

Standardized Unexpected Earnings In The U. S. Technology Sector^{*}

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Abstract

Earnings surprise occurs when the firm's reported earnings per share deviates from the street estimate. This study shows that earnings surprises are useful in identifying portfolios that yield excess returns in the U.S. tech sector. The tech portfolios with the most positive earnings surprises outperformed the tech portfolios with the most negative earnings surprises in terms of both mean and median returns in the U.S. stock market. The study demonstrates that arbitrage profits could be generated if investors bought (short sold) the tech stocks with the highest earnings surprises (the lowest) two or three months after the end of the quarter. The study demonstrates that this trading strategy is most effective when fewer rather than more financial analysts follow the firms.

Introduction

Earnings surprise occurs when the firm's reported earnings per share deviates from the street estimate or the analysts' consensus forecast. The unexpected earnings have been found to be useful in predicting abnormal stock returns. The investment implications of the size and sign of the unexpected earnings in global equity markets are well addressed in recent years. For example, Sultan (1994) finds that the unexpected earnings can be used as a discriminator between stocks that performed relatively well and stocks that performed relative poorly in Japan. Brown and Jeong (1998) show that an earnings surprise predictor is effective in selecting stocks from S&P 500 firms. Dische and Zimmermann (1999) report that abnormal returns can be earned from the portfolio of the Swiss stocks exhibiting the most positive earnings revision. Conroy, Eades and Harris (2000) find that stock prices are significantly affected by earnings surprises in Japan. Mozes (2000) shows that the strategy of buying stocks on the basis of positive forecasted earnings surprises is more profitable for value firms than for growth firms. Bird, McElwee and McKinnon (2000) provide insights into how to identify investment opportunities based on earnings surprises and highlight the extent to which the opportunities differ across countries. Hsu (2001) demonstrates that it is profitable to take a long position in the portfolios with the highest earnings surprises and a short position in the portfolios with the lowest earnings surprises in the Asia/Pacific equity market. Levis and Liodakis (2001) conclude that positive and negative earnings surprises have an asymmetrical effect on the returns of low- and high-rated stocks in the U.K. However, not much on the subject is documented for specific industry sectors. The objective of this study is to contribute to the literature by adding this missing piece. The focus is on the U.S. technology sector as it has attracted significant public interest in recent years. This paper first examines if a trading strategy on the basis of earnings surprises worked in the U.S. tech sector. Then it investigates if the strategy worked better for firms followed by fewer rather than more financial analysts.

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Data And Analysis

This study is based upon a sample of the U.S. tech firms with fiscal year ending in March, June, September or December compiled in I/B/E/S History database for the period 1994 – 2000. To eliminate firms with inactive trading, the sample includes only those firms followed by at least three financial analysts. The sample universe consists of roughly 270 tech firms in 1994, growing to 500 firms in 2000, resulting in 7966 stock-quarter observations for the analysis.

To see if earnings surprises can be used to construct a trading strategy, the relationship between earnings surprises and stock performance is examined. Standardized unexpected earnings, SUE, is used to measure earnings surprise:

$$SUE_Q = (A_Q - F_Q) / SD_Q$$

...where

- SUE_Q = quarter Q standardized unexpected earnings
- A_Q = quarter Q actual earnings per share reported by the firm
- F_Q = quarter Q consensus earnings per share forecasted by analysts in quarter Q-1
- SD_Q = quarter Q standard deviation of earnings estimates

SUE measures the earnings surprise in terms of the number of standard deviation above or below the consensus earnings estimate. The absolute value of SUE measures the degree of unexpected earnings and the sign of SUE indicates whether the unexpected earnings are above or below the consensus estimate. That is, the greater the positive SUE the greater the earnings surprise above the earnings estimate while the smaller the negative SUE the greater the earnings surprise below the earnings estimate. There's no earnings surprise when SUE equals zero; the actual earnings per share is in line with the consensus earnings estimate.

At the end of each quarter from 1994.4 to 1999.4, firms are ranked on the basis of their SUE scores and categorized into one of the five portfolios. The portfolio ranked the highest on SUE contains firms with SUE ≥ 5 and the portfolio ranked the lowest on SUE contains firms with SUE ≤ -5. The main interest of the analysis is on these two extreme portfolios.

The 3-month holding period rate of return, R, is then calculated as the sum of the stock's dividend yield and capital gains yield for each firm:

$$R_{t+3} = [DIV_{t+3} / P_t] + [(P_{t+3} - P_t) / P_t]$$

...where

- R_{t+3} = three-month holding period rate of return, transaction made in month t
- DIV_{t+3} = dividends on common stock during the three-month holding period
- P_{t+3} = month t+3 price of stock
- P_t = month t price of stock

Table 1 summarizes the descriptive statistics of the 3-month holding period returns for the portfolios ranked the highest and the lowest on SUE. The highest SUE portfolios outperformed the lowest SUE portfolios in terms of both mean return and median return in all 20 quarters when the stock transactions were made at the ending month of SUE quarter for the period 1995.1 to 1999.4. Figure 1 shows the quarterly mean returns for the two portfolios over the quarters 1995.2 to 2000.1. The differences between the two portfolios' mean (median) returns ranging from 12.7% to 62.3% are statistically significant for all 20 investment periods. The implication is that going long in the portfolios with SUE ≥ 5 and going short in the portfolios with SUE ≤ -5 can generate handsome arbitrage profits in every single quarter from 1995.2 to 2000.1. As SUE information is not available at the end of the SUE quarter in practice, predicting SUE is an important task for fund managers and investors.

Table 1
Quarterly Return^a Statistics Of The Portfolios Ranked The Highest And The Lowest On SUE

SUE Quarter		SUE ≥ 5	SUE ≤ -5	Spread	T-Statistics
95.1	Mean	0.196	-0.051	0.247	(3.996)***
	Median	0.198	-0.057	0.255	(4.545)***
	Standard Deviation	0.202	0.274		
	Count	59	24		
95.2	Mean	0.371	0.030	0.341	(6.229)***
	Median	0.360	0.010	0.351	(8.885)***
	Standard Deviation	0.281	0.230		
	Count	55	34		
95.3	Mean	0.161	-0.195	0.356	(4.275)***
	Median	0.074	-0.223	0.298	(6.611)***
	Standard Deviation	0.449	0.255		
	Count	41	32		
95.4	Mean	0.131	-0.254	0.385	(5.623)***
	Median	0.039	-0.266	0.305	(8.287)***
	Standard Deviation	0.361	0.227		
	Count	39	38		
96.1	Mean	0.253	-0.075	0.328	(5.580)***
	Median	0.197	-0.119	0.317	(8.457)***
	Standard Deviation	0.323	0.212		
	Count	51	32		
96.2	Mean	0.088	-0.240	0.327	(6.904)***
	Median	0.127	-0.252	0.379	(13.309)***
	Standard Deviation	0.246	0.197		
	Count	42	48		
96.3	Mean	0.039	-0.088	0.127	(2.267)*
	Median	0.016	-0.065	0.081	(1.947)*
	Standard Deviation	0.278	0.267		
	Count	55	41		
96.4	Mean	-0.124	-0.323	0.199	(3.819)***
	Median	-0.134	-0.338	0.204	(4.727)***
	Standard Deviation	0.220	0.237		
	Count	57	30		
97.1	Mean	0.365	-0.140	0.505	(7.672)***
	Median	0.303	-0.077	0.381	(9.361)***
	Standard Deviation	0.401	0.241		
	Count	60	35		
97.2	Mean	0.311	-0.056	0.367	(6.043)***
	Median	0.202	-0.012	0.214	(5.264)***
	Standard Deviation	0.350	0.266		
	Count	60	43		
97.3	Mean	-0.097	-0.410	0.313	(7.488)***
	Median	-0.076	-0.450	0.375	(11.330)***
	Standard Deviation	0.220	0.209		
	Count	74	40		
97.4	Mean	0.342	-0.097	0.439	(7.175)***
	Median	0.344	-0.171	0.515	(10.906)***
	Standard Deviation	0.309	0.331		
	Count	63	49		

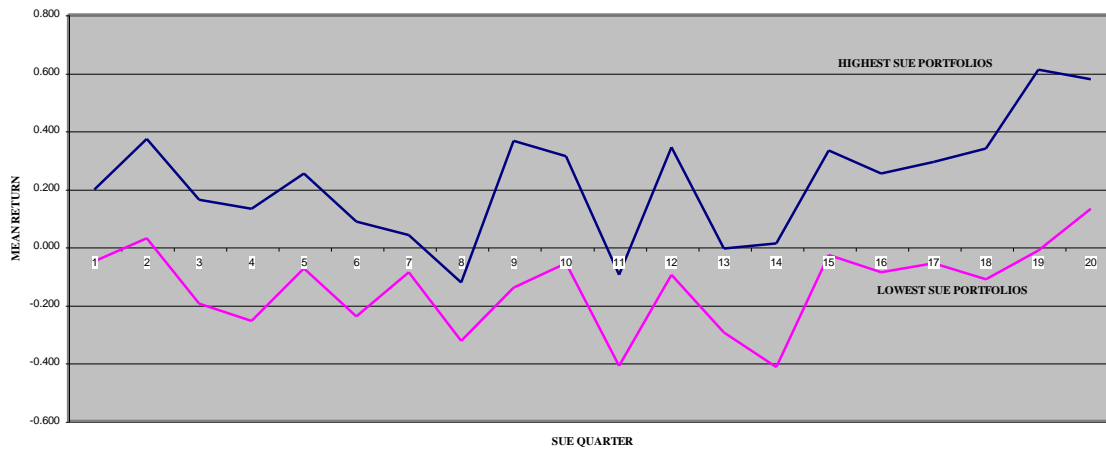
98.1	Mean	-0.006	-0.296	0.290	(6.964)***
	Median	-0.022	-0.336	0.313	(10.437)***
	Standard Deviation	0.251	0.216		
	Count	76	52		
98.2	Mean	0.011	-0.414	0.425	(9.775)***
	Median	0.001	-0.405	0.406	(17.896)***
	Standard Deviation	0.310	0.186		
	Count	70	67		
98.3	Mean	0.333	-0.028	0.360	(5.126)***
	Median	0.279	-0.070	0.348	(5.947)***
	Standard Deviation	0.354	0.469		
	Count	83	64		
98.4	Mean	0.251	-0.089	0.340	(3.569)***
	Median	0.137	-0.122	0.259	(4.167)***
	Standard Deviation	0.711	0.403		
	Count	97	42		
99.1	Mean	0.292	-0.057	0.350	(4.348)***
	Median	0.207	-0.100	0.308	(5.130)***
	Standard Deviation	0.488	0.433		
	Count	83	52		
99.2	Mean	0.338	-0.112	0.450	(7.873)***
	Median	0.273	-0.191	0.463	(11.218)***
	Standard Deviation	0.381	0.283		
	Count	93	47		
99.3	Mean	0.610	-0.013	0.623	(6.519)***
	Median	0.433	-0.058	0.490	(8.285)***
	Standard Deviation	0.728	0.384		
	Count	94	42		
99.4	Mean	0.578	0.132	0.446	(3.609)***
	Median	0.562	0.001	0.561	(5.068)***
	Standard Deviation	0.602	0.683		
	Count	121	38		

^a Stock transactions were made at the ending month of the SUE quarter.

*** Significant at .0005 level.

* Significant at .05 level.

Figure 1
Quarterly Mean Returns of Portfolios Ranked the Highest and the Lowest on Sue, 1995.2-2001.1



Accurately predicting SUE is extremely rewarding but it's not an easy job, especially for individual investors with limited information. Is trading according to the public information of past SUE still profitable? In practice, firms announce quarterly earnings within two months after the end of the quarter for the first three quarters and within three months after the end of the fourth quarter. To ensure that SUE information is available to the public at the time of the stock transactions, the stocks are bought in May, August, November and March hereinafter in this study. Once again, firms are ranked according to their SUE scores and placed in one of the five portfolios for each of the SUE quarters, 1994.4 - 1999.3. All stocks are held for three months and sold at the end of the 3-month holding period; the reposition of portfolio holdings takes place every three months throughout the 5-year study period. Table 2 shows the holding period return statistics by SUE category. Notice that the portfolios with $SUE \geq 5$ outperformed the portfolios with $SUE \leq -5$ in 18 out of the 20 investment periods in terms of both mean and median returns. The two exceptions are SUE quarters 1996.3 and 1998.4. Also shown in Table 2 is that the higher returns generated by the portfolios are not associated with the higher standard deviations. That is, risk as measured in terms of the dispersion of the returns is not a factor in determining the portfolio return over the 5-year investment horizon in this study. Table 2 suggests that investors could have reaped arbitrage profits if they traded portfolios on the basis of the previous quarter's SUE scores, i.e., bought the highest SUE portfolios and short sold the lowest SUE portfolios every three months.

Table 2
Quarterly Return^a Statistics Of The Portfolios Ranked On SUE

SUE Quarter		$SUE \geq 5$	$5 > SUE \geq 1$	$1 > SUE > -1$	$-1 \geq SUE > -5$	$-5 \geq SUE$	All
94.4	Mean	0.152	0.121	0.156	0.159	0.020	0.136
	Median	0.186	0.128	0.134	0.137	-0.033	0.137
	Standard Deviation	0.258	0.217	0.199	0.269	0.242	0.230
	Count	40	79	85	40	19	263
95.1	Mean	0.275	0.243	0.243	0.110	0.137	0.224
	Median	0.252	0.177	0.194	0.066	0.144	0.180
	Standard Deviation	0.241	0.359	0.308	0.221	0.241	0.300
	Count	59	84	71	34	23	271
95.2	Mean	0.080	-0.032	-0.014	-0.076	-0.102	-0.020
	Median	0.061	-0.035	-0.048	-0.099	-0.151	-0.043
	Standard Deviation	0.351	0.259	0.212	0.318	0.230	0.278

95.3	Count	55	98	71	38	34	296
	Mean	0.071	-0.034	-0.044	-0.051	0.042	-0.019
	Median	0.070	-0.026	-0.042	-0.046	0.034	-0.019
95.4	Standard Deviation	0.244	0.335	0.217	0.255	0.257	0.276
	Count	40	101	83	55	32	311
	Mean	0.095	0.059	0.067	0.074	0.079	0.071
96.1	Median	0.150	0.027	0.059	0.036	0.061	0.059
	Standard Deviation	0.290	0.275	0.259	0.315	0.237	0.274
	Count	39	89	104	60	38	330
96.2	Mean	-0.176	-0.191	-0.124	-0.236	-0.179	-0.172
	Median	-0.168	-0.220	-0.132	-0.223	-0.170	-0.179
	Standard Deviation	0.223	0.251	0.269	0.192	0.211	0.243
96.3	Count	50	90	115	55	31	341
	Mean	0.089	0.135	0.015	0.091	-0.032	0.060
	Median	0.134	0.097	0.029	0.069	-0.021	0.046
96.4	Standard Deviation	0.265	0.329	0.271	0.340	0.259	0.301
	Count	42	88	116	62	48	356
	Mean	-0.041	0.030	0.096	0.052	0.146	0.056
97.1	Median	-0.016	0.018	0.073	0.083	0.137	0.055
	Standard Deviation	0.287	0.289	0.294	0.271	0.368	0.300
	Count	55	95	111	70	41	372
97.2	Mean	0.356	0.136	0.176	0.127	0.093	0.177
	Median	0.266	0.107	0.154	0.077	0.018	0.138
	Standard Deviation	0.389	0.340	0.285	0.360	0.292	0.337
97.3	Count	57	128	138	54	27	404
	Mean	0.237	0.228	0.224	0.135	0.197	0.213
	Median	0.234	0.193	0.186	0.076	0.163	0.178
97.4	Standard Deviation	0.294	0.329	0.371	0.262	0.303	0.328
	Count	58	112	121	53	32	376
	Mean	0.033	0.017	-0.010	-0.006	-0.008	0.006
98.1	Median	-0.017	-0.009	-0.028	-0.027	-0.047	-0.024
	Standard Deviation	0.265	0.306	0.247	0.331	0.289	0.285
	Count	60	148	135	60	43	446
98.2	Mean	0.053	0.003	0.028	-0.025	-0.028	0.012
	Median	0.060	-0.003	0.036	-0.028	-0.016	0.015
	Standard Deviation	0.193	0.289	0.221	0.228	0.302	0.249
98.3	Count	73	138	126	63	39	439
	Mean	-0.040	-0.097	-0.140	-0.110	-0.089	-0.103
	Median	-0.033	-0.090	-0.147	-0.135	-0.109	-0.114
98.1	Standard Deviation	0.248	0.239	0.227	0.280	0.257	0.246
	Count	58	140	129	63	46	436
	Mean	-0.037	-0.149	-0.199	-0.274	-0.239	-0.175
98.2	Median	-0.051	-0.179	-0.212	-0.266	-0.261	-0.208
	Standard Deviation	0.328	0.233	0.267	0.188	0.287	0.271
	Count	75	115	147	69	51	457
98.3	Mean	0.076	-0.026	0.013	0.036	0.016	0.016
	Median	0.048	-0.011	-0.011	0.037	0.006	0.004
	Standard Deviation	0.312	0.273	0.303	0.337	0.264	0.298
98.3	Count	72	129	133	78	66	478
	Mean	0.180	0.049	0.132	0.161	0.029	0.107
	Median	0.181	0.024	0.056	0.075	0.017	0.054

98.4	Standard Deviation	0.374	0.314	0.374	0.544	0.373	0.385
	Count	83	145	156	61	63	508
	Mean	0.157	0.112	0.194	0.190	0.237	0.165
	Median	0.062	0.079	0.141	0.133	0.238	0.118
99.1	Standard Deviation	0.454	0.353	0.366	0.414	0.345	0.387
	Count	96	138	137	64	37	472
	Mean	0.225	0.105	0.069	0.054	0.074	0.107
	Median	0.158	0.076	0.001	-0.033	0.005	0.054
99.2	Standard Deviation	0.370	0.315	0.326	0.408	0.338	0.346
	Count	81	143	125	54	51	454
	Mean	0.469	0.317	0.289	0.136	0.185	0.306
	Median	0.437	0.230	0.134	0.075	0.112	0.221
99.3	Standard Deviation	0.455	0.501	0.530	0.387	0.597	0.507
	Count	91	156	124	54	45	470
	Mean	0.619	0.467	0.448	0.732	0.438	0.518
	Median	0.533	0.397	0.328	0.547	0.473	0.408
	Standard Deviation	0.665	0.577	0.655	0.936	0.758	0.683
	Count	94	164	133	54	41	486

^a Stock transactions were made two months after the end of the SUE quarter for the first three quarters and three months after the end of the SUE quarter for the fourth quarter.

The strategy seems tempting, the question is: Are the spreads between the two portfolios statistically significant? This study examines whether excess returns (losses) indeed exist in the highest (lowest) SUE portfolios and if they are significant statistically. Excess return (loss) is defined as the difference between the mean return of each SUE portfolio and the mean return of all SUE portfolios in each investment period. Table 3 presents the excess mean returns (losses) by SUE category. As displayed in the table that the portfolio ranked the highest on SUE generated excess returns in 17 out of the 20 investment periods. Its overall mean of the excess returns is 6% with standard deviation of 6.5% and is significant at .0005 level. On the other hand, the portfolio ranked the lowest on SUE yielded excess losses in 15 out of the 20 investment periods. Its overall mean of excess losses is 3.3% with standard deviation of 6.2% and is significant at .05 level. The results suggest that arbitrage returns could be achieved by trading portfolios on the basis of past earnings surprises. If investors bought (short sold) the U.S. tech stocks with $SUE \geq 5$ ($SUE \leq -5$) two or three months after the end of SUE quarter from 1994.4 to 1999.3 and rebalanced their portfolio holdings every three months, they would have earned a handsome arbitrage quarterly mean return of 9.3% (=6%+3.3%) over the 5-year investment horizon.

Table 3
Three-Month Holding Period Excess Returns^a By SUE Category, # Of Analysts^b ≥ 3

SUE Quarter	$SUE \geq 5$	$5 > SUE \geq 1$	$1 > SUE > -1$	$-1 \geq SUE > -5$	$-5 \geq SUE$
94.4	0.017	-0.014	0.020	0.023	-0.115
95.1	0.051	0.019	0.019	-0.115	-0.088
95.2	0.100	-0.011	0.007	-0.055	-0.082
95.3	0.089	-0.016	-0.025	-0.033	0.060
95.4	0.024	-0.012	-0.004	0.004	0.008
96.1	-0.003	-0.019	0.049	-0.064	-0.007
96.2	0.028	0.075	-0.045	0.030	-0.092
96.3	-0.097	-0.026	0.040	-0.004	0.090
96.4	0.179	-0.041	-0.001	-0.050	-0.084
97.1	0.025	0.016	0.012	-0.077	-0.015
97.2	0.027	0.012	-0.016	-0.011	-0.013
97.3	0.042	-0.009	0.017	-0.037	-0.040

97.4	0.063	0.006	-0.036	-0.007	0.014
98.1	0.139	0.026	-0.023	-0.098	-0.063
98.2	0.060	-0.042	-0.003	0.020	0.000
98.3	0.073	-0.058	0.025	0.054	-0.077
98.4	-0.008	-0.054	0.028	0.025	0.071
99.1	0.119	-0.002	-0.038	-0.053	-0.032
99.2	0.164	0.012	-0.017	-0.169	-0.121
99.3	0.101	-0.051	-0.070	0.214	-0.080
Mean	0.060	-0.009	-0.003	-0.020	-0.033
Standard Deviation	0.065	0.032	0.031	0.078	0.062
t- Statistics	(4.130)***	(1.322)	(0.465)	(1.158)	(2.416)*

^a Excess return=mean return of each SUE portfolio–mean return of all SUE portfolios in each investment period.

^b # of analysts = the number of financial analysts following the firm.

*** Significant at .0005 level.

* Significant at .05 level.

To see if the number of financial analysts following the firm plays any role in the relationship between SUE and the subsequent stock performance, the analysis is repeated in each of the three subgroups: group 1 contains the firms followed by no more than 5 analysts, group 3 with at least 10 analysts and group 2 contains the rest of the firms in the sample. The results are summarized in Tables 4, 5 and 6. The portfolios that consistently outperformed the others across all three groups are the ones with SUE ≥ 5 . The mean excess returns are 3.8% (t-statistics = 2.302), 7.3% (t-statistics = 3.661), and 9.5% (t-statistics = 4.449) in groups 1, 2, and 3 respectively. The arbitrage trading strategy, taking a long position in the highest SUE portfolios and a short position in the lowest SUE portfolios is effective only in group 1. As is evidenced in Table 4, when the stocks are followed by three to five financial analysts, the 3.8% mean excess return from investing in the highest SUE portfolios and the 4.3% mean excess loss from investing in the lowest SUE portfolios are statistically significant at .05 level. The arbitrage quarterly mean return equals 8.1% (=3.8%+4.3%) if investors adopted the trading strategy and repositioned their portfolio holdings on 3-month intervals over the 5-year study period. Tables 5 and 6 reveal that the arbitrage trading strategy is no longer effective when the stocks are followed by more than five analysts. As the stocks are monitored by more analysts in the market, more relevant information about the firm may be available to the public sooner and thus, arbitrage opportunities disappear. Nevertheless, when firms are followed by more than five analysts, investors could still gain more than 7% (significant at .005 level) quarterly mean excess return by investing in portfolios with SUE ≥ 5 over the five-year investment horizon.

Table 4
Three-Month Holding Period Excess Returns By SUE Category, 3 \leq # Of Analysts < 5

SUE Quarter	SUE ≥ 5	5 > SUE ≥ 1	1 > SUE > -1	-1 \geq SUE > -5	-5 \geq SUE
94.4	-0.019	-0.001	-0.009	-0.011	-0.111
95.1	0.004	0.066	0.046	-0.136	-0.069
95.2	0.141	0.008	0.005	-0.118	-0.116
95.3	0.085	-0.007	-0.038	-0.084	0.030
95.4	0.007	0.014	-0.018	0.034	0.038
96.1	-0.012	-0.027	0.086	-0.102	-0.007
96.2	-0.062	0.088	-0.102	0.004	-0.138
96.3	-0.118	-0.016	-0.016	-0.010	0.062
96.4	0.159	-0.052	-0.028	-0.077	-0.127
97.1	0.042	-0.005	0.014	-0.114	-0.086
97.2	0.029	0.028	0.001	0.023	-0.061

97.3	0.035	-0.015	-0.005	-0.076	-0.060
97.4	0.045	-0.038	-0.070	-0.010	0.029
98.1	0.162	-0.014	-0.046	-0.108	-0.083
98.2	0.083	-0.013	0.006	0.004	-0.015
98.3	-0.024	-0.046	0.011	0.056	-0.076
98.4	-0.009	-0.042	0.020	-0.004	0.056
99.1	0.087	-0.016	-0.027	-0.035	-0.028
99.2	0.114	0.000	-0.146	-0.165	-0.214
99.3	0.007	-0.011	-0.053	0.320	0.120
Mean	0.038	-0.005	-0.018	-0.030	-0.043
Standard Deviation	0.073	0.035	0.050	0.104	0.082
t- Statistics	(2.302)*	(0.635)	(1.630)	(1.314)	(2.331)*

* Significant at .05 level.

Table 5
Three-Month Holding Period Excess Returns By Sue Category, 5 ≤ # Of Analysts < 10

SUE Quarter	SUE ≥ 5	5 > SUE ≥ 1	1 > SUE > -1	-1 ≥ SUE > -5	-5 ≥ SUE
94.4	-0.032	-0.003	0.027	-0.004	-0.127
95.1	0.122	-0.062	-0.019	-0.173	-0.075
95.2	0.021	-0.039	0.018	0.035	-0.024
95.3	0.111	-0.035	-0.030	0.000	0.290
95.4	0.076	-0.036	0.073	-0.153	-0.041
96.1	-0.027	-0.078	-0.060	-0.022	0.050
96.2	0.116	0.004	0.031	0.068	0.031
96.3	-0.075	-0.029	0.056	-0.046	0.127
96.4	0.289	-0.073	0.064	0.109	0.175
97.1	-0.035	0.099	-0.018	-0.042	0.131
97.2	0.074	0.021	0.021	-0.008	0.165
97.3	0.059	-0.026	0.033	-0.057	0.083
97.4	0.067	0.037	-0.019	-0.029	-0.002
98.1	0.122	0.034	-0.032	-0.122	-0.096
98.2	-0.003	-0.126	-0.028	0.045	0.001
98.3	0.106	-0.117	0.068	0.017	-0.110
98.4	0.002	-0.073	0.039	0.009	0.022
99.1	0.201	-0.029	-0.051	-0.068	-0.023
99.2	0.091	-0.032	0.114	-0.086	-0.088
99.3	0.163	-0.038	0.003	0.271	-0.447
Mean	0.073	-0.030	0.014	-0.013	0.002
Standard Deviation	0.089	0.053	0.046	0.097	0.152
t- Statistics	(3.661)**	(2.527)*	(1.393)	(0.588)	(0.062)

** Significant at .005 level.

* Significant at .05 level.

The weak form of efficient-market hypothesis states that one cannot make easy profits by acting on past information. That is, the market has no memory and knowing the past doesn't help in generating future returns. The results presented in this study seem to suggest otherwise. Is the market really inefficient in its weak form? Instead of refuting the hypothesis, one possible explanation for the results in this study is explored. To see if the size and sign of past SUE might be indicative of the size and sign of future SUE, the serial correlations of SUEs over the quarters of 1994.4 – 1999.2 are calculated and summarized in Table 7. It is interesting to note that the SUE in quarter Q is positively correlated with the SUE in the subsequent four quarters, Q+1, Q+2, Q+3 and Q+4, with the mean correlation coefficient equaling .349, .255, .226 and .180 respectively. Figure 2 displays that the coefficients of correlation are positive in all paired quarters, thus the stock with high SUE tends to have high SUE in subsequent quarters and vice versa. Trading on the basis of previous quarter's SUE is profitable as it is directly correlated with the SUE in the subsequent quarter. It is possible that trading on past SUE won't be effective when the previous quarter's SUE is no longer strongly correlated with the subsequent quarter's SUE in the future.

Table 6
Three-Month Holding Period Excess Returns By SUE Category, # Of Analysts ≥ 10

SUE Quarter	SUE ≥ 5	5 > SUE ≥ 1	1 > SUE > -1	-1 ≥ SUE > -5	-5 ≥ SUE
94.4	0.171	-0.060	0.079	0.152	-0.066
95.1	0.117	-0.054	0.012	-0.010	-0.192
95.2	0.046	-0.037	0.001	0.001	-0.013
95.3	0.062	-0.022	0.027	0.060	0.022
95.4	0.012	-0.063	-0.041	0.024	-0.054
96.1	0.128	0.135	0.123	-0.007	-0.047
96.2	0.244	0.079	0.050	0.074	-0.032
96.3	-0.001	-0.061	0.195	0.077	0.189
96.4	0.143	0.043	-0.016	-0.138	-0.061
97.1	0.054	-0.015	0.088	0.062	0.021
97.2	-0.039	-0.070	-0.122	-0.179	na
97.3	0.029	0.050	0.043	0.170	0.059
97.4	0.124	0.080	0.034	0.069	-0.041
98.1	0.085	0.104	0.055	-0.023	0.081
98.2	0.067	-0.011	0.008	0.041	0.078
98.3	0.242	0.001	0.012	0.152	0.009
98.4	-0.014	-0.055	0.032	0.173	0.252
99.1	0.100	0.048	-0.046	-0.077	-0.059
99.2	0.330	0.069	0.040	-0.300	0.052
99.3	0.007	-0.011	-0.053	0.320	0.120
Mean	0.095	0.007	0.026	0.032	0.017
Standard Deviation	0.096	0.064	0.068	0.138	0.101
t- Statistics	(4.449)***	(0.527)	(1.722)	(1.041)	(0.719)

na = not available

*** Significant at .0005 level.

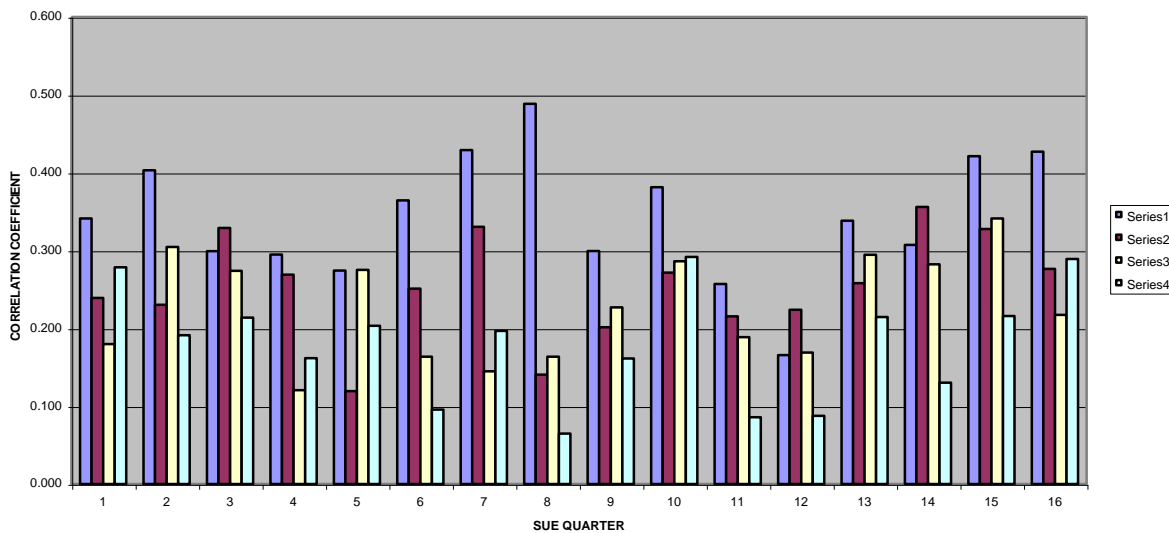
Table 7
Serial Correlation Coefficient of SUE, By Quarter

Q	Q+1	Q+2	Q+3	Q+4
94.4	0.341	0.239	0.180	0.278
95.1	0.403	0.230	0.305	0.191
95.2	0.299	0.329	0.274	0.214
95.3	0.295	0.269	0.121	0.162
95.4	0.274	0.119	0.275	0.203
96.1	0.364	0.251	0.164	0.096
96.2	0.429	0.330	0.145	0.197
96.3	0.488	0.141	0.164	0.065
96.4	0.299	0.202	0.227	0.161
97.1	0.381	0.272	0.286	0.292
97.2	0.257	0.215	0.189	0.086
97.3	0.166	0.224	0.169	0.088
97.4	0.338	0.258	0.294	0.215
98.1	0.307	0.356	0.282	0.130
98.2	0.421	0.327	0.341	0.216
98.3	0.427	0.276	0.217	0.289
98.4	0.397	0.284	0.203	
99.1	0.466	0.262		
99.2	0.275			
Mean	0.349	0.255	0.226	0.180

Q = the SUE quarter

Q+j = j quarter(s) after the SUE quarter, j = 1, 2, 3, 4.

Figure 2
Serial Correlation Coefficient Of SUE




Series 1 = Correlation coefficient between SUE in Q and SUE in Q+1

Series 2 = Correlation coefficient between SUE in Q and SUE in Q+2

Series 3 = Correlation coefficient between SUE in Q and SUE in Q+3

Series 4 = Correlation coefficient between SUE in Q and SUE in Q+4

Summary And Conclusions

This study shows that unexpected earnings are useful in identifying portfolios that yield excess returns in the U.S. tech sector. The highest SUE portfolios outperformed the lowest SUE portfolios in terms of both mean and median returns in every single quarter from 1995.2 to 2000.1 when the portfolios were invested at the ending month of the SUE quarter for the quarters of 1995.1 to 1999.4. As SUE information is not available at the end of the SUE quarter, accurately predicting SUE is extremely rewarding for fund managers and investors in the U.S. tech stock market. In addition, the study finds that arbitrage returns could be achieved by trading portfolios on the basis of past earnings surprises. If investors bought (short sold) the U.S. tech stocks with $SUE \geq 5$ ($SUE \leq -5$) two or three months after the end of SUE quarter from 1994.4 to 1999.3 and rebalanced their portfolio holdings every three months, they would have earned a handsome arbitrage quarterly mean return of 9.3% over the 5-year investment horizon. The study demonstrates that this trading strategy is most effective when the firms are followed by three to five financial analysts. When the stocks are widely monitored by analysts in the market, more relevant information about the stock may be available to the public sooner and thus, arbitrage opportunities disappear. Nonetheless, when firms are followed by more than five analysts, investors could still gain more than 7% (significant at .005 level) quarterly mean excess return by investing in portfolios with $SUE \geq 5$ over the five-year investment horizon. Finally, the study suggests that trading on the basis of previous quarter's SUE is profitable as it is directly correlated with the SUE in the subsequent quarter. It is possible that trading on past SUE won't be effective when the previous quarter's SUE is no longer strongly correlated with the subsequent quarter's SUE in the future. 

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