



**Investcorp**

**Alternative Beta Strategies**

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Northfield 20<sup>th</sup> Annual Research Conference

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# Summary

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- **What is Alternative Beta**
- **Investcorp's Research Findings**
- **Our Approach to:  
Equity Market Neutral, and  
Convertible Arbitrage**
- **Conclusion**

# What is Alternative Beta?

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- **The term “beta” is frequently used for referring to market return**

- Technically, beta is the exposure to the market return
- It comes from Capital Asset Pricing Model (CAPM)

$$r_i = \alpha_i + \beta_i \cdot (r_m - r_f) + \varepsilon_i$$

- For equity markets, cap-weighted market indices (S&P 500, MSCI, etc.) are used to represent the market return

- **Alternative beta**

- Alternative beta refers to the market return of “alternative” assets
- Most recently, the term has been popularized for referring to hedge fund returns

# What is Alternative Beta?

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- **In recent years, academics and investors have come to realize that there is a significant amount of traditional market beta imbedded in hedge fund returns**
  - Fung & Hsieh, Harry Kat, Andrew Lo, Agarwal & Naik
  - Notable pension funds like CalPERS have made similar observations
- **Conceptually speaking:**
  - Hedge fund return =
    - True Manager Alpha (idiosyncratic, difficult to replicate)
    - + Alternative Beta Return (reproducible)
    - + Market exposure return (inexpensive)

Some would argue that the 1st component is small – especially net of fees.

Maybe an index-fund approach can provide most of the benefits of investing in hedge funds.

# Why Alternative Beta?

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- 1. Systematic return of hedge fund strategies appears to be a substantial portion of total returns**
- 2. Captures most of the common return characteristics of individual hedge fund strategies**
- 3. Allows investors to focus on selecting highest conviction alpha managers, especially those that are capacity constrained**
- 4. Facilitates efficient tactical tilts to a hedge fund portfolio**
- 5. Has reduced manager-specific risk**
- 6. Reduces fees paid by investors thus generating higher net returns**
- 7. Holdings are transparent**
- 8. The process is scalable**
- 9. Provides investors with better benchmarks for manager evaluation**
- 10. Style purity enables improved asset allocation.**

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**ALTERNATIVE BETA**  
**Competing Approaches**

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# Other Approaches to Alternative Beta

	TRADE-BASED	FACTOR MODELING	FOF PEER GROUPS
Description	Invest in universe of representative individual securities	Holdings of derivatives that <u>mimic</u> hedge fund index returns	Invest in managers who provide exposure to the strategy
Examples	Investcorp	Investment Banks and certain Academics	CSFB/Tremont, HFR, Plus Funds Allocation Index
Replication Approach	Hedge Fund Strategies and sub-strategies	Composite Views	Fund of Funds, Hedge Fund Strategies
Beta	Strategy Beta	Correlated Beta	Beta + manager alpha + noise (e.g. style drift)
Implementation	Difficult to implement due to individual Security	Simple to implement	Modest (picking managers who are representative of the peer group)
Summary	Purest replication of hedge fund strategies	Imprecise, Liquid, Possibly low cost	Selection Bias and Style Drift Expensive and Imprecise

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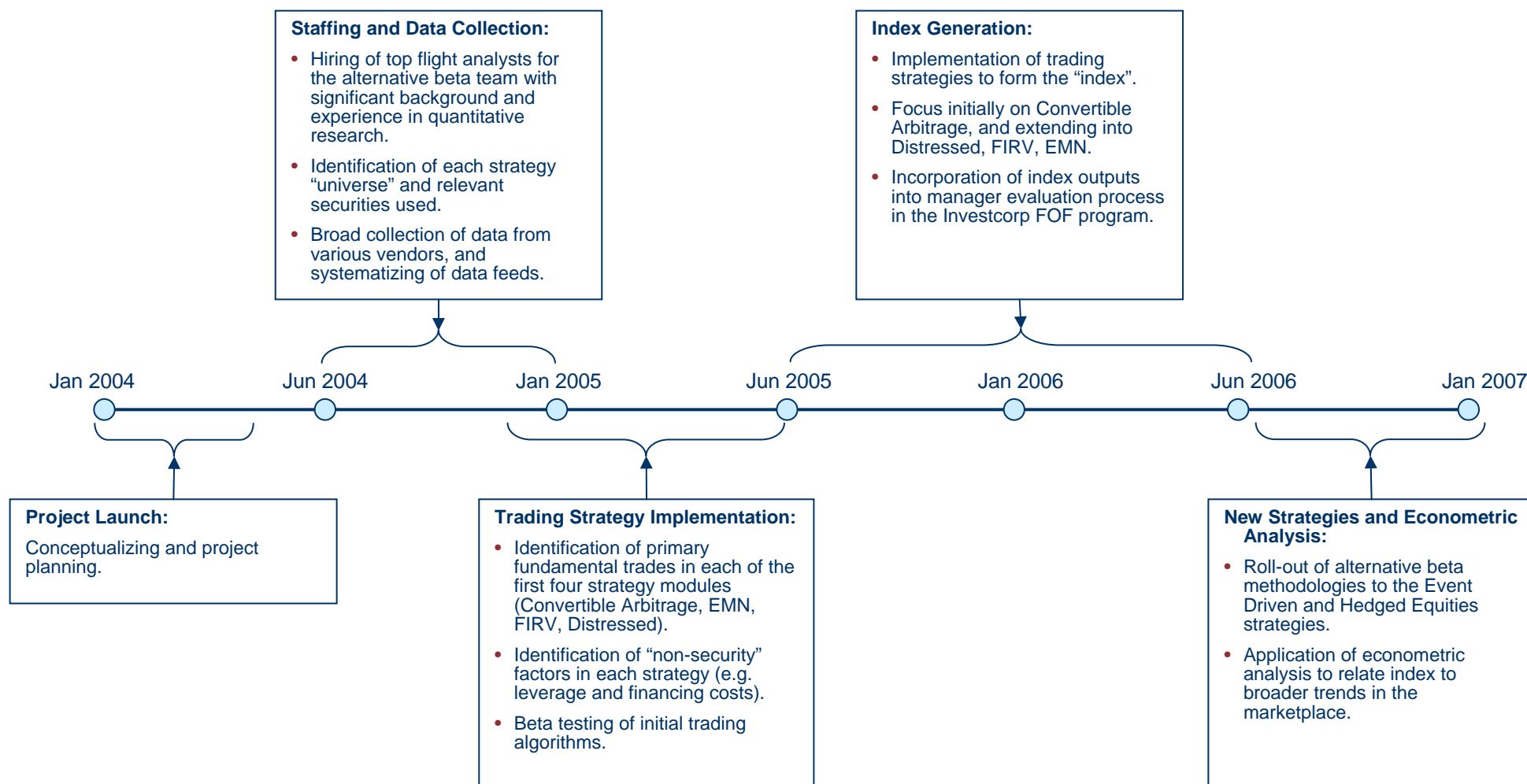


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**INVESTCORP'S**  
**Alternative Beta Approach**  
**History & Process**

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# History of Development



Investcorp has been researching and developing Alternative Beta Indices for 3 years.

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# Investcorp's Alternative Beta Strategy Process

Investcorp Alternative Beta strategies implement actual fundamental trades across the universe of securities within each hedge fund strategy.



## Description:

- There are inherent trades within each particular hedge fund strategy that are unique to each strategy
- Investcorp identifies and tracks these fundamental trades
- Investcorp has established rules to determine when and how certain types of trades are implemented within each strategy
- Identify and account for operational factors that face each particular hedge fund strategy:
  - Leverage (use of and cost of)
  - Transaction costs
  - Liquidity
- Gather the universe of securities that are traded within each strategy from multiple data sources
- Implement the fundamental trades and practical constraints across the universe of securities within each hedge fund strategy

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## Convertible Arbitrage Example:

- Buy and hold the Convertible Bond issue
- Delta hedging
- Remaining accepted risk is credit and volatility
- Leverage 1:1
- Periodic delta hedging
- Use of 90-day and 5-yr volatility as inputs
- Periodic FX hedging
- Use of credit indices as a credit benchmark input
- Incorporate cost
- Leverage
- Other constraints
- Static terms and conditions data: 8,300 bonds in US, Japan, Europe and Asia (Monis/Jeffries, Mergent, ISMA, Nikkei/NEEDS)
- Dynamic price data: 6,400 bonds globally (Monis/Jeffries, Morgan Stanley, ISMA, Nikkei/NEEDS)
- Actual implementation based on investable universe of convertible securities in the market

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**INVESTCORP'S**  
**Trade Based Approach**  
**Results: Equity Market Neutral**

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# Outline

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- **Methodology**
- **Universe/Data**
- **Results**

# Methodology

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- **We conducted a statistical analysis of EMN hedge fund returns in a linear-regression framework against well-known market risk factors (Fama-French three factors) AND a set of widely adopted equity return factors by EMN funds.**
- **Fama-French factors** <sup>[1]</sup>
  - Equity Market return
  - Value minus Growth (HML)
  - Small minus Big (SMB)
- **Equity return factor categories** <sup>[2]</sup>
  - Analyst behavior (LTG, analyst coverage, dispersion, revision, etc)
  - Quality of earnings and operating efficiencies/competitiveness (earnings management/manipulation, operating leverage, etc)
  - Technical (momentum/reversal factors)
  - Valuation (B/P, E/P, etc)

- **Return attribution:**

$$R = \alpha + \beta_1 F_1 + \beta_2 F_2 + \dots + \beta_K F_K + e$$

[1]: See, e.g., Fama, E.F. and French, K.R., Multifactor explanations of asset pricing anomalies, Journal of Finance, Vol. 51, 55-84, 1996

[2]: See, e.g., Carhart, M. M., On persistence in mutual fund performance. Journal of Finance 52(1), 57-82, 1997.

## Methodology (Continued)

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- **Step 1:** <sup>[1]</sup>  
**Fund returns are regressed against Fama-French factors in a step-wise fashion, and only exposures that are statistically significant are kept,**
- **Step 2:** <sup>[1]</sup>  
**Residuals from step 1 (and the intercept) are regressed against the common set of equity return factors in a step-wise procedure. Only statistically significant exposures are kept,**
- **Step 3:**  
**We create linear factor clone of various EMN indices using static regression results for the whole period analyzed. When constructing the clone, we omitted the intercept term in the regression <sup>[2]</sup> while keeping the exposures that were found to be statistically significant in Steps 1 and 2. Factor Clones are created based on regression results over the whole time period.**

<sup>[1]</sup>We used stepwise regression to eliminate spurious statistical relationships between fund returns and various factors, thus avoid reporting inflated r-square numbers that would have resulted from a non-discretionary pooled regression, regardless of the statistical significance of the exposures.

<sup>[2]</sup>See, e.g., Hasanhodzic, Jasmina and Lo, Andrew W., "Can Hedge-Fund Returns Be Replicated?: The Linear Case" (August 16, 2006). Available at SSRN.

# Data

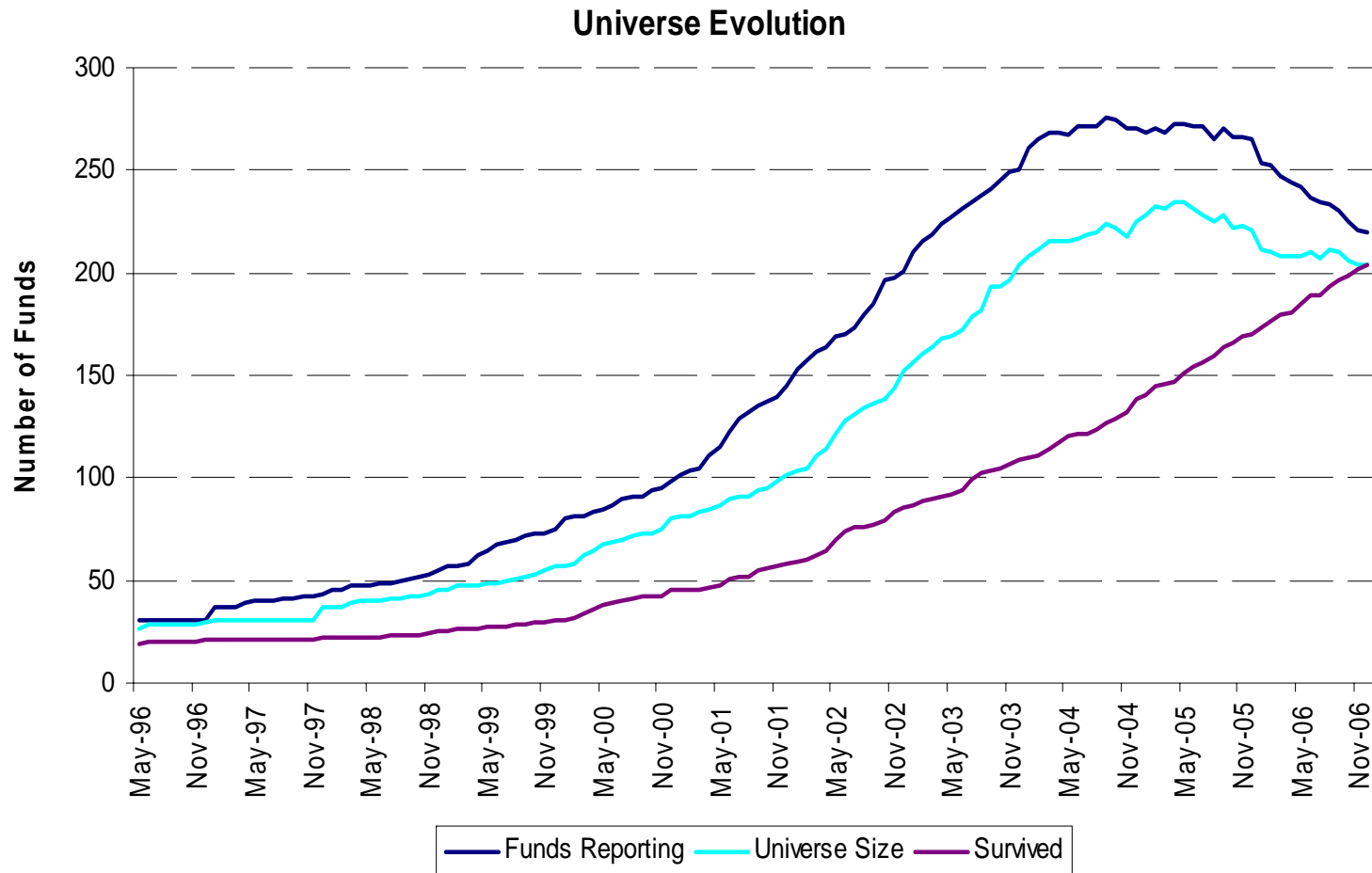
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- **Our fund universe is comprised of over 400 EMN managers for whom Investcorp has monthly performance data**
- **Data dates back to 1984 (for a limited number of funds)**
- **Our analysis covers the period from 06/1995 to 12/2006**
- **Only funds with at least 12 months of performance data are included in the universe**
- **Survivorship bias *does* exist, especially for the period before 2003**
- **Overall, the universe is fairly representative of the EMN strategy and exhibits very high correlations with returns of various hedge fund EMN indices**
- **Market factor returns (U.S. as an example)**
  - Market: Russell 3000
  - HML : Russell 3000 Value – Russell 3000 Growth
  - SMB : Russell 2000 - Russell 1000
- **Common equity return factor returns**
  - Generated from proprietary Investcorp research.

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# Investcorp Universe Size through time



Funds survived are those funds that were included in universe and were still reporting performance data at of the end of the testing period (12/2006)

# Investcorp Universe vs. HFRI EMN Index

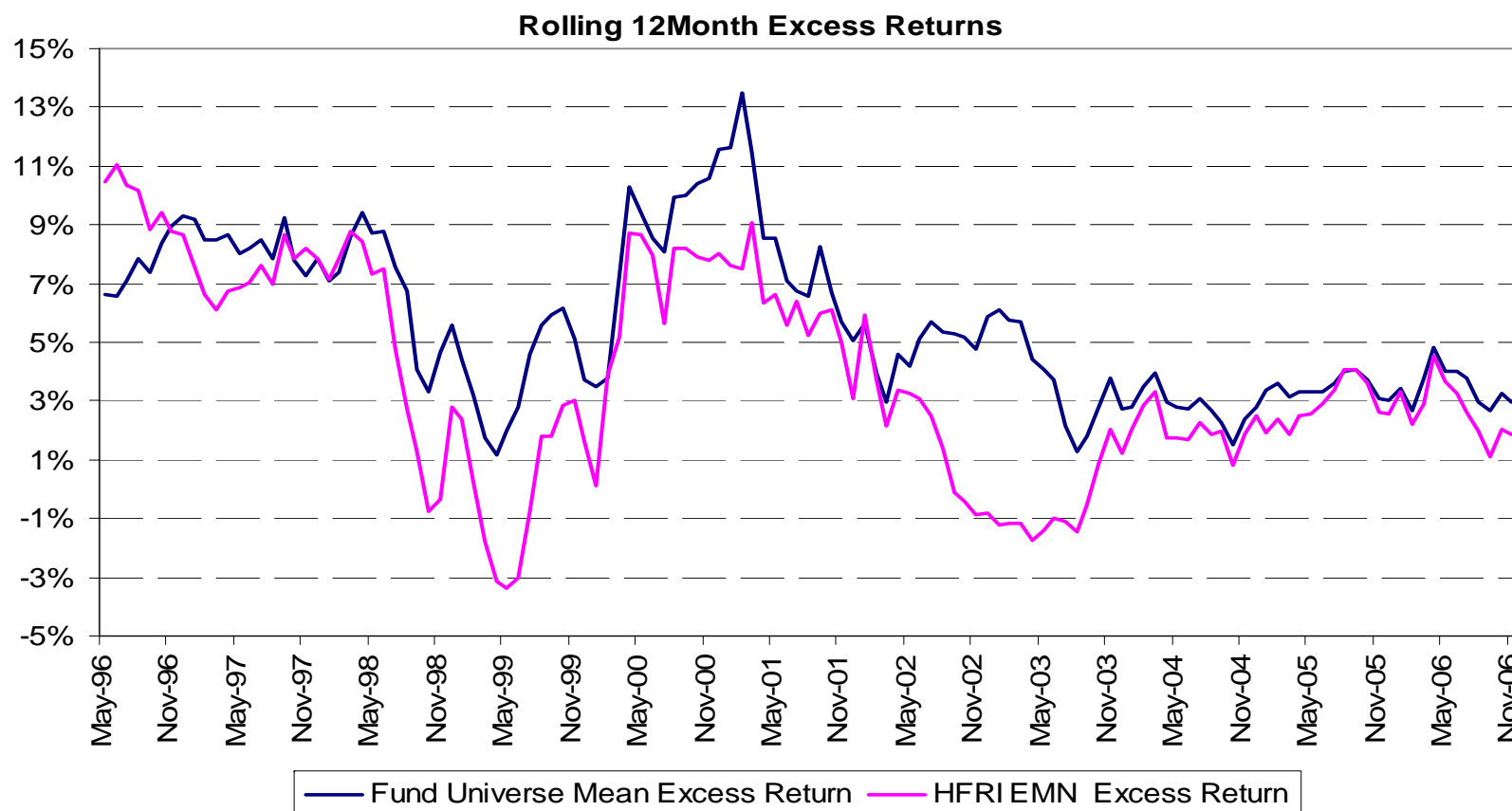


Table 1: Correlations between Investcorp universe mean excess return and HFRI EMN index excess returns

Correlation	Universe	HFRI EMN
Universe Mean	1.00	<b>0.78</b>
HFRI EMN		1.00

Source: Investcorp

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# Alternative Beta explains a large portion of the returns

Table 2: Average R-square with market factors only for different sub-strategies in different time periods

	(Pre Bubble) 06/95-08/98	(Rise) 09/98 - 08/00	(Burst) 09/00 - 12/03	(Post) 01/03 - 12/06	(Full History) 06/95 - 12/06
<b>Quantitative</b>	28.68%	17.72%	36.69%	16.74%	20.89%
<b>Fundamental</b>	15.46%	33.89%	40.43%	16.07%	14.87%
<b>Stat Arb</b>	21.28%	28.29%	26.82%	14.54%	19.12%
<b>Others</b>	30.39%	27.84%	31.59%	16.65%	20.35%

Table 3: Average R-square with market & Investcorp factors for different sub-strategies in different time periods

	06/95-08/98	09/98 - 08/00	09/00 - 12/03	01/03 - 12/06	06/95 - 12/06
<b>Quantitative</b>	39.42%	35.06%	43.89%	31.60%	33.14%
<b>Fundamental</b>	25.02%	40.31%	45.39%	23.60%	22.36%
<b>Stat Arb</b>	43.40%	38.84%	33.56%	22.21%	25.08%
<b>Others</b>	30.39%	34.14%	36.89%	22.42%	25.42%

\* Numbers colored in grey are for periods for which we have less than 10 funds reporting in that region.  
Global funds are proxied with US factors since the majority of these funds invest most in US

Source: Investcorp

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# Alpha does exist, though not always

Table 4: Median EMN manager monthly alpha & t-stat with market factors only by sub-strategy and time periods

Period Sub-strategy	06/95-08/98		09/98 - 08/00		09/00 - 12/03		01/03 - 12/06		Whole Period	
	Alpha	t-stat	Alpha	t-stat	Alpha	t-stat	Alpha	t-stat	Alpha	t-stat
Quantitative	0.70%	1.25	-0.20%	-0.46	0.13%	0.28	0.06%	0.28	0.13%	0.72
Fundamental	0.70%	2.52	1.12%	2.18	0.69%	1.98	0.08%	0.35	0.24%	1.09
Stat Arb	0.63%	1.33	1.19%	1.12	-0.46%	-1.16	-0.03%	-0.12	-0.27%	-0.85
Others	0.36%	1.65	1.16%	2.06	0.61%	1.78	0.11%	0.45	0.11	0.45

Table 5: Median EMN manager monthly alpha & t-stat with market & Investcorp factors by sub-strategy and time periods

Period Sub-strategy	06/95-08/98		09/98 - 08/00		09/00 - 12/03		01/03 - 12/06		Whole Period	
	Alpha	t-stat	Alpha	t-stat	Alpha	t-stat	Alpha	t-stat	Alpha	t-stat
Quantitative	0.64%	2.52	-0.28%	-0.46	0.08%	0.13	0.02%	0.09	0.10%	0.60
Fundamental	0.70%	3.04	1.12%	3.27	0.67%	3.44	0.02%	0.13	0.19%	0.75
Stat Arb	0.44%	1.04	0.99%	1.50	-0.46%	-1.22	-0.03%	-0.14	-0.32%	-1.36
Others	0.36%	20.25	1.16%	2.14	0.61%	1.78	0.06%	0.41	0.10%	0.27

Source: Investcorp

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# HFRI EMN Index Returns Explained by Factors

Table 6: Percentage of HFRI EMN returns explained by factors (R-square)

Period	(Pre Bubble) 06/95 - 08/98	(Rise) 09/98 - 08/00	(Burst) 09/00 - 12/03	(Post) 01/03 - 12/06	(Full History) 06/95 - 12/06
Market Factors Only	37.00%	24.73%	44.01%	43.67%	9.50%
Market + Investcorp Factors	57.87%	54.35%	52.37%	69.52%	41.30%

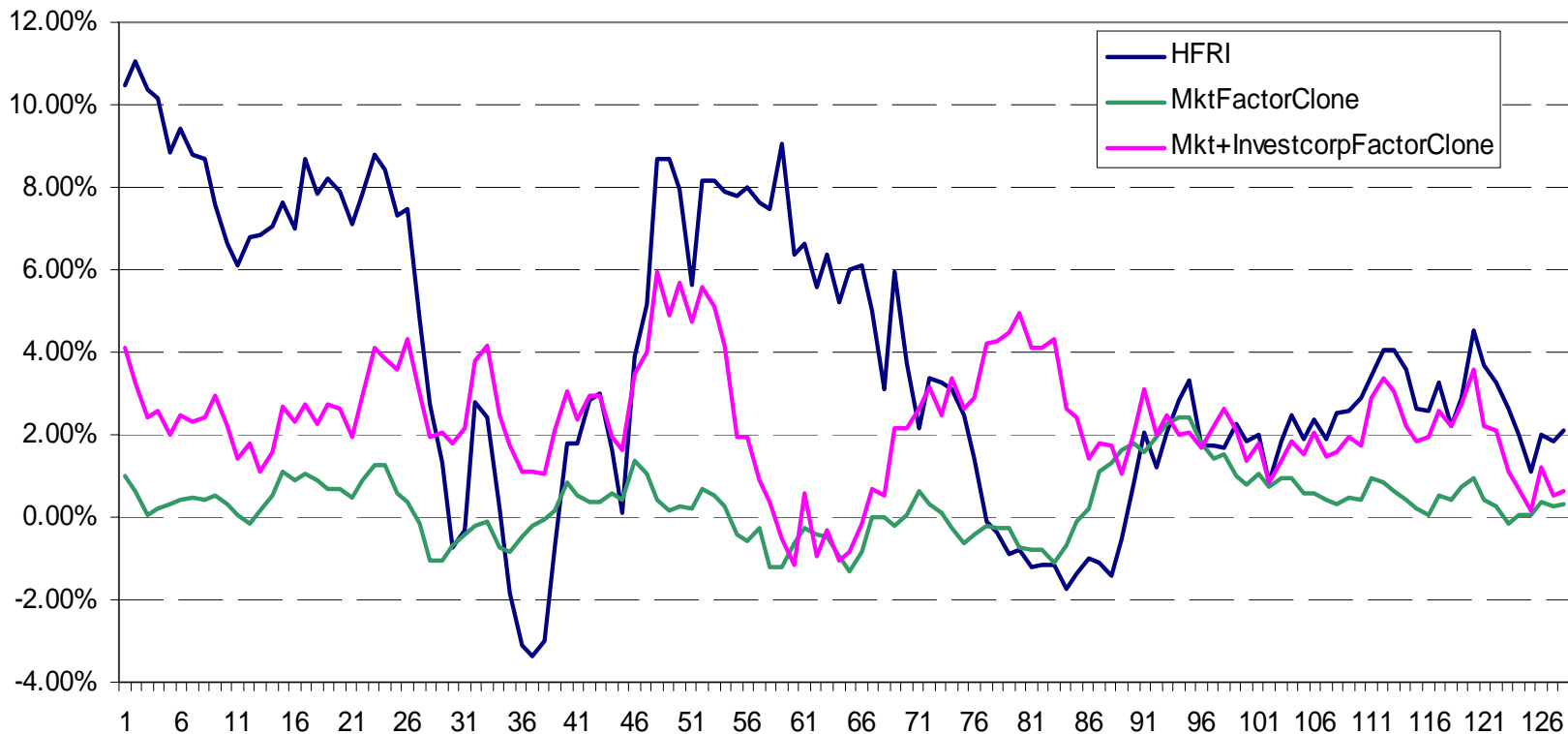
Table 7: HFRI EMN index monthly Alphas and t-stats in different time periods \*

Period	06/95-08/98		09/98 - 08/00		09/00 - 12/03		01/03 - 12/06		Whole Period	
	Alpha	t-stat	Alpha	t-stat	Alpha	t-stat	Alpha	t-stat	Alpha	t-stat
Market Factors Only	2.47%	2.38	0.12%	0.48	-0.04%	-0.32	0.85%	2.15	0.48%	4.36
Market + Investcorp Factors	2.40%	28.97	0.01%	0.53	-0.15%	-1.20	0.81%	19.07	0.35%	5.72

\* Index returns are regressed against our US factors.

# HFRI EMN Return: Realized Vs Factor Clones

## (Rolling 12 Months Excess Returns)



\*Factor clone is a weighted average of the factor returns where the weights are determined by the same regression procedure which we have described on slides before, but with intercept being omitted. See, e.g., Hasanhodzic, Jasmina and Lo, Andrew W., "Can Hedge-Fund Returns Be Replicated?: The Linear Case" (August 16, 2006). Available at SSRN.

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## Returns Stats of HFRI EMN and the Clones

	Ann RoR	Ann Vol	Sharpe	% Up	Ann RoR			
					1Y	3Y	5Y	10Y
<b>HFRI</b>	8.07%	3.06%	1.29	82%	5.80%	5.51%	4.05%	6.93%
<b>Mkt Factor Clone</b>	4.53%	0.92%	0.41	94%	4.82%	3.84%	3.19%	4.27%
<b>Mkt+Investcorp Factor Clone</b>	6.52%	1.97%	1.20	84%	4.68%	4.83%	4.82%	6.18%

	Best Month	Worst Month	Ann downside Deviation	Sortino Ratio
<b>HFRI</b>	3.59%	-1.67%	2.05%	1.83
<b>Mkt Factor Clone</b>	1.07%	-0.45%	0.68%	0.49
<b>Mkt+Investcorp Factor Clone</b>	2.29%	-1.22%	1.40%	1.63

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**INVESTCORP'S**  
**Trade Based Approach**  
**Results: Convertible Arbitrage**

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# Objectives

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- **Build pure “passive” indices**
- **Determine key drivers of the strategy**
- **Conduct manager/index style analysis**

# Methodology

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## What is the Convertible Arbitrage trade?

- ✓ Construct a “market neutral” portfolio:
  - (+) Buy and hold CB at issue
  - (-) Delta hedging
  - (-) With or without Interest rate hedging
  - (-) FX exposure hedging
- ✓ Remaining risk that we accept for this portfolio:
  - Credit risk
  - Volatility risk
- ✓ Main sources of P&L:
  - Gamma trading
  - Valuation
  - Omicron
  - Carry

## Methodology (continued)

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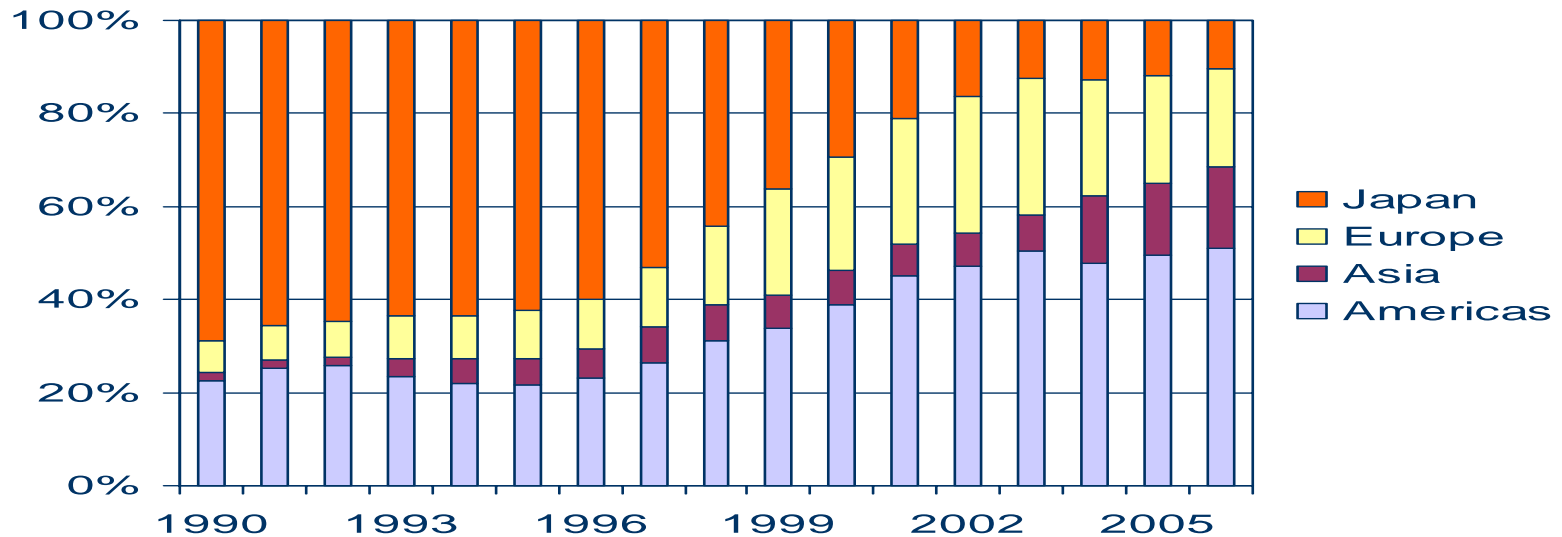
### Assumptions and basic rules:

- ❑ Leverage 1:1
  - Monthly rebalancing
  
- ❑ Weekly delta-hedging
  - Use of theoretical data from Monis valuation tool
  - Min Delta change of 5%
  
- ❑ Use of the 90 day and 5 year historical volatility as Input
  
- ❑ Monthly IR hedging
  - Use of theoretical Rho and five different maturities of swaps
  
- ❑ Monthly FX hedging
  
- ❑ Use of credit indices as credit benchmark input
  - Credit indices based on geography, rating and/or sector

# Data and coverage

# static bonds: 8370  
 # bonds with price: 6455  
 # of years history: 15  
 # regions covered: 4

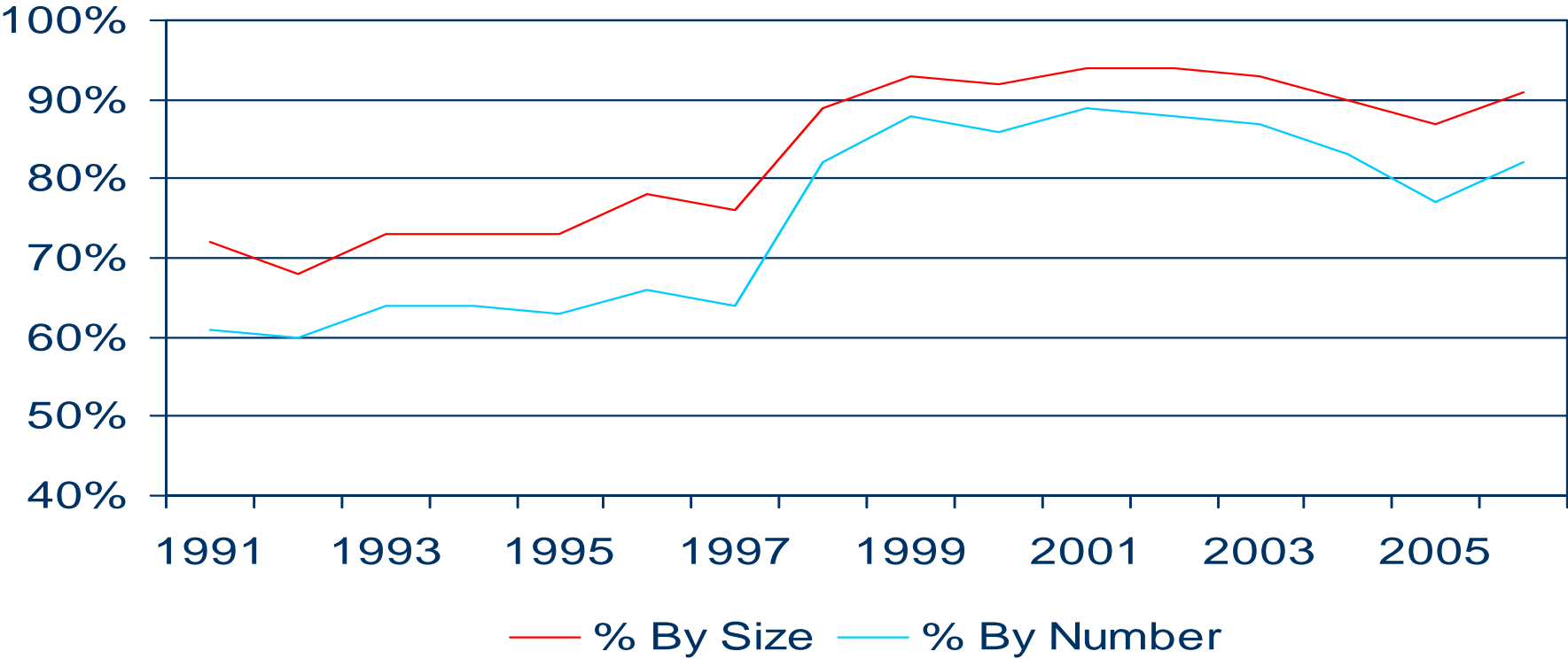
Region	#	% Total
Americas	2461	38%
Euro	894	14%
Japan Dom	615	10%
Japan Euro	1882	29%
Asia	603	9%



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# Data and coverage (continued)

## % Global Coverage



Source: Investcorp

# Passive indices

## Conclusion:

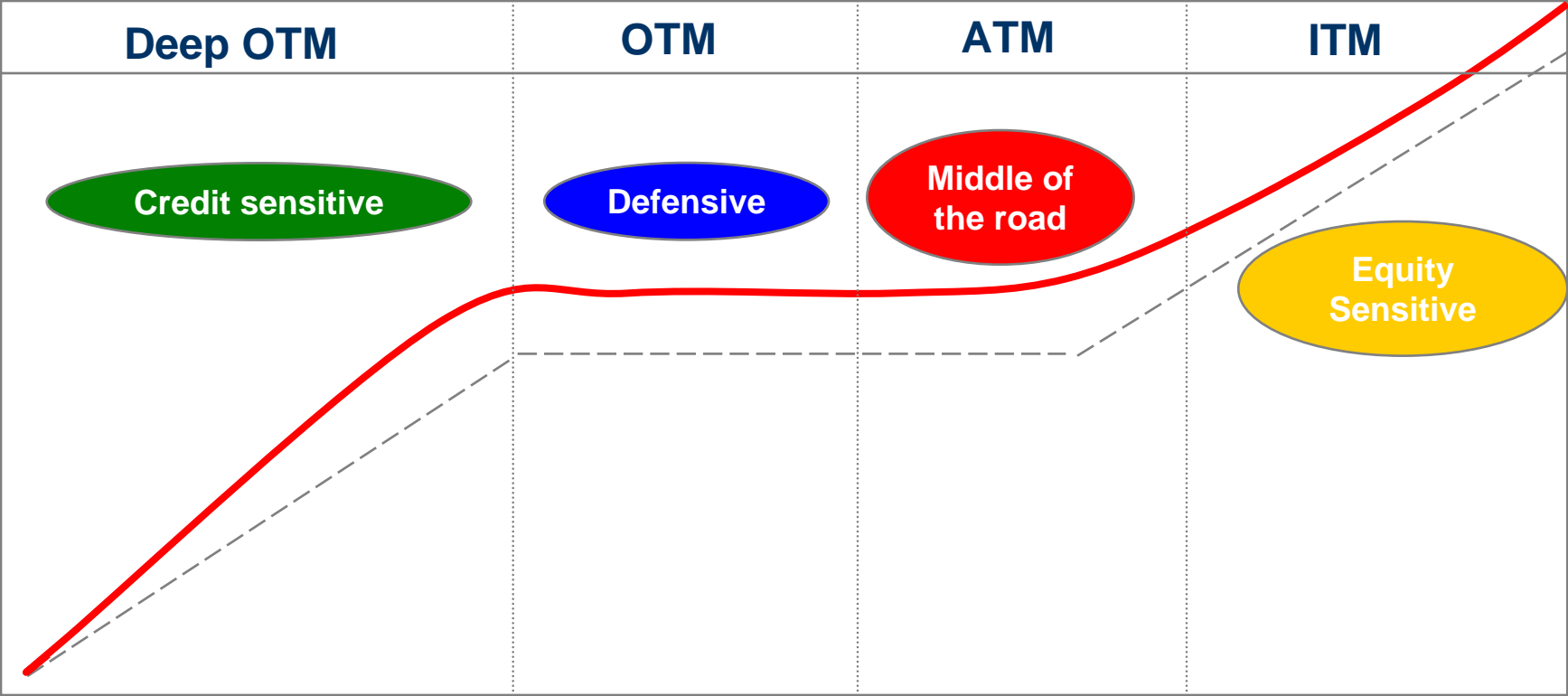
- Global Universe:  
Sharpe ratio 1.27.
- Global deep OTM is best performer in terms of excess return and Sharpe.
- No big difference between using 90 day and 5 year historical volatility.
- Non-IR hedged has higher Sharpe compare to IR hedged over a long periods.

01/91-9/07				
Non-IR Hedged		Excess Return	Stddev	Sharpe
<b>Global Universe</b>		4.74%	3.73%	1.27
Continuum	– Deep OTM	6.78%	3.89%	1.56
	– Out-of-the-Money	5.90%	4.08%	1.36
	– At-the-Money	4.85%	4.29%	1.09
	– In-the-Money	1.97%	4.95%	0.44
Credit	– High Yield	6.29%	4.78%	1.28
	– Cross-over	4.76%	3.59%	1.41
	– Investment Grade	4.07%	3.72%	1.11
<b>US Universe</b>		4.97%	3.99%	1.18
Continuum	– Deep OTM	6.02%	6.39%	0.79
	– Out-of-the-Money	5.47%	4.03%	1.19
	– At-the-Money	5.33%	4.71%	1.05
	– In-the-Money	2.39%	7.52%	0.24
Credit	– High Yield	6.64%	5.11%	1.22
	– Cross-over	4.79%	3.68%	1.15
	– Investment Grade	2.26%	3.61%	0.67
<b>EU Universe</b>		4.42%	3.41%	1.46
Continuum	– Deep OTM	4.98%	5.93%	1.02
	– Out-of-the-Money	4.06%	4.11%	1.20
	– At-the-Money	5.77%	3.80%	1.16
	– In-the-Money	4.17%	6.76%	0.84
Credit	– High Yield	4.41%	7.45%	0.59
	– Cross-over	4.42%	4.39%	1.01
	– Investment Grade	4.82%	3.77%	1.41
<b>JP Universe</b>		4.14%	4.07%	1.02
Continuum	– Deep OTM	5.81%	4.16%	1.32
	– Out-of-the-Money	5.29%	4.41%	1.16
	– At-the-Money	4.02%	4.62%	0.93
	– In-the-Money	1.87%	5.31%	0.43
Credit	– High Yield	5.43%	5.29%	0.50
	– Cross-over	4.69%	4.43%	1.09
	– Investment Grade	3.89%	4.11%	1.01

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# Background

## ➤ Convertible Continuum



## Passive indices (continued)

Correlation with HFR and CSFB/Tremont convertible arbitrage indices across geographies:

	HFR			CSFB/ Tremont	
	1/91-8/07	1/91-12/98	1/99-8/07	1/94-8/07	1/99-8/07
	Full Period	1st Half	2nd Half	Full Period	2nd Half
<b>US</b>	52.04%	53.40%	50.71%	48.99%	49.71%
<b>EU</b>	30.54%	28.60%	31.20%	25.36%	31.59%
<b>JP</b>	19.67%	13.45%	35.34%	30.41%	35.41%
<b>Asia</b>	42.99%	48.96%	41.00%	38.54%	34.77%
<b>Global</b>	32.99%	19.16%	59.89%	45.77%	59.35%

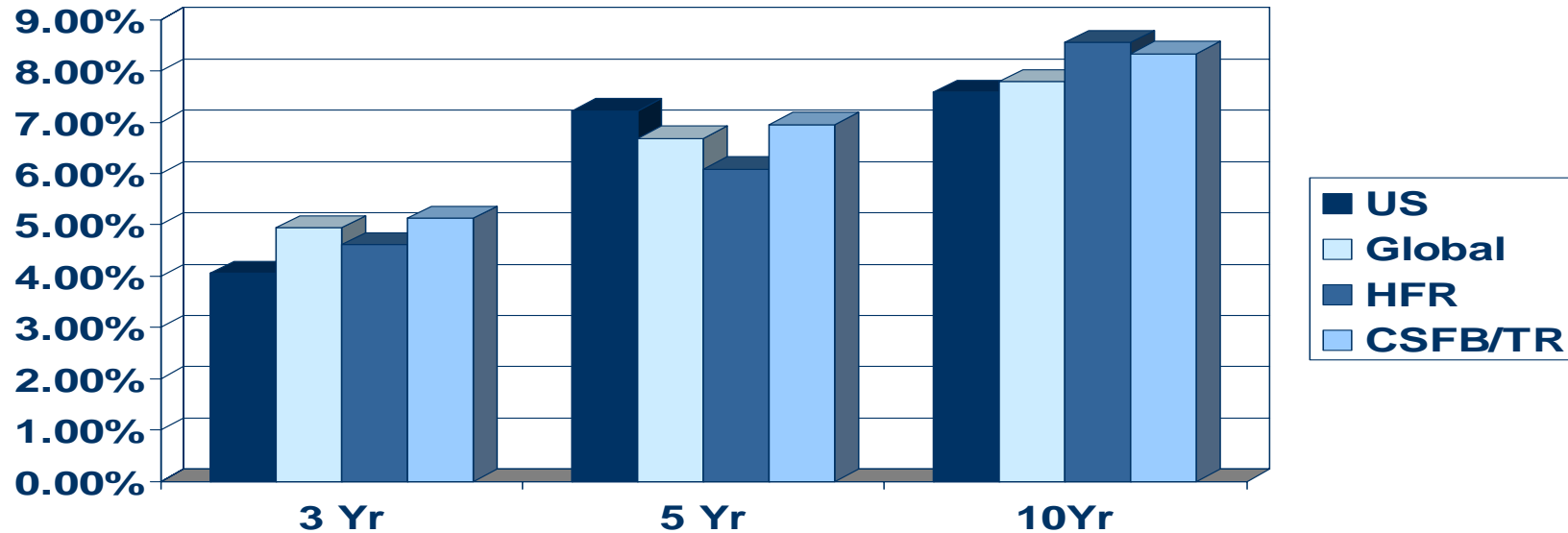
### Conclusion:

- Consistent correlation throughout history
- US shows highest correlation with HFRI/CSFB
- Significantly higher correlation between HFRI/CSFB indices and Global universe in recent years.



# Passive indices (continued)

## Average Annual Returns



## Sensitivity of HFRI/CSTR to US index

Fund Name	R Square	Beta	T-stat
HFRI	51.03%	0.56	3.45
CSFB/Tremont	41.53%	0.65	2.91

Source: Investcorp

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# Return Stats

## Return stats

	Ann RoR	Std Devn	Sharpe Ratio	Sortino Ratio	Best Month	Worst Month	% Up Months	% Down Months	Max. Drawdown
HFRI	9.16%	3.56%	1.40	1.67	3.33%	(-3.19%)	83.03%	16.97%	(-7.34%)
CSTR	8.90%	4.57%	1.03	1.27	3.57%	(-4.68%)	78.18%	21.82%	(-12.03%)
IC Global	8.02%	3.02%	1.27	1.73	3.77%	(-2.26%)	81.82%	18.18%	(-2.26%)

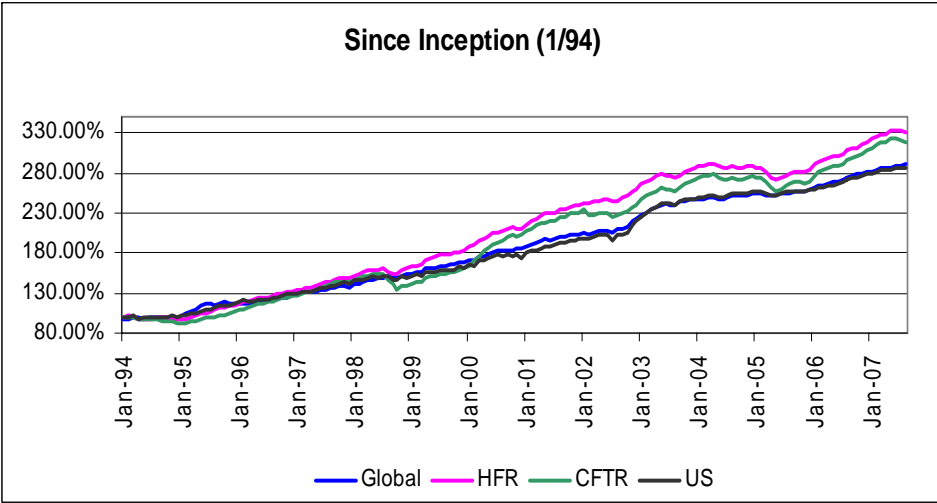
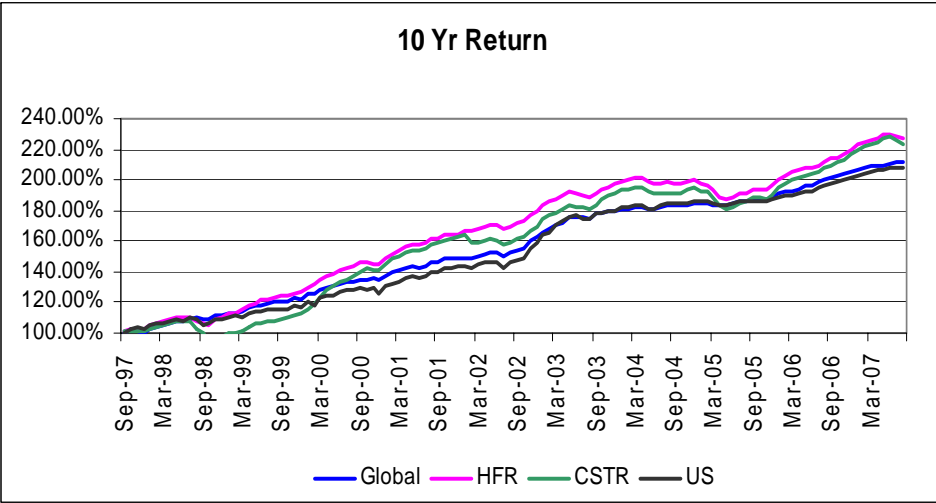
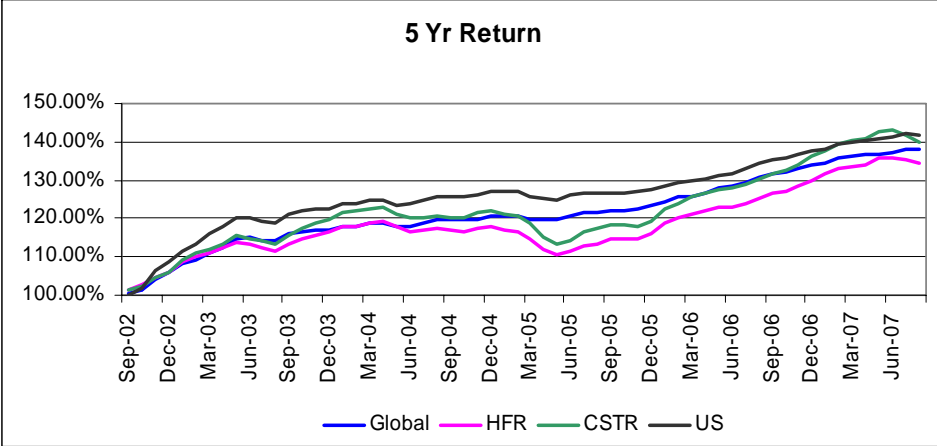
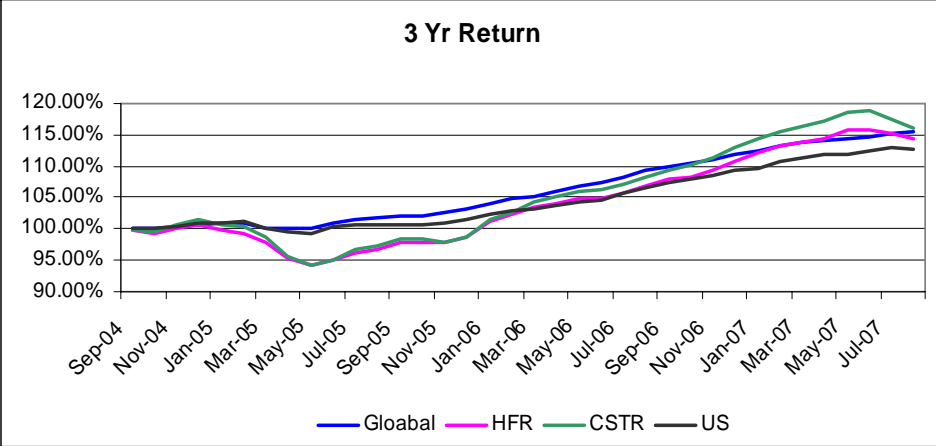
## Annual Returns

	Avg Ann RoR	1 Yr	3Yr	5Yr	10Yr
HFRI	9.16%	7.60%	5.16%	6.04%	8.58%
CSTR	8.90%	8.32%	5.84%	7.09%	8.44%
IC Global	8.02%	6.45%	5.24%	6.81%	7.79%

Stats based on 1/1994-9/2007 period

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# Cumulative Returns



## Conclusion

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- **Our research shows alternative beta explains a fairly large portion of Equity Market Neutral and Convertible Arbitrage strategy returns,**
- **However, managers have shown alpha-generating capability, though it has become much harder to come by,**
- **We believe there is a strong case for Alternative Beta products in Equity Market Neutral, Convertible Arbitrage, and other such similar strategies.**

## Conclusion (Continued)

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- 1) In our opinion, the market opportunity for both Alpha generating and Beta replicating hedge fund managers should grow. However, we expect the latter to grow at a far more rapid pace, especially when performance and cost are taken into consideration,**
- 2) Our analysis indicates that Alpha has been and can be generated, and the producer of Alpha will be commensurately compensated,**
- 3) We believe, that while the future of Alternative Beta investment strategy is favorable, the investment process itself will likely evolve from a regression based approach to a trade based approach,**
- 4) We at Investcorp also think that a trade based approach is more precise, less likely to deviate significantly from the specific strategy return, and should be cost effective for investors,**
  - In other words, a trade based Alternative Beta implementation strategy is optimum in terms of expected Return, Risk and Cost.**

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