

# The Role of Hedge Funds in Institutional Portfolios

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# Executive Summary

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- A diversified portfolio of hedge funds offers stable returns that are significantly higher than those of bonds, exhibiting very low volatility.
- The returns of a diversified portfolio of hedge funds are relatively uncorrelated with other assets.
- Consequently, a modest allocation to hedge funds in an institutional portfolio will enhance returns with a decline or, at most, no appreciable increase in risk.

# The Asset Allocation Decision

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- Fixed Income
- Equities
- Real Estate
- Alternatives
  - Venture Capital
  - Private Equity
  - Hedge Funds

# Table 1 - Hedge Fund Strategies

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- Convertible Arbitrage
- Distressed Securities
- Equity Hedge
- Event Driven
- Fixed Income Arbitrage
  - Spread Trading
  - Mortgages
- Merger Arbitrage
- Macro
- Equity Market Neutral

# Economics of Hedge Funds

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- Hedge funds are not asset classes.
- Hedge funds apply strategies.
- Low risk funds are primarily market neutral; no natural price effects.
- High risk funds take direction bets, e.g. macro funds or emerging market funds.

# Hedge Funds vs. Asset Funds

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- Focus managerial ability and attention.
- Example: long-short funds can short poor stocks and not just hold less of them.
- Leverage forces prudent funds to tighten risk control relative to asset funds.
- Corporate financial structure incentives:
  - fixed fee pays costs.
  - performance fee depends on returns – returns are as important as asset base.

# Example: Long-Short Equity Strategies

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- A ‘neural net’-based long short strategy.
  - Algorithm looks at recent market moves to identify signals for a buy or a sell.
  - Fund goes long or short futures up to some specified leverage limit depending on the signal.
  - Futures are always in net zero supply – each long is balanced by a short position.

# Market Effect

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- The outstanding open interest in the S&P futures > \$200 billion.
- Related contracts raise total to > \$500 billion.
- Total NYSE stock value > \$5 trillion.
- \$20 billion in futures < 5% of total open interest.

# Total Hedge Fund Impact

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- ‘Back of the envelope’
  - Alpha = 4% on \$160 billion = \$6 billion.
  - Double to include unreported funds = \$12 billion.
  - Double to include banks and funds with similar strategies = \$24 billion.
  - Double for conservatism = \$50 billion.
- \$50 billion/\$50 trillion in world assets = 1/1000 = 10bps.

# Economic Impact Assessment

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- No measurable effect on valuation levels.
- Potential effect on spreads, but what matters is net shift into strategies.
  - Some enter but some exit.
  - No net addition when a manager switches firms.
- Within strategies spreads may narrow.
- Short the spread.

# Statistics

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- Mean returns
- Standard deviations
- Correlations
- Lessons from the numbers

# Historical Returns, Standard Deviations, and Significance

	Jan 1993 - Dec 2002		Jan 1998 - Dec 2002	
	Return*	St.Dev*	Return*	St.Dev*
A. HFRI Convertible Arbitrage Index (offshore)	11.28%	4.20%	11.84%	3.25%
B. HFRI Distressed Securities Index (offshore)	11.18%	5.37%	6.51%	6.34%
C. HFRI Emerging Markets Index (offshore)	10.38%	15.75%	0.91%	18.22%
D. HFRI Equity Hedge Index (offshore)	14.23%	8.70%	11.84%	10.40%
E. HFRI Event Driven Index (offshore)	12.79%	6.62%	7.10%	7.38%
F. HFRI Fixed Income Arbitrage Index (offshore)	6.31%	4.18%	2.24%	4.96%
G. HFRI Macro Index (offshore)	16.03%	9.47%	9.07%	7.88%
H. HFRI Merger Arbitrage Index (offshore)	10.86%	3.81%	7.07%	4.58%
I. HFRI Equity Market Neutral Index (offshore)	6.85%	3.79%	6.00%	3.46%
Equal Weighted (EQW)	11.26%	5.04%	7.13%	5.63%
Equal Weighted less Macro & Emerging Mkts (EQW2)	10.56%	3.74%	7.58%	4.27%
MSCI Europe (MSDUE15)	4.63%	15.55%	-5.55%	18.63%
DAX	3.12%	24.68%	-11.58%	29.39%
PEXP (PEXATR)	7.34%	3.12%	6.20%	3.03%

*Based on monthly data - \*Annualized*

# Correlations

Jan 1993-Dec 2002	A	B	C	D	E	F	G	H	I
A. HFRI Convertible Arbitrage Index (offshore)	1.00	0.53	0.41	0.46	0.51	0.14	0.37	0.39	0.32
B. HFRI Distressed Securities Index (offshore)	0.53	1.00	0.60	0.52	0.69	0.36	0.47	0.56	0.23
C. HFRI Emerging Markets Index (offshore)	0.41	0.60	1.00	0.67	0.62	0.25	0.57	0.46	0.10
D. HFRI Equity Hedge Index (offshore)	0.46	0.52	0.67	1.00	0.70	0.04	0.60	0.53	0.33
E. HFRI Event Driven Index (offshore)	0.51	0.69	0.62	0.70	1.00	0.19	0.54	0.67	0.31
F. HFRI Fixed Income Arbitrage Index (offshore)	0.14	0.36	0.25	0.04	0.19	1.00	0.21	0.07	0.16
G. HFRI Macro Index (offshore)	0.37	0.47	0.57	0.60	0.54	0.21	1.00	0.31	0.23
H. HFRI Merger Arbitrage Index (offshore)	0.39	0.56	0.46	0.53	0.67	0.07	0.31	1.00	0.25
I. HFRI Equity Market Neutral Index (offshore)	0.32	0.23	0.10	0.33	0.31	0.16	0.23	0.25	1.00
Equal Weighted (EQW)	0.61	0.77	0.86	0.83	0.84	0.33	0.75	0.63	0.36
Equal Weighted less Macro & EM (EQW2)	0.67	0.81	0.69	0.82	0.88	0.35	0.60	0.71	0.49
MSCI Europe (MSDUE15)	0.21	0.39	0.53	0.63	0.52	0.09	0.39	0.48	0.15
DAX	0.16	0.40	0.54	0.56	0.51	0.10	0.38	0.45	0.06
PEXP (PEXATR)	0.16	0.09	-0.08	0.02	0.10	-0.03	0.36	-0.12	0.11

*All correlations are based on monthly data.*

# Correlations (continued)

Jan 1993-Dec 2002	EQW	EQW2	MSCI EUR	DAX	PEXP
A. HFRI Convertible Arbitrage Index (offshore)	0.61	0.67	0.21	0.16	0.16
B. HFRI Distressed Securities Index (offshore)	0.77	0.81	0.39	0.40	0.09
C. HFRI Emerging Markets Index (offshore)	0.86	0.69	0.53	0.54	-0.08
D. HFRI Equity Hedge Index (offshore)	0.83	0.82	0.63	0.56	0.02
E. HFRI Event Driven Index (offshore)	0.84	0.88	0.52	0.51	0.10
F. HFRI Fixed Income Arbitrage Index (offshore)	0.33	0.35	0.09	0.10	-0.03
G. HFRI Macro Index (offshore)	0.75	0.60	0.39	0.38	0.36
H. HFRI Merger Arbitrage Index (offshore)	0.63	0.71	0.48	0.45	-0.12
I. HFRI Equity Market Neutral Index (offshore)	0.36	0.49	0.15	0.06	0.11
Equal Weighted (EQW)	1.00	0.94	0.59	0.56	0.09
Equal Weighted less Macro & EM (EQW2)	0.94	1.00	0.56	0.51	0.07
MSCI Europe (MSDUE15)	0.59	0.56	1.00	0.79	-0.01
DAX	0.56	0.51	0.79	1.00	-0.03
PEXP (PEXATR)	0.09	0.07	-0.01	-0.03	1.00

*All correlations are based on monthly data.*

# Time Series Properties: Naive Prediction

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	<b>Annualised Return</b>	<b>Annualised Standard Deviation</b>	<b>Serial Correlation</b>
<b>Convertible Arbitrage</b>	11.28%	4.20%	0.51
<b>Distressed Securities</b>	11.18%	5.37%	0.46
<b>Event Driven</b>	12.79%	6.62%	0.23
<b>Fixed Income Arbitrage</b>	6.31%	4.18%	0.39
<b>Macro</b>	16.03%	9.47%	0.22
<b>Merger Arbitrage</b>	10.86%	3.81%	0.16
<b>Equity Market Neutral</b>	6.85%	3.79%	0.17
<b>Equal Weighted less Macro (EQW2)</b>	10.56%	3.74%	0.46
<b>MSCI Europe</b>	4.63%	15.55%	-0.04

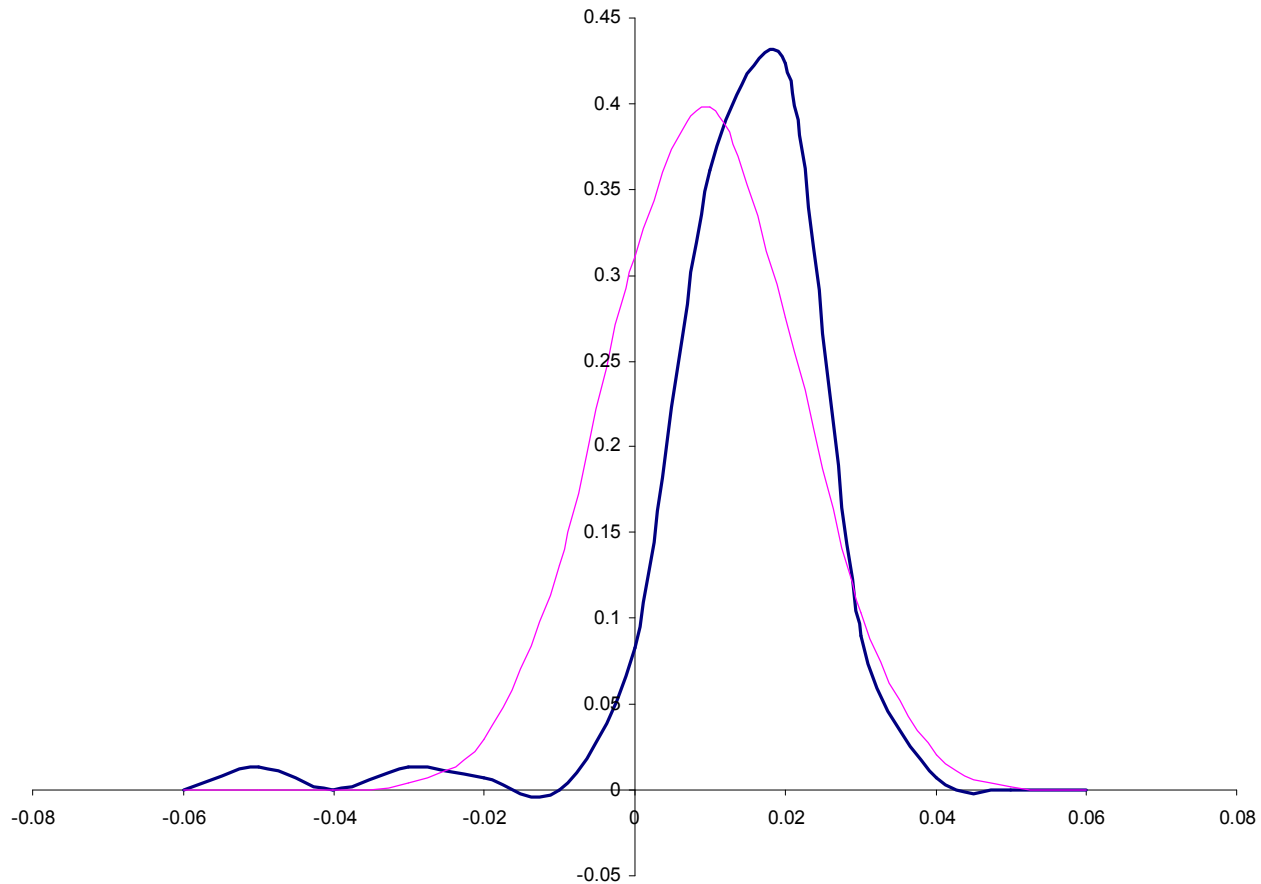
# Other Risks: Skewness & Kurtosis

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	Annualised Return	Annualised Standard Deviation	Skewness	Kurtosis
Convertible Arbitrage	11.28%	4.20%	-1.67	5.50
Distressed Securities	11.18%	5.37%	-1.57	9.81
Event Driven	12.79%	6.62%	-0.57	5.15
Fixed Income Arbitrage	6.31%	4.18%	-3.28	17.29
Macro	16.03%	9.47%	0.53	0.97
Merger Arbitrage	10.86%	3.81%	-2.27	9.75
Equity Market Neutral	6.85%	3.79%	-0.01	0.65
Equal Weighted less Macro (EQW2)	10.56%	3.74%	-1.29	5.05
MSCI Europe	4.63%	15.55%	-0.76	1.14

# Return Distributions: Merger Arbitrage

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# Lessons from Statistics

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- The risks of a diversified portfolio of hedge funds are substantially less than that for stocks.
- The average returns on such a portfolio have been superior to those for stocks.
- The low volatility of the portfolio of hedge funds implies that their future returns will be comparable to the historical results.
- The high volatility of stocks renders any predictions about their future returns both unknown and unknowable.

## Practical Implication

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- Adding hedge funds to a portfolio historically would have raised return and, prospectively, should not be expected to diminish returns.

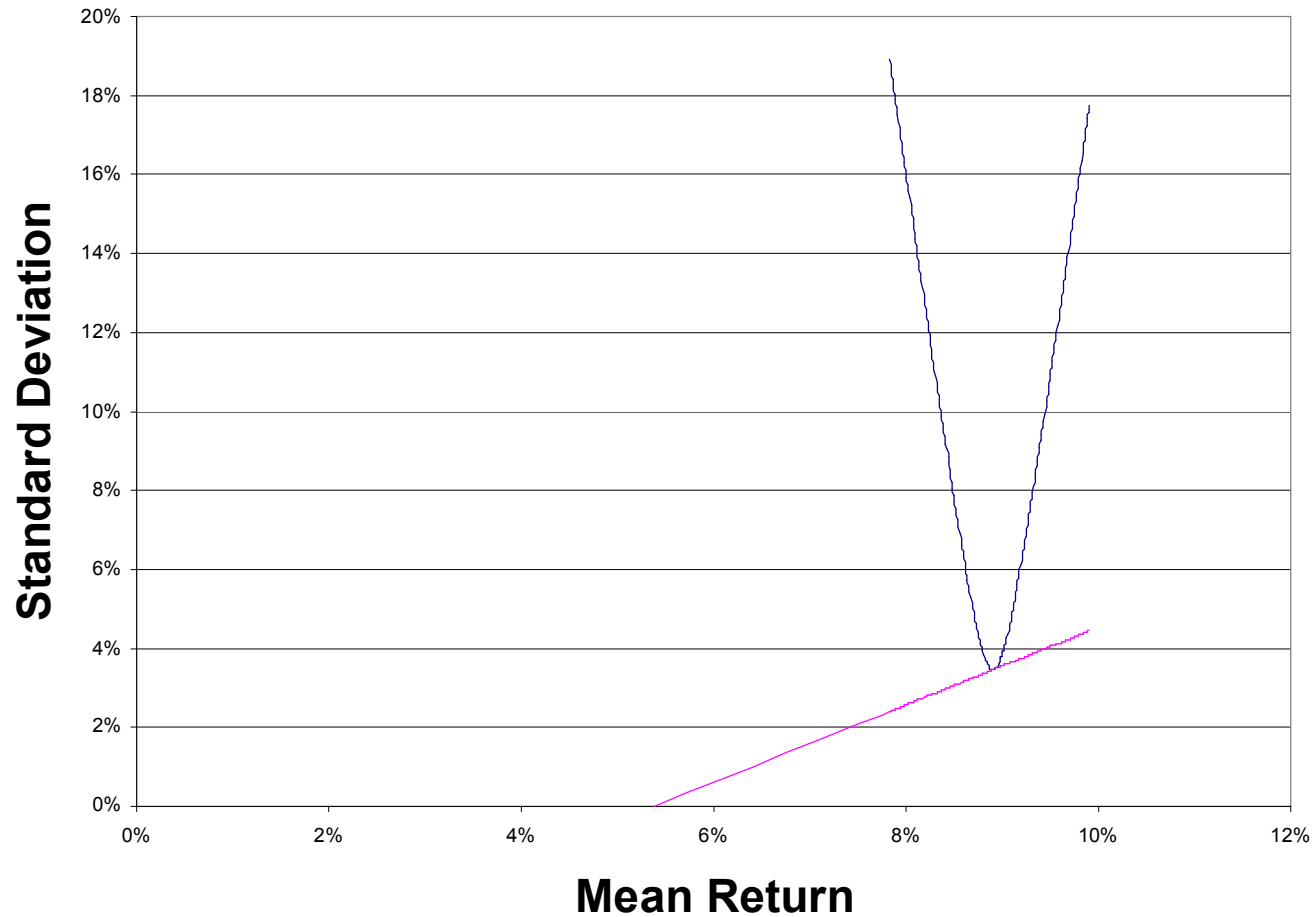
# Finding the Right Asset Allocation

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- Mean variance analysis.
- Optimizing versus satisficing.
- The distributional approach.
- Bootstrapping.

# The Mean Variance Approach

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# Assessing Mean Variance Analysis

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- Correct emphasis on diversification
  - BUT:
- Too heavy reliance on historical average returns.
- ‘Black Box’:
  - Don’t know what features lead to what results.
- Suggestive and attractive.
- And, not to be taken too seriously.

# Distributional Approach

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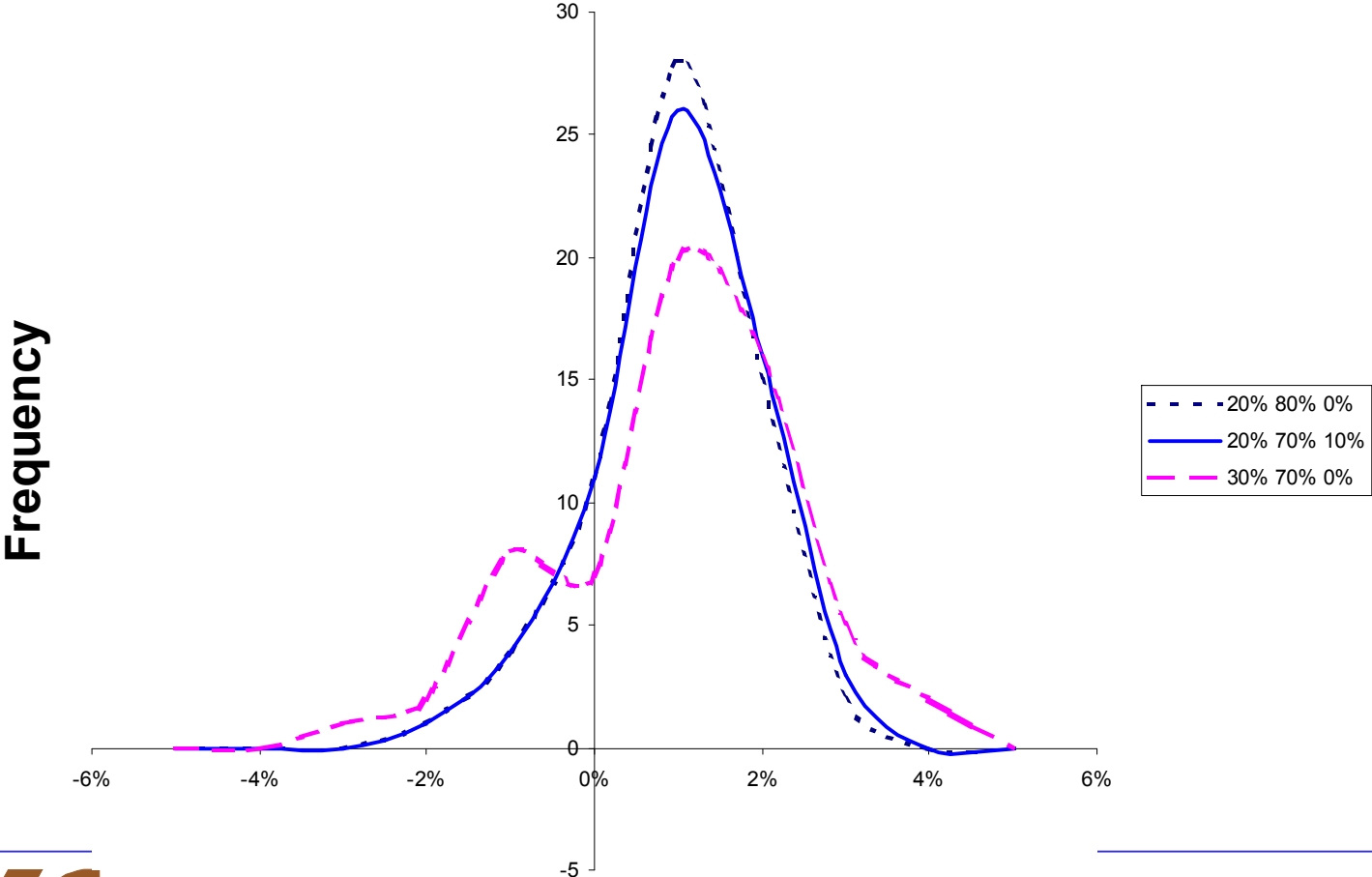
- Choose relevant portfolios some near and some far from current allocation.
- Good global candidate portfolio choices:
  - Equal weighted.
  - Market, i.e., value weighted.
- A marginal analysis: impact of change from current allocation.
- Simulate and ‘Bootstrap’ to display return features.

# Candidate Portfolio Allocations

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Jan 1993-Dec 2002	A			B		
<b>Stocks (DAX)</b>	10%	10%	20%	0%	0%	0%
<b>Bonds (PEXP)</b>	90%	80%	80%	100%	90%	50%
<b>Hedge Funds (EQW2)</b>	0%	10%	0%	0%	10%	50%
<b>Return*</b>	7.23%	7.55%	7.05%	7.34%	7.67%	8.97%
<b>St. Dev.*</b>	3.68%	3.63%	5.46%	3.12%	2.86%	2.52%
<i>Based on monthly data - *Annualized</i>						

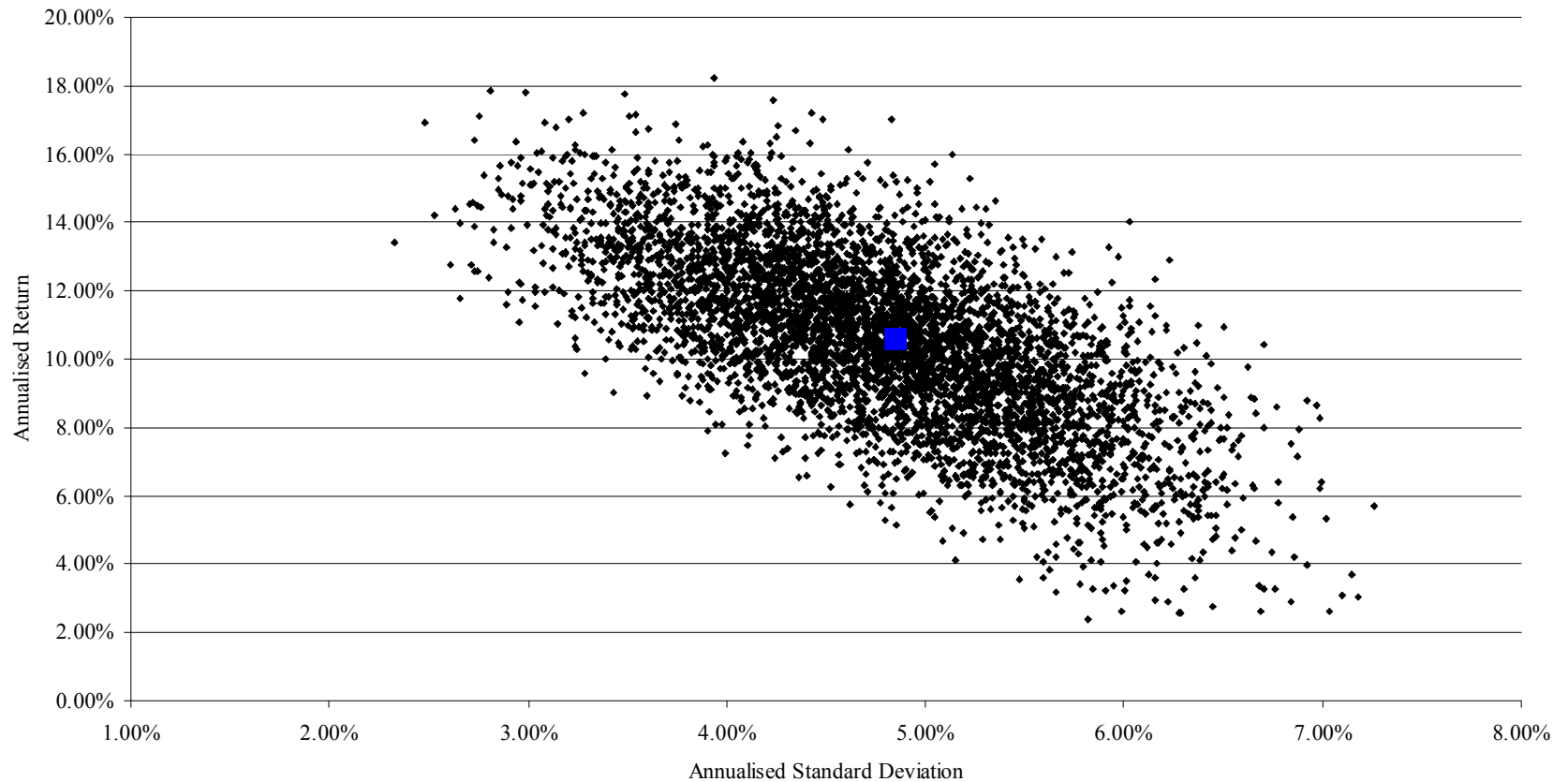
# Return Distributions Across Allocations



# Bootstrap Analysis

## Example: Convertible Arbitrage

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# Active Management

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- Individual hedge funds must be subject to rigorous analytic and fundamental analysis.
- Diversification across funds and strategies, whilst actively managing the allocation to those strategies can add value.
- Efficient market is a useful intuition, but does not apply.
- There must be a return for making markets efficient which is what hedge funds do.

## Example: Merger Arbitrage

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- Deal Flow is observable.
- Higher returns are available when deal flow is up and lower returns follow low deal flow.
- Merger Return (t) =  $a + b * \text{Deal Flow}(t-6)$
- Reliable but weak: t stat = 2.2.

## Example: Convertible Arbitrage

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- Less dependent on deal flow because of existing stock.
- Volatility, yield curve and credit spreads impact returns.

## Conclusions

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- Hedge funds can lower the risk and enhance the returns of an institutional portfolio.
- An allocation of 10% at a minimum is prudent and risk reducing.
- Active management can add value.