Daniel and Titman (1997)

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Abstract

- The size effect and the book-to-market effect are due to their factor loadings (Fama and French (1993))
- No, the effects are due to their characteristics (Daniel and Titman (1997))

Introduction

- Size and book-to-market explain all but momentum, while β doesn't (Fama and French (1992, 1996), Jegadeesh and Titman (1993))
- They proxy systematic risks such as distress and duration (Fama and French (1993, 1996))
- Smalls and values earn more due to investor misbehaviors such as extrapolation and overoptimism (Lakonishok et al. (1994))
- FF93 show the factor model (Merton (1973), Ross (1976)) and the loading pattern, while LSV94 point out the low correlation between the two factors and other macro factors
- The authors test if the factor loadings are priced, and conclude that there exist neither such factors nor such premia
  - The three factors disappear after controlling characteristics
  - Smalls and highs earn more regardless of their loadings (s, h)
  - Low β stocks don't underperform high β ones ceteris paribus

Table 1: Poor Bigs, Size Effect in January

	Low		Book-to-Market		High
Panel A: All Months					
Small	0.371	0.748	0.848	0.961	1.131
	0.445	0.743	0.917	0.904	1.113
Size	0.468	0.743	0.734	0.867	1.051
	0.502	0.416	0.627	0.804	1.080
Big	0.371	0.412	0.358	0.608	0.718
Panel B: Januarys only					
Small	6.344	6.091	6.254	6.827	8.087
	3.141	4.456	4.522	4.914	6.474
Size	2.397	3.374	3.495	3.993	5.183
	1.416	1.955	2.460	3.515	5.111
Big	0.481	1.224	1.205	2.663	4.043
Panel C: Non-Januarys only					
Small	−0.162	0.271	0.365	0.438	0.510
	0.204	0.412	0.595	0.545	0.635
Size	0.296	0.509	0.488	0.588	0.682
	0.420	0.278	0.463	0.562	0.720
Big	0.361	0.340	0.283	0.424	0.421

2. A Model of the Return Generating Process

- The null DGP and its expected return function are

$$r_{it} = E\left[r_{it}\right] + \sum \beta_{ij} f_{jt} + \underbrace{\theta_{it-1} f_{Dt}}_{\text{distress } (B/M)} + \varepsilon_{it}$$

$$E_{t-1}\left[r_{it}\right] = r_{ft} + \sum \beta_{ij} \lambda_j + \theta_{it-1} \lambda_D$$

- With time-varying premia, $E\left[r_{it}\right] = r_{ft} + \sum \beta_{ij} \lambda_{jt-1}$
  - Are $\Delta\lambda_{jt}$ autocorrelated?
  - θ_{it} to be observable, mean-reverting, negatively correlated with r_{it-s}, so high θ portfolios time the factors
- In the characteristic model, $E\left[r_{it}\right] = a + b_1 \theta_{it-1}$
  - Firms with high β (behave as if distressed) but low θ (are not distressed) have low $E[r]$

Figure 1: $r_L > r_H$ Before *HML*, January Effect

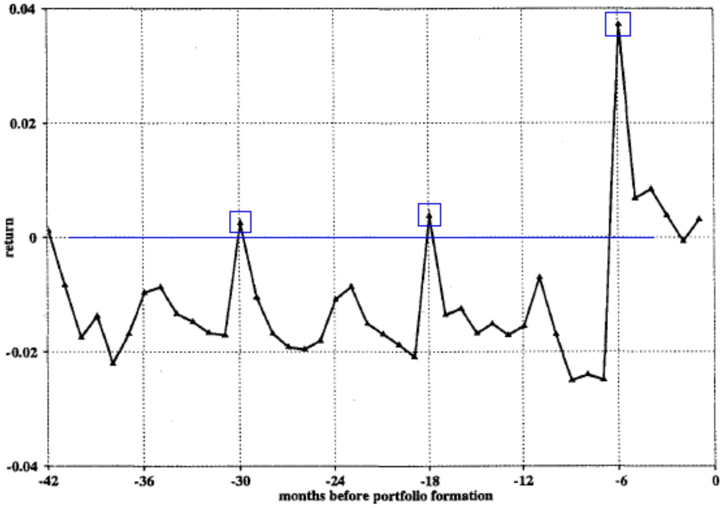

Table 2: Covariation Doesn't Disappear after Formation

Comovements May Get Weaker If the Distress Factor, but Not

Size/BM Portfolio	Formation Year											
	Backward Looking						Forward Looking					
	5	4	3	2	1	0	0	−1	−2	−3	−4	−5
Panel A: Standard Deviations												
L/S	7.01	6.94	6.95	6.97	6.74	6.61	6.56	6.60	6.70	6.62	6.57	6.41
M/S	5.73	5.77	5.74	5.67	5.61	5.55	5.25	5.36	5.46	5.45	5.43	5.42
H/S	5.74	5.73	5.69	5.70	5.97	5.67	5.25	5.18	5.38	5.48	5.47	5.40
L/B	4.89	4.92	4.84	4.88	4.91	4.82	4.61	4.66	4.79	4.83	4.81	4.79
M/B	4.42	4.40	4.47	4.49	4.47	4.37	4.16	4.27	4.37	4.46	4.48	4.42
H/B	4.61	4.68	4.59	4.58	4.77	4.55	4.23	4.23	4.27	4.34	4.37	4.46
Mkt	5.13	5.13	5.09	5.07	5.05	4.96	4.74	4.80	4.92	4.94	4.93	4.88
SMB	3.04	3.02	2.96	2.88	2.78	2.80	2.63	2.68	2.76	2.79	2.78	2.75
HML	$\boxed{2.20}$	2.29	2.53	2.88	3.30	$\boxed{2.55}$	2.51	2.28	2.12	2.13	2.20	2.21
Panel B: Standard Deviations–Januarys Excluded												
L/S	6.63	6.54	6.60	6.66	6.59	6.31	6.22	6.15	6.20	6.17	6.06	5.90
M/S	5.32	5.37	5.33	5.28	5.27	5.16	4.84	4.92	5.03	5.00	5.01	5.01
H/S	5.30	5.26	5.13	5.09	5.21	5.11	4.63	4.67	4.91	5.03	5.07	4.99
L/B	4.83	4.85	4.76	4.77	4.82	4.73	4.46	4.48	4.58	4.62	4.62	4.61
M/B	4.33	4.30	4.34	4.37	4.27	4.21	3.90	4.08	4.17	4.27	4.25	4.21
H/B	4.42	4.45	4.33	4.27	4.32	4.27	3.88	3.87	4.05	4.14	4.23	4.27
Mkt	4.89	4.87	4.82	4.79	4.76	4.68	4.40	4.45	4.59	4.62	4.62	4.57
SMB	2.74	2.71	2.66	2.60	2.62	2.56	2.39	2.41	2.47	2.54	2.54	2.52
HML	$\boxed{2.20}$	2.31	2.46	2.76	2.92	$\boxed{2.45}$	2.38	2.24	2.09	2.09	2.15	2.18

Table 3: Returns Don't Differ Across Loadings

Quintile Portfolios by β_{HML} from Each of 3×3 BM-SZ Portfolios

Char Port		Factor Loading Portfolio				
BM	SZ	1	2	3	4	5
1	1	0.202	0.833	0.902	0.731	0.504
1	2	0.711	0.607	0.776	0.872	0.710
1	3	0.148	0.287	0.396	0.400	0.830
2	1	1.036	0.964	1.014	1.162	0.862
2	2	0.847	0.957	0.997	0.873	0.724
2	3	0.645	0.497	0.615	0.572	0.718
3	1	1.211	1.112	1.174	1.265	0.994
3	2	1.122	1.166	1.168	1.080	0.955
3	3	0.736	0.933	0.571	0.843	0.961
Average		0.740	0.817	0.846	0.866	0.806

Table 4: Characteristics Somewhat Differ Across Loadings

Char Port		Factor Loading Portfolio				
BM	SZ	1	2	3	4	5
Panel A: Book-to-Market Relative to Median						
1	1	0.415	0.466	0.492	0.501	0.440
1	2	0.404	0.453	0.487	0.501	0.505
1	3	0.360	0.399	0.457	0.507	0.542
2	1	0.980	0.991	1.013	1.017	1.011
2	2	0.963	0.996	1.003	1.013	1.021
2	3	0.949	0.975	0.998	1.027	1.025
3	1	1.908	1.841	1.876	1.941	2.242
3	2	1.624	1.725	1.708	1.732	1.890
3	3	1.568	1.563	1.554	1.638	1.747
Average		1.019	1.045	1.065	1.097	1.158
Panel B: Market Equity Relative to Median						
1	1	0.239	0.262	0.255	0.251	0.212
1	2	1.178	1.235	1.280	1.239	1.240
1	3	34.716	42.269	55.325	30.111	24.842
2	1	0.226	0.248	0.265	0.264	0.239
2	2	1.194	1.171	1.197	1.205	1.204
2	3	23.951	41.405	27.428	25.675	21.163
3	1	0.173	0.207	0.227	0.237	0.205
3	2	1.146	1.187	1.215	1.217	1.191
3	3	10.615	27.661	21.152	11.626	15.288
Average		8.160	12.849	12.038	7.981	7.287

Table 4 (cont.): Isn't It $\frac{1}{\sum_i \text{ME}_{i,t}} \sum_i \text{BM}_{i,t}\text{ME}_{i,t}$ instead?

Table IV

Average Book-to-Market and Size of Test Portfolios

Portfolios are formed based on size (SZ), book-to-market (BM), and preformation HML factor loadings. At each yearly formation date, the average size and book-to-market for each portfolio is then calculated, using value weighting:

$$\overline{\text{SZ}}_t = \frac{1}{\Sigma_i \text{ME}_{i,t}} \sum_i \text{ME}^2_{i,t} \qquad \boxed{\overline{\text{BM}}_t = \frac{1}{\Sigma_i \text{ME}_{i,t} \, \Sigma_i \text{BM}_{i,t} \cdot \text{ME}_{i,t}}.}$$

Then, at each point, $\overline{\text{SZ}}_t$ and $\overline{\text{BM}}_t$ are divided by the median market equity (ME) and median book-to-market for NYSE firms at that point in time. The two time series are then averaged to get the numbers that are presented in the table below.

Table 5: Post-β_{HML}s Differ Across Pre-β_{HML}s

Char Port BM	SZ	Factor Loading Portfolio 1	2	3	4	5	Factor Loading Portfolio 1	2	3	4	5
		α					$t(\alpha)$				
1	1	−0.58	0.14	0.06	−0.17	−0.67	−3.97	1.04	0.48	−1.34	−4.00
1	2	0.16	0.05	0.13	0.16	−0.08	0.94	0.47	1.12	1.33	−0.63
1	3	0.02	0.05	0.06	−0.06	0.28	0.15	0.42	0.50	−0.55	2.26
2	1	0.13	0.08	0.06	0.21	−0.31	1.05	0.87	0.73	2.13	−2.31
2	2	0.03	0.20	0.22	0.01	−0.31	0.24	1.71	2.05	0.14	−2.66
2	3	0.19	−0.08	0.05	−0.10	−0.07	1.13	−0.50	0.35	−0.67	−0.46
3	1	0.08	0.05	0.10	0.01	−0.47	0.70	0.55	1.06	0.10	−3.27
3	2	0.17	0.22	0.25	0.05	−0.31	1.25	1.67	1.94	0.36	−1.63
3	3	−0.01	0.16	−0.23	−0.12	−0.18	−0.04	1.13	−1.45	−0.74	−0.90
Average		0.02	0.10	0.08	0.00	−0.24	0.16	0.82	0.75	0.08	−1.51
		$\hat{\beta}_{\mathrm{HML}}$					$t(\hat{\beta}_{\mathrm{HML}})$				
1	1	−0.40	−0.38	−0.11	−0.04	0.25	−7.09	−7.09	−2.32	−0.84	3.91
1	2	−0.60	−0.32	−0.18	−0.05	0.05	−9.13	−7.15	−3.98	−1.02	1.01
1	3	−0.70	−0.44	−0.22	−0.11	−0.02	−12.85	−9.85	−4.72	−2.48	−0.44
2	1	0.02	0.19	0.32	0.35	0.48	0.39	5.51	9.69	9.06	9.13
2	2	0.17	0.23	0.28	0.36	0.49	3.23	5.14	6.59	8.67	10.98
2	3	0.03	0.24	0.22	0.31	0.49	0.50	3.90	4.03	5.53	8.40
3	1	0.42	0.50	0.57	0.75	0.91	9.74	13.00	16.26	19.74	16.11
3	2	0.40	0.58	0.56	0.72	0.82	7.32	11.40	11.07	13.91	11.26
3	3	0.45	0.56	0.67	0.81	1.00	6.69	10.03	10.91	12.81	12.90
Average		−0.02	0.13	0.23	0.34	0.50	−0.13	2.77	5.28	7.26	8.14
		$\hat{\beta}_{\mathrm{SMB}}$					$t(\hat{\beta}_{\mathrm{SMB}})$				
1	1	1.23	1.07	1.07	1.18	1.39	23.27	21.29	24.34	26.33	22.97
1	2	0.81	0.55	0.62	0.55	0.61	13.06	13.04	14.93	12.78	14.18
1	3	−0.14	−0.17	−0.16	−0.08	0.04	−2.84	−4.16	−3.59	−1.88	0.83
2	1	1.19	0.95	0.94	0.89	1.15	27.05	29.40	30.56	24.74	23.63
2	2	0.54	0.45	0.44	0.47	0.72	10.99	10.87	11.09	12.10	17.112
2	3	−0.22	−0.25	−0.15	−0.10	−0.07	−3.63	−4.39	−3.02	−1.96	−1.21
3	1	1.24	1.01	0.95	1.04	1.25	30.74	27.73	28.97	29.27	23.67
3	2	0.61	0.43	0.37	0.43	0.69	12.08	9.09	7.86	8.80	10.17
3	3	−0.06	−0.15	−0.17	0.05	0.10	−1.02	−2.90	−3.04	0.82	1.35
Average		0.58	0.43	0.43	0.49	0.65	12.19	11.11	12.01	12.33	12.52
Char Port BM	SZ	Factor Loading Portfolio 1	2	3	4	5	Factor Loading Portfolio 1	2	3	4	5
		$\hat{\beta}_{\mathrm{Mkt}}$					$t(\hat{\beta}_{\mathrm{Mkt}})$				
1	1	1.12	1.03	1.07	1.04	1.15	33.32	32.30	38.04	36.38	29.66
1	2	1.14	1.03	1.03	1.07	1.08	28.90	38.38	38.90	39.26	39.07
1	3	0.99	0.98	0.95	1.04	1.04	30.72	36.77	33.61	38.47	36.39
2	1	0.99	0.93	0.95	0.95	1.08	35.45	45.11	48.49	41.54	34.84
2	2	1.06	0.96	0.94	1.01	1.06	33.42	35.91	37.40	41.19	39.56
2	3	0.97	1.02	0.96	1.04	1.07	25.56	28.22	29.97	31.22	30.42
3	1	1.01	0.92	0.94	1.05	1.17	39.10	39.96	45.23	46.16	34.94
3	2	1.05	0.99	0.98	1.02	1.20	32.59	32.78	32.32	32.82	27.74
3	3	1.02	1.03	0.99	1.03	1.15	25.81	31.25	26.97	27.20	24.96
Average		1.04	0.99	0.98	1.03	1.11	31.65	35.63	36.77	37.14	33.06

Table 6: Characteristic-Balanced Portfolios Generates αs

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	$\boxed{2.12}$	−0.99	−2.07	−4.69	10.96
2	3	0.79	−1.41	−2.34	−3.96	9.11
3	1	$\boxed{2.53}$	−5.30	−0.48	−8.00	23.36
3	2	$\boxed{2.01}$	−2.30	−0.63	−4.52	8.58
3	3	1.08	−1.30	−2.36	−4.98	12.39
Combined portfolio		$\boxed{0.354}$	−0.110	−0.134	$\boxed{-0.724}$	41.61
		(2.30)	(−3.10)	(−2.40)	(−12.31)	

Tables 5 and 6: Characteristic Models Win

- Table 5: While factor models say that the alphas are zero across the loading portfolios, characteristic models say that high (low) loadings imply low (high) alphas
  - Mean (in Table 3): 0.74% (P1) v. 0.81% (P5)
  - Alpha (in Table 5): 0.02% (P1) v. −0.24% (P5)
- Table 6: Characteristic-balanced portfolios
  - Long P1 & P2 and short P4 & P5
  - While factor models predict $\mu \neq 0$ and $\alpha = 0$, characteristic models predict $\mu = 0$ and $\alpha \neq 0$, repsectively
  - μ of the combined (not reported): −0.12% with t=−0.60
  - α of the combined (Table 6): 0.35% with t=2.30
- Consistent (inconsistent) with characteristic (factor) models

Table 7: Post-β_{SMB}s Differ Across Pre-β_{SMB}s

Char Port		$\hat{\alpha}$					$t(\hat{\alpha})$				
BM	SZ	1	2	3	4	5	1	2	3	4	5
1	1	−0.28	−0.01	−0.06	−0.10	−0.65	−1.94	−0.06	−0.44	−0.75	−3.58
1	2	0.07	0.20	0.13	0.01	0.01	0.57	1.79	1.10	0.08	0.03
1	3	0.25	0.06	0.01	−0.08	0.05	2.40	0.55	0.06	−0.67	0.38
2	1	0.16	0.07	0.06	−0.05	0.06	1.38	0.73	0.69	−0.48	0.37
2	2	0.11	−0.10	0.06	0.12	−0.05	0.84	−0.87	0.54	1.05	−0.38
2	3	0.08	0.01	−0.16	0.10	−0.03	0.50	0.08	−1.04	0.88	−0.27
3	1	0.02	0.11	−0.06	−0.13	−0.11	0.21	1.14	−0.63	−1.14	−0.75
3	2	0.19	0.23	−0.12	−0.01	0.15	1.20	1.79	−0.91	−0.07	0.75
3	3	0.23	−0.10	−0.16	−0.38	0.08	1.29	−0.67	−1.09	−2.58	0.45
Average		0.09	0.05	−0.03	−0.06	−0.05	0.72	0.50	−0.19	−0.41	−0.33

Char Port		$\hat{\beta}_{\text{SMB}}$					$t(\hat{\beta}_{\text{SMB}})$				
BM	SZ	1	2	3	4	5	1	2	3	4	5
1	1	1.01	1.06	1.18	1.20	1.45	19.14	24.93	26.04	25.18	21.96
1	2	0.49	0.54	0.59	0.71	0.84	11.33	13.21	13.38	15.00	15.40
1	3	−0.29	−0.11	−0.11	−0.03	0.15	−7.81	−2.58	−2.50	−0.69	2.89
2	1	0.84	0.85	0.91	1.17	1.57	20.58	26.15	26.53	29.86	28.18
2	2	0.25	0.45	0.47	0.67	0.86	5.29	10.74	12.01	16.38	18.15
2	3	−0.38	−0.26	−0.14	0.06	0.25	−6.38	−5.46	−2.54	1.44	5.44
3	1	0.89	0.93	1.06	1.23	1.49	21.34	26.51	30.70	28.70	27.07
3	2	0.12	0.34	0.57	0.65	0.91	2.05	7.43	11.53	12.56	12.96
3	3	−0.33	−0.11	0.05	0.00	0.20	−5.27	−2.04	0.87	0.01	3.21
Average		0.29	0.41	0.51	0.63	0.86	6.70	10.99	12.89	14.27	15.03

Char Port		Mean Returns					Char-Balanced Portfolio: t-Statistics				
BM	SZ	1	2	3	4	5	$\hat{\alpha}$	$\hat{\beta}_{\text{Mkt}}$	$\hat{\beta}_{\text{SMB}}$	$\hat{\beta}_{\text{HML}}$	R^2
1	1	0.52	0.80	0.79	0.75	0.38	1.76	−3.85	−6.15	0.75	25.84
1	2	0.64	0.84	0.81	0.65	0.75	0.96	−3.37	−5.47	2.10	24.16
1	3	0.49	0.38	0.30	0.35	0.46	1.21	−3.82	−5.12	0.13	20.98
2	1	1.09	0.93	1.03	0.94	1.22	0.86	−5.51	−11.72	2.82	52.98
2	2	0.85	0.69	0.87	1.00	1.01	−0.22	−5.74	−8.56	0.53	40.82
2	3	0.57	0.54	0.42	0.80	0.86	0.08	−4.23	−8.19	−1.56	33.03
3	1	1.13	1.23	1.14	1.15	1.27	1.43	−6.15	−9.29	0.78	44.85
3	2	1.01	1.23	0.96	1.09	1.29	0.76	−4.81	−8.25	2.11	39.09
3	3	0.84	0.72	0.77	0.69	1.08	1.15	−6.02	−4.80	−2.13	26.41
Avg/coef		0.79	0.82	0.79	0.82	0.92	0.258	−0.331	−0.790	0.057	
(t stat)								(1.68)	(−9.25)	(−14.10)	(0.96)

Table 8: Post-β_{Mkt}s Differ Across Pre-β_{Mkt}s

Char Port		$\hat{\alpha}$					$t(\hat{\alpha})$				
BM	SZ	1	2	3	4	5	1	2	3	4	5
1	1	−0.22	−0.11	−0.07	−0.16	−0.39	−1.30	−0.89	−0.54	−1.22	−2.46
1	2	0.31	0.26	0.08	−0.10	−0.17	2.76	2.42	0.64	−0.72	−1.17
1	3	0.31	0.07	0.05	0.00	−0.30	2.40	0.66	0.42	0.03	−2.16
2	1	−0.02	0.16	0.25	−0.06	−0.08	−0.19	1.64	2.30	−0.69	−0.60
2	2	0.16	0.09	−0.02	−0.01	−0.01	1.22	0.82	−0.14	−0.10	−0.10
2	3	0.04	−0.03	−0.01	0.01	−0.21	0.24	−0.18	−0.07	0.04	−1.23
3	1	0.25	0.07	0.09	−0.05	−0.36	1.77	0.69	1.05	−0.50	−3.63
3	2	0.21	0.39	−0.06	0.19	−0.31	1.18	2.65	−0.43	1.36	−1.57
3	3	0.08	−0.11	0.05	−0.06	−0.25	0.38	−0.66	0.32	−0.39	−1.45
Average		0.12	0.09	0.04	−0.03	−0.23	0.94	0.79	0.39	−0.24	−1.60

Char Port		$\hat{\beta}_{Mkt}$					$t(\hat{\beta}_{Mkt})$				
BM	SZ	1	2	3	4	5	1	2	3	4	5
1	1	1.00	0.96	1.07	1.11	1.20	25.90	32.58	38.44	36.26	32.20
1	2	0.95	0.98	1.07	1.16	1.20	36.16	39.08	35.77	34.41	35.14
1	3	0.90	0.95	1.00	1.07	1.16	30.51	38.71	36.38	40.47	35.94
2	1	0.79	0.87	0.94	1.04	1.19	27.77	37.87	37.78	47.48	39.26
2	2	0.81	0.91	0.99	1.07	1.23	26.48	34.61	40.70	42.46	34.61
2	3	0.82	0.91	1.05	1.15	1.21	21.27	25.42	27.76	35.02	30.03
3	1	0.84	0.85	0.97	1.08	1.26	25.44	34.55	46.30	45.87	54.38
3	2	0.84	0.94	1.04	1.13	1.30	20.44	27.72	32.63	35.62	28.09
3	3	0.84	0.94	1.09	1.19	1.20	18.06	25.15	28.39	33.62	30.59
Average		0.87	0.92	1.02	1.11	1.22	25.78	32.85	36.02	39.02	35.58

Char Port		Mean Returns:					Char-Balanced Portfolio: t-Statistics				
BM	SZ	1	2	3	4	5	$\hat{\alpha}$	$\hat{\beta}_{Mkt}$	$\hat{\beta}_{SMB}$	$\hat{\beta}_{HML}$	R^2
1	1	0.69	0.73	0.81	0.63	0.49	0.73	−4.86	−0.14	4.19	24.61
1	2	0.91	0.86	0.70	0.67	0.52	2.98	−6.56	−3.74	1.43	30.54
1	3	0.54	0.31	0.39	0.35	0.22	2.20	−5.36	−5.46	−0.16	27.78
2	1	0.80	1.04	1.16	0.98	1.07	1.11	−9.76	−7.41	0.87	51.41
2	2	0.88	0.86	0.84	0.87	0.98	0.91	−8.22	−5.24	1.63	41.88
2	3	0.59	0.46	0.59	0.71	0.58	0.56	−7.16	−3.60	0.47	30.88
3	1	1.33	1.13	1.23	1.20	1.03	2.87	−10.89	−5.53	−0.03	49.85
3	2	1.06	1.36	0.95	1.31	0.84	1.66	−6.40	−4.95	1.53	33.44
3	3	0.77	0.73	0.89	1.00	0.74	0.60	−5.72	−4.63	0.59	27.70
Avg/coef		0.84	0.83	0.84	0.86	0.72	0.474	−0.540	−0.540	0.150	
(t-stat)							(2.19)	(−10.78)	(−6.87)	(1.78)	

Tables 7 and 8: It's the Characteristics

- Table 7: Quintile portfolios by β_{SMB} from each of 3×3
- Table 8: Quintile portfolios by β_{Mkt} from each of 3×3
- Combined characteristic-balanced portfolios in both tables display negative loadings (-0.79 and -0.54) but positive alphas (0.26% and 0.47%)
- Why does the combined characteristic-balanced portfolio from HML in Table 6 have negative loadings on Mkt and SMB as well? Similarly, why do the combined characteristic-balanced portfolios from SMB and Mkt respectively in Tables 7 and 8 have negative loadings on Mkt and SMB respectively as well?
    - $\beta_{\text{Mkt}} = -0.11$ and $\beta_{\text{SMB}} = 0.13$ in Table 6
    - $\beta_{\text{Mkt}} = -0.33$ in Table 7
    - $\beta_{\text{SMB}} = -0.54$ in Table 8

Table 9: Factor Models Fail Not Due to Liquidity

High Returns to Illiquid Ones May Conceal Factor Models If Low Loadings, but Not

Char Port		Factor Loading Portfolio				
BM	SZ	1	2	3	4	5
1	1	75.6	66.1	60.3	60.1	58.7
1	2	96.6	61.8	50.6	47.4	56.3
1	3	52.7	39.3	37.9	41.1	45.8
2	1	61.9	43.7	40.2	40.2	46.2
2	2	62.3	42.5	38.4	39.9	42.8
2	3	44.6	39.3	37.6	38.7	39.9
3	1	49.1	38.6	38.2	42.0	45.4
3	2	56.2	43.1	44.7	44.2	51.6
3	3	49.0	41.5	38.8	45.9	44.5
Average		60.89	46.21	42.97	44.39	47.91

Table 10: Factor Models Fail Not Due to Momentum

High Returns to Recent Winners May Conceal Factor Models If Low Loadings, but Not

Char Port		Factor Loading Portfolio					
BM	SZ	1	2	3	4	5	5-1
1	1	1.74	1.83	1.79	1.77	1.50	−0.24
1	2	2.59	2.15	1.79	1.88	1.93	−0.66
1	3	1.88	1.62	1.41	1.40	1.52	−0.36
2	1	1.25	1.31	1.17	1.15	1.24	−0.02
2	2	1.30	1.17	1.12	1.26	1.37	0.06
2	3	1.09	1.26	1.03	1.08	1.25	0.17
3	1	0.87	0.96	0.90	0.84	0.61	−0.26
3	2	0.97	1.01	0.96	1.04	0.89	−0.08
3	3	0.85	1.02	1.23	1.14	1.09	0.24
Average		1.39	1.37	1.27	1.28	1.27	−0.13

5. Conclusions

- There's no separate distress factor; the comovement lasts long before and after formation
- Loadings don't explain returns after characteristics
  - Noisy loadings may not provide additional information after characteristics; even under factor models, as long as characteristics proxy true loadings well
  - Finer factors (than Fama–French) also reject factor models
  - If exists, the unobserved distress factor may have a higher Sharpe ratio (than Fama–French, the Sharpe ratios of which are already too high to be justified), but unreasonable

5. Conclusions (cont.)

- If it's characteristics, then
  - Characteristic arbitrages will enable positive alphas
  - Characteristic matching will outperform factor regression
  - Modigliani–Miller theorem will be violated
- Why characteristics? Candidate stories include
  - Extrapolating investors overpricing (underpricing) growth (value) stocks based on past growth rates
  - Fund managers who know the book-to-market effect, but pick growth stocks to convince their sponsors
  - Liquidity since volumes are related to sizes and past returns; but not to book-to-markets (Table 9)
  - Or just a common misbelief shared by investors believing sizes and book-to-markets proxy systematic risks