	0.63	7.71	11.04	0.70
M24	2.7	–0.02	6.56	0.00	0.22	3.92	0.06
M25	17.6	14.90	8.91	1.67	12.73	8.34	1.53
M26	25.7	22.98	14.82	1.55	25.99	14.28	1.82
M27	2.7	–0.04	5.89	–0.01	–0.42	4.34	–0.10
M28	5.7	3.02	3.86	0.78	3.51	3.79	0.93
M29	22.7	19.97	12.74	1.57	19.53	12.14	1.61
M30	10.0	7.27	22.39	0.32	3.32	14.42	0.23
M31	3.7	1.02	13.90	0.07	–1.71	8.18	–0.21
M32	10.3	7.62	13.71	0.56	8.50	9.07	0.94
M33	14.7	11.98	19.49	0.61	12.72	18.29	0.70
M34	5.7	2.98	3.47	0.86	1.72	2.99	0.57
Average	8.14	5.45		0.47	3.84		0.34
Max.	25.70	22.98		1.67	25.99		1.81
Median	6.30	3.61		0.45	2.29		0.29
Min.	0.80	–1.87		–1.99	–8.97		–2.02

Notes: Data are based on 72 monthly observations. Average annual return is the total return earned by the fund. Excess annual return is the total return earned by the fund minus the risk-free rate. Annual alpha is the annualized alpha coefficient estimated for Equation 1 for each manager. Tracking error is the standard deviation of annualized alpha returns. *IR* and *IR** are defined in the text.

Calculations shown in Table 5 indicate that the mean and median values of *IR** are smaller than they are for the traditional *IR*. More surprising is the substantial impact of using *IR** on the ranking of funds. For example, M2, M5, M6, M17, M21, and M22 show a substantial decline when *IR** is used rather than *IR*. Their previous positive *IR* values switch to negative *IR** values. M7, M8, and M32, however, benefit considerably from using *IR**.

This large impact results from the fact that some funds are earning beta returns while other funds are offering pure alpha returns in the sense of Equation 2.

To investigate how much of these returns is pure alpha and how much is attributable to exposure to risk factors (beta), we regressed the monthly excess returns of the 34 currency managers on the four explanatory factors. **Table 6** summarizes our results.

Table 6. Regression Results for Individual Currency Managers, 2001–06

	Intercept		Carry		Trend		Value		Volatility		
Manager	Intercept	*t*-Stat	Beta	*t*-Stat	Beta	*t*-Stat	Beta	*t*-Stat	Beta	*t*-Stat	R^2
M1	**0.0184**	**3.3236**	–0.6550	–0.5143	–0.0269	–0.0687	–1.6564	–0.5314	–0.1815	–0.3414	0.0189
M2	–0.0020	–1.1294	**2.2714**	**5.4067**	**0.9036**	**6.9854**	0.3357	0.3265	**0.3762**	**2.1457**	0.6889
M3	0.0002	0.2317	–0.3562	–1.3858	–0.0029	–0.0370	0.6393	1.0164	0.0662	0.6172	0.0401
M4	0.0024	1.3573	–0.4595	–1.1223	**–0.2625**	**–2.0827**	**2.1998**	**2.1954**	**0.3418**	**2.0002**	0.1757
M5	–0.0034	–1.4687	**2.6656**	**4.8841**	**0.7108**	**4.2298**	–0.2206	–0.1651	0.0630	0.2768	0.5157
M6	–0.0074	–1.2462	**6.6620**	**4.8397**	**1.7715**	**4.1797**	–0.8883	–0.2636	0.2216	0.3857	0.5103
M7	**0.0015**	**3.4981**	–0.1508	–1.4402	0.0155	0.4808	–0.1610	–0.6284	0.0763	1.7460	0.1658
M8	**0.0051**	**3.9239**	–0.4723	–1.5731	0.0579	0.6264	–0.3537	–0.4812	0.2144	1.7106	0.1681
M9	0.0086	1.4950	0.1918	0.1436	0.0280	0.0681	1.3053	0.3995	0.1539	0.2761	0.0058
M10	0.0025	0.9721	0.0786	0.1297	0.0439	0.2355	0.6464	0.4356	0.0295	0.1167	0.0066
M11	**–0.0015**	**–4.4319**	–0.0810	–1.0098	–0.0138	–0.5622	0.2719	1.3853	0.0107	0.3205	0.0479
M12	0.0004	0.1100	–1.2423	–1.2625	0.5025	1.6586	2.1556	0.8951	0.7023	1.7099	0.1410
M13	0.0001	0.0482	0.1051	0.1180	**1.4515**	**5.2885**	–1.5816	–0.7250	0.5213	1.4012	0.4566
M14	0.0109	1.0571	–4.0068	–1.6923	**2.1114**	**2.8963**	–0.3642	–0.0628	–1.6972	–1.7174	0.1479
M15	–0.0002	–0.0582	**1.9720**	**2.3417**	**0.9330**	**3.5983**	–2.3471	–1.1387	0.3023	0.8600	0.3462
M16	0.0022	0.9892	–0.1483	–0.2876	0.2014	1.2678	**3.5933**	**2.8459**	0.1525	0.7083	0.1461
M17	–0.0061	–1.4582	**3.2239**	**3.3270**	0.1397	0.4685	**4.8788**	**2.0572**	0.1974	0.4882	0.3483
M18	–0.0018	–1.2855	0.3595	1.0952	–0.0601	–0.5954	1.3643	1.6981	0.2302	1.6802	0.1313
M19	0.0023	0.7936	0.5512	0.8039	–0.3075	–1.4568	–1.9338	–1.1523	0.3323	1.1612	0.0474
M20	0.0027	0.2994	–0.7516	–0.3602	**5.5147**	**8.5848**	–0.5740	–0.1124	0.6160	0.7074	0.6294
M21	–0.0041	–0.6902	2.5661	1.8694	**3.0227**	**7.0749**	0.4007	0.1180	0.3109	0.5369	0.5618
M22	–0.0004	–0.1536	**1.5987**	**2.3802**	0.3345	1.6175	2.3903	1.4541	0.2561	0.9135	0.2505
M23	0.0064	1.5299	–0.4939	–0.5120	0.3493	1.1761	1.4823	0.6278	0.6301	1.5648	0.0906
M24	0.0001	0.1236	–0.5023	–1.4654	**0.9771**	**9.2566**	0.6966	0.8302	0.0747	0.5223	0.6429
M25	**0.0106**	**3.3421**	–0.0430	–0.0590	0.1080	0.4816	**3.6282**	**2.0347**	**0.6363**	**2.0924**	0.1244
M26	**0.0216**	**3.9814**	–1.4220	–1.1389	0.1577	0.4102	1.5233	0.4985	0.7424	1.4245	0.0705
M27	–0.0003	–0.2091	0.2896	0.7629	**0.4485**	**3.8373**	–0.1075	–0.1157	**0.5799**	**3.6603**	0.4567
M28	**0.0029**	**2.0267**	–0.0783	–0.2363	–0.0064	–0.0633	–0.1904	–0.2346	0.1627	1.1755	0.0347
M29	**0.0162**	**3.5206**	–1.0116	–0.9535	0.0415	0.1271	4.8410	1.8645	0.8304	1.8753	0.0919
M30	0.0027	0.5040	**4.0590**	**3.2210**	**2.0985**	**5.4085**	**–8.4047**	**–2.7251**	**1.1319**	**2.1520**	0.5855
M31	–0.0014	–0.4590	**1.5484**	**2.1666**	**1.7395**	**7.9050**	–2.2846	–1.3061	0.4585	1.5370	0.6541
M32	**0.0070**	**2.0515**	–0.2912	–0.3673	**1.5875**	**6.5019**	–0.5135	–0.2645	**0.7304**	**2.2068**	0.5621
M33	0.0106	1.5220	1.0493	0.6563	–0.3504	–0.7118	–1.9321	–0.4938	**1.8784**	**2.8150**	0.1196
M34	0.0014	1.2557	0.5082	1.9439	**0.2158**	**2.6814**	–0.0213	–0.0333	0.1457	1.3351	0.2583
Average	0.0032	0.7461	0.5157	0.6091	0.7187	2.3961	0.2594	0.3014	0.3323	1.1784	0.2718
Max.	0.0216	3.9814	6.6620	5.4067	5.5147	9.2566	4.8788	2.8459	1.8784	3.6603	0.6889
Median	0.0019	0.6488	0.0178	0.0295	0.2086	1.2220	0.1253	0.0424	0.2792	1.2553	0.1670
Min.	–0.0074	–4.4319	–4.0068	–1.6923	–0.3504	–2.0827	–8.4047	–2.7251	–1.6972	–1.7174	0.0058

Notes: Regression results for Equation 1 are for 34 managers. Data are based on 72 monthly observations. Boldface indicates statistical significance at the 5 percent level.

Several observations stand out. First, only eight managers produced positive and significant alpha (intercept), which indicates that the *IR*s from Table 5 may be misleading; a substantial part of the returns stemmed from exposure to the four trading factors. In the context of our factor model (Equation 1), returns generated by currency managers are not pure alpha returns but consist of alpha and beta returns. For example, in Table 6, M2 has significant exposure to three factors—carry, trend, and volatility. The coefficients on these three factors are highly significant, and the R^2 (0.689) is the highest of all 34 managers. According to Table 5, this manager had generated an annualized excess return of 3.70 percent since 2001, but Table 6 suggests that these returns were primarily beta returns. The alpha for M2 is –20 bps per month and not statistically different from zero. Table 5 gave M2's annualized alpha return as –2.48 percent, leading to the poor *IR** of –0.52.

At the other end of the spectrum is M28. The R^2 in Table 6 for M28 is 0.0347, among the lowest in our sample, which suggests that this manager had no significant exposure to any of our four factors. M28 generated a significant alpha, however, of 0.29 percent per month. The average annualized excess return for M28 is 3.02 percent in Table 5, a little less than the excess return generated by M2, but our analysis shows that M28 is offering alpha returns whereas M2 is offering beta exposure. Therefore, the *IR** for M28 is higher than this manager's standard *IR* (0.93 instead of 0.78) but the *IR** for M2 is negative and much lower than this manager's standard *IR* (–0.52 instead of 0.74). The *IR**s of these two managers are completely different (which might lead to different incentive fees), whereas the *IR*s are almost identical.

In Table 6, the R^2 exceeds 50 percent for 9 of the 34 managers. Thus, our factors seem to explain a meaningful portion of returns for many managers. These results are potentially important because they could have implications for pricing investment mandates. Clients may be willing to pay high fees for alpha but should wish to gain beta exposure more cheaply.

A second observation from Table 6 is that the highest exposure remains to the trend-following factor. The trend factor is significant for 15 managers. The carry factor is significant for eight managers, and volatility and value are significant for only seven and five managers, respectively. These results suggest that the trend style continued to dominate among currency managers (the other factors appear to have played a significant role, however, for some funds). The continued popularity of a trend style could be because currency managers who marketed a trend-following investment style to their clients in the 1990s found abandoning "trend" difficult despite the recent underperformance of this trading strategy.

Several managers (M7, M8, and M14, for example) had negative exposure to carry in the study period.[24] They could be value managers because currencies that are presumed to be undervalued often exhibit low interest rates (such as the CHF and the JPY). Or these managers may have been playing a "divergence trade"—that is, borrowing the high-interest-rate currency and owning the low-interest-rate currency while hoping for a devaluation of the high-interest-rate currency.[25] One manager (M4) had a negative exposure to the trend factor and might be characterized as "contrarian."

On the one hand, 21 of the 34 managers had significant exposures to at least one factor, 9 of them had significant exposures to two factors, and 2 managers had significant exposures to three factors. M30 had a significant exposure to all four factors. The implication is that managers were diversifying across different styles by having exposure to more than one style factor.[26] On the other hand, 13 of the 34 managers had no significant exposure to any style factor. For these 13 managers, none of the coefficient *t*-statistics are significant at the 95 percent confidence level. These managers might be classified as the true alpha seekers, or they may be simply offering exposure to other trading styles or risk factors than the four considered here.[27]

Sources of Alpha: The Role of Timing. In principle, currency managers might earn alpha returns from a variety of skillful trading decisions, including which currencies to pair in a trading strategy, how to weight those positions in the overall portfolio, which instruments to use to establish positions, and when to enter and lift trades. We investigated whether managers demonstrated any timing expertise, in the sense of shifting their reliance on a particular trading style as returns from that style varied.

A manager with the expertise to increase (decrease) reliance on factor F_i when returns on F_i are rising (falling) shows positive timing ability. To test this possibility, we ran regressions of the following form for each manager:[28]

$$R_{j,t} = \alpha_j + \sum_i \beta_{i,j} F_{i,t} + \sum_i \gamma_{i,j} F_{i,t}^2 + \mu_{j,t}. \qquad (5)$$

Our results, provided in **Table 7**, contain 19 significant coefficients on the quadratic terms (3 for carry timing, 7 for trend timing, 3 for value timing, and 6 for volatility timing). Fully 17 of these coefficients are positive, which indicates market-timing ability. About one-half of the managers have market-timing ability in some style; the greatest timing ability is in the trend factor.

Note also that the intercepts in the market-timing regressions are smaller than those in the four-factor regression. Only two managers (M8 and M29) have positive and significant intercept terms after accounting for market timing, compared with eight in the four-factor model. This result suggests that much of the alpha return comes from market timing.

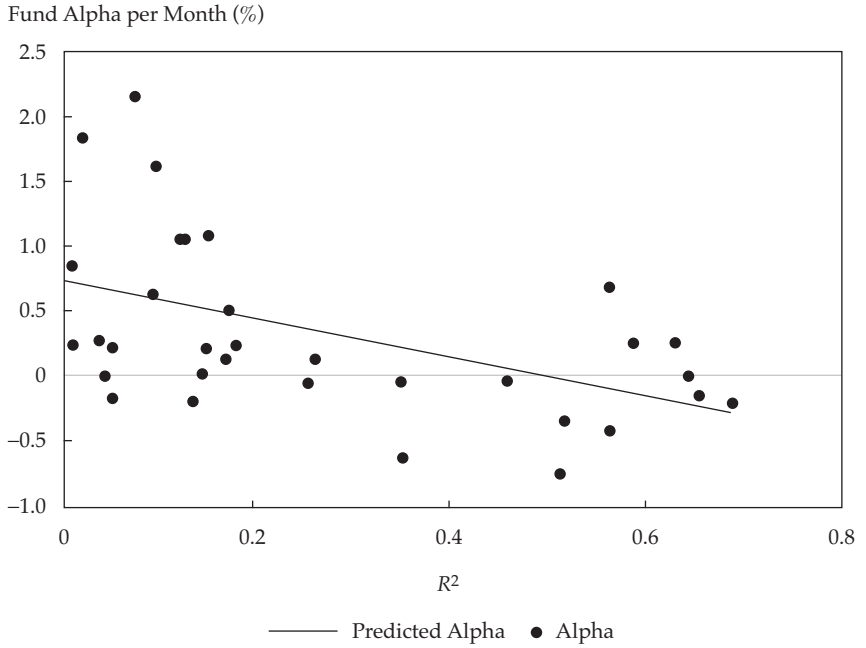
Alpha Returns and Beta Returns: Possible Trade-Off. To investigate the potential trade-off between true alpha and style betas as hypothesized by Anson (2008), we regressed the intercept terms (alphas) for each of the 34 funds against the R^2 from the time-series regression of each fund. The results of this cross-sectional regression are shown in **Figure 2**. We found a significant inverse relationship between fund alphas and the R^2s such that each 1 percent increase in R^2 tended to reduce monthly excess

Table 7. Market-Timing Model

Mgr	Intercept	*t*-Stat	β Carry	*t*-Stat	β Trend	*t*-Stat	β Value	*t*-Stat	γ Vol.	*t*-Stat	γ Carry	*t*-Stat	γ Trend	*t*-Stat	γ Value	*t*-Stat	γ Vol.	*t*-Stat	R^2
M1	0.0144	1.82	–1.88	–1.91	0.07	0.14	–1.02	–0.32	–0.38	–0.65	304.65	**2.08**	1.31	0.07	–324.07	–0.50	–16.19	–0.67	0.08
M2	–0.0017	–0.63	1.95	**4.13**	0.96	**6.78**	0.58	0.54	0.37	1.93	72.74	1.38	–1.49	–0.25	–77.12	–0.31	–10.28	–1.28	0.70
M3	0.0006	0.39	–0.38	–1.37	0.04	0.57	0.62	0.99	0.06	0.57	–0.24	–0.00	–7.54	**–2.15**	59.79	0.41	9.74	**2.04**	0.15
M4	0.0007	0.25	–0.58	–1.23	–0.27	–1.93	2.14	**2.01**	0.28	1.44	36.08	0.69	0.81	0.13	17.77	0.07	4.61	0.57	0.18
M5	–0.0010	–0.26	2.89	**4.65**	0.78	**4.20**	–0.38	–0.27	0.23	0.91	–58.85	–0.85	–6.43	–0.83	341.23	1.07	–8.75	–0.82	0.53
M6	–0.0011	–0.12	7.03	**4.48**	1.96	**4.18**	–1.09	–0.31	0.61	0.95	–106.5	–0.61	–16.66	–0.85	710.23	0.88	–23.74	–0.89	0.52
M7	0.0012	1.74	–0.11	–0.96	0.01	0.43	–0.26	–0.98	0.08	1.74	–5.02	–0.38	–0.34	–0.23	97.03	1.59	0.89	0.44	0.20
M8	0.0045	**2.19**	–0.33	–0.98	0.06	0.58	–0.63	–0.83	0.25	1.80	–23.58	–0.62	–1.22	–0.28	278.46	1.59	1.81	0.31	0.20
M9	0.0025	0.31	0.86	0.60	–0.23	–0.59	0.44	0.08	–0.10	–0.16	–132.7	–0.84	10.73	0.67	59.35	0.04	51.63	**2.37**	0.09
M10	–0.0005	–0.14	0.33	0.53	–0.07	–0.39	0.27	0.12	–0.11	–0.40	–48.61	–0.71	3.90	0.50	–5.64	–0.01	27.22	**2.61**	0.10
M11	–0.0020	**–4.16**	–0.09	–1.73	–0.01	–0.97	0.23	1.86	–0.00	–0.24	5.94	0.36	–0.50	–0.34	20.07	0.49	3.38	**2.39**	0.13
M12	–0.0058	–0.85	–1.31	–1.16	0.40	1.20	1.59	0.62	0.54	1.17	54.30	0.43	7.57	0.53	304.72	0.52	14.24	0.74	0.16
M13	–0.0008	–0.14	0.07	0.07	1.52	**4.99**	–1.93	–0.84	0.57	1.37	17.08	0.15	–7.92	–0.62	476.21	0.91	3.65	0.21	0.47
M14	0.0108	0.64	–2.25	–0.97	1.47	**2.50**	–0.71	–0.16	–1.79	–1.45	–397.0	–0.71	55.25	**2.40**	–911.11	–0.92	–1.61	–0.05	0.25
M15	–0.0094	**–2.18**	1.60	**2.52**	0.92	**3.23**	–3.24	–1.22	0.12	0.30	139.36	**2.11**	–1.56	–0.16	775.14	0.95	22.84	1.27	0.44
M16	0.0004	0.11	–0.37	–0.64	0.21	1.24	3.56	**2.67**	0.09	0.38	62.25	0.95	–1.10	–0.14	54.97	0.18	2.94	0.29	0.16
M17	–0.0090	–1.36	2.84	**2.59**	0.18	0.57	4.87	1.97	0.03	0.07	89.84	0.73	–9.11	–0.66	–25.70	–0.04	25.69	1.37	0.37
M18	–0.0064	**–3.04**	0.08	0.22	–0.12	–1.16	1.18	1.48	0.09	0.65	92.97	**2.37**	8.49	1.92	62.18	0.34	0.56	0.09	0.25
M19	–0.0011	–0.24	0.21	0.27	–0.38	–1.66	–1.82	–1.03	0.18	0.57	98.34	1.13	12.25	1.25	–226.41	–0.56	–6.35	–0.47	0.08
M20	–0.0210	–1.55	0.49	0.21	4.75	**7.06**	–3.70	–0.73	0.29	0.31	–104.7	–0.42	72.88	**2.59**	1,602.9	1.39	7.39	0.19	0.68
M21	–0.0117	–1.29	2.32	1.55	2.96	**6.31**	–0.42	–0.11	0.29	0.43	120.85	0.48	13.18	0.58	822.99	1.01	–18.4	–0.67	0.58
M22	0.0022	0.49	2.12	**2.78**	0.30	1.31	2.12	1.29	0.39	1.26	–129.7	–1.53	1.76	0.18	131.35	0.33	–5.79	–0.44	0.28
M23	–0.0017	–0.27	–1.16	–1.11	0.07	0.22	1.99	0.84	0.10	0.25	185.10	1.60	29.50	**2.26**	–1,108.05	**–2.07**	13.00	0.73	0.21
M24	–0.0043	**–2.05**	–0.59	**–2.15**	0.85	**7.56**	0.49	0.71	–0.08	–0.47	48.59	1.11	12.09	**3.08**	–52.80	–0.31	5.21	1.00	0.68
M25	0.0006	0.14	0.11	0.14	–0.07	–0.32	2.39	1.36	0.51	1.60	37.24	0.43	18.34	1.88	852.38	**2.13**	5.30	0.39	0.25
M26	0.0114	1.36	–1.01	–0.72	–0.11	–0.26	0.35	0.11	0.43	0.75	–42.71	–0.27	14.42	0.83	383.00	0.54	48.48	2.05	0.14
M27	–0.0062	**–2.68**	0.32	1.30	0.23	**2.47**	–0.44	–0.55	0.39	**2.63**	28.79	0.55	21.70	**3.95**	–83.24	–0.47	1.77	0.25	0.59
M28	–0.0018	–0.90	0.00	0.01	–0.07	–0.72	–0.84	–1.08	0.11	0.77	15.68	0.40	5.92	1.36	489.63	**2.75**	6.24	1.05	0.21
M29	0.0189	**2.62**	–0.04	–0.03	0.03	0.09	4.05	1.50	1.05	**2.13**	–232.2	–1.74	–8.30	–0.55	680.58	1.11	14.05	0.68	0.14
M30	–0.0132	–1.60	3.67	**2.67**	1.67	**4.06**	–9.00	**–2.91**	0.49	0.87	170.98	1.12	39.80	**2.32**	–389.84	–0.55	32.09	1.37	0.63
M31	–0.0090	–1.89	1.07	1.34	1.64	**6.91**	–2.57	–1.43	0.21	0.64	152.12	1.72	10.60	1.06	79.38	0.19	8.89	0.65	0.68
M32	–0.0026	–0.50	–0.12	–0.14	1.34	**5.19**	–1.44	–0.73	0.44	1.25	16.48	0.17	17.59	1.62	303.13	0.68	29.64	2.01	0.61
M33	0.0079	0.71	1.81	0.98	–0.49	–0.89	–2.92	–0.70	1.95	**2.57**	–148.1	–0.72	9.27	0.40	666.94	0.70	6.72	0.21	0.13
M34	–0.0010	–0.60	0.42	1.42	0.16	1.91	–0.16	–0.24	0.07	0.65	36.51	1.11	5.56	1.51	53.44	0.35	0.24	0.04	0.30
Aver.	–0.0010	–0.40	0.59	0.51	0.61	1.91	–0.17	0.11	0.23	0.78	10.47	0.34	9.14	0.71	179.97	0.43	7.56	0.59	0.33
Max.	0.0189	2.62	7.03	4.65	4.75	7.56	4.87	2.67	1.95	2.63	304.65	2.37	72.88	3.95	1,602.90	2.75	51.63	2.61	0.70
Med.	–0.0011	–0.25	0.10	0.18	0.17	0.89	–0.21	–0.14	0.22	0.70	22.94	0.42	5.74	0.52	70.78	0.38	4.91	0.42	0.25
Min.	–0.0210	–4.16	–2.25	–2.15	–0.49	–1.93	–9.00	–2.91	–1.79	–1.45	–397.0	–1.74	–16.66	–2.15	–1,108.0	–2.07	–23.74	–1.28	0.08
Results for the BCTI, full sample: 1990–2006																			
BCTI	–0.0023	–1.45	0.80	**3.68**	1.17	**14.28**	–1.18	**–2.65**	0.02	0.27	12.55	0.87	7.77	**3.34**	–89.72	–1.61	–3.13	–1.12	0.68

Notes: Regression results for Equation 5 are for managers $j = 1, \ldots, 34$. Data are based on 72 monthly observations. Boldface indicates statistical significance at the 5 percent level. Mgr = manager.

Figure 2. Relationship between Currency Managers' Alpha and R^2



Note: The regression statistics are as follows (boldface indicates statistical significance at the 5 percent level):

intercept (*t*-statistic in parentheses)	*coefficient*, R^2 (*t*-statistic in parentheses)	R^2
0.70% **(4.46)**	–0.014 **(3.17)**	23.9%

returns by about 1.4 bps. The more individual fund returns could be explained by our four style factors, the less likely was the fund to generate a true alpha in the sense of a return that is uncorrelated with a readily attained market index or trading strategy.

Conclusion

We investigated which factors help explain an index of currency-trading returns and the returns for individual currency managers. The results show that four factors, representing four styles of currency investing, explain a significant part of these returns. The average excess return of the BCTI was positive at 25 bps per month between 1990 and 2006. Once we accounted for the four systematic beta factors, however, the alpha became negative (–9 bps per month) and not statistically different from zero. Considering that our sample returns are net of management fees, which are typically 2 percent per year (or about 16 bps per month) plus a share of profits, our estimated alpha would be positive only prior to management fees and transaction costs. This finding is not encouraging news for currency managers.

The 1990s and the post-2000 period exhibit some interesting differences. First, volatility was not a significant factor in the 1990s, but it became significant after 2000. This change may be related to the increase in options turnover in the most recent years. Second, the average excess return in the 1990s was 36 bps per month, but after 2000, the average excess return declined to only 8 bps per month. In neither period, however, were currency managers able to generate a positive alpha on average. Despite all the talk in the currency fund industry that the recent years have been more challenging for currency management, we witnessed a decline only in the beta returns. The average alpha has remained almost the same, –16 bps per month in the 1990s and –11 bps per month after 2000.

Not all the news is bad for currency managers, however. Our results show that 24 percent of the managers were able to generate positive and significant alphas between 2001 and 2006. The average alpha of these "stars" was quite high, 104 bps per month (or 12.48 percent per year), and significant. Importantly, this 104 bps of alpha remained after taking into account the four explanatory factors—carry, trend, value, and volatility (the first three of which reflect returns on naive currency-trading strategies)—and after deducting all management fees. This finding demonstrates that currencies have similarities to other asset classes whose returns can

be related to risk factors. Although the average manager may underperform, some skilled managers are able to deliver significant alpha.

What do our results mean for active currency management? They support the notion that the FX market offers opportunity for alpha generation. Greater emphasis should be put on "active," however, in currency management. Our factor model makes clear that not all returns generated by currency managers are pure alpha. A significant part of currency returns comes from exposure to a small set of factors that proxy the returns from well-known and easily implemented trading styles. This realization may lead to some repricing for "active" currency products. Funds will have difficulty justifying alpha fees for exposure to currency style betas that could be earned more cheaply.

Our results also suggest that the recent lackluster returns from currency managers are the result of declining beta returns that stem mainly from the declining profitability of trend-following rules—not from declining alpha generation. In the context of our factor model, alpha generation did not decline after 2000 in comparison with the 1990s. Our results show that delivering alpha has never been easy, which helps explain why investors are willing to pay high fees for true alpha performance. An index of currency managers tended to underperform in the 1990s and after 2000, but some skillful managers were able to deliver positive and significant alphas.

Our results are subject to the limitation that we analyzed only one index of currency hedge fund managers who contributed their data for the 1990–2006 period and only those individual managers who survived in the 2001–06 period. Further research (which we have begun) is needed to establish whether our model holds up for other currency fund indices, other managers, and other time periods.

We acknowledge helpful comments from Mark Anson and Robert Whitelaw on earlier drafts of this article.

This article qualifies for 1 CE credit.

Notes

1. Poole (1967), Dooley and Shafer (1976), Sweeney (1986), Levich and Thomas (1993), and Neely, Weller, and Dittmar (1997), among others, documented the profitability of technical trend-following models in currency markets. Bilson (1981) demonstrated that a persistent forward-rate bias could be exploited for trading profits, and many others have shown the general tendency for currencies with high interest rates to appreciate. See Froot and Thaler (1990) for a survey and Burnside, Eichenbaum, Kleschelski, and Rebelo (2006) for a recent study. Studies prepared at Citibank (2003) and Deutsche Bank (2007) suggest that simple trading strategies based on mean reversion to long-run PPP (purchasing power parity) exchange rates have been profitable.
2. See Branson and Henderson (1985) for a survey article.
3. The seminal article in this area is Meese and Rogoff (1983). Rogoff (2002) argued that the evidence for unpredictability is still compelling.
4. See the studies cited in Note 1. Burnside et al. (2006), among others, showed that currency returns are uncorrelated with the returns of other asset classes.
5. See Fung and Hsieh (1997) for their seminal paper, in which they used dynamic trading strategies as style factors to model hedge fund returns. Fung and Hsieh provided follow-up studies in 2002 and 2004.
6. The Bank for International Settlements conducted surveys of global FX trading during our sample period—specifically, in 1992, 1995, 1998, 2001, and 2004. In all five surveys, the G–10 currencies accounted for an average 89.8 percent of all currency turnover.
7. In a LexisNexis search, we found references to the "carry trade" in the popular press in the 1970s. Academic papers such as those of Bilson (1981) and Froot and Thaler (1990) publicized the puzzling profitability of the carry trade, which many academic papers call the "forward-rate bias strategy."
8. The Citibank Beta1 G10 Carry Index is an equally weighted basket of carry trades in 13 pairs of currencies selected from among the 10 major currencies (Citibank 2007). We also included the Citibank EM Carry Index as a fifth explanatory variable to test for the possibility that exposure to emerging markets is significant. This variable was not statistically significant.
9. A survey by Taylor and Allen (1992) found that 90 percent of FX traders in the United Kingdom made use of technical analysis. A more recent survey by Cheung and Chinn (2001) of FX traders in the United States found that technical trading was the most commonly reported trading practice. References to the extensive literature on technical trading in currencies are in Note 1.
10. The AFX is based on trading in seven currency pairs—EUR and USD, USD and JPY, USD and CHF, GBP and USD, EUR and JPY, EUR and GBP, EUR and CHF—weighted by their volume of turnover in the spot market. The AFX is prepared at Liverpool John Moores University.
11. The Big Mac Index introduced by the *Economist* magazine in 1988 is a well-known example of measuring currency over- and undervaluation on the basis of a single homogeneous good.
12. Recent papers documenting the mean-reverting tendency of real exchange rates (for example, Taylor and Taylor 2004) have rehabilitated PPP and provided a firm foundation for using PPP as part of a trading strategy.
13. The G10 PPP relies on 13 pairs of currencies selected from among the 10 major currencies and uses Organization for Economic Cooperation and Development measures of PPP (Citibank 2007).
14. Prior to the introduction of the euro in January 1998, we used implied volatility for the DEM/USD rate. Monthly data on volatility for other major currencies prior to 1995 are not available. For the 2001–06 period, the correlation between our volatility measure and a currency-volatility benchmark prepared by Deutsche Bank based on nine major currency pairs is 0.91.

15. We are grateful to Barclay Hedge for supplying the monthly data on its index. As in previous studies of hedge fund returns, we used monthly data. Daily data were not available. Although daily data would have provided a larger sample and potentially greater estimation precision, daily data also bring certain problems. First, given the volatile nature of around-the-clock FX trading, daily fund returns may be subject to inaccuracies, which produce noise in the data. Second, holiday trading schedules vary from country to country. As a result, some currencies that are used to construct the daily return factors will be missing daily data points and currency managers closed for the holiday will have missing data points. Using weekly or monthly data mitigates these problems. For these reasons, in future research, even if daily data are available, we will work with weekly data.
16. As our proxy for LIBID in month t, we used the one-month USD LIBOR rate on the last day of month $t - 1$ as quoted by the British Bankers' Association minus 12.5 bps.
17. There is substantial correlation between our currency-volatility measure, the Chicago Board Options Exchange Volatility Index (VIX), which is a proxy for the volatility in the equity market, and Merrill Lynch & Co.'s MOVE Index, which is a proxy for volatility in the bond market. All three measures have declined considerably since 2000.
18. To test for the possibility that monthly returns were "managed," we included one-month lagged returns as a fifth explanatory variable. This variable was not statistically significant.
19. Based on our estimated model, the 34 bps comprises 10 bps attributable to carry (equal to the carry coefficient multiplied by the average carry return), 27 bps to trend, –3 bps to value, and 0 bps to volatility.
20. See Pukthuanthong-Le, Levich, and Thomas (2007); Pukthuanthong-Le and Thomas (2008).
21. See http://cisdm.som.umass.edu/index.asp.
22. We are grateful to Barclay Hedge for supplying the monthly data on individual managers; we identify them only by number.
23. As one indicator of the potential bias, we note that in 2001, the BCTI was based on data from 47 funds. Only 34 of those survived to establish a full six-year history through 2006.
24. In a specification that omitted the value factor, these coefficients were also statistically significant.
25. George Soros used this strategy to garner great profits in the summer of 1992 by borrowing high-interest-rate Italian lire and British pounds to own low-interest-rate German marks.
26. Using simulated data, Binny (2005) showed that alternative currency-trading styles (value forecasting, trend-following, return forecasting, and nondirectional strategies) produce returns that are imperfectly correlated.
27. When we included lagged returns as a fifth explanatory variable, the lagged returns were significant for six managers, with significant positive coefficients in four cases and significant negative coefficients in two cases. These results are consistent with the notion that returns at some funds may be managed. In two cases (M16 and M23), alpha became insignificant after adding lagged returns to the regression.
28. The classic reference for this type of specification is Treynor and Mazuy (1966). Lo (2007) proposed a quadratic term as a way to detect market-timing skills.

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