

# THE ABCs OF ALPHA, BETA AND CHANGING MARKETS

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## Executive Summary

**Over the past 40 years, the market has changed substantially, becoming more disaggregated and more complex. Rather than being intimidated by these complexities, we believe investors should take advantage of them to systematically gain better insights into their portfolio allocations, investments, and managers:**

- The desire for alpha remains consistent. But accurately assessing both the sources of and impediments to alpha in your portfolio can be challenging. Are managers delivering what they promised? Is the investment adding or detracting from the overall portfolio? What other options are there? Is the current asset allocation strategy working?
- Without a systematic lens, investors may myopically focus on alpha and overlook additional elements that impact performance, and therefore, may not have a complete understanding of the earning potential of their portfolio. This is where a quant could be helpful. Because of their ability to process large amounts of data, a good quantitative manager has the ability to assess these performance drivers and optimize portfolios in a way that not only aims to capture excess returns, but also accounts for performance detractors, expected and unexpected.
- Knowledge is power. In current markets, the options available to investors are endless. By understanding the components that impact portfolio outcomes and using some (relatively) simple math, investors can evaluate impact and opportunity at the manager level, at the asset-class level, and for the portfolio as a whole, thus allowing them to take control of their investments.

## IT STARTED WITH ALPHA VS. BETA, AND THEN IT GOT COMPLICATED

Market structures have changed a lot over the past few decades. This transformation resulted in an influx of new products and vehicles, creating a large opportunity set for savvy investors. But with so many options, the investment picture has become clouded. So how can investors break through to see the light? Try looking at the world through the eyes of a quant. Terrifying? Sure, if you're afraid machines are going to take over the world or that you'll have to use those math skills you cast aside in high school. Full disclosure: there is math. But I promise to keep it simple and to use a minimal amount of "nerd-speak" to demonstrate that a systematic approach could help even the most biased investor judge how their individual investment choices should form a complete portfolio, particularly given the shifting market landscape. In doing so, we can provide a starting point for evaluating investment managers in general, recognize the opportunities available more specifically in equities, and even appreciate how quant investing could provide a nimble, uncorrelated enhancement to an investor's overall book.

## THE NEVER-ENDING STORY: IN SEARCH OF ALPHA

Passive vs. active, growth vs. value, short-term vs. long-term. Whatever the investment strategy, it all boils down to one thing: Investors will never end their quest for alpha. In theory, finding "alpha," or reliable excess return, should be easy. The

Capital Asset Pricing Model (CAPM) sums this up: anything that outperforms its benchmark is alpha, the rest is beta (or the return of that benchmark). In simpler times – when the average investor could only pick from a relatively small number of mutual funds – this not only helped decide where to invest, but also what fees to pay: more beats less, so only pay for more.

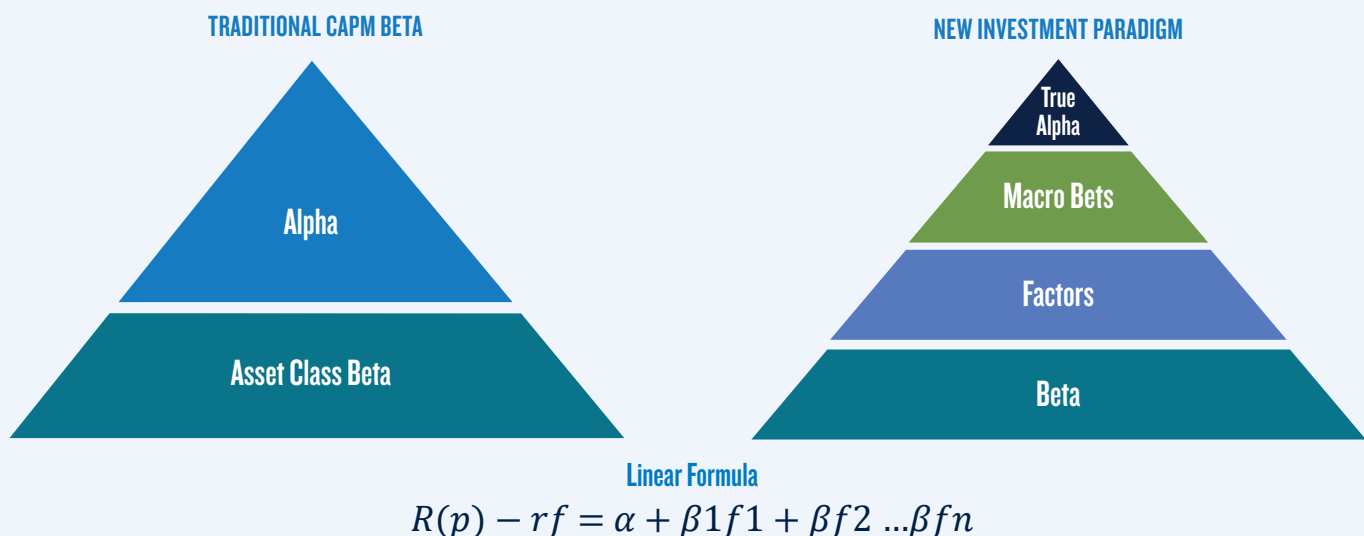
But the last 40+ years have seen the market get more disaggregated – and while it's changed substantially over that time, the increasing complexity is in many ways advantageous to today's investor. On the other hand, the choices are more complicated. While beta and alpha remain the same, there are now "factors" and "macro" segments.<sup>1</sup> These new players are fairly easy to define: factors are characteristics that identify stocks that tend to move together, like size, dividend yield or industry membership. Macro simply looks to time investments based on market conditions.

Put more directly, while alpha still exists, it has become rarer and more expensive. Because it has become easier to identify more beta-like segments of the market, true alpha is a much smaller percentage of the overall opportunity set than many

## Shifting markets require a systematic approach to:

- Evaluate investment managers
- Uncover opportunities in equity markets
- Portfolio enhancement through nimble, uncorrelated quant investing

Figure 1: Evolving Market Views: New Opportunities



Source: PGIM Quant. For illustrative purposes only.

1. Note that we could argue about the names and even numbers of investment segments, but for the sake of simplicity, I'm leaving it at these four.

have realized, something many investment managers hope we don't notice. For the sake of this discussion, let's define alpha as the excess return a manager provides above and beyond all market segments. The desire for alpha is so strong, investors are willing to pay more for it, even if they have no idea how the manager is getting it, as the rise of private equity and hedge fund assets have proven. And while we might not know exactly what they are doing, we can use the following framework to help identify, review, and evaluate these managers systematically.

In order to evaluate investment impact and opportunity, we'll have to use the dreaded math I warned you about, but fear not: it is very straightforward. The return of a portfolio (minus the risk-free rate) is the sum of the weight ( $\beta$  or beta) of each segment times the return of that segment.

This formula is no different than how a final grade is calculated in school: the result of each test times the weight of each test, all added together, gives the final grade for the class. By using this structure, an investor can identify what the return of each segment of their portfolio is, decide on how well it's doing, and determine if it justifies its fee. This method is also a convenient yardstick for measuring like-for-like investment managers. Not only does it demonstrate if they're beating their standard index, but it can also show how they fare against peers – a report card for the class. At the total portfolio level, an asset owner now has a detailed framework for measuring the components of their investments at each asset class.

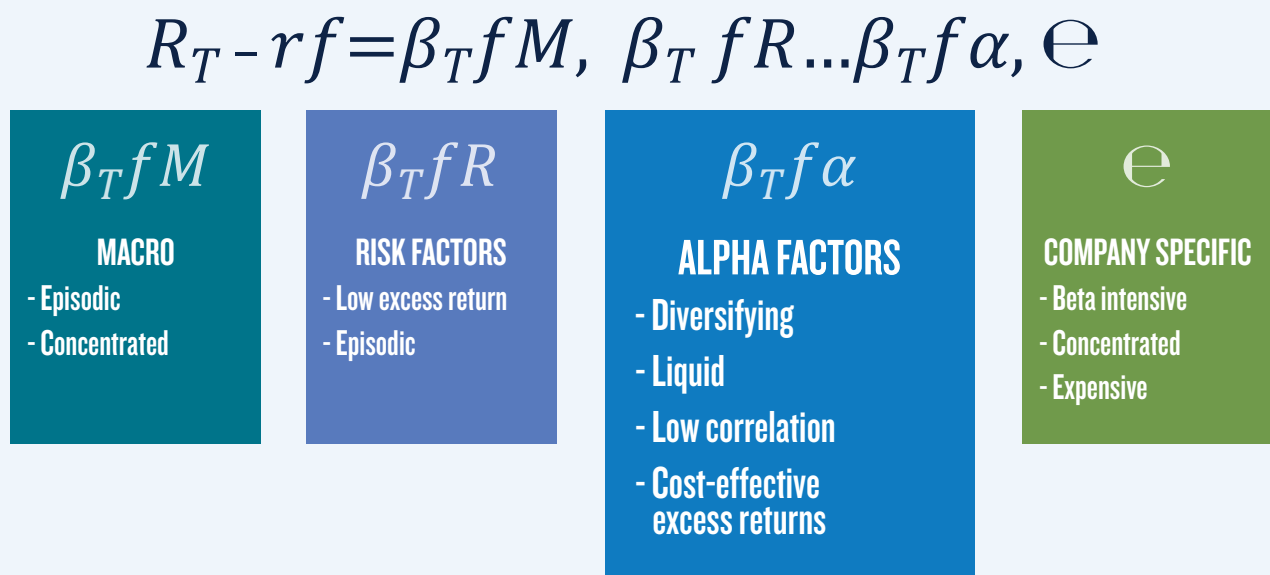
## WINDS OF CHANGE: MOVING BEYOND ALPHA AND BETA

Let's shift our focus to equities, specifically. The liquidity and global nature of the asset class, along with their impressive returns for the past decade, have made equities a major allocation in most investors' portfolios. At the same time, the return drivers of an equity portfolio really do mirror the broader investment opportunities.

Leveraging the segments defined previously, we can break out the performance drivers of an active equity portfolio in the same format (Figure 2) and highlight those areas where systematic investing can be especially beneficial.<sup>2</sup>

- The old CAPM focuses largely on the market risk premium, or **market beta**, of the portfolio. Beta isolates how much of a portfolio is driven by the index exposure and, as we discussed above, should be a low driver of excess returns for an active manager. Concentration risk is also a consideration, as beta is driven by the winners in the index. Here is also where we address the risk-free rate – something that has found renewed relevance amid the current market environment. Why? Markets are risky by nature. When the risk-free rate is high, the equity risk premia (the inherent market risk) have to compensate investors with a higher rate of return to make the risk worthwhile. However, as we adjust to the new market reality, beta becomes nothing more than a risk factor, freely accessible via an ETF.

Figure 2: Deconstructing Returns: Understanding the New Paradigm



Source: PGIM Quant. For illustrative purposes only.

2. Some of you might notice I am not including alpha here as an input in the formula. Rather, I'm more interested in identifying where that alpha or excess return is coming from. Really, this is just a classification of investment manager types within a total portfolio, not a perfect representation of the Fama-Macbeth framework, on which this note is philosophically based.

- The second driver is **macro**, which aims to take advantage of market reactions to economic changes. Because of its relevance to current market conditions, macro often piques investor interest and excitement and is often viewed through the lens of multi-asset strategies. In the equity space, where the options are more limited, such bets often take shape through targeted segments of a market, such as over- and underweights to sectors or countries. These bets are typically based on timely information such as interest rates or GDP forecasts, and the concentrated exposures can pay off well. However, it's often binary – homeruns or strikeouts. Make no mistake, especially in the multi-asset world, a good macro investor can provide diversified returns.

However, simple or static macro bets (e.g., a constant overweight in one part of the world) are really just more beta.

- The segment at the far right of our spectrum is **company specific**. Often called discretionary, stock selection treats each company individually. Rather than a systematic review of many companies, there is a narrow focus on a select number of companies. Both time consuming and limiting, this approach is frequently concentrated in nature, which leaves little room for error. If only 20% of an index can be reviewed, you had better make sure it's the right 20%!

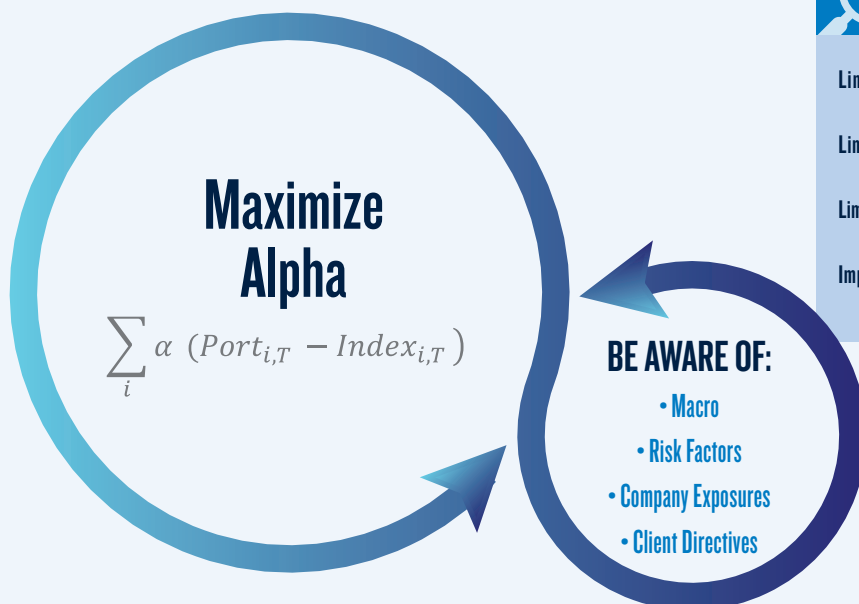
As we move onto my favorite part, factors, note that I have separated them into two categories to highlight the real opportunity in this space: risk factors and alpha factors.

Here's where an objective, systematic, data-driven approach can shine:

- **Risk factors** are lower quality and do not provide consistent excess returns. Size is a classic example, as smaller names have traditionally been riskier than their larger cap compatriots but have generally delivered higher returns. This makes sense – getting in on the ground floor leaves more room for upside. However, as we have seen in the US over the last decade or so with the FANG and FANG-like names, the pay-off can be inconsistent – size does not provide a constant payout. Other risk factor examples include simple market exposure sector, regional, and country bets. In short, unless there is a macro view driving the investment decision (in which case these bets move to the macro segment), there is limited reason to have exposure to these factors.
- High-quality factor exposure, in contrast, is an alpha driver. **Alpha factors** look to systematically identify return drivers that are not related to the concentration and crowdedness of risk factors and are independent and diversifying to macro signals. Because they look to harvest returns across many different securities by using numerous inputs, alpha factors are by nature diversified. The key takeaway is that alpha factors are unique and independent from the other segments, especially risk factors, and thus provide uncorrelated sources of excess returns.

There is no point in having the best recipe if you can't eat the meal, so how quants implement the alpha factor exposure

Figure 3: Optimizing for Outcomes



**A CLOSER LOOK AT THE MATH**

Limit Macro Exposure:  $\lambda \sum_i^M (Port_{i,T} - Index_{i,T})$

Limit Risk Factor Exposure:  $\lambda \sum_i^{RF} (Port_{i,T} - Index_{i,T})$

Limit Concentrated Company Exposures:  $\lambda \sum_i^e (Port_{i,T} - Index_{i,T})$

Implement Client Directives:  $\lambda \sum_i^\infty Tax (Port_{i,T} - Port_{i,T-1})$

Source: PGIM Quant. For illustrative purposes only.

to capture excess return while accounting for various risk factors and macroeconomic conditions is just as important as the quality of the returns themselves. Broadly speaking, quants use an optimizer to build their portfolios. I won't lie to you, the math involved in the optimization process can be complicated, but the concept is simple: maximize what you want and minimize what you don't, as shown in Figure 3. By not just focusing on alpha, but also building in the diversification needed to manage for market curveballs and client directives, a good quant manager should ensure that they're not swimming in the same pool as other managers, while focusing on those independent alpha drivers. Quants shouldn't crowd out other managers.

Ultimately, every investor wants controlled beta and alpha, so a partnership with the right investment manager could provide targeted risk control, exposure diversification, correlation management, and direct alpha.

You'll note that each of the formulas in Figures 2 and 3 include a T, which stands for timing. Not all managers include this element in their optimization process, but I believe that an effective active manager should not maintain static exposures. As market conditions change, investors of all stripes need to adapt, including quant managers. Ideas and data that work in one part of the market may not work (or even exist) in others. What drives a tech company will likely be quite different from a utility, much less so if one is in India and the other is in Germany.

Exposures must therefore be dynamic and deployed where expectations for payoff are high, and it follows that research into new ideas should be a constant. Markets are always evolving, and smart investors recognize there is no room to rest on their laurels.

In current markets, savvy investors should be looking to do more with their equity allocation. The client-directed options available with a smart manager are varied and wide, from [regional exposure](#) to [diverse and comprehensive access to smaller names](#) to [building customized ESG solutions \(without sacrificing returns\)](#). And while investors want to do more with their equity allocation, they want it done with lower fees. The key is nimble solutions that blend risk control with return goals, all while solving multiple problems for the same dollar contributed. One-trick ponies just can't run in this race anymore.

## THE SEARCH IS OVER: TAKING CONTROL OF YOUR PORTFOLIO

By borrowing the segmentation method to better understand the opportunity set, we've outlined the benefits of a systematic approach for at least a portion of an investor's portfolio.

## The Final Countdown:

- Segmentation that breaks out active equity performance drivers helps identify where systematic investing can be especially beneficial
- Each exposure can be measured and judged
- Similar exposures can be diversified
- Building-block risk controls let investors decide if the sum is worth the parts

To begin with, an easy-to-understand report card for your managers is a plus, but the ability to measure your managers, both individually and in aggregate, on all relevant segments is even better. Each exposure can be measured and judged, similar exposures (say, many bets on US large-cap tech names) can be diversified, and the investor can decide if the sum is worth all of the parts, allowing for a building-block level of risk control for the portfolio. Note that this segmentation knowledge need not stop at the asset class level. If all of the equity managers and all of the fixed income managers are heavily invested in the same sector or country, an asset owner might want to diversify across their asset classes.

Importantly, this approach also helps when choosing managers within the asset classes of a portfolio. One such solution is the "core-satellite" approach, where the main components of the equity book are held by a core manager, based on alpha factors, with minimal risk factor exposure. The core would be diversified, well priced, and expected to do well in most market conditions. It would be supplemented by smaller, more concentrated, higher-risk and uncorrelated investments with managers that use either a macro or discretionary (or combined) approach. Satellite managers could be rotated based on market conditions, thus allowing for more targeted and risk-directed allocations.

Yes, math can be a bit intimidating, but using a little math and keeping it simple let me illustrate the advantages of a systematic framework for juggling the many options open to investors. The structure allows for a direct yet flexible approach, especially in equity markets, and demonstrates how viewing the exposures that managers use can be governed at the overall portfolio level, matching return and risk expectations of the end asset owner. Now, if we want to get into more math, we can start talking optimization... any takers?

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