Converting Stock Winner Insights into Code: A Review of the Financial Strength into Code (FSiC) Screening & Trading System

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Abstract — The goal of most equity traders is to identify and profit from investing in extraordinary assets – the companies that exhibit exceptional stock price performance during both bull and bear markets. The ability to identify these stocks before their moves is not easy and countless time and attention has been poured into this subject. The truth is there is correlation among stock market winners—and strategies and tests have been defined to pre-expletively identify and invest in these names. Methodologies defined by Jegadeesh, Livermore, Lo, O'Neil, Wyckoff and others challenge the Efficient Market Hypothesis and articulate strategies to identify these future market winners. The challenge in executing this strategy in reality, however, is multi-faceted: behavioral, physiological, technical and repeatable are all problems that prevent converting these insights into profitable trading strategies. Just as computer programming code can convert even the most complex task into repeatable mundane actions, we too are proposing a new code set to turn identification of stock market winners into a consistent insight and actionable trade.

In this paper we present the Financial Strength into Code (FSiC) screening and trading program. At its core, the program attempts to translate complex signals of past market winners into code for future market trading. These signals include custom-designed price/volume momentum strength, fundamental strength and breakout attenuation. Each feature has been documented previously in aforementioned papers to signal the start of a future winner – we attempt to put this signal into repeatable code. Furthermore, our system goes beyond stock selection, and implements this trading strategy without human bias.

Our empirical findings reveal FSiC can identify future stock market winners and generate a significantly higher return than the benchmark – buy & hold of the S&P 500. Specifically, across all U.S.-listed stocks from 2005-2024 surpassing $1B market cap at trade time FSiC generated an average weekly return of 0.45% vs. S&P 500 of 0.19%. Geometric return over this test window unveils an extensive portfolio gain multitude the S&P 500. The program correctly predicted and traded winners before they were acknowledged by the broader market: MNST, CBRE, AKAM, AEM, for example. This paper also acknowledges the bias back testing and our analysis falters by exclusion of bankrupt or acquired companies in prior periods. However, beyond this limitation, significant care was paid to eliminate forward-looking bias.

This paper outlines the mechanisms of FSiC, why we began creating this code set, review of historical data findings and next steps with this code including live trading.

I. Introduction

In the arena of financial markets the quest to uncover stocks that consistently defy expectations—those rare "extraordinary stocks" that thrive in both booming bull markets and punishing bear markets—has captivated investors for generations. These stocks, often described as the market's hidden gems, possess a unique alchemy: they lead advances, surging ahead with speed and strength, while also weathering downturns with resilience. Yet, identifying these market leaders before they ascend to greatness is a challenge that has confounded even the most astute investors. The obstacles are formidable: an overwhelming deluge of financial data, the distorting influence of human biases, and the psychological pitfalls that cloud judgment in moments of uncertainty.

Investors have sought to decode the secrets of stock market winners, and convert these seemingly one-off events into repeatable patterns. Many “tools” have failed to consistently identify these winners including technical analysis, blanket financial statement analysis or even newer techniques such as machine learning approaches. This inability gives further credibility to the Efficient Market Hypothesis and that any attempt to overcome its forces is moot. However, through all the financial market noise, several insights have showed promise: price momentum, combined with fundamental strength and trading dynamics, when combined, offer a counterpoint suggesting that patterns of outperformance can be detected and exploited. However, translating these case study insights into a consistent, scalable trading strategy has proven elusive. Behavioral biases and technical complexities are all to blame.

Enter the Financial Strength into Code (FSiC) program: an attempt to take these raw market signals, convert them into repeatable/consistent code that can enable stock selection of future winners, and actionable trading to exploit its findings. The key to FSiC is its precision and impartiality. By distilling key indicators—such as price momentum and volume strength, fundamental metrics, and breakout performance—into algorithmic rules, FSiC attempts to capture the essence of what makes a stock extraordinary and put this into code.

II. Methodology

This section details the methodology behind FSiC. The program’s focus is in its name – turn stock market “feelings” about strength into repeatable code. Moving beyond simple, single-factor approaches, FSiC employs a comprehensive, multi-dimensional analysis to identify future winning companies. The strategy is built upon the principle that sustained stock market success is driven by a confluence of factors, not just one isolated metric. But it also acknowledged

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that some of the best future winners, were also the best past winners. Several key indicators used include:

- **Relative Price Momentum:** Not to be confused with technical analysis' RSI, this method details momentum into offensive and defensive performance.
- **Fundamental Momentum:** Identifying companies with improving underlying business strength and earnings potential.
- **Synergistic Twin Momentum:** Combining price and fundamental.
- **Tactical Breakout Rules:** Optimizing entry points while actively managing risk.

By weaving these elements together into a cohesive and disciplined process, FSiC aims to construct a portfolio concentrated in equities exhibiting the strongest likelihood of generating superior, risk-adjusted returns over the long term.

A. Harnessing Offensive & Defensive Price Momentum

The FSiC strategy initiates its selection process by leveraging the well-documented phenomenon of price momentum, with a twist. This component is predicated on the observation that stocks exhibiting strong historical price appreciation often tend to continue their upward trajectory, fueled by investor psychology, trend-following behavior, and the gradual incorporation of positive information into market prices. The twist is benchmarking this relative performance via offensive and defensive phases of the index. The exact methodology utilized here is proprietary, yet the outcome is a ranking of companies across the U.S. based on this gauge.

B. Fundamental Momentum on Key Metrics

Beyond the insights gleaned from price action, the FSiC strategy delves into the fundamental underpinnings of company performance by incorporating fundamental momentum. This dimension focuses on identifying companies experiencing positive shifts in their underlying business prospects and earnings trajectory. The core principle is that improving financial fundamentals often precede and ultimately drive sustained stock price appreciation.

However, not all financial metrics are the same, nor important. In prior research, it was found that only a handful out of the hundreds of potential financial metrics are indicative of financial strength, and forward stock price appreciation. Again, a proprietary technique is utilized to assess these financial metrics, along with modifications necessary to derive a fundamental ranking scale. Currently, our financial insights are limited to annual data, with quarterly potentially adding more nuanced moves, with potential for more noise on the fringes. Additional research is needed here.

C. Twin Momentum

After price and fundamental momentum are graded, FSiC culminates this data into a unified "twin momentum" framework. This approach recognizes that relying solely on either price or fundamental momentum in isolation can be prone to noise and false positives. By requiring stocks to demonstrate strength across both dimensions, FSiC aims to identify companies with a higher probability of sustained outperformance.

A proprietary module is used to grade this twin momentum, with the result being a composite score for all U.S. companies. From this re-ranked list, the top quintile of stocks are selected as the "approved" candidates for the FSiC portfolio. This specific number is chosen to provide a balance between portfolio concentration in high-conviction ideas and sufficient diversification to mitigate idiosyncratic risk.

This dual-filter, twin momentum approach is central to the FSiC strategy's effectiveness. It ensures that the selected stocks are not merely riding short-term market fads or benefiting from temporary earnings boosts. Instead, it prioritizes companies demonstrating both market-validated strength, as reflected in their price momentum, and improving business fundamentals, as evidenced by positive financial results. This synergistic combination significantly reduces the risk of selecting stocks based on spurious signals and increases the likelihood of identifying truly high-quality, growth-oriented companies.

D. Tactical Entry Via Breakout Signals

Identification of winners is not enough – market entry timing is critical to FSiC's success. Tactical trading rules are defined to optimize entry points for the twin momentum-selected stocks and establish clear exit strategies to determine once a stop is "out of favor".

For entry timing, FSiC employs a proprietary composite breakout rule built upon multiple metrics. At a high level these include near-term price movements, volume, changes vs. benchmark and market cap weights. Using the selection of "approved" stock candidates, the breakout rules are assessed. If the composite signal reaches the threshold, the stock is now upgraded from "approved" to "breakout upgrade".

A stock that is designated as a breakout upgrade is one where the twin momentum is met, and the stock is in an active breakout phase. The rationale behind this rule is a shift in market sentiment, reduced overhead resistance, and increased investor interest, potentially leading to further price gains. To profit from this, the stock is awarded a base breakout level and the portfolio is actively weighted towards this inclusion. On subsequent evaluations, if the stock is again approved and breaking out, this breakout level is further upgraded and the weighting toward this stock across the portfolio is increased. This strategy has been defined across literature as pyramiding, and is a key element to FSiC's logic.

Conversely, to proactively manage downside risk, FSiC implements clean rules to identify when a stock is out of favor and actively sell the position. While other risk-mitigation metrics were investigated such as stop-loss rules, these were ruled out as twin momentum should be a better classification of the stock vs. market, vs. arbitrary stop-loss thresholds. Instead, when an owned stock at any breakout level is no longer on the "approved" stock list, the stock is immediately sold. This intends to identify when stocks are out of favor and actively close the position.

III. Back test Methods

This section details the rigorous back testing framework employed to empirically evaluate the efficacy of FSiC. To assess its ability to generate superior risk-adjusted returns in the U.S. equity market, we conducted a comprehensive

historical simulation spanning a 20-year period. The back testing process was designed to mirror real-world trading conditions as closely as possible and prevent future biases, utilizing robust data sources, clearly defined parameters, and established statistical methodologies. The core objective was to determine whether the integrated, multi-factor approach of the FSiC strategy could consistently deliver statistically significant outperformance over relevant market benchmarks.

A time-series back test was conducted over an extended period from 2005 to 2024. This timeframe encompasses a variety of market cycles, including periods of both bull and bear markets, economic expansions and contractions, and varying levels of market volatility. This period provides a robust dataset to assess the strategy's performance across diverse market conditions and enhances the statistical validity of the results.

The back test universe comprised of all U.S. NYSE, AMEX or NASDAQ listed stocks. This universe was chosen to reflect the practical scope of a U.S. equity investment strategy, though there is no limitation to the strategy's potential in other international markets. The back test was structured to simulate a realistic portfolio management process, incorporating weekly portfolio rebalancing, transaction cost considerations and adherence to pre-defined FSiC trading rules. This comprehensive approach allows for a thorough and credible assessment of the FSiC strategy's historical effectiveness and its potential for future application. The market cap cutoff was set at $1 billion to ensure the portfolio only traded stocks with sufficient liquidity. Transaction costs were pre-set at 5%. The key limitation of this back test is lack of data on acquired or bankrupt companies. While we anticipate this will affect our results, the lack of portfolio concentration significant dampens its negatives. This will need to be kept in mind for live trading uses of FSiC.

All FSiC portfolio weightings were dependent on the stock's breakout level, with active pyramiding in place. All analyses and trades were conducted on the Friday of each trading week, with Monday used if Thursday was a Holiday. The closing price of each stock was used as the entry and exit prices, with the bid/ask spread being represented in the 5% transaction cost. The performance for each week was computed based on these closing prices along with the direct weights of the portfolio.

Weekly portfolio returns were calculated and compared against the S&P 500 benchmark. Returns did not include dividend income, due to back testing complexity. A suite of standard performance metrics was calculated.

IV. Empirical findings

The results demonstrate the strategy's ability to generate significant outperformance relative to the S&P 500. Over the evaluation period, the FSiC portfolio achieved an average weekly return of 0.45% vs. S&P 500's 0.19%. Median returns were 0.65% vs. S&P 500 0.35%, minimum return -21.5% vs. S&P 500 -19.8%, and maximum return 25.3% vs. S&P 500 13.3%. This stark differential in average returns underscores the FSiC strategy's capacity to generate substantial alpha and consistently outperform broad market averages. Computing a T-Test vs. S&P 500, the average return was statistically significant with a P-value of 0.008.

Beyond average returns, running FSiC through its hypothetical portfolio creation further demonstrates the potential in the program via geometric returns. Two $1,000 portfolios were created at the back test's onset in 2005 and invested in either FSiC or S&P 500. After 20 years the FSiC portfolio was worth $26,395 vs. S&P 500 worth $4,719. Not only does this demonstrate the potential of compounding interest, it shows the potential in FSiC to consistently identify winners.

Reviewing the hypothetical portfolio's holdings, FSiC was able to correctly identify several winners before they were known.

- **MNST – Monster Beverage.** The portfolio invested in the company multiple times, including 2005-2007 during its 5x move. MNST ultimately returned 66,150% during the back test window, which FSiC was able to capture a portion of this performance.
- **CBRE – CBRE Group.** The portfolio purchased CBRE multiple times including 2005-2006 for a 3x gain and again in 2013. CBRE ultimately returned 2,119% during the back test window.
- **AKAM – Akamai Technology:** The portfolio purchased AKAM in 2005, 2006, 2010, 2012 and 2014. AKAM appreciated 4,846% during the back test window.
- **AEM – Agnico Eagle Mines:** The portfolio purchase AEM in 2005-2006 and again in 2020. The 2005-2006 purchase was during AEM's $12 to $40 price move. AEM appreciated 869% during the back test window.

Not all FSiC portfolio trades were successful and the strategy can incorrectly identify winners, when they are in fact losers.

- **NATI – Nordic American Tankers:** The portfolio purchased NATI in 2006 and 2008, during which the stock declined ~-40%.
- **MSTR – MicroStrategy:** While MSTR has returned 2,770% during the back test period, the portfolio purchased the stock at the wrong times – incorrectly identifying a breakout winner. This included in 2021 when the stock lost 40% of its value over several months.

Beyond portfolio-level performance, the back testing process yielded valuable insights into the defining characteristics of stocks identified as "winners" by the FSiC strategy. Analysis of the portfolio holdings and their performance patterns revealed a consistent set of attributes associated with market leadership. Specifically, stock market winners, as identified by FSiC, demonstrably exhibit:

Elevated Relative Strength: These stocks consistently displayed high relative strength, consistently outperforming the broader market benchmark over extended periods.

Frequent Trading at New Highs: A hallmark of these winning stocks was their propensity to frequently trade at new 52-week (and often all-time) highs. This pattern underscores the importance of breakout behavior and the power of sustained upward price momentum as a signal of market leadership. The FSiC strategy's breakout rule effectively

captured this characteristic, facilitating timely entry into stocks exhibiting this bullish price action.

Robust Profitability and Growth Trajectories: Consistently, the stock market winners identified by FSiC demonstrated strong profitability metrics, such as high Return on Equity (ROE) and Gross Margins exceeding industry medians. Furthermore, they exhibited impressive growth trajectories, characterized by robust revenue and earnings growth, often exceeding industry averages. These fundamental strengths underpinned their sustained market outperformance and validated the inclusion of fundamental momentum as a core component of the FSiC strategy.

Different variations of the back test were also conducted, including a 10% percentile cut (vs. 20%), and lowering the market cap threshold limits to $50M (vs. $1B). On the 10% percentile cut performance increased vs. 20% with the negative being a higher max draw down. Specifically, the 10% portfolio returned an average of 0.48% per week. Minimum weekly return is -24.8%, maximum weekly return is 29.2%. On a $1,000 hypothetical portfolio, the strategy returns $31,823 over a 20 year window.

Overall, the portfolio was able to identify winners more frequently than losers, and double or triple down (or more) on winners as the breakout level intensified. By actively picking winners better, and increasing portfolio weightings as breakouts were upgraded, FSiC was able to achieve its impressive return characteristics. Our results resonate with established literature highlighting the persistent outperformance of momentum strategies, the importance of relative strength in stock selection, and the enduring value of fundamental quality metrics in identifying sustainable market leaders. By converting all these qualities of Financial Strength into Code, we intend to active utilize this program for active trading.

V. Live Trading

FSiC was designed from the ground-up to be deployed in an active trading manner. While the specific code base is proprietary a rough outline of its mechanism are below.

Require: U.S. National Exchanged List Stocks (S_i), Percentile cutoff (P), current holdings (H_i).
For each stock (i) within S **do**:
Calculate relative strength using an offensive vs. defensive benchmark (RS_i).
Calculate fundamental strength using key metrics (FS_i).
Rank RS and FS across i. Calculate composite score and rank across Si (CS_i).
Form top P highest CSi rank (SP_i).
For each stock (i) in SP **do**:
Calculate if breakout has occurred (SPB_i).
For each stock (i) in H **do**:
If included within SP: Hold.
If not included within SP: Sell.
For each stock (i) in SPB **do**:
If included within H, calculate new breakout level (BL).
If not included within H, set BL to 1.
For each BL and each stock (i) **do**:
Weight BL, calculate new portfolio, execute Buy trades.

The FSiC program is designed to be executed weekly. The technology stack uses for FSiC includes Python, Docker, Google Cloud Run, Google Cloud Firebase and GitHub. The GitHub repository contains the necessary endpoints and details for active deployment.

VI. Conclusion

In the demanding pursuit of market outperformance, this paper has presented Financial Strength into Code (FSiC) as a novel, systematic approach to identifying and capitalizing on extraordinary stocks. Moving beyond subjective interpretations of markets and biased-influence of human thinking, FSiC provides a compelling pathway for translating the qualitative insights of successful traders into an operational algorithm. The rigorous back testing conducted over two decades demonstrates the potential of this code-driven methodology to not only discern future market leaders but also to generate significant alpha compared to broad market benchmarks. While acknowledging the inherent limitations of back testing and the exclusion of certain corporate events, the consistent outperformance and the identification of genuine historical winners within the simulated portfolio underscore the robustness of the FSiC framework.

This research contributes to the ongoing dialogue surrounding momentum and growth investing by offering a practical, coded implementation that addresses the challenges of behavioral biases and inconsistent execution. FSiC's multi-faceted approach, incorporating price and fundamental momentum with tactical breakout rules, provides a more nuanced and potentially resilient strategy compared to relying on single-factor models. Looking ahead, the next logical phase for FSiC lies in the transition to live trading. Beyond immediate application, this work encourages a shift towards more systematic and code-driven approaches in investment strategies, highlighting the enduring potential of blending established market principles with the precision and objectivity of computational power to navigate the complexities of the financial markets. Ultimately, FSiC offers a tangible tool for investors seeking to consistently identify and profit from the market's exceptional performers.

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