

Decentralized Investment Management: Evidence from the Pension Fund Industry

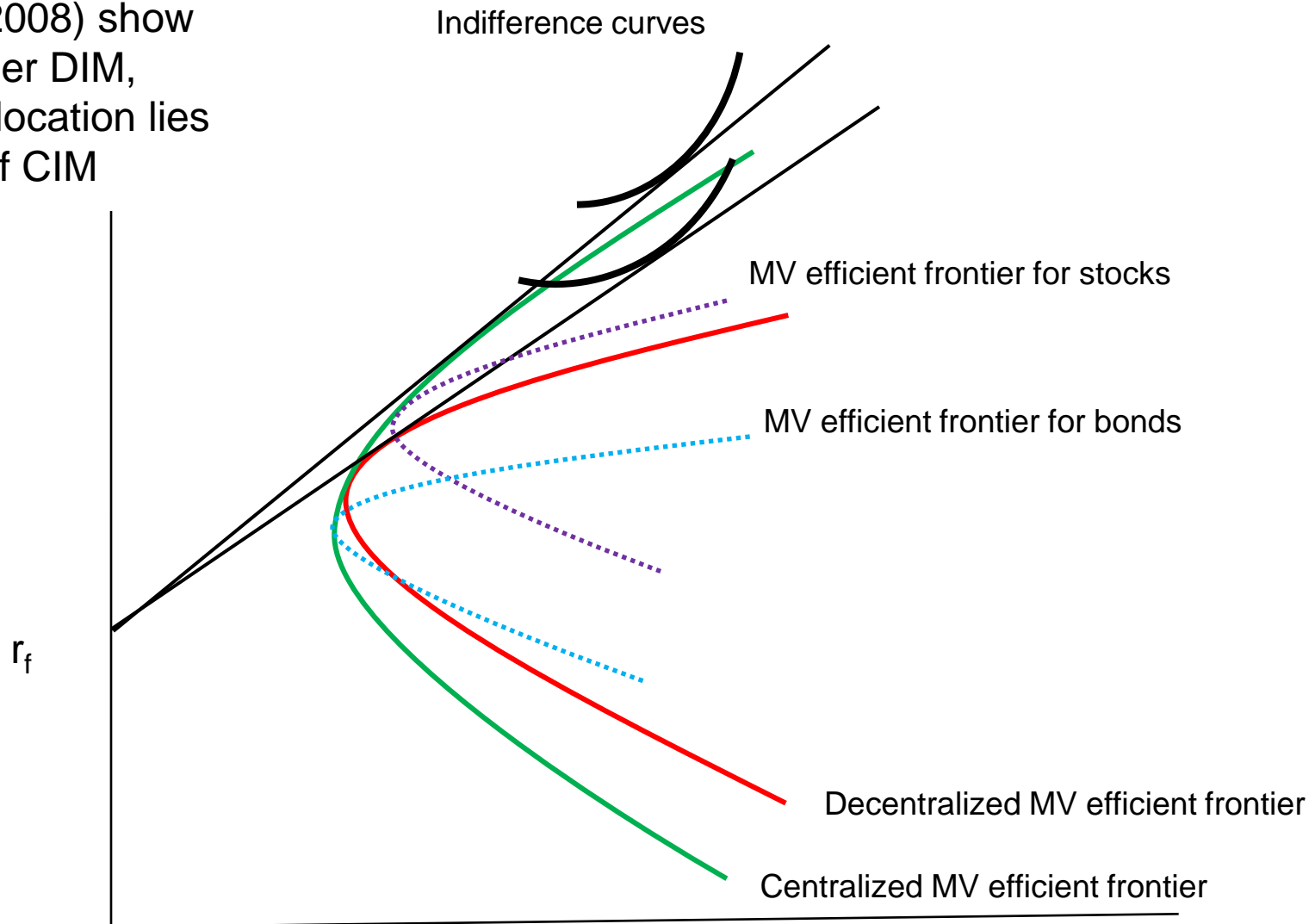
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Wermers*

Decentralized Investment Management

- CIO of pension fund (sponsor) employs (multiple) asset managers to implement and execute investment strategies in separate asset classes.
 - Specialization but diversification loss:
 - Sharpe (1981), Van Binsbergen, Brandt & Koijen (2008)
 - Bhattacharya & Pfleiderer (1984) DPM
 - Competition:
 - Holmstrom (1982); Shleifer (1985)
 - Diversify alpha strategies:
 - Kapur and Timmermann (2005)
 - Economies/Diseconomies of scale:
 - Berk & Green (2004), but higher fees
- Application to segregated pension funds:
 - Segregated pension schemes:
 - Pension fund owns the assets (cf mutual funds/unit trusts)
 - Pension fund allocates capital to fund managers who allocate these funds to the assets in their asset class.

Van Binsbergen, Brandt & Koijen (2008)

vBBK (2008) show that under DIM, asset allocation lies to SW of CIM



Decentralized MV efficient frontier is the CIO's optimal linear combinations of the stock and bond efficiency frontiers

Extend vBBK (2008) with skilled managers

1. For even low levels of manager skill CIO prefers decentralized skilled manager
2. Skilled managers always choose riskier portfolio than unskilled
3. CIO will choose a riskier overall portfolio
4. With uncertainty about manager skills,
 - may or may not decentralize
 - If DIM: CIO may choose less risky portfolio (*cf* #3)

CAPS Sample

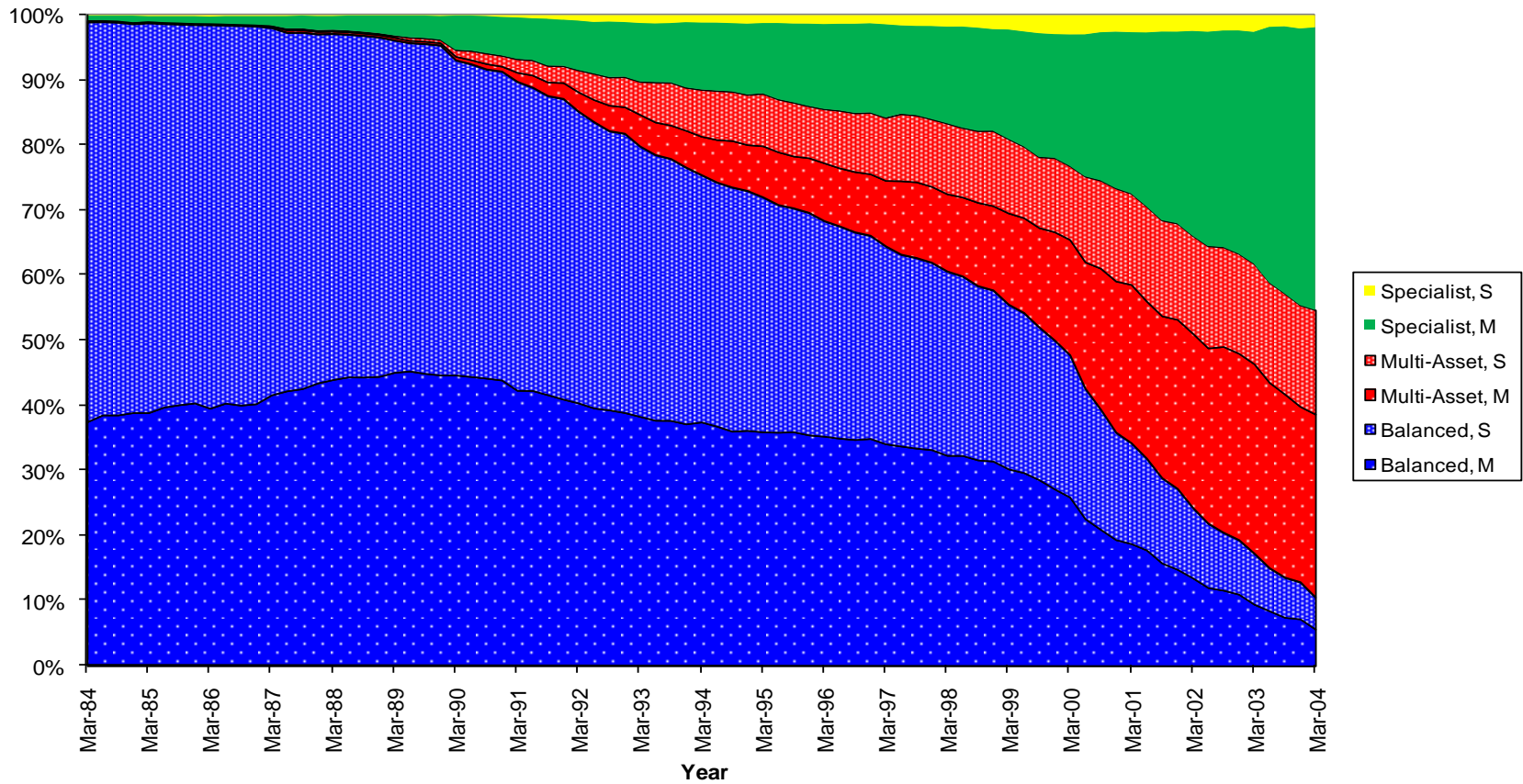
- Dataset provided by BNY Mellon Asset Servicing
 - formerly Russell-Mellon-CAPS — commonly known as “CAPS”)
- Quarterly returns on coded investment portfolios of 2,385 self-administered UK pension funds from March 1984 to March 2004
- Seven asset categories
- Unique data on *type of mandate*, mandate size
- 364 coded fund management houses
 - in-house & external

Segregated Pension Fund Management

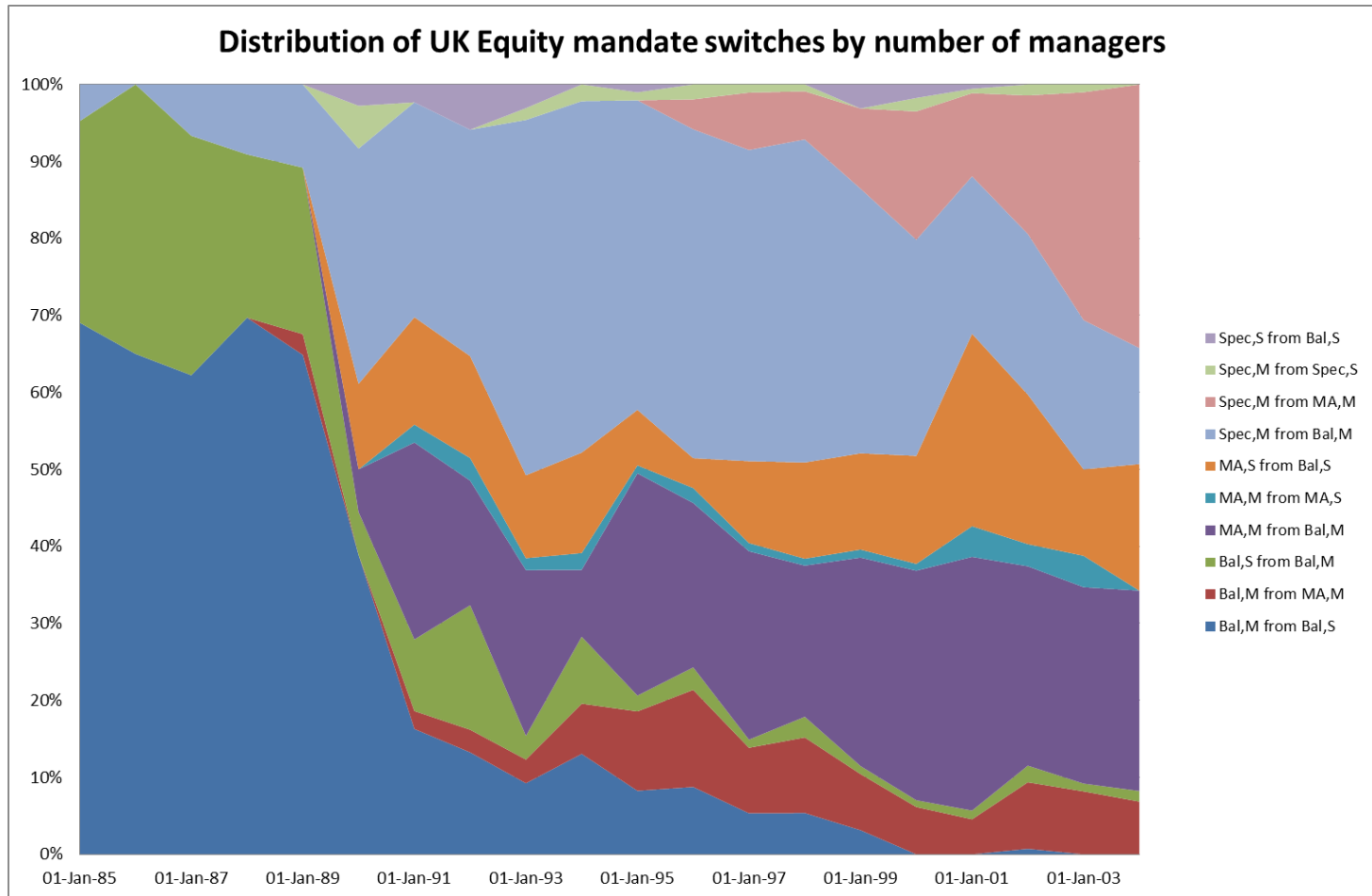
- Different types of mandates
 - Balanced:
 - fund manager invests across full range of assets: market timing & selectivity
 - Specialist:
 - manager assigned single asset class; sponsor decides SAA
 - Multi-asset:
 - $1 < \text{asset classes} < 7$
 - Use of Single/Multiple managers
- Investigate two shifts in Decentralized Investment Management with respect to segregated pension funds
 - Move from balanced to specialist
 - Move to multiple managers

Trends in CAPS Sample

Distribution of Percentage of UK Equity Mandates by Single and Multiple Manager and Mandate type



Trends in CAPS Sample



CAPS Sample Asset Allocation

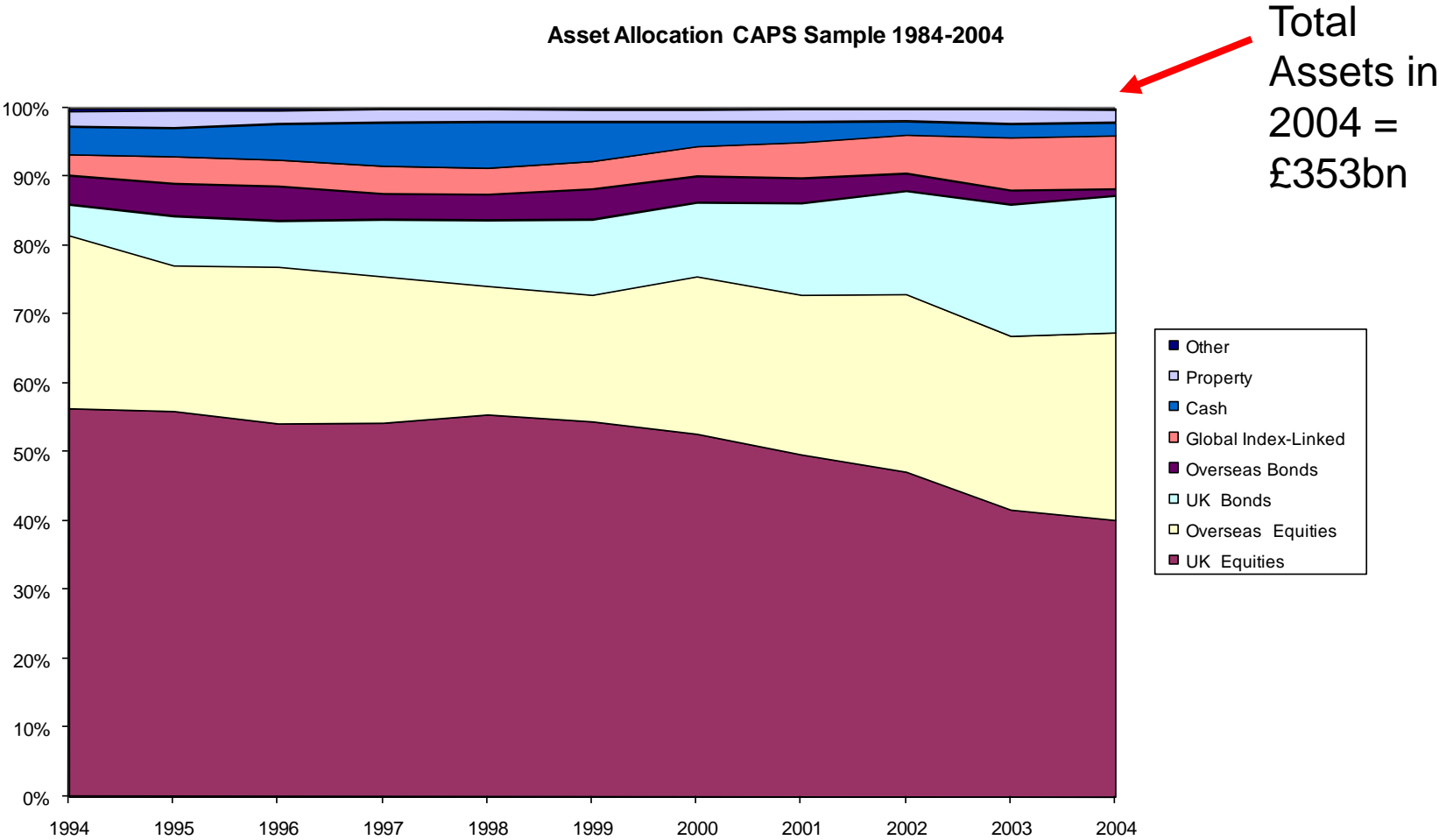


Table I: Distribution of Funds

Panel B: Distribution of Funds by Number of Managers

Asset Class	Managers	Jan 1984		Jan 1994		Jan 2004	
		Mean Size	Percentage	Mean Size	Percentage	Mean Size	Percentage
UK Equities	1	30.87	80.42	72.06	72.99	42.44	56.83
	2	32.01	14.76	62.25	19.83	45.76	26.19
	3 or more	38.06	4.82	129.13	7.18	71.51	16.98

Panel C: Distribution of Funds by Mandate Type

Asset Class	Mandate	Jan 1984		Jan 1994		Jan 2004	
		Funds (Count)	Managers (Average)	Funds (Count)	Managers (Average)	Funds (Count)	Managers (Average)
UK Equities	Specialist	12	2.33	119	2.03	284	2.17
	Multi-Asset	2	2.00	173	1.36	384	1.67
	Balanced	952	1.26	821	1.36	83	1.46

Testing Performance by mandate

- Four factor model + timing for UK Equities

$$r_{ift} = \alpha_{if} + \beta_{1if}r_{mt} + \beta_{2if}SMB_t + \beta_{3if}HML_t + \beta_{4if}MOM_t + \beta_{5if}r_{mt}^2 + \varepsilon_{ift},$$

- Selectivity:
$$\bar{\alpha} = \frac{1}{F} \sum_{f=1}^F \frac{1}{M} \sum_{i=1}^M \alpha_{if}.$$

- Market Timing:
$$TM_{if} = \alpha_{if} + \beta_{5if}Var(r_m),$$

- Bootstrapped standard errors
- UK Bonds (Two factors)
- International Equities
 - international 3-factor model with market factor split

Fees

- Simulate segregated fees:
 - fees charged for segregated mandates is proprietary information
- Instead assume fee structure for retail products is same as for wholesale products by fund manager
 - Defaqto management fees on 3,589 unit trusts by fund manager
 - Use Mercer global fees survey of over 4,000 fund managers in segregated mandates

Fund Management Fees % AUM Across Mandate Type by Size of Mandate

(Median fees across managers for Segregated Portfolios)

UK Investments (Pounds sterling)	25M	50M	100M	250M
UK - Multi-Asset (ie Balanced)	0.49	0.43	0.35	0.29
UK - Equity All Cap	0.60	0.48	0.42	0.35
UK - Equity Small Cap	0.75	0.70	0.56	0.49
International Investments (US dollars)				
International Global Equity - Growth	0.75	0.70	0.65	0.54
International Global Equity - Value	0.80	0.76	0.65	0.57
Emerging Markets Equity	1.00	0.95	0.88	0.83

Table II: Performance by asset class

Mean Returns ;	Pre-fee	Post-fee
UK Equity	15.96%	14.17%
UK Bonds	10.87%	10.44%
Int. Equity	12.64%	11.12%
Alpha estimates:		
UK Equity	-0.05%	-0.40%
UK Bonds	0.70%	0.34%
Int. Equity	0.94%	-0.04%

Table III: Performance by mandate

	UK Equities		UK Bonds		Int. Equities	
	Pre-fee	Post-fee	Pre-fee	Post-fee	Pre-fee	Post-fee
<i>Specialist mandates</i>						
Alpha	0.67%	0.35%	1.17%	1.03%	2.26%	1.79%
TM	0.91%*	0.59%	0.98%	0.83%	1.55%	1.16%
<i>MA mandates</i>						
Alpha	0.46%	0.12%	0.81%	0.46%	1.91%	1.58%
TM	0.43%	0.09%	0.55%	0.20%	1.04%	0.69%
<i>Balanced</i>						
Alpha	-0.24%	-0.54%	0.62%	0.29%	0.48%	0.16%
TM	0.09%	0.21%	0.65%	0.28%	-1.85%	-2.23%

Transitions/Switches:

1. Characteristics of funds switching managers
 - Anticipated dis-economies of scale:
 - Fund size/ fees
2. Event study on performance before and after switch
 - Bal2Spec; S2M, effect on incumbent
3. Competition
 - After conditioning on size
4. Risk

Table IV: Characteristics of Transitions

Relative size of fund's UK equity class to other fund's in same quarter

Note: these are small

Panel A. Single-to-Single Managers Switches

		Specialist	Multi-Asset	Balanced
Specialist	Num	9	NA	NA
	Size	0.40	NA	NA
	Fees	0.02%	NA	NA
	Returns	1.95%	NA	NA
Multi-Asset	Num	5	36	1
	Size	0.46	0.42	0.01
	Fees	0.14%**	0.02%	0.06%
	Returns	4.18%	0.38%	-8.10%
Balanced	Num	12	42	206
	Size	0.14	0.19	0.67
	Fees	0.15%***	0.03%***	0.03%***
	Returns	4.34%***	0.92%**	1.69%***

Differential in 4-quarters returns: Typically +ve

Change in fees: typically higher

Table IV: Characteristics of Transitions

Panel B. Single-to-Multiple Managers Switches

		Specialist	Multi-Asset	Balanced
Specialist	Num	42	10	5
	Size	1.66	1.40	0.92
	Fees	0.03%	0.00%	-0.03%
	Returns	1.31%*	3.60%	-1.56%
Multi-Asset	Num	18	31	6
	Size	1.42	1.02	1.56
	Fees	0.08%**	0.05%**	0.00%
	Returns	1.34%	-0.05%	2.21%
Balanced	Num	30	14	218
	Size	1.32	0.67	1.01
	Fees	0.09%***	0.06%**	0.02%***
	Returns	1.53%**	2.19%*	0.63%**

Note: Much larger relative size for S2M than S2S

Size distribution of switchers

Figure 3: Distribution of Relative Fund-Size for Single- and Multiple-Managed Funds

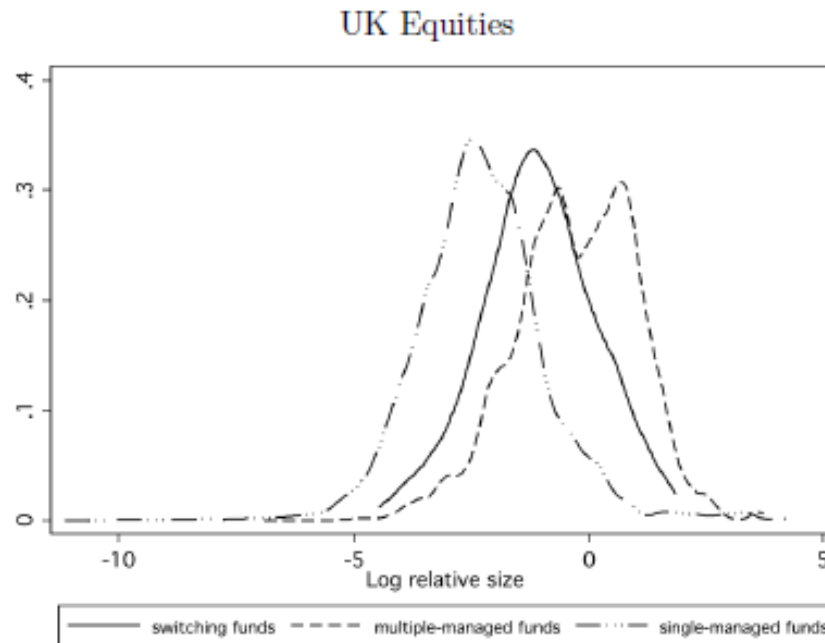


Table V: Event study
Performance around switches balanced-to-specialist

A. Balanced to Specialist Mandates

Quarters Before/ After Switch	UK Equities		UK Bonds		Int. Equities		Total Portfolio	
	Returns	t-stat	Returns	t-stat	Returns	t-stat	Returns	t-stat
-4	-0.23%	-0.52	0.21%	0.49	2.87%	1.92	0.02%	0.04
-3	-0.79%	-1.57	0.63%	1.37	2.00%	1.37	0.05%	0.14
-2	-1.08%	-2.67	0.17%	0.33	0.62%	0.46	-0.52%	-1.46
-1	0.59%	0.90	0.08%	0.15	2.08%	1.38	-0.22%	-0.65
1	1.00%	1.73	0.61%	1.20	0.29%	0.20	0.62%	1.42
2	0.81%	1.93	1.60%	3.51	2.24%	1.77	0.48%	1.37
3	0.56%	1.06	0.84%	1.82	3.57%	2.48	0.83%	2.12
4	-0.34%	-0.87	0.18%	0.36	-1.50%	-1.12	0.24%	0.58
Performance Before	-0.36%		0.27%		1.89%		-0.17%	
Performance After	0.53%		0.82%		1.16%		0.55%	
P-value	0.0060		0.0544		0.7664		0.0040	

B. Single to Multiple Managers Switch

B1. Fund Performance

Quarters Before/ After Switch	UK Equities		UK Bonds		Int. Equities		Total Portfolio	
	Returns	t-stat	Returns	t-stat	Returns	t-stat	Returns	t-stat
-4	-0.57%	-1.18	-0.63%	-1.52	-1.55%	-1.10	-0.69%	-1.42
-3	-0.59%	-1.10	-0.02%	-0.05	1.90%	1.44	0.39%	0.83
-2	-1.24%	-2.59	-0.81%	-1.68	-0.65%	-0.48	-0.28%	-0.58
-1	0.22%	0.33	1.18%	2.04	-1.74%	-1.25	0.08%	0.13
1	0.28%	0.74	0.09%	0.21	-0.40%	-0.28	-0.26%	-0.70
2	0.54%	1.78	0.20%	0.50	0.08%	0.06	0.22%	0.65
3	-0.61%	-1.43	0.53%	1.27	-0.63%	-0.53	-0.51%	-1.30
4	0.11%	0.24	-0.45%	-1.09	-0.24%	-0.17	0.44%	0.81
Performance Before	-0.53%		-0.04%		-0.54%		-0.11%	
Performance After	0.09%		0.10%		-0.30%		-0.03%	
P-value	0.0345		0.3329		0.4028		0.4039	

B2. Performance of the Incumbent Manager

Quarters Before/ After Switch	UK Equities		UK Bonds		Int. Equities		Total Portfolio	
	Returns	t-stat	Returns	t-stat	Returns	t-stat	Returns	t-stat
-4	-1.09%	-1.77	-0.89%	-1.47	-3.93%	-2.04	0.44%	0.62
-3	0.31%	0.53	0.33%	0.56	2.06%	1.13	0.38%	0.73
-2	-1.13%	-2.23	-0.83%	-1.07	-0.43%	-0.26	-0.32%	-0.52
-1	-0.16%	-0.25	1.04%	1.76	-1.65%	-0.93	-0.03%	-0.04
1	0.23%	0.37	-0.48%	-0.75	-1.06%	-0.50	0.71%	0.99
2	1.51%	2.01	0.91%	1.32	-0.83%	-0.45	-0.13%	-0.16
3	-0.30%	-0.49	0.21%	0.36	-0.54%	-0.34	0.88%	1.07
4	-0.34%	-0.55	-0.95%	-1.57	0.63%	0.31	0.20%	0.33
Performance Before	-0.51%		-0.06%		-0.99%		0.11%	
Performance After	0.28%		-0.07%		-0.46%		0.41%	
P-value	0.0374		0.5064		0.3452		0.2716	

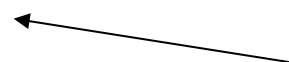
Table VI Panel A: Portfolio variance & No. managers & Size

$$\bar{\sigma}_{SIZE, NMAN}^2 = \frac{1}{T} \sum_{t=1}^T \left(\frac{1}{NMAN_t - 1} \sum_{f=1}^{NMAN_t} (r_{ft} - \bar{r}_t)^2 \right)$$

Total Portfolio

Managers	Size tercile		
	Small	Medium	Large
1	0.471	0.335	0.310
2	0.393	0.255	0.224
3 or more	0.240	0.221	0.189

MR test	Size	0.054
	Managers	0.000
	Joint	0.015



Monotonic
Relationship
Test: Patton &
Timmerman
(2010)

Table VI Panel B: Portfolio variance & No. managers

$$\overline{\sigma}_{\phi}^2 = \frac{1}{F_{\phi}} \sum_{f=1}^{F_{\phi}} \left(\frac{1}{\tau_f - 1} \sum_{t=1}^{\tau_f} (r_{ft} - \bar{r}_f)^2 \right)$$

	Full Sample	
	Fund	Fund Manager
Single-Managed Funds	5.54	5.51
Multiple-Managed Funds	5.01	5.84
<i>t</i> -test	4.18	-3.21

Summary of Findings

- Specialists outperform balanced managers
 - Some performance persistence of specialists
- Switch to specialists due to
 - Underperformance of balanced managers due to diseconomies of scale
- Multiple managers used to reduce diseconomies of scale, and subsequent co-ordination problems reduced with risk controls
- Competition: threat of new managers improves performance of incumbent
- Same Sharpe ratios of decentralised funds, implying
 - Performance improved

Conclusions

- Examined the properties of decentralized investment managements
- Separating mandates by mandate type identifies significant performance of specialist mandates:
 - Annualized alphas of 0.67% for UK equity specialists; & 0.46% for MAs
 - No evidence of market timing skills for balanced mandates
- Use of multiple managers
 - Weak evidence that competition produces better performance
 - Funds with multiple managers have lower risk levels
- Dynamics of mandate-type and # managers
 - Switches after poor performance, and short-term subsequent improvement
- Dynamics of switch to multiple managers an attempt to avoid diseconomies of scale in performance (Berk and Green, 2004)