

**EDHEC Alternative  
Investment Days  
2007**

Bringing Academic Insights to  
Alternative Investment

**14:30-16:00  
Stream 1C:  
Hedge Fund Indices**

Chairman:

**Noël Amenc**, Professor of Finance, EDHEC Business School and Director, EDHEC Risk and Asset Management Research Centre

Speaker:

**Felix Goltz**, Senior Research Engineer, EDHEC Risk and Asset Management Research Centre

Panellists:

**Alain Dubois**, Chairman, Lyxor Asset Management and Advisory Board Member, EDHEC Risk and Asset Management Research Centre

**Laurent Favre**, CEO, AlternativeSoft

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# Hedge Fund Indices

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# Introduction

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- **The growing offer of indices...**
  - Growth of the hedge fund industry was accompanied by creation of indices
  - Starting in 2002, traditional index brands entered the market
  - Increasing focus on indices results from “institutionalisation”
- **...has led to controversy in the industry**
  - One view: Hedge fund indices don't make sense
  - A different view: Hedge fund indices are essential tools:
    1. to reflect risk and return of hedge fund strategies
    2. for performance measurement
    3. for asset allocation

# Outline

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- **Section 1: Non-investable HF Indices: Overview and Problems**
- **Section 2: Investable HF Indices: Overview and Problems**
- **Section 3: Reconciling Representativity and Investability**
- **Conclusion**

# Non-investable Indices Overview

- Hedge fund indices rely on different databases
- Hedge fund indices follow different construction methodologies and management principles

Index Provider	Launch Date of indices	Start date of indices database	Index Weighting	Nbr of Funds in the Database	Nbr of Funds in the Indices	Rebalancing Frequency
Altvest	2000	1993	E.W.*	+3200	+2200	Monthly
Barclay Group	2003	1997	E.W.*	+4460	4400	Monthly
CISDM	1994	1990	Median	+7600	3892	Monthly
CSFB/Tremont	1999	1994	V.W.**	+4500	413	Quarterly
EACM	1996	1996	E.W.*	100	100	Annual
EDHEC	2003	1997	P.C.A.***	n.a.	n.a.	Quarterly
Hennessee	1987	1987	E.W.*	+3000	900	Annual
HF Net	1998	1976 -1995 *	E.W.*	+5000	+3600	Monthly
HFR	1994	1990	E.W.*	2300	+1600	Monthly
MSCI	2002	2002	E.W.* & V.W.** **	+2000	+2000	Quarterly***
Van Hedge	1994	1988	Multi-Factor model	+6700	+2000	Monthly

\* E.W. stands for Equally Weighted, \*\* V.W. stands for Value Weighted, \*\*\* P.C.A. stands for Principal Component Analysis, \* Depends on the strategy, \*\* For the global indices, \*\*\* For inclusion and Monthly for the "reranking" of funds

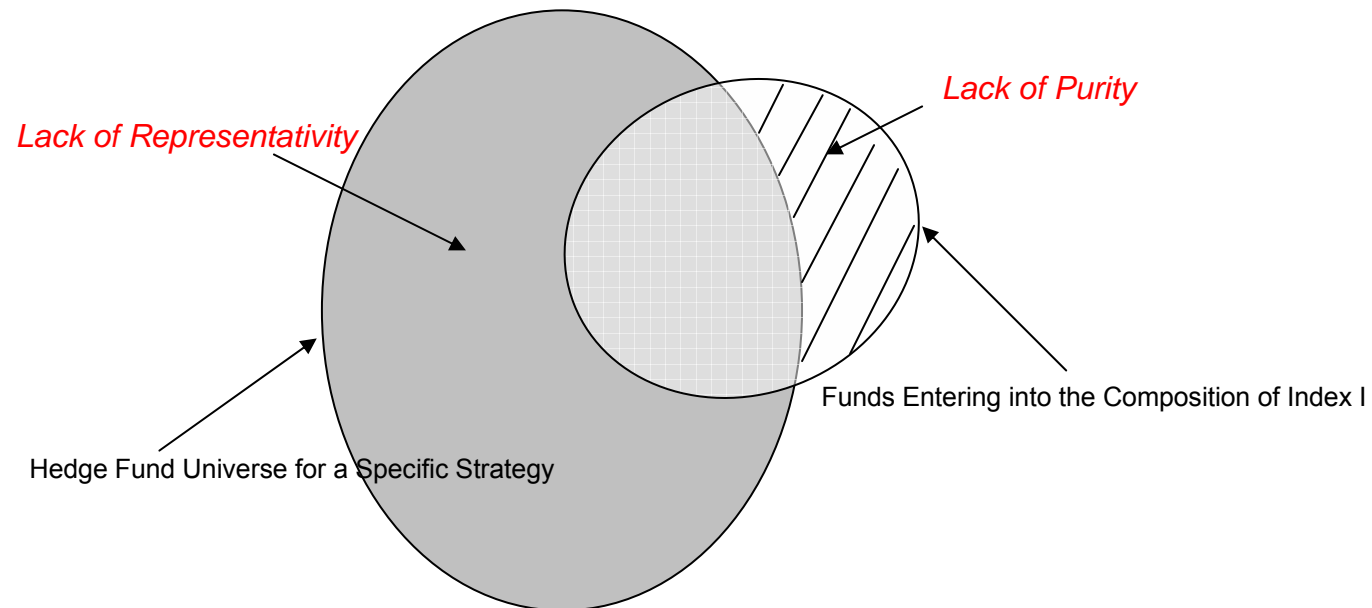
Source: EDHEC Risk

# Non-investable Indices

## Purity and Representativity

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- Hedge Fund Indices rely on databases that are not exhaustive
- Style classification is faced with numerous problems



# Non-investable Indices

## Heterogeneity (I)

### Monthly Return Differential between the Different Indices Available on the Market

<b>Investment Styles</b>		<b>Max differences (with dates and indices)</b>
Convertible Arbitrage	7.55%	(Dec 01: EACM (-6.93%) / Hennessee (0.62%))
CTA Global	8.28%	(Apr 04: S&P (-8.06%) / Barclay (0.22%))
Distressed Securities	7.75%	(Aug 98: CSFB (-12.45%) / Van Hedge (-4.70%))
Emerging Markets	19.45%	(Aug 98: CISDM (-26.65%) / Altvest (-7.20%))
Equity Market Neutral	5.00%	(Dec 99: Hennessee (0.20%) / Van Hedge (5.20%))
Event Driven	5.37%	(Aug 98: CSFB (-11.77%) / S&P (-6.40%))
Fixed Income Arbitrage	7.96%	(Oct 98: Hennessee (-8.56%) / Van Hedge (-0.60%))
Funds of Funds	8.01%	(Dec 99: CISDM (2.41%) / Altvest (10.42%))
Global Macro	14.17%	(Oct 98: CSFB (-11.55%) / Altvest (2.62%))
Long/Short Equity	9.51%	(Feb 00: Altvest (3.50%) / CSFB (13.01%))
Merger Arbitrage	3.18%	(Jan 99: CSFB (-1.51%) / Altvest (1.67%))
Relative Value	13.34%	(Oct 98: S&P (-6.90%) / HF Net (6.44%))
Short Selling	21.13%	(Feb 00: Van Hedge (-24.30%) / EACM (-3.17%))

Source: EDHEC Risk

From January 1998 through December 2005

# Non-investable Indices

## Heterogeneity (II)

Correlation Coefficients between the Different Indices Available on the Market

<b>Investment Styles</b>	<b>Min</b>	<b>Average</b>	<b>Max</b>	<b>Heterogeneity*</b>
Convertible Arbitrage	64.06%	84.17%	96.25%	15.83%
CTA Global	87.48%	92.74%	95.76%	7.26%
Distressed Securities	71.89%	86.85%	96.50%	13.15%
Emerging Markets	66.92%	89.47%	98.75%	10.53%
Equity Market Neutral	17.02%	47.93%	88.60%	52.07%
Event Driven	87.19%	91.76%	97.81%	8.24%
Fixed Income Arbitrage	37.72%	67.28%	92.67%	32.72%
Funds of Funds	80.77%	92.21%	99.51%	7.79%
Global Macro	39.00%	72.44%	91.42%	27.56%
Long/Short Equity	59.12%	84.41%	98.95%	15.59%
Merger Arbitrage	77.23%	89.78%	96.79%	10.22%
Relative Value	2.42%	53.98%	93.35%	46.02%
Short Selling	-48.66%	59.96%	96.61%	40.04%

Source: Edhec Risk

From Jan. 1998 through Dec. 2005

\*The Heterogeneity Index HI is defined as follows:  $HI = 1 - \text{Average Correlation Coefficient}$

# **Noninvestable Indices**

## **Constructing an Index of Indices**

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**Given the problems of existing indices, an investor has 3 options:**

- **Option 1: Build a new index**
- **Option 2: Select one of the available indices**
- **Option 3: Build an index (i.e., a portfolio) of indices**
  - Enhances representativity
  - Reduces biases

# Non-investable Indices

## Constructing an Index of Indices

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- **PCA of index returns (competing indices for the same strategy)**

- We extract the 1st principal component (PC1)

- This yields the “best one dimensional summary” of the data

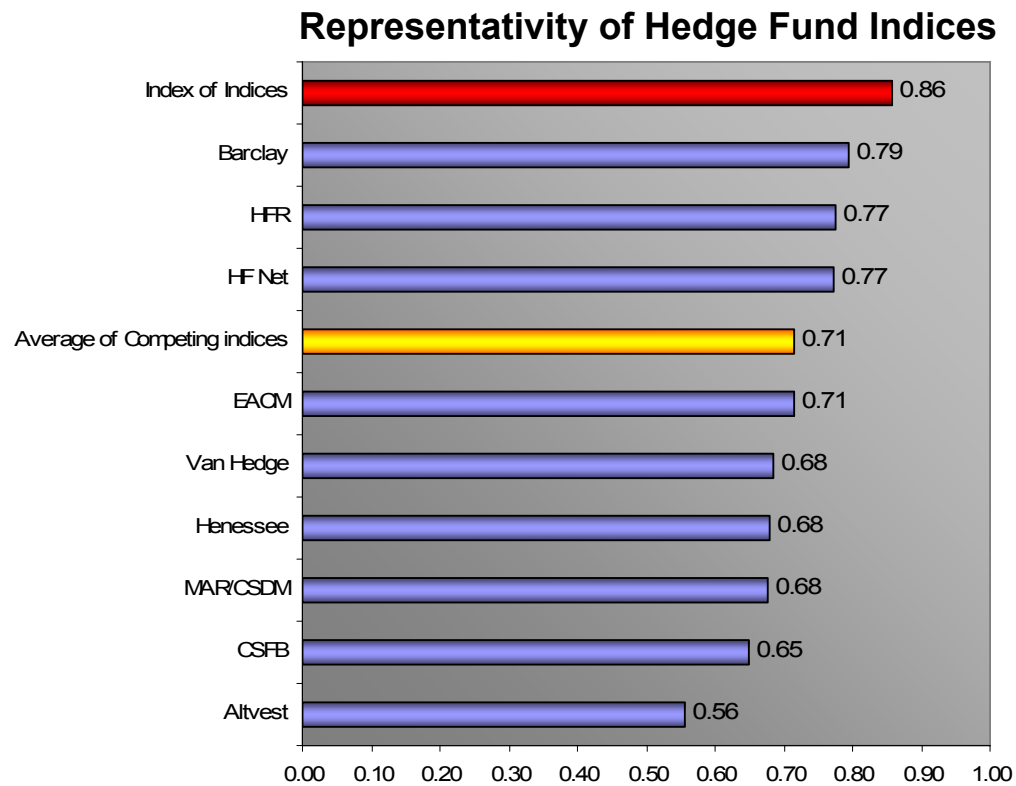
$$\max_w \frac{\lambda_1}{\sum_{i=1}^N \lambda_i} \quad \text{where } \lambda\{i\} \text{ is the eigenvalue associated with the } i\text{th principal component}$$

- We perform normalization in order to obtain a portfolio of indices.

# Non-investable Indices

## Constructing an Index of Indices

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\*Avg. correlation coefficient for a provider's indices with equally-weighted portfolios constructed from a merger of CISDM, HF Net, and Barclay Databases.

*Data from January 1997 through December 2004*

# Investable Indices Overview

- **Lack of investability severely limits the use of hedge fund indices**
- **“Investable” indices based on a small number of funds have been launched**

Index Provider	Launch date	Base date	Strategy / Fund Weighting	Nbr of Funds in Database / Eligible Universe	Nbr of Funds in the Index	Rebalancing Frequency
CSFB/Tremont	Aug-03	Jan.-00	V.W. / V.W.	3300 / 420	60	Semi annually
Dow Jones	Nov-03	Jan.-02	n.a. / E.W.	300 / 100	35	Quarterly *
FTSE	Apr-04	Jan.-98	I.W. / I.W.	6000 / 75	40	Annual * *
HFRX	Mar-03	Jan.-00	V.W / *	2300 / n.m.**	n.a.***	Quarterly
MSCI	Jul-03	Jan.-00	Adj. Median Asset Weighted / E.W.	105 / n.m.**	97	Quarterly
S&P	May-02	Jan.-98	E.W. / E.W.	3500 / 300	40	Annual * * *

\* Fund weightings are optimised to maximize correlation with their group

Source: Géhin and Vaissié (2005)

\*\* n.m. stands for not mentioned

\*\*\* Optimal number of funds for strategy replication is determined through Monte Carlo simulation

\* Additions or deletions can occur without notice at the complete and absolute discretion of Dow Jones

\* \* Funds may be added/deleted more frequently in response to changing market conditions or fund-specific events

\* \* \* Annual at the strategy level and periodically on the fund level

# Investable Indices Problems

- **Investability constraint leads to inclusion of a small number of funds. This conflicts with the objective of representativity**
- **Selection and backfilling biases (“funds of funds”)**
- **Heterogeneity problem is even more pronounced (see example)**

**Example: S&P Event Driven vs HFRX Event Driven Index**

	Return		Risk measures		Comovement with MSCI World		
	Correlation	Average Return*	Volatility*	Modified VaR**	Covariance -beta	Coskewness-beta	Cokurtosis-beta
<b>S&amp;P</b>	0.6	8.36%	1.96%	0.17%	0.08	-0.24	0.07
<b>HFR</b>		9.38%	3.44%	0.33%	0.18	-0.65	0.17

*\* annualized statistics are given, \*\* non-annualised 5%-quantiles are estimated, Daily returns data from 01/04/2003 to 30/12/2005*

# Reconciling Investability & Representativity Methodology

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- **Selection Stage**

(every six months with a 36-month calibration period)

- **Construction of the PC1 on a sample of normalised fund returns**
- **Selection of the funds with the highest correlation with the PC1**

- **Optimisation Stage**

(every three months with a 36-month calibration period)

- **Obtain portfolio that maximises the correlation with the PC1**
- **Weight constraints are imposed (i.e., weights are comprised between 5% and 20%).**

# Reconciling Investability & Representativity Results

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**Correlation with Investable Indices**

	PC1	FSL Portfolio*
Convertible Arbitrage	0.95	0.93
CTA Global	0.96	0.95
Event Driven	0.96	0.91
Equity Long / Short	0.95	0.94
Equity Market Neutral	0.63	0.25

**Correlation with avg of non-investable indices**

	PC1	FSL Portfolio*
Convertible Arbitrage	0.89	0.88
CTA Global	0.98	0.97
Event Driven	0.95	0.92
Equity Long / Short	0.90	0.92
Equity Market Neutral	0.16	0.41

\* Out-of-sample results, FSL portfolios are equally-weighted portfolios made up of all funds included in the CISDM, HF Net & Altvest databases. Data from 01/ 2001 through 12/2003

These indices are

- Investable
- representative of the investment strategy

# Conclusion

## Building Funds of Indices

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### **Investability allows implementation of**

- **Optimal Diversification (SSA)**
- **Substitution of Stock/Bond exposure through return-enhancing HF strategies**
- **Tactical Bets (TSA)**

### **Representativity provides**

- **... “normal” returns rather than returns to the index’s choice of managers:**
  - Avoiding manager selection risk
  - Clear separation of asset allocation and manager selection
- **...style exposure results from the explicit choice rather than the index’s choice**
  - Control of style exposure
  - Unbiased performance attribution

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