

# ***Presentation to the Q Group Colloquium***



GLOBAL LEADERS IN MULTI-MANAGER INVESTING

## **Australian Equity Manager Out-performance: Skill or Luck?**

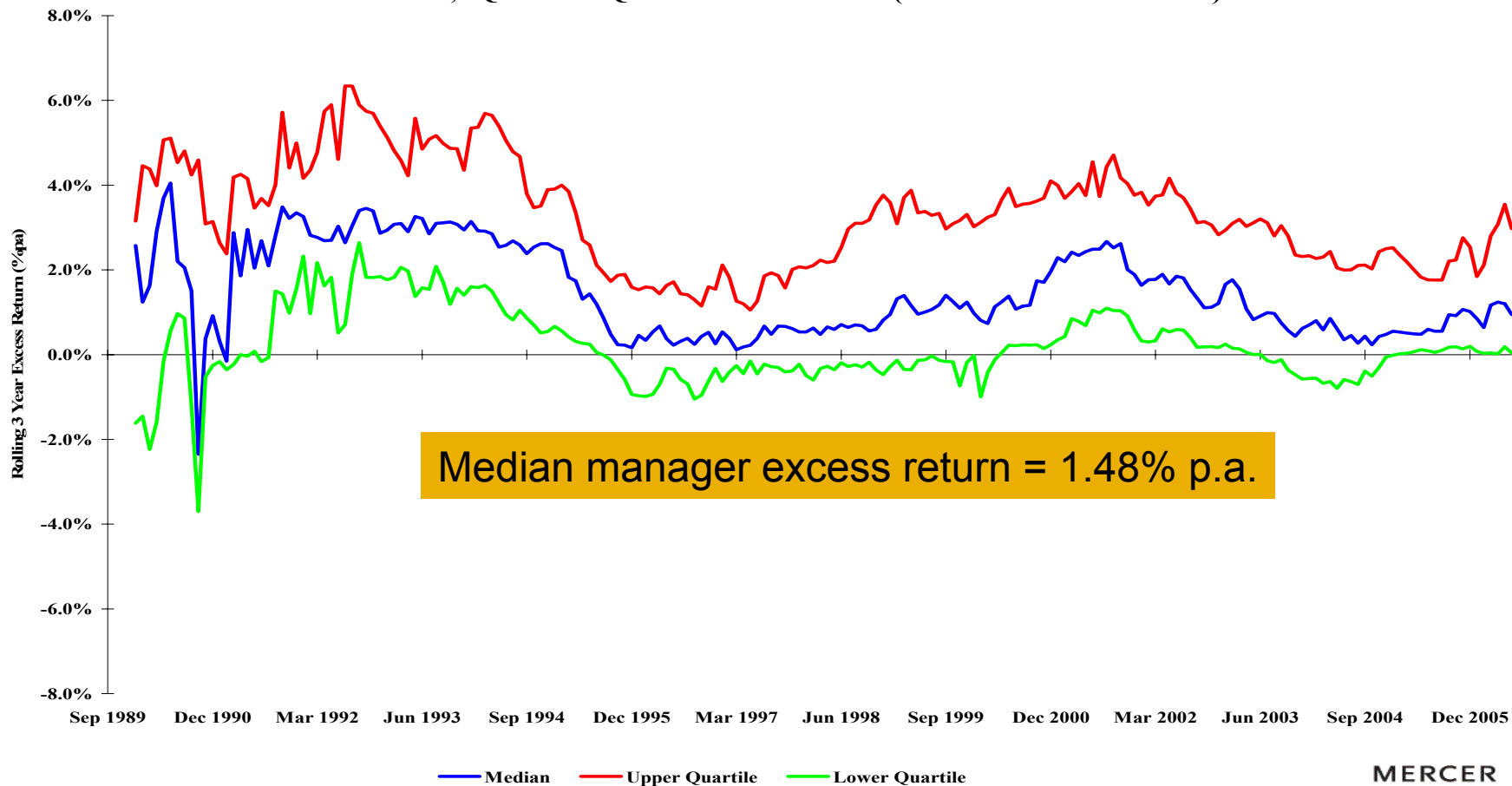
**14 September 2006**

Rob Pereira, PhD

# Is this Out-Performance due to Skill or Luck?

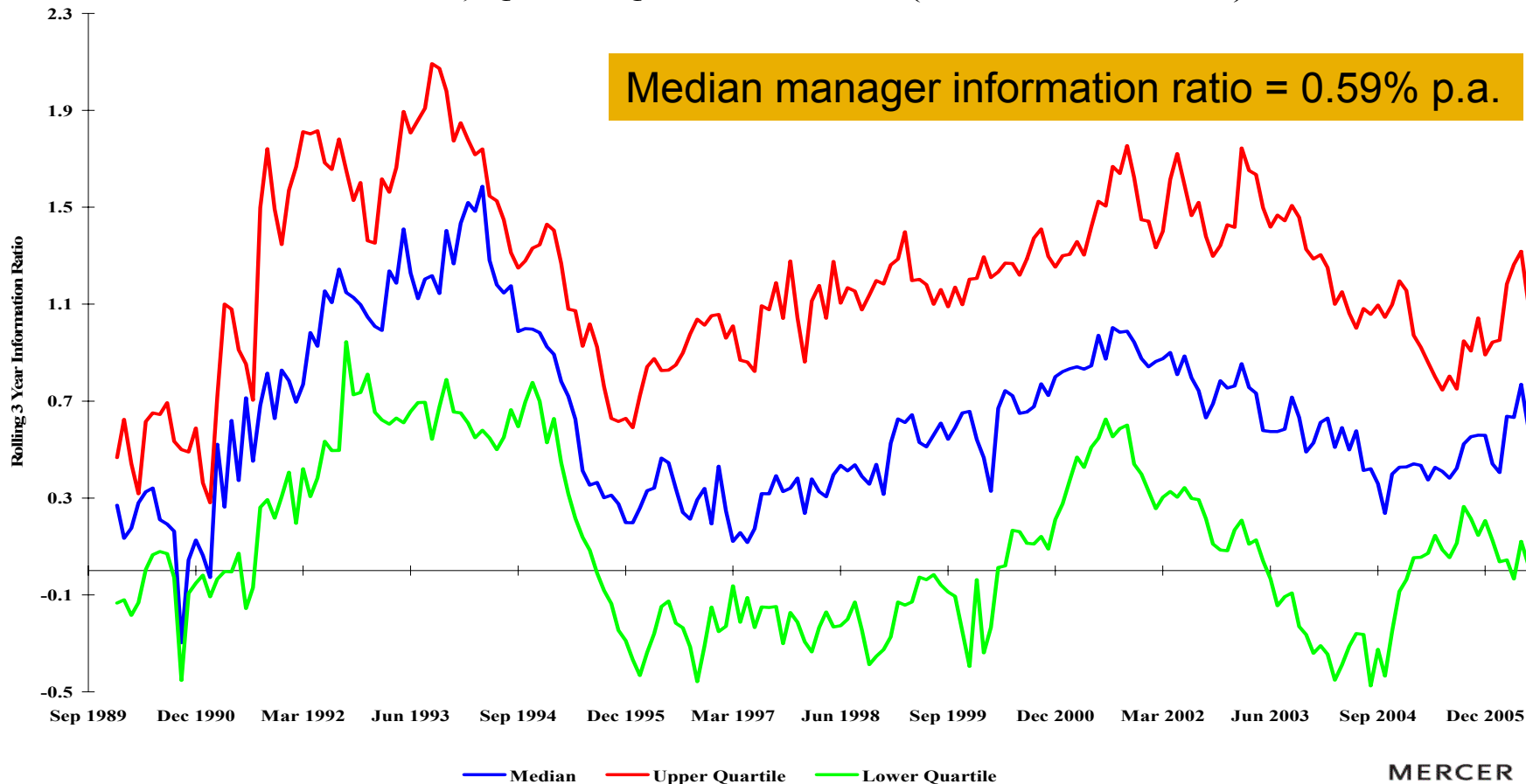
## Median

Excess Return in Australian Shares from Sep 1989 to Jun 2006  
Median, UQuart & LQuart versus ASX-300 (before tax and before fees)



# Is this Out-Performance due to Skill or Luck?

**Median**  
Information Ratio in Australian Shares from Sep 1989 to Jun 2006  
Median, UQuart & LQuart versus ASX-300 (before tax and before fees)



# Overview

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- 1. Motivation**
- 2. Previous studies**
- 3. Methodology**
- 4. Results**
- 5. Conclusion**



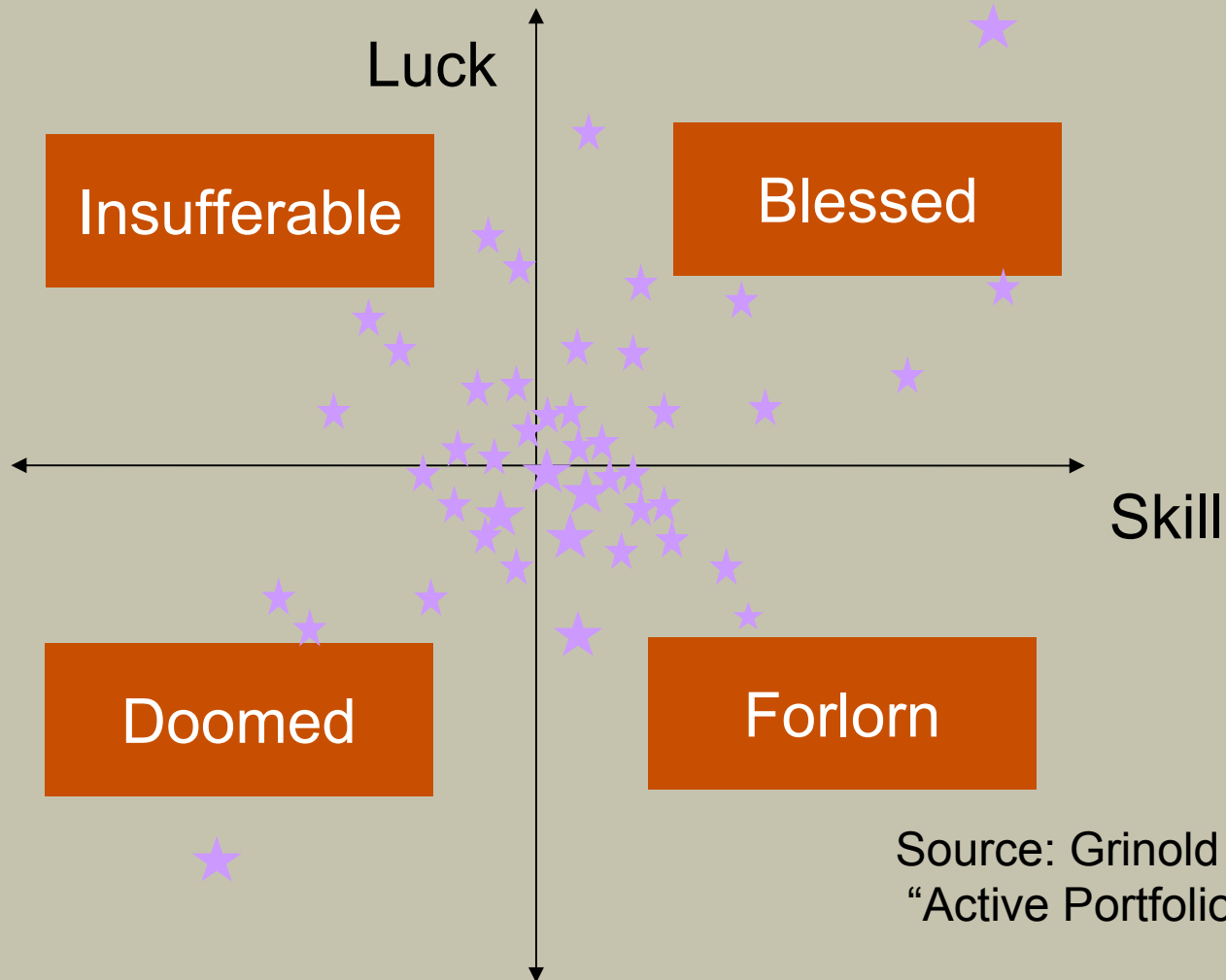
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# 1. Motivation

*“Portfolio returns are noisy, which makes it difficult to detect performance even when it exists”*

*(Grinblatt & Titman 1994)*

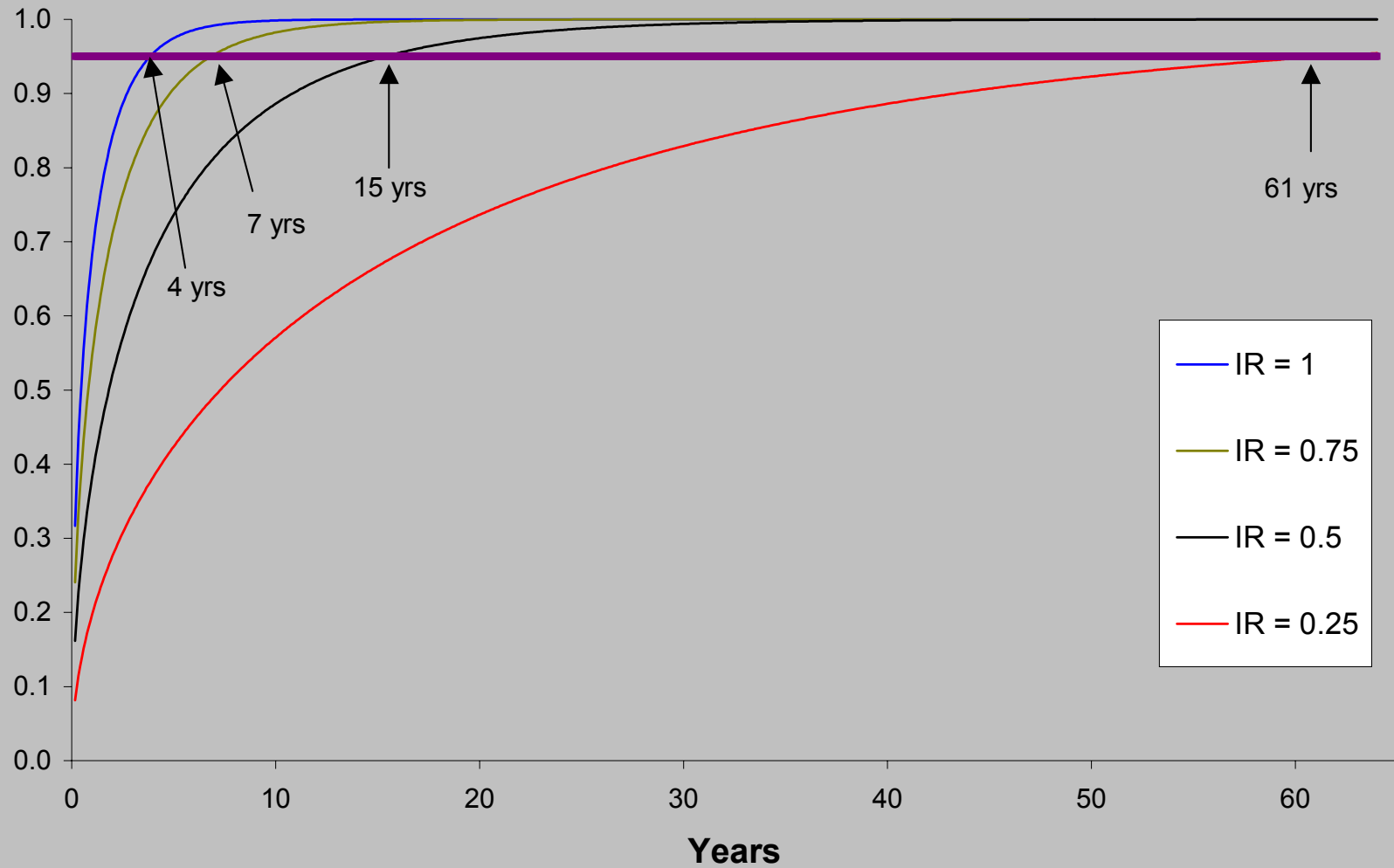
# Skill OR Luck?



Source: Grinold & Kahn (2000),  
"Active Portfolio Management"

# Number of Years Required for Statistical Significance

Confidence Level



# Not many funds with long histories

## Australian Shares

### Returns for periods ended 30 June 2006

	3 Months	1 Year	4 Years	7 Years	12 Years	15 Years
	(%)	(%)	(% pa)	(% pa)	(% pa)	(% pa)
Number of Funds	122	115	77	51	20	7
Upper Quartile	0.6	28.7	18.8	15.0	15.1	15.5
Median	-0.2	25.6	17.7	13.9	13.7	14.2
Lower Quartile	-0.6	23.8	17.1	12.9	13.0	13.5
S&P/ASX 300	-0.3	24.0	17.0	12.2	12.4	12.7
S&P/ASX 100 Leaders	-0.1	23.9	16.7	12.4	12.7	12.7
S&P/ASX 200	-0.2	23.9	17.0	12.3	12.4	12.7

Source: Mercer Performance Analytics



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## 2. Previous Studies

*“The proof is in the taste of the pudding”*

# Fund Performance Studies

- **Pioneering studies**
  - Treynor (1965), Sharpe (1966) & Jensen (1968)
- **Critiques of the methodology used by initial studies**
  - Benchmark error, survivorship bias, time varying  $\alpha$  &  $\beta$
- **Subsequent studies**
  - Grinblatt & Titman (1994), Goetzmann & Ibbotson (1994)
- **Bootstrap approach**
  - Kosowski et al (2006) & Cuthbertson et al (2005)

# Australian Evidence

Authors	Year of Publication	Sample Period	Funds Covered	Methodology	Fund Manager Stock Selection Ability	Survivor Bias
Praetz	1976	1967-1971	Retail Unit Trusts	SR, TR, Alpha	Underperformance	Yes
Bird, Chin and McCrae	1983	1973-1981	380 Superannuation Funds	SR, TR, Alpha	Mixed*	Yes
Robson	1986	1969-1978	67 Wholesale Unit Trusts	SR, TR	Mixed*	Yes
Sinclair	1990	1981-1987	16 Pooled-Superannuation Trusts	Alpha	Outperformance	Yes
Gallagher	1999	1991-1998	33 Superannuation Funds	Alpha	Underperformance	Yes
Hallahan and Faff	1999	1988-1997	65 Equity unit trusts	Alpha	Underperformance	Yes
Sawicki and Ong	2000	1983-1995	97 Retail Unit Trusts	Cond-Alpha	Underperformance	Yes
Gallagher	2001	1991-1998	16 Pooled-Superannuation Trusts	Alpha	Underperformance	Yes
Allen and Soucik	2002	1985-1999	636 Equity and Fixed Interest Funds	Alpha, Cond-Alpha	Mixed**	No
Drew, Veeraraghavan and Wilson	2005	1991-2000	134 Retail Superannuation Funds	Alpha	Underperformance	No



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## 3. Methodology

*“All models are wrong, but some are useful”*

*(Box 1976)*

# Performance Metrics

- **Industry practice**
  - qualitative surveys of raw return performance
  - $\alpha = R_p - R_b$  which assumes  $\beta = 1 \rightarrow IR = \alpha / TE$
- **Risk adjusted returns**
  - **ratios approach**
    - Sharpe, Treynor, & Information ratios (or appraisal ratio)
  - **regression based approach**
    - CAPM & APT
    - Factors based approach – Fama French, etc.

# Performance Evaluation Models

- **Two models considered:**
  - Jensen's alpha
  - Fama-French Three Factor Model
    - Market
    - Value
    - Size
- **Other models, not considered in this study**
  - Carhart Four Factor Model
    - Momentum
  - Conditional models
    - Time-varying alphas and betas

# Separating Skill from Luck

- **Bootstrap approach**
  - generate artificial distribution by sampling with replacement from the original data set
- **Application**
  - to construct an artificial distribution of alphas imposing the restriction of zero manager skill
    - hence alphas are due to luck NOT skill
  - make inferences about stock picking ability

# Bootstrap Procedure

1. Run this regression

$$r_{i,t} = a + \beta_{i,1} \cdot \text{RMRF} + \beta_{i,2} \cdot \text{SMB}_t + \beta_{i,3} \cdot \text{HML}_t + \varepsilon_{i,t}$$

> collect the estimated coefficients and residuals

2. Sample with replacement from the series of residuals for fund i. Do this  $B = 1,000$  times.

> collect the 1,000 re-sampled sets of residuals

3. Using the re-sampled residuals & imposing  $H_0: \alpha = 0$ , calculate artificial excess returns

$$r^b_{i,t} = b_{i,1} \cdot \text{MRP} + b_{i,2} \cdot \text{SMB}_t + b_{i,3} \cdot \text{HML}_t + e^b_{i,t}$$

> 1,000 samples of artificial excess returns

# Bootstrap Procedure

4. Regress artificial fund returns on RMRF, SMB & HML. Do this for each bootstrapped sample.

$$r_{i,t}^b = a + \beta_{i,1} \cdot \text{RMRF} + \beta_{i,2} \cdot \text{SMB}_t + \beta_{i,3} \cdot \text{HML}_t + \varepsilon_{i,t}$$

> 1,000 samples of artificial alphas

5. Repeat steps 1 to 4 for all the other funds
6. Place the resulting alphas in a matrix & construct a cross sectional distribution of alphas sorted from highest to lowest

# Cross Sectional Distribution of Alphas

- Each row is an alpha distribution capturing sampling variation around a mean value of zero (by construction)
- Top (bottom) row represents max. (min.) mean alpha across all the bootstrap samples
- Top (bottom) row is the luck distribution for the best (worst) performing fund

$$\begin{bmatrix} \hat{\alpha}_1^1 & \hat{\alpha}_1^2 & \cdots & \hat{\alpha}_1^B \\ \hat{\alpha}_2^1 & \hat{\alpha}_2^2 & \cdots & \hat{\alpha}_2^B \\ \vdots & \vdots & \ddots & \vdots \\ \hat{\alpha}_N^1 & \hat{\alpha}_N^2 & \cdots & \hat{\alpha}_N^B \end{bmatrix}$$



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## 4. Results

*“Say not “I have found the truth”, but rather, “I have found a truth.”*

*(Kahil Gibran, The Prophet)*

# Data

- Time series data from Jan 90 to Dec 04
- Manager data
  - Australian equity open-end unit trusts
  - Morningstar database – inc. non-surviving funds
  - full sample of 456 funds (retail = 226 & w/sale = 230)
  - restricted to 222 funds (retail = 109 & w/sale = 113)
- Market data
  - S&P/Citigroup market & style indices (mkt & FF RP proxies)

# Descriptive Statistics of the Funds

## Excess Returns

### Mean

W/sale  $\cong$  5% p.a.

Retail  $\cong$  4.5% p.a.

### Median

w/sale  $\cong$  5% p.a.

Retail  $\cong$  3.5% p.a.

### Skewness

W/sale; no skew

Retail; positive skew

### Leptokurtosis

W/sale; no leptokurtosis

Retail; leptokurtosis

## Fund Characteristics

### ave. age

W/sale  $\cong$  5.0 years

Retail  $\cong$  6.4 years

### ave. size

W/sale  $\cong$  \$325m

Retail  $\cong$  \$230m

### ave. fees

W/sale  $\cong$  0.9% p.a.

Retail  $\cong$  1.8% p.a.

# Cross Sectional Performance Models

	Single-Factor Model	Three-Factor Model
<i>Regression Constant</i>		
Median Alpha (% per month)	-0.04 (0.31)	-0.04 (0.32)
<i>Regression Coefficients</i>		
Average $\beta_i$ estimate	0.90 (25.46)	0.91 (23.5)
Average $s_i$ estimate	-	0.09 (1.42)
Average $h_i$ estimate	-	-0.06 (0.72)
<i>Regression Diagnostics</i>		
Adjusted R <sup>2</sup>	0.80	0.82
Residuals not normally dist (% of funds)	60	58

# Statistical Significance of the alphas

## Top half of the distribution

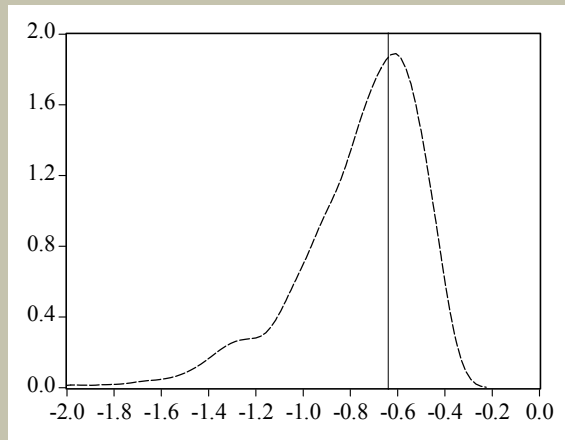
	40%	20%	10%	5.	4.	3.	2.	1
3-factor Alpha (% pm)	0.00	0.12	0.29	0.68	0.78	0.85	1.26	1.85
Bootstrapped Alpha (% pm)	0.03	0.11	0.19	0.40	0.44	0.50	0.61	0.86
Equiv. Parametric <i>p</i> -value	0.491	0.339	0.003	0.024	0.003	0.027	0.010	0.014
Bootstrapped <i>p</i> -value	1.000	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

## Bottom half of the distribution

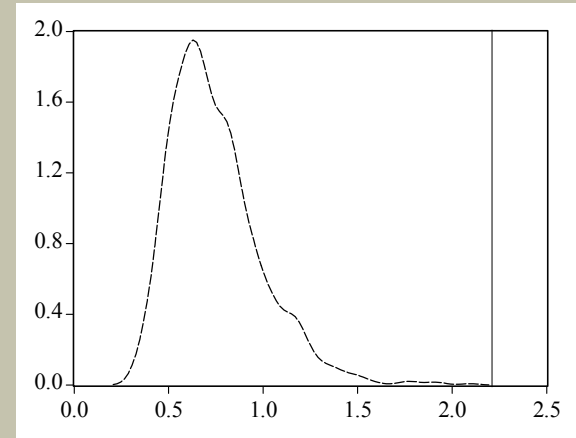
	222	221	220	219	218	90%	80%	60%
3-factor Alpha (% pm)	-0.66	-0.61	-0.61	-0.60	-0.58	-0.28	-0.19	-0.09
Bootstrapped Alpha (% pm)	-0.88	-0.61	-0.50	-0.44	-0.40	-0.19	-0.11	-0.03
Equiv. Parametric <i>p</i> -value	<0.001	<0.001	<0.001	0.033	0.025	0.009	0.179	0.115
Bootstrapped <i>p</i> -value	1.000	0.2995	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

# Comparing actual to bootstrapped alpha

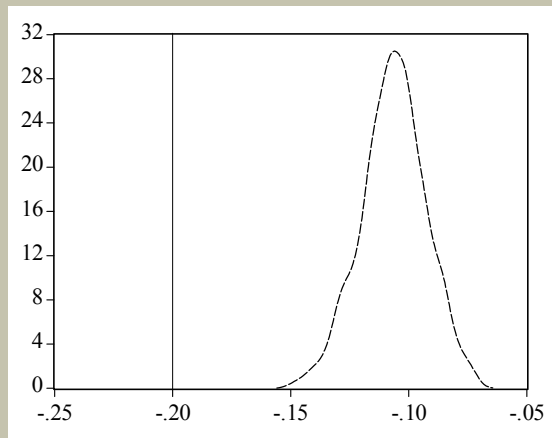
## Bottom fund



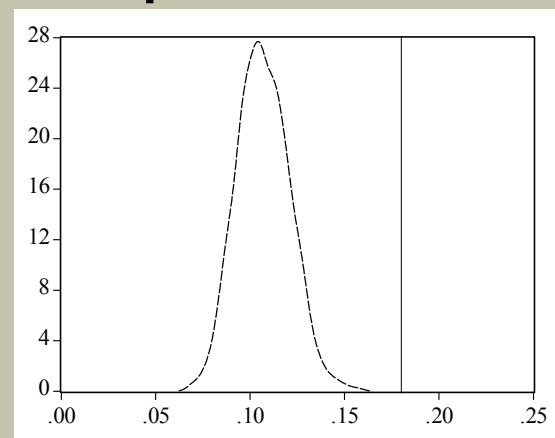
## Top fund



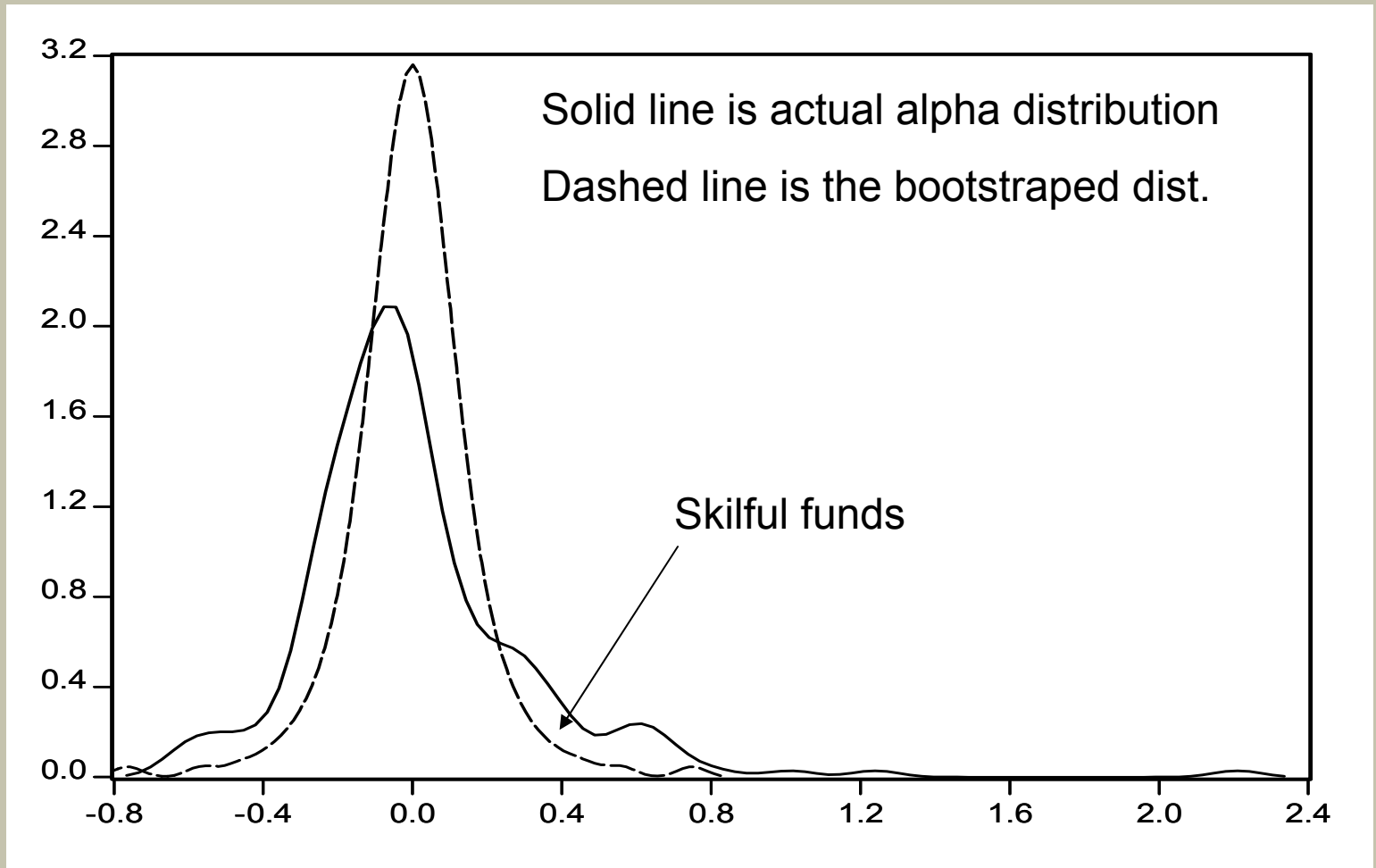
## 20<sup>th</sup> percentile fund



## 80<sup>th</sup> percentile fund



# Cross-Sectional Distributions of Actual and Bootstrapped Jensen's Alphas



# Performance Persistence for a 3-Year Ranking Period

3-Year Ranking Period	1-Year Holding Period	
	Alpha	<i>p</i> -value
1.Decile	0.10	0.128
2.Decile	-0.01	0.474
3.Decile	0.02	0.302
4.Decile	0.05	0.020
5.Decile	0.02	0.207
6.Decile	0.00	0.224
7.Decile	-0.16	0.008
8.Decile	-0.13	0.006
9.Decile	-0.27	<0.001
10.Decile	-0.16	0.223
2-9 spread*	0.26	0.014
1-10 spread*	0.26	0.089

# Performance Persistence for a 1-Year Ranking Period

1-Year Ranking Period	1-Year Holding Period	
	Alpha	<i>p</i> -value
1.Decile	0.31	<0.001
2.Decile	0.14	0.009
3.Decile	0.18	0.005
4.Decile	-0.07	0.107
5.Decile	-0.09	0.102
6.Decile	-0.17	<0.001
7.Decile	-0.02	0.328
8.Decile	-0.03	0.350
9.Decile	-0.31	<0.001
10.Decile	-0.40	<0.001
2-9 spread*	0.45	<0.001
1-10 spread*	0.71	<0.001



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## 5. Conclusion

*“What does this all mean?”*

# Statistical Significance of Alphas

- **General results**
  - The median fund under-performs
  - Most funds below median fund appear to possess negative skill, except the bottom few
  - More importantly, funds in top quintile appear to possess stock picking ability
- **Robustness across different alpha measures & retail & wholesale split of funds**
- **Some, albeit weak, persistence over time**

# Implications for Investors

- Only a small cohort of managers are truly skilful
  - To identify these managers, good research is critical
- Skill can only be observed in the data ex post
- Unfortunately skill cannot be observed ex ante
- Therefore ...
  - This bootstrap analysis is appropriate for monitoring & evaluating managers' performance of the funds investors already own
  - To identify skilful managers ex ante it is necessary to undertake predominately qualitative analysis



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**1936** Tacoma, Headquarters

**1969** New York **1979** London **1984** Sydney **1984** Toronto **1986** Tokyo **1991** Auckland **1994** Paris **1999** Singapore

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