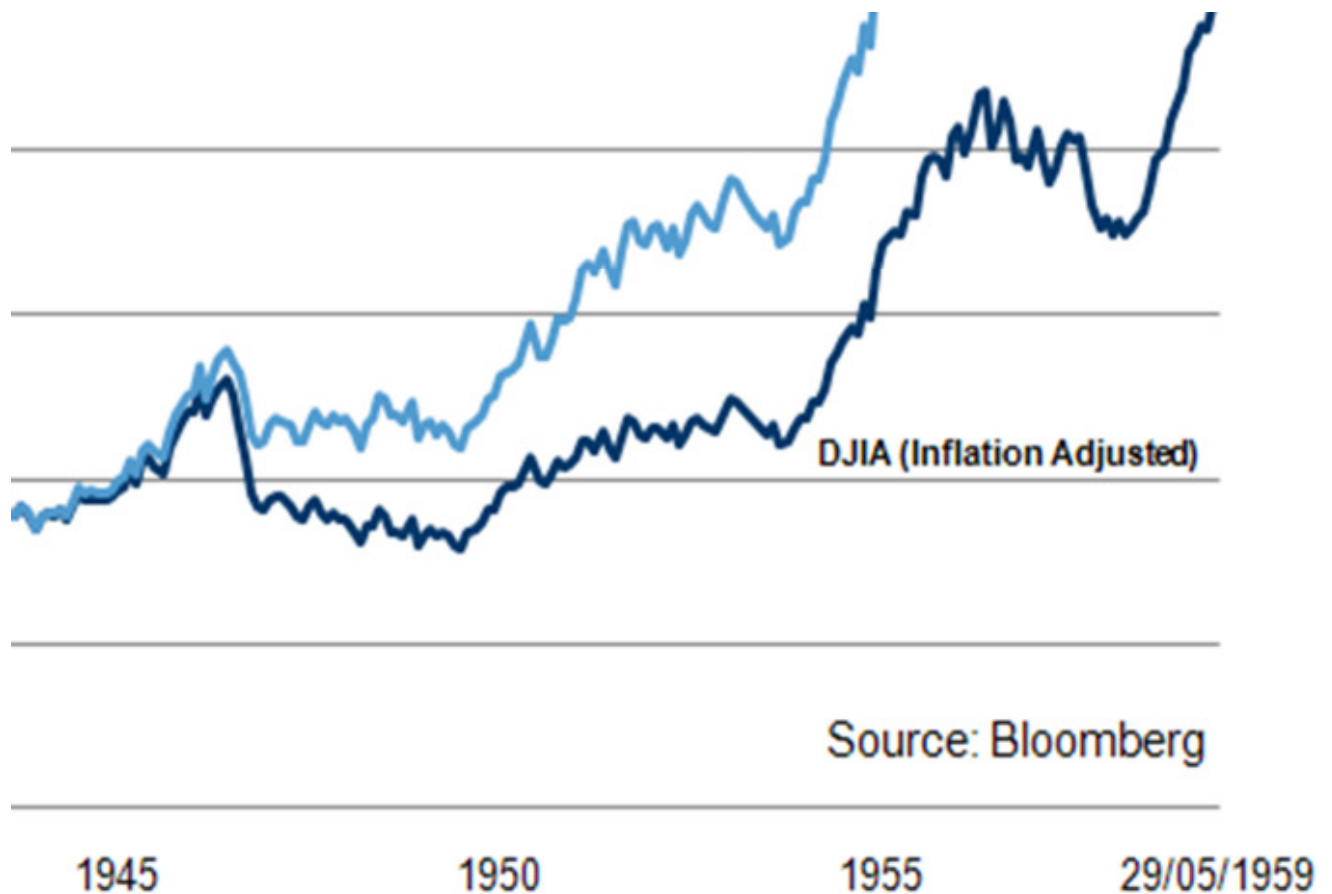


CAIA Member Contribution



**Long Term Investors,
Tail Risk Hedging,
and the Role of Global
Macro in Institutional
Portfolios**

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1. Introduction

This paper focuses on two related topics: the tension between the fundamental premise of long-term investing and the post-crisis pressure to mitigate tail risks; and new approaches to asset allocation and the potential role of global macro strategies in institutional portfolios.

To really understand why these issues are increasingly coming to the fore, it is important to recall the sheer magnitude of losses suffered by sovereign wealth funds and other long-term investors at the peak of the recent financial crisis and to appreciate how shocked they were to see large double-digit percentage drops, not only in their own portfolios, but also in portfolios of institutions that many of them were looking to as potential role models, namely the likes of Yale and Harvard university endowments. Losses for many broadly diversified, multi-asset class portfolios ranged anywhere from 20% to 30% in the course of just a few months. In one of the better publicized cases, Norway's sovereign fund lost more than 23%, or in dollar equivalent more than \$96 billion, an amount that at the time constituted their entire accumulated investment returns since inception in 1996. Some of the longer standing sovereign wealth funds in Asia and the Middle East, which had long invested in a wide range of alternative asset classes such as private equity, real estate and hedge funds, are rumoured to have done even worse in that infamous year.

Not surprisingly, in the crisis post-mortem, sovereign investors have been asking some pretty tough questions: what went wrong with our asset allocation; we thought we had sufficient diversification, but being invested in a broad range of asset classes clearly failed to protect us at precisely the time when it mattered most. In other words, the tail events of 2008 proved to be as unexpected as they were painful. If diversification didn't work, what can long-term investors do to protect their portfolios going forward?

2. Broad equity risk as the main culprit

In trying to explain the failure of classic portfolio diversification during the crisis of 2008, there is one particularly compelling line of inquiry which looks to map various common risk factors onto asset classes to ascertain contributions to overall risk in a typical institutional portfolio. A number of asset management firms have done such analyses and the results surprised many institutional investors, showing far more concentrated exposures to broad equity risk than had been implied by asset class weights. While this is not news to most asset allocation experts, for many non-specialist audiences and stakeholders in SWF nations this may come as a revelation, since in the past most discussions of portfolio diversification revolved almost exclusively around asset class weights rather than the esoteric concepts of risk factors and risk premia.¹

To illustrate the point, let's first look at the classic 60/40 institutional portfolio, which has come to represent the typical case of a generic pension fund in the U.S. and increasingly elsewhere around the world. This portfolio is managed in a way that maintains long-term allocation of 60% to broadly diversified equity, typically dominated by developed markets, and 40% to broadly diversified bonds, with a strong bias toward the U.S., Japan, and other government issuers. As one asset management firm recently demonstrated in its proprietary research,

while traditional asset allocation exposure to equity is limited to 60%, in terms of relative risk contributions, equity accounts for more than 95% of total portfolio risk.

While the 60/40 model may be representative of the broader pension fund industry, this is not how most sophisticated endowments and sovereign wealth funds would have allocated their capital prior to the crisis. However, even in portfolios much more broadly diversified by asset class, broad equity risk still dominates. Continuing with the above analysis, the asset management firm in question looked at a hypothetical portfolio of 9 different asset classes, with individual allocations ranging from 5% to 15%, and discovered that broad equity risk still accounted for more than 80% of total portfolio risk.

There is nothing untoward with a combined equity position - including both public and private equities in developed and emerging markets - being the largest allocation in a long-term, saving-oriented institutional portfolio. Conceptually it makes sense: residual claims on productive capital stock and real assets have always been considered the best long-term bet on real growth in a portfolio. Empirically, there is also overwhelming historical evidence in support of superior expected long-term returns from equity compared to bonds, bills and cash. Therefore, it is only natural that long-term institutional investors have come to rely on equity as the main growth engine in their portfolios.

However, if the actual exposure to broad equity risk turns out to be much larger and more concentrated than previously thought, two questions arise. First, can the stakeholders in the fund get comfortable with this higher level of equity risk and the concomitant exposure to tail events, such as 2008? This question goes to the very heart of the debate about liability profiles, time horizons and investment beliefs, and how they influence strategic asset allocation. If the answer to this question is no, then the second question is: how does one protect the portfolio from tail risks?

Before we consider these questions, we need to think carefully about what we mean by tail risks and which specific tail events are most relevant in the context of long-term investing.

3. Tail-risk hedging

In the post-crisis environment, "tail-risk hedging" has become a buzzword. Not only are investment banks falling over themselves to offer various clever ideas of hedging left tail risk, but also in the hedge fund space the past two years has seen significant growth in the number of new funds dedicated to tail-risk hedging. A quick search on the internet will reveal a dozen such dedicated funds, with the vast majority set up in the last 12-18 months.

While all of them differ markedly in their philosophy, approach, and instruments used, on the most basic level they are all trying to achieve the same objective: provide the end-investor with an optimal combination of "convex" exposures that will be a drag on performance in good years, but offer spectacular returns in bad years, counterbalancing the collapse in the more traditional 'growth assets', such as equity and corporate bonds, thereby helping to mitigate the left tail risk. One can think of a continuum of tail risk solutions, depending on the desired level of hedging precision; whether the end-investors want to do it themselves directly in the capital markets or through a dedicated fund; and how active or passive they are prepared to be in this activity.

An example of a passive approach, in its most basic form, would be to buy out-of-the-money put options on underlying equity indices. The upside is that the basis risk is low to non-existent, as you are protecting your portfolio precisely against the risks it is exposed to, but of course it is costly to keep rolling over these protection programs, especially during crises and in their immediate aftermath, when implied volatility tends to spike up dramatically.

At the other end of the spectrum are various active hedging programs, which seek to lower the on-going costs of tail risk protection by broadening the eligible universe of instruments and accepting a much higher basis risk. In other words, they try to make the underlying portfolios more robust to shocks on an on-going and cost-efficient basis, but they do so at the expense of much lower precision. Typically, such managers will look beyond the plain vanilla stock index put options to consider some optimal combination of volatility options (e.g., options on VIX), variance swaps, out-of-the-money Treasury calls, CDS protection, long positions in carry-funding currencies like the Japanese yen and the Swiss franc, and so on. Inevitably, there is a trade-off between lower costs of hedging and a higher basis risk, but for an investor who is looking for on-going and open-ended protection against undefined tail risk events this might be a better solution.

3.1. Tail-risk hedging vs. global macro

In extremis, a very active approach to tail risk hedging can converge on global macro, not least due to the similarities in their active trading styles and the broad universe of eligible instruments. Much more important are the following two considerations. First, both strategies tend to do very well in times of market dislocation and economic distress: in industry parlance, both tend to be 'long volatility' and 'long convexity.' Secondly, in order to construct a very elaborate, actively managed tail-risk hedging solution, the specialist manager needs to be very good at formulating and thinking through different macroeconomic scenarios and how they might impact various macro-financial linkages between economies, markets and instruments. For example, if you are trying to protect a U.S. equity-centric portfolio by buying, amongst other things, protection on Spanish and Portuguese sovereign debt, you are likely to have a pretty good idea of the various types of macroeconomic scenarios that may unfold in the near future, as well as their respective probabilities, and the transmission mechanisms linking underlying instruments. Conceptually, this is global macro investing at its finest.

Yet specialist tail-risk managers by definition focus only on one area, left tail risk. Macro managers, on the other hand, consider not only the left tail, but also the entire return distribution – they have the flexibility, nimbleness, and ability to go long volatility whenever they choose. And this is a key difference: dedicated tail risk funds are structurally long volatility, “bleeding” money during good times in the hope of shooting the lights out during a crisis. Global macro managers are not structurally disadvantaged in the same way: as long as they continue to operate in the most liquid markets and maintain rigorous stop-loss discipline, during quiescent periods they can be short volatility and long carry, thus making money in macroeconomic environments where tail-risk hedgers are designed to lose money. In other words, good and experienced global macro managers tend to have positive expected returns over the entire return distribution and across different market cycles. In the context of recent tail-risk hedging discussions, a sizable institutional allocation to a carefully selected portfolio of global macro managers may turn out to be both a cheaper and a more efficient solution for those investors who discovered in the recent crisis that they do need such protection.

A more interesting and challenging question, however, is how the other institutional investors should think about tail risks. Specifically, if you are a genuinely unconstrained, long-term and patient investor, as many sovereign wealth funds are, should you be buying such tail risk protection? Or should you not instead be a seller of such insurance? After all, isn't it a natural and normal part of the process of earning long-term expected risk premia to accept higher interim volatility and to ride out the occasional storm that other, more constrained or shorter horizon investors cannot afford? In fact, this exact point was one of the key findings and recommendations by a group of experts who recently published a seminal report looking into potential ways of improving the management of Norway's sovereign wealth fund and achieving better long-term investment returns.

3.2. The true tail risk for long-term investors

This brings us to an important insight: the relevant definition of a tail risk that can be truly disastrous for long-term institutional investors may not be a short-term, or medium-term, double-digit drop in the value of their portfolios, for this is par for the course if you are in the business of earning long-term risk premia. Instead, it is more likely to be the failure to earn and accrue such risk premia over the multi-decade investment horizon.

And according to Modern Portfolio Theory, this is indeed a variation of a tail risk. Typically, conventional wisdom supporting the notion of long-term equity exposure is based on the so-called 'time diversification' argument – the idea that if you have a long investment horizon, you can afford to tolerate more risk, because the annualized variability of returns and the likelihood of loss diminish dramatically through time. While this is true, what often gets omitted in these discussions is the all-important corollary: that the distribution of terminal wealth increases with time, thus increasing the potential magnitude of end-of-horizon losses. As in the earlier discussion above, this also constitutes a tail risk, inasmuch as it represents a low-probability, high-impact event. However, it is a tail risk of a very different kind, which cannot easily be hedged in the capital markets: just ask a broker-dealer for terms on a 30-year stock index put option. Option pricing theory effectively corroborates the point that risky assets get riskier with time.

But what about empirical evidence? Aren't we taught that over long enough periods, equity returns handily beat bonds and cash? They do, but there are always exceptions, especially if you were a passive investor in the Japanese equity market for the two 'lost decades' since January 1990 (see Exhibit 1).

And what about the worst economic debacle of the 20th century, the Great Depression? As Exhibit 2 shows, after the spectacular collapse in 1929, the Dow Jones Industrial Average did not recover in nominal terms until mid-1950s and in real terms not until the end of that decade. For a long-term investor, who risks capital in the short term to accrue the equity risk premium over the long term, this constitutes not two, but three lost decades! So if this tail risk is the one that really matters to long-term investors and if there are no hedging solutions readily available in the capital markets, what, if anything, can be done about it? This is where some new developments in asset allocation theory look particularly promising.

4. New approaches to asset allocation

One proposition that is being increasingly researched and discussed in this context is the so-called "risk-factor-

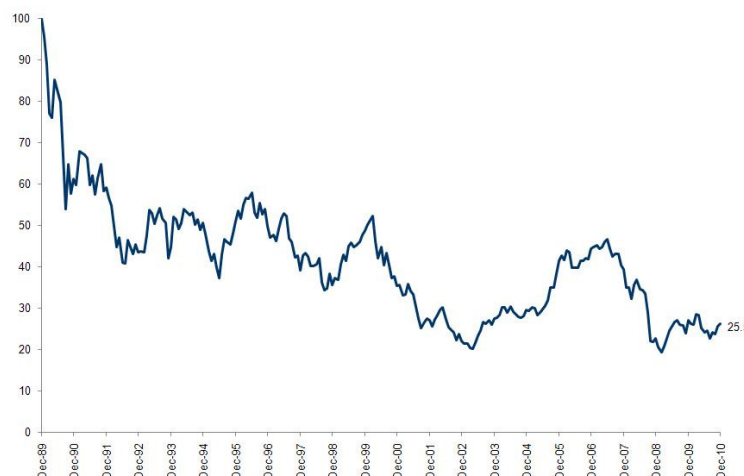


Exhibit 1 Performance of the Nikkei 1990-2010

Source: Bloomberg

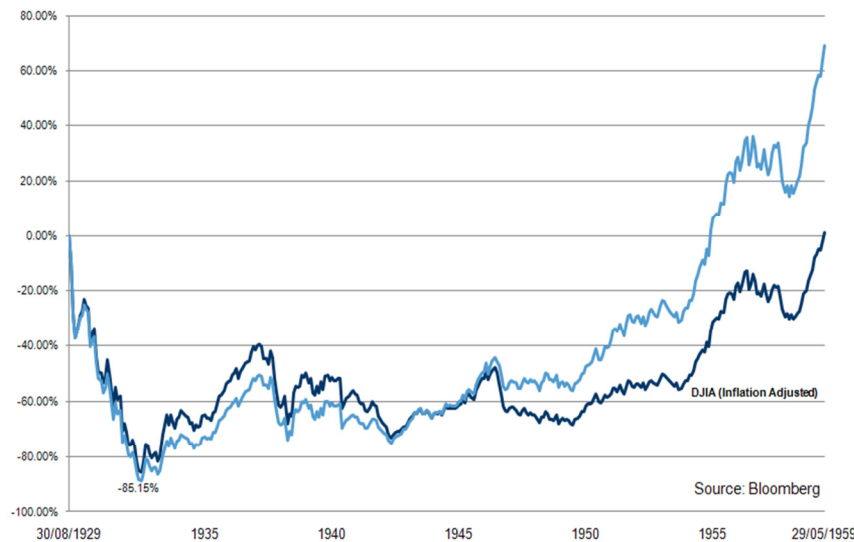


Exhibit 2 Performance of the U.S. Stock Market 1929-1959

Source: Bloomberg

based approach" (as opposed to the traditional asset-class-based approach), which actually builds on seminal academic research into common risk factors undertaken back in the 1970s and 1980s and which today is getting more traction thanks to research by people like Andrew Ang, a professor at Columbia Business School in New York. Specifically, in a 2010 paper on sovereign wealth fund management, he proposed what might be called a "nutritionist's view of asset allocation", which he described as follows:

"Factors are to assets what nutrients are to food. [Consider] the five essential nutrients necessary for life: water, carbohydrates, protein, fiber, and fat. Factors are the nutrients of the financial world... Factor risk is reflected in different assets just as nutrients are obtained by eating different foods... Assets are bundles of different types of factors just as foods contain different combinations of nutrients... This is the modern theory of asset pricing; assets have returns, but these returns reflect the underlying factors behind those assets."

As noted earlier, even the most sophisticated institutional portfolios tend to be dominated by the three 'growth asset' risk premia: equity, credit and illiquidity. To the extent that hedge funds in their entirety are viewed as an asset class and analyzed through the lens of broad-based hedge fund indices, it can be shown that they too tend to be dominated by the same three risk premia. However, we do not believe that this type of analysis does justice to hedge funds, which – in our view – cannot, and should not, be viewed as a stand-alone, homogenous asset class like all the others. In fact, we are of the opinion that in order to take full advantage of the 'nutritionist's view of asset allocation,' it is imperative to unbundle the multitude of risk factors and risk premia contained in different hedge fund strategies. If analyzed on a granular enough level, and decomposed and reconstituted in a highly customized and structured way, different hedge fund strategies can offer access to a much broader set of risk factors – not just equity, term, credit and illiquidity, but also value, size, momentum, carry and volatility, to name just the most obvious ones. For illustration purposes, Exhibit 3 summarizes long-term evidence on various risk premia, which comes from the previously mentioned expert report commissioned by Norway's sovereign wealth fund.

The promise that this approach holds to mitigating multi-decade tail risks threatening long-term investors is

Exhibit 3 Average Risk Premia

Premium	Data source	Average reward	Period
Equity premium	U.S. stocks vs. bills	5.2%	1900–2009
Term premium	U.S. bonds vs. bills	1.0%	1900–2009
Credit premium	U.S. corporates vs. Treasuries	0.4%	1926–2009
Value premium	UK value vs. growth	2.9%	1900–2009
Size premium	UK small vs. market	2.4%	1955–2009
Momentum premium	UK winners vs. losers	10.3%	1900–2009
Carry premium	Currencies	6.1%	1983–2009

Source: "Investment Strategy and the Government Pension Fund Global – Strategy Council 2010"

in its potential to combine genuinely orthogonal risk premia, allowing for much better calibrated and more sophisticated portfolio growth engines.

Another promising direction in asset allocation research focuses on more dynamic and discretionary approaches, based on broader asset class definitions geared to different macroeconomic regimes. The underlying idea is very simple: different macroeconomic environments – growth, inflation, recession, deflation, contraction, stagflation, etc. – impact different types of assets and strategies differently. The traditional equity-centric portfolio, even when it is supposedly reasonably well diversified, is effectively geared to only one type of macroeconomic environment: high growth, low inflation, low or stable interest rates and volatility, reasonable access to credit and liquidity. Yet in most other macroeconomic environments it is effectively suboptimal.

If one could come up with a different typology of asset classes and strategies, fully taking into account their respective sensitivities to different macroeconomic conditions, then arguably one could construct a portfolio that is more robust and resilient to major macroeconomic and policy shifts. If one could then take this investment process a step further by developing a reasonably successful analytical framework to not simply react to, but to pre-empt such major shifts, then this asset allocation approach may hold even more promise. While completely different in its philosophy to the risk-factor-based approach, it too could help mitigate long-term tail risks.

5. The role of global macro in institutional portfolios

In our view, all of this bodes extremely well for the future of hedge funds in general and global macro strategies in particular. For starters, if institutional investors begin to think less in terms of asset classes and more in terms of risk factors and risk premia, then the age-old distinction between 'traditional' and 'alternative' investments will increasingly become obsolete. More and more funds who perhaps have shunned hedge funds or were not allowed to invest in them, may well seek out those providers who can construct better growth engines for their portfolios, irrespective of where the underlying components may be sourced. In this context, global macro funds have the added advantage of being in a very small class of strategies that can offer investors 'long volatility' and 'long convexity' exposure in times of market dislocation and distress. This becomes even more compelling when one compares and contrasts them to dedicated tail-risk hedge funds, as discussed previously.

As for those long-term investors who decide against tail-risk hedging and instead become providers of insurance themselves, there is still a place for global macro strategies in their portfolios, as there will be a place for highly liquid government bonds: the only difference will be in the allocation amount, which will be dictated not by

liquidity and insurance considerations, but by the optimal long-term trade-off between diversification and expected return. To the extent that some of these investors eventually shift to some form of a macroeconomic regime-based asset allocation system, as described above, the logic of allocating a meaningful amount to global macro strategies will become even more compelling. It is early morning in global macro land.

¹The other two risk premia that were present in most multi-asset class portfolios and arguably aggravated the situation in 2008 were credit and illiquidity. Just like with equity risk premium, they tend to generate their best returns in the same type of environment. One can think of all three as 'growth asset' premia.

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Author Bio

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