



Improving Earnings Forecasts with Estimize Crowd Sourced Data

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Executive Summary

McKinley Capital Management, LLC (“McKinley Capital” or the “firm”) is a global equity investment adviser. A prime component of the firm’s investment process is the use of earnings forecast data to seek companies that will be able to consistently achieve earnings surprise and acceleration. The firm is an industry leader in the creation and use of better systems and databases to collect and analyze earnings estimates and growth forecasts. In its search for better earnings data, McKinley Capital has entered into a research partnership with Estimize. Estimize is a “Big-Data” company that uses “crowdsourcing” techniques to gather earnings estimates from sell-side analysts (the traditional source), as well as buy-side and individual investor participants, which is a sample set that has never before been collected at scale. McKinley Capital has tested whether Estimize estimates provide investable information that is not otherwise available from its competitors. The test results are presented in this paper. The answer is: affirmative! Estimize data appears to contain unique and valuable pre-earnings and post-earnings announcement information in a form that can be useful for an institutional equity manager such as McKinley Capital.

Introduction

Many equity specialists believe that company earnings play a vital role in equity investment analysis and subsequent performance. Classes of active equity managers employ strategies that seek superior forecasts of future earnings and earnings growth. For example, McKinley Capital incorporates measure of “earnings acceleration” into its quantitative stock selection process. The firm favors stocks with upward consensus level earnings¹ revisions when the more accurate analysts’ estimates are also above consensus. The theory — rooted in behavioral finance — is that positive company news results in upward earnings revisions at the consensus level, but that the magnitude of the revisions systematically understates the true impact of the news. This effect is known as anchoring. The firm seeks to confirm the possibility of mispricing due to anchoring by comparing consensus estimates with the most accurate analysts’ estimates. Ideally, the accurate analysts, who should be less affected by anchoring, will post above consensus estimates. If not, the stock can be rejected for purchase. It is readily apparent that advisers who employ earnings estimates would benefit from better data, both at the consensus and superior analyst levels.

Historically, consensus earnings estimates have been based on sell-side analyst reports. Most accurate analyst designations have been drawn from among sell-side analysts. However, some think that sell-side revisions are less than accurate reflections of the true value of news. As noted above, this may be influenced by a cognitive error in

¹McKinley Capital broadly defines earnings, which may include measures like cash flow, revenues, and dividends.



the analysts' thinking. In addition, some market participants believe that many companies encourage conservative earnings analyst estimates in order to increase the probability of positive earnings "surprise." Knowledgeable investment advisers, like McKinley Capital, look beyond consensus sell-side estimates to assess the true prospects for upside surprise. McKinley Capital is an innovative creator of new methodologies used in the search for superior earnings estimates. The firm believes that a significant portion of its investment success results from its earnings acceleration ("E") model, and the use of better estimates.

In the continual search for superior earnings estimates, McKinley Capital has entered into a research partnership with Estimize. Estimize collects information to compute and publish earnings and revenue forecasts. Estimize is a "Big-Data" company that uses "crowdsourcing" techniques to gather earnings estimates from sell-side, buy-side, and individual investor participants. There are more than 50,000 participants who provide forecasts to Estimize on over 2,100 U.S. listed stocks via estimate entry forms on its web site (www.estimize.com). In return for an individual's contribution of a specific estimate, that individual is provided with free access to view peer estimates for that specific earnings report. Estimize uses this information to compute and publish Estimize "consensus" forecasts.² McKinley Capital believes that the expansive base of "Big-Data" available to Estimize might lead to better earnings forecasts than those computed using only sell-side estimates. In effect, it might be possible to consider Estimize's combined analysis output as the "most accurate analyst", and the Estimize estimate as the "smart estimate", to compare with consensus. The next section of the paper shows some of the firm's tests of Estimize estimates.

Testing the Efficiency of Estimize Crowd-Sourced Earnings Forecasts

Pre-Announcement Effects

McKinley Capital first analyzed the information content of the Estimize earnings forecasts that were available prior to earnings announcements. The test period was September 2010 through September 2016.³ For each U.S. stock in its database, Estimize provided its daily proprietary "consensus" earnings estimates for the next earnings announcement. In some cases, estimates were available for further out announcement quarters. Consensus estimates were available both as unweighted and weighted averages of all individual analyst estimates provided to Estimize. Weights for the weighted averages were determined

by Estimize using its proprietary models based on: 1) the historic accuracy of the individual estimator, 2) the number of estimates the estimator had provided, and 3) recent estimates received higher weights. Estimize also provided a parallel "Wall Street Consensus" estimate.⁴ At times, the Estimize consensus forecasts varied significantly from the Wall Street consensus forecast. The research question is whether large pre-announcement deviations provide investable information. Do significantly higher or lower estimates lead to higher or lower returns as the market begins to incorporate the Estimize information prior to the earnings announcement?

To answer this question, McKinley Capital noted the first instance — prior to the earnings announcement — of a difference of more than 10%⁵ between the Estimize and Wall Street consensus estimates, for each stock in the Estimize database. The firm found over 2,400 instances of positive deviations, and over 1,000 instances of negative deviations. For each instance, the firm measured the stock's return from the first day of deviation until the close the day before the earnings announcement. The results for both unweighted and weighted estimates are reported in the following table and charts. On average, across all of the stocks and announcement periods, the relative returns for the positive deviation stocks were not statistically different from zero. It did not matter whether the estimates were unweighted or weighted. However, the negative deviation stocks underperformed the S&P 500 by -168 basis points ("bps") on an unweighted basis and -11 bps on a weighted basis. These results are both economically meaningful and statistically significant. During the test period, most small cap stocks (stocks in the Russell 2000) had few estimates. If the study is limited to large cap stocks (stocks in the Russell 1000), the corresponding results for the negative deviation stocks are -274 bps using unweighted estimates and -200 bps using weighted estimates. Even with fewer observations the results remain highly economically meaningful and statistically significant. The returns for the positive deviation stocks, while positive, were not statistically distinguishable from zero. There did not appear to be any important effects for small stocks — those in the Russell 2000 — or for micro cap stocks — those not in either index (all other trades).

Chart Two shows the distribution of time between the first +/- 10% estimate difference and the realized announcement day for the unweighted trades. The largest batch is close to the actual announcement day. Estimize receives many of its estimates close to announcement, so this effect is not surprising. The second largest batch is right after announcement day for the

² From Estimize website: <http://www.estimize.com>.

³ Estimize has computed earnings forecasts for U.S. traded stocks beginning in September of 2010 on a limited basis. More complete coverage began at the beginning of 2012. All estimate data was provided by Estimize. All returns for this study were computed by McKinley Capital using FactSet data.

⁴ "Wall Street Consensus estimates" were provided by Estimize — using data it acquired from Zacks.

⁵ 1c for stocks with Wall Street consensus estimates of less than 10c.



previous announcement.

This data confirms some intuition, and also provides evidence that there might be valuable information content in Estimize estimates that is not incorporated in Wall Street consensus estimates or by the market. Intuitively, many probably believe that “Street” analysts systematically underestimate earnings. This allows firms to report regular and positive earnings “surprises.” The fact that independent estimates are higher than street estimates might not be valuable information about earnings, but only a confirmation of street estimate bias. Most of the actual earnings information seems to be contained on the “avoid” side. As the data indicates, significant economic benefit is potentially derived from shorting/selling/avoiding stocks when the Estimize earnings estimate comes in significantly below Wall Street consensus. This type of information is potentially valuable to managers seeking to avoid stocks that might have future unexpected and negative surprises. When used as an avoid signal, this information can be employed with little to no transaction costs. It is also interesting to note that the unweighted test works better than the weighted test. This observation implies that the value of “crowd-sourcing” is in increasing the number of estimates. Weighting, while seemingly logical, has the potential to effectively reduce impact of some number of estimates.⁶

Chart One: Unweighted Pre-Announcement Signal Returns September 2010 – September 2016*

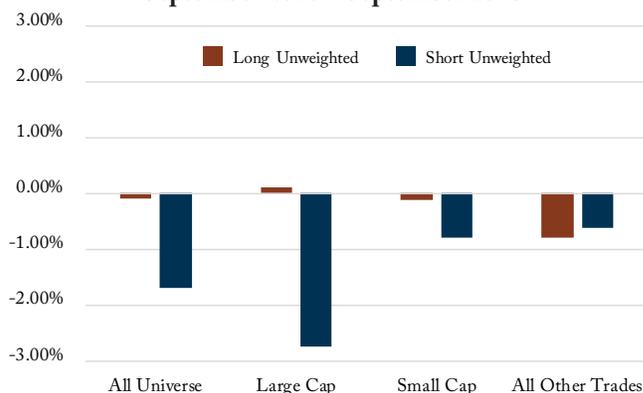


Chart Two: Number of Trades September 2010 – September 2016*

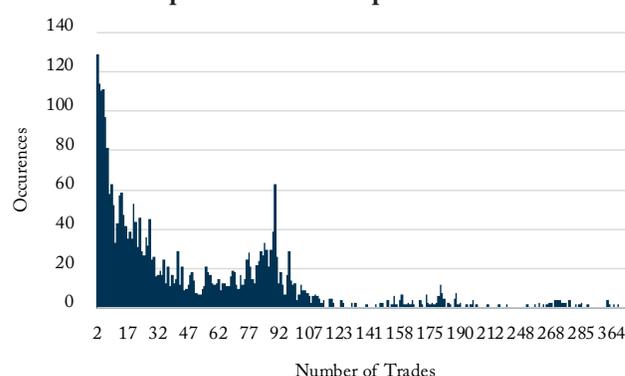


Table One: Pre-Announcement Drift September 2010 – September 2016*

Trade	Avg. of Abs. Return	Avg. of S&P 500	Avg. of Rel. Return	# Trades	St. Dev. Abs. Return
Long Unweighted	1.27%	1.34%	-0.08%	2402	15.71%
Long Weighted	1.11%	1.19%	-0.08%	2430	16.13%
Short Unweighted	-0.15%	1.53%	-1.68%	842	17.91%
Short Weighted	0.61%	1.73%	-1.21%	1056	18.26%

Large Cap

Trade	Avg. of Abs. Return	Avg. of S&P 500	Avg. of Rel. Return	# Trades	St. Dev. Abs. Return
Long Unweighted	1.53%	1.43%	0.10%	1282	15.63%
Long Weighted	1.79%	1.36%	0.43%	1279	17.30%
Short Unweighted	-1.17%	1.58%	-2.75%	393	17.06%
Short Weighted	-0.28%	1.72%	-2.00%	533	17.20%

Small Cap

Trade	Avg. of Abs. Return	Avg. of S&P 500	Avg. of Rel. Return	# Trades	St. Dev. Abs. Return
Long Unweighted	1.03%	1.15%	-0.12%	852	16.30%
Long Weighted	0.30%	0.93%	-0.63%	886	15.20%
Short Unweighted	0.71%	1.49%	-0.78%	354	19.12%
Short Weighted	1.34%	1.72%	-0.38%	412	19.81%

All Other Trades

Trade	Avg. of Abs. Return	Avg. of S&P 500	Avg. of Rel. Return	# Trades	St. Dev. Abs. Return
Long Unweighted	0.72%	1.51%	-0.79%	269	14.13%
Long Weighted	0.55%	1.29%	-0.73%	265	13.01%
Short Unweighted	0.84%	1.45%	-0.62%	95	16.50%
Short Weighted	2.19%	1.85%	0.34%	111	17.15%

⁶ In some cases, the estimate spread between the Estimize numbers and the Wall Street consensus numbers persisted through the close of trading on the day before the earnings announcement. McKinley Capital tested whether there is further tradeable information in those instances. However, the firm was unable to confirm a relationship between the spread at the close of trading before the announcement and the price change from close to open. It is possible that any information content in the spread had been discounted prior to the earnings announcement.

* All data sourced from Estimize, FactSet, and McKinley Capital Management, LLC. June, 2017.



Post Announcement Day Effects

Many investment advisers, including McKinley Capital, believe that the stocks of companies that announce **significant** and positive earnings surprises tend to outperform in the weeks after the surprise. To test this assumption, McKinley Capital measured the returns for stocks in the Estimize database that exceeded/fell short of the final earnings estimate by 10% or more.⁷ Cumulative returns were measured through the close on announcement day, through the day after the announcement, through two days after the announcement, through five days after the announcement, and through twenty days after the announcement.⁸ Earnings surprises were identified against both the unweighted Estimize final earnings estimates⁹ and against the Wall Street consensus final earnings estimates. The results are reported in Table Two.

On the positive surprise side, the results confirm the intuition of those advisers, that believe surprise matters past the initial announcement effect. Subsequent to whatever price change occurs from the previous close to the open after the announcement, positive surprise tends to be followed by positive excess returns. For stocks of all sizes, the price change from the open to close on announcement day averaged 30 bps for all stocks with positive surprise relative to the unweighted Estimize final estimates, and 25 bps for all stocks with positive surprise relative to the Wall Street consensus final estimates. While the path was variable, by day twenty, the cumulative excess return averaged 121 bps for all stocks with positive surprise relative to the Wall Street consensus final estimates. The results were in the same direction whether the universe was large, small, or micro. Unlike the pre-announcement

Table Two: Post-Announcement Drift
September 2010 – September 2016 (RD denotes Report Day)

Trade	RD Rel. Return	Through RD +1 Rel. Return	Through RD +2 Rel. Return	Through RD +5 Rel. Return	Through RD +20 Rel. Return	Number of Trades
Long Unweighted	0.30%	0.24%	0.26%	0.50%	1.21%	4785
Long Wall St. Consensus	0.25%	0.17%	0.14%	0.30%	1.11%	5898
Short Unweighted	-0.45%	-0.02%	-0.06%	0.19%	1.01%	3271
Short Wall St. Consensus	-0.39%	-0.03%	-0.04%	0.28%	1.15%	2419

Large Cap

Trade	RD Rel. Return	Through RD +1 Rel. Return	Through RD +2 Rel. Return	Through RD +5 Rel. Return	Through RD +20 Rel. Return	Number of Trades
Long Unweighted	0.25%	0.20%	0.20%	0.38%	1.01%	2014
Long Wall St. Consensus	0.17%	0.11%	0.09%	0.26%	0.89%	2619
Short Unweighted	-0.03%	-0.15%	-0.15%	0.08%	0.64%	1172
Short Wall St. Consensus	0.00%	-0.20%	-0.22%	0.10%	0.75%	816

Small Cap

Trade	RD Rel. Return	Through RD +1 Rel. Return	Through RD +2 Rel. Return	Through RD +5 Rel. Return	Through RD +20 Rel. Return	Number of Trades
Long Unweighted	0.46%	0.32%	0.35%	0.65%	1.39%	2332
Long Wall St. Consensus	0.40%	0.26%	0.19%	0.35%	1.25%	2785
Short Unweighted	-0.84%	0.10%	0.17%	0.65%	1.86%	1641
Short Wall St. Consensus	-0.76%	0.11%	0.28%	0.86%	1.83%	1253

All Other Trades

Trade	RD Rel. Return	Through RD +1 Rel. Return	Through RD +2 Rel. Return	Through RD +5 Rel. Return	Through RD +20 Rel. Return	Number of Trades
Long Unweighted	-0.03%	0.03%	0.05%	0.26%	1.10%	439
Long Wall St. Consensus	-0.14%	-0.01%	0.17%	0.24%	1.49%	494
Short Unweighted	-0.18%	-0.12%	-0.64%	-1.15%	-1.09%	458
Short Wall St. Consensus	-0.01%	-0.13%	-0.72%	-1.17%	-0.36%	350

Source: Estimize, FactSet, and McKinley Capital Management, LLC. March, 2017.

⁷ 1c for stocks with Wall Street consensus earnings estimate of 10c or less. 10% seems a reasonable if arbitrary definition of “significant.”

⁸ The announcement day, day t, return was measured from the day t open to the day t close for any stock that announced its earnings from any time after the close on day t-1 to before the open on day t. Subsequent returns were measured beginning with the close on day t.

⁹ There was no appreciable difference in the results whether the Estimize unweighted or weighted final earnings estimates were used.



effects, the post-announcement effects were slightly more pronounced for small and micro than large stocks. For each market capitalization bucket, there were more positive surprises vs. the Wall Street consensus estimates than against Estimize estimates. This fact suggests that Estimize (“crowd-sourced”) estimates are better predictors of positive earnings announcements than are street estimates. This fact also explains why returns were higher (except for the micro cap stocks) for surprises against Estimize estimates than against Wall Street consensus estimates — the surprise was “more of a surprise!”

On the earnings miss side the results were rather anomalous. While the initial announcement day average price change was slightly negative, by day twenty, the cumulative excess return was quite positive (except for the micro cap stocks). This is true whether one considers the Estimize or the Wall Street consensus tests. In the small cap space, the positive average cumulative return for a miss significantly exceeded the positive average cumulative return for a positive surprise. The only explanation seems to be that participants systematically (“sell the rumor” and “buy the news” for stocks that miss. Equally incongruous is the fact that there are more misses when measured against Estimize “crowd-sourced” estimates than when measured against street estimates. This fact either indicates that Wall Street estimates are better predictors of misses or that “crowd-sourced” estimates are systematically more optimistic. What makes this even more anomalous is that on the pre-announcement side, “crowd-sourced” estimates below Wall Street estimates constituted a good negative relative return indicator up until the announcement. In a future test, it could be informative to break the miss sample into two — those with “crowd-sourced” estimates below Wall Street estimates, and those with “crowd-sourced” estimates above Wall Street estimates.

The combined results of the pre-announcement and post-announcement effects, suggest several ways that advisers might use “crowd-sourced” earnings estimates. Avoid owning stocks — particularly large cap stocks — when the “crowd-sourced” earnings estimate is first observed to be significantly below street estimates. Hold, or consider buying stocks with significant positive earnings surprise — especially when the actual earnings number exceeds the “crowd-sourced” estimate. Sell earnings misses with extreme caution! At least this data suggests the counter-intuitive notion that positive excess returns are obtained on average for U.S. stocks with earnings misses. Contrarians might even consider buying on initial down moves in stocks with earnings misses!

Comparison with another Recent Research Study

Wolfe Research (“Wolfe”) recently published a study analyzing the characteristics and efficacy of the Estimize estimates.¹⁰ While Wolfe used different methodologies, results were similar in many cases, and different in a few. Consistent with McKinley Capital’s research, Wolfe found that most of the significant Estimize estimates occurred close to the actual earnings announcement day (Wolfe, page 7). Wolfe measured the actual accuracy of all Estimize estimates versus its version of Wall Street estimates, and found that Estimize earnings estimates were more accurate (Wolfe, pages 8-9). However, Wolfe did not measure whether accuracy per se lead to excess returns. McKinley Capital found that Estimize estimates were more accurate for stocks that would go on to announce large positive surprises, and that such accuracy lead to positive excess returns. However, as noted above, McKinley Capital found the opposite results for stocks that would go on to miss. The Wolfe study did not differentiate between the surprise/miss buckets. Wolfe constructed an estimate weighting scheme along the lines of the Estimize weighting scheme. Wolfe found their weighted estimates were more accurate than unweighted estimates, but did not report whether that accuracy lead to a return difference (Wolfe, pages 16-21). As noted above, McKinley Capital did not conclude that Estimize weighted estimates could be used to outperform versus unweighted estimates either pre-announcement or post-announcement. Wolfe found that large earnings estimate revisions in the week before an announcement led to positive announcement day returns for both Estimize and street estimates (Wolfe, pages 22-26) in the direction of the revisions. McKinley Capital found a similar result leading up to but not on announcement day; based not on revision, but on the difference between “crowd-sourced” and Wall Street estimates. The firm also found a post-announcement effect. However, McKinley Capital noted above that the negative one day relative returns of misses were quickly reversed, and over twenty days went the other way. McKinley Capital also found a positive surprise effect which increased over twenty days. The Wolfe study only considered the effect through three days, and missed the significant longer-term result (Wolfe, pages 26-27).

Conclusion

One of McKinley Capital’s investment edges is its ability to analyze earnings forecast data and identify likely candidates for earnings surprises. The firm constantly searches for better and more accurate sources for its underlying data. McKinley Capital has entered a research partnership with Estimize. Estimize has surpassed some of its competitors

¹⁰ Sheng Wang, Yin Luo, Javed Jussa, Gaurav Rohal, *Crowdsourcing Earnings and Revenue Estimates: More Accurate and Timelier Estimates Lead to Better Investment Strategies*, (New York: Wolfe Research, April 24, 2017).



by having developed advanced “crowd-source” technology to incorporate more information into its earnings forecasts. As reported in this paper, the firm tested the quality of Estimize estimates. The firm concluded that the use of Estimize data might provide the potential for better incorporating market-moving earnings forecast and surprise events; especially downside pre-announcement events and positive earnings surprises. McKinley Capital will increasingly look for ways to incorporate Estimize and other comparable information into its calculations. The firm believes that, over time, this enhancement will result in benefits to its customers in the form of enhanced investment results. McKinley Capital would be pleased to speak with you about this research.

Appendix — Information Provided by Estimize¹¹

Estimize is an online community, fully established in 2011, in which contributors can supply financial forecasts of EPS and revenues on U.S. equities. Contributors can be buy-side investment professionals, independent researchers, individual traders, or students. The community is split broadly among these groups, with no one group dominating the sample or providing particularly accurate estimates relative to the others. Because of the diversity of the backgrounds and methodologies underpinning the contributed forecasts, the estimates in the Estimize system represent a distinct alternative to estimates from traditional sources such as sell-side equity research desks.

Traditional sell-side data suffers from several potential inherent biases. Professional forecasters’ livelihood depends on providing accurate information to buy-side clients. However, in surveys of the buy-side, forecasting ability is rarely ranked among the most important characteristics of sell-side analysts. Analysts are more valued for providing corporate access, detailed research reports, and general industry information (Boni and Womack, 2002).

Furthermore, there exists evidence of behavioral biases in sell-side earnings estimates, including herding behavior (Trueman, 1994; Hong et al, 2000). Any individual forecaster is unlikely to want to make particularly bold estimates away from the consensus for fear of being exposed as incorrect. Regulatory constraints on sell-side analysts, particularly since the financial reforms in the early 2000’s, also constrain an analyst’s ability to produce timely updates to their research. More compliance steps are now involved. As a result, changes in sell-side forecasts tend to be gradual.

Lastly, there is evidence that institutional biases may exist. Many analysts are employed by large financial institutions which also maintain investment banking arms. To the extent these banks want to retain the advisory business of their corporate clients, there may be inherent pressure on those entities to provide unrealistically optimistic forecasts for the earnings of certain issuers or at least avoid pessimistic forecasts (Boni and Womack, 2002; Michaely and Womack, 1999). In theory, there are regulatory practices in place to deter such biases, including required disclosures and information barriers, but these concerns remain.

The Estimize system provides alternative forecasts which may be less affected by such biases. Forecasters on Estimize have the flexibility to provide honest and timely estimates. They are not compensated by the platform for being optimistic,

¹¹ This information is as provided by Estimize.



precise, or for providing any particular quantity of data. There are incentives to be accurate. One incentive is self-promotion. Self-promotion could be particularly important for independent researchers or for students who would like to be able to point to a published track record of estimates. Contributors to Estimize receive free access to their estimates and to the consensus for any stock for which they publish an estimate. Contributors also receive alerts and notifications regarding trends in the data. This “give-to-get” model does drive contribution to the platform. However, our user surveys indicate that “the good of the many” is the driving incentive for cooperation among financial community peers. Market participants, especially large institutional managers, want to understand where their own expectations stand in relation to those of their peers. Such an understanding is a useful tool to judge whether a fundamental thesis is truly different. In order to gain the benefits of a more robust earnings data set, Estimize finds that managers are willing to share their own expectations.

A “crowd-sourced” platform, Estimize takes advantage of the “wisdom of the crowd;” thereby providing a diversifying source of information. As the size of the sample set of estimates continues to increase, Estimize gains additional ability to overweight historically accurate analysts, and to incorporate new behavioral and statistical variables that are highly correlated to accurate estimates. Estimize will continue to incorporate the benefits of better data as the scope of data contributions continues to increase in the future.

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Disclosure

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