

Patterns in Currency Hedge Fund Returns and Trading Styles

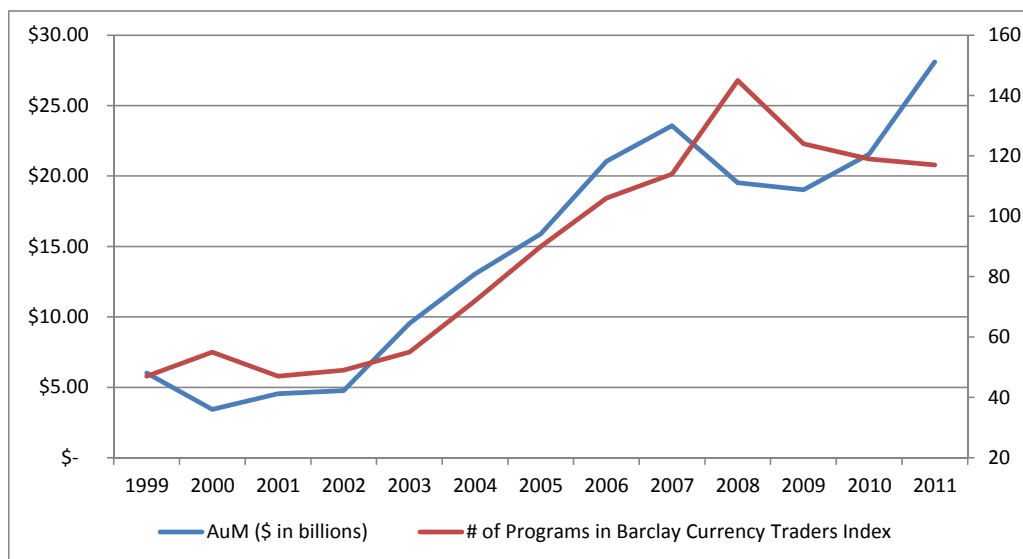
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p. 1

Barclay Currency Traders Index No. of Programs and AUM in \$ billions on December 31



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p. 2

Three Studies on Currency Hedge Fund Management

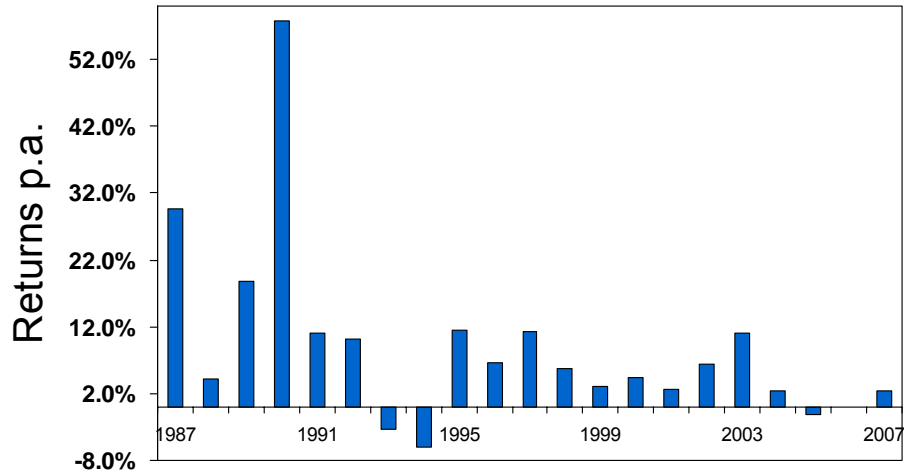
- **Do Currency Fund Managers Beat the Benchmark?**
 - » Currency as an asset class debate
 - » Model currency hedge fund returns (for an index and individual funds) as a function of style factors.
 - » Style factors have high explanatory power and offer a new benchmark for excess returns
- **Trades of the Living Dead**
 - » Use new daily data base, analyze returns and behavior of surviving vs. deceased currency funds
- **Detecting Crowded Trades in Currency Funds**
 - » Analyze number of funds crowding into common trading strategies and later performance

What's the Right Benchmark for Currency Hedge Fund Managers?

- **Motivation**
 - » Are professional currency managers doing well or poorly?
 - » Relative to what? What's the right benchmark?
- **Methodology**
 - » Model currency returns using a factor model: "style factors"
 - » Factors proxy well-known currency trading styles
 - » Examine index returns 1990-2006; individual manager returns 2001-06
 - » Analyze sources of alpha and possible alpha-beta trade-off
- **Results and implications of benchmark choice for performance measurement and rankings**

Currency Managers Have Performed Well in the Past (or Have They?)

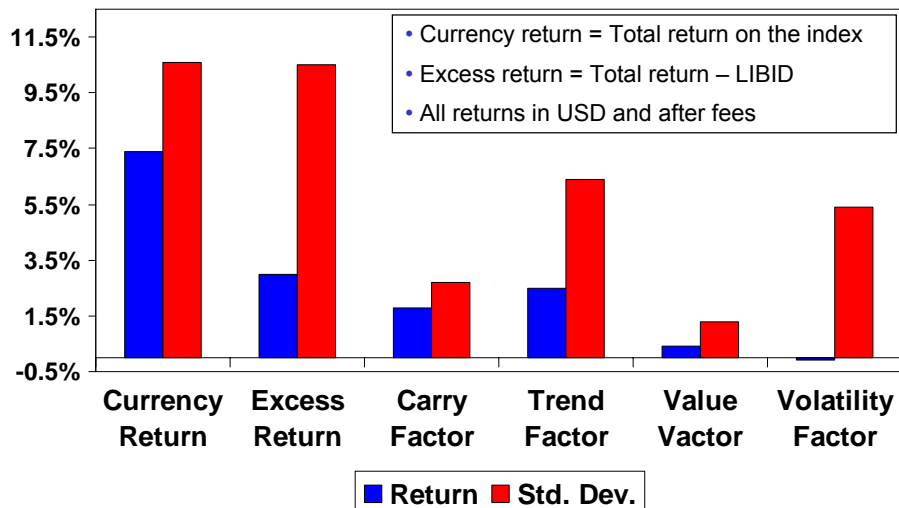
The Barclay Currency Traders Index



Source: The Barclay Group, www.barclaygrp.com

Currency Returns and Currency Risk Factors

Per annum figures for Jan. 1990 - Dec. 2006 (N=204)



What is the Right Benchmark?

- The conventional standard: The expected rate of return from currency investment is zero
 - » For a funded program (i.e. a currency hedge fund with funds under management) \Rightarrow benchmark = risk-free rate = LIBID
 - » For an unfunded program (i.e. a currency overlay with only trading lines against collateral) \Rightarrow benchmark = 0
- Theoretical basis for the conventional benchmark
 - » Most all macroeconomic models treat currency risk as diversifiable
 - » Empirically, most studies find currency is zero-beta asset.
- By comparison, standard APT (Arbitrage Pricing Theory) models express returns as a linear function of risk or macroeconomic factors
 - » If such factors exist (e.g. small firms, value firms, etc.) and investors can easily implement these as trading strategies, then the return on those strategies could serve as an alternative benchmark.

The Basic Model

- Propose a standard factor model of the form:

$$R_t = \alpha + \sum_i \beta_i F_{i,t} + \varepsilon_t$$

where

- » R is the excess return generated by the currency manager, defined as the total return less the periodic risk-free rate
- » α is a measure of active manager skill,
- » F is a beta factor, that requires a systematic risk premium in the market,
- » β is a coefficient or factor loading that measures the sensitivity of the manager's returns to the factor, and
- » ε is a random error term

Excess Currency Index Returns as a Function of Four Factors

$$R_t = \alpha + \sum_i \beta_i F_{i,t} + \varepsilon_t$$

Barclay Currency Traders Index		Citibank Beta1 G10 Carry Index	AFX Index	Citibank Beta1 G10 PPP Index	Implied Volatility
	Alpha	Carry Beta	Trend Beta	Value Beta	Vol. Beta
Jan 1990 - Dec 2006 R ² =0.66	-9 bps (-0.72)	0.70 (3.30)	1.28 (17.44)	-1.01 (-2.25)	0.04 (0.43)

Excess Currency Index Returns as a Function of Four Factors (split sample)

Barclay Currency Traders Index		Carry Index	AFX Index	PPP Index	Implied Volatility
	Alpha	Carry Beta	Trend Beta	Value Beta	Vol. Beta
Jan 1990 - Dec 2000 R ² =0.68	-16bps (-0.72)	0.74 (2.78)	1.44 (14.91)	-1.38 (-2.44)	-0.04 (-0.38)
Jan 2001 - Dec 2006 R ² =0.77	-11bps (-1.00)	1.03 (3.99)	0.77 (9.71)	-0.64 (-1.01)	0.33 (3.09)

Regression Results for 34 Individual Managers

- Eight managers (24%) exhibit positive and significant alpha
- R^2 exceeds 50% for 9 of the 34 managers. Substantial part of the excess returns stems from exposure to our risk factors
- The highest exposure remains towards the trend-following factor (15 managers). The carry factor is significant for 8 managers and volatility and value for only 7 and 5 managers
- Twenty-one managers have a significant exposure to at least one factor
 - » 9 of those have significant exposure to two factors, and
 - » 2 managers have significant exposure to three factors
 - » One manager has a significant exposure to all four factors
- Thirteen managers (38%) have no significant exposure towards any style. True alpha hunters?

Alpha hunters and Beta grazers?

- Consider managers M2 and M28
 - » Both earned about 3% p.a. or so above LIBID. That's good.
 - » M2's returns were highly correlated with 3 factors (β grazer)
 - » M28's returns were not correlated with the factors (α hunter)
 - » A style factor benchmark changes performance measures

Jan 01- Dec 06	Excess Return	Alpha	Carry Beta	Trend Beta	Value Beta	Vol. Beta
M2 $R^2=0.69$	3.70%	-2bps (-1.12)	2.27 (5.40)	0.90 (6.98)	0.33 (0.32)	0.37 (2.14)
M28 $R^2=0.03$	3.02%	3bps (2.02)	-0.07 (-0.23)	-0.00 (-0.06)	-0.19 (-0.23)	0.16 (1.17)

Beating the Benchmark – Some Implications

- Performance evaluation
 - » Changing the benchmark can radically change ranking of managers and assessment of their performance
- Management Fees
 - » Is the 2 & 20 formula appropriate for all managers?
- Strategies toward currency
 - » Can investors replicate the bulk of currency fund manager returns through ETFs geared to the style factors?

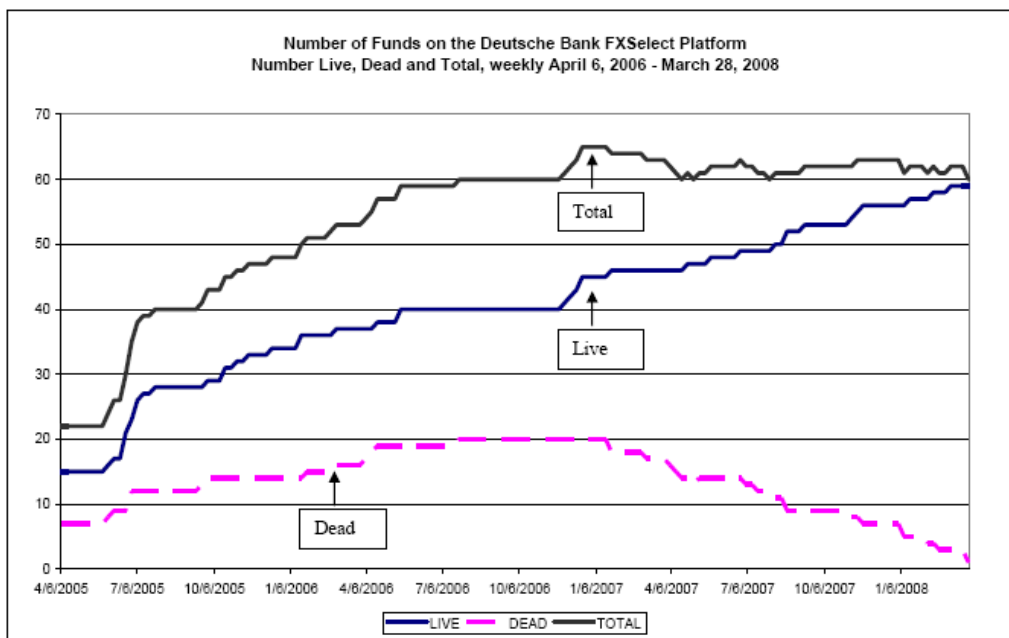
“Trades of the Living Dead” - Introduction

- Motivation – Questions following from our earlier research
 - » Is past performance a predictor of future performance?
 - » Are currency investment styles persistent?
 - » Are there differences between surviving and deceased funds?
- Methodology
 - » New database of daily returns from Deutsche Bank FXSelect trading platform, that includes living and deceased funds
 - » Regressions using “style factors” provide estimate of alpha and beta elements of currency hedge fund returns
- Brief Overview of Results
 - » In this sample and sample period, little alpha or alpha persistence
 - » Significant betas and beta persistence
 - » Significant differences in returns and styles of living and dead funds

Database on Currency Hedge Fund Returns

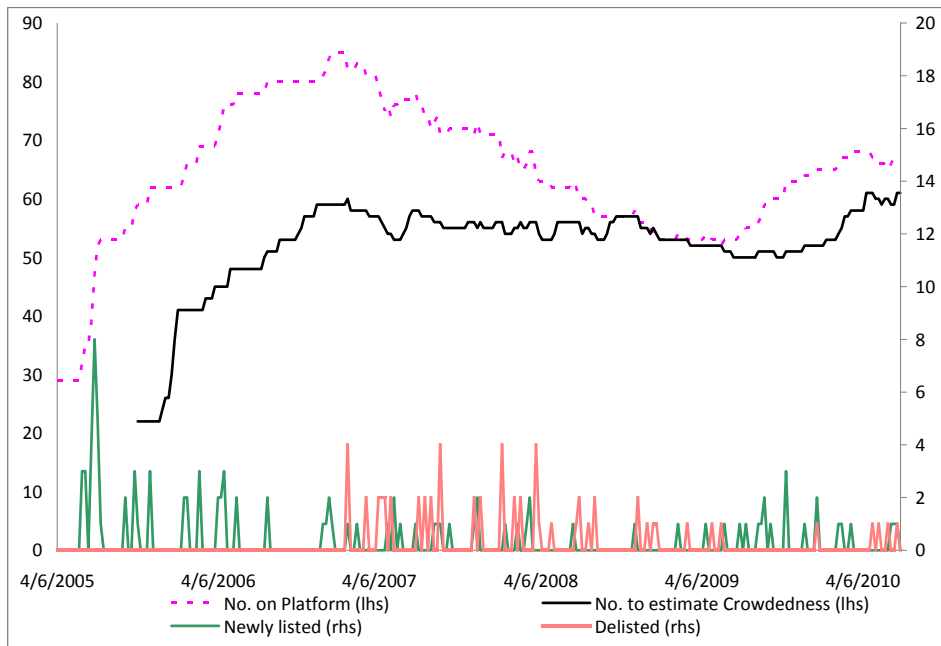
- Deutsche Bank FXSelect platform
 - » Launch date – March 2005
 - » Hosts currency hedge fund managers and open to DB clients
- Criteria for hosting a manager on DB FXS
 - » At least 18 months daily track record, verified by third party
 - » No more than 20% draw-down of AUM within prior 12 months
 - » AUM at least 15 million USD
- DB provided data on all funds on the platform from inception
 - » High quality data, audited with DB as prime broker
 - » Daily data, April 2005 – March 2008; Returns are gross of fees
 - » Transform daily data to weekly returns; n=156 weeks
 - » No. of funds varies as new funds list and active funds de-list
 - » Overall, 80 funds had a presence on the platform at any one time, from 22 funds (April 2005) to 65 funds (December 2006)

Number of Funds on the DB FXSelect Platform



Number of Funds on DB FX Select Platform, Number Used to Estimate Crowdedness, Number Newly Listed and Delisted

Weekly data: 4/06/2005 - 6/30/2010



p. 17

Grouping Managers into Fund of Funds

- An investible index of all funds on the DB FXSelect platform

$$R_{FOF,t} = \sum_{j=1}^{n_t} R_{j,t} / n_t$$

$R_{j,t}$ is weekly return for manager j at time t

n_t is number of managers on the platform at time t

- Indices to measure the performance of “live” and “dead” funds

$$R_{L,t} = \sum_{j=1}^{n_{L,t}} R_{j,t}^L / n_{L,t} \qquad R_{D,t} = \sum_{j=1}^{n_{D,t}} R_{j,t}^D / n_{D,t}$$

for funds that are

- live (L) as of April 2008 and on the platform at time t
- dead (D) as of April 2008 but available at time t

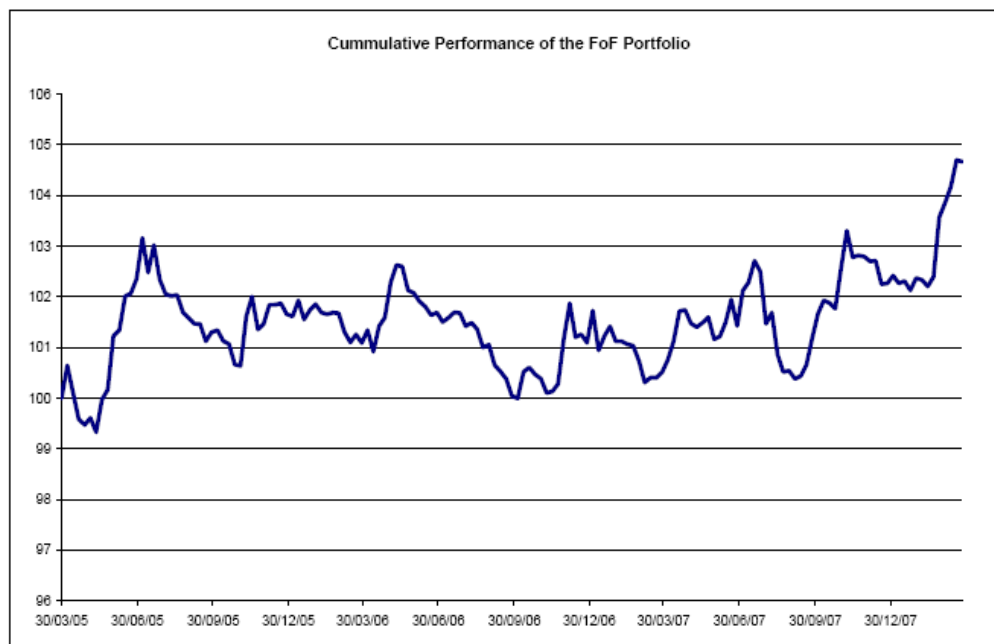
Excess Currency Index Returns as a Function of Four Factors

$$R_t = \alpha + \sum_i \beta_i F_{i,t} + \varepsilon_t$$

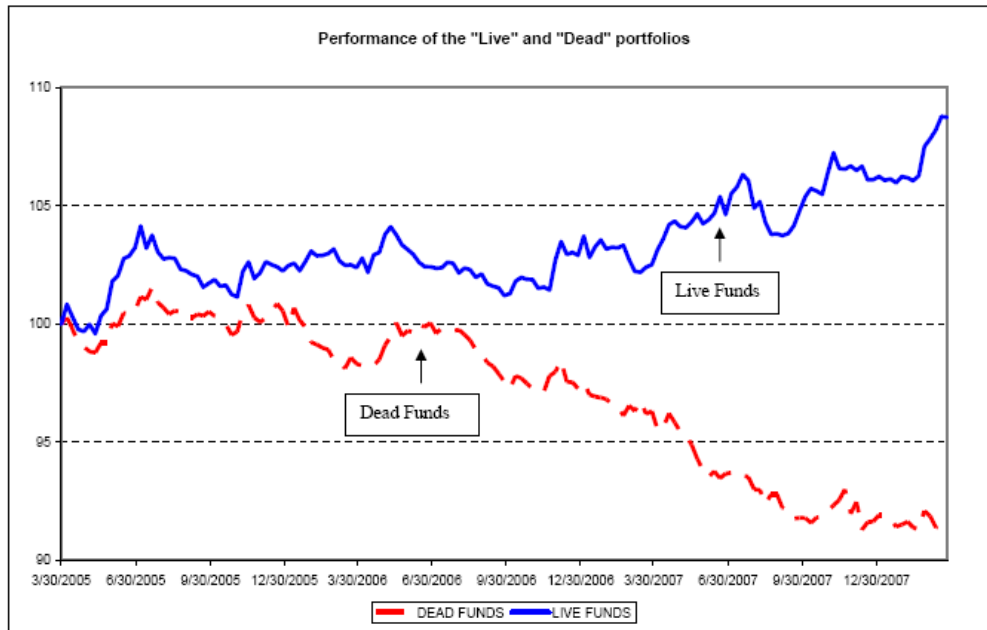
Fund	Alpha	F ₁ (Carry)	F ₂ (Trend)	F ₃ (Value)	F ₄ (Volatility)	R ²
Investible FoF	0.1 bps (0.31)	0.14 (6.03)	0.40 (10.88)	-0.08 (-3.85)	0.12 (1.53)	0.534
“Live” FoF	2.7 bps (1.16)	0.19 (7.21)	0.45 (10.70)	-0.10 (-4.25)	0.15 (1.74)	0.550
“Dead” FoF	-6.4 bps (-2.31)	-0.06 (-2.12)	0.23 (4.57)	0.02 (0.75)	-0.01 (-0.15)	0.183

Based on 156 weekly returns, 4/06/2005 – 3/26/2008. T-values in parentheses.

Cumulative Performance: Investible FoF Portfolio



Cumulative Performance: "Live" and "Dead" Portfolios



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p. 21

Differences Between Live and Dead Funds

- R^2 for Live funds (55%) greater than for Dead funds (18%)
- Alpha estimates
 - » Live funds - Positive alpha, but not significant
 - » Dead funds - Significant negative alpha
- Beta estimates
 - » Live funds
 - ◆ Significant (+) Carry and Trend betas; Significant (-) Value beta
 - » Dead funds
 - ◆ Significant (-) Carry beta; Smaller, but significant, Trend beta
 - ◆ Insignificant Value beta
- Market timing ability (estimated using regressions with F^2 terms)
 - » Both live and dead funds show positive timing ability in trend
 - » Weaker evidence that dead funds have negative timing in volatility

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p. 22

Regression Results for Individual Managers

- 15 Managers with full 3-year sample
 - » None have significant alpha
 - » All but 2 have significant beta w.r.t. at least one factor
- Analyze individual managers in successive yearly samples
 - » Years 1, 2 and 3 with N= 22, 52, and 46 managers
 - » Fraction of managers with significant betas

	Carry Beta	Trend Beta	Value Beta	Volatility Beta
April 05 – March 06	9%	50%	14%	14%
April 06 – March 07	15%	35%	10%	13%
April 07 – March 08	50%	28%	37%	17%

Performance and Style Persistence

- Use successive one-year samples
 - » Limited by those funds that survive for 24 months
 - » Performance persistence using estimated alphas
$$\alpha_{jt} = \delta_0 + \delta_1 \alpha_{jt-1} + \mu_{jt}$$
 - » Style persistence using estimated betas
$$\beta_{jt} = \delta_0 + \delta_1 \beta_{jt-1} + \mu_{jt}$$
 - » Results show “average” persistence of the group, not of an individual manager
 - » Empirical results (in this sample)
 - ◆ No evidence of alpha persistence (contrary to our earlier study)
 - ◆ Significant evidence of beta, or style persistence

“Trades of the Living Dead” Conclusions and Implications

- New data on new sample period confirm our earlier results:
 - » Four factors, representing four well-known strategies, explain a significant part of fund returns.
- Significant differences between living and dead funds
 - » Living funds track factor benchmarks more closely
 - » Dead funds have negative alpha, from negative exposure to profitable factor benchmarks and weak timing ability
- In tests measuring persistence on average among individual managers
 - » No significant performance persistence
 - » Significant style persistence
- Style persistence should benefit institutional managers seeking to diversify across various currency investment strategies

Crowded Trades - Introduction

- Motivation and Intuition
 - » Crowded trades may pose an additional systemic financial risk
 - » Some FX trades (e.g. Carry) suffered huge losses in recent crisis
 - » Both investors and regulators could take action if (a) crowded trades could be spotted and (b) crowding could be linked to risk
- Methodology and Limitations
 - » Measure style factors to calculate how many professional funds are following a style
 - » Crowdedness defined by popularity of a trading style or strategy
- Brief Overview of Results
 - » In this sample of managers and sample period, the fraction of managers following Carry, Trend and Value varies considerably
 - » Crowdedness appears linked to high past returns (herding behavior)
 - » Unanswered questions: Is crowding linked to risk, or return?

Crowded Fishing is Bad for Returns



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p. 27

Crowded Places Can Be Dangerous



“There's a whiff of the lynch mob or the lemming migration about any overlarge concentration of like-thinking individuals, no matter how virtuous their cause.”

P. J. O'Rourke, *Parliament of Whores* (1991)

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p. 28

A Definition of Crowdedness

- The crowdedness of style F at time t ($C_{F,t}$) as
 - » the percentage of the funds (a) with significant positive exposure to style F
 - » less the percentage of the funds (b) with significant negative exposure to the same style (contrarians).

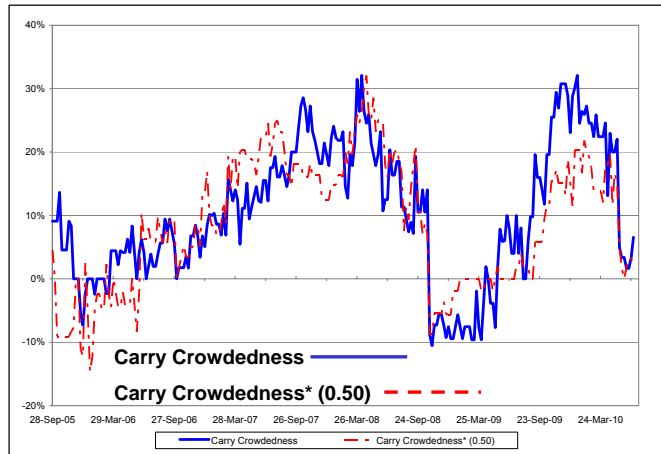
$$C_{F,t} = a_{F,t} - b_{F,t}$$

Empirical Results on Crowdedness

- Crowdedness varies considerably over the sample
 - » Carry: from -7% to 31%
 - » Trend: from +4% to 34%
 - » Value: from +12% to -27%
- What leads to crowding or thinning?
 - » Some evidence that prior returns on a strategy induce entry
 - » And lack of returns induces exit or migration away
- Who does the crowding?
 - » Some funds change their style and link to a new strategy
 - » Other funds linked to a strategy join (leave) the DB platform

Robustness Tests

- We define fund j in strategy i only if $t(\beta_i) \geq 2$
 - » What if you were less demanding. Ignore significance and use $\beta_i \geq 0.25$; or 0.50; or 0.75; or 1.0? *Very similar results.*



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p. 31

Some Initial Conclusions and Implications

- New measure of crowdedness shows considerable variability
- Crowdedness may contain information about additional risks (or opportunities) of remaining in a particular trade
 - » Carry became crowded in 2008 Q1 prior to its collapse
 - » Value was crowded with contrarian positions prior to its surge
 - » Trend crowdedness dissipated prior to a surge in returns
- Crowdedness data could inform both managers and regulators
 - » Managers want the first-mover advantage of finding uncrowded trades, that are then discovered by others
 - » As speculators enter into a trade, prices adjust leaving lower expected returns for future speculators
 - » Managers could assign greater risk to crowded trades
 - » Regulators could measure crowdedness and publicize results

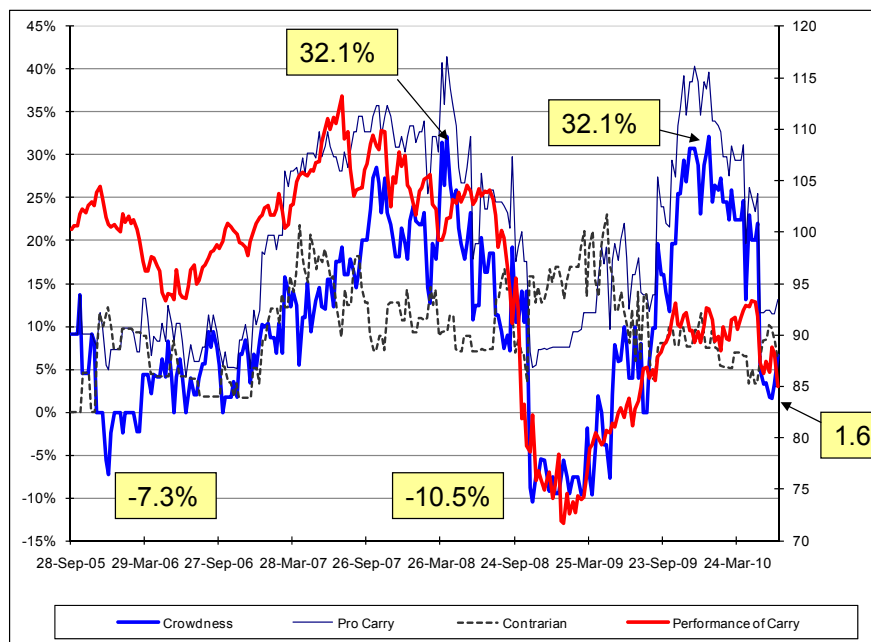
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p. 32

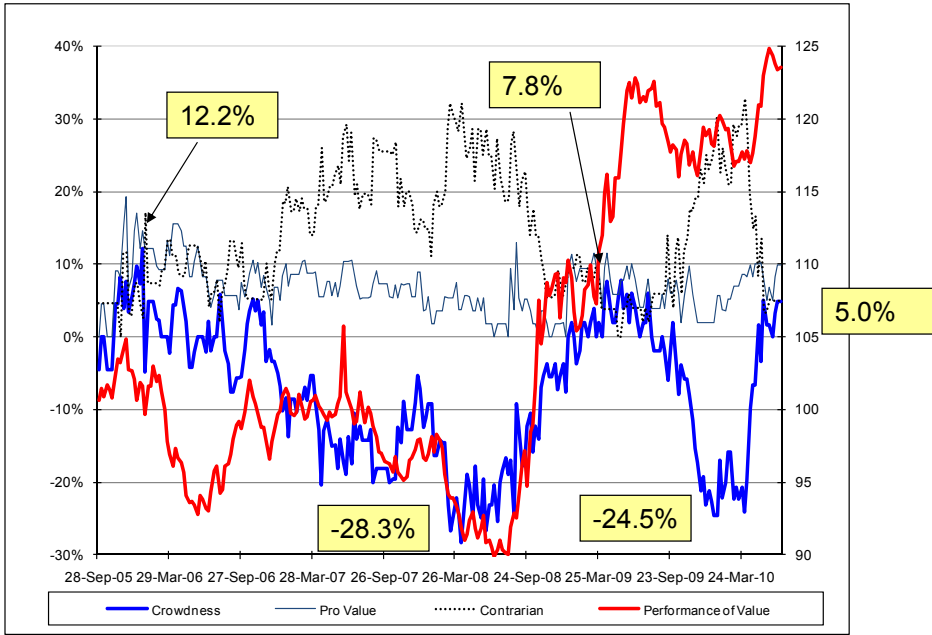
Out-of-Sample Analysis of Crowdedness

- The original sample spanned April 6, 2005 – March 26, 2008 (n=156 weeks)
- We extended the sample through June 30, 2010 to analyze if cycles of high crowdedness (low performance) and low crowdedness (high performance) continued.
- During the global financial crisis, we observe familiar patterns of crowdedness and performance
 - » Carry collapses during the crisis, returns to popularity, and then collapses again with the Greek crisis and flash crash
 - » Value reflects flight to undervalued currencies during crises
 - » Trend followers returned when performance picked up

Carry Crowdedness – Updated to June 30, 2010

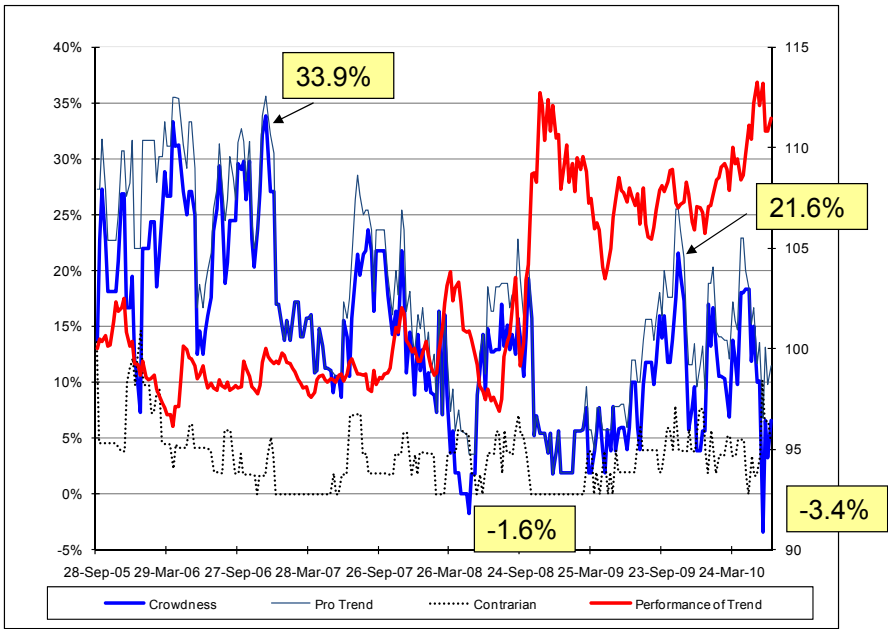


Value Crowdedness – Updated to June 30, 2010



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Trend Crowdedness – Updated to June 30, 2010



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What else? What next?

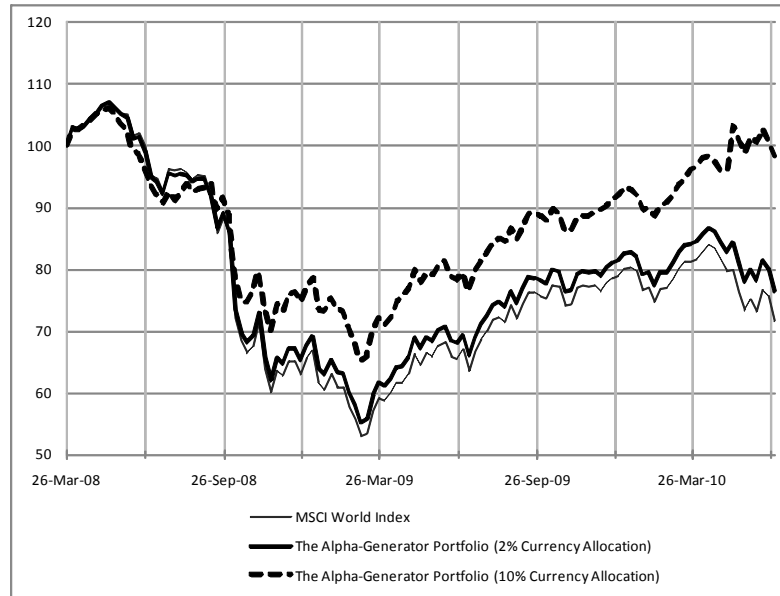
- What would currency funds (either beta grazers or alpha hunters) add to a global equity portfolio?
 - » Linked to currency as an asset class debate
 - » Pojarliev and Levich, "Are All Currency Managers Equal?" *Journal of Portfolio Management*, Summer 2011.
- Trading strategies based on crowdedness
 - » Do strategies based on crowdedness outperform?
 - ◆ Exit (under-weight) crowded trades and enter (over-weight) uncrowded trades
- A "Crowdedness Index" as public information
 - » Could produce and provide to market as a risk indicator
 - » Could this measure of crowdedness be used in other markets – e.g. gold, commodities, or more generally?

Out-of-Sample Relative Performance to the MSCI World Index by Adding Currency Managers

	2% Allocation to Currency Managers				10% Allocation to Currency Managers			
	Excess Return	Tracking Error	Info. Ratio	Std. Dev. of Returns	Excess Return	Tracking Error	Info. Ratio	Std. Dev. of Returns
Portfolio 1: Equity + Total Return FX	123 bps	76 bps	1.62	23.03%	614 bps	380 bps	1.62	20.05%
Portfolio 2: Equity + Beta Chasing FX	57 bps	74 bps	0.77	23.27%	284 bps	369 bps	0.77	20.96%
Portfolio 3: Equity + Alpha Hunting FX	182 bps	66 bps	2.78	23.62%	911 bps	328 bps	2.78	22.96%
Portfolio 4: Equity + Alpha Generating FX	257 bps	92 bps	2.80	22.84%	1284 bps	458 bps	2.80	19.48%

Sample period – April 2, 2008 – June 30, 2010

Performance of Global Equities and Impact of Adding Currency Managers



Selected References

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- Momtchil Pojarliev and Richard M. Levich, "Trades of the Living Dead: Style Differences, Style Persistence and Performance of Currency Fund Managers," *Journal of International Money and Finance*, Dec. 2010, pp. 1752-75.
- Momtchil Pojarliev and Richard M. Levich, "Detecting Crowded Trades in Currency Funds," *Financial Analysts Journal*, Jan./Feb. 2011, pp. 26-39.