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- **Abstract**
  - $^{\exists}$Value premium in U.S. stock returns
  - Risk model≳Characteristic model
    - ✓ Risk model: EMH view by Fama-French
    - ✓ Characteristic model: non-EMH view by Daniel-Titman

1 Summary Statistics for the Premiums

- CAPM⇒$^{\exists}$B/E anomaly ∴ CAPM≠perfect
  - ✓ raised by Rosenberg, Reid, and Lanstein (1985, JPM)
- $^{\exists}$4 explanations for B/E anomaly
  - ① just a chance result ∴ $^{\nexists}$B/E anomaly for out of sample
    - ✓ raised by MacKinlay (1995, JFE) etc.
    - ✓ disputed by Fama and French (1998, JF) etc.
  - ② high B/M=high risk ∴ high return=compensation; RISK MATTERS!
    - ✓ consistent with Ross (1976, JET)
    - ✓ documented by Fama and French (1993, JFE)
    - ✓ FF model⇒$^{\nexists}$CAPM anomaly
  - ③ investor overreaction to firm performance⇒$^{\exists}$value premium; NOT RISK!
    - ✓ high B/M=weak fundamental⇒investors' irrationally low valuation⇒ high return ∵ correction of overreaction
    - ✓ raised by Lakonishok, Shleifer, and Vishny (1994, JF)
  - ④ generalized version of ③, i.e. Characteristic model; NOT RISK!
    - ✓ preference for High B/E (strong) stocks⇒high price⇒low return
    - ✓ suggested by Daniel-Titman (1997)

- Daniel-Titman (1997) said
  - ✓ stock returns=f(firm characteristics)
  - ✓ firm characteristics=relative distress ∴ B/E=proxy for relative distress
  - ✓ ∴ Fama-French (1993) risk story=not the case
- empirical key: $^{\exists}\text{Corr}(\text{HML loading, B/E}) \neq 0$?
- Davis-Fama-French (2000) says that
  - ✓ results of Daniel-Titman (1997)=just sample specific
  - ✓ in overall sample⇒Risk model≳Characteristic Model
- Fama-French three-factor model

$$\text{E}(R_i) - R_f \quad = \quad b_i[\text{E}(R_M) - R_f] + s_i\text{E}(\text{SMB}) + h_i\text{E}(\text{HML})$$

- Fama-French factors

for time t (◯=stock, Portfolio returns are computed value-weighting basis.)

① factor mimicry → Factor returns will be used as explanatory variables.

Size \ B/M	Low (30%)	Medium (40%)	High (30%)
Small (50%)	S/L_t ◯◯◯ ◯◯◯ ◯◯◯	S/M_t ◯◯◯◯ ◯◯◯◯ ◯◯◯◯	S/H_t ◯◯◯ ◯◯◯ ◯◯◯
Big (50%)	B/L_t ◯◯◯ ◯◯◯ ◯◯◯	B/M_t ◯◯◯◯ ◯◯◯◯ ◯◯◯◯	B/H_t ◯◯◯ ◯◯◯ ◯◯◯

$$\text{SMB}_t \quad = \quad \frac{\text{S/L}_t + \text{S/M}_t + \text{S/H}_t}{3} - \frac{\text{B/L}_t + \text{B/M}_t + \text{B/H}_t}{3}$$

$$\text{HML}_t \quad = \quad \frac{\text{S/H}_t + \text{B/H}_t}{2} + \frac{\text{S/L}_t + \text{B/L}_t}{2}$$

② portfolio-for-test construction → Portfolio returns will be used as explained variables.

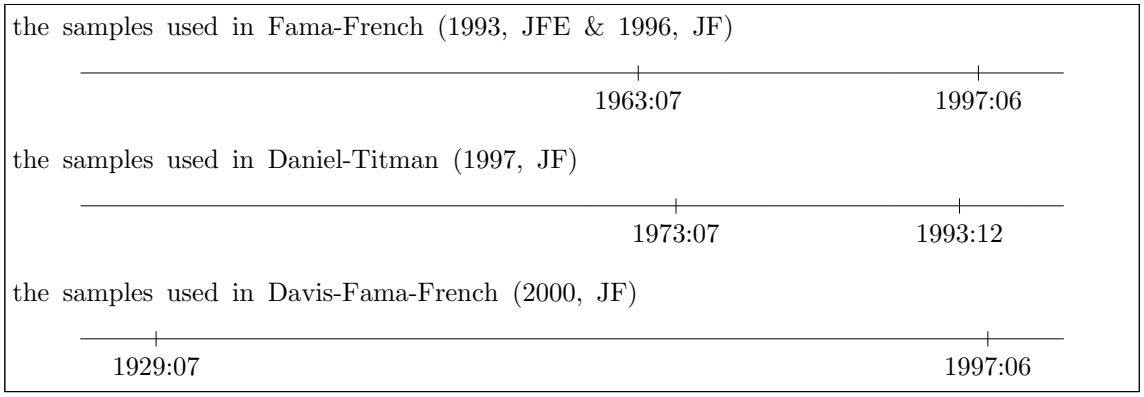
Size \ B/M	Low (30%)	Medium (40%)	High (30%)
Small (33%)	$\text{S/L}_t = \text{R}_{\text{S/L,t}}$ ◯◯◯ ◯◯◯	S/M_t ◯◯◯ ◯◯◯	S/H_t ◯◯◯ ◯◯◯
Medium (33%)	M/L_t ◯◯◯ ◯◯◯	M/M_t ◯◯◯ ◯◯◯	M/H_t ◯◯◯ ◯◯◯
Big (33%)	B/L_t ◯◯◯ ◯◯◯	B/M_t ◯◯◯◯ ◯◯◯◯	B/H_t ◯◯◯ ◯◯◯

$$\text{R}_{\text{S/L,t}} \quad := \quad \sum_{\text{i} \in \text{S/L}} \text{w}_{\text{i,t}} \text{R}_{\text{i,t}}$$

- Table 1

	$R_M - R_f$	SMB	HML	S/L	S/M	S/H	B/L	B/M	B/H
7/29–6/97: 816 months									
Ave	0.67	0.20	0.46	1.05	1.30	1.53	0.89	1.04	1.34
Std	5.75	3.26	3.11	7.89	7.49	8.38	5.65	6.19	7.41
t(Ave)	3.34	1.78	4.24	3.80	4.96	5.21	4.52	4.78	5.16
7/29–6/63: 408 months									
Ave	0.82	0.19	0.50	1.09	1.22	1.49	0.81	1.01	1.40
Std	6.89	3.65	3.59	9.01	9.13	10.57	6.50	7.73	9.52
t(Ave)	2.41	1.07	2.80	2.44	2.71	2.85	2.52	2.64	2.98
7/63–6/97: 408 months									
Ave	0.52	0.21	0.43	1.01	1.38	1.57	0.98	1.06	1.27
Std	4.32	2.83	2.54	6.60	5.38	5.37	4.65	4.12	4.38
t(Ave)	2.44	1.53	3.38	3.10	5.17	5.88	4.24	5.20	5.87
7/73–12/93: 246 months									
Ave	0.51	0.33	0.50	1.23	1.60	1.76	0.96	1.20	1.44
Std	4.79	2.75	2.74	6.88	5.64	5.68	5.22	4.53	4.67
t(Ave)	1.68	1.88	2.87	2.81	4.46	4.87	2.90	4.17	4.83

- ✓ $^{\exists}$significance in $R_M - R_f > 0$ $\therefore$ $^{\exists}$market premium
- ✓ $^{\exists}$significance in HML>0 $\therefore$ $^{\exists}$value premium
- ✓ $^{\nexists}$significant in SMB>0 $\therefore$ low size premium
- ✓ Daniel-Titman (1997) said: $R_i - R_f \neq f(s_i)$
- ✓ Davis-Fama-French (2000) says: that view has little power $\because$ low size premium



2 Sorts on Size and BE/ME

A. Three-Factor Regressions

- Table 2

	BE/ME	Size	Ex Ret	a	b	s	h	$t(a)$	$t(b)$	$t(s)$	$t(h)$	R^2
7/29–6/97												
S/L	0.55	22.39	0.61	−0.42	1.06	1.39	0.09	−4.34	30.78	19.23	1.73	0.91
S/M	1.11	22.15	1.05	−0.01	0.97	1.16	0.37	−0.18	53.55	19.49	9.96	0.96
S/H	2.83	19.05	1.24	−0.03	1.03	1.12	0.77	−0.73	67.32	39.21	26.97	0.98
M/L	0.53	55.85	0.70	−0.06	1.04	0.59	−0.12	−1.29	55.83	18.01	−4.30	0.96
M/M	1.07	55.06	0.95	−0.01	1.05	0.47	0.34	−0.15	32.98	17.50	9.50	0.96
M/H	2.18	53.21	1.13	−0.04	1.08	0.53	0.73	−0.90	47.85	8.99	11.12	0.97
B/L	0.43	94.65	0.58	0.02	1.02	−0.10	−0.23	0.88	148.09	−6.88	−13.52	0.98
B/M	1.04	92.06	0.72	−0.09	1.01	−0.14	0.34	−1.76	61.61	−4.96	13.66	0.95
B/H	1.87	89.53	1.00	−0.09	1.06	−0.07	0.84	−1.40	52.12	−0.86	21.02	0.93
7/29–6/63												
S/L	0.68	23.83	0.69	−0.53	1.01	1.47	0.23	−3.04	18.66	15.72	2.82	0.90
S/M	1.35	23.63	1.21	−0.01	0.96	1.24	0.38	−0.07	34.72	15.60	6.21	0.95
S/H	3.96	20.23	1.44	−0.03	1.02	1.17	0.83	−0.40	44.71	28.80	17.76	0.98
M/L	0.64	55.20	0.84	−0.08	0.98	0.56	0.01	−1.14	37.44	12.26	0.39	0.96
M/M	1.28	54.20	1.13	0.00	1.07	0.47	0.33	0.07	26.38	11.77	7.73	0.97
M/H	2.83	51.59	1.30	−0.07	1.07	0.50	0.79	−0.92	52.49	5.44	7.74	0.97
B/L	0.48	94.92	0.72	−0.01	1.02	−0.08	−0.20	−0.20	131.66	−4.89	−8.09	0.99
B/M	1.21	91.97	0.89	−0.09	1.00	−0.12	0.37	−1.20	43.96	−2.90	10.08	0.96
B/H	2.33	88.91	1.30	0.00	1.02	−0.12	0.97	−0.01	34.28	−0.96	17.99	0.94
7/63–6/97												
S/L	0.42	20.94	0.54	−0.22	1.06	1.22	−0.14	−3.31	60.47	39.87	−4.51	0.96
S/M	0.87	20.68	0.89	0.03	0.97	1.02	0.31	0.71	74.53	52.41	13.82	0.98
S/H	1.71	17.88	1.04	0.04	0.99	1.03	0.62	1.27	75.12	64.49	25.86	0.98
M/L	0.42	56.51	0.56	−0.02	1.07	0.58	−0.24	−0.33	71.73	27.08	−9.73	0.96
M/M	0.87	55.93	0.77	0.02	1.00	0.48	0.30	0.31	64.36	22.60	11.22	0.95
M/H	1.54	54.83	0.96	0.03	1.05	0.55	0.63	0.53	69.16	28.08	24.23	0.96
B/L	0.38	94.38	0.45	0.10	0.99	−0.15	−0.32	2.89	91.73	−8.92	−16.53	0.98
B/M	0.86	92.14	0.54	−0.04	0.99	−0.19	0.25	−0.70	55.19	−6.91	8.53	0.91
B/H	1.41	90.16	0.70	−0.13	1.04	−0.01	0.69	−2.59	76.64	−0.36	28.53	0.94

- ✓ corresponding risk loadings=strongly ordered $\because$ size-B/M sorting
- ✓ Fama-French model test=Gibbons-Ross-Shanken test$\rightarrow H_0$: $a_i=0$ $^{\forall}i$=rejected
- ✓ $\therefore$ Fama-French model for S/L$\Rightarrow{}^{\exists}$problems

B. Is the Extended Sample Unusual?

- power of test=f(# of data, σ of characteristics, σ of risk loadings)
- $^{\nexists}$size tilt in the samples, $^{\exists}$time effect in B/M $\because$ Great Depression
- $\therefore$ Critical characteristics & risk-loadings are similar to those samples.
- $+$ $^{\exists}$strong value premium $\therefore$ Powerful tests for both models might be applicable.

3 BE/ME versus HML Risk Loading

- Risk model says: a_i=0 $^{\forall} i$
- Characteristic model says: $^{\exists} a_i \neq 0$ ∵ mismatch b/w HML h_i & B/M
- ∴ distinguishing b/w two models=isolating independent $\sigma(h_i)$ from σ(B/M)
- Daniel-Titman (1997, JF) suggested following ways

Size \ B/M	Low	Medium	High	Strategy
Small	S/L & h_i ▲▲	S/M & h_i ▲▲	S/H & h_i ▲▲	Buy
	S/L & h_i ▲	S/M & h_i ▲	S/H & h_i ▲	
	S/L & h_i -	S/M & h_i -	S/H & h_i -	-
	S/L & h_i ▽	S/M & h_i ▽	S/H & h_i ▽	Shortsell
	S/L & h_i ▽▽	S/M & h_i ▽▽	S/H & h_i ▽▽	
Medium	M/L & h_i ▲▲	M/M & h_i ▲▲	M/H & h_i ▲▲	Buy
	M/L & h_i ▲	M/M & h_i ▲	M/H & h_i ▲	
	M/L & h_i -	M/M & h_i -	M/H & h_i -	-
	M/L & h_i ▽	M/M & h_i ▽	M/H & h_i ▽	Shortsell
	M/L & h_i ▽▽	M/M & h_i ▽▽	M/H & h_i ▽▽	
Big	B/L & h_i ▲▲	B/M & h_i ▲▲	B/H & h_i ▲▲	Buy
	B/L & h_i ▲	B/M & h_i ▲	B/H & h_i ▲	
	B/L & h_i -	B/M & h_i -	B/H & h_i -	-
	B/L & h_i ▽	B/M & h_i ▽	B/H & h_i ▽	Shortsell
	B/L & h_i ▽▽	B/M & h_i ▽▽	B/H & h_i ▽▽	

- Then, Hh-Lh arbitrage portfolio(0-size, 0-B/M, High h_i) is constructed.
  - ✓ Daniel-Titman (1997, JF) used after-1973 samples ∵ $^{\exists}$too small # of stocks
- Instead of $3^2 \cdot 5$ portfolios, Davis-Fama-French (2000, JF) used 3^3 portfolios.
- pre-formation risk-loadings for portfolio formation of Daniel-Titman (1997, JF)

- Table 3

	BE/ME	Size	Ex Ret	a	b	s	h	$t(a)$	$t(b)$	$t(s)$	$t(h)$	R^2
Low BE/ME												
S/L/Lh	0.51	22.29	0.49	−0.56	1.21	1.25	−0.02	−2.88	16.53	6.93	−0.22	0.70
S/L/Mh	0.57	22.79	0.69	−0.34	1.07	1.21	0.15	−2.15	16.26	12.47	1.27	0.77
S/L/Hh	0.56	21.05	0.76	−0.38	1.03	1.64	0.26	−1.91	10.96	7.21	2.03	0.73
M/L/Lh	0.49	55.14	0.62	−0.04	1.09	0.60	−0.42	−0.53	49.96	14.44	−10.88	0.91
M/L/Mh	0.54	56.08	0.66	−0.07	0.97	0.59	−0.10	−1.02	50.53	14.55	−3.04	0.91
M/L/Hh	0.56	56.12	0.81	−0.08	1.06	0.57	0.15	−1.10	31.80	8.98	3.05	0.90
B/L/Lh	0.36	95.28	0.56	0.01	1.11	−0.10	−0.38	0.12	60.37	−2.66	−9.52	0.93
B/L/Mh	0.44	94.64	0.61	0.11	0.95	−0.11	−0.24	2.25	69.71	−6.36	−11.55	0.94
B/L/Hh	0.53	92.21	0.59	−0.05	0.98	−0.07	−0.01	−0.89	49.70	−1.94	−0.41	0.92
Medium BE/ME												
S/M/Lh	1.09	22.01	1.03	0.06	1.01	1.11	0.14	0.56	26.47	18.39	2.90	0.88
S/M/Mh	1.12	22.57	1.06	0.05	0.86	1.22	0.39	0.54	23.54	8.99	5.68	0.87
S/M/Hh	1.13	21.47	1.10	−0.13	1.04	1.20	0.62	−1.43	41.36	24.02	11.07	0.91
M/M/Lh	1.04	55.04	0.89	0.02	1.05	0.51	0.13	0.29	50.84	19.02	4.26	0.93
M/M/Mh	1.07	55.33	0.97	0.06	1.01	0.39	0.34	0.95	20.68	5.63	5.98	0.92
M/M/Hh	1.11	54.66	0.99	−0.10	1.09	0.51	0.55	−1.44	28.30	12.08	11.84	0.93
B/M/Lh	0.99	90.04	0.69	−0.08	1.02	−0.01	0.19	−0.96	29.75	−0.10	3.48	0.86
B/M/Mh	1.04	92.14	0.60	−0.17	1.01	−0.24	0.30	−2.16	45.14	−8.05	9.28	0.89
B/M/Hh	1.08	90.34	0.88	−0.07	1.04	−0.05	0.56	−0.81	35.50	−0.88	8.90	0.88
High BE/ME												
S/H/Lh	2.41	18.08	1.26	0.07	0.97	1.19	0.64	0.97	30.53	14.84	8.70	0.94
S/H/Mh	2.71	19.67	1.19	−0.04	1.04	1.04	0.70	−0.65	45.61	14.65	18.45	0.94
S/H/Hh	3.47	18.99	1.30	−0.13	1.09	1.18	0.99	−1.59	43.08	31.05	21.11	0.95
M/H/Lh	2.04	52.62	1.08	0.02	1.04	0.56	0.53	0.32	29.13	8.10	5.94	0.91
M/H/Mh	2.11	53.43	1.09	−0.06	1.02	0.64	0.72	−0.83	38.12	8.98	18.55	0.93
M/H/Hh	2.39	53.24	1.24	−0.07	1.19	0.40	0.93	−0.81	33.97	4.27	10.17	0.91
B/H/Lh	1.76	86.90	1.02	−0.06	1.15	−0.03	0.69	−0.47	16.50	−0.25	6.00	0.77
B/H/Mh	1.84	88.72	1.01	−0.04	0.99	0.00	0.85	−0.38	22.05	0.00	11.51	0.82
B/H/Hh	1.99	88.75	1.04	−0.07	1.04	−0.04	0.91	−0.63	21.12	−0.24	13.07	0.81

- ✓ succeed to isolate the variation of SMB-risk-loading h_i from the variation of size and B/M ratio
- ✓ $\therefore$ It is possible to construct the portfolios which contain similar characteristics in size and B/M ratio but different risk-loadings.
- ✓ If Character model approach is true in the reality, then the characteristic-balanced portfolios should generate similar excess returns that is insignificantly different from zero.
- ✓ However, above characteristic-balanced portfolios generate bigger returns for high risk-loading portfolio and smaller returns for low risk-loading portfolio.

- Regressions for Characteristic model

  $R_{\mathrm{Hh}}-R_{\mathrm{Lh}} = a+b(R_M-R_f)+s\mathrm{SMB}+h\mathrm{HML}$

- Table 4

Period	Ave	t(Ave)	a	b	s	h	$t(a)$	$t(b)$	$t(s)$	$t(h)$	R^2
7/29–6/97	0.12	1.56	−0.06	−0.01	0.03	0.38	−0.83	−0.48	0.91	11.92	0.29
7/29–6/63	0.19	1.49	0.01	−0.01	0.06	0.35	0.11	−0.19	1.09	6.99	0.24
7/63–6/97	0.05	0.56	−0.14	0.01	−0.01	0.43	−2.07	0.48	−0.28	14.32	0.42
7/73–12/93	0.03	0.25	−0.22	0.02	0.03	0.46	−2.28	0.61	0.80	11.35	0.44
7/29–6/72 & 1/94–6/97	0.16	1.63	−0.00	−0.01	0.03	0.36	−0.01	−0.31	0.74	8.80	0.26

  - ✓ $^{\exists}$significant big returns for high-h loaded portfolios $\because$ $\hat{\mu}>0$ $^{\forall}$sample period
  - ✓ Characteristics model says that

    H_0: $\hat{\mu}(R_{\mathrm{Hh}}-R_{\mathrm{Lh}})=0$ $^{\forall}$sample period $\because$ $^{\nexists}$characteristics on arbitrage portfolio

    H_1: $\hat{\mu}(R_{\mathrm{Hh}}-R_{\mathrm{Lh}})>0$ $\because$ $^{\exists}$high loading on arbitrage portfolio (hereby AP)
  - ✓ Risk model says that

    H_0: $\hat{a}(R_{\mathrm{Hh}}-R_{\mathrm{Lh}})=0$ $\because$ high loading captures compensatory returns for AP.

    H_1: $\hat{a}(R_{\mathrm{Hh}}-R_{\mathrm{Lh}})<0$ $\because$ illusional positive premium should be offset by $\hat{a}$.
  - ✓ in Daniel-Titman (1997, JF) sample

    The result is consistent with Characteristic model instead of Risk model.
  - ✓ in entire sample used by Davis-Fama-French (2000, JF)

    Opposite result is obtained; Risk model's prediction is better.
- Thus, rejection of Fama-French three factor RISK model in favor of Daniel-Titman CHARACTERISTIC model is special to just their own sample period.
- Despite of these numbers, the research should be conducted carefully since the results are seriously sensitive toward Risk model.

4 Sorts on Market Slopes

- Table 5

	BE/ME	Size	Ex Ret	a	b	s	h	$t(a)$	$t(b)$	$t(s)$	$t(h)$	R^2
7/29–6/97												
Lb	0.77	86.18	0.64	0.11	0.80	−0.06	−0.01	2.24	43.68	−2.34	−0.42	0.91
Mb	0.74	89.80	0.67	0.02	0.99	−0.08	−0.01	0.72	123.45	−5.92	−0.89	0.98
Hb	0.80	83.78	0.75	−0.11	1.21	0.13	0.04	−2.06	70.43	4.59	1.40	0.96
Hb − Lb			0.12	−0.22	0.41	0.19	0.06	−2.32	12.06	3.76	0.95	0.49
7/29–6/63												
Lb	0.84	86.46	0.79	0.15	0.77	−0.02	0.03	1.79	31.60	−0.63	0.75	0.91
Mb	0.81	92.21	0.81	0.02	0.97	−0.10	0.01	0.51	81.79	−5.43	0.58	0.98
Hb	0.86	86.30	0.90	−0.14	1.26	0.09	−0.01	−1.82	58.45	2.45	−0.28	0.97
Hb − Lb			0.11	−0.29	0.50	0.11	−0.05	−1.98	11.59	1.64	−0.54	0.57
7/63–6/97												
Lb	0.69	85.90	0.48	0.06	0.87	−0.14	−0.01	1.16	55.17	−5.96	−0.56	0.92
Mb	0.67	87.39	0.52	−0.01	1.04	−0.07	0.02	−0.40	121.70	−5.09	1.23	0.98
Hb	0.74	81.26	0.60	−0.05	1.13	0.22	0.04	−0.74	61.68	8.12	1.20	0.94
Hb − Lb			0.12	−0.11	0.26	0.36	0.06	−0.99	7.93	7.57	0.97	0.37
7/73–12/93												
Lb	0.78	85.37	0.47	0.10	0.87	−0.16	−0.04	1.30	44.02	−5.20	−1.08	0.93
Mb	0.79	85.79	0.54	0.01	1.04	−0.05	0.02	0.21	103.56	−3.29	1.01	0.98
Hb	0.87	79.55	0.59	−0.09	1.13	0.25	0.05	−1.04	48.82	6.65	1.21	0.95
Hb − Lb			0.12	−0.19	0.25	0.41	0.09	−1.22	6.19	6.26	1.21	0.38

  - ✓ reasonability of the pre-formation risk-loading approach; all of the post-formation portfolios' loadings for market risk are alinged correctly through the pre-formation risk-loadings; i.e. informative.
  - ✓ Excess returns between Beta-sorted groups are quite small.
  - ✓ But the loadings for the portfolios are significantly different because they are constructed based on pre-formation risk-loading approach.
  - ✓ Since the market premium $R_M - R_f$ is positive in average, the second term of the regression overstates the variation of the portfolios' excess returns.
  - ✓ Their overstatement is controlled by the intercept terms' variation.
- These results are consistent with the existing research results that the relation between average returns and single market β is too flat to justify.
  - ✓ raised by Fama and MacBeth (1973, JPE), Fama-French (1992, JF), etc.
- Three factor models' explanation can be distorted if their estimated market-risk-loading β is significantly different from 1.0; they should not be different from each other based on existing researchs' observation.

5 Summary and Conclusions

- $^{\exists}$robust value premium
- Fama-French RISK model$\gtrsim$Daniel-Titman CHARACTERISTIC model
- $\because$ The observation of Daniel-Titman (1997, JF) is just sample-specific.
- GRS rejection=shortcoming of FF model, but cannot be cured by DT model

Appendix

- Daniel-Titman (1997, JF) p. 22 Table 6

Char Port		Char-Balanced Portfolio: *t*-Statistics				
BM	SZ	$\hat{\alpha}$	β_{Mkt}	β_{SMB}	β_{HML}	R^2
1	1	1.43	−0.43	−2.69	−9.21	31.48
1	2	0.50	0.18	1.98	−8.99	31.48
1	3	−0.48	−1.62	−2.52	−8.57	27.11
2	1	1.37	−2.02	1.31	−7.13	18.43
2	2	2.12	−0.99	−2.07	−4.69	10.96
2	3	0.79	−1.41	−2.34	−3.96	9.11
3	1	2.53	−5.30	−0.48	−8.00	23.36
3	2	2.01	−2.30	−0.63	−4.52	8.58
3	3	1.08	−1.30	−2.36	−4.98	12.39
Combined portfolio		0.354	−0.110	−0.134	−0.724	41.61
		(2.30)	(−3.10)	(−2.40)	(−12.31)	

  - ✓ different from what the reported number by Davis-Fama-French (2000, JF)

- 김상환(2009, 한국증권학회지)

< 요 약 >

Fama-French 3요인 모형이 대부분의 주식시장에서 예상수익률의 횡단면변화를 적절하게 설명할 수 있는 것으로 밝혀지자 시장위험과 HML, SML 등 위험요인에 대한 베타값들이 주식수익률을 결정하는 것으로 해석되었다. 그러나 Daniel and Titman(1997)은 Fama-French 모형의 우수한 설명력은 단순히 기업들의 공통적인 특성이 주식수익률에 반영된 결과라며 위험요인에 근거한 기존의 해석을 반박하며, Fama and French(1993)의 요인모형에 대립되는 자산가격결정모형으로 특성모형(characteristics model)을 제안하였다. 본 연구는 우리나라 주식수익률이 위험요인에 의해 결정되는지 아니면 특성에 의해 결정되는가를 검증하였다.

기업규모와 장부가-시가비율 등 기업특성을 기준으로 분류한 포트폴리오를 다시 위험요인에 대한 민감도(loading)를 기준으로 세분하는 방법으로 검증포트폴리오를 구성한 다음 검증포트폴리오의 평균수익률을 비교한 결과에 의하면 기업특성을 통제한 이후에는 위험요인에 대한 민감도가 평균수익률에 유의적인 영향을 미치지 못하는 것으로 나타났다. 또한 기업특성을 통제하고 위험요인에 민감하도록 구성된 특성제거포트폴리오(characteristic-based portfolio)를 이용한 검증결과에서도 주식수익률이 체계적 위험에 대한 보상으로 결정되는 전통적인 균형가격결정모형은 기각되고 기업의 특성이 직접적으로 주식수익률을 결정하는 특성모형은 기각하지 못하는 것으로 나타났다. 이러한 검증결과는 투자자들이 항상 합리적으로 행동한다는 기존의 투자이론을 부정하고 행태재무이론(behavioral finance)을 실증적으로 뒷받침하고 있다.

- 김상환(2009, 한국증권학회지) p. 315 표 6

Panel A: Mean Excess Monthly Returns (in Percentage) of the 45 Portfolios Sorted by HML Factor Loading

Characteristics		Factor Loading Portfolios: Mean Excess Return			
B/M	Size	1	2	3	Avg.
1	1	0.345	1.569	0.584	0.833
1	2	-0.166	0.374	1.007	0.405
1	3	0.461	0.615	1.266	0.781
2	1	0.956	1.529	1.913	1.466
2	2	-0.120	0.784	0.848	0.503
2	3	0.243	0.444	0.940	0.542
3	1	2.175	1.756	2.164	2.032
3	2	0.819	1.171	1.362	1.118
3	3	0.687	1.516	1.178	1.127
average		0.600	1.084	1.252	-

Panel B: Intercepts and Their t statistics from the Fama-French Three-factor Model

		Factor loading Portfolio α			Factor loading Portfolio $t(\alpha)$		
B/M	Size	1	2	3	1	2	3
1	1	-0.062	1.065	0.310	-0.09	1.74	0.43
1	2	-0.510	0.002	0.579	-1.01	0.01	1.42
1	3	1.030	0.811	1.417	2.68	2.15	2.59
2	1	0.448	0.981	1.031	0.83	1.79	2.06
2	2	-0.585	0.299	0.171	-1.58	0.83	0.40
2	3	0.042	0.513	0.572	0.11	1.41	1.45
3	1	1.494	0.739	1.069	3.35	2.04	2.30
3	2	0.094	0.409	0.376	0.24	1.10	0.79
3	3	0.240	1.237	0.802	0.55	2.85	1.82
average		0.243	0.673	0.703	-	-	-
GRS F-test = 2.50 (p-value < 0.01)							

Panel C: Mean and Regression Results from the Characteristics Balanced Portfolios Sorted by HML Factor Loading

Characteristics		Characteristic-Balanced Portfolios: Mean Reurn and Regression Coeff.					
B/M	Size	Mean	α	β_{HML}	β_{SMB}	β_{Mkt}	R^2
1	1	0.239	0.372	-0.097	-0.123	-0.113	0.010
1	2	1.173**	1.089*	0.256**	-0.255**	-0.193**	0.104
1	3	0.805	0.387	0.354**	0.259**	0.062	0.087
2	1	0.957	0.583	0.331**	0.213**	0.069	0.072
2	2	0.969*	0.756	0.388**	-0.166**	0.070	0.101
2	3	0.697	0.530	0.325**	-0.143**	0.140**	0.108
3	1	-0.011	-0.424	0.591**	-0.091	0.090	0.123
3	2	0.543	0.281	0.396**	-0.075	0.138**	0.092
3	3	0.491	0.562	0.060	-0.195**	0.118*	0.054
Single Portfolio		0.651* (1.93)	0.460 (1.44)	0.289** (5.10)	-0.064 (-1.55)	0.042 (1.18)	0.136

Panel C: Mean and Regression Results from the Characteristics Balanced Portfolios Sorted by HML Factor Loading

Characteristics		Characteristic-Balanced Portfolios: Mean Reurn and Regression Coeff.					
B/M	Size	Mean	α	β_{HML}	β_{SMB}	β_{Mkt}	R^2
1	1	-0.295	-0.796	0.425**	0.310**	0.080	0.069
1	2	-0.772	-1.065*	0.192*	0.302**	0.251**	0.150
1	3	0.190	0.339	-0.097	-0.093	0.199**	0.051
2	1	-0.810	-0.845	0.092	-0.054	0.095	0.015
2	2	-0.268	-0.219	-0.156**	0.178**	0.220**	0.135
2	3	0.853	0.801	-0.016	0.171**	0.274**	0.087
3	1	-0.299	-0.152	-0.230**	0.079	0.062	0.027
3	2	0.087	0.110	-0.116	0.141*	0.075	0.025
3	3	0.168	0.360	-0.187*	-0.011	0.356**	0.118
Single Portfolio		-0.127 (-0.40)	-0.163 (-0.54)	-0.010 (5.25)	0.114 (-0.19)	0.179 (2.88)	0.138

cf. 표 7