ARTICLE

The Whole Story: Factors + Asset Classes

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Key Points

- Collectively, academics and practitioners run so many backtests that a t-statistic of 2 is no longer sufficient to validate a factor strategy.
- Factors with positive premiums that do not covary with macro risks make the most attractive investments.
- Emerging markets are underfunded opportunities with problems that can affect values by eroding cash flows or driving up the discount rate at just the wrong time.
- A handful of persistent factors deliver premiums, but actual transactions have to do with assets. Factor- and asset-based approaches are incomplete without each other.

Every year we invite some of the investment industry's most creative thinkers to speak about their work at the Research Affiliates' Advisory Panel conference. Along with Nobel laureates Vernon Smith and Harry Markowitz, the speakers at our 14th annual meeting included Campbell Harvey, Richard Roll, Andrew Karolyi, Bradford Cornell, Andrew Ang, Charles Gave, Tim Jenkinson, and our very own Rob Arnott.[1] The richness of the speakers' presentations beggars any attempt to summarize them; I'll limit myself to the points I found most intriguing and illuminating. I also acknowledge that this account may reflect my own capacity for misinterpretation as much as the genius of the speakers' actual research.

Factors Everywhere

Cam Harvey of Duke University's Fuqua School of Business and the Man Group, who recently completed a six year stint as editor of the *Journal of Finance*, spoke about revising the traditional t-statistic standard to counter the industry's collective data-snooping for new factors. Dick Roll presented a protocol for factor identification which helps classify a factor as either behavioral or risk-based in nature. These two topics are at the center of our research agenda (Hsu and Kalesnik, 2014; Hsu, Kalesnik, and Viswanathan, 2015).

Cam has written about the factor proliferation that has resulted from extensive data-mining in academia and the investment industry (Harvey, Liu, and Zhu, 2015; Harvey and Liu, 2015). As of year-end 2014 he and his colleagues turned up 316 supposed factors reported in top journals and selected working papers, with an accelerating pace of new discoveries (roughly 40 per year). Cam's approach to adjusting the traditional t-stat is mathematically sophisticated but conceptually intuitive. When one runs a backtest to assess a signal that is, in fact, uncorrelated with future returns, the probability of observing a t-stat greater than 2 is 2.5%. However, when thousands upon thousands of such backtests are conducted, the probability of seeing a t-stat greater than 2 starts to approach 100%.

To establish a sensible criterion for hypothesis testing in the age of dirt-cheap computing power, we need to adjust the t-stat for the aggregate number of backtests that might be performed in any given year by researchers collectively. Recognizing that there are a lot more professors and quantitative analysts running a lot more backtests today than 20 years ago, Cam argued that a t-stat threshold of 3 is certainly warranted now. Applying this standard of significance, Cam also concluded that outside of the market factor, the other factors that seem to be pervasive and believable are the old classics: the value, low beta, and momentum effects. The newer anomalies are most likely results of datamining.

I am happy to note that at Research Affiliates we adopt an even more draconian approach to research. For example, Dr. Feifei Li requires a *t*-stat greater than 4 from our more overzealous junior researchers. Indeed, as we add to our research team and thus the number of backtests that we perform in aggregate, we recognize that our "false discovery" rate also increases meaningfully. We must and have developed procedures for establishing robustness beyond the simple *t*-stat.

Richard Roll, who was recently appointed Linde Institute Professor of Finance at Caltech, reminded us that there are essentially three types of factor strategies:

- Those that do not appear to be correlated with macro risk exposures yet generate excess returns.
- Those that are correlated with macro risks and thus produce excess returns.
- Those that seem to be correlated with sources of volatility but don't give rise to excess returns.

Dick proposed an identification scheme which first extracts the macro risk factors through a principal component approach and then determines whether known factor strategies belong to the first, second, or third group. The principal components should be derived from a large universe of tradable portfolios representing diverse asset classes and equity markets as well as proven systematic strategies. Think of the extracted principal components as the primary sources of systematic volatility in the economy. A modified Fama–MacBeth cross-sectional regression approach, which uses only "real" assets to span the cross-section, should then be applied to determine which principal components command a premium and which do not. Then we examine the "canonical" correlation between the principal components and the various factor strategies of interest. This will help us identify which factor strategies derive greater returns than their exposure to systematic volatility would warrant, and which, in contrast, derive less return than their exposure would suggest. For instance, Dick concluded that momentum is almost certainly a free lunch: it creates excess returns without exhibiting any meaningful covariance with true underlying risks (Pukthuanthong and Roll, 2014).

The factor emphasis of the meeting continued with Andrew Ang, the Ann F. Kaplan Professor of Business at Columbia. Andrew presented a framework for factor investing that encourages investors to think more about factors and less about asset classes (Ang, 2014). Andrew argues that factors are like nutrients as asset classes are like meals. Ultimately, what we care about are the vitamins, amino acids, proteins, carbohydrates, and other nutrients we get from meals.

The beauty of this analogy is that it illustrates wonderfully both the power of the factor framework for helping investors invest better and the danger associated with a narrow focus on factor investing while ignoring asset classes. The factor framework tells us that whether we invest in U.S., European, Japanese, or Chinese equities, we are exposed to the global growth factor and earn a risk premium associated with that exposure. This is similar to recognizing that whether we eat a steak, a duck breast, or a salmon fillet—seemingly very different meals—we are nonetheless eating protein, with little other nutrients like fiber, vitamin C, or complex carbohydrates. This intuition helps us understand more scientifically our portfolio diversification.

However, there is a deeper intuition that is unfortunately missed by most proponents of factor investing. It is dangerous to assume that factor loadings are the only salient information in investing; I think it is a mistake to assume that portfolios with similar factor exposures are largely identical, irrespective of the prices charged. There are numerous combinations of different assets which result in similar factor exposures, just as there is a large variety of foods which can be combined to create different meals providing similar nutrients. While my mother cares deeply about the nutrients in the meals she prepares, she cares just as much about the cost of the ingredients that go into her dishes. If salmon is on sale at the supermarket, Mom will prepare a meal based on salmon.

We need to remember that investors transact in the asset space and that there are often a dozen different asset mixes which provide exposure to the same factor. The successful investor will be the one who buys her factor exposures cheaply. For example, we can buy global growth by buying emerging market stocks or U.S. stocks. Currently, emerging market stocks have a cyclically adjusted P/E (CAPE) of about 12, and U.S. stocks, about 25. Does it not matter whether we purchase global growth through EM equities or U.S. equities?

I also wish to offer caution on the emerging trend toward “pure” factor portfolios. Going back to the food/nutrient analogy: would one consider it wise to replace traditional home-cooked meals with a chemical cocktail of vitamins and nutritional supplements? Similarly, would factor portfolios constructed from long–short portfolios based on complex quantitative models provide more effective and complete access to the essential drivers of long-term returns than asset classes? I fear the definitiveness of some of the factor gurus —a certainty that can feel like hubris. Here, I suspect that we overestimate the current state of knowledge regarding both health and economics.

Asset Class Champions

Taking us from the equity risk factor domain back to the asset class domain, Andrew Karolyi, the current editor of the *Review of Financial Studies*, shared the research set forth in his new book, *Cracking the Emerging Markets Enigma*. Andrew summed it up well when he referred to emerging markets as “underfunded growth opportunities with problems.” He constructed risk indicators and assigned them to six key categories: market capacity constraints, foreign investability restrictions, limits on legal protections, operational inefficiencies, corporate opacity, and political instability.

To properly understand these risk categories, it is useful to distinguish between risks that drive co-movement and risks that are related to macro risk exposures—in other words, distinguish between covariance risk and the risk of potential negative shocks to the investor’s projected cashflow stream. In this context, Andrew’s risk categories can help investors decide whether it’s more appropriate to adjust their discount rate or their cash flow projections. For example, low investment capacity generally translates into a higher market price impact than a naïve return forecast derived from backtested results would suggest. Similarly, foreign investability restrictions, such as dividend withholding taxes or advance funding requirements, often meaningfully reduce investment returns as well. Such outcomes are more closely associated with high implied transactions costs than with macro risks. However, political instability can mean that emerging market investments are high-beta to global growth shocks; and political instability in resource-intensive countries additionally implies high sensitivity to commodity price shocks. These co movement risks mean certain emerging market investments may produce extremely poor performance when investors can least afford it.

The shift from factor-centric investing toward strategies centered on asset classes continued with Charles Gave’s talk on current risks in the global economy. Charles’s GaveKal newsletters are widely distributed and devoured with great interest at our own and many other research shops. Amid a dizzying array of charts and tables, he recommended that investors raise cash, sell U.S. and Eurozone assets, and buy Japanese and Chinese securities. Let me commend Charles on his intrepid short-term forecasting. I must confess that, as a two-handed economist, I only have the conviction to report what has occurred on average historically. It’s up to my listeners to conclude, with a leap of faith, that the long-horizon future might rhyme with the past.

Professor Karolyi and Monsieur Gave’s emphasis on emerging markets helps explain Research Affiliates’ position. We are overweight emerging market equities in our portfolios. This decision is easy to understand in light of the Shiller CAPE and our firm’s contrarian philosophy. However, in the past three years, cheap assets have become cheaper. The Shiller CAPE’s poor track record as a valuation measure with predictive power has caused investors to question one of the crowning achievements of the 2013 Nobel Laureate in Economics from Yale. But Rob Arnott and Tzee-man Chow demonstrated that conditioning the Shiller CAPE on real interest rate and inflation information sharply improves its forecast accuracy. Essentially, the economy appears to support high CAPEs when there is modest inflation (about 2% to 3%) and a moderate real interest rate (3% to 4%). As the rates of inflation and real interest diverge from these benign zones, the supportable CAPE declines drastically. The low inflation and near-zero real interest rate suggest a much lower CAPE for the U.S. economy than current equity prices reflect (CAPE > 25). This might presage downside U.S. equity price risk.

In Closing

I have pointed out, in passing, the points of contact between the 2015 Advisory Panel attendees' inquiries into factor investing and Research Affiliates' own research agenda. Like Cam Harvey, we are deeply distrustful of the factor proliferation, which has resulted in a vast zoo of factors numbering more than 300 and increasing rapidly. Our own factor robustness research has led us to conclude, as did Cam, that there are only a handful of persistent, investable sources of equity returns (Hsu, Kalesnik, and Viswanathan, 2015). Like Dick Roll, we wish to increase exposure to reliable sources of returns which do not exhibit high covariance with systematic risk factors, and to eliminate exposures to systematic sources of volatility which carry little or no premium. Thus it is more than an academic exercise for us to determine whether the value/rebalancing premium represents a return to "emotional/psychological" stress—a fear premium—or compensation for taking on more volatility or negative tail risk.

Finally, we advocate a framework for understanding asset pricing that is simultaneously asset-class- and factor-based. We acknowledge that the factor-based analysis offers powerful insights and smartly reduces complexity: dealing with five primary macro factors is easier than analyzing hundreds of asset classes and investment strategies. However, we also recognize that information about factor exposures is insufficient for guiding allocation decisions. Similar factor exposures can be arrived at through different asset class mixes. In order to create a portfolio with the appropriate exposures at an attractive price, we also need to understand the valuation levels at which the different assets trade. Factor-based investing and its complement, asset-class-based investing are, in our mind, incomplete descriptions of the world without each other.

Endnote

1. I also gave a talk based on a forthcoming paper I co-authored with Brett W. Myers of Texas Tech University and Ryan Whitby of Utah State University (2016). The paper presents, in considerably greater detail, research that Vish Viswanathan and I introduced in "Woe Betide the Value Investor" (2015): the average investor in value mutual funds squanders the value premium by attempting to time the market. This finding implies that the value premium is likely to persist, with high capacity, because value investors themselves are financing it.

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