Agnostic fundamental analysis works

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1.Introduction

Background

- A cornerstone of market efficiency is the principle that that strategies derived from public information should not work.
- Fundamental analysis is based on the principle that stock have an intrinsic fair value and the investors can earn abnormal profits from stock specific signals indicating deviations from fair value.
- Most studies of fundamental analysis require highly stylized models of fair value, which offers to much discretion to researchers over the choice of model and its parameters.

1.Introduction

Motivation

- Too much discretion makes it hard to assess whether fundamental analysis works or if the observed abnormal profits are the outcome of a data snooping exercise, We want to apply minimal discretion in fundamental analysis to assess whether fundamental analysis works and whether stock market information efficiency.

1.Introduction

Questions

- Whether fundamental analysis form accounting information contains information about future stock returns? Yes
- Whether mispricing signal from peer-implied fair value can forecasts returns? Yes
- What is more likely account for the profitability of the trading strategy based on mispricing signal ?

  Convergence to fair value
- Whether mispricing signal proxies for an anomaly previously seen in the literature? No

1.Introduction

Research contents

- We use accounting information to compute stock's degree of under- or overvaluation and relate it to returns over the subsequent months.
- We study that M(mispricing signal) can forecast returns.
- We study that convergence to fair value better explains the results of profitability.
- We find mispricing signal does not proxies for an anomaly previously seen in the literature and find a way to analyze the role of 28 accounting items played in alpha-generating

1.Introduction

Related researches

- Frankel and Lee (1998) show that deviations from fair value predict long-term returns, , especially between 24 and 36 months after receiving the mispricing signal.
- Ou and Penman (1989) consider accounting variables as predictors of future earnings changes and shows that the logit-estimated probability of an earnings increase forecasts stock returns.
- Abarbanell and Bushee(1998) study the April to March returns of firms with December fiscal year-ends and find that the weighted averages of the ranks for changes in nine accounting variables predict a firm’s return.

1.Introduction

Contribution

- We find that market price do not fully reflect accounting data.
- We apply minimal discretion in estimating a peer-implied intrinsic value to examine if a reasonably agnostic form of fundamental analysis works. It seems to work very well.
- Obvious steps for future research would extend this analysis to global financial markets and to address whether firms are aware of how their share prices deviate from fair value.

1.Introduction

Framework

Approximate a company's fair equity value and the mispricing signal ,then relate the signal to return.

Whether mispricing signal can forecast returns even after controlling for lots of characteristics.

What explains the abnormal profitability best?

Whether the signal's black box proxies for an anomaly previous seen in the literature ? and what role did each of the 28 accounting items play by in the black box?

2.Data

- Data source: Center for Research in Securities Prices (CRSP), CRSP-merged Compustat Point-in-Time database and Kenneth French data library
- period: March 1987 to December 2012
- Frequencies : monthly
- Sample: stocks on the New York Stock Exchange, American Stock Exchange or Nasdaq Stock Market–National Market System, with a share price of at least $5 , a positive number of common shares, positive total assets, possess a Standard Industrial Classification (SIC) code that is not financial services (codes 60–69).
- Variables: market capitalizations, mispricing signal, and 28 accounting items .

2.Data

More details

- 16 of 28 accounting items come from most recently reported balance sheet, 11 come from income sheet and 1 comes from cash flow sheet.
- All variables that inform trading positions are winsorized.
- 28 items, because it is the largest number of items that achieve a sample of 2000 firms at the sample period's start. And a lot of uncommon items are redundant and can be spanned by the most common 28 items.
- The 16 items from balance sheet used at the start of each trading month are from the most recently statement , and those from income and cash flow sheet are sum of the quarterly values of from the most 4quarterly sheet to eliminate seasonal distortions.

3.1 Empirical result

- The mispricing signal (M) and summary statistics

$$M_{j,t} = \frac{p_{j,t} - v_{j,t}}{v_{j,t}}$$

- $p_{j,t}$ means the predicted value of company j at time t, with $v_{j,t}$ the market capitalization.

3.1 Empirical result

Summary statistics by mispricing signal quintiles

Characteristics	All (1)	Correlation (2)	Signal quintiles Q1 (overvalued) (3)	Q2 (4)	Q3 (5)	Q4 (6)	Q5 (undervalued) (7)
Mispricing signal (M)	0.9640	1.000	−2.0253	−0.2427	0.3996	1.3042	5.3848
Market capitalization	2,847.7	−0.068	3,541.8	5,941.9	3,006.4	1,365.7	381.3
Book/market	0.5774	0.291	0.4071	0.4198	0.5054	0.6361	0.9186
Beta	0.9280	−0.139	1.0259	1.0018	0.9764	0.9102	0.7227
Accruals	0.9507	−0.010	1.8169	0.8555	0.6942	0.6995	0.7328
SUE	0.0140	0.026	0.0275	0.0021	0.0093	0.0230	0.0082
Gross profitability	0.3685	0.042	0.3011	0.3811	0.3907	0.3875	0.3819
Earnings yield	0.0210	0.159	−0.0537	0.0271	0.0387	0.0439	0.0488
Return from prior month t	2.0692	−0.029	3.5124	2.7653	1.9508	1.3282	0.7908
Return from month $t-1$ to $t-11$	23.41	−0.068	38.741	32.365	21.825	14.64	9.670
Return from month $t-12$ to $t-59$	99.43	−0.048	109.19	114.73	107.47	92.44	73.45

3.2 Empirical result

Raw return

		OLS							TS
			Signal quintiles					Q5–Q1 (undervalued–overvalued)	Q5–Q1
	All	Correlation	Q1 (overvalued)	Q2	Q3	Q4	Q5 (undervalued)	Fraction > 0 [*p*-value]	Average [*t*-statistic]	Average [*t*-statistic]
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Panel A: Equally weighted portfolios										
Return in month $t+1$	0.9224	0.0050	0.6309	0.9166	0.9713	1.0420	1.0502	58.1 [0.00]	0.4192 [2.38]	0.6790 [4.03]
Return in month $t+1$ (1987–1999)	1.0575	0.0071	0.7122	1.1522	1.1609	1.1850	1.0763	58.4 [0.04]	0.3641 [1.56]	0.5622 [2.41]
Return in month $t+1$ (2000–2012)	0.7889	0.0030	0.5507	0.6840	0.7841	0.9009	1.0244	57.7 [0.05]	0.4737 [1.79]	0.7943 [3.26]
Panel B: Value-weighted portfolios										
Return in month $t+1$	0.8669	0.0091	0.4753	0.8964	0.8971	1.0519	1.0217	54.5 [0.11]	0.5465 [2.53]	0.4850 [1.67]
Return in month $t+1$ (1987–1999)	1.4113	0.0013	1.0979	1.4080	1.4248	1.3505	1.2417	52.6 [0.52]	0.1437 [0.57]	−0.0474 [−0.13]
Return in month $t+1$ (2000–2012)	0.3294	0.0168	−0.1394	0.3914	0.3763	0.7571	0.8046	56.4 [0.11]	0.9440 [2.72]	1.0106 [2.24]

3.3 Empirical result

Fama-MacBeth cross-sectional regressions

$$R_{j,t+1} = a_t + b_t M_{j,t} + \sum_{S=1}^{S} c_{S,t} x_{j,S,t} + e_{j,t+1}$$

- $R_{j,t+1}$means the return of stock j at t month
- $x_{j,S,t}$ is the end-of-month t value of firm j's control characteristic s including industry fixed effects.
- the regressions use quintile dummies (Q2, Q3, Q4, and Q5, with Q1 omitted due to the regression intercept)

3.3 Empirical result

	OLS										TS	
	Specification 1		Specification 2		Specification 3		Specification 4		Specification 5		Specification 6	
	Coefficient	[*t*-statistic]	Coefficient	[*t*-statistic]	Coefficient	[*t*-statistic]	Coefficient	[*t*-statistic]	Coefficient	[*t*-statistic]	Coefficient	[*t*-statistic]
Panel A: Regressions with quintile dummies for full-sample period												
Mispricing Signal (M) (Q5)	0.4614 ***	[2.79]			0.5376 ***	[4.37]			0.3621 ***	[2.82]	0.4353 ***	[3.67]
Beta (Q5)			−0.1028	[−0.47]	−0.1274	[−0.60]	−0.0141	[−0.07]	−0.0593	[−0.30]	−0.0073	[−0.04]
Market capitalization (Q5)			−0.0248	[−0.12]	−0.0374	[−0.18]	−0.0536	[−0.27]	−0.1257	[−0.62]	−0.0173	[−0.08]
Book/market (Q5)			0.3022 *	[1.78]	0.1040	[0.62]	0.3552 **	[2.22]	0.2429	[1.45]	0.1818	[1.06]
Short-term reversal (Q5)			−1.1099 ***	[−6.24]	−1.0818 ***	[−6.14]	−1.1857 ***	[−6.84]	−1.1663 ***	[−6.79]	−1.1656 ***	[−6.74]
Momentum (Q5)			0.7910 ***	[3.75]	0.8079 ***	[3.81]	0.5447 ***	[2.67]	0.5627 ***	[2.76]	0.5746 ***	[2.82]
Long-term reversal (Q5)			−0.2791 **	[−2.46]	−0.3082 ***	[−2.75]	−0.2095 *	[−1.96]	−0.2063 *	[−1.94]	−0.2274 **	[−2.14]
Accruals (Q5)							−0.6624 ***	[−7.64]	−0.6498 ***	[−7.53]	−0.6400 ***	[−7.36]
SUE (Q5)							0.4094 ***	[4.31]	0.4043 ***	[4.25]	0.4138 ***	[4.35]
Gross profitability (Q5)							0.5516 ***	[5.00]	0.5457 ***	[4.94]	0.5265 ***	[4.76]
Earnings yield (Q5)							0.4754 ***	[4.32]	0.3732 ***	[3.22]	0.3220 ***	[2.79]
Intercept	0.2945	[0.77]	0.7835	[1.60]	0.6402	[1.27]	0.5373	[1.02]	0.5208	[0.97]	0.4131	[0.77]
Number of observations	1,349		1,349		1,349		1,349		1,349		1,349	
Adj. *R*-squared	0.041		0.073		0.074		0.078		0.080		0.079	
Industry control	Yes		Yes		Yes		Yes		Yes		Yes	
Panel B: Regressions with quintile dummies 1993–2012												
Mispricing Signal (M) (Q5)	0.5650 ***	[2.94]			0.5755 ***	[4.10]			0.4784 ***	[3.32]	0.4551 ***	[3.35]
Beta (Q5)			−0.1313	[−0.50]	−0.1657	[−0.65]	−0.0397	[−0.16]	−0.0896	[−0.38]	−0.0441	[−0.18]
Market capitalization (Q5)			−0.0906	[−0.37]	−0.1618	[−0.65]	−0.1252	[−0.55]	−0.2207	[−0.93]	−0.0942	[−0.39]
Book/market (Q5)			0.3941 *	[1.96]	0.1830	[0.92]	0.4597 **	[2.48]	0.3179	[1.62]	0.2754	[1.37]
Short-term reversal (Q5)			−1.0877 ***	[−5.01]	−1.0524 ***	[−4.89]	−1.1629 ***	[−5.50]	−1.1334***	[−5.42]	−1.1365 ***	[−5.38]
Momentum (Q5)			0.6287 **	[2.39]	0.6529 **	[2.47]	0.4480 *	[1.77]	0.4714 *	[1.86]	0.4826 *	[1.90]
Long-term reversal (Q5)			−0.3022 **	[−2.26]	−0.3281 **	[−2.50]	−0.2111 *	[−1.69]	−0.2075 *	[−1.67]	−0.2356 *	[−1.89]
Accruals (Q5)							−0.5721 ***	[−5.75]	−0.5589 ***	[−5.65]	−0.5485 ***	[−5.48]
SUE (Q5)							0.3112 ***	[2.73]	0.3072 ***	[2.69]	0.3130 ***	[2.75]
Gross profitability (Q5)							0.5637 ***	[4.26]	0.5513 ***	[4.18]	0.5380 ***	[4.06]
Earnings yield (Q5)							0.4074 ***	[3.16]	0.2818 **	[2.08]	0.2576 *	[1.94]
Intercept	0.1265	[0.29]	0.7091	[1.20]	0.5982	[0.98]	0.4982	[0.78]	0.4758	[0.73]	0.3683	[0.57]
Number of observations	1,437		1,437		1,437		1,437		1,437		1,437	
Adj. *R*-squared	0.045		0.079		0.080		0.084		0.086		0.085	
Industry control	Yes		Yes		Yes		Yes		Yes		Yes	

3.3 Empirical result

Factor model time series regressions

$$r_{q,t+1} = \alpha_q + \sum_{l=1}^{L} \beta_{q,l} F_{l,t+1} + \epsilon_{q,t+1}$$

- $r_{q,t+1}$ is the industry-adjusted month t + 1 return on quintile portfolio q based on $M_{j,t}$.
- $F_{l,t+1}$ is the return difference (or excess return) of the lth factor portfolio.

3.3 Empirical result

	OLS												TS	
	Q1 (overvalued)		Q2		Q3		Q4		Q5 (undervalued)		Q5–Q1 (undervalued–overvalued)		Q5–Q1 (undervalued–overvalued)	
	Coefficient	[*t*-statistic]	Coefficient	[*t*-statistic]	Coefficient	[*t*-statistic]	Coefficient	[*t*-statistic]	Coefficient	[*t*-statistic]	Coefficient	[*t*-statistic]	Coefficient	[*t*-statistic]
Panel A: Equal-weighted portfolios (with industry control)														
Industry-adjusted returns	−0.4482***	[−3.36]	−0.1884	[−1.30]	−0.0852	[−0.62]	0.0091	[0.08]	0.0332	[0.30]	0.4814***	[3.19]	0.7400***	[4.97]
Six-factor model														
Alpha	−0.5978***	[−5.34]	−0.2976**	[−2.48]	−0.1980	[−1.62]	−0.0764	[−0.68]	0.0253	[0.26]	0.6232***	[5.11]	0.8709***	[8.31]
Mkt_RF	0.0805***	[2.95]	0.0838***	[2.86]	0.0792***	[2.66]	0.0635**	[2.32]	−0.0290	[−1.22]	−0.1095***	[−3.68]	−0.1784***	[−6.98]
SMB	−0.0708*	[−1.72]	−0.1660***	[−3.75]	−0.1632***	[−3.62]	−0.0873**	[−2.11]	−0.1126***	[−3.13]	−0.0418	[−0.93]	−0.1183***	[−3.07]
HML	−0.0042	[−0.10]	−0.0026	[−0.06]	0.1368***	[2.99]	0.2215***	[5.28]	0.2644***	[7.24]	0.2685***	[5.89]	0.3241***	[8.27]
Mom	0.2681***	[11.17]	0.2688***	[10.43]	0.2069***	[7.88]	0.1004***	[4.17]	0.0393*	[1.87]	−0.2288***	[−8.75]	−0.2136***	[−9.50]
ST_Rev	−0.0895***	[−2.78]	−0.1277***	[−3.70]	−0.0432	[−1.23]	−0.0164	[−0.51]	−0.0256	[−0.91]	0.0639*	[1.82]	0.0834***	[2.77]
LT_Rev	−0.0328	[−0.62]	−0.0985*	[−1.74]	−0.1670***	[−2.89]	−0.1654***	[−3.13]	−0.1679***	[−3.64]	−0.1350**	[−2.35]	−0.0357	[−0.72]
R-squared	0.35		0.37		0.26		0.17		0.30		0.40		0.54	
Number of observations	310		310		310		310		310		310		310	
Eight-factor model														
Alpha	−0.6840***	[−6.04]	−0.4002***	[−3.31]	−0.3469***	[−2.95]	−0.2246**	[−2.08]	−0.0707	[−0.71]	0.6133***	[4.83]	0.8039***	[7.43]
Mkt_RF	0.0998***	[3.49]	0.1072***	[3.51]	0.1120***	[3.77]	0.0987***	[3.62]	−0.0028	[−0.11]	−0.1026***	[−3.20]	−0.1593***	[−5.84]
SMB	−0.0204	[−0.48]	−0.1069**	[−2.38]	−0.0746*	[−1.71]	−0.0049	[−0.12]	−0.0667*	[−1.81]	−0.0464	[−0.98]	−0.0880**	[−2.19]
HML	−0.0716	[−1.31]	−0.0843	[−1.45]	0.0223	[0.39]	0.0989*	[1.90]	0.1739***	[3.65]	0.2455***	[4.02]	0.2585***	[4.97]
Mom	0.2517***	[10.53]	0.2494***	[9.77]	0.1784***	[7.19]	0.0727***	[3.19]	0.0223	[1.07]	−0.2294***	[−8.56]	−0.2252***	[−9.87]
ST_Rev	−0.1022***	[−3.23]	−0.1422***	[−4.21]	−0.0662**	[−2.01]	−0.0351	[−1.16]	−0.0324	[−1.17]	0.0699**	[1.97]	0.0799***	[2.64]
LT_Rev	0.0260	[0.47]	−0.0315	[−0.53]	−0.0604	[−1.05]	−0.0790	[−1.49]	−0.1376***	[−2.83]	−0.1636***	[−2.63]	−0.0202	[−0.38]
CMA	−0.0172	[−0.22]	−0.0124	[−0.15]	−0.0423	[−0.52]	0.0090	[0.12]	0.0720	[1.04]	0.0891	[1.01]	0.0648	[0.86]
RMW	0.2291***	[4.18]	0.2681***	[4.58]	0.4037***	[7.10]	0.3712***	[7.10]	0.2009***	[4.19]	−0.0282	[−0.46]	0.1314**	[2.51]
R-squared	0.39		0.41		0.37		0.29		0.34		0.40		0.55	
Number of observations	310		310		310		310		310		310		310	

(*continued on next page*)

3.3 Empirical result

Table 4 (*continued*)

	OLS												TS	
	Q1 (overvalued)		Q2		Q3		Q4		Q5 (undervalued)		Q5–Q1 (undervalued–overvalued)		Q5–Q1 (undervalued–overvalued)	
	Coefficient	[*t*-statistic]	Coefficient	[*t*-statistic]	Coefficient	[*t*-statistic]	Coefficient	[*t*-statistic]	Coefficient	[*t*-statistic]	Coefficient	[*t*-statistic]	Coefficient	[*t*-statistic]
Panel B: Value-weighted portfolios (with industry control)														
Industry-adjusted returns	−0.4878**	[−2.48]	−0.2453	[−1.07]	−0.1999	[−0.95]	−0.0025	[−0.02]	0.0277	[0.19]	0.5155***	[2.73]	0.5966**	[2.40]
Six-factor model														
Alpha	−0.4594***	[−3.09]	−0.2573*	[−1.79]	−0.2125	[−1.50]	−0.0448	[−0.34]	0.0066	[0.05]	0.4660***	[2.87]	0.6417***	[3.96]
Mkt_RF	0.1031***	[2.85]	0.0351	[1.00]	0.0389	[1.12]	0.0983***	[3.03]	0.1000***	[3.21]	−0.0031	[−0.08]	−0.2128***	[−5.39]
SMB	−0.6386***	[−11.68]	−0.8843***	[−16.72]	−0.7925***	[−15.14]	−0.4358***	[−8.89]	−0.3154***	[−6.70]	0.3232***	[5.40]	0.1029*	[1.72]
HML	−0.1230**	[−2.22]	0.1233**	[2.30]	0.1462***	[2.75]	0.1649***	[3.31]	0.2007***	[4.20]	0.3237***	[5.33]	0.6810***	[11.25]
Mom	0.2016***	[6.33]	0.2450***	[7.95]	0.1873***	[6.15]	0.0911***	[3.19]	−0.0051	[−0.19]	−0.2067***	[−5.93]	−0.3798***	[−10.93]
ST_Rev	−0.1567***	[−3.67]	−0.1785***	[−4.32]	−0.0261	[−0.64]	−0.0361	[−0.94]	−0.0193	[−0.52]	0.1374***	[2.94]	0.3034***	[6.51]
LT_Rev	−0.0968	[−1.38]	−0.0072	[−0.11]	−0.1087	[−1.62]	−0.1092*	[−1.74]	−0.1052*	[−1.75]	−0.0084	[−0.11]	0.0006	[0.01]
R-squared	0.47		0.64		0.58		0.34		0.26		0.31		0.61	
Number of observations	310		310		310		310		310		310		310	
Eight-factor model														
Alpha	−0.5241***	[−3.40]	−0.4394***	[−3.19]	−0.3746***	[−2.81]	−0.2133*	[−1.67]	−0.1334	[−1.06]	0.3907**	[2.34]	0.3070**	[2.04]
Mkt_RF	0.1208***	[3.11]	0.0763**	[2.19]	0.0688**	[2.05]	0.1368***	[4.23]	0.1322***	[4.16]	0.0114	[0.27]	−0.1150***	[−3.02]
SMB	−0.6079***	[−10.63]	−0.7787***	[−15.23]	−0.6835***	[−13.84]	−0.3387***	[−7.13]	−0.2352***	[−5.04]	0.3727***	[6.01]	0.2485***	[4.44]
HML	−0.1843**	[−2.49]	−0.0208	[−0.31]	0.0403	[0.63]	0.0307	[0.50]	0.0885	[1.46]	0.2728***	[3.39]	0.3442***	[4.75]
Mom	0.1902***	[5.85]	0.2105***	[7.24]	0.1546***	[5.51]	0.0592**	[2.19]	−0.0315	[−1.19]	−0.2217***	[−6.29]	−0.4369***	[−13.74]
ST_Rev	−0.1611***	[−3.75]	−0.2046***	[−5.32]	−0.0602	[−1.62]	−0.0599*	[−1.67]	−0.0387	[−1.10]	0.1224***	[2.62]	0.2902***	[6.89]
LT_Rev	−0.0770	[−1.02]	0.1138*	[1.68]	0.0506	[0.78]	0.0009	[0.01]	−0.0154	[−0.25]	0.0616	[0.75]	0.0571	[0.77]
CMA	0.0501	[0.47]	−0.0275	[−0.29]	−0.1576*	[−1.70]	−0.0206	[−0.23]	−0.0128	[−0.15]	−0.0629	[−0.54]	0.3775***	[3.59]
RMW	0.1344*	[1.80]	0.4791***	[7.19]	0.5060***	[7.86]	0.4405***	[7.11]	0.3634***	[5.97]	0.2290***	[2.83]	0.6248***	[8.57]
R-squared	0.48		0.69		0.66		0.44		0.35		0.33		0.69	
Number of observations	310		310		310		310		310		310		310	

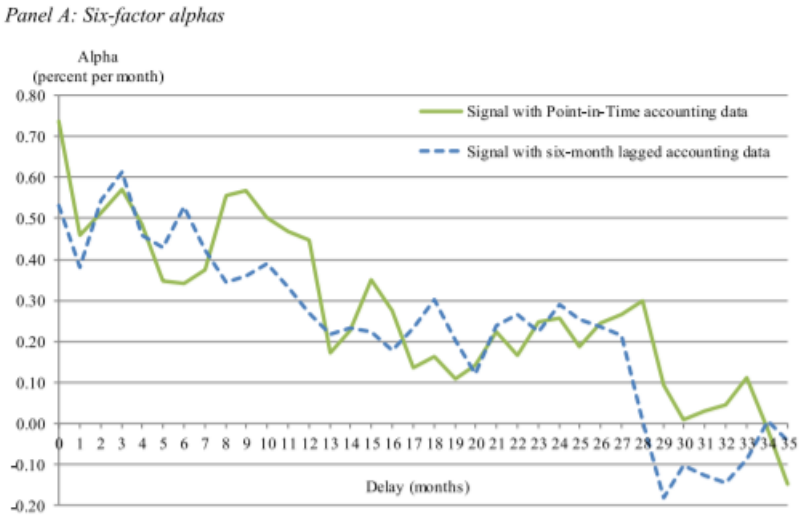
3.4 Empirical result

Convergence to fair value better explain the profitability than alternatives.

- Alpha spreads(intercept) already control for known sources of risk in table 3 and table 4.
- Signal delay shows the convergence to fair value.

3.4 Empirical result

Signal delay



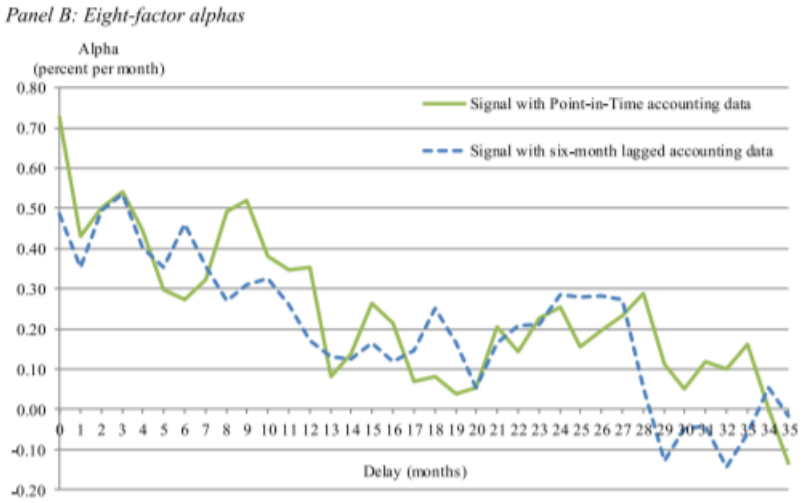


Fig 1 shows strategy's performance when constructing a mispricing signal using accounting data point-in-time(solid line)or that are lagged by six months relative to the point date(dashed lines)

3.4 Empirical result

Signal delay

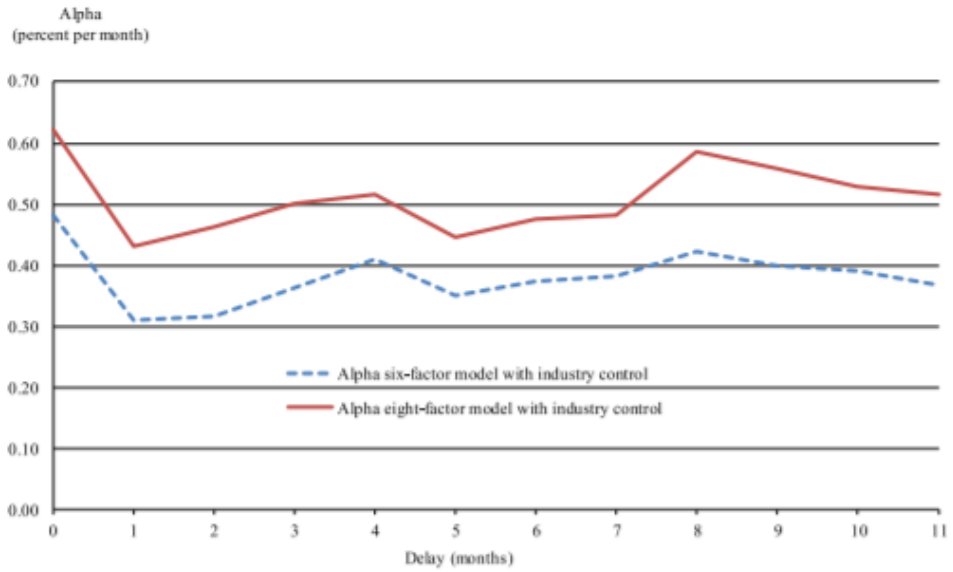


Fig 2 shows the six- and eight-factor alphas when updating market capitalization and accounting data, but using stale regression coefficients for weighting the accounting variables to derive fair value. averaging the weights over various windows does not enhance performance or prevent performance decay with a delayed signal.

3.5 Empirical result

Mispricing strategies within quintiles of other anomalies.

	Q1		Q2		Q3		Q4		Q5	
Variable	Coefficient	[*t*-statistic]	Coefficient	[*t*-statistic]	Coefficient	[*t*-statistic]	Coefficient	[*t*-statistic]	Coefficient	[*t*-statistic]
Panel A: Six-factor alphas of long-short mispricing strategies										
Beta	0.7066***	[4.56]	0.3736**	[2.58]	0.5126***	[3.56]	0.4138**	[2.40]	0.7525***	[4.04]
Book/market	0.4123*	[1.95]	0.2349	[1.46']	0.4028**	[2.57]	0.4948***	[3.11]	0.4846***	[2.89]
Market capitalization	0.8621***	[5.30]	0.7783***	[4.80]	0.7415***	[4.80]	0.5527***	[3.80]	0.2656*	[1.96]
Short-term reversal	1.1474***	[5.65]	0.7717***	[5.07]	0.5141***	[3.21]	0.0916	[0.61]	0.1723	[0.92]
Momentum	1.1044***	[5.82]	0.6540***	[3.99]	0.4950***	[3.37]	0.5871***	[3.82]	0.7501***	[3.83]
Long-term reversal	0.6473***	[3.38]	0.7433***	[4.62]	0.5243***	[3.44]	0.4824***	[3.03]	0.8142***	[4.04]
Accruals	0.6504***	[3.64]	0.6358***	[4.26]	0.6084***	[3.95]	0.5585***	[3.19]	0.5152**	[2.24]
SUE	0.6647***	[3.52]	0.5426***	[3.48]	0.4615***	[3.06]	0.9610***	[5.94]	0.8052***	[4.88]
Gross profitability	0.5798***	[3.31]	0.6178***	[3.78]	0.5031***	[3.17]	0.6362***	[3.80]	0.4306**	[2.33]
Scaled NOA	1.1401***	[5.34]	0.4899***	[2.97]	0.3133*	[1.94]	0.5988***	[3.71]	0.6507***	[3.75]
Share issuance	0.4006***	[2.81]	0.5818***	[4.08]	0.4666***	[2.96]	0.6528***	[3.66]	0.5649***	[2.93]
Asset growth	0.5854***	[3.40]	0.3891***	[2.70]	0.7570***	[5.47]	0.7354***	[4.23]	0.4320**	[2.17]
Capital investment	0.5611***	[3.17]	0.3701**	[2.20]	0.3779**	[2.38]	0.8187***	[5.24]	0.6171***	[3.39]
Investment ratio	0.5025***	[3.06]	0.5903***	[3.59]	0.7694***	[5.15]	0.7517***	[4.50]	0.6091***	[2.99]
External financing	0.4274***	[2.78]	0.3787**	[2.31]	0.5534***	[3.38]	0.5600***	[3.11]	0.4572**	[2.07]
Z-score	0.4821**	[2.47]	0.3137**	[2.07]	0.4994***	[2.93]	0.5599***	[3.24]	0.6645***	[3.26]
Leverage	0.6900***	[3.24]	0.6642***	[3.96]	0.2939*	[1.93]	0.3526**	[2.43]	0.6085***	[3.73]
Illiquidity	0.6265***	[4.67]	0.7351***	[5.07]	0.7322***	[4.72]	0.5024***	[2.92]	0.7572***	[3.88]
Earnings yield	0.4072**	[2.07]	0.4904***	[2.70]	0.4286***	[2.79]	0.3555***	[2.60]	0.4838***	[3.07]
Dividend/price	0.7381***	[4.77]	0.5341***	[3.01]	0.6333***	[3.89]	0.4584***	[2.98]	0.5531***	[3.09]
Cash flow/price	0.6512***	[3.39]	0.2443	[1.39]	0.1678	[1.20]	0.5626***	[3.64]	0.5413***	[3.32]
V/P	0.6256***	[3.17]	0.5141***	[3.07]	0.4796***	[3.31]	0.3204**	[2.37]	0.5765***	[3.61]

3.5 Empirical result

Mispricing strategies within quintiles of other anomalies.

Panel B: Eight-factor alphas of long-short mispricing strategies										
Beta	0.6886***	[4.27]	0.3097**	[2.07]	0.4516***	[3.05]	0.2862	[1.64]	0.6512***	[3.40]
Book/market	0.3378	[1.55]	0.2685	[1.60]	0.5072***	[3.16]	0.5523***	[3.43]	0.6487***	[3.87]
Market capitalization	0.8367***	[4.98]	0.6307***	[3.87]	0.5310***	[3.51]	0.4308***	[2.89]	0.0996	[0.73]
Short-term reversal	1.1781***	[5.57]	0.7496***	[4.76]	0.4981***	[3.00]	0.1228	[0.79]	0.1553	[0.80]
Momentum	1.1272***	[5.73]	0.7154***	[4.24]	0.5269***	[3.47]	0.5509***	[3.44]	0.8120***	[3.99]
Long-term reversal	0.6404***	[3.21]	0.7238***	[4.37]	0.5980***	[3.79]	0.4732***	[2.85]	0.7741***	[3.69]
Accruals	0.6838***	[3.68]	0.6609***	[4.29]	0.5600***	[3.55]	0.5075***	[2.79]	0.5488**	[2.29]
SUE	0.7341***	[3.74]	0.4388***	[2.74]	0.4129***	[2.63]	0.9553***	[5.69]	0.8121***	[4.73]
Gross profitability	0.6050***	[3.31]	0.6803***	[4.03]	0.5355***	[3.26]	0.5844***	[3.37]	0.4404**	[2.29]
Scaled NOA	0.9964***	[4.52]	0.4326**	[2.53]	0.2368	[1.41]	0.6645***	[3.99]	0.6660***	[3.73]
Share issuance	0.5324***	[3.70]	0.6795***	[4.68]	0.4184**	[2.56]	0.5655***	[3.05]	0.5921***	[2.95]
Asset growth	0.5712***	[3.18]	0.3960***	[2.66]	0.7381***	[5.16]	0.7528***	[4.16]	0.4766**	[2.30]
Capital investment	0.5835***	[3.16]	0.4195**	[2.41]	0.4096**	[2.49]	0.8340***	[5.18]	0.6116***	[3.22]
Investment ratio	0.4909***	[2.90]	0.5186***	[3.03]	0.7951***	[5.11]	0.7865***	[4.53]	0.6880***	[3.25]
External financing	0.4602***	[2.91]	0.4708***	[2.80]	0.5945***	[3.49]	0.5369***	[2.87]	0.4686**	[2.04]
Z-score	0.5641***	[2.78]	0.4070***	[2.62]	0.6390***	[3.71]	0.6327***	[3.61]	0.7241***	[3.50]
Leverage	0.6510***	[2.95]	0.6288***	[3.60]	0.3592**	[2.31]	0.3126**	[2.10]	0.7214***	[4.34]
Illiquidity	0.5869***	[4.21]	0.5666***	[3.86]	0.6655***	[4.17]	0.3623**	[2.14]	0.7479***	[3.68]
Earnings yield	0.5953***	[2.97]	0.5178***	[2.75]	0.5627***	[3.69]	0.4145***	[3.04]	0.5812***	[3.72]
Dividend/price	0.7528***	[4.68]	0.5842***	[3.18]	0.6962***	[4.16]	0.5296***	[3.36]	0.6060***	[3.30]
Cash flow/price	0.8311***	[4.25]	0.2803	[1.54]	0.2665*	[1.87]	0.6796***	[4.46]	0.6124***	[3.72]
V/P	0.6177***	[3.00]	0.5105***	[2.93]	0.5016***	[3.37]	0.3357**	[2.46]	0.6082***	[3.81]

Mispricing signal does not proxies for an any anomaly previous seen in the literature.

3.5 Empirical result

The role of each of 28 accounting items

Variables	Industry-adjusted return		Six-factor alpha		Eight-factor alpha	
	Coefficient	[*t*-statistic]	Coefficient	[*t*-statistic]	Coefficient	[*t*-statistic]
Panel A: Variable additions (sequentially added variables)						
None (just regression intercept)	−0.1172	[−0.70]	−0.1559	[−1.20]	−0.0718	[−0.54]
ATQH (total assets)	−0.0353	[−0.20]	−0.0946	[−0.70]	−0.0602	[−0.43]
SEQQH (total stockholders equity)	0.1970	[1.01]	0.1862	[1.28]	0.0993	[0.66]
ICAPTQH (total invested capital)	0.1884	[1.14]	0.1754	[1.34]	0.1702	[1.25]
PSTKRQH (redeemable preferred/preference stock)	0.1967	[1.19]	0.1901	[1.46]	0.1895	[1.40]
TEQQH (total stockholders equity)	0.1993	[1.21]	0.1957	[1.50]	0.1939	[1.43]
PPENTQH (total (net) property, plant, and equipment)	0.2045	[1.26]	0.1994	[1.50]	0.1852	[1.34]
LTQH (total liabilities)	0.1989	[1.22]	0.1929	[1.45]	0.1805	[1.30]
PSTKQH (total preferred/preference stock (capital))	0.1855	[1.12]	0.1778	[1.32]	0.1609	[1.14]
CEQQH (total common/ordinary equity)	0.1797	[1.09]	0.1744	[1.30]	0.1547	[1.11]
AOQH (total other assets)	0.2142	[1.39]	0.2341*	[1.85]	0.2252*	[1.71]
DLTTQH (total long-term debt)	0.2347	[1.62]	0.2617**	[2.12]	0.2838**	[2.21]
LOQH (total other liabilities)	0.2387*	[1.65]	0.2685**	[2.13]	0.3015**	[2.30]
ACOQH (total other current assets)	0.2664*	[1.77]	0.2920**	[2.27]	0.3313**	[2.48]
CHEQH (cash and short-term investments)	0.2622*	[1.72]	0.3386**	[2.46]	0.4658***	[3.35]
LCOQH (total other current liabilities)	0.2777*	[1.82]	0.3449**	[2.49]	0.4786***	[3.43]
APQH (accounts payable)	0.2660*	[1.74]	0.3407**	[2.51]	0.4863***	[3.59]
DVPQH (preferred/preference dividends)	0.2479	[1.62]	0.3261**	[2.40]	0.4679***	[3.46]
SALEQH (sales/turnover (net))	0.3711**	[2.51]	0.4474***	[3.49]	0.5579***	[4.27]
XIDOQH (extraordinary items and discontinued operations)	0.3427**	[2.33]	0.4293***	[3.39]	0.5294***	[4.09]
IBQH (income before extraordinary items)	0.5926***	[4.03]	0.7419***	[6.04]	0.7530***	[5.87]
IBADJQH (income before extraordinary items, adjusted for common stock equivalents)	0.6329***	[4.24]	0.7793***	[6.26]	0.7825***	[6.02]
NIQH (net income (loss))	0.6263***	[4.24]	0.7643***	[6.18]	0.7613***	[5.90]
IBCOMQH (income before extraordinary items, available for common)	0.6114***	[4.21]	0.7445***	[6.08]	0.7394***	[5.79]
PIQH (pretax income)	0.6551***	[4.49]	0.7815***	[6.43]	0.7733***	[6.10]
TXTQH (total income taxes)	0.6058***	[4.10]	0.7354***	[5.95]	0.7356***	[5.70]
NOPIQH (nonoperating income (expense))	0.6329***	[4.29]	0.7627***	[6.37]	0.7258***	[5.82]
DOQH (discontinued operations)	0.6463***	[4.44]	0.7802***	[6.55]	0.7495***	[6.04]
DVQH (cash dividends)	0.4814***	[3.19]	0.6232***	[5.11]	0.6133***	[4.83]
Panel B: Signal deletions (sequentially dropped variables)						
None (signal with all variables)	0.4814***	[3.19]	0.6232***	[5.11]	0.6133***	[4.83]

3.5 Empirical result

The role of each of 28 accounting items

ATQH (total assets)	0.4877***	[3.23]	0.6287***	[5.13]	0.6190***	[4.86]
SEQQH (total stockholders equity)	0.4634***	[3.09]	0.6040***	[4.92]	0.5907***	[4.63]
ICAPTQH (total invested capital)	0.4523***	[3.01]	0.5876***	[4.77]	0.5701***	[4.45]
PSTKRQH (redeemable preferred/preference stock)	0.4338***	[2.90]	0.5707***	[4.65]	0.5516***	[4.32]
TEQQH (total stockholders equity)	0.4222***	[2.82]	0.5593***	[4.57]	0.5446***	[4.28]
PPENTQH (total (net) property, plant, and equipment)	0.4267***	[2.86]	0.5604***	[4.58]	0.5469***	[4.29]
LTQH (total liabilities)	0.3619**	[2.35]	0.5094***	[4.23]	0.4851***	[3.86]
PSTKQH (total preferred/preference stock (capital))	0.3785**	[2.44]	0.5252***	[4.31]	0.4974***	[3.92]
CEQQH (total common/ordinary equity)	0.4058***	[2.69]	0.5429***	[4.54]	0.5202***	[4.19]
AOQH (total other assets)	0.3963***	[2.85]	0.5381***	[4.47]	0.5721***	[4.75]
DLTTQH (total long-term debt)	0.3558**	[2.37]	0.4874***	[4.01]	0.4561***	[3.69]
LOQH (total other liabilities)	0.4135***	[2.72]	0.5192***	[4.23]	0.4408***	[3.49]
ACOQH (total other current assets)	0.3754**	[2.45]	0.4689***	[3.83]	0.3955***	[3.14]
CHEQH (cash and short-term investments)	0.3644**	[2.14]	0.3796***	[2.91]	0.2946**	[2.18]
LCOQH (total other current liabilities)	0.3357**	[1.98]	0.3504***	[2.68]	0.2821**	[2.08]
APQH (accounts payable)	0.3380**	[2.01]	0.3507***	[2.69]	0.2951**	[2.17]
DVPQH (preferred/preference dividends)	0.3422**	[2.01]	0.3566***	[2.71]	0.3005**	[2.20]
SALEQH (sales/turnover (net))	0.1898	[1.06]	0.2023	[1.56]	0.1097	[0.83]
XIDOQH (extraordinary items and discontinued operations)	0.1825	[1.03]	0.1971	[1.55]	0.1028	[0.78]
IBQH (income before extraordinary items)	0.1904	[1.08]	0.2149*	[1.68]	0.1210	[0.92]
IBADJQH (income before extraordinary items, adjusted for common	0.1899	[1.07]	0.2126*	[1.65]	0.1121	[0.85]
NIQH (net income (loss))	0.1738	[0.98]	0.2034	[1.58]	0.1108	[0.83]
IBCOMQH (income before extraordinary items, available for common)	0.1427	[0.81]	0.1634	[1.27]	0.0839	[0.63]
PIQH (pretax income)	0.0067	[0.04]	−0.0033	[−0.02]	−0.0733	[−0.52]
TXTQH (total income taxes)	−0.0598	[−0.35]	−0.0865	[−0.64]	−0.0203	[−0.15]
NOPIQH (nonoperating income (expense))	−0.0607	[−0.35]	−0.0889	[−0.66]	−0.0413	[−0.30]
DOQH (discontinued operations)	−0.0589	[−0.34]	−0.0909	[−0.67]	−0.0363	[−0.26]
DVQH (cash dividends)	−0.1172	[−0.70]	−0.1559	[−1.20]	−0.0718	[−0.54]
Panel C: Balance sheet, income and cash flow statement items						
All balance sheet items	0.2643*	[1.73]	0.3396**	[2.50]	0.4852***	[3.59]
All income and cash flow statement items	0.3380**	[2.01]	0.3507***	[2.69]	0.2951**	[2.17]

4.Conclusion

- We apply minimal discretion in estimating a intrinsic value ,and use it to predicts returns in the subsequent month and up to three years in the future ,and the abnormal return spreads range from 4% to 10%. Thus, market price do not fully reflect accounting data.
- One could investigate other potentially valuable information with the type of statistical analysis undertaken here.
- We have presented evidence supporting the claim that the abnormal profits earned from our version of fundamental analysis are not due to an omitted risk factor.
- Because the accounting data seem to have an underlying factor structure, fewer accounting variables could do as well as, or improve upon, the strategies derived here. We leave that, and improvements in the fair value estimation approach, to future research.
- Obvious steps for future research would extend this analysis to global financial markets and to address whether firms are aware of how their share prices deviate from fair value.