

Quantitative investing has many advantages if done properly, as well as numerous potential pitfalls that researchers need to avoid. In this thought piece, we will demonstrate one potential pitfall using some test results from a popular stock selection factor, Earnings Surprise.

So, you may be asking yourself... "What is earnings surprise?" The factor simply measures by how much a company's reported earnings differ from expectations, relative to the stock's price. The factor is quantified as:

$$\frac{(\text{Reported EPS} - \text{Expected EPS})}{\text{Stock Price}}$$

For example, in February 2012, Apple (AAPL) had an Earnings Surprise as calculated below:

$$\frac{(\text{Reported Q4 EPS of } \$13.87 - \text{Expected Q4 EPS of } \$10.16)}{\text{Price of } \$405} = 0.92\% \text{ Earnings Surprise}$$

Earnings surprise is a popular criterion for stock selection because earnings reports are closely watched by the market, and positive (negative) earnings relative to "street" expectations tend to send stocks higher (lower). The market often underreacts to meaningful changes in corporate fundamentals in the short run, leading to subsequent earnings surprises and price drifts in the direction of those surprises.

Now let's review the testing results. When this factor is tested over a universe of the 3000 largest U.S.-listed names, with returns measured each month over a subsequent 1-month time horizon, the factor appears to generate positive investment returns. The top-rated 20% of the universe outperforms the bottom 20% by 0.21% per month from August 2000 to December 2011. This means that employing a strategy of buying the top-rated quintile and shorting the bottom-rated quintile would yield over 2% annually. Not bad.

Can these results actually be replicated in the real world? Herein lies the SURPRISE! When we look more deeply into the results, we will actually find that almost all of the strategy's added value is coming from the least liquid stocks, and thus, cannot be replicated on a large scale. In the table below, you will see that we have broken down the Earnings Surprise results into five quintiles, based upon stock liquidity, such that the most liquid stocks are in the 1st quintile and the least liquid stocks are in the 5th quintile (see below). As you can see, the most positive returns are coming from the most illiquid group, quintile five. This is the quintile that will be the most difficult and expensive to trade, because the stocks within it are likely to have the highest bid-ask spreads, and the stock prices in this group will be moved around most easily when an investor is trying to trade them. This means that in the real world, for a manager that is managing even something as small as \$100 million, the stocks in the least liquid quintile cannot be effectively traded. When confined to the more liquid quintiles, a manager who is trying to add value by buying stocks with positive Earnings Surprise is unlikely to be able to generate a meaningful profit. Simply put, the strategy is not gainfully investable.

(continued on the next page)

| EPS Surprise, Large Universe | | | |
|-------------------------------------|-------------------------|--------------|-------------|
| 2000 to 2011 | | | |
| | Quintile 1 - Quintile 5 | IC | IC |
| All | 0.21 | 0.013 | 0.70 |
| 1 (Liquid) | 0.20 | 0.016 | 0.39 |
| 2 | -0.06 | 0.006 | 0.14 |
| 3 | 0.01 | 0.006 | 0.15 |
| 4 | 0.28 | 0.012 | 0.28 |
| 5 (Illiquid) | 0.83 | 0.022 | 0.52 |

Just to prove this point, we created a new universe of investable stocks where we included not only the largest 3000 U.S.-listed names, but also screened the names based upon liquidity, looking for the 2000 most liquid stocks each month. This currently limits the universe to stocks trading over \$1 million per day. In this universe, the test results get much worse, and if transaction costs are taken into account here, one should conclude that no alpha is achievable at all.

| EPS Surprise, Large & Liquid Universe | | | |
|--|-----------------------------------|--------------|--------------|
| 2000 to 2011 | | | |
| | Quintile 1 - Quintile 5 Return | IC | IC T-Stat |
| All | 0.08 | 0.007 | 0.31 |
| 1 (Liquid) | 0.10 | 0.015 | 0.27 |
| 2 | 0.13 | 0.014 | 0.26 |
| 3 | 0.12 | 0.009 | 0.17 |
| 4 | -0.07 | 0.005 | 0.09 |
| 5 (Illiquid) | 0.04 | 0.001 | 0.01 |

While it is easy to assume, in testing quantitative investment factors, that one could buy and sell all stocks at their listed price in any volume at any given time, we believe this is an illusion that unnecessarily gives an upward bias to certain testing results. At Matarin, we are focused on delivering excellent returns for our clients in the real world (it's tough to spend "theoretical profits"). Therefore, we always ensure that the universe over which factors are tested mirrors that over which assets will be invested.