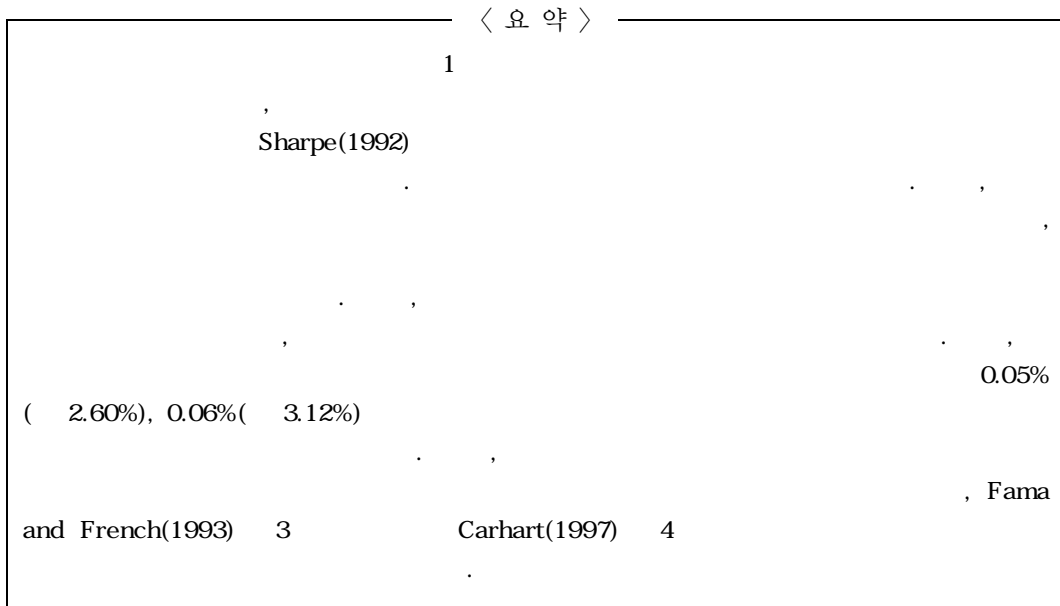


Sharpe의 방법론을 이용한 한국 주식형펀드의 운용스타일 및 성과분석*

(KAIST)

(KAIST)**



: Sharpe

JEL : G11

*

**

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2009-10-17; 1 2010-01-19, 2 2010-05-06; 2010-05-31

Sharpe

1. 서론

2007 12 17 114 2001 12 6 9

Malkiel(1995)

, Barberis and Shleifer(2003)

, Fama and French(1992, 1993)

and Woo(2004)

Sharpe(1992)

(2.60%), 0.06%(3.12%)

and French(1993) 3

Carhart(1997) 4

, Fama

(emerging

market) ¹⁾
(holding-
based style analysis, HBSA) (return-based style
analysis, RBSA) . , HBSA

(window dressing)

. , RBSA

. , HBSA

HBSA
RBSA

²⁾

RBSA

Sharpe(1992)

(quadratic program-

ming)

. Sharpe

1

³⁾

. , Sharpe

(Morningstar)

1)

Barber et al.(2009)

2)

3 ~5

1

3) Sharpe

3

Sharpe

(Ferson and Schadt, 1996).

(term spread),

(credit spread),

Bollen and Busse(2004)

(short-window regression)

2

3

4

5

6

2. 관련문헌연구

2.1 HBSA와 RBSA의 비교에 관한 연구

HBSA	RBSA			Kaplan(2003)	De Roon et al.(2004)		
		Kaplan(2003)	2000	1	2002	12	1,909
HBSA	RBSA						

, RBSA

, De Roon et

al.(2004) 1992 1998 18

(mean absolute deviation, MAD)

, HBSA 0.05, RBSA 0.15 HBSA

Rekenthaler et al.(2004)

RBSA HBSA

4)

1.36% 1.55%

RBSA

4) RBSA 3

HBSA

, HBSA

1

2.2 운용스타일분석에 관한 연구

Sharpe(1992) 12
 5) , , 1
 , 95.20%, 95.16%, 92.22% Sharpe
 Sharpe
 , 636 - 0.74%
 , Chan et al.(2002) 1976 1997 3,336
 HBSA , S&P 500
 , (2008) 90%
 5 2007 12 10
 5 , ,
 , Kang et al.(2009)
 Fama and French(1993) 3 Carhart(1997) 4
 1999 2007 200
 200
 5) 12 4 , 5 , 3
 -

Sharpe

⁶⁾ , Chan et al.(2002)

2.3 스타일을 이용한 성과분석에 관한 연구

Davis(2001) 1965 1998 4,686

1

3

Bollen

and Busse(2004)

Teo and Woo(2001)

6

Brown and Harlow(2005) 1988 2003

(tracking error)

⁷⁾

Brown and Harlow(2005)

(2003) 1998 1 2001 11

- 6.43%

6) Chan et al.(2002)

0.73, /
0.26

0.71

0.41,

7) Kacperczyk et al.(2005) 1984 1999

7 2003 12 3 (2005)
 CAPM Ferson and Schadt(1996) CAPM
 3~ 4% Kang et al.(2009) Fama and French(1993)
 3 Carhart(1997) 4
 Barber et al.(2009) Carhart(1997) 4
 0.43%

3. 분석 방법론

3.1 Sharpe의 스타일분석

Sharpe(1988, 1992) RBSA

Sharpe

$$R_{it} = b_{i1}F_{1t} + b_{i2}F_{2t} + \dots + b_{ik}F_{kt} + e_{it} \tag{1}$$

$$b_{i1} + b_{i2} + \dots + b_{ik} = 1 \tag{2}$$

$$0 \leq b_{ij} \leq 1, 1 \leq j \leq k \tag{3}$$

R_{it} t i , $F_{1t}, F_{2t}, \dots, F_{kt}$ t k
 e_{it} t i
 (2) 1

$b_{i1}, b_{i2}, \dots, b_{ik}$ i
 (3)

. Sharpe

$b_{i1}, b_{i2}, \dots, b_{ik}$. Sharpe

$$(1) \quad b_{i1}F_{1t} + b_{i2}F_{2t} + \dots + b_{ik}F_{kt} + e_{it}$$

e_{it}

Sharpe

Sharpe

$$R^2 = 1 - \frac{Var(e_{it})}{Var(R_{it})} \quad (4)$$

$$(4) \quad Var(\cdot) \quad (4) \quad 1 \quad (1)$$

$$e_{it} \quad (4)$$

(4)
Lobosco and DiBartolomeo(1997)

. Lobosco and DiBartolomeo(1997) Sharpe

Carlo simulation)

(Monte
i

$$\frac{\sigma_a}{\sigma_{B_i} \times \sqrt{n-l-1}} \quad (5)$$

$$\sigma_a \quad (1) \quad , \sigma_{B_i} \quad i$$

$$, l \quad (1) \quad 0 \quad . n$$

3.2 Sharpe의 이차계획법과 회귀분석의 차이점

Sharpe

.⁸⁾ Sharpe

8) 19 . "Fabozzi, F., Handbook of equity style management, 3rd ed., John Wiley and Sons, Inc, Hoboken, New Jersey, 2003."

0

$$Var(R_{it} - b_{i1}F_{1t} - b_{i2}F_{2t} - \dots - b_{ik}F_{kt}) = 0 \quad (6)$$

t ,
 5% “A”
 , Sharpe “A”
 , Sharpe
 , Sharpe

.⁹⁾ , Sharpe
 ” 2 , 1 , “B
 B
 .¹⁰⁾

4. 연구의 자료

2001 1 2007 12
¹¹⁾

~¹²⁾

9) , (style rotation)

10) Sharpe (constrained multivariate regression)
 <Appendix>

11) 2001 2001

12) ~

Sharpe

, Lobosco and DiBartolomeo(1997)

(high- frequency data)

11
 “2D”, “31”, “41”, “43”, “45”
 , 30- 60%, 60- 80%, 80- 90%, 90%
 “41”, “43”, “45”
 1

5

30%

Brown et al.(1992)

13)

1,961

3.57

< 1>

60%
 (NAV),

2001
 , KOSPI 200
 , KOSPI 200
 NAV

2007

	NAV			KOSPI 200		
	()	()	(%)	()	()	(%)
2001	1254	7415	16.45	15.99		12.65
2002	1365	10935	10.26	4.68		- 2.93
2003	1191	12593	25.08	22.92		19.17
2004	1121	11508	0.70	8.20		9.82
2005	1099	21360	60.15	54.74		59.41
2006	1138	56086	4.25	4.62		3.41
2007	914	106053	33.45	32.11		47.48
			21.48	20.47		21.29
			20.54	18.20		23.30

13)

6

< 1>

NAV,

, KOSPI 200

NAV

KISVALUE

. Fama and French(1993)

6

6

30/40/30%

(breakpoint)

12

30/40/30%

9

1

Fama and French(1993)

3

Carhart(1997)

4

, Fama and French

3

, SMB(small minus big)

9

3

3

, HML(high minus low)

3

3

. Carhart(1997)

Carhart

, $t-12$

$t-2$

30%

30%

t

4

, BP

BP

AAA

BBB

364

14)

14)

(2006)

, t

364

, $t+1$

357

Sharpe

5. 실증분석결과

5.1 모형선택

Sharpe

Sharpe

4

9

364

9

1

9

9

4

2

60%

4

2 BP, BP, AAA, BBB

3

Sharpe(1995)

364

4

Fama

and French(1993)

< 2 >

$$1: R_{it} = b_{i1}SG_t + b_{i2}SB_t + b_{i3}SV_t + b_{i4}MG_t + b_{i5}MB_t + b_{i6}MV_t + b_{i7}BG_t + b_{i8}BB_t + b_{i9}BV_t + b_{i10}RF_t + e_{it} \quad (7)$$

$$2: R_{it} = b_{i1}SG_t + b_{i2}SV_t + b_{i3}BG_t + b_{i4}BV_t + b_{i5}RF_t + e_{it} \quad (8)$$

$$3: R_{it} = b_{i1}SG_t + b_{i2}SV_t + b_{i3}BG_t + b_{i4}BV_t + b_{i5}RF_t + b_{i6}LT_t + b_{i7}ST_t + b_{i8}AAA_t + b_{i9}BBB_t + e_{it} \quad (9)$$

$$4: R_{it} = b_{i1}S_t + b_{i2}MG_t + b_{i3}MV_t + b_{i4}BG_t + b_{i5}BV_t + b_{i6}RF_t + e_{it} \quad (10)$$

Sharpe

0.94, BP AAA 0.96
3
B

16)
< 4>

Sharpe
1

1

78.83%, 78.35%

2

Sharpe
17)

3

Sharpe

2

1 2
9

1 2

2

4

16)
t 3.77

0.31%

17)

20%

80%,
Sharpe
Sharpe(1992)

(1992, 1995)
1985 1

1989 12

Vanguard

92.22%

95.20%

5.2 펀드스타일 및 운용스타일 지속성

5.2.1 국내 주식형펀드의 운용스타일

1

1,961 (8) (10)

< 5>

Panel A 2

Lobosco and DiBar-

tolomeo(1997) (5) . Panel B

t diff

Fama and French(1993)

364
2001

2007

Panel A:

	-	-	-	-	
(%)	3.18	0.95	43.08	22.30	30.49
	0.17	0.08	0.40	0.29	0.53
				(%)	
p- value < .10	10.12	1.02	92.39	89.99	91.36
p- value < .05	7.51	0.61	91.52	88.81	90.29
p- value < .01	4.96	0.00	90.24	85.69	87.23

Panel B:

	-	-	-	-	
(%)	4.57	1.37	61.98	32.08	
(%)	0.59	0.60	69.06	29.75	
diff(%)	3.99	0.76	- 7.08	2.33	
t-	16.72	8.15	- 17.35	4.99	

< 5> Panel A 2

Sharpe

18)

sco and DiBartolomeo(1997)

(5)

Lobo-

Panel B

t¹⁹⁾ diff

< 5>

3.99%
(2008) Kang et al.(2009)

20)

30%

2

< 4>

3

6%

80%

3

1%

10%

10%

18) 4

2

19)

70%

65%

20)

, Kang et al.(2009)

KOSPI 200

200

Sharpe

< 6 >

Panel A

2

t

$t+1$

%

$t+1$

%

$t+1$

Panel B

t

$t+1$

t

Fama

and French(1993)

364

2001

2007

Panel A:

							R2
	2001	1.73	0.60	37.41	15.62	44.64	0.81
	2002	2.31	0.82	55.82	14.88	26.18	0.83
	2003	2.73	0.45	51.60	16.02	29.20	0.80
(%)	2004	1.77	0.87	56.06	16.69	24.61	0.85
	2005	5.67	0.87	33.45	30.12	29.89	0.77
	2006	4.42	3.88	38.57	27.99	25.14	0.83
	2007	7.14	2.05	37.85	37.65	15.31	0.85
				(t)			
	2001~2002	2.32	2.10	39.80	-5.52	-37.56	
	2002~2003	2.08	-3.42	-15.51	2.90	10.94	
	2003~2004	-1.77	2.55	7.67	0.71	-6.81	
	2004~2005	13.80	-0.40	-41.79	32.62	16.19	
	2005~2006	-10.21	10.93	10.48	-5.80	-5.31	
	2006~2007	7.25	-4.66	-4.17	20.25	-13.88	

Panel B:

						(%)	t
	2001~2002	-1.11	1.11	5.42	-5.42		
		(-1.27)	(1.27)	(9.39)	(-9.38)		
	2002~2003	0.97	-0.98	1.77	-1.77		
		(2.60)	(-2.60)	(6.72)	(-6.72)		
	2003~2004	-1.29	1.29	1.18	-1.18		
		(-0.07)	(0.07)	(3.27)	(-3.27)		
	2004~2005	4.72	-4.72	-15.31	15.31		
		(7.64)	(-7.64)	(-19.95)	(19.95)		
	2005~2006	1.17	-1.17	1.32	-1.32		
		(2.32)	(-2.32)	(0.17)	(-0.17)		
	2006~2007	1.00	-1.00	1.16	-1.16		
		(2.51)	(-2.51)	(0.72)	(-0.72)		

Idzorek and Bertsch(2004)

2001 2007 1

$\bar{c}_1, \bar{c}_2, \dots, \bar{c}_K$, i $c_{i1}, c_{i2}, \dots, c_{iK}$. K

$$i = \sqrt{(c_{i1} - \bar{c}_1)^2 + (c_{i2} - \bar{c}_2)^2 + \dots + (c_{iK} - \bar{c}_K)^2} \quad (11)$$

2 $K=5$, 4 $K=6$. , t t+1

t+1 (MAE)

(11)

(11)

$K=2$.

< 7>	Panel A	B	2	4	**	5%
	0.64		2		0.62,	4
		2	4		0.58, 0.59	24)
				0.51, 0.53		

24) t t+1
2002 2003

Sharpe

< 7 >

Panel A: 2 4 Idzorek and Bertsch(2004)
(MAE)

2001 2007 1

(11)

, t t+ 1 , t t+ 1

(MAE) Panel , ** 5%

Panel A: 2

	2001~ 2002	2002~ 2003	2003~ 2004	2004~ 2005	2005~ 2006	2006~ 2007
MAE	0.59**	0.74**	0.68**	0.49**	0.60**	0.56*
MAE	0.19	0.14	0.17	0.23	0.19	0.20
MAE	0.53**	0.71**	0.72**	0.28	0.65**	0.53**
MAE	0.20	0.15	0.15	0.28	0.17	0.21
MAE	0.55**	0.67**	0.55**	0.43**	0.43**	0.34
MAE	0.21	0.16	0.21	0.24	0.23	0.26

Panel B: 4

	2001~ 2002	2002~ 2003	2003~ 2004	2004~ 2005	2005~ 2006	2006~ 2007
MAE	0.64**	0.75**	0.69**	0.52**	0.62**	0.57**
MAE	0.18	0.14	0.16	0.22	0.18	0.20
MAE	0.57**	0.70**	0.72**	0.29	0.67**	0.52**
MAE	0.19	0.15	0.15	0.28	0.17	0.21
MAE	0.53**	0.65**	0.54**	0.46**	0.51**	0.43**
MAE	0.21	0.17	0.21	0.23	0.21	0.23

5.3 펀드의 성과 및 성과지속성

5.3.1 국내 주식형펀드의 성과

< 8 >

2, 4, Fama and French(1993) 3 Carhart(1997) 4

Lobosco and DiBartolomeo

(1997) 2 4 (5)

2001 1 2007 12

	2	4	Fama French(1993)	Carhart(1997)
(%)	0.049	0.059	0.057	0.055
()				
	0.73	0.77	0.73	0.70
p- value < .10	0.15	0.17	0.29	0.17
p- value < .05	0.06	0.08	0.18	0.10
p- value < .01	0.02	0.02	0.05	0.03
	0.27	0.23	0.27	0.30
p- value < .10	0.14	0.12	0.14	0.12
p- value < .05	0.09	0.09	0.09	0.08
p- value < .01	0.06	0.05	0.04	0.04
R ²	0.78	0.79	0.81	0.82

< 8 > 1, 2 2 4

25)

0.05%(2.60%), 0.06%(3.12%)

73%, 77%

15%

14% 10%

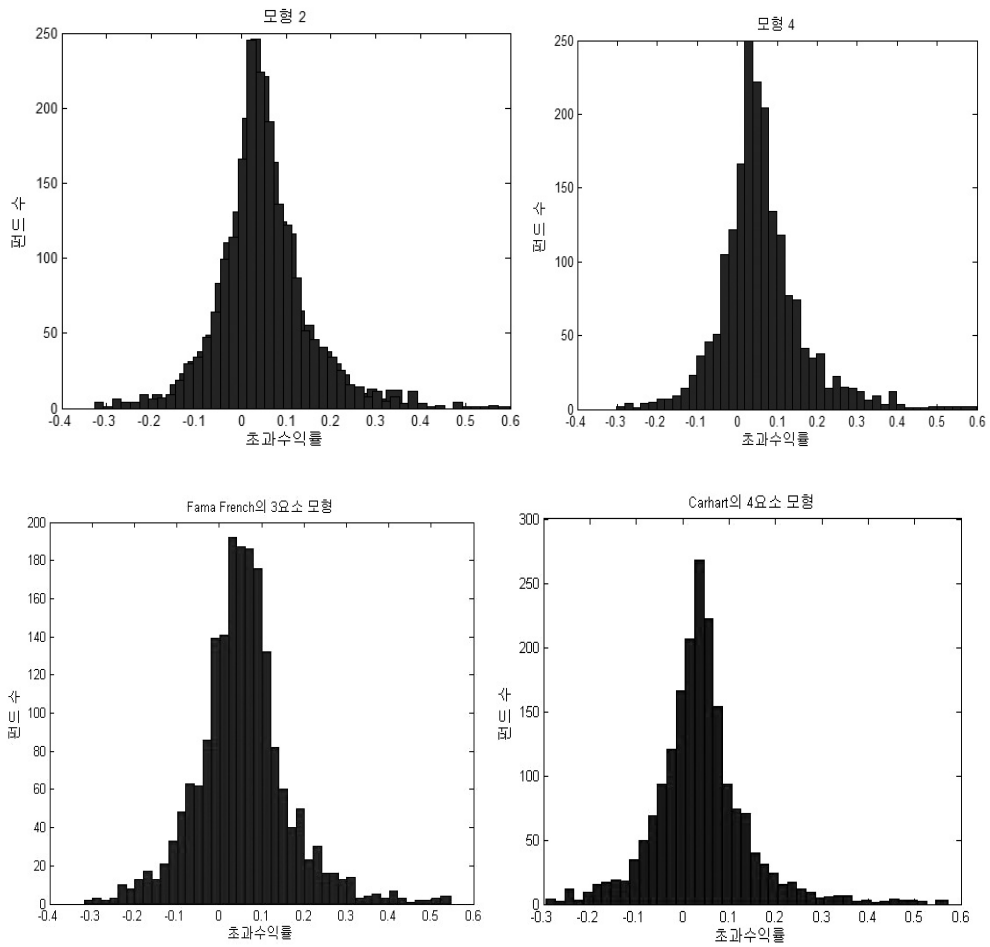
1 >

25) 2 4 (8) (10)

Sharpe

26)

< 1 >
2 4
Fama and French(1993) 3 Carhart(1997) 4



Sharpe
Fama and French(1993) 3

26) Jensen(1968), Ippolito(1989), Elton et al(1993), Malkiel(1995), Carhart(1997)

Carhart(1997) 4 .²⁷⁾ Fama and French 3
 Carhart 4 .

$$R_{it} - R_{ft} = \alpha_i + \beta_i RMRF_t + s_i SMB_t + h_i HML_t + e_{it} \quad (12)$$

$$R_{it} - R_{ft} = \alpha_i + \beta_i RMRF_t + s_i SMB_t + h_i HML_t + m_i UMD_t + e_{it} \quad (13)$$

$R_{it} - R_{ft}$ i t , $RMRF_t, SMB_t, HML_t$ Fama and French 3 ,
 . UMD_t

1 Carhart
 . < 8> 3, 4 Fama and French 3 Carhart 4

. , Fama and French Carhart
 2 4 ,

. , Carhart 4 Fama and French 3

5.2.2

. , Bollen and Busse(2004)

< 9> 2 4
 . ,
 78%, 79%
 . , 2004 2005
 < 8> . , 2004 - 0.08~

27)

Sharpe

0.09% < 1> < 8>
 < 9>

< 9>

2 4
 (R²),

Lobosco and DiBartolomeo(1997)

(5)

()

2001 1

2007 12

		2						
		2001	2002	2003	2004	2005	2006	2007
	(%)	0.03	0.09	0.08	- 0.09	- 0.05	0.00	0.04
	R ²	0.81	0.83	0.80	0.85	0.77	0.83	0.86
		0.61	0.81	0.78	0.19	0.31	0.47	0.66
	p- value < .10	0.05	0.04	0.17	0.04	0.10	0.05	0.09
	p- value < .05	0.03	0.02	0.08	0.02	0.02	0.03	0.04
	p- value < .01	0.00	0.01	0.02	0.00	0.00	0.01	0.01
		0.39	0.19	0.22	0.81	0.69	0.53	0.34
	p- value < .10	0.10	0.13	0.14	0.30	0.21	0.08	0.12
	p- value < .05	0.07	0.10	0.11	0.16	0.14	0.07	0.11
	p- value < .01	0.05	0.09	0.07	0.06	0.06	0.05	0.07
		4						
		2001	2002	2003	2004	2005	2006	2007
	(%)	0.02	0.09	0.08	- 0.08	- 0.01	0.01	0.06
	R ²	0.82	0.83	0.81	0.85	0.79	0.84	0.86
		0.58	0.81	0.79	0.22	0.41	0.54	0.71
	p- value < .10	0.05	0.04	0.18	0.07	0.15	0.07	0.11
	p- value < .05	0.03	0.02	0.09	0.04	0.05	0.04	0.06
	p- value < .01	0.00	0.00	0.02	0.01	0.01	0.01	0.02
		0.42	0.19	0.21	0.78	0.59	0.46	0.29
	p- value < .10	0.10	0.14	0.15	0.27	0.10	0.08	0.12
	p- value < .05	0.07	0.10	0.11	0.13	0.06	0.07	0.11
	p- value < .01	0.05	0.09	0.08	0.05	0.03	0.05	0.09

5.3.2 국내 주식형펀드의 성과지속성

Bollen and Busse(2004)

$$Perf_{p,t} = \alpha_t + \beta_t Perf_{p,t-1} + \varepsilon_{p,t} \quad (14)$$

$$Perf_{p,t} = \beta_t Perf_{p,t-1} + \varepsilon_{p,t} \quad (14)$$

()
 2001 2007
 1 , < 10> Panel A
 2 4
 β_t

() (14)
 < 10> Panel B (C) . Panel B, 2 2005
 2006 β_t 4
 2005 2006
 β_t
 . Panel C
 β_t

(2003) 3 (2005)

6. 결론

RBSA HBSA RBSA
 RBSA Sharpe(1992)

0.05% (2.60%), 0.06% (3.12%)

3.57

참 고 문 헌

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〈Appendix〉

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gression)

(constrained multivariate re-

$$R_{it} = \alpha_i + b_{i1}F_{1t} + b_{i2}F_{2t} + \cdots + b_{ik}F_{kt} + e_{it} \quad (\text{A1})$$

$$b_{i1} + b_{i2} + \cdots + b_{ik} = 1 \quad (\text{A2})$$

$$0 \leq b_{ij} \leq 1, \quad 1 \leq j \leq k \quad (\text{A3})$$

$$R_{it} = \alpha_i + b_{i1}F_{1t} + b_{i2}F_{2t} + \cdots + b_{ik}F_{kt} + e_{it} \quad (\text{A4})$$

$$\hat{\alpha}_i = \frac{1}{n} \sum_{t=1}^n \left(R_{it} - \sum_{s=1}^k \hat{b}_{is} F_{st} \right) \quad (\text{A5})$$

$$n \quad (\text{A1}) \quad (\text{A5}) \quad (\text{A4}) \quad (\text{A1})$$

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$$\sum_{p=1}^n \left[R_{ip} - \sum_{j=1}^k b_{ij} F_{jp} - \frac{1}{n} \sum_{t=1}^n \left(R_{it} - \sum_{s=1}^k b_{is} F_{st} \right) \right]^2 = \text{Var} \left[R_{ip} - \sum_{j=1}^k b_{ij} F_{jp} \right] \quad (\text{A5})$$

$$b_{i1}, b_{i2}, \dots, b_{ik}$$

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$$(\text{A6})$$

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$$(\text{A7})$$

$$\hat{\alpha} + \hat{b}_{i1}F_{i1} + \hat{b}_{i2}F_{i2} + \cdots + \hat{b}_{ik}F_{ik} \quad (\text{A6})$$

$$\hat{b}_{i1}F_{i1} + \hat{b}_{i2}F_{i2} + \cdots + \hat{b}_{ik}F_{ik} \quad (\text{A7})$$

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Investment Styles and Performance Persistence of Equity Funds in Korea Using Sharpe's style analysis*

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Abstract

This paper investigates the investment styles and performance persistence of equity funds in Korea using Sharpe (1992)'s style analysis methodology. Unlike the regression analysis, both the portfolio and positivity constraints are imposed in style analysis proposed by Sharpe. The empirical findings documented in this paper are as follows: First, relative to the market capitalization of stocks in each style portfolio, equity funds in Korea have high exposure to the small and value stocks, though the absolute exposure of large and growth stocks are higher than that of small and value stocks. Second, the investment styles are time-varying. Especially, funds that invest in small stocks have increased over the last seven years. Third, using the two style benchmark portfolios, equity funds create the abnormal annual return of 2.60% and 3.12%, respectively. Finally, out-performance of equity funds in Korea is confirmed using the conditional performance measurement. For robustness check, we employ the famous Fama and French three-factor model (1993) and Carhart four-factor model (1997) as our performance measure and the outperformance is still present.

Keywords: Sharpe's Style Analysis; Investment Styles; Shifts in Investment Styles; Performance Measurement; Performance Persistence

JEL Classification: G11

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