

Identifying Expectation Errors in Quantitative Investment Research

Throughout stock market history, the persistent underperformance of “glamour firms” (firms with high growth potential) and surprisingly strong performance of value firms (low growth potential) is fueled by pricing misvaluations. Using mathematical models that are free from embedded human biases corrects these pricing errors and yields a lucrative long/short investment method for Fidelis Capital, LLC.

Researchers from disciplines across the sciences and mathematics agree that an unemotional and systematic computer will outperform an emotional and myopic person. Leli and Filskov found in their seminal 1984 study that a mathematical model could predict the extent of a patient’s brain damage 25% more accurately than clinicians. Joel Greenblatt demonstrated that investment accounts managed by a simple rules-based system yielded total returns 24.7% higher than the returns yielded by accounts with human managers (from May 2009 through April 2011). William Grove and his team meanwhile, analyzed forecast accuracy estimates from 136 different studies and found that, cumulatively, mathematical models or systems equal or beat experts 94% of the time (Grove, Zald, Lebow, Snitz, & Nelson, 2000). The investing model, or system, therefore, can be considered that strategy’s optimal performance (or ceiling); it predicts an outcome as accurately as any entity can, and humans can only hope to come close or match its performance.

Fidelis Capital, LLC digested the research, which illustrates and quantifies the degree to which systematic decision-making dominates the performance of an expert or team of experts making subjective and idiosyncratic decisions. We then

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took the research further, exploring how to use this data to achieve optimal risk adjusted returns for investors across all elements of the market cycle. Our firm has been built around this pragmatic ethos. We care deeply about, and are deeply loyal to our investors and our overriding priority is to achieve the best risk adjusted returns on their behalf. We do this by using a rules-based system, which positions investors at the intersection of the two most persistent methods of stock market outperformance: value and “behavioral” investing. , Our investment system identifies financial quality while systematically reducing or even eliminating human biases. This investment system is the key to our success and has led us to critically examine the market pricing of value and growth stocks.

Historically, S&P 500 stocks in the US are typically sold at 16 times the company’s annual earnings. Stocks with pricing multiples below 16 can be called ‘value stocks’ while stocks with multiples higher than 16 can be termed ‘glamour’ or growth stocks. This disparity in pricing multiples is dictated by higher or lower expectations regarding future performance. Across market history, however, value and glamour stocks have acted as the tortoise and hare of the stock market; the exciting, high-risk glamour stock repeatedly falls short of market expectations, while the stodgy, low-risk value stock consistently exceeds expectations (Piotroski & So, 2012). Historically, analysts have accepted the ‘risk-based interpretation’ as an explanation for this value anomaly.

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The risk-based interpretation unpacks the inverse relationship between a company's book-to-market ratio and its future growth rates. Book-to-market ratios are calculated by dividing companies' accounting values by their designated market values. Using the book-to-market ratio, analysts can discern whether a company is undervalued (has a ratio greater than 1) or overvalued (has a ratio less than 1). The risk-based interpretation asserts, then, that (on average) the more a company is overvalued, the more its growth rates will decline in the future; alternately, the more a company is undervalued, the more its growth rates will increase in the future.

This theory can be used to explain the value anomaly. Glamour firms, typically, are overvalued because the market expects them to grow significantly in the future. When glamour firms meet expectations, they prove to be a lucrative investment for the stockowner. When they fail expectations, however, they yield significant negative returns. Value firms, on the other hand, are undervalued because past performances and potential for future growth seem weak. They are lower-risk and potentially less lucrative but when they match or exceed market expectations, they yield positive returns. The risk-based interpretation argues that, on average, the costly failures of glamour stocks outweigh their rich successes and so value stocks slowly and steadily outperform.

The overvaluation or undervaluation of stocks, however, is often based on human biases rather than statistical data. If a stock has performed well [poorly] in

the past, analysts tend to feel optimistic [pessimistic] about its performance in the future;. This is referred to as Recency Bias. Furthermore, studies show that humans are resistant to contrarian data, while lending more weight to data that confirms existing beliefs, known as the Confirmation Bias. This means that we are slow to revise our opinion of a firm's future performance even if, for example, its accounting value has grown or its management has changed. Because market value is often based on fallible, human expectations of a firm's future performance, human biases create pricing errors in the stock market.

At Fidelis we believe that human biases contribute materially to the value anomaly. To prove our claim, we look at two key statistics: pricing multiples and fundamentals. Pricing multiples give us a relative measure of human biases; the higher the multiple is above 16, the stronger the human expectation of future growth (and vice versa). To measure the strength of a company's fundamentals, we scrutinize each company's profitability, financial leverage, liquidity, and operational efficiency. Using the quarterly financial statements we interrogate the data, examining each of these four indicators of financial quality in multiple ways. Ultimately, if a company's pricing multiple matches the strength of its fundamentals, then the evaluation of market value is unbiased. If the pricing multiple is inconsistent with the strength of the fundamentals, then human biases have influenced the evaluation of the firm's market value and spurred it either too high or too low.

When a company sports an unbiased evaluation (or book-to-market ratio of 1) then the value/glamour effect in returns is essentially zero; both value and glamour firms, when evaluated objectively, perform according to expectations. Furthermore, when firms are evaluated objectively, there are very few revisions to expectations that take place following an earnings report. Alternatively, when human biases influence companies' evaluations (and so contribute to the creation of book-to-market ratios that are greater or less than 1), the value/glamour effect returns. Value firms outperform glamour firms, and expectations regarding value firms' future performances are retrospectively revised upwards. These findings showcase the connection between optimism/pessimism biases and the existence of the value anomaly.

This connection constitutes the foundation of our investment method. We identify firms with weak fundamentals but high pricing multiples as potentially overvalued; we then recommend shorting these stocks because we suspect their pricing multiples are inflated by the optimism bias and will soon decrease. We also identify firms with strong fundamentals but low pricing multiples as potentially undervalued and recommend long investing in these stocks (to exploit pessimism biases and profit from likely increases in pricing multiples). Our investment method is most effective in a market that is improving from low to high investor sentiment (with expected annual returns between 12% and 27% as sentiment improves). Our method, furthermore, is singularly dependable because it roots out, rather than



rests on, the influence of human biases. Using mathematical models, we have unpacked the value/glamour effect, identified two biases that contribute to widespread pricing errors in the market, and committed to working on either end of the pricing spectrum to detect these errors and maximize your returns.

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