

**Online appendix to
The short of it: Investor sentiment and anomalies**

by

Robert F. Stambaugh, Jianfeng Yu, and Yu Yuan

Table A1
Excess Raw Returns and Benchmark-adjusted Returns for the 11 Anomalies:

The table reports average excess returns and benchmark-adjusted return on the eleven anomalies. The sample period is from 1965:8 to 2008:1 for all but the anomaly based on failure probability, whose data begin 1974:12, and anomalies based on O-score and return on assets, whose data begin 1972:1.

	1 (long)	2	3	4	5	6	7	8	9	10 (short)	Long-Short
<u>A. Excess Returns on Individual Portfolios</u>											
Failure probability	0.94	0.67	0.56	0.60	0.69	0.54	0.68	0.50	0.20	-0.01	0.95
Ohlson's O (distress)	0.51	0.55	0.51	0.53	0.49	0.32	0.33	0.33	0.17	-0.19	0.70
Net stock issues	0.70	0.57	0.51	0.44	0.57	0.56	0.51	0.29	0.18	0.07	0.63
Comp. equity issues	0.62	0.70	0.58	0.55	0.47	0.57	0.36	0.47	0.25	0.20	0.42
Total accruals	0.72	0.57	0.65	0.54	0.45	0.44	0.48	0.38	0.51	0.13	0.58
Net operating assets	0.71	0.58	0.65	0.57	0.52	0.62	0.43	0.34	0.35	0.06	0.65
Momentum	1.11	0.79	0.62	0.52	0.45	0.36	0.37	0.24	0.03	-0.45	1.56
Gross profitability	0.69	0.44	0.36	0.46	0.51	0.49	0.43	0.37	0.33	0.29	0.40
Asset growth	1.00	0.72	0.77	0.60	0.52	0.54	0.52	0.37	0.47	0.04	0.96
Return on assets	0.64	0.54	0.58	0.45	0.44	0.50	0.49	0.39	-0.01	-0.34	0.98
Investment/assets	0.91	0.68	0.75	0.59	0.53	0.48	0.30	0.44	0.44	0.15	0.75
<u>B. Benchmark-adjusted Returns on Individual Portfolios</u>											
Failure probability	0.39	0.08	-0.08	-0.12	-0.04	-0.30	-0.20	-0.40	-0.84	-1.16	1.55
Ohlson's O (distress)	0.21	0.06	-0.05	-0.05	-0.20	-0.37	-0.24	-0.34	-0.54	-0.93	1.13
Net stock issues	0.20	-0.02	0.04	-0.01	0.13	0.14	0.05	-0.15	-0.28	-0.46	0.66
Comp. equity issues	0.02	0.18	0.10	0.08	0.10	0.21	-0.09	0.03	-0.25	-0.41	0.43
Total accruals	0.26	0.10	0.17	0.10	-0.01	0.04	0.04	-0.05	0.09	-0.34	0.61
Net operating assets	0.25	0.14	0.22	0.18	0.09	0.16	-0.09	-0.14	-0.12	-0.51	0.76
Momentum	0.63	0.31	0.14	0.04	-0.04	-0.15	-0.15	-0.30	-0.56	-1.14	1.77
Gross profitability	0.43	0.16	0.02	0.04	0.00	-0.07	-0.12	-0.12	-0.23	-0.23	0.66
Asset growth	0.22	0.10	0.14	0.09	0.01	0.07	0.11	-0.02	0.12	-0.44	0.66
Return on assets	0.38	0.14	0.09	-0.15	-0.19	-0.20	-0.28	-0.29	-0.57	-0.90	1.28
Investment/assets	0.17	0.06	0.13	0.11	0.10	0.10	-0.06	0.07	0.03	-0.37	0.54

Table A2
Anomalies During Periods of High and Low Investor Sentiment:
CAPM-Adjusted Returns on Long-Short Strategies

The table reports average CAPM-adjusted returns following high and low levels of investor sentiment, as classified based on the median level of the index of Baker and Wurgler (2006). The average returns in high- and low-sentiment periods are estimates of a_H and a_L in the regression,

$$R_{i,t} = a_H d_{H,t} + a_L d_{L,t} + bMKT_t + \epsilon_{i,t},$$

where $d_{H,t}$ and $d_{L,t}$ are dummy variables indicating high- and low-sentiment periods, and $R_{i,t}$ is the excess return in month t on either the long leg, the short leg, or the difference. Also reported are returns on a strategy that equally combines the strategies available within a given month. The sample period is from 1965:8 to 2008:1 for all but anomaly (1), whose data begin 1974:12, and anomalies (2) and (10), whose data begin 1972:1. All t-statistics are based on the heteroskedasticity-consistent standard errors of White (1980).

	Long Leg			Short Leg			Long – Short		
	High Sent.	Low Sent.	High – Low	High Sent.	Low Sent.	High – Low	High Sent.	Low Sent.	High – Low
Failure probability	0.38 (2.24)	0.26 (1.86)	0.12 (0.57)	-1.74 (-3.69)	-0.23 (-0.65)	-1.51 (-2.61)	2.12 (3.95)	0.49 (1.17)	1.63 (2.47)
Ohlson's O (distress)	0.10 (0.95)	-0.08 (-0.88)	0.19 (1.30)	-1.40 (-4.10)	-0.31 (-1.17)	-1.08 (-2.47)	1.50 (4.34)	0.23 (0.73)	1.27 (2.71)
Net stock issues	0.40 (4.13)	0.18 (2.59)	0.22 (1.85)	-0.81 (-5.24)	-0.09 (-0.79)	-0.72 (-3.78)	1.20 (6.63)	0.27 (2.00)	0.94 (4.20)
Comp. equity issues	0.32 (2.22)	0.23 (1.97)	0.09 (0.46)	-0.60 (-3.56)	-0.05 (-0.43)	-0.55 (-2.71)	0.92 (4.14)	0.28 (1.76)	0.64 (2.34)
Total accruals	0.03 (0.14)	0.30 (1.78)	-0.27 (-0.93)	-0.96 (-3.60)	-0.06 (-0.34)	-0.90 (-2.76)	0.99 (3.43)	0.36 (1.63)	0.63 (1.73)
Net operating assets	0.20 (1.24)	0.24 (1.98)	-0.04 (-0.21)	-0.90 (-5.41)	-0.07 (-0.55)	-0.83 (-3.98)	1.10 (4.94)	0.31 (1.73)	0.79 (2.75)
Momentum	0.44 (2.01)	0.64 (3.30)	-0.19 (-0.65)	-1.63 (-4.47)	-0.57 (-2.24)	-1.06 (-2.36)	2.08 (4.64)	1.21 (3.56)	0.87 (1.53)
Gross profitability	0.33 (2.29)	0.19 (1.34)	0.14 (0.70)	-0.32 (-1.97)	0.05 (0.32)	-0.36 (-1.70)	0.64 (2.90)	0.14 (0.60)	0.50 (1.55)
Asset growth	0.49 (2.66)	0.51 (2.48)	-0.02 (-0.09)	-0.96 (-5.41)	-0.16 (-1.20)	-0.79 (-3.57)	1.45 (5.56)	0.68 (2.91)	0.77 (2.23)
Return on assets	0.29 (2.07)	-0.05 (-0.34)	0.34 (1.71)	-1.52 (-3.88)	-0.48 (-1.72)	-1.04 (-2.17)	1.81 (4.41)	0.43 (1.30)	1.38 (2.63)
Investment/assets	0.14 (0.88)	0.68 (4.19)	-0.55 (-2.41)	-0.80 (-5.03)	-0.00 (-0.01)	-0.80 (-3.70)	0.94 (4.75)	0.68 (3.30)	0.26 (0.91)
Combination	0.28 (4.82)	0.30 (5.56)	-0.02 (-0.27)	-1.03 (-6.36)	-0.16 (-1.40)	-0.86 (-4.38)	1.30 (7.87)	0.46 (4.28)	0.84 (4.33)

Table A3
Investor Sentiment and Anomalies: Predictive Regressions for
CAPM-Adjusted Returns on Long-Short Strategies

The table reports estimates of b in the regression,

$$R_{i,t} = a + bS_{t-1} + cMKT_t + u_t,$$

where $R_{i,t}$ is the excess return in month t on either the long leg, the short leg, or the difference, and S_t is the level of the investor-sentiment index of Baker and Wurgler (2006). Also reported are returns on a strategy that equally combines the strategies available within a given month. The sample period is from 1965:8 to 2008:1 for all but anomaly (1), whose data begin 1974:12, and anomalies (2) and (10), whose data begin 1972:1. All t-statistics are based on the heteroskedasticity-consistent standard errors of White (1980).

	Long Leg		Short Leg		Long – Short	
	\hat{b}	t-stat.	\hat{b}	t-stat.	\hat{b}	t-stat.
Failure probability	-0.03	-0.19	-1.14	-3.01	1.11	2.39
Ohlson's O (distress)	0.04	0.42	-0.72	-2.79	0.76	2.84
Net stock issues	0.06	1.07	-0.40	-3.95	0.47	3.84
Comp. equity issues	0.08	0.88	-0.24	-2.22	0.32	2.25
Total accruals	-0.12	-0.75	-0.42	-2.17	0.29	1.47
Net operating assets	0.07	0.69	-0.38	-3.41	0.45	3.34
Momentum	-0.21	-1.56	-0.48	-1.79	0.26	0.85
Gross profitability	0.14	1.34	-0.19	-1.55	0.33	1.85
Asset growth	-0.05	-0.37	-0.41	-3.23	0.36	1.89
Return on assets	0.08	0.80	-0.78	-2.77	0.86	2.72
Investment/assets	-0.29	-2.28	-0.30	-2.82	0.02	0.14
Combination	-0.03	-0.83	-0.44	-3.76	0.41	3.68

Table A4
Anomalies During Periods of High and Low Investor Sentiment:
Four-Factor-Adjusted Returns on Long-Short Strategies

The table reports average benchmark-adjusted returns following high and low levels of investor sentiment, as classified based on the median level of the index of Baker and Wurgler (2006). The average returns in high- and low-sentiment periods are estimates of a_H and a_L in the regression,

$$R_{i,t} = a_H d_{H,t} + a_L d_{L,t} + bMKT_t + cSMB_t + dHML_t + fLIQ_t + \epsilon_{i,t},$$

where $d_{H,t}$ and $d_{L,t}$ are dummy variables indicating high- and low-sentiment periods, and $R_{i,t}$ is the excess return in month t on either the long leg, the short leg, or the difference. Also reported are returns on a strategy that equally combines the strategies available within a given month. The sample period is from 1965:8 to 2008:1 for all but anomaly (1), whose data begin 1974:12, and anomalies (2) and (10), whose data begin 1972:1. All t-statistics are based on the heteroskedasticity-consistent standard errors of White (1980).

	Long Leg			Short Leg			Long – Short		
	High Sent.	Low Sent.	High – Low	High Sent.	Low Sent.	High – Low	High Sent.	Low Sent.	High – Low
Failure probability	0.45 (2.67)	0.35 (2.42)	0.10 (0.47)	-1.65 (-4.43)	-0.58 (-1.81)	-1.07 (-2.19)	2.10 (4.62)	0.92 (2.45)	1.17 (1.97)
Ohlson's O (distress)	0.23 (2.47)	0.15 (1.94)	0.08 (0.66)	-1.27 (-5.49)	-0.61 (-3.29)	-0.65 (-2.21)	1.50 (6.29)	0.77 (3.76)	0.73 (2.34)
Net stock issues	0.27 (3.45)	0.08 (1.09)	0.20 (1.93)	-0.77 (-4.72)	-0.10 (-0.85)	-0.68 (-3.50)	1.05 (6.03)	0.17 (1.33)	0.88 (4.13)
Comp. equity issues	0.07 (0.67)	0.03 (0.33)	0.04 (0.26)	-0.64 (-3.66)	-0.21 (-1.81)	-0.43 (-2.08)	0.71 (3.41)	0.25 (1.50)	0.47 (1.81)
Total accruals	0.16 (0.74)	0.31 (1.97)	-0.14 (-0.55)	-0.76 (-3.15)	-0.12 (-0.72)	-0.64 (-2.26)	0.93 (3.15)	0.43 (1.80)	0.50 (1.37)
Net operating assets	0.20 (1.25)	0.29 (2.07)	-0.09 (-0.44)	-0.87 (-5.03)	-0.11 (-0.93)	-0.77 (-3.71)	1.07 (4.75)	0.40 (2.07)	0.68 (2.33)
Momentum	0.68 (3.75)	0.57 (3.23)	0.12 (0.48)	-1.54 (-4.23)	-0.80 (-3.15)	-0.74 (-1.68)	2.23 (4.68)	1.37 (3.74)	0.86 (1.45)
Gross profitability	0.42 (2.94)	0.28 (2.19)	0.15 (0.78)	-0.38 (-2.33)	0.03 (0.22)	-0.41 (-1.91)	0.80 (3.51)	0.25 (1.13)	0.56 (1.78)
Asset growth	0.38 (2.31)	0.20 (1.12)	0.18 (0.74)	-0.83 (-4.58)	-0.11 (-0.87)	-0.72 (-3.31)	1.21 (4.96)	0.31 (1.46)	0.90 (2.84)
Return on assets	0.50 (3.97)	0.27 (2.26)	0.23 (1.35)	-1.30 (-4.11)	-0.54 (-2.12)	-0.76 (-1.92)	1.80 (5.10)	0.81 (2.75)	0.99 (2.19)
Investment/assets	-0.01 (-0.04)	0.29 (2.04)	-0.29 (-1.44)	-0.75 (-4.42)	-0.06 (-0.46)	-0.69 (-3.20)	0.75 (3.73)	0.35 (1.75)	0.40 (1.46)
Combination	0.29 (5.52)	0.24 (4.93)	0.05 (0.71)	-0.94 (-6.72)	-0.26 (-2.91)	-0.68 (-4.03)	1.23 (8.15)	0.51 (4.74)	0.73 (3.89)

Table A5
Investor Sentiment and Anomalies: Predictive Regressions for
Four-Factor-Adjusted Returns on Long-Short Strategies

The table reports estimates of b in the regression,

$$R_{i,t} = a + bS_{t-1} + cMKT_t + dSMB_t + eHML_t + fLIQ_t + u_t,$$

where $R_{i,t}$ is the excess return in month t on either the long leg, the short leg, or the difference, and S_t is the level of the investor-sentiment index of Baker and Wurgler (2006). Also reported are returns on a strategy that equally combines the strategies available within a given month. The sample period is from 1968:1 to 2008:1 for all but anomaly (1), whose data begin 1974:12, and anomalies (2) and (10), whose data begin 1972:1. All t-statistics are based on the heteroskedasticity-consistent standard errors of White (1980).

	Long Leg		Short Leg		Long – Short	
	\hat{b}	t-stat.	\hat{b}	t-stat.	\hat{b}	t-stat.
Failure probability	-0.00	-0.03	-0.93	-2.83	0.92	2.21
Ohlson's O (distress)	0.06	0.81	-0.54	-2.75	0.59	3.08
Net stock issues	0.02	0.32	-0.40	-3.82	0.42	3.70
Comp. equity issues	-0.03	-0.42	-0.18	-1.56	0.14	1.09
Total accruals	-0.06	-0.36	-0.24	-1.37	0.18	0.88
Net operating assets	0.05	0.53	-0.36	-3.19	0.41	3.06
Momentum	0.03	0.25	-0.30	-1.11	0.33	0.96
Gross profitability	0.20	1.93	-0.26	-1.94	0.46	2.47
Asset growth	-0.02	-0.19	-0.33	-2.67	0.31	2.08
Return on assets	0.14	1.43	-0.60	-2.57	0.74	2.73
Investment/assets	-0.20	-1.89	-0.23	-2.04	0.02	0.17
Combination	0.01	0.23	-0.34	-3.18	0.35	3.16

Table A6
Anomalies During Periods of High and Low Investor Sentiment:
Equally Weighted Benchmark-Adjusted Returns on Long-Short Strategies

The table reports average benchmark-adjusted returns following high and low levels of investor sentiment, as classified based on the median level of the index of Baker and Wurgler (2006). The average returns in high- and low-sentiment periods are estimates of a_H and a_L in the regression,

$$R_{i,t} = a_H d_{H,t} + a_L d_{L,t} + bMKT_t + cSMB_t + dHML_t + \epsilon_{i,t},$$

where $d_{H,t}$ and $d_{L,t}$ are dummy variables indicating high- and low-sentiment periods, and $R_{i,t}$ is the excess return in month t on either the long leg, the short leg, or the difference. Also reported are returns on a strategy that equally combines the strategies available within a given month. The sample period is from 1965:8 to 2008:1 for all but anomaly (1), whose data begin 1974:12, and anomalies (2) and (10), whose data begin 1972:1. All t-statistics are based on the heteroskedasticity-consistent standard errors of White (1980).

	Long Leg			Short Leg			Long – Short		
	High Sent.	Low Sent.	High – Low	High Sent.	Low Sent.	High – Low	High Sent.	Low Sent.	High – Low
Failure probability	0.75 (6.91)	0.66 (6.00)	0.08 (0.53)	-1.87 (-5.06)	-0.82 (-3.21)	-1.05 (-2.31)	2.61 (6.46)	1.49 (5.06)	1.13 (2.24)
Ohlson's O (distress)	0.46 (4.87)	0.40 (4.39)	0.05 (0.41)	-1.86 (-6.50)	-0.75 (-3.57)	-1.10 (-3.14)	2.31 (7.97)	1.15 (4.83)	1.16 (3.08)
Net stock issues	0.26 (2.39)	0.36 (5.11)	-0.10 (-0.82)	-0.84 (-4.08)	-0.22 (-1.90)	-0.61 (-2.59)	1.09 (6.34)	0.58 (4.73)	0.51 (2.40)
Comp. equity issues	0.26 (2.83)	0.24 (3.48)	0.03 (0.23)	-0.72 (-4.04)	-0.19 (-1.52)	-0.53 (-2.43)	0.98 (5.88)	0.43 (3.30)	0.55 (2.65)
Total accruals	0.04 (0.17)	0.45 (2.55)	-0.41 (-1.33)	-0.66 (-2.88)	-0.03 (-0.18)	-0.64 (-2.30)	0.70 (4.09)	0.48 (2.98)	0.23 (0.98)
Net operating assets	0.28 (1.80)	0.45 (3.40)	-0.17 (-0.85)	-1.16 (-5.70)	-0.44 (-4.20)	-0.72 (-3.14)	1.44 (6.49)	0.88 (6.05)	0.55 (2.07)
Momentum	0.55 (3.65)	0.61 (4.73)	-0.06 (-0.32)	-1.17 (-2.63)	-0.05 (-0.19)	-1.12 (-2.14)	1.72 (3.63)	0.66 (2.22)	1.06 (1.87)
Gross profitability	0.51 (3.02)	0.34 (3.45)	0.17 (0.84)	-0.47 (-1.41)	0.31 (1.33)	-0.78 (-1.89)	0.97 (3.22)	0.03 (0.14)	0.94 (2.42)
Asset growth	0.13 (0.49)	0.74 (3.72)	-0.61 (-1.81)	-1.14 (-5.22)	-0.37 (-3.46)	-0.78 (-3.16)	1.27 (5.09)	1.10 (6.27)	0.17 (0.56)
Return on assets	0.82 (6.72)	0.73 (7.81)	0.09 (0.57)	-0.68 (-1.40)	0.21 (0.66)	-0.89 (-1.56)	1.50 (3.19)	0.52 (1.59)	0.98 (1.73)
Investment/assets	0.11 (0.54)	0.63 (4.35)	-0.51 (-1.98)	-1.22 (-5.88)	-0.24 (-2.17)	-0.98 (-4.19)	1.33 (6.85)	0.86 (6.20)	0.47 (1.97)
Combination	0.36 (3.24)	0.50 (6.93)	-0.14 (-1.07)	-1.04 (-4.34)	-0.23 (-1.70)	-0.80 (-2.89)	1.39 (8.48)	0.73 (7.27)	0.66 (3.40)

Table A7
Investor Sentiment and Anomalies: Predictive Regressions for
Equally Weighted Benchmark-Adjusted Returns on Long-Short Strategies

The table reports estimates of b in the regression,

$$R_{i,t} = a + bS_{t-1} + cMKT_t + dSMB_t + eHML_t + u_t,$$

where $R_{i,t}$ is the excess return in month t on either the long leg, the short leg, or the difference, and S_t is the level of the investor-sentiment index of Baker and Wurgler (2006). Also reported are returns on a strategy that equally combines the strategies available within a given month. The sample period is from 1965:8 to 2008:1 for all but anomaly (1), whose data begin 1974:12, and anomalies (2) and (10), whose data begin 1972:1. All t-statistics are based on the heteroskedasticity-consistent standard errors of White (1980).

	Long Leg		Short Leg		Long – Short	
	\hat{b}	t-stat.	\hat{b}	t-stat.	\hat{b}	t-stat.
Failure probability	0.05	0.42	-0.76	-2.22	0.81	2.11
Ohlson's O (distress)	0.12	1.69	-0.86	-3.31	0.98	3.81
Net stock issues	-0.12	-1.61	-0.27	-1.76	0.16	1.22
Comp. equity issues	-0.05	-0.95	-0.30	-2.51	0.24	2.18
Total accruals	-0.21	-1.17	-0.32	-1.95	0.11	0.86
Net operating assets	-0.02	-0.18	-0.38	-2.71	0.37	2.84
Momentum	-0.09	-0.90	-0.56	-1.56	0.47	1.19
Gross profitability	0.13	1.07	-0.26	-1.17	0.40	2.14
Asset growth	-0.35	-1.99	-0.40	-2.47	0.05	0.34
Return on assets	0.18	2.18	-0.59	-1.36	0.76	1.87
Investment/assets	-0.37	-2.44	-0.48	-3.53	0.11	0.90
Combination	-0.09	-1.20	-0.40	-2.23	0.31	2.45