

Performance Consistency in International Equities—The Advantage of an Adaptive Quantitative Approach

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In brief

- International markets are generally considered more inefficient than US equity markets; can these anomalies be attributed in part to behavioral biases?
- The expected growth rate of a company is crucial to understanding the nature of the mistakes investors make—this is why an adaptive approach is important.
- Sectors play a key role in explaining returns of international markets over time.
- Deploying active share proportionately in your portfolio is more effective than targeting short-term fluctuations in tracking error. By taking numerous smaller active bets, performance consistency is improved.

Equity returns in international markets are driven by two different sources: systematic factors and idiosyncratic risk. In the pursuit of these sources of alpha, investment managers generally employ one of the following approaches: (1) bottom-up (idiosyncratic risk), (2) top-down (systematic factors), or (3) a blend of the two. In this piece, we will describe how a bottom-up, quantitative investment process can be well suited to deliver consistent positive excess returns in international equity markets by focusing on two key elements of the investment process: a) a stock selection model that captures the long-term drivers of future returns via firm fundamentals, and b) the use of rankings generated by that stock selection model to construct portfolios that will deliver predictable alpha and beta returns. We will also discuss the behavioral biases that can affect security prices in international equity markets and how a sector based, adaptive weighting model to capture and exploit these biases can be effective.

BEHAVIORAL BIASES AFFECT STOCK VALUES

International markets are generally considered more inefficient than domestic (US) markets, whether by looking at:

- measures of co-movement or tendency for stocks to move in same direction (lower in the US),
- transaction costs (lower in the US), or
- availability of stock-level information (higher in the US).

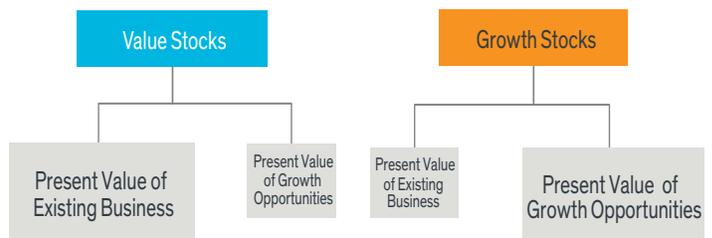
A large body of literature attributes these anomalies to behavioral biases. We believe that two well-established behavioral biases

are very important in explaining mistakes made by investors when evaluating the future prospects for individual stocks.

The first one, overconfidence, characterizes behavior like the human tendency to assign unduly high weight to their own forecasts (Kahneman and Tversky, 1973), and to form preferences based on situational framing (the idea that problems can be described or framed in multiple ways that give rise to different preferences) (Kahneman and Tversky, 1984). Overconfidence bias also suggests that investors can be slow to adjust their expectations to new information that runs counter to their current opinions (Daniel, Hirshleifer, and Subrahmanyam, 1998). The second one, prospect theory, suggests that losses hurt investors more than gains give them pleasure, which in turn will make investors sell winning stocks too early and hold on to losing stocks longer than they should (Kahneman and Tversky, 1991).

Why are these biases relevant? Figure 1 illustrates a simplified framework for valuing the price of a stock. The price of a stock is made up of two components: the present value of a future stream of earnings as they exist today, and the present value of future earnings that would come from untapped growth opportunities. For a slow or no growth stock, the present value of growth opportunities becomes trivial and the value of the stock is almost entirely dependent on the value of current earnings (Scott, Stumpp, and Xu, 1999). Any behavioral biases held by investors would be based on their belief that they know something about the firm that is inconsistent with the lack of growth prospects. On the other hand, for fast growth companies behavioral errors will be based on biased estimates of future growth prospects. In both cases, the expected growth rate of a company becomes crucial to understanding the nature of the mistakes investors make. This is why an adaptive approach that takes into consideration the growth prospects of a company is important so that present earnings and potential future growth can be weighed accordingly.

1/ SLOW AND FAST GROWTH STOCKS AND IMPLICATIONS OF BIASES



Source: QMA.

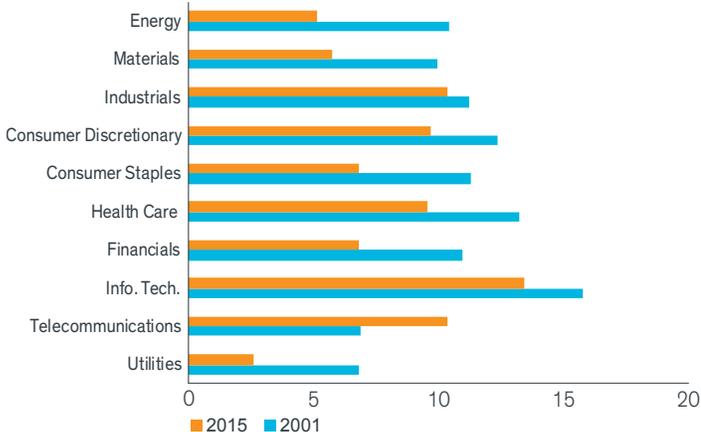
SECTORS PROVIDE RICHER OPPORTUNITY SET

A sector based approach is an effective implementation of an adaptive stock selection model in international equity markets. It is widely accepted by academics that in international developed markets (beginning with Heston and Rowenhorst, 1994) sectors play a much bigger role than countries in explaining the cross section of stock returns over time. In other words, international stock returns are explained more by the sector they belong to than by the country where they are located physically.

How large and widespread are the differences in growth expectations in international markets over time? Figure 2 shows the differences in long-term growth estimates. What stands out from this chart is the dynamic nature (or volatility) of sectors over time. For example, Utilities and Materials in developed markets have significantly lower growth prospects today than at the turn of the millennium. Energy and Telecom have also experienced large shifts in growth expectations.

2/ LONG-TERM EPS GROWTH ESTIMATES BY SECTOR

Developed ex. US



As of 12/31/2015.

Source: QMA, using data provided by FactSet, Thomson Reuters I/B/E/S. Source of sector classification: S&P/MSCI.

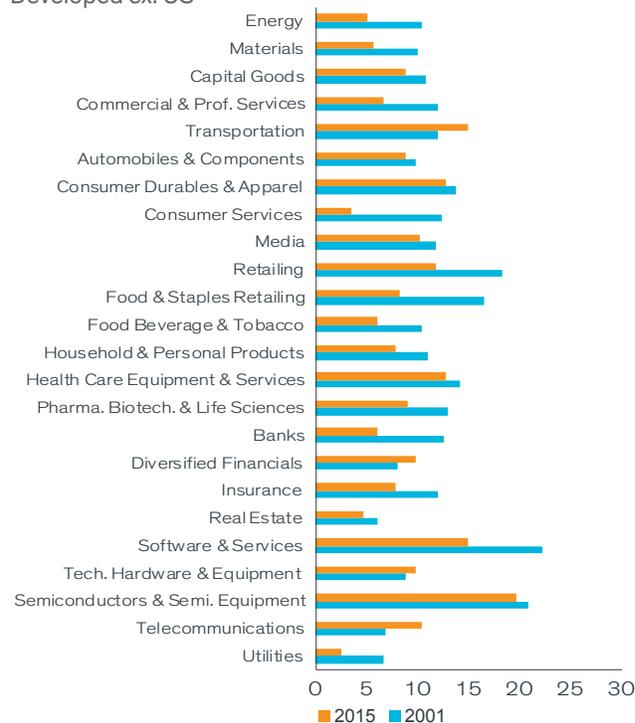
The chart above is being shown to illustrate the 3-5 EPS Growth Estimates from I/B/E/S. 'Developed ex. US' represents the countries included in the MSCI World ex. US Index. Please see 'Notes to Disclosure' for Important Information including financial indices and disclosures.

Sectors, however, are too broad to tell the complete story. We have to look within sectors to fully explain why a such an approach makes sense. Figure 3 illustrates the differences in growth estimates that often occur within industries. These large gaps in growth expectations help support the use of an adaptive approach within sectors, i.e., applying different weights to a

company's valuation and growth fundamental measures according to each company's growth expectation. For instance, within Financials, industries such as Banks or Real Estate have significantly different growth expectations that we need to take into account when we evaluate the future prospects of a specific bank or a real estate company.

3/ LONG-TERM EPS GROWTH ESTIMATES BY INDUSTRY

Developed ex. US



As of 12/31/2015.

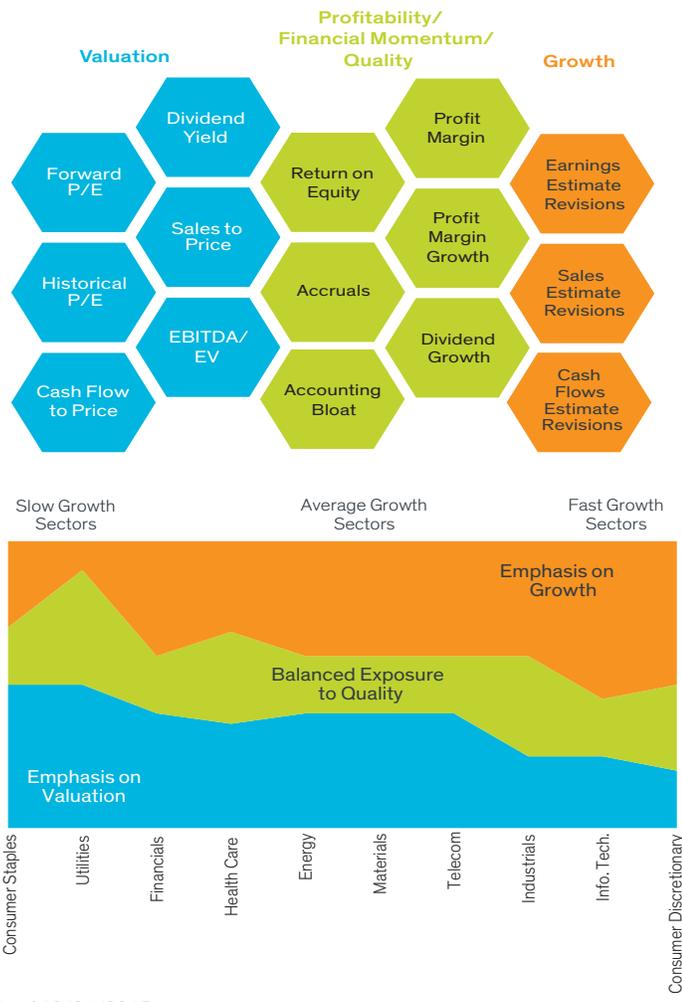
Source: QMA, using data provided by FactSet, Thomson Reuters I/B/E/S.

The chart above is being shown to illustrate the 3-5 EPS Growth Estimates from I/B/E/S. 'Developed ex. US' uses the countries included in the MSCI World ex. US Index. Please see 'Notes to Disclosure' for Important Information including financial indices and disclosures.

APPROACHING SECTORS A DIFFERENT WAY

In the case of QMA, employing a sector-based model does not mean making top-down allocations or decisions. Rather, our goal is to use stock selection to capture the large divergence in growth expectations at the sector and industry level. Graphically depicted in Figure 4, we use company level fundamentals that measure valuation, growth, and quality. QMA organizes the universe of stocks according to their growth rates by sector and ranks stocks based on fundamental measures that best capture desired factor exposures (valuation, growth, profitability/momentum/quality). Within each sector, we weigh these fundamentals according to each company's expected growth, i.e., each company will have a unique weighting scheme based on its unique growth ranking within its sector.

4/ SECTOR-BASED ADAPTIVE FACTOR WEIGHTING



As of 12/31/2015. Source: QMA.

Once we have a stock selection model, the next step is to build a portfolio that optimizes the alpha delivery potential. For us, portfolios generally have the following characteristics: a) deliver small but consistent alpha across numerous bets, b) have low correlation with other fundamental and quantitative active managers, and c) focus on measures of risk that would maximize the risk-adjusted delivery of alpha. The first two components have been discussed by many before, so here we will focus on the third point, i.e., what is the appropriate measure of risk to focus on when constructing an international bottom-up portfolio.

FOCUS ON CONSISTENT, MEASURED ALPHA

The concept of active share, or dollar-at-risk, has been discussed by many since Cremers and Petajisto (2009) first introduced it. The concept, devilishly simple, measures the sum of absolute value of the differences between each holding's weight in a portfolio and the weight in a benchmark portfolio. A large body of criticism to this measure centers on its one-size fits all applicability and argues that fundamental and quantitative approaches should be evaluated independently. In a quant-based portfolio, efficient low tracking error levels may be achieved by targeting an active share level between 50% and 60%. Higher tracking error portfolios may be achieved by increasing the active share target all the way up to 80% to 90%. Our focus here is not to discuss what the optimal level of active share is. Instead, we believe that the thoughtful deployment of active share should be the focus. Put differently, we build portfolios that deploy active share proportionally—effectively avoiding extreme bets and ensuring our portfolios are positioned with large numbers of small positions that seek to deliver the desired, consistent payoff profile.

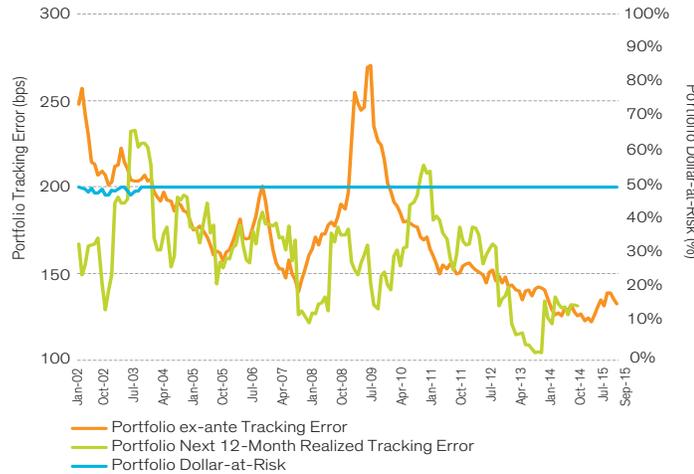
Active share is an indirect measure of risk as it does not directly map into units of returns, performance, or utility. However, a particular level of active share for a particular strategy can be expected to correspond to a targeted level of tracking error over longer time horizons. The advantage of active share is that it is not a measure that fluctuates with temporary changes in market conditions and, therefore, allows the investment process to dedicate all of the portfolio turnover to alpha generation instead of chasing a quick-changing short-term risk estimate. Such a longer-term focus is especially appropriate for portfolios such as ours, which do not use significant levels of leverage and are specifically managed to avoid unintended and untargeted sources of risk.

Exhibit 5 shows another advantage of focusing on active share to deploy risk budget. The chart shows the active share level of a MSCI EAFE Markets 2% tracking error portfolio, with 100% annual turnover. The blue line shows the desired level of active share, the orange line shows the ex-ante tracking error based on a multi-factor risk model, and the green line shows the ex-post tracking error. As evident in the picture, ex-ante and ex-post tracking error differ substantially at times. A portfolio manager intent on keeping a certain target level of ex-ante risk would find herself spending a significant amount of turnover just to keep up with ex-ante risk changes. To us, this is a wasteful use of turnover.



One result of our proportionate deployment of active share across the entire opportunity set is the use of turnover to increase the level of expected alpha in our portfolios, taking numerous, smaller active bets within sectors and within sectors across countries with the intent of increasing portfolio return consistency.

5/ ACTIVE SHARE AS PORTFOLIO RISK MEASURE



Source: QMA. Shown for illustrative purposes only. Research results from 1/1/2002 to 9/30/2015. The research results are not intended to be indicative of QMA performance nor does it constitute investment advice.

What does an efficient portfolio look like, based on all we have discussed here? One way to define efficiency is found when looking at the proportion of risk contributed by factors as well as by idiosyncratic risk. In particular, a common heuristic is to have at least 70% of the risk coming from stock specific sources. In the case of QMA portfolios, our stock specific risk comes from three distinct types of bottom-up stock selection: a) within countries, b) within sectors, and c) within sectors across countries.

The quantitative process described here can be a powerful addition to an investment strategy as a stand-alone or as a complement to high concentration, high tracking error products (more prevalent among fundamental investors). Figure 6 illustrates how fundamental and quant approaches pay off may, on average, at different points of the business cycle. Combining the two approaches could result in a smoother returns path over time.

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6/ EAFE STRATEGIES— FUNDAMENTAL* VS. QUANT MANAGERS

Rolling Three-Year Median Gross Excess Returns



*Fundamental includes both Fundamental and Combined Managers within the eVestment EAFE Large Cap Equity Universe. Source: QMA, eVestment. Data derived from eVestment EAFE Large Cap Equity Universe, including inactive products. Excess returns were calculated using manager preferred benchmarks. For Median Quant Managers, the primary investment approach of quantitative was selected. For Median Non-Quant Managers, the primary investment approach excludes quantitative. Data from 12/1/1996 to 12/31/2015.

CONCLUSION

Without a systematic model, managers make active decisions to over/underweight securities that can often result in erosion of portfolio value. That's because different behavioral biases exist that can lead to mistakes when assessing the price of a (value) stock based on the present value of earnings from existing assets or of a (growth) stock based on the present value of future growth opportunities. QMA's systematic and intuitive approach to international developed markets seeks to exploit behavioral biases that affect security prices through a sector-based, adaptive factor weighting model designed to deliver consistent performance. We believe that our approach—focused on providing stable, neutral exposures to systematic factors along with consistent exposures to idiosyncratic risk that delivers alpha—provides investors with an effective way to exploit persistent market mispricing.

About QMA

Since 1975, QMA has served investors by combining experienced judgment with detailed investment research with the goal of capturing repeatable long-term outperformance. Today, we manage approximately \$113 billion* in assets globally for a worldwide institutional client base, including corporate and public pension plans, endowments and foundations, multi-employer pension plans, and sub-advisory accounts for other financial services companies.

*As of 12/31/2015.

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