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## Rethinking Beta



Max Darnell  
Partner, Chief  
Investment Officer



Ed Peters  
Co-Director of  
Global Macro



Jia Ye, PhD  
Partner, Chief  
Investment Strategist

Professional investors today speak incessantly about beta, still treating beta as the cornerstone of investment portfolios that it should be, yet using the term in most instances in a manner that is devoid of the meaning and the insight that justifies that foundational treatment. The term beta is routinely treated as synonymous with the term “asset class,” and by treating it this way, the term is divorced from the concept of systematic risk, or non-diversifiable risk that made it important in the first place. By reuniting the term with its original meaning, we will come to see that there is much more to asset allocation, and much more to the principle of diversification, than simply “spreading” risk across different asset classes. Asset allocation should be approached more actively with intentions to shape and mold combinations of assets and asset classes into the beta we need.

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**A diversified “basket of asset classes”  
is not the finished product we seek.**

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To reach this conclusion, we will need to show that there are no such betas as “stock market betas,” “bond betas,” “commodity betas,” or “hedge fund betas.” Asset classes are not betas, and we should cease equating the two. Beta is what *results* from combining assets and/or asset classes. Think of beta as the output, not the input to asset allocation. Beta is the result of combining sources of risk in such a way that the diversifiable risk has been diversified away. This means that diversification is not merely a matter of avoiding the problem of having all your eggs in one basket, but rather it is a process by which uncompensated risks are neutralized. These arguments taken together set the stage for us to *create* beta that suits most investors’ common requirements, and we will provide our own developing view on what is, in fact, an essential building block or foundation for asset allocation.

## In Search of Principles

The generally accepted role that asset classes play as the basic building blocks in asset allocation appears to be based on practical rather than principled considerations. While grouping assets into asset classes is conceptually convenient, and while transacting in asset classes is simple and cost effective, this should not mislead us into thinking that there is something essential, from a risk and return perspective, about these aggregations of assets

With asset classes other than conventional stocks, bonds and real estate now playing more significant roles in portfolios today, we have naturally grown more inquisitive about what qualifies as an asset class. Are hedge funds an asset class? Is currency? Is alpha in general an asset class? Not only do we have trouble defining what is, and what is not, an asset class, we have trouble agreeing as to how assets should be placed among the asset classes. Catastrophe bonds and credit default swaps, to take just two examples, don’t fit neatly into asset class categories any easier than hedge fund betas do. What are they then? We find that there are no set principles in seeking an answer to these questions. That, in and of itself, should signal that we do not have a proper handle on what the basic building blocks of asset allocation are and should be. Where do we look for principles then?

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Start by defining our intention: we seek “beta” when allocating investment capital to asset classes. In the common vernacular of investors, people mistakenly equate the term “beta” with exposure to an individual market or

asset class. They speak of the “stock market beta,” the “small cap beta,” the commodity beta,” and so on. When most investors speak of separating alpha and beta, asset classes are treated as the reference point as evidenced by the fact that what is meant is the separation of an active return earned in a market or asset class from the return on the market or asset class itself – the former, of course, being “alpha” and the latter being “beta.” The same meanings of alpha and beta are implied when speaking of porting alpha onto beta. Defining the term beta as the return on a market or asset class disassociates it from the all important insight which generated the term at its origin, so we must take a moment here to recall what was rich and useful about the term beta in its original use.

### Reclaiming Beta

Beta, in its formal definition, is defined as an exposure to a specific type of risk. Investors expect to be paid a premium for the risks that they bear over and above the time value of money. That sounds simple enough until you note that not all risks should be compensated with such a premium. The central and essential contributions of Harry Markowitz’s 1952 paper “Portfolio Selection,” Bill Sharpe’s Capital Asset Pricing Model (CAPM), and Jack Treynor’s initially unpublished papers on the same subject lies in taking a portfolio view of risk, and drawing a distinction in that portfolio context between diversifiable and non-diversifiable risk. *Risks that can be diversified away through other holdings within a portfolio context merit no risk premium.* Beta is defined<sup>1</sup> as exposure to non-diversifiable, or systematic, risk.

So why is it wrong to equate asset class exposure with beta or with systematic risk? For two reasons. First, asset classes don’t contain risks that are unique to themselves alone. This phenomenon has been, perhaps, most discussed in relation to hedge funds or alternatives which have taken on asset class status for many investors. There the work of Joanne Hill, Andrew Lo, Harry Kat, Thomas Schneeweis, Bill Fung, David Hsieh, Greg Jensen, and Lars Jaeger<sup>2</sup> tell us that hedge funds on average have significant exposures to the equity market, to interest rates, to changes in volatility, to changes in credit spreads, etc. The fact is that the conclusions of this work pertain to all asset classes, as all asset classes have exposures to risks that can be found in varying, and typically significant, degrees in other more traditional asset classes.

Second, and more importantly, it is wrong to treat asset classes and beta as equivalent because much of the risk associated with any individual asset class is diversifiable, i.e., asset classes are not merely containers of only non-diversifiable risks. When we combine different markets or different asset classes in a portfolio, they diversify some/much of the risks that each carries. Bonds, for example, can help

to diversify away some portion of the “equity market risk,” as can real estate and commodities. Hmm. So Markowitz,<sup>3</sup> Shape and Treynor would tell us that the non-diversifiable risk of stocks is not merely the risk that is left after all *stock-based* opportunities for diversification are taken into account, but after all opportunities for diversification are considered, wouldn’t they? Beta can’t be located in isolated market segments of the portfolio. It can only be observed at the *full* portfolio level.

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The academic literature supported this line of argument years ago. During the academic debates about “the death of beta” – recall the papers from Fama and French, Roll and Ross, and Chan and Lakonishok – Roll and Ross pointed out that Fama and French’s study may have failed to observe a risk premium on high beta stocks because not all of the relevant assets were included in the measurement of beta and the risk premium. They meant that not all available *equity* shares were included. It is only a small step from that statement to a broader charge that not all available assets were included.<sup>4</sup> Bonds, real estate, commodities, and all other assets in an investment portfolio should have been included when measuring beta. As a result, much of the empirical work surrounding beta was asking questions from the wrong perspective.

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There is then, no “stock beta,” no “bond beta,” no “commodity beta,” and no “hedge fund beta.” There is only that systematic risk left after all diversification possibilities have been exhausted. There seems little doubt that asset classes are not the basic building blocks for our portfolios, and that what we’re after is not an optimized and diversified exposure to asset classes. Rather we’re after that stuff that diversification has failed to dissolve when combining assets in a portfolio.

### Soup or Salad?

We can see two immediate and practical implications stemming from this shift in world view. First, this shift in perspective causes us to think of the asset allocation exercise as being transformative rather than a matter of mere capital

allocation, or “spreading risk across asset classes.” Second, because asset allocation is transformative, this emphasizes the need to refocus on the investment goals underlying asset allocation, allowing the engineering of risk-adjusted return to serve a larger purpose. When focusing on the investment goals, this model provides a cleaner framework for considering where the line is drawn between essential and non-essential investment exposures.

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**Diversification is used to *dissolve* the diversifiable sources of risk. Beta is *produced* by this mixing and dissolving**

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In the asset class-centric model, asset classes are thought of as beta(s), and asset classes are the raw material inputs into asset allocation. The product of the mixing in the asset class-centric model is merely a diversified basket of what we started out with. In the beta-centric model, asset allocation is a transformative process that blends assets or asset classes. Diversification is used to *dissolve* the diversifiable sources of risk. Beta is *produced* by this mixing and dissolving rather than existing as a raw material input into asset allocation.

A very simplistic analogy may be helpful here. Asset allocation, as it has traditionally been practiced, bears more resemblance to making a salad than to making soup. Traditional asset allocation takes the raw ingredients found on market shelves and simply tosses them together in the bowl. The ingredients are not transformed in any manner other than perhaps slicing them into pieces as we might a carrot in a salad. (Slicing asset classes into pieces has been common as a part of the traditional approach, as we’ve sliced equities into value, growth, large, small, emerging, and developed, for example, or we’ve sliced bonds into sovereign, corporate, investment grade and high yield.)

Making soup differs from making salad in that the aim of soup making is to create a new substance rather than a mere collection of different foods that happen to occupy a common space as we have in a salad. The resulting soup is a thing in and of itself. Beta is the new substance that we intend to produce through asset allocation. At this point, the difference remains one largely of semantics and perspective, but this shift in perspective allows us to take a next step that leads us beyond mere semantics and perspective.

Realize that the transformation that takes place in making soup is more than just a mixing. If the onions in the soup are caramelized, for example, oxidation occurs which releases chemicals and sweetens the taste of the onions. With the application of heat, the nature of the ingredient is changed to serve our end goal. In asset allocation, with the applica-

tion of leverage, we may change the relative risk characteristics of bonds, or with the application of options, we may change the characteristics of the return distribution of stocks or other assets and asset classes. Such transformations are at odds with the asset class-centric model since the asset classes *are* the betas we supposedly desire, whereas in the beta-centric model, it should seem wholly consistent that we might want to transform characteristics of assets or asset classes since they are merely ingredients used to produce the new beta substance. Given this view of beta, it should be clear that the use of beta is not nearly as passive an exercise as generally assumed.

### Essential Beta and Beyond

We might extend the analogy one step further to capture a final insight. Making soup typically begins with making soup stock. Soup stock is the foundation upon which many different soups are built by then adding other ingredients. Is there a basic stock, or a common foundation, that could or should be used in most investment portfolios? We think so. We refer to the investment equivalent of soup stock as “essential beta,” and after defining essential beta, we will explore the reasons why different investors may all start with the same stock, but why they should also treat it as a foundation upon which to build differentiated portfolios that suit investors differentiated needs.

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**Most portfolios are intended to serve some form of future consumption, and participating in the ownership of future production will allow one to convert assets in the present to consumption in the future.**

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In a set of companion papers we will elaborate on what comprises a portfolio of essential beta. For our purposes here, recognize that nearly all investors have a common goal of participating in real economic growth. Most portfolios are intended to serve some form of future consumption, and participating in the ownership of future production will allow one to convert assets in the present to consumption in the future. Ownership of economic growth then is the core ingredient, and this comes largely from equities. Treasuries, TIPS and commodities provide *essential functions* in this core portfolio in that they diversify away a significant amount of the diversifiable, and uncompensated risk in equities, and in so doing they smooth away some of the volatility that equities will deliver. Treasuries are included because they have a highly significant ability to dissolve diversifiable risks, and they are leveraged to maximize that effect, and because future consumption is real, not nominal, assets that deliver real returns, e.g., TIPS and commodities, are

included as well. Investors want to participate in ownership of economic growth in the most efficient manner possible,

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**Characteristics of this essential foundation may be enhanced. In particular, derivatives can be used to adjust the risk and return characteristics.**

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and with these holdings, they do so cheaply, with attractive risk-adjusted returns, and as they value liquidity and transparency in what they own, these holdings satisfy additional, important objectives.

As we've indicated, the characteristics of this essential foundation may be enhanced. In particular, derivatives can be used to adjust the risk and return characteristics of this in ways that will be valued by the vast majority of investors. It is also the case that different versions of this foundation will better serve the investment goals in different market or economic environments. This means that the optimal proportions of the ingredients will vary depending upon market and economic conditions, as will the choice of derivatives used to transform the risk and return characteristics of these ingredients. These are all topics for other papers, so we'll treat these features superficially here and make the important point that, across time, the resulting beta will turn out not to resemble closely either the equity investment, nor the average blend of the assets.

It is also important to recognize that the primary goal is not focused on engineering, i.e., this is not primarily about engineering a portfolio that has the best return per unit of volatility. Rather we're seeking to rid the portfolio of as much diversifiable and uncompensated risk as possible, and address directly the common objective of most investment portfolios. The core ingredients consist of those that are essential to aligning the investment portfolio with common investment objectives. Remember, this is not the soup, but the soup stock. Other ingredients such as other sources of beta (e.g., exotic betas, or uncommoditized betas) and alpha sources should then be added separately to create that portfolio that best serves the individual needs of the individual investor.

Our drawing of a line between essential beta and other beta- or alpha-based sources of returns is important, and it cries out for justification. The critical assumption that leads to our separating essential beta from the rest is that investors have different return objectives and require different combinations of the non-essential beta sources of return to meet those different objectives. As non-essential betas and alpha sources are added to the portfolio, essential beta remains a benchmark relative to which risk in the total portfolio should be measured so that risk relative to the objective is measured.

This topic is so broad and important in its implications that we will address it separately in a later article to give it the attention it deserves.

## Conclusion

To be passive means to accept what is given in the form in which it is given. Investors are not wholly passive in making asset allocation decisions: they do make choices about which asset classes to invest in and in what proportions to invest in them. Investors have been generally passive, however, in how they handle the investment options handed to them by the market. Asset classes are treated as finished product rather than as potential inputs to asset allocation that can be reshaped to suit their need. As a result, diversification tends to take on its most passive meaning, which is to spread risk across your investments in the hope that they don't all perform poorly at the same time. The more active meaning of diversification is that by combining assets or asset classes, certain risks imbedded in those assets or asset classes can be disposed of, particularly those risks that are uncompensated due to the fact that they can be diversified away.

We are advocating a more active approach to be taken with respect to the investment options available to asset allocation work. We should have goals in mind for beta, and we should use the tools at our disposal to reshape the raw materials given to us by the market for use in asset allocation. We'll speak in more depth in subsequent papers about what those tools are, and how they can be used.

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## Endnotes

<sup>1</sup> While Markowitz did not introduce the term, he laid the foundation for it. Formally, the term “beta” was first introduced by Sharpe, Linter, and Treynor in their work on the Capital Asset Pricing Model (CAPM) during the mid 1960s. It was defined as measuring the exposures of a security or a portfolio to the broad market, the only systematic risk allowed for in CAPM. Over time, the notion that there might be more than one systematic risk took hold, and was introduced in Ross and Roll’s work on Arbitrage Pricing Theory (APT).

<sup>2</sup> There are far too many authors and articles to cite comprehensively on this topic. We’ve included a handful of citations as examples at the end.

<sup>3</sup> Harry Markowitz highlighted in his paper, “The ‘Two Beta’ Trap,” (1984) that there are two different betas referred to in the literature, a normative beta consistent with his 1952 work, and a positive beta consistent with CAPM. The relevant difference here is that the latter necessarily pertains to the market portfolio while the former need not. As you will come to see, we are clearly following Markowitz in that we do not hold the market portfolio out as being the defining portfolio. Our comments so far, however, pertain equally to either use of the term beta.

<sup>4</sup> See Stambaugh (1982) for an example of this extension.

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### First Quadrant, L.P.

800 E. Colorado Boulevard, Suite 900, Pasadena, California 91101 • 626.683.4223

Marketing Services: [info@firstquadrant.com](mailto:info@firstquadrant.com) • [www.firstquadrant.com](http://www.firstquadrant.com)

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