

***Sabrient***  
**Insider/Analyst**  
**Quant-weighted Indexes**

***Whitepaper:***

**The methodology behind the Sabrient  
Insider/Analyst Quant-weighted Indexes**

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## Abstract

The Sabrient Insider/Analyst Quant-weighted Indexes are designed to help markets incorporate the dynamics of both insider behavior and analysts' earnings revisions into stock valuations. Companies are selected for inclusion in each of two 100-stock portfolios by using a factor analysis in a process that extracts information from available insider activity and analyst estimates and confirms the information to avoid behavioral pitfalls of the insiders and analysts.

The resultant *large-cap* portfolio has had a risk profile similar to the market (estimated beta 1.069) with an historical 7.6% differential return per year vs. the S&P 500 Index.

The resultant *multi-cap* portfolio has had a risk profile slightly higher than the market (estimated beta 1.27) with an historical 12.3% differential return per year vs. the S&P 1500 Index.

Indexes are rebalanced monthly, and there are no sector concentration restrictions and no turnover limitations in either portfolio.

## Tracking Insider Trading

The phrase “insider trading” carries an aura of the forbidden and conjures up images of SEC investigations that result in corporate leaders being walked through their offices in handcuffs.

The fact is, although insider trading on specific non-public knowledge is clearly an offense in the United States, trading on less-specific knowledge is not generally frowned upon. After all, employees will always have knowledge of their company that is not generally public, and unless trading in an employer's stock is totally prohibited, this knowledge will often be used in determining whether or not to make trades, and when to do so.

The insiders who are likely to know the most about their company's future prospects are corporate officers, especially the Chief Executive Officer (CEO), President, Chief Financial Officer (CFO), directors, and shareholders who own more than 5% of the company's securities.

Fortunately for those who track insider trading, these insiders are required by the Securities and Exchange Commission (SEC) to file a Statement of Changes in Beneficial Ownership of Securities (Form 4) by the end of the second business day following the day on which the trade is executed.

So, by tracking such insider transactions, one may discern valuable information about a company's prospects.

Legitimate *insider buying* has proven to be a reliable predictor of stock price appreciation.

However, insiders can overestimate the value of their special knowledge or be overly optimistic about their own firm's chances of success. So interpreting the knowledge gleaned from SEC Form 4 filings can be somewhat tricky. How much information is in these filings? Which are the salient numbers? How can they be best extracted? These are some of the questions that must be answered when building an index on an insider/analyst model.

Rather than using multiple regression and optimization, Sabrient Systems employs a non-linear, relevance scoring methodology within a scientific hypothesis-testing approach to test logical combinations of factors. In creating the Sabrient Insider/Analyst Indexes, our goal was to create a portfolio of 100 stocks that we felt had a higher probability of performing well in the medium term based on transactions of insiders.

The first problem is how to increase specificity of the insider purchases. Many of the Form 4 filings involve purchases as part of compensation (such as the exercise of options). Often, these are more related to liquidity needs than speculation on the company's performance. Open-market purchases, however, require insiders to take their own money and purchase stock on the open market.

By using only *open-market purchases* from the SEC Form 4, we have increased the predictive power of this factor.

## Tracking the Other Insiders

Another group that has intimate knowledge of a company's future prospects is the Wall Street analysts who follow a company and its industry. We consider them another type of "insider" in that they publish quarterly estimates of a company's future earnings and revenues, based on their study and analysis of the company and its industry, including visits to corporate headquarters and conversations with corporate officers about the future of the company.

Analysts' estimates are the numbers that the investing public expects the company to meet and hopefully beat every quarter.

Analysts frequently make changes to their estimates when they learn something new—good or bad—about the company or its industry. *Positive* changes in analysts' estimates are another reliable predictor of stock price appreciation, so we decided to include Wall Street analysts' opinions as a check to the insider activity.

If either corporate insiders or Wall Street analysts indicate positive results for a particular firm, then the company's stock is considered for inclusion in the index. If both the insiders and analysts indicate positive results, the stock will likely perform well.

Finally, we decided to "quant-weight" each of the 100 stocks that made it to the final portfolio. We weight each position in a piecewise exponential fashion so that the top 50 represent a range of 2.6% (for the highest ranked stock) to 0.96% for the 50<sup>th</sup> ranked stock; then we flat-weight the bottom 50 stocks so that each represents 0.35% of the index. This captures the benefit of exponential weighting without under-representing the bottom stocks and to ensure adequate diversification and liquidity.

## Eligibility Criteria for Index Components

We decided to create two versions of the Sabrient Insider/Analyst Index, one comprised solely of large-cap stocks; the other comprised of a broader mix of large-cap, mid-cap, and small-cap stocks. There are several eligibility criteria, but one of the most important is membership in a specific S&P index.

- To be included in the large-cap index, we require the stock to be a member of the S&P 500 Index.
- To be included in the multi-cap index, we require the stock to be a member of the S&P 1500 Index.

There are no sector concentration limits on the selected stocks.

## Factors

Quantitative factors derived from raw data feeds are used in a fixed algorithm to select stocks for inclusion in the Sabrient Insider/Analyst Indexes.

### ***First Cut***

The following four factors used are to winnow the stocks in the S&P indexes to 200 stocks (from the S&P 500) or 600 stocks (from the S&P 1500). At least one of the four factors must be positive for a stock to make the first cut.

(1) *Number of Purchasers*: The number of insiders that have purchased company stock on the open market is considered very important. The more insiders purchasing shares on the open market, the greater the significance, as we assume insiders are making informed decisions to purchase, and we rely upon insiders' collective intelligence to find interesting candidates for the index.

(2) *Percent Increase in Holdings*: In addition to the number of insiders that purchase over a given time frame, the percentage gain in shares is considered significant. If someone purchases just a tiny amount compared with their current holdings, then this is not a strong vote. On the other hand, if someone doubles or triples their holdings, then this is considered significant.

(3) *Number of Positive Analyst Revisions*: A factor based on the number of Wall Street analysts who revise expectations positively, especially earnings estimates, is used to corroborate the insiders' vote of confidence with their purchases. If both corporate insiders and Wall Street analysts agree that the stock is due for price appreciation, then this is considered highly significant.

(4) *Percent increase in Analyst Expectations*: As with the insider purchases, the amount that expectations are revised by analysts is important. If analysts increase their expectations of earnings per share by a large amount, then this may be of importance and is dealt with accordingly.

### ***Second Cut***

A quantitative overlay ranks the stocks from the first cut (200 stocks, if using membership in the S&P 500 index; 600, if using membership in the S&P 1500 index) using a forward-looking "outlook score."

This score rewards strong historical and projected growth trends, low current and projected valuation, high quality of earnings, and favorable dynamics of Wall Street analyst estimates. The top 100 stocks from this second cut are used to populate the index.

### ***Final Ranking***

The final 100 stocks are then weighted based on their relative ranking in the aforementioned "outlook score" quant overlay. The top 50 stocks are weighted exponentially so that the top 50 represent a range of 2.6% (for the highest ranked stock) to 0.96% for the 50<sup>th</sup> ranked stock, and each of the bottom 50 stocks is given a flat-weighting of 0.35% in the index.

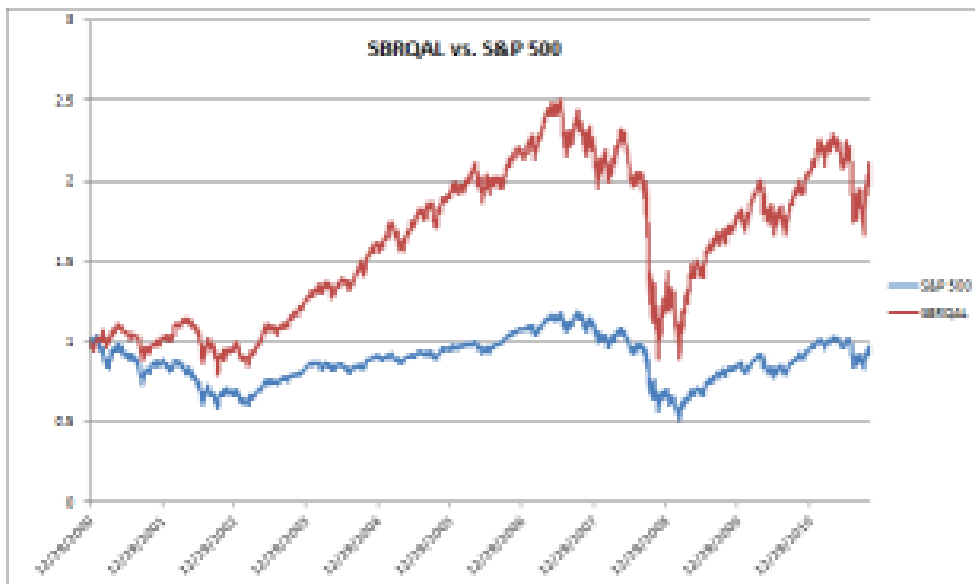
### Sabrient Insider/Analyst Large-cap Quant-weighted Index (SBRQAL)

The backtested results of the Sabrient Insider/Analyst Large-cap Quant-weighted Index, based on the factors discussed above, are impressive.

#### Returns

The gross return series (value of \$1 invested) for SBRQAL and the S&P 500 Index are plotted below for the past 10 years, 9 months.

Over the past 10 years (December 29, 2000 through September 30, 2011), the S&P 500 Index has experienced a yearly average return of -0.5% while experiencing an annualized volatility of 16.4%<sup>1</sup>.



**Figure 1:** Return series for the Sabrient Large-cap Insider/Analyst Quant-Weighted Index (SBRQAL) and the S&P 500 Index from December 29, 2000 to September 30, 2011.

During the same period, the 100-stock SBRQAL Index had an average return of +6.9% with an annualized volatility of 20.3%. The Sharpe ratio for SBRQAL was 0.74.

The returns only include price changes, so dividends and other disbursements of held stocks were not included in these figures.

#### Risk Considerations

SBRQAL has an estimated beta of 1.069—quite close to the S&P 500. This means that the risk of this portfolio from a single factor model point of view is similar to that of the equity market overall.

<sup>1</sup> Volatility annualizations based on assumed-independent monthly return figures.

**Turnover**

SBRQAL is rebalanced monthly to maximize information timeliness, and there are no limitations with regard to turnover.

**Sabrient Insider/Analyst Multi-cap Quant-weighted Index (SBRQAM)**

The backtested results of the Sabrient Insider/Analyst Multi-cap Quant-weighted Index, based on the factors discussed above, are even more impressive than the results of SBRQAL.

**Returns**

The gross return series (value of \$1 invested) for SBRQAM and the S&P 1500 Index are plotted below for the past 10 years.

Over the past 10 years (December 29, 2000 through September 30, 2011), the S&P 1500 Index has experienced a yearly average return of +0.2%, while experiencing an annualized volatility of 16.6%.



**Figure 2:** Return series for the Sabrient Multi-cap Insider/Analyst Quant-Weighted Index (SBRQAM) and the S&P 1500 Index from December 29, 2000 to September 30, 2011.

During the same period, the 100-stock SBRQAM Index had an average return of +11.6% with an annualized volatility of 24.5%. The Sharpe ratio for SBRQAM was 0.92.

The returns only include price changes, so dividends and other disbursements of held stocks were not included in these figures.

***Risk Considerations***

SBRQAM has an estimated beta of 1.27—slightly higher than the S&P 1500. This means that the risk of this portfolio from a single factor model point of view is slightly higher than the equity market overall.

***Turnover***

SBRQAM is rebalanced monthly to maximize information timeliness, and there are no limitations with regard to turnover.

**Synopsis**

The Sabrient Insider/Analyst Quant-Weighted Indexes were created to help markets incorporate significant insider and analyst information into stock valuation. This is done by using a factor-based analysis to create a portfolio that best extracts and confirms publicly-available information on insider activity and analyst revisions. There are no sector concentration restrictions and no turnover limitations.

The resultant 100 stock portfolios have historically displayed risk profiles similar to the market while providing from 8.27% to 13.57% average differential return per year vs. the relevant benchmarks (the S&P 500 Index and the S&P 1500 Index).

These reasonable betas and Sharpe ratios suggest that the observed differential returns are achieved not by taking on more systematic risk, but rather through taking advantage of information not priced into the securities at the time of their inclusion in the Sabrient index.