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Asset Allocation: Risk Models for Alternative Investments
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Introduction

Asset allocators attempting to diversify and improve expected returns of their portfolio may turn to alternative investments to do so. In the process, they may use a risk factor approach to select the best asset. However, this is made harder due to the limited availability of accurate data as a result of the practice of smoothing return indices of such assets. Consequently, their volatility and correlation are often underestimated, leading investors into believing that these assets have high returns with lower risk while diversifying their portfolio. This paper proposes a methodology to obtain a more accurate mark-to-market risk for alternative and illiquid investments, and how to estimate risk factor exposures when reported returns may have been smoothed.

Modelling Methodology

To address the issue of downward-biases for volatility and correlation, the authors suggested using risk models for private asset classes that rely on their public equivalent, and to identify systematic return drivers affecting each asset class. The asset classes are categorised as private equity and venture capital, real assets, and hedge funds. The authors do so by combining fundamental and empirical methods. They first used economic intuition, drawing parallels between alternative assets and their publicly traded equivalent, to narrow the set of factors. Their research showed that private equities are exposed to the same liquidity risk factor as public equity and other alternative investments[1]. They also found that the risk characteristics of private and public real estate are very similar once the correct risk factors have been selected and the effects of smoothing, liquidity and, leverage have been taken into account[2]. Additionally, academics generally agree that hedge fund volatility is largely influenced by market-related forces. Following this, they estimated the exposure of risk factors by taking observed index returns[3] to be a moving-average of past returns and subsequently, that each factor can be expressed as a weighted sum of past risk factors. They then applied a uniform set of factors, consistent with equities and bonds, along with econometric methods across all asset classes. Additionally, statistical methods were adjusted by using transformed risk factor returns that account for the lag structure of the index to reflect the nature of the reporting biases in the illiquid return series.

Result

Private equity, venture capital, and real assets were found to be exposed to equity beta[4], credit spread duration[5], real interest rate duration[6], other equity factor betas[7], and liquidity beta[8]. Risk factors for hedge funds consisted of conventional risk factors[9], "alternative beta" risk factors[10] and equity beta. Putting it all together, it is revealed that reported volatility is significantly lower, across all asset classes, than those attained by the authors' with private equity and real assets being the most sensitive to

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[1] Franzoni, Francesco, Eric Nowak, and Ludovic Phalippou 2012 "Private Equity Performance and Liquidity Risk." Journal of Finance, vol. 67, no.6 (December)
[2] Pederson, Niels, Fei He, Ashish Tiwari and Andrew M. Hoffmann 2012 "Modelling the Risk Characteristics Real Estate Investments." PIMCO Analytics
[3] The authors used quarterly data from December 1991 till December 2012 except for timberland and farmland where monthly data from January 1995 till December 2012 were used instead
[4] representing most of the mark-to-market risk across alternatives
[5] captures bond-like cash flow risk and financing effects
[6] representing inflation-hedging characteristics of certain alternative asset classes
[7] Referring to size, value and industry-specific equity factors. Table 2 of the article goes into greater detail of these factors).
[8] They found that nearly all alternative asset classes have significant exposure to some form of liquidity risk, suggesting that investors also need to select a desired level of liquidity risk
[9] US equity, emerging markets equity, commodity duration, and spread exposures
[10] foreign exchange carry, exposure to volatility and momentum

smoothing. In addition, their model generated higher equity correlation, signifying that alternative assets may not diversify an investor's portfolio as much as he would have hoped, especially for illiquid assets as demonstrated from figure 1.

Figure 1: Portfolio Volatility Estimates: Reported vs. Adjusted, December 1991 – December 2012
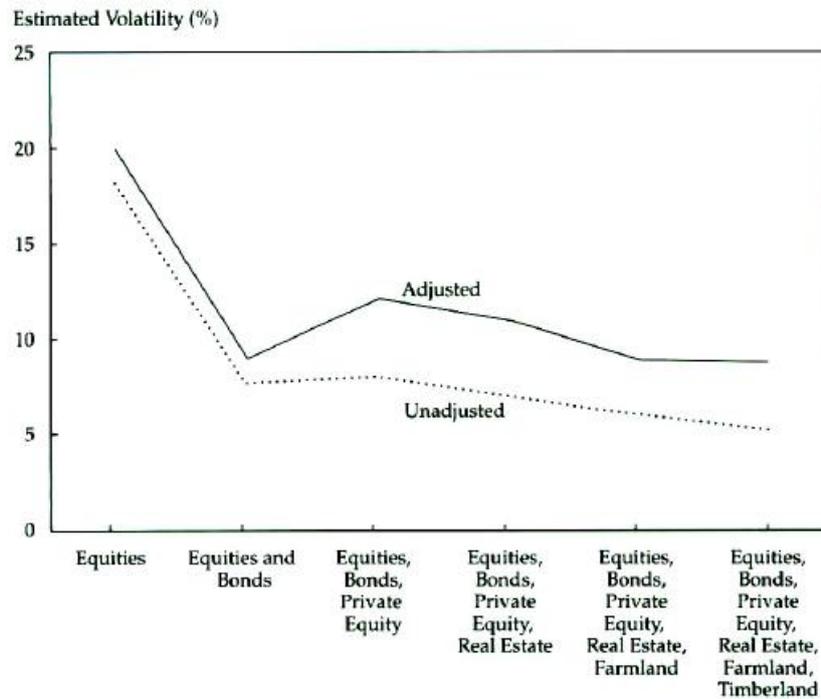
Key Takeaway

The methodology introduced by the authors is optimistic in producing a more accurate model compared to using the smoothed, reported index returns. It reveals that alternative assets have significant exposure to the same risk factors as their publicly traded equivalent, being driven by changes in interest rates, how investors value risky cash flows, liquidity and other specialized factors. Investors should be more cautious when adding alternative assets to diversify their portfolio as there is a higher correlation with their public market counterparts than would have been initially believed. However, investors should not be deterred from investing in illiquid assets but are advised to adjust the required rate of return upwards and to determine their own threshold of illiquidity.