STAT 222 - Feature Selection

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Recovery Stage

Stepwise Selection - Low Return

The table below contains the following regression information for the following stepwise selections:

1. Backward AIC
2. Backward BIC
3. Forward AIC
4. Forward BIC

[1] "R^2 for Full Model: 0.773" [1] "Adjusted R^2 for Full Model: 0.756"

	Dependent variable:			
	R1−RF			
	(1)	(2)	(3)	(4)
CMA	0.259***	0.238***	0.016	0.238***
	(0.061)	(0.054)	(0.181)	(0.054)
CRD	-0.049*			
	(0.025)			
LIQ	-0.152***	-0.156***	-0.153***	-0.156***
	(0.027)	(0.023)	(0.023)	(0.023)
ME	0.118***	0.140***	0.074	0.140***
	(0.041)	(0.040)	(0.053)	(0.040)
Mkt−RF	0.581***	0.571***	0.612***	0.571***
	(0.028)	(0.027)	(0.039)	(0.027)
RMW	-0.134**		-0.180**	
	(0.056)		(0.089)	
ROE	0.096*			
	(0.050)			
PC2			-0.234	
			(0.157)	
Constant	0.250***	0.222***	0.236***	0.222***
	(0.052)	(0.050)	(0.051)	(0.050)
Observations	175	175	175	175

R^2	0.772	0.762	0.768	0.762
Adjusted R^2	0.762	0.757	0.760	0.757
Residual Std. Error	0.626 (df = 167)	0.634 (df = 170)	0.629 (df = 168)	0.634 (df = 170)
F Statistic	80.654*** (df = 7; 167)	136.193*** (df = 4; 170)	92.747*** (df = 6; 168)	136.193*** (df = 4; 170)
Note:				*p<0.1; **p<0.05;** p<0.01

[1] "Selected Factors: CMA, LIQ, ME, `Mkt-RF` "

Stepwise Selection - Medium Return

The table below contains the following regression information for the following stepwise selections:

1. Backward AIC
2. Backward BIC
3. Forward AIC
4. Forward BIC

[1] "R^2 for Full Model: 0.747" [1] "Adjusted R^2 for Full Model: 0.728"

	Dependent variable:			
	`R2-RF`			
	(1)	(2)	(3)	(4)
CMA	0.221***	0.221***	0.221***	0.221***
	(0.061)	(0.061)	(0.061)	(0.061)
LIQ	-0.131***	-0.131***	-0.131***	-0.131***
	(0.026)	(0.026)	(0.026)	(0.026)
ME	0.154***	0.154***	0.154***	0.154***
	(0.045)	(0.045)	(0.045)	(0.045)
`Mkt-RF`	0.593***	0.593***	0.593***	0.593***
	(0.031)	(0.031)	(0.031)	(0.031)
Constant	0.467***	0.467***	0.467***	0.467***
	(0.057)	(0.057)	(0.057)	(0.057)
Observations	175	175	175	175
R^2	0.742	0.742	0.742	0.742
Adjusted R^2	0.736	0.736	0.736	0.736
Residual Std. Error (df = 170)	0.716	0.716	0.716	0.716
F Statistic (df = 4; 170)	122.546***	122.546***	122.546***	122.546***
Note:				*p<0.1; **p<0.05;** p<0.01

[1] “Selected Factors: CMA, LIQ, ME, `Mkt-RF`”

Stepwise Selection - High Return

The table below contains the following regression information for the following stepwise selections:

1. Backward AIC
2. Backward BIC
3. Forward AIC
4. Forward BIC

[1] “R^2 for Full Model: 0.704” [1] “Adjusted R^2 for Full Model: 0.682”

	Dependent variable:			
	`R3-RF`			
	(1)	(2)	(3)	(4)
CMA	0.204***	0.204***	0.234***	0.289***
	(0.074)	(0.074)	(0.072)	(0.070)
PC3			-0.204***	-0.157***
			(0.064)	(0.056)
LIQ	-0.103***	-0.103***	-0.116***	
	(0.032)	(0.032)	(0.039)	
ME	0.176***	0.176***		
	(0.055)	(0.055)		
MOM			-0.065**	
			(0.032)	
`Mkt-RF`	0.624***	0.624***	0.626***	0.583***
	(0.038)	(0.038)	(0.038)	(0.031)
Constant	0.687***	0.687***	0.734***	0.701***
	(0.069)	(0.069)	(0.069)	(0.069)
Observations	175	175	175	175
R^2	0.700	0.700	0.700	0.685
Adjusted R^2	0.693	0.693	0.691	0.679
Residual Std. Error	0.872 (df = 170)	0.872 (df = 170)	0.874 (df = 169)	0.891 (df = 171)
F Statistic	99.101*** (df = 4; 170)	99.101*** (df = 4; 170)	78.932*** (df = 5; 169)	123.674*** (df = 3; 171)
Note:				*p<0.1; **p<0.05;** p<0.01

[1] “Selected Factors: CMA, LIQ, ME, `Mkt-RF`”

Expansion Stage

Stepwise Selection - Low Return

The table below contains the following regression information for the following stepwise selections:

1. Backward AIC
2. Backward BIC
3. Forward AIC
4. Forward BIC

[1] "R^2 for Full Model: 0.784" [1] "Adjusted R^2 for Full Model: 0.78"

	Dependent variable:			
	R1−RF			
	(1)	(2)	(3)	(4)
CMA	0.174**		0.204***	0.267***
	(0.083)		(0.057)	(0.053)
CRD	-0.045**			
	(0.019)			
EG	0.077*			
	(0.046)			
LIQ			-0.006	
			(0.022)	
HML	0.276***	0.309***	0.294***	0.071*
	(0.035)	(0.026)	(0.054)	(0.041)
IA	-0.146*			
	(0.078)			
MOM	-0.064***	-0.084***		
	(0.021)	(0.019)		
PC5			-0.032	0.493***
			(0.097)	(0.047)
PC7			0.039	0.398***
			(0.069)	(0.050)
Mkt−RF	0.812***	0.797***	0.857***	0.590***
	(0.018)	(0.018)	(0.042)	(0.020)
RMW	0.361***	0.352***	0.404***	
	(0.035)	(0.032)	(0.069)	
PC4			-0.204***	
			(0.047)	

SMB	0.337***	0.331***	0.305***	
	(0.028)	(0.027)	(0.043)	
Constant	0.056*	0.060**	0.029	0.147***
	(0.032)	(0.030)	(0.036)	(0.031)
Observations	598	598	598	598
R^2	0.783	0.778	0.783	0.760
Adjusted R^2	0.780	0.776	0.780	0.758
Residual Std. Error	0.715 (df = 588)	0.721 (df = 592)	0.715 (df = 588)	0.749 (df = 592)
F Statistic	235.712*** (df = 9; 588)	414.416*** (df = 5; 592)	235.986*** (df = 9; 588)	375.036*** (df = 5; 592)
Note:				*p<0.1;* ***p<0.05;*** p<0.01

[1] “Selected Factors: HML, MOM, `Mkt-RF`, RMW, SMB”

Stepwise Selection - Medium Return

The table below contains the following regression information for the following stepwise selections:

1. Backward AIC
2. Backward BIC
3. Forward AIC
4. Forward BIC

[1] “R^2 for Full Model: 0.781” [1] “Adjusted R^2 for Full Model: 0.777”

	Dependent variable:			
	R2-RF			
	(1)	(2)	(3)	(4)
CMA	0.176*		0.185**	0.302***
	(0.092)		(0.073)	(0.046)
EG	0.120**			
	(0.051)			
HML	0.325***	0.306***	0.131**	
	(0.037)	(0.028)	(0.057)	
IA	-0.216**			
	(0.087)			
LIQ	0.047**	0.057***		
	(0.021)	(0.021)		
MOM	-0.042*			
	(0.022)			

ME			-0.205*	
			(0.119)	
Mkt-RF	0.856***	0.836***	0.671***	0.609***
	(0.022)	(0.021)	(0.048)	(0.036)
PC5			0.436***	0.579***
			(0.113)	(0.075)
PC7			0.478***	0.571***
			(0.104)	(0.079)
RMW	0.358***	0.381***	0.191***	0.183***
	(0.040)	(0.036)	(0.073)	(0.061)
SMB	0.376***	0.350***	0.361***	0.094**
	(0.033)	(0.031)	(0.122)	(0.045)
CRD			0.117***	0.134***
			(0.034)	(0.031)
ROE			-0.165***	-0.248***
			(0.060)	(0.053)
Constant	0.195***	0.210***	0.286***	0.310***
	(0.035)	(0.034)	(0.037)	(0.035)
Observations	598	598	598	598
R^2	0.781	0.775	0.781	0.778
Adjusted R^2	0.777	0.773	0.777	0.775
Residual Std. Error	0.795 (df = 588)	0.804 (df = 592)	0.795 (df = 587)	0.799 (df = 589)
F Statistic	232.687*** (df = 9; 588)	406.890*** (df = 5; 592)	209.513*** (df = 10; 587)	258.286*** (df = 8; 589)
Note:				*p<0.1;* ***p<0.05;*** p<0.01

[1] “Selected Factors: HML, LIQ, `Mkt-RF`, RMW, SMB”

Stepwise Selection - High Return

The table below contains the following regression information for the following stepwise selections:

1. Backward AIC
2. Backward BIC
3. Forward AIC
4. Forward BIC

[1] “R^2 for Full Model: 0.765” [1] “Adjusted R^2 for Full Model: 0.76”

	Dependent variable:

	R3−RF			
	(1)	(2)	(3)	(4)
CMA	0.158			
	(0.108)			
EG	0.176***	0.187***		
	(0.060)	(0.060)		
HML	0.350***	0.322***	0.076	0.193***
	(0.044)	(0.035)	(0.055)	(0.038)
IA	-0.245**			
	(0.104)			
MOM			0.290***	0.114***
			(0.067)	(0.032)
ME			-0.239*	-0.328**
			(0.131)	(0.128)
ROE			-0.371***	
			(0.123)	
LIQ	0.153***	0.162***	-0.120**	
	(0.025)	(0.024)	(0.054)	
Mkt−RF	0.903***	0.903***	0.716***	0.790***
	(0.025)	(0.025)	(0.040)	(0.028)
RMW	0.367***	0.356***		
	(0.047)	(0.045)		
PC5			0.902***	0.475***
			(0.155)	(0.060)
SMB	0.402***	0.409***	0.267*	0.516***
	(0.038)	(0.038)	(0.151)	(0.126)
PC7			0.357***	0.307***
			(0.068)	(0.064)
PC6			0.633***	0.343***
			(0.125)	(0.056)
Constant	0.319***	0.313***	0.540***	0.453***
	(0.042)	(0.042)	(0.050)	(0.040)
Observations	598	598	598	598
R^2	0.765	0.762	0.763	0.760
Adjusted R^2	0.761	0.760	0.759	0.756
Residual Std. Error	0.952 (df = 589)	0.955 (df = 591)	0.956 (df = 587)	0.962 (df = 589)
F Statistic	239.157*** (df = 8; 589)	315.505*** (df = 6; 591)	189.293*** (df = 10; 587)	232.618*** (df = 8; 589)

Note: *p<0.1; **p<0.05;** p<0.01

[1] “Selected Factors: EG, HML, LIQ, `Mkt-RF` , RMW, SMB”

Downturn Stage

Stepwise Selection - Low Return

The table below contains the following regression information for the following stepwise selections:

1. Backward AIC
2. Backward BIC
3. Forward AIC
4. Forward BIC

[1] “R^2 for Full Model: 0.723” [1] “Adjusted R^2 for Full Model: 0.718”

	Dependent variable:			
	`R1-RF`			
	(1)	(2)	(3)	(4)
CRD	-0.108***	-0.108***	-0.064**	-0.065**
	(0.022)	(0.022)	(0.028)	(0.028)
HML	-0.108***	-0.108***		
	(0.036)	(0.036)		
IA	0.204***	0.204***		
	(0.045)	(0.045)		
LIQ	-0.064***	-0.064***		
	(0.021)	(0.021)		
`Mkt-RF`	0.660***	0.660***	0.559***	0.568***
	(0.018)	(0.018)	(0.020)	(0.019)
RMW	0.220***	0.220***	0.321***	0.349***
	(0.038)	(0.038)	(0.052)	(0.050)
PC8			0.115*	0.132**
			(0.059)	(0.058)
SMB	0.122***	0.122***	0.057*	0.057*
	(0.029)	(0.029)	(0.029)	(0.029)
PC7			-0.434***	-0.374***
			(0.093)	(0.087)
EG			-0.310***	-0.252***
			(0.086)	(0.079)

ROE			0.088*	
			(0.049)	
Constant	0.101***	0.101***	0.139***	0.140***
	(0.032)	(0.032)	(0.032)	(0.032)
Observations	668	668	668	668
R^2	0.722	0.722	0.723	0.721
Adjusted R^2	0.719	0.719	0.719	0.718
Residual Std. Error	0.813 (df = 660)	0.813 (df = 660)	0.812 (df = 659)	0.813 (df = 660)
F Statistic	244.342*** (df = 7; 660)	244.342*** (df = 7; 660)	214.746*** (df = 8; 659)	244.125*** (df = 7; 660)
Note:				*p<0.1;* ***p<0.05;*** p<0.01

[1] “Selected Factors: CRD, HML, IA, LIQ, `Mkt-RF` , RMW, SMB”

Stepwise Selection - Medium Return

The table below contains the following regression information for the following stepwise selections:

1. Backward AIC
2. Backward BIC
3. Forward AIC
4. Forward BIC

[1] “R^2 for Full Model: 0.721” [1] “Adjusted R^2 for Full Model: 0.716”

	Dependent variable:			
	R2-RF			
	(1)	(2)	(3)	(4)
CRD	-0.045*		-0.037	
	(0.025)		(0.023)	
EG	-0.082			
	(0.052)			
HML	-0.140***	-0.093**		
	(0.040)	(0.036)		
IA	0.234***	0.247***	0.168*	
	(0.049)	(0.049)	(0.087)	
LIQ	-0.065***	-0.066***		
	(0.023)	(0.023)		
ME	0.122***	0.134***	0.078***	
	(0.031)	(0.031)	(0.030)	

Mkt-RF	0.699***	0.704***	0.795***	0.808***
	(0.020)	(0.020)	(0.032)	(0.031)
RMW	0.263***	0.220***	0.399***	0.366***
	(0.047)	(0.041)	(0.053)	(0.053)
CMA			0.034	0.249***
			(0.099)	(0.041)
PC5			0.302***	0.307***
			(0.068)	(0.067)
Constant	0.243***	0.222***	0.204***	0.188***
	(0.035)	(0.035)	(0.036)	(0.035)
Observations	668	668	668	668
R^2	0.720	0.716	0.719	0.714
Adjusted R^2	0.716	0.714	0.716	0.712
Residual Std. Error	0.883 (df = 659)	0.887 (df = 661)	0.883 (df = 660)	0.889 (df = 663)
F Statistic	211.536*** (df = 8; 659)	278.060*** (df = 6; 661)	241.568*** (df = 7; 660)	413.866*** (df = 4; 663)
Note:				*p<0.1;* ***p<0.05;*** p<0.01

[1] “Selected Factors: Mkt-RF , RMW, CMA, PC5”

Stepwise Selection - High Return

The table below contains the following regression information for the following stepwise selections:

1. Backward AIC
2. Backward BIC
3. Forward AIC
4. Forward BIC

[1] “R^2 for Full Model: 0.739” [1] “Adjusted R^2 for Full Model: 0.735”

	Dependent variable:			
	R3-RF			
	(1)	(2)	(3)	(4)
EG	-0.134**		-0.162***	
	(0.055)		(0.055)	
HML	-0.141***	-0.112***	-0.082*	
	(0.044)	(0.043)	(0.049)	
IA	0.186***	0.192***	0.127**	
	(0.057)	(0.057)	(0.057)	

ME	0.150***	0.167***		
	(0.034)	(0.033)		
MOM	0.089***	0.081***		
	(0.025)	(0.025)		
Mkt-RF	0.762***	0.769***	0.840***	0.744***
	(0.021)	(0.021)	(0.039)	(0.018)
PC3			-0.169***	-0.209***
			(0.035)	(0.033)
RMW	0.277***	0.213***	0.309***	
	(0.051)	(0.044)	(0.065)	
PC5			0.210**	
			(0.087)	
Constant	0.375***	0.361***	0.369***	0.388***
	(0.039)	(0.039)	(0.041)	(0.039)
Observations	668	668	668	668
R^2	0.738	0.736	0.739	0.727
Adjusted R^2	0.735	0.734	0.736	0.726
Residual Std. Error	0.987 (df = 660)	0.990 (df = 661)	0.986 (df = 660)	1.004 (df = 665)
F Statistic	265.956*** (df = 7; 660)	307.077*** (df = 6; 661)	266.588*** (df = 7; 660)	884.675*** (df = 2; 665)
Note:				*p<0.1;* ***p<0.05;*** p<0.01

[1] "Selected Factors: Mkt-RF , PC3"

Depression Stage

Stepwise Selection - Low Return

The table below contains the following regression information for the following stepwise selections:

1. Backward AIC
2. Backward BIC
3. Forward AIC
4. Forward BIC

[1] "R^2 for Full Model: 0.909" [1] "Adjusted R^2 for Full Model: 0.905"

	Dependent variable:			
	R1-RF			
	(1)	(2)	(3)	(4)

CMA	0.243***	0.229***		
	(0.073)	(0.073)		
EG	-0.292***	-0.281***	-0.330***	-0.307***
	(0.079)	(0.079)	(0.083)	(0.083)
MOM	-0.102***	-0.075***		
	(0.031)	(0.028)		
PC5			0.351***	0.314***
			(0.097)	(0.095)
`Mkt-RF`	0.926***	0.914***	0.957***	0.930***
	(0.026)	(0.025)	(0.027)	(0.024)
ME			-0.396*	-0.215
			(0.209)	(0.186)
RMW	0.266***	0.356***	0.221**	0.338***
	(0.086)	(0.071)	(0.097)	(0.074)
ROE	0.169*		0.171*	
	(0.090)		(0.092)	
SMB	0.468***	0.458***	0.748***	0.585***
	(0.050)	(0.050)	(0.187)	(0.165)
PC2			0.227***	0.176**
			(0.075)	(0.071)
Constant	0.147**	0.159**	0.186***	0.183**
	(0.071)	(0.071)	(0.072)	(0.072)
Observations	287	287	287	287
R^2	0.907	0.906	0.908	0.907
Adjusted R^2	0.905	0.904	0.906	0.905
Residual Std. Error	1.153 (df = 279)	1.158 (df = 280)	1.149 (df = 278)	1.154 (df = 279)
F Statistic	389.798*** (df = 7; 279)	450.185*** (df = 6; 280)	343.824*** (df = 8; 278)	389.078*** (df = 7; 279)
Note:				*p<0.1;* ***p<0.05;*** p<0.01

[1] "Selected Factors: CMA, EG, MOM, `Mkt-RF`, RMW, SMB"

Stepwise Selection - Medium Return

The table below contains the following regression information for the following stepwise selections:

1. Backward AIC
2. Backward BIC
3. Forward AIC

4. Forward BIC

[1] “R^2 for Full Model: 0.892” [1] “Adjusted R^2 for Full Model: 0.887”

	Dependent variable:			
	R2−RF			
	(1)	(2)	(3)	(4)
CMA	0.119			
	(0.082)			
EG	-0.301***	-0.335***	-0.390***	-0.329***
	(0.088)	(0.085)	(0.090)	(0.087)
LIQ	0.067*			
	(0.037)			
Mkt−RF	0.900***	0.901***	0.932***	0.899***
	(0.030)	(0.024)	(0.029)	(0.025)
ME			-0.103	0.051
			(0.174)	(0.163)
RMW	0.310***	0.450***	0.369***	0.444***
	(0.092)	(0.064)	(0.083)	(0.067)
ROE	0.147*		0.181*	
	(0.087)		(0.093)	
PC5			0.194*	
			(0.104)	
SMB	0.476***	0.495***	0.606***	0.446***
	(0.057)	(0.053)	(0.176)	(0.164)
Constant	0.299***	0.320***	0.318***	0.318***
	(0.077)	(0.076)	(0.076)	(0.077)
Observations	287	287	287	287
R^2	0.891	0.888	0.891	0.888
Adjusted R^2	0.888	0.887	0.888	0.886
Residual Std. Error	1.238 (df = 279)	1.246 (df = 282)	1.239 (df = 279)	1.248 (df = 281)
F Statistic	326.060*** (df = 7; 279)	561.018*** (df = 4; 282)	325.089*** (df = 7; 279)	447.399*** (df = 5; 281)
Note:				*p<0.1;* ***p<0.05;*** p<0.01

[1] “Selected Factors: EG, Mkt−RF, RMW, SMB”

Stepwise Selection - High Return

The table below contains the following regression information for the following stepwise selections:

1. Backward AIC
2. Backward BIC
3. Forward AIC
4. Forward BIC

[1] “R^2 for Full Model: 0.88” [1] “Adjusted R^2 for Full Model: 0.875”

	Dependent variable:			
	R3−RF			
	(1)	(2)	(3)	(4)
EG	-0.349***	-0.349***	-0.515***	-0.515***
	(0.096)	(0.096)	(0.101)	(0.101)
LIQ	0.099***	0.099***		
	(0.038)	(0.038)		
CMA			0.318***	0.318***
			(0.082)	(0.082)
Mkt−RF	0.898***	0.898***	0.785***	0.785***
	(0.033)	(0.033)	(0.034)	(0.034)
RMW	0.323***	0.323***		
	(0.090)	(0.090)		
ROE	0.236**	0.236**		
	(0.094)	(0.094)		
ME			-0.027	-0.027
			(0.188)	(0.188)
PC4			-0.840***	-0.840***
			(0.123)	(0.123)
SMB	0.504***	0.504***	0.585***	0.585***
	(0.061)	(0.061)	(0.188)	(0.188)
Constant	0.430***	0.430***	0.594***	0.594***
	(0.083)	(0.083)	(0.084)	(0.084)
Observations	287	287	287	287
R^2	0.879	0.879	0.879	0.879
Adjusted R^2	0.877	0.877	0.877	0.877
Residual Std. Error (df = 280)	1.347	1.347	1.347	1.347
F Statistic (df = 6; 280)	340.484***	340.484***	340.379***	340.379***
Note:				*p<0.1; **p<0.05;** p<0.01

[1] “Selected Factors: EG, LIQ, Mkt−RF , RMW, ROE, SMB”

Final Factors

Note: I simply took the union of the selected factors for each return level. While this works fine for *Recovery* and *Expansion*, we will probably have to handpick the factors for *Downturn* and *Depression*.

Recovery

	Dependent variable:		
	R1−RF	R2−RF	R3−RF
	(1)	(2)	(3)
CMA	0.238***	0.221***	0.204***
	(0.054)	(0.061)	(0.074)
LIQ	-0.156***	-0.131***	-0.103***
	(0.023)	(0.026)	(0.032)
ME	0.140***	0.154***	0.176***
	(0.040)	(0.045)	(0.055)
Mkt−RF	0.571***	0.593***	0.624***
	(0.027)	(0.031)	(0.038)
Constant	0.222***	0.467***	0.687***
	(0.050)	(0.057)	(0.069)
Observations	175	175	175
R^2	0.762	0.742	0.700
Adjusted R^2	0.757	0.736	0.693
Residual Std. Error (df = 170)	0.634	0.716	0.872
F Statistic (df = 4; 170)	136.193***	122.546***	99.101***
Note:			*p<0.1;* ***p<0.05;*** p<0.01

Expansion

	Dependent variable:		
	R1−RF	R2−RF	R3−RF
	(1)	(2)	(3)
HML	0.313***	0.314***	0.319***
	(0.027)	(0.030)	(0.036)
MOM	-0.094***	-0.049**	-0.011
	(0.020)	(0.022)	(0.026)
Mkt−RF	0.818***	0.856***	0.906***
	(0.020)	(0.022)	(0.026)

RMW	0.317***	0.341***	0.353***
	(0.035)	(0.038)	(0.046)
SMB	0.362***	0.385***	0.413***
	(0.029)	(0.032)	(0.039)
LIQ	-0.035*	0.051**	0.160***
	(0.019)	(0.021)	(0.025)
EG	0.077*	0.131**	0.191***
	(0.046)	(0.051)	(0.061)
Constant	0.054*	0.192***	0.314***
	(0.032)	(0.035)	(0.042)
Observations	598	598	598
R^2	0.780	0.778	0.762
Adjusted R^2	0.778	0.776	0.759
Residual Std. Error (df = 590)	0.719	0.798	0.956
F Statistic (df = 7; 590)	299.121***	296.200***	270.080***
Note:			*p<0.1;* ***p<0.05;*** p<0.01

Downturn

	Dependent variable:		
	R1−RF	R2−RF	R3−RF
	(1)	(2)	(3)
CRD	-0.086***	-0.051*	-0.004
	(0.027)	(0.029)	(0.033)
HML	-0.119***	-0.071	-0.034
	(0.044)	(0.048)	(0.054)
IA	0.170*	0.191**	0.253**
	(0.088)	(0.095)	(0.107)
LIQ	-0.064**	-0.029	0.026
	(0.029)	(0.031)	(0.035)
Mkt−RF	0.659***	0.759***	0.872***
	(0.036)	(0.039)	(0.044)
RMW	0.231***	0.311***	0.324***
	(0.074)	(0.080)	(0.090)
SMB	0.155***	0.087*	0.059
	(0.044)	(0.048)	(0.054)
CMA	0.093	0.036	-0.116
	(0.092)	(0.100)	(0.112)

PC5	-0.014	0.162	0.292**
	(0.101)	(0.109)	(0.123)
PC3	0.053	-0.020	-0.109**
	(0.043)	(0.047)	(0.053)
Constant	0.096***	0.220***	0.347***
	(0.034)	(0.037)	(0.042)
Observations	668	668	668
R^2	0.723	0.720	0.737
Adjusted R^2	0.718	0.716	0.733
Residual Std. Error (df = 657)	0.813	0.884	0.992
F Statistic (df = 10; 657)	171.206***	168.830***	184.092***
Note:			*p<0.1;* ***p<0.05;*** p<0.01

Depression

	Dependent variable:		
	R1−RF	R2−RF	R3−RF
	(1)	(2)	(3)
CMA	0.267***	0.125	0.012
	(0.076)	(0.082)	(0.089)
EG	-0.265***	-0.308***	-0.351***
	(0.082)	(0.089)	(0.097)
MOM	-0.088***	-0.036	-0.013
	(0.034)	(0.036)	(0.039)
Mkt−RF	0.914***	0.899***	0.898***
	(0.028)	(0.030)	(0.033)
RMW	0.259***	0.304***	0.316***
	(0.086)	(0.092)	(0.101)
SMB	0.450***	0.475***	0.503***
	(0.053)	(0.057)	(0.062)
LIQ	0.041	0.054	0.096**
	(0.036)	(0.039)	(0.043)
ROE	0.152*	0.192*	0.253**
	(0.091)	(0.098)	(0.107)
Constant	0.139*	0.298***	0.429***
	(0.071)	(0.077)	(0.084)
Observations	287	287	287
R^2	0.908	0.891	0.880

Adjusted R^2	0.905	0.888	0.876
Residual Std. Error (df = 278)	1.152	1.238	1.351
F Statistic (df = 8; 278)	341.601***	285.390***	253.669***
Note:			*p<0.1;* ***p<0.05;*** p<0.01