



**Financial
Management**



Investor Sentiment and Return Predictability Of the Option to Stock Volume Ratio

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Introduction	Variables and Summary Statistic	Empirical Analysis	Additional Analysis	Concluding Remarks
<div> <div>A</div> <div>Investor sentiment & O/S-return</div> <div>Investigate the effect of investor sentiment on the return predictive power of the option to stock volume ratio (O/S).</div> </div> <div> <div>B</div> <div>BW Investor Sentiment Index & other consumer sentiment indices</div> <div>Concentrate on the aspects of Baker and Wurgler's (2006) (BW hereafter) Investor Sentiment Index that differentiate it from other consumer sentiment indices.</div> </div>				

Introduction	Variables and Summary Statistic	Empirical Analysis	Additional Analysis	Concluding Remarks
<div> <div>  <div> Short sale constraints <ul style="list-style-type: none"> Affect predictive power of O/S Has an important impact on efficient investments in the option market Makes options attractive </div> </div> <div>  <div> O/S <ul style="list-style-type: none"> Negatively related to future stock returns when facing short sale constraints Predictability increase when irrational demand in stocks. Informed trading in the option market making O/S informative </div> </div> </div> <div> <div>  <div> High sentiment period <ul style="list-style-type: none"> O/S has stronger relation with future stock returns than low sentiment period + Short sale constraints → trade option </div> </div> <div>  <div> Consumer sentiment <ul style="list-style-type: none"> Alternative measure of investor sentiment Survey-based that involves US households May not have a direct connection with Investor Sentiment </div> </div> </div>				

Introduction	Variables and Summary Statistic	Empirical Analysis	Additional Analysis	Concluding Remarks
<div> Johnson and So (2012) <ul style="list-style-type: none"> Focus on the effect of short sale constraints on the predictive power of O/S Use a firm-specific measure of short sale constraints <ul style="list-style-type: none"> → Residual institutional ownership (RI): indirect measure of short sale constraints </div> <div> JS Kim, DH Kim, and SW Seo (2017) <ul style="list-style-type: none"> Investigates the effect of investor sentiment that reflects irrational demand and short sale constraints <ul style="list-style-type: none"> → Expect that the predictive power of O/S increase with irrational demand and short sale constraints Also contains information on short sale constraints <ul style="list-style-type: none"> → BW Investor Sentiment Index </div>				

Introduction	Variables and Summary Statistic	Empirical Analysis	Additional Analysis	Concluding Remarks
<div> A Investor sentiment & O/S-return The return predictive power of the O/S is primarily driven by results derived during high investor sentiment periods. </div> <div> B BW Investor Sentiment Index & other consumer sentiment indices The effect of the BW Investor Sentiment Index to be stronger than those of consumer sentiment indices. </div>				

Introduction	Variables and Summary Statistic	Empirical Analysis	Additional Analysis	Concluding Remarks
<p>A. Investor and Consumer Sentiment Measures</p> <div> <div> <p>Investor Sentiment Index of BW</p> <ul style="list-style-type: none"> Studies suggest various mispricing measures including trading volume, the premium for dividend paying stocks, the closed-end fund discount, the number of initial public offerings (IPOs), the mean first day IPO return, the equity share in new issues BW adopt a principal component methodology to extract common variation among the six variables Macroeconomic factors have noticeable impacts on investor sentiment suggesting that the result of raw investor sentiment are consistent with those of the residuals from the regression of such factor </div> <div> <p>Consumer Sentiment Indices</p> <ul style="list-style-type: none"> MCSI & CB Survey-based methodology among US households The use of MCSI predates that of the CB Index Lemmon and Portniaguina (2006) use CB Index as a measure of investor sentiment MSCI captures changes in consumer sentiment sooner than the CB Index does </div> </div>				

Introduction	Variables and Summary Statistic	Empirical Analysis	Additional Analysis	Concluding Remarks
<p>B. The Option to Stock Volume Ratio</p> <div> <div>  <p>Definition:</p> $O/S_{i,w} = \frac{OPVOL_{i,w}}{STVOL_{i,w}}$ </div> <div>  <p>Parameter</p> <ul style="list-style-type: none"> $OPVOL_{i,w}$: weekly sum of the total number of contracts traded across all options listed for stock i $STVOL_{i,w}$: weekly sum of the total stock volume in units of 100 to make it more comparable with the quantity of stocks handled by option contracts as each option pertains to 100 shares of stock </div> </div> <div>  <p>Note :</p> <ul style="list-style-type: none"> Data sources: <ul style="list-style-type: none"> Option : OptionMetrics Stock : CRSP Filter : <ul style="list-style-type: none"> Options that expires between 5~30 days Firm-week at least 25 call and 25 put contracts Eliminate closed-end funds, real estate investment trusts, American depository receipts, and firms whose stock price are lower than \$1 </div>				

Introduction	Variables and Summary Statistic		Empirical Analysis	Additional Analysis		Concluding Remarks	
C. Summary Statistics and Correlations							
Panel A. Sample Characteristics and O/S Descriptive Statistics by Year							
Year	Firms	Firm-Weeks	Mean (%)	P25	P50	P75	Skew
1996	1,405	23,352	5.421	1.585	3.176	6.261	4.459
1997	1,709	28,470	5.273	1.552	3.081	6.266	4.378
1998	1,910	31,527	4.614	1.362	2.746	5.586	4.480
1999	1,960	35,019	4.569	1.378	2.903	5.874	4.518
2000	2,023	43,496	4.172	1.394	2.811	5.328	4.324
2001	1,782	36,983	3.600	1.063	2.174	4.333	5.735
2002	1,667	34,209	3.446	0.959	2.077	4.307	4.665
2003	1,587	34,083	4.176	1.040	2.311	5.046	6.991
2004	1,775	39,993	4.991	1.215	2.739	6.141	4.421
2005	1,819	42,932	5.576	1.207	2.846	6.530	6.027
2006	1,962	50,771	5.985	1.330	3.198	7.246	5.984
2007	2,086	55,602	5.937	1.262	3.052	6.939	5.640
2008	1,966	53,057	5.145	1.056	2.570	5.967	5.436
2009	1,800	47,141	5.596	1.195	2.864	6.496	5.484
2010	1,848	47,781	6.105	1.201	2.954	6.869	5.743
2011	1,842	48,025	6.272	1.192	3.014	7.090	5.505
2012	1,704	42,877	6.641	1.222	3.134	7.390	6.010
2013	1,860	46,294	7.001	1.330	3.373	7.992	6.261
2014	1,947	49,793	6.406	1.240	3.110	7.451	6.137
ALL		791,405	5.312	1.252	2.849	6.269	5.377

Introduction	Variables and Summary Statistic		Empirical Analysis	Additional Analysis	Concluding Remarks
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C. Summary Statistics and Correlations

Panel B. Firm Characteristics by O/S Deciles							
	VLC	VLP	OPVOL	EQVOL	LSIZE	BM	MOMEN
1 (Low)	186	119	305	92,610	8.239	0.558	1.487
2	371	227	599	79,803	8.023	0.511	3.369
3	625	372	997	84,369	7.993	0.494	4.835
4	1,026	612	1,637	96,457	8.013	0.479	5.465
5	1,601	958	2,560	108,334	8.071	0.465	6.202
6	2,612	1,588	4,200	129,582	8.169	0.453	6.805
7	4,237	2,645	6,882	154,046	8.283	0.439	7.644
8	6,438	4,130	10,568	169,889	8.378	0.431	8.325
9	9,616	6,494	16,110	175,527	8.451	0.417	10.042
10 (High)	19,581	13,470	33,050	151,163	8.436	0.385	13.391
High-Low	19,395	13,351	32,746	58,553	0.198	-0.173	11.905

- VLC (VLP):**
Total call (put) options trading volume for the corresponding week in units of 100 share
- OPVOL :**
Total options trading volume = VLC + VLP
- EQVOL :**
Total equity trading volume in unit of 100 shares
- LSIZE :**
Measure of firm size judged by the log of the market capitalization at each firm's most recent quarterly earnings announcements in Compustat
- BM :**
Log of the book-to-market ratio
- EQVOL :**
The market-adjusted stock returns for the 6 previous month

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C. Summary Statistics and Correlations

Panel C. Summary Statistics for Baker and Wurgler's (2006) Investor Sentiment Index							
N	Mean	SD	Minimum	P25	P50	P75	Maximum
228	0.070	0.572	−0.902	−0.296	−0.018	0.231	2.497

Panel D. Sample Characteristics and O/S Descriptive Statistics during High and Low Sentiment Periods

Sentiment Period	Firms	Firm-Weeks	Mean	P25	P50	P75	Skew
High Sent.	4,656	375,724	4.840	1.283	2.767	5.822	4.942
Low Sent.	4,528	415,681	5.780	1.221	2.931	6.713	5.810

1 Investor sentiment has a negligible impact on the O/S

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C. Summary Statistics and Correlations

	BW_SENTI	MCSI	CB	CULMKT
MCSI	1 0.467*** (0.000)			
(p-value)				
CB	0.611*** (0.000)	0.877*** (0.000)		
(p-value)				
CULMKT	−0.172*** (0.009)	0.013 (0.840)	0.013 (0.840)	
(p-value)				
CFNAI	2 −0.140** (0.035)	0.104 (0.117)	0.129* (0.051)	0.732*** (0.000)
(p-value)				

***Significant at the 0.01 level.
**Significant at the 0.05 level.
*Significant at the 0.10 level.

- CULMKT :
The past market return over the 12 previous months
- CFNAI :
Weighted average of 85 indicators of economic activity and inflationary pressure used as a measure of real economic activities taken from the Federal Reserve Bank of Chicago

1 Investor sentiment has an economically significant relation with consumer sentiment.

2 Indicative of the difference between the information contained in the investor and consumer Sentiment indices.

Introduction	Variables and Summary Statistic	Empirical Analysis	Additional Analysis	Concluding Remarks
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A. Investor Sentiment and Profits in O/S Long-Short Strategy

$$r^P - r^f = \alpha + \beta_m(r_{mkt} - r^f) + \beta_{SMB}SMB + \beta_{HML}HML + \beta_{UMD}UMD + \varepsilon, \quad (2)$$

	Excess Return			CAPM			Three Factor			Four Factor		
	All	High	Low	All	High	Low	All	High	Low	All	High	Low
1 (Low)	0.316 (2.936)	0.280 (1.722)	0.353 (2.487)	0.081 (0.741)	-0.044 (-0.272)	0.235 (1.556)	0.026 (0.234)	-0.164 (-1.012)	0.267 (1.777)	0.067 (0.610)	-0.164 (-0.987)	0.288 (1.947)
2	0.282 (2.469)	0.225 (1.283)	0.339 (2.309)	0.035 (0.305)	-0.098 (-0.563)	0.193 (1.238)	-0.010 (-0.089)	-0.208 (-1.188)	0.216 (1.382)	0.019 (0.161)	-0.229 (-1.273)	0.234 (1.512)
3	0.292 (2.473)	0.224 (1.210)	0.359 (2.451)	0.044 (0.364)	-0.099 (-0.536)	0.228 (1.462)	-0.010 (-0.082)	-0.223 (-1.206)	0.259 (1.666)	0.012 (0.096)	-0.261 (-1.379)	0.276 (1.791)
4	0.243 (1.995)	0.132 (0.691)	0.353 (2.335)	-0.004 (-0.034)	-0.191 (-1.005)	0.215 (1.335)	-0.054 (-0.434)	-0.310 (-1.622)	0.250 (1.551)	-0.028 (-0.220)	-0.350 (-1.788)	0.269 (1.693)
5	0.229 (1.858)	0.084 (0.429)	0.374 (2.465)	-0.032 (-0.251)	-0.239 (-1.234)	0.205 (1.276)	-0.076 (-0.602)	-0.340 (-1.740)	0.229 (1.425)	-0.045 (-0.353)	-0.372 (-1.855)	0.249 (1.570)
6	0.144 (1.117)	-0.023 (-0.111)	0.311 (2.037)	-0.111 (-0.844)	-0.346 (-1.667)	0.176 (1.083)	-0.157 (-1.190)	-0.446 (-2.132)	0.202 (1.246)	-0.127 (-0.950)	-0.482 (-2.249)	0.222 (1.388)
7	0.205 (1.576)	0.080 (0.378)	0.329 (2.180)	-0.049 (-0.368)	-0.242 (-1.147)	0.196 (1.219)	-0.086 (-0.639)	-0.327 (-1.527)	0.217 (1.348)	-0.063 (-0.470)	-0.367 (-1.675)	0.234 (1.466)
8	0.159 (1.205)	0.013 (0.061)	0.304 (1.986)	-0.102 (-0.757)	-0.309 (-1.443)	0.158 (0.966)	-0.146 (-1.081)	-0.422 (-1.956)	0.189 (1.159)	-0.122 (-0.896)	-0.463 (-2.095)	0.207 (1.283)
9	0.167 (1.244)	0.054 (0.245)	0.280 (1.797)	-0.092 (-0.673)	-0.268 (-1.229)	0.135 (0.816)	-0.130 (-0.944)	-0.371 (-1.685)	0.156 (0.936)	-0.111 (-0.799)	-0.417 (-1.848)	0.172 (1.044)
10 (High)	0.105 (0.811)	-0.009 (-0.045)	0.218 (1.410)	-0.142 (-1.073)	-0.332 (-1.611)	0.096 (0.583)	-0.184 (-1.390)	-0.439 (-2.114)	0.118 (0.715)	-0.171 (-1.281)	-0.495 (-2.329)	0.133 (0.811)
1 - 10	0.212 (3.279)	0.289 (2.521)	0.135 (2.257)	0.223 (3.372)	0.288 (2.513)	0.139 (2.186)	0.210 (3.146)	0.276 (2.367)	0.149 (2.343)	0.239 (3.562)	0.332 (2.792)	0.155 (2.446)
(1 + 2) - (9 + 10)	0.163 (3.069)	0.230 (2.374)	0.097 (2.187)	0.175 (3.215)	0.175 (2.366)	0.229 (2.076)	0.098 (2.996)	0.219 (2.228)	0.105 (2.203)	0.185 (3.331)	0.260 (2.587)	0.108 (2.282)

Note :

- High O/S portfolios underperform low O/S portfolios, especially during high sentiment periods.
- Consistent with the results from Johnson and So (2012)

1 The return predictability of the O/S is **more significant during high investor sentiment periods** than low investor sentiment periods

2 The differences in the alphas of four-factor models among O/S portfolios during the whole sample period can be largely **attributed to those during high sentiment periods**

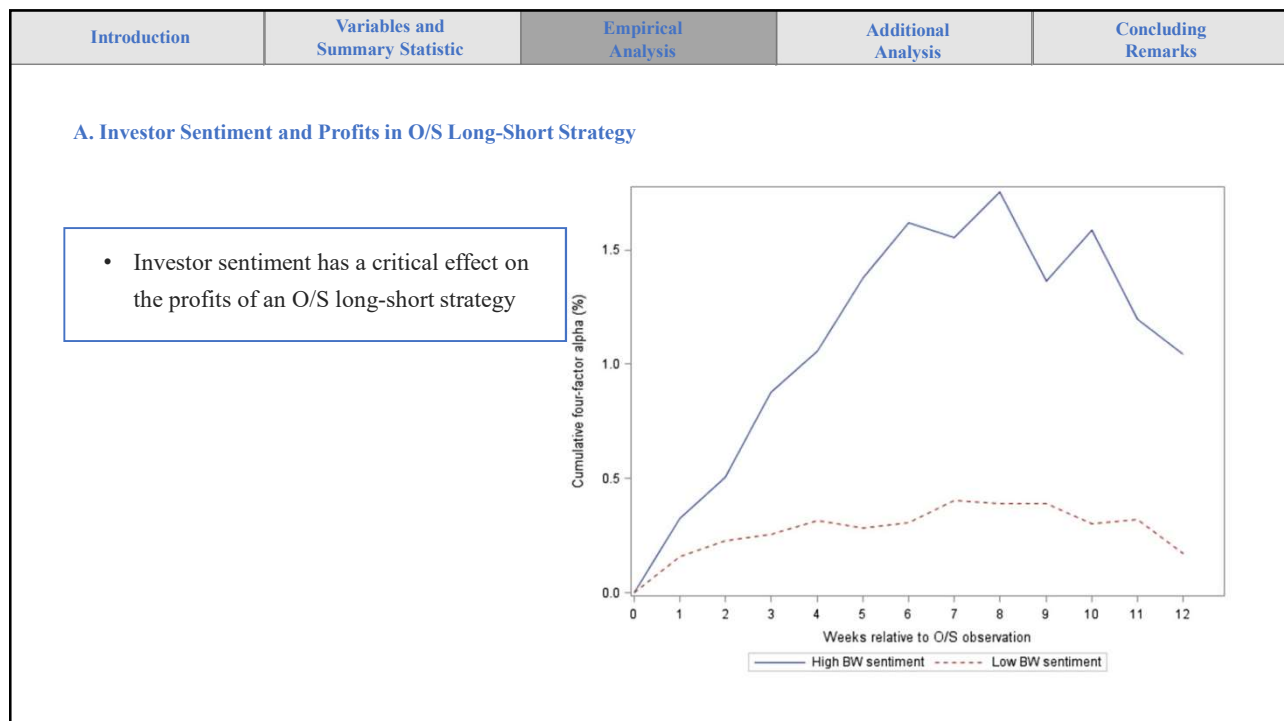
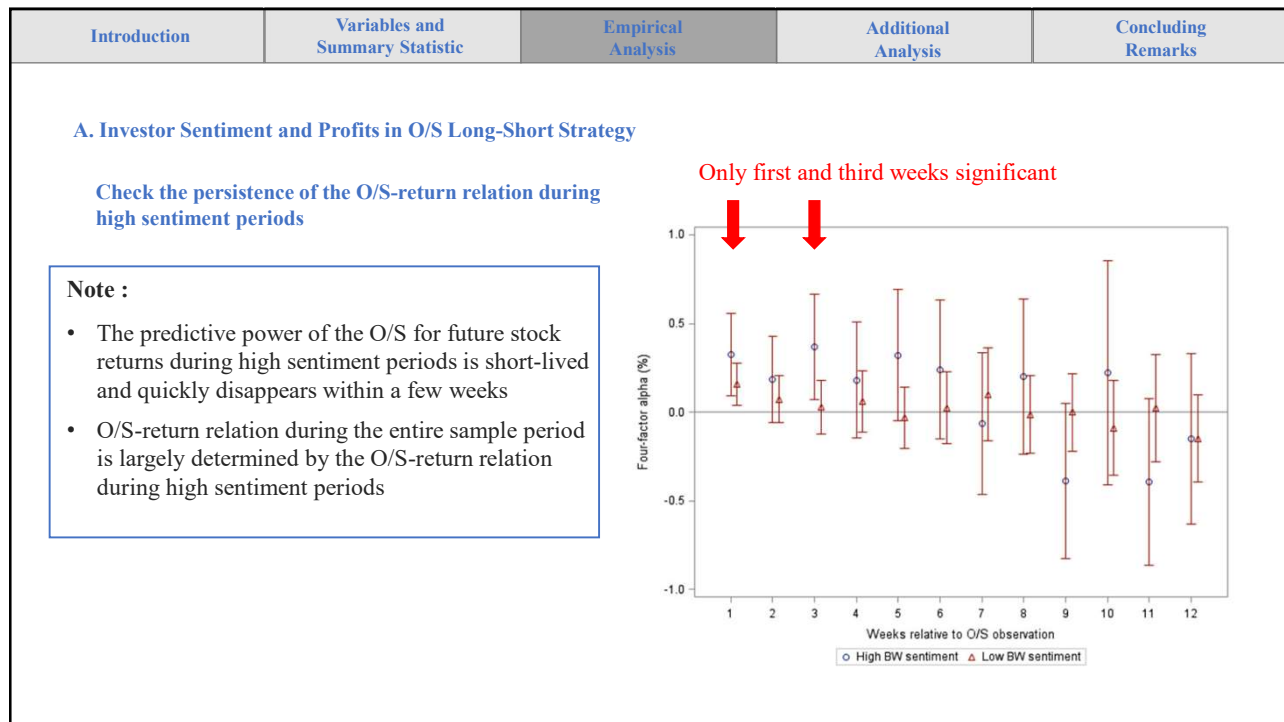
Introduction	Variables and Summary Statistic	Empirical Analysis	Additional Analysis	Concluding Remarks
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A. Investor Sentiment and Profits in O/S Long-Short Strategy

	Four Factor		
	All	High	Low
1 (Low)	0.067 (0.610)	-0.164 (-0.987)	0.288 (1.947)
2	0.019 (0.161)	-0.229 (-1.273)	0.234 (1.512)
3	0.012 (0.096)	-0.261 (-1.379)	0.276 (1.791)
4	-0.028 (-0.220)	-0.350 (-1.788)	0.269 (1.693)
5	-0.045 (-0.353)	-0.372 (-1.855)	0.249 (1.570)
6	-0.127 (-0.950)	-0.482 (-2.249)	0.222 (1.388)
7	-0.063 (-0.470)	-0.367 (-1.675)	0.234 (1.466)
8	-0.122 (-0.896)	-0.463 (-2.095)	0.207 (1.283)
9	-0.111 (-0.799)	-0.417 (-1.848)	0.172 (1.044)
10 (High)	-0.171 (-1.281)	-0.495 (-2.329)	0.133 (0.811)
1 - 10	0.239 (3.562)	0.332 (2.792)	0.155 (2.446)
(1 + 2) - (9 + 10)	0.185 (3.331)	0.260 (2.587)	0.108 (2.282)

Note :

- This O/S-return relation becomes pronounced during high sentiment periods as **short sale constraints** bind more strongly during these periods than during other
- The profits of **short-leg positions** generally drive the differences of a long-short strategy's profits based on the O/S between high sentiment and low sentiment periods
- During high sentiment periods, informed traders influence the profitability of short-legs more so than long legs



Introduction	Variables and Summary Statistic				Empirical Analysis		Additional Analysis		Concluding Remarks	
B. Does the BW Investor Sentiment Index Contain Unique Information										
Panel A. MCSI										
	Excess Return		CAPM		Three Factor		Four Factor			
	High	Low	High	Low	High	Low	High	Low		
1 (Low)	0.160 (1.053)	0.472 (3.089)	-0.142 (-0.937)	0.278 (1.771)	-0.203 (-1.333)	0.265 (1.679)	-0.200 (-1.276)	0.273 (1.754)		
2	0.126 (0.757)	0.438 (2.791)	-0.187 (-1.125)	0.239 (1.480)	-0.236 (-1.419)	0.231 (1.424)	-0.253 (-1.470)	0.238 (1.478)		
3	0.162 (0.930)	0.421 (2.643)	-0.144 (-0.823)	0.202 (1.234)	-0.197 (-1.126)	0.188 (1.143)	-0.239 (-1.323)	0.195 (1.193)		
4	0.055 (0.303)	0.430 (2.626)	-0.253 (-1.401)	0.220 (1.304)	-0.304 (-1.679)	0.207 (1.223)	-0.350 (-1.875)	0.216 (1.283)		
5	0.049 (0.261)	0.408 (2.539)	-0.266 (-1.418)	0.179 (1.089)	-0.304 (-1.608)	0.169 (1.017)	-0.338 (-1.733)	0.177 (1.079)		
6	-0.045 (-0.225)	0.332 (2.015)	-0.358 (-1.794)	0.112 (0.660)	-0.395 (-1.969)	0.101 (0.592)	-0.419 (-2.027)	0.109 (0.642)		
7	-0.006 (-0.029)	0.414 (2.488)	-0.324 (-1.617)	0.214 (1.240)	-0.361 (-1.787)	0.210 (1.209)	-0.399 (-1.912)	0.216 (1.253)		
8	-0.023 (-0.112)	0.340 (2.062)	-0.343 (-1.657)	0.120 (0.709)	-0.387 (-1.862)	0.116 (0.678)	-0.424 (-1.975)	0.123 (0.724)		
9	0.013 (0.061)	0.321 (1.893)	-0.313 (-1.495)	0.116 (0.661)	-0.355 (-1.680)	0.109 (0.617)	-0.400 (-1.836)	0.115 (0.658)		
10 (High)	-0.063 (-0.318)	0.271 (1.621)	-0.380 (-1.925)	0.081 (0.470)	-0.426 (-2.145)	0.077 (0.444)	-0.484 (-2.368)	0.083 (0.481)		
1 - 10	0.223 (1.936)	0.201 (3.383)	0.238 (2.067)	0.196 (3.169)	0.223 (1.913)	0.187 (3.011)	0.284 (2.372)	0.190 (3.066)		
(1 + 2) - (9 + 10)	0.168 (1.734)	0.159 (3.536)	0.182 (1.879)	0.160 (3.391)	0.171 (1.739)	0.155 (3.271)	0.216 (2.135)	0.156 (3.310)		

Note :

- During high consumer sentiment periods, the profits of an O/S long-short strategy are larger and more strongly significant than those during low consumer sentiment periods.
- Consistent with the empirical evidence in the literature that **uses consumer sentiment indices as alternative measures of investor sentiment**.

Note :

- During high consumer sentiment periods, the profits of an O/S long-short strategy are larger and more strongly significant than those during low consumer sentiment periods.
- Consistent with the empirical evidence in the literature that **uses consumer sentiment indices as alternative measures of investor sentiment**.

Introduction	Variables and Summary Statistic				Empirical Analysis		Additional Analysis		Concluding Remarks	
B. Does the BW Investor Sentiment Index Contain Unique Information										
Panel B. CB Index										
	Excess Return		CAPM		Three Factor		Four Factor			
	High	Low	High	Low	High	Low	High	Low		
1 (Low)	0.263 (1.794)	0.369 (2.338)	-0.097 (-0.659)	0.247 (1.500)	-0.166 (-1.139)	0.233 (1.397)	-0.135 (-0.905)	0.255 (1.540)		
2	0.245 (1.519)	0.320 (1.969)	-0.120 (-0.747)	0.184 (1.085)	-0.168 (-1.048)	0.179 (1.046)	-0.156 (-0.950)	0.198 (1.156)		
3	0.245 (1.437)	0.338 (2.074)	-0.116 (-0.676)	0.185 (1.089)	-0.171 (-1.002)	0.169 (0.982)	-0.184 (-1.051)	0.188 (1.097)		
4	0.160 (0.899)	0.326 (1.955)	-0.202 (-1.137)	0.181 (1.044)	-0.257 (-1.444)	0.165 (0.938)	-0.264 (-1.446)	0.186 (1.060)		
5	0.136 (0.738)	0.323 (1.959)	-0.230 (-1.252)	0.157 (0.918)	-0.265 (-1.431)	0.148 (0.858)	-0.264 (-1.395)	0.170 (0.989)		
6	0.033 (0.166)	0.256 (1.522)	-0.332 (-1.691)	0.099 (0.567)	-0.359 (-1.820)	0.094 (0.529)	-0.363 (-1.798)	0.116 (0.659)		
7	0.098 (0.492)	0.312 (1.856)	-0.270 (-1.358)	0.174 (0.991)	-0.312 (-1.554)	0.173 (0.971)	-0.315 (-1.533)	0.189 (1.063)		
8	0.070 (0.345)	0.248 (1.480)	-0.299 (-1.461)	0.092 (0.525)	-0.345 (-1.682)	0.087 (0.490)	-0.346 (-1.645)	0.104 (0.589)		
9	0.090 (0.434)	0.244 (1.433)	-0.283 (-1.361)	0.105 (0.592)	-0.329 (-1.570)	0.098 (0.546)	-0.346 (-1.616)	0.117 (0.651)		
10 (High)	-0.018 (-2.219)	0.227 (1.349)	-0.384 (-1.960)	0.101 (0.576)	-0.429 (-2.176)	0.093 (0.521)	-0.460 (-2.279)	0.109 (0.616)		
1 - 10	0.281 (2.420)	0.143 (2.515)	0.288 (2.479)	0.146 (2.453)	0.263 (2.233)	0.140 (2.328)	0.325 (2.713)	0.146 (2.430)		
(1 + 2) - (9 + 10)	0.217 (2.219)	0.109 (2.625)	0.225 (2.300)	0.112 (2.563)	0.212 (2.130)	0.111 (2.496)	0.258 (2.543)	0.113 (2.556)		

Note :

- the profits of an O/S long-short strategy with the MCSI and the CB Index during low consumer sentiment periods are larger and more strongly significant than those of the BW Investor Sentiment Index during low sentiment periods with the exception of the three-factor and four-factor models with the CB Index.

Larger than that of BW Investor Sentiment

Note :

- the profits of an O/S long-short strategy with the MCSI and the CB Index during low consumer sentiment periods are larger and more strongly significant than those of the BW Investor Sentiment Index during low sentiment periods with the exception of the three-factor and four-factor models with the CB Index.

Larger than that of BW Investor Sentiment

Introduction	Variables and Summary Statistic				Empirical Analysis				Additional Analysis		Concluding Remarks	
B. Does the BW Investor Sentiment Index Contain Unique Information												
Bottom 50% of the MCSI					Top 50% of the MCSI							
Excess Return		Four Factor		Excess Return		Four Factor						
	High	Low	High	Low	High	Low	High	Low				
1 (Low)	0.520 (1.995)	0.424 (2.485)	0.418 (1.432)	0.190 (1.204)	-0.068 (-0.310)	0.391 (1.888)	-0.518 (-2.235)	0.151 (0.697)				
2	0.448 (1.753)	0.428 (2.298)	0.350 (1.285)	0.189 (0.947)	-0.119 (-0.464)	0.374 (1.771)	-0.554 (-2.063)	0.039 (0.174)				
3	0.442 (1.699)	0.401 (2.131)	0.323 (1.175)	0.178 (0.878)	-0.105 (-0.392)	0.424 (1.925)	-0.590 (-2.091)	0.091 (0.396)				
4	0.448 (1.686)	0.413 (2.112)	0.338 (1.202)	0.199 (0.953)	-0.265 (-0.918)	0.338 (1.607)	-0.756 (-2.476)	-0.012 (-0.055)				
5	0.424 (1.650)	0.393 (1.997)	0.330 (1.221)	0.155 (0.736)	-0.270 (-0.913)	0.382 (1.673)	-0.725 (-2.315)	0.054 (0.225)				
6	0.335 (1.258)	0.329 (1.663)	0.254 (0.902)	0.121 (0.570)	-0.459 (-1.490)	0.361 (1.467)	-0.904 (-2.766)	0.067 (0.260)				
7	0.414 (1.522)	0.415 (2.108)	0.354 (1.217)	0.202 (0.949)	-0.465 (-1.472)	0.438 (1.823)	-0.923 (-2.748)	0.101 (0.397)				
8	0.267 (0.997)	0.410 (2.083)	0.193 (0.682)	0.189 (0.890)	-0.443 (-1.387)	0.394 (1.528)	-0.926 (-2.745)	0.113 (0.415)				
9	0.322 (1.152)	0.320 (1.624)	0.205 (0.686)	0.069 (0.324)	-0.449 (-1.404)	0.467 (1.755)	-0.934 (-2.758)	0.160 (0.570)				
10 (High)	0.250 (0.969)	0.291 (1.394)	0.140 (0.543)	0.024 (0.032)	-0.389 (-1.339)	0.252 (0.950)	-0.897 (-2.930)	-0.089 (-0.318)				
1 - 10	0.270 (2.772)	0.133 (1.012)	0.278 (2.388)	0.167 (1.514)	0.320 (1.797)	0.139 (0.955)	0.379 (2.012)	0.240 (1.543)				
(1 + 2) - (9 + 10)	0.198 (2.630)	0.121 (1.360)	0.211 (2.439)	0.143 (1.746)	0.326 (2.200)	0.024 (0.189)	0.379 (2.433)	0.059 (0.441)				

Note :

- MCSI **cannot weaken** the effect of the BW Investor Sentiment Index on the profitability of an O/S long-short strategy. The profits of an O/S long-short strategy during high and low MCSI periods still vary with the BW Investor Sentiment Index.

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B. Does the BW Investor Sentiment Index Contain Unique Information

Bottom 50% of the CB Index

Top 50% of the CB Index

Excess Return

Four Factor

Excess Return

Four Factor

High

Low

High

Low

High

Low

High

Low

1 (Low)

2

3

4

5

6

7

8

9

10 (High)

1 – 10

(1 + 2) – (9 + 10)

0.338

0.400

0.198

0.327

0.086

0.438

−0.506

0.253

(1.330)

(2.114)

(0.744)

(1.596)

(0.395)

(2.228)

(−2.198)

(1.279)

0.238

0.400

0.123

0.304

0.084

0.404

−0.484

0.135

(0.920)

(2.020)

(0.450)

(1.419)

(0.330)

(2.029)

(−1.795)

(0.661)

0.269

0.406

0.141

0.318

0.060

0.417

−0.568

0.147

(1.035)

(2.047)

(0.516)

(1.479)

(0.224)

(1.995)

(−1.979)

(0.686)

0.290

0.361

0.161

0.279

−0.117

0.392

−0.735

0.146

(1.087)

(1.795)

(0.575)

(1.281)

(−0.404)

(1.919)

(−2.372)

(0.704)

0.266

0.378

0.151

0.296

−0.121

0.398

−0.684

0.129

(1.029)

(1.843)

(0.559)

(1.336)

(−0.408)

(1.810)

(−2.148)

(0.574)

0.186

0.324

0.089

0.264

−0.320

0.366

−0.897

0.116

(0.700)

(1.566)

(0.320)

(1.183)

(−1.029)

(1.544)

(−2.684)

(0.483)

0.253

0.370

0.167

0.291

−0.315

0.483

−0.898

0.221

(0.930)

(1.854)

(0.581)

(1.342)

(−0.988)

(2.044)

(−2.614)

(0.912)

0.107

0.386

0.008

0.315

−0.293

0.419

−0.902

0.199

(0.399)

(1.916)

(0.030)

(1.438)

(−0.911)

(1.660)

(−2.624)

(0.770)

0.206

0.282

0.077

0.200

−0.343

0.504

−0.957

0.244

(0.741)

(1.416)

(0.264)

(0.927)

(−1.063)

(1.918)

(−2.764)

(0.904)

0.141

0.311

0.008

0.214

−0.276

0.220

−0.902

−0.075

(0.523)

(1.539)

(0.027)

(0.973)

(−0.943)

(0.839)

(−2.883)

(−0.278)

0.197

0.089

0.191

0.113

0.361

0.219

0.396

0.328

(2.329)

(1.177)

(2.122)

(1.368)

(2.004)

(1.475)

(2.035)

(1.142)

0.114

0.104

0.118

0.109

0.394

0.059

0.434

0.109

(1.680)

(1.153)

(1.629)

(1.067)

(2.637)

(0.464)

(2.702)

(0.818)

Note :

Overall, the BW Investor Sentiment Index has a significant influence on the profitability of an O/S long-short strategy after considering the MCSI and the CB Index

Introduction	Variables and Summary Statistic	Empirical Analysis	Additional Analysis	Concluding Remarks
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B. Does the BW Investor Sentiment Index Contain Unique Information

$$R_{p,t} - \hat{\beta}_p F_t = \gamma_0 + \gamma_1 BW_SENTI_{t-1} + \gamma_2 CON_SENTI_{t-1} + \varepsilon_t,$$

	Raw Spread Return				Four-Factor Risk-Adjusted Spread Return			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Intercept	0.002*** (2.867)	0.002*** (2.911)	0.002*** (2.827)	0.002*** (2.781)	0.002*** (3.342)	0.002*** (3.367)	0.002*** (3.311)	0.002*** (3.234)
BW_SENTI	0.003** (2.527)	0.004*** (2.700)	0.004*** (2.928)	0.004*** (2.470)	0.002** (2.159)	0.003** (2.141)	0.003** (2.431)	0.003* (1.919)
CB		-4.3×10^{-5} (-1.144)		1.5×10^{-5} (0.211)		-2.6×10^{-5} (-0.705)		3.2×10^{-5} (0.451)
MCSI			-1.0×10^{-4} (-1.484)	-1.2×10^{-4} (-0.968)			-7.4×10^{-5} (-1.117)	-1.2×10^{-4} (-0.976)
Adj. R ² (%)	0.656	0.790	0.882	0.887	0.480	0.531	0.608	0.629

Note :

- The coefficient estimates for BW_SENTI are always **positive** and significant supporting our hypothesis that O/S return predictability becomes strong during high investor sentiment periods.
- Tables V to VII present empirical evidence that confirms the **superior informativeness of the BW Investor Sentiment Index** with regard to the predictive power of O/S compared to the consumer sentiment indices.

Introduction	Variables and Summary Statistic	Empirical Analysis	Additional Analysis	Concluding Remarks
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	UP Market State				DOWN Market State			
	Excess Return High	Four Factor Low	Excess Return High	Four Factor Low	High	Low	High	Low
1 (Low)	0.412 (2.567)	0.295 (2.119)	-0.019 (-0.115)	0.248 (1.651)	-0.274 (-0.624)	0.655 (1.598)	-0.623 (-1.252)	0.231 (0.533)
2	0.351 (1.956)	0.287 (1.917)	-0.105 (-0.555)	0.190 (1.178)	-0.356 (-0.793)	0.675 (1.653)	-0.781 (-1.517)	0.314 (0.718)
3	0.359 (1.893)	0.348 (2.331)	-0.121 (-0.602)	0.284 (1.768)	-0.376 (-0.797)	0.529 (1.293)	-0.820 (-1.530)	0.136 (0.312)
4	0.301 (1.520)	0.298 (1.925)	-0.155 (-0.740)	0.227 (1.360)	-0.638 (-1.338)	0.659 (1.589)	-1.110 (-2.051)	0.205 (0.466)
5	0.268 (1.293)	0.284 (1.859)	-0.171 (-0.778)	0.177 (1.079)	-0.627 (-1.339)	0.789 (1.862)	-0.896 (-1.668)	0.373 (0.827)
6	0.158 (0.716)	0.265 (1.793)	-0.297 (-1.272)	0.204 (1.216)	-0.813 (-1.641)	0.618 (1.453)	-1.178 (-2.065)	0.248 (0.556)
7	0.256 (1.143)	0.267 (1.751)	-0.217 (-0.916)	0.174 (1.055)	-0.710 (-1.373)	0.687 (1.626)	-1.074 (-1.783)	0.348 (0.763)
8	0.234 (1.012)	0.242 (1.540)	-0.258 (-1.054)	0.159 (0.937)	-0.900 (-1.791)	0.668 (1.590)	-1.293 (-2.249)	0.245 (0.546)
9	0.213 (0.897)	0.227 (1.396)	-0.315 (-1.252)	0.125 (0.709)	-0.684 (-1.348)	0.622 (1.508)	-1.046 (-1.781)	0.295 (0.664)
10 (High)	0.097 (0.428)	0.169 (1.018)	-0.408 (-1.710)	0.067 (0.373)	-0.549 (-1.167)	0.526 (1.353)	-0.883 (-1.632)	0.181 (0.430)
1 - 10	0.315 (2.224)	0.126 (1.844)	0.389 (2.605)	0.181 (2.482)	0.275 (1.730)	0.129 (1.013)	0.260 (1.370)	0.050 (0.356)
(1 + 2) - (9 + 10)	0.226 (1.902)	0.093 (1.803)	0.299 (2.386)	0.123 (2.237)	0.301 (2.119)	0.091 (1.034)	0.263 (1.541)	0.035 (0.353)

UP market state

- cumulative returns of the CRSP value-weighted index that includes dividends for the months $t - k$ to $t - 1$ are nonnegative

The return predictive power of the O/S becomes **strong** during high sentiment periods compared to those during low sentiment periods after controlling for economic state variables

Introduction	Variables and Summary Statistic				Empirical Analysis		Additional Analysis		Concluding Remarks	
Economic Contraction					Economic Expansion					
Excess Return		Four Factor		Excess Return		Four Factor				
High Low		High Low		High Low		High Low				
1 (Low)	-0.116 (-0.482)	0.574 (2.311)	-0.628 (-2.395)	0.398 (1.531)	0.706 (3.364)	0.109 (0.736)	0.435 (1.802)	0.096 (0.570)		
2	-0.221 (-0.856)	0.572 (2.273)	-0.781 (-2.750)	0.372 (1.404)	0.693 (3.007)	0.094 (0.584)	0.272 (1.020)	-0.015 (-0.080)		
3	-0.222 (-0.813)	0.554 (2.190)	-0.795 (-2.658)	0.392 (1.472)	0.680 (2.824)	0.153 (0.951)	0.265 (0.948)	0.079 (0.431)		
4	-0.352 (-1.263)	0.564 (2.181)	-0.917 (-3.000)	0.374 (1.379)	0.609 (2.416)	0.118 (0.699)	0.199 (0.679)	0.047 (0.243)		
5	-0.405 (-1.463)	0.612 (2.355)	-0.886 (-2.898)	0.388 (1.427)	0.583 (2.186)	0.143 (0.845)	0.168 (0.540)	0.011 (0.060)		
6	-0.523 (-1.739)	0.526 (2.014)	-1.022 (-3.067)	0.329 (1.206)	0.510 (1.830)	0.055 (0.324)	0.143 (0.446)	-0.023 (-0.116)		
7	-0.449 (-1.480)	0.560 (2.175)	-0.973 (-2.886)	0.393 (1.447)	0.611 (2.119)	0.081 (0.475)	0.153 (0.455)	-0.045 (-0.232)		
8	-0.549 (-1.815)	0.528 (2.033)	-1.094 (-3.277)	0.330 (1.208)	0.605 (2.025)	0.049 (0.284)	0.110 (0.317)	-0.044 (-0.222)		
9	-0.513 (-1.675)	0.468 (1.821)	-1.048 (-3.089)	0.298 (1.099)	0.609 (1.983)	0.092 (0.497)	0.051 (0.143)	-0.057 (-0.270)		
10 (High)	-0.418 (-1.464)	0.420 (1.650)	-0.941 (-2.984)	0.264 (0.979)	0.417 (1.419)	-0.011 (-0.062)	-0.101 (-0.297)	-0.108 (-0.514)		
1 - 10	0.302 (2.597)	0.154 (1.856)	0.313 (2.396)	0.133 (1.517)	0.288 (1.463)	0.121 (1.367)	0.537 (2.376)	0.204 (2.046)		
(1 + 2) - (9 + 10)	0.297 (2.837)	0.129 (2.182)	0.290 (2.464)	0.104 (1.644)	0.186 (1.144)	0.061 (0.915)	0.379 (2.014)	0.123 (1.625)		

Economic contraction

- Negative values of CFNAI

Economic Expansion

- Nonnegative values of CFNAI

The difference between the O/S profits in high and low sentiment periods cannot be explained by economic condition.

Introduction	Variables and Summary Statistic				Empirical Analysis	Additional Analysis		Concluding Remarks		
Panel A. 12-Month Cumulative Returns of the Value-Weighted Index										
	Raw Spread Return					Four-Factor Risk-Adjusted Spread Return				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Intercept	0.002** (2.338)	0.002* (1.870)	0.002* (1.821)	0.002 (1.641)	0.002 (1.589)	0.002** (2.389)	0.002** (2.272)	0.002** (2.235)	0.002** (2.090)	0.002** (2.029)
BW_SENTI	0.003** (2.530)	0.003** (2.530)	0.004*** (2.725)	0.004*** (2.963)	0.004** (2.492)	0.003** (2.288)	0.003** (2.246)	0.003** (2.292)	0.003** (2.529)	0.003** (2.098)
12-month	0.001	0.001	0.001	0.001	0.001	0.003	0.004	0.004	0.004	0.004
CULMKT	(0.243)	(0.195)	(0.364)	(0.286)	(0.241)	(0.942)	(1.060)	(1.172)	(1.128)	(1.064)
12-month		0.001	0.002	0.004	0.005		-0.007	-0.007	-0.005	-0.004
CULMKT ²		(0.111)	(0.116)	(0.311)	(0.350)		(-0.528)	(-0.524)	(-0.373)	(-0.314)
CB			-4.5 × 10 ⁻⁵ (-1.194)		1.7 × 10 ⁻⁵ (0.230)			-3.2 × 10 ⁻⁵ (-0.857)		1.8 × 10 ⁻⁵ (0.256)
MCSI				-1.1 × 10 ⁻⁴ (-1.544)	-1.3 × 10 ⁻⁴ (-1.005)				-7.9 × 10 ⁻⁵ (-1.164)	-1.1 × 10 ⁻⁴ (-0.827)
Adj. R ² (%)	0.662	0.663	0.810	0.909	0.914	0.571	0.600	0.676	0.739	0.746

Introduction	Variables and Summary Statistic		Empirical Analysis	Additional Analysis	Concluding Remarks
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Panel B. CFNAI										
	Raw Spread Return					Four-Factor Risk-Adjusted Spread Return				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Intercept	0.002*** (2.689)	0.002*** (2.581)	0.002*** (2.626)	0.002** (2.506)	0.002** (2.464)	0.002*** (3.331)	0.002*** (3.200)	0.002*** (3.234)	0.002*** (3.135)	0.002*** (3.082)
BW_SENTI	0.003** (2.531)	0.003** (2.507)	0.004*** (2.615)	0.004*** (2.904)	0.004** (2.468)	0.003** (2.313)	0.003** (2.301)	0.004** (2.311)	0.004*** (2.596)	0.004** (2.181)
CFNAI	-1.2×10^{-4} (-0.141)	1.4×10^{-4} (0.087)	0.001 (0.542)	0.001 (0.650)	0.001 (0.626)	0.001 (0.800)	0.001 (0.597)	0.002 (0.918)	0.002 (1.025)	0.002 (0.990)
CFNAF		1.1×10^{-4} (0.186)	3.4×10^{-4} (0.537)	4.3×10^{-4} (0.675)	4.3×10^{-4} (0.667)		1.3×10^{-4} (0.218)	3.1×10^{-4} (0.497)	3.9×10^{-4} (0.621)	3.9×10^{-4} (0.611)
CB			-4.7×10^{-5} (-1.144)		7.7×10^{-6} (0.107)			-3.8×10^{-5} (-0.919)		1.0×10^{-5} (0.145)
MCSI				-1.1×10^{-4} (-1.471)	-1.2×10^{-4} (-0.930)				-9.0×10^{-5} (-1.223)	-1.0×10^{-4} (-0.819)
Adj. R^2 (%)	0.687	0.691	0.826	0.915	0.916	0.578	0.583	0.670	0.738	0.740

After considering market states and consumer sentiment indices, the BW Investor Sentiment Index contains additional information that further explains the time series variation of the profits of an O/S long-short strategy.

Introduction	Variables and Summary Statistic	Empirical Analysis	Additional Analysis	Concluding Remarks
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O/S-return & investor sentiment				
O/S-return relation becomes stronger during high investor sentiment period due to higher short sale constraints and irrational demand				
Profitability last time				
The profitability of an O/S long-short strategy during high investor sentiment periods last for only three weeks				
Investor sentiment & consumer sentiment				
BW Investor sentiment index has its own unique impact on future stock return, but that consumer sentiment & macroeconomic fundamentals do not				
Investor sentiment & rational asset pricing models				
Investor sentiment provides an important clue to the phenomenon unexplained by rational asset pricing models and economic theories				