100 Main Street Suite 301
Safety Harbor, FL 34695

TEL (727) 799-3671 (888) 248-8324 FAX (727) 799-1232

Quantitative Investing

Douglas W. Case, CFA

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QUANTITATIVE EQUITY INVESTING

Quantitative equity investing has grown considerably in prominence over the last several years. The pace of acceptance of quantitative investing's systematic analyses has recently accelerated in response to the difficult volatility experienced with the bursting of the stock market's bubble. Many large, traditional investment firms are now requiring their portfolio managers to pass their stock ideas through a series of financial statement quality screens and other risk assessments. However, for many people quantitative investing remains an enigma --- what does it mean to be a *"quant"*?

Investment Principles and Investment Methods

Investment managers typically have a set of principles or criteria that they employ to identify superior securities that they expect will yield greater than market returns. These investment principles are typically closely related to a manager's identified investment style. Value styled investors typically exhibit preferences for low share prices relative to tangible asset values, earnings and/or dividends. Growth styled investors typically focus on identifying the shares of companies with the greatest prospects for rapid rates of growth in sales and/or earnings. But what are the investment principles of a quantitative investor? Are their principles biased towards value, growth, neither or both?

The simple answer to the above question is --- yes; quantitative investors can be biased towards the principles of value, growth, and neither or both investment styles. Being a quant is not a statement regarding the inherent style of an investor or their investment principles. Being a quant is rather a statement regarding the *methods* or *tools* that such an investor uses to measure, evaluate and implement any given set of investment principles. Quantitative investing represents a greater reliance upon a statistical, systematic methodology to investment decision-making. Therefore, you will find quantitative value investors, quantitative growth investors, quantitative momentum investors and quantitative variations of all types of investment styles.

Quantitative methods can be employed throughout all aspects of the investment process --- research, stock selection, portfolio construction, trading, and performance attribution. To gain a better understanding of quantitative equity investing, let's compare aspects of the typical approach to stock selection and portfolio construction for quants versus their traditional investor peers.

Stock Selection

Successful active stock selection requires the investor to develop an effective means for determining the (relative) attractiveness of securities within a broad universe of stocks. Typically the basis for such determinants of stock attractiveness includes financial fundamentals of the company, macro-economic and macro-market conditions, and prevailing patterns in the stock's price and trading volume. The effectiveness of an investor's evaluation of these determinants of stock attractiveness is related to the *scope* and *rigor* of their valuation analysis.

The scope of the valuation analysis for the quantitative investor is defined more by its *breadth* while the traditional investor's emphasis is on *depth*. A quantitative investor will rely upon computer-based analyses of large data sets of financial, macro, price and volume data. The incredible expansion in the affordability of computer resources combined with the availability of vast databases provides the quant with the foundation for evaluating thousands of stocks within hours. Therefore, a quantitative investor will look to add value by expanding the breadth of opportunities to differentiate attractive from unattractive stocks.

For the traditional investor, their reliance will be upon a staff of analysts plus possibly economists and strategists to generate opinions regarding the attractiveness of individual stocks. Typically the selection universe of stocks is narrowed to allow the analysts to focus more deeply upon the dynamics of fewer stocks. These financial analysts will usually have backgrounds from industries similar to those of the

companies they are assigned to evaluate. In this case, the traditional investor will derive its added value from the depth of understanding they possess regarding a narrower, more (humanly) manageable universe of stocks.

The rigor or the standards employed by the quantitative investor focuses on the *repeatability* of their valuation analysis. A quant will systematically evaluate the same financial, macro and share price characteristics for all stocks in the same manner over and over from one period to the next. By focusing on systematic repeatability the quant is hoping to capture time after time the insights of their investment principles while minimizing the slippage of analytic inconsistencies.

A traditional investor will look to benefit from the *flexibility* of their approach to valuation analysis. They will potentially evaluate stocks differently based upon the company's type of business and based upon how they foresee environmental influences impacting future operations. The traditional investor will also consider softer qualitative judgments regarding evaluations of the quality of management, the value of brand awareness, and the actions of company competitors. By having flexibility to incorporate the impact of unquantifiable influences the traditional manager hopes to develop a more nuanced opinion of a stock's attractiveness.

Portfolio Construction

Quantitative methods have arguably received even greater acceptance in their use towards risk management and portfolio construction. Nobel Prize winner, Harry Markowitz, suggested that investors should diversify their portfolios by targeting the highest expected return for a chosen level of tolerable risk instead of just looking for the highest expected return without regard to risk. The potential benefits to be derived from rigorous, risk managed portfolio construction became clearer following the market's peak in 2000 and its subsequent extended decline.

Quantitative investors use risk management practices to measure, manage and monitor their portfolio's expected volatility relative to a benchmark. Sources of expected portfolio volatility, or risk, arise from exposures to common influences such as beta, style, market capitalization, industries and stock specific events. Third party software vendors such as Barra provide sophisticated risk measurement models that make such analyses readily available to all investors; however, the quant will typically rely upon such tools to a much greater extent when constructing, or optimizing, their portfolios.

Until the past several years, traditional investors did not make much use of risk management tools during their portfolio construction process. Their portfolio construction process was less rigorous and perhaps more intuitive by typically holding their highest rated stocks in approximately equal proportions. However, this approach can lead to unintended biases and sources of risk that might go largely unseen by the traditional investor. For example, assigning high rankings to Motorola, Office Depot and Time Warner, which are diversified by industry, but when combined yield a high beta bias to a portfolio.

An investor that exceeds the return of the market by taking on more risk than the market has grown to be seen as not necessarily "beating the market" (i.e., assuming a high beta bias in a rising market environment). Therefore, you are now seeing all investors being asked by clients to discuss the biases within their portfolio relative to their benchmark and then measuring performance adjusted for intended versus unintended exposures.

Concluding Remarks

The tools used by quantitative investors and quantitative equity investing will continue to grow in acceptance as the level of investment sophistication increases throughout the industry. Investors are relying less on hunches and Wall Street research while clients are looking beyond star portfolio managers of the past that were given unquestioned unilateral leeway while making investment decisions. This does not mean that quantitative investing is inherently superior to traditional approaches --- there are both good

and bad quantitative and traditional investors. However, the breadth and repeatability of systematic stock selection plus the benefits of risk managed portfolio construction is making quantitative investment methods and in turn, quants increasingly attractive.

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