New Trends in Asset Allocation

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In recent years we have witnessed several new trends in asset allocation. The emphasis on liabilities has increased, the number of asset classes has risen significantly and there has been an increased willingness to invest in illiquid asset classes. The focus on the return distribution has increased as well and underpins the interest in hedge funds, alternative beta and investments with a convex return payoff. The growth of derivatives has boosted the trend towards the separation of alpha and beta: an asset class is now held because of its risk premium and an actively managed portfolio of idiosyncratic risk is held for the alpha or excess return it can procure in the hands of a skilled manager. The complexity of these developments has given rise to the growth of fiduciary management. In terms of tactical asset allocation, the interest in quantitative approaches to expected return modelling continues to rise, underpinned by an effort to reduce the influence of psychological factors and to increase the number of de-correlated positions (breadth) whereby the returns of pair trades are easier to model compared to using a qualitative approach. Despite all these developments, the basic challenges of the simple, old-fashioned asset allocation are as high as ever. They concern the need to estimate the expected return vector of the asset classes over short and long horizons, to calculate the correlation structure and to anticipate its evolution and to find a way of dealing with fluctuations in risk aversion and possibly illiquid markets.

Introduction

For any investor who has been exposed to financial markets for a number of years, it is clear that the overall return of a portfolio depends on the mix between the different asset classes. Academic research has shown that the asset allocation decision explains up to 90% of portfolio returns (EDHEC (2008, p. 21)). Many investors will, at some point, have felt frustrated about their asset allocation, particularly if they were in equities when markets were collapsing or in cash instruments when stock markets were rallying, and will have asked themselves why they got it wrong. Part of the challenge relates to the fact that the asset allocation decision is a type of binary decision: "do I want to be in equities or in cash instruments?". Getting it right or wrong can have far-reaching consequences. Technically speaking, asset allocation is a low-breadth decision whereby breadth refers to the number of uncorrelated bets: in an extreme case, you make one decision (equities or cash, or, more generally speaking, risky assets or the risk-free asset) and you must see to it that it's the right one. Even when you make several decisions, (ie: high-breadth, investing in a number of asset classes at the same time) there is a risk of correlation between them if they're all based on the same view of the world. It is tempting to make an analogy with the weather. When somebody decides in the morning to go to the office in a shirt (ie: no jacket or raincoat), leaves his umbrella at home and decides to use his bicycle instead of his car, this person can be extremely happy or extremely unhappy depending on whether his weather forecast was right. Although he took various decisions (what to wear; take an umbrella or not; means of transport) all decisions were correlated and driven by one factor: his optimism with respect to the weather[1]. In investment decisions we face the same issue. Decisions are made with the objective of achieving attractive returns given the risk taken based on expectations about the future. These, in turn, are determined by the investor's analysis of the return and risk drivers. To put it briefly, the investor is confronted with a frustrating situation: the asset allocation decision is extremely important and yet extremely difficult. The

1. This issue has been captured in the "fundamental law of active management" which I will come back to later.

purpose of this article is to analyse this problem in its different dimensions and to describe ways of making it more manageable.

What is an Investment Portfolio?

At first glance, the question "What is an investment portfolio?" may seem simple. A portfolio is simply a collection of assets that are expected to generate a return. These returns, however, are unknown and fluctuate, so the investor is exposed to risk as well.

Now let's refine this answer. The asset allocation of a portfolio describes the way in which the portfolio is structured in terms of asset classes (cash, equities, government bonds, credit, currencies, commodities, etc.). The asset class exposures imply factor exposures. For example, a factor which is relevant for equity returns is the business cycle. For bonds, this factor is relevant as well, via inflation expectations and monetary policy. A portfolio may also be exposed to idiosyncratic risk. If this company-specific exposure is intended, this is called a bottom-up decision. If it is unintended, it represents an imperfect replication of the systematic risk of an asset class. It leads to "unintended alpha" whereby alpha refers to the excess return of a portfolio vis à vis its benchmark. Alpha has to be differentiated from beta, which represents the pure return of an asset class[2]. Factor exposures are called top-down exposures. They provide a risk premium over the risk-free rate of return. The portfolio manager can decide to manage his portfolio passively (no re-balancing at all or re-balancing to compensate for drift resulting from return differences between the various asset classes), or actively. Active management can imply changing the asset mix at certain long intervals (updating the strategic mix so as to introduce new assets or to take into account structural changes in the expected risk premiums), but it can also imply a more dynamic management so as to reflect shorter-term changes in expected return or appetite for risk (tactical asset allocation).

For each asset class, a decision is needed on how to create the exposure: fully diversified, thereby eliminating the idiosyncratic risk, or partially diversified, so as to have intended idiosyncratic exposure ("stock picking"). The idiosyncratic return is called pure alpha[3], but the return from tactical asset allocation decisions can also be labelled as alpha ("top down alpha").

Combining the previous two paragraphs, a portfolio can be viewed as a series of exposures to asset classes, which implies factor exposures which should be rewarded with risk premiums, and idiosyncratic risks (per asset class). The investor will seek to diversify his exposures, including the idiosyncratic ones. Why should he? The answer seems obvious and is rooted in popular wisdom ("not putting all your eggs in the same basket"). Aside from this maxim, there is uncertainty about expected returns. Investors are risk averse, and thus try to reduce the volatility of portfolio returns either because of liquidity constraints (manage cash calls) or for accounting reasons (volatility induced by asset/liability mismatch in the pension fund of a company).

Before starting to build a portfolio and taking decisions, there are still some questions which need to be addressed:
- How should risk be treated?
- How many exposures should be taken?
- How should exposure be allocated?
- How should exposure be managed?

These will be discussed in the following paragraphs.

The Treatment of Risk

What is the risk for an investor? The answer to this question is multi-layered. First, the returns, and hence risk drivers, are to be considered. This refers back to the discussion about factor exposures: it is important that an investor is aware that his portfolio is, for example, highly sensitive to the business cycle or to the behaviour of equity markets in general (high beta). The analysis of the ex-ante tracking error of a portfolio is highly relevant here and seeks to show in detail where the sensitivities of a portfolio are with regards to its benchmark. One can then consider different statistical concepts: standard deviation of return, value at risk, realised tracking error, etc. These risk outcomes tend to be the most in focus. However, the third, and final, angle is even more important; not meeting

2. Pure return refers to a portfolio which exactly replicates a benchmark, so there is no unintended alpha return (= excess return of the portfolio vis à vis the benchmark). Alpha and beta refer to regression analysis. Because the excess return over the risk free rate is a compensation for the extra risk, which is captured via the beta in a regression, one refers to the asset class return as beta return.
3. Pure alpha implies that the excess return of a portfolio against a benchmark has been split in a beta component, which reflects systematic exposure to some factor, and an alpha component, which is de-correlated from any systematic factor exposure. The excess return over a benchmark of an equity manager may to some extent be explained by factor exposures (regional bets, market timing, style tilts, etc.) and have less to do with pure stock selection skills than one would think at first sight.

the investment objective or not meeting regulatory requirements. The latter is particularly relevant in the case of pension funds: under IFRS / IAS19 accounting norms, pension fund liabilities must be discounted at market rates instead of fixed rates ("fair value accounting")[4]. As a consequence, the net present value of pension fund liabilities fluctuates as interest rates vary. In addition, the norms require that a pension fund surplus or deficit exceeding 10% of the net present value of liabilities should be taken on the sponsor's balance sheet (but the impact on the P&L can be spread over the average duration of liabilities). As a consequence, pension fund solvency risk appears on the radar screen of CEO's.

The former risk concept, the risk of not meeting the investment objective, makes it essential to define the objective correctly. This should *not* be simply stated as "realising a return of x percent". First of all, because one has to take into account the risk, in statistical terms, which is needed to target this return. Even more importantly, the investor should explain why he needs such a return. This forces him to think of his future liabilities or the cash calls he will need to make. It will make him think about the true risks he's exposed to: an individual saving for his retirement income should be worried about not matching the annual inflation instead of paying too much attention to short horizon value at risk. In reality, risk cannot be seen as separate from risk appetite, which is largely influenced by investor psychology. The tendency of a lot of investors to exhibit greater sensitivity to downside risk than to upside opportunities makes it relevant to introduce asymmetric returns in a portfolio. Positive skewness, can be obtained by investing in, for example, convertible bonds, in absolute return strategies which seek to outperform a money market benchmark, in hedge funds or funds of hedge funds, CPPI strategies (which dynamically modify the mix between a risky portfolio and a risk free asset so as to protect a certain floor yet give exposure most of the time to the risky assets), or option-based capital protected products. In doing so, the investor will need to factor in the impact on the expected return and/or the expected manager alpha: an absolute return product will not give systematic exposure to the market risk, so you miss out on the risk premium, whereas a capital-protected product typically gives exposure to a passive portfolio, taking away the stock-picking alpha.

A final point which needs to be emphasised under the risk heading is the need to monitor aggregate factor exposure. This is particularly relevant in an asset allocation framework where a broad range of asset classes are used with specialist managers in charge of the underlying asset classes with the objective of generating additional excess return. It is possible that the specialist managers also take top-down exposures via style (growth versus value), size (small versus large caps) or beta (high, low) tilts[5]. These tilts may actually be correlated with the active positions, *i.e.* the divergences vis à vis the benchmark, introduced by the asset allocator. Factor analysis will show what the aggregate exposures are. This also argues for running scenario analysis and stress testing, as the market developments since the summer of 2007 have demonstrated.

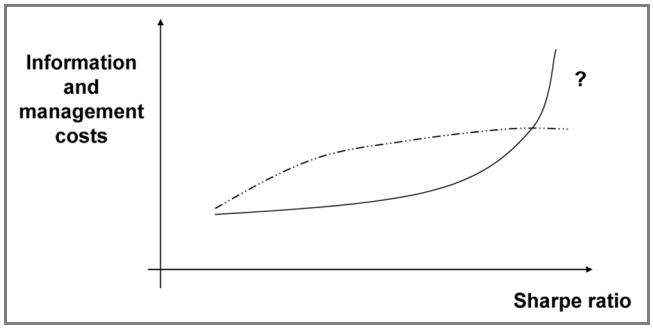
How Many Exposures?

The generalised use of modern portfolio theory taught investors a long time ago about the importance of diversification. Once you start working with a covariance matrix, the temptation is to keep on adding asset classes because of their diversification effects. The recipe seems to be: increase the number of exposures as long as you can increase the Sharpe ratio of a portfolio[6]. In practice, there are several implementation issues. Who defines the expected return and how is it calibrated so as to achieve consistency of the relative returns across asset classes? An asset class might have interesting diversification characteristics but also considerable tail risk (a criticism which is raised about some types of hedge funds). How stable is the correlation with other asset classes? What about liquidity (the possibility to buy and sell easily without creating market disruption)? Will the asset class be managed actively or passively? Are there any fiduciary considerations[7]? The complexity of these questions increases strongly once one goes beyond the traditional asset classes. This has also stimulated the development of a new type of service, fiduciary management, which addresses all these points (and others) and facilitates the task of pension fund boards. This is closely related to the more

4. IFRS/ IAS accounting norms have been mandatory for all EU listed companies (and their pension funds) since January 1, 2005. Corporations only issuing bonds have only had to comply to these standards since January 1, 2007.
5. This point also applies to the fixed income part of the portfolio (duration position, exposure to credit spreads, rating buckets, etc.).
6. The reward can be significant. The risk of a traditional European equity/eurozone bonds portfolio can be reduced by more than 30% quite easily by adding global equities, small caps equities, convertibles and corporate bonds.
7. Recently, a major Scandinavian pension fund decided to move to statistical hedge fund replication to avoid the due diligence burden of direct hedge fund investments.

general question of the implementation costs of establishing exposure. As illustrated in figure 1, the pursuit of a higher Sharpe ratio may come at an exponentially increasing information and management cost related to the ever-extending range of assets classes.

Figure 1: Implementation Costs and Broadening the Investment Universe



Nowadays, the investment universe of a sophisticated institutional investor can easily cover the following asset classes (the list is not exhaustive): listed equities (size, style, region, sector, etc.), listed real estate, non-listed real estate, private equity, infrastructure, government bonds, credit, loans, emerging markets bonds, structured credit, convertibles, hedge funds, commodities, currencies, timber, carbon emission rights, real assets (land for use in agriculture).

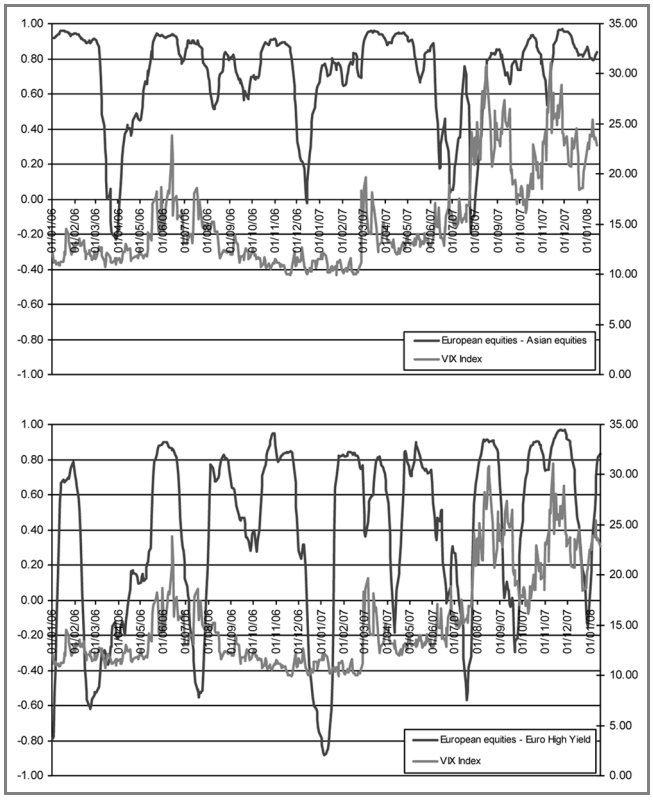
A more recent trend is the search for so-called alternative beta. Whereas (standard) beta refers to the risk premium obtained by investing in traditional asset classes, alternative betas refer to alternative systematic risk premiums obtained by investing in alternative asset classes. The systematic return characteristics of portfolios of hedge funds immediately spring to mind, but the boundary between standard and alternative beta isn't always clear. It can be argued that a continuum exists, moving from standard to alternative beta: in the standard CAPM the risk premium is for the market factor. Then one can look at small versus large caps, value versus growth, high versus low price momentum, up versus down earnings revisions, high versus low earnings momentum, volatility, etc. Key questions in the quest for alternative betas are: what is the risk premium? Can one do market timing on these? What is the correlation with more standard factors? This topic has also led to the development of hedge fund replication methods, going from simple regression models to sophisticated strategies which seek to mimic the return distributions of hedge fund portfolios.

How to Allocate the Exposures?

The short answer to this question is "it's all about expected return, risk and correlation". Before elaborating on this, it is important to point out that the development of asset/liability management techniques in portfolio management has had quite an impact. In liability-driven investment solutions, a sub-portfolio can be separated to mimic the future obligations whereby the hedge is either imperfect, leaving money to be invested in other instruments than bonds or swaps, or leverage is allowed. In both cases the objective is to benefit from risk premiums in another subportfolio, the active or return portfolio. Though this will lower the funding costs, it raises the question of the attitude of the plan sponsor towards risk. This approach obviously has a big impact on the exposure allocation which is not driven by expected return but by risk matching considerations.

In terms of expected returns used for the strategic asset allocation, expected risk premiums need to be determined whereby it is recommended to take into account mean-reversion phenomena and the position in the cycle, unless the forecast horizon is very long. For tactical asset allocation where the forecast horizon is only a number of months, the investor will typically express views, as opposed to quantifying the expected returns, unless he would run a completely quantitative process. Particular attention should be paid to the estimation of variances and correlations, as these can fluctuate substantially and as they impact the optimal portfolio compositions and hence the calculated marginal contribution to tracking-error or Sharpe ratio. This is a key factor to observe because small active positions, i.e. small deviations from the benchmark, can nevertheless represent a sizeable marginal contribution to tracking-error depending on the risk and correlation of the asset. The variability of correlations is illustrated in figure 2: the increase in market volatility in the second half of 2007 – as captured by the VIX index – was accompanied by a rise in the rolling 30-day correlation between respectively European and Asian equities and between European equities and European high-yield bonds. It seemed like diversification opportunities were vanishing when they were most needed, *i.e.* when volatility was rising.

Figure 2: Rolling 30-day Correlations (01/01/2006-15/01/2008)



How to Manage Exposure?

The management of asset classes relates to how the exposures are established and how to allocate the risk budget. On the former, the development and growth of derivative instruments in the past 25 years has had a fundamental impact on operational efficiency. Though the industry is still faced with challenges (counterparty risk in the case of over-the-counter derivatives; complexity in terms of pricing certain instruments), it has been comforting to see that since the credit crisis of 2007, the credit derivative market has remained liquid, while the cash market for bonds has suffered from varying degrees of sustained illiquidity.

In terms of investment philosophy, a topic which has seen a growing debate concerns the choice of indices for performance evaluation[8]. In equity management, this concerns the advantages and drawbacks of capitalisation weighted indices (which is the case for the majority of indices), a major drawback being that it forces the manager to buy more of a company which has witnessed a rise in its share price and vice versa ("buy high, sell low"). Other indices have been proposed which don't suffer from this phenomenon and which allocate the weights in terms of fundamental company data. The choice of a benchmark is also particularly relevant in the case of balanced portfolios. Asset classes with a high risk premium (*e.g.* emerging markets equities), and hence a higher risk, will get a low active weight in the portfolio when they are treated as an off-benchmark position (their higher risk will consume a lot of tracking-error, which will cap the weight given to this asset). The pension fund should thus consider whether it isn't preferable to have this asset class in the benchmark so as to have sufficient longer-term exposure to the risk premium provided by, for example, emerging equities.

A fundamental question on the implementation of tactical asset allocation views concerns the possible separation of alpha and beta risk and return exposure. As mentioned before, the total expected return of an asset class consists of the risk-free rate of return, a risk premium for the systematic risk exposure and a pure alpha return. This is obtained after filtering out all systematic factor exposures. Moreover, at the portfolio level there can be an extra source of alpha return coming from tactical asset allocation decisions. Alpha return exposure comes at a cost: it increases the tracking error of the portfolio against its benchmark and moving from a passive to an active portfolio implies that the total risk increases. If one accepts this, it implies that the initial risk budget wasn't fully utilised. If the budget was already fully used, a trade-off is taking place between, on the one hand, alpha return and extra risk (information ratio), and on the other hand, extra directional risk and return (Sharpe ratio). For example, suppose a simple portfolio consisting of 50% European equities (passively managed) and 50% euro-zone government bonds. Moving from passive to active (with a high tracking-error) on the equity part will increase overall portfolio risk, which forces a reduction in the equity weight so as to stay within the initial risk envelope: the exposure to possible manager alpha has come at a price by lowering the exposure to the risk premium (beta return) of equities vis à vis bonds. The different exposures in an actively versus passively managed asset class are shown in table 1.

8. The use of "indices" as opposed to "benchmark" is intentional. Indices can serve as a performance comparison yardstick but not as a reference for portfolio construction. Quite often, the positioning of an index portfolio in a mean-variance framework is unattractive because of inefficient diversification. A benchmark guides a manager in the construction of his portfolio because the benchmark portfolio has been built specifically to address the diversification and portfolio efficiency issue. Ex-post, the performance should be compared to this benchmark via detailed performance attribution. In practice, most people tend to mix indices and benchmarks as concepts. See EDHEC (2008) for more details.

Table 1: Risk and Return Exposures in an Active and a Passive Portfolio

	Passive portfolio	Active portfolio
Risk free rate	X	X
Risk premium	X	X
Premium for illiquidity	X	X
Manager alpha		X
Asset volatility	X	X
Tracking-error		X

It can work the other way around as well. As shown in the theoretical example in table 2, consider a portfolio consisting exclusively of three actively managed asset classes A,B and C. Without looking at the absolute risk of the different asset classes, it seems compelling to take exposure to asset classes H, I and J because of their highly diversifying characteristics. If this exposure can only be established passively, it implies that we now face a trade-off between risk diversification and alpha generation.

Table 2: the Alpha Cost from Adding Many Beta Sources

Asset	Expected return (beta)	Expected alpha	Total expected return	Risk	Diversification effect (1 = low, 5 = high)
A	4%	1%	5%	…	
B	8%	2.5%	11%	…	
C	10%	3.5%	14%	…	
D	5%	0%	5%	…	1
E	6%	0%	6%	…	2
F	7%	0%	7%	…	2
G	6%	0%	6%	…	3
H	8%	0%	8%	…	4
I	5%	0%	5%	…	5
J	4%	0%	4%	…	5

In summary, there is a beta cost from adding alpha sources (for a given risk budget, there is a trade-off between getting more exposure to manager alpha versus passive, directional risk (*i.e.* risk premium) exposure) but there is also an alpha cost from adding beta sources with low alpha opportunity (efficient asset classes) or where one doesn't have alpha skill.

Alpha skill is obviously a key concept in allocating the risk budget, which triggers the question; do all asset classes provide the same alpha opportunities? The answer is clearly negative. Table 3 illustrates the point for US equities, European equities and Euro bonds management. The difference between the 95th percentile, the median manager return and the index return is quite revealing.

Table 3: Return Comparison Between Active Managers and Indices (5 Year Average)

	5 Years	
	(% pa)	Perc
95th Percentile	19.7	
Median	16.1	
Russell 1000	16.0	(48)
MSCI US Large Cap 300	15.2	(29)
MSCI US Large Cap Growth	13.1	(8)
95th Percentile	21.5	
Median	17.5	
MSCI Europe	17.2	(43)
MSCI Europe Value	19.9	(79)
MSCI Europe Growth	14.5	(6)
95th Percentile	4.1	
Median	3.9	
Citigroup EGBI	3.8	(42)
Lehman Bros Euro Aggregate Gov	3.8	(40)

Source: Mercer.

Up to now we have discussed the trade-off between alpha exposure via the underlying asset classes in a balanced portfolio ("asset class alpha" via various equity universes, bonds, etc.) and the directional exposure to the risk premium of the asset classes. There is still another trade-off to discuss, the one between asset class alpha and excess return coming from tactical asset allocation. Table 4 summarises the issues.

Table 4: Trade-off between Asset Class Alpha and TAA Alpha

Asset class alpha	
Pro	Con
Higher breadth	Information gathering costs

TAA alpha	
Pro	Con
Lower information gathering costs	Lower breadth (unless you diversify mpore)

The investor faces two issues: information costs and diversification of his decisions (bets). On the former, the costs can quickly become prohibitively high for certain asset classes in view of the requirements in terms of analyst teams, data providers, etc. The solution for the pension fund is of course to outsource the management of this asset class and for the asset management company to focus on a more narrow range of specialisations. It is safe to assume that bottom-up research and portfolio management will incur higher costs than top-down analysis and management, for the simple reasons that the number of variables to be analysed is more limited in the latter than in the former. In top-down work, the number of decisions will also be smaller. To be successful, this also requires that the few decisions taken are the right ones.

The question of a possible trade-off between the number of decisions and the overall success as a portfolio manager

has been analysed by Grinold and Kahn and has led to "the fundamental law of active management"[9]. This law states that the information ratio (IR) of a portfolio (the ratio between the excess return and the tracking-error) is proportional to the square root of breadth, i.e. the number of independent bets in the portfolio, the proportionality factor being the information coefficient (IC), which expresses how good one is in making forecasts:

$$IR = IC * \sqrt{Breadth}$$

This implies that adding asset classes will increase portfolio breadth and hence the information ratio, provided that the bets on the new asset classes are de-correlated from the old ones and provided that the information coefficient doesn't decline. Both conditions are key but the information coefficient, in particular, needs to be emphasised: adding asset classes to a portfolio only makes sense if the analytical resources are increased as well or provided that the management can be outsourced. On the issue of breadth: an obvious way of increasing the number of de-correlated bets is to outsource the management of an underlying asset class to several managers where history has shown that their performance is imperfectly correlated. There are two caveats: the need to be aware of the burden this may create in managing the managers and, more importantly, the need to avoid falling in the "over-diversification trap"[10].

The fundamental law has since been extended by including another proportionality factor, the transfer coefficient TC[11].

$$IR = IC * TC * \sqrt{Breadth}$$

The transfer coefficient captures how good one is in translating views in portfolio decisions. Regulatory constraints or mandate restrictions are a key factor here. In equity management, this has led to the development of 130/30 funds. These are less constraining for the manager to express his views than a standard fund or portfolio in which no short-selling is allowed. In view of the possible significant impact of the transfer coefficient on the excess return, the need and usefulness of certain mandate restrictions should be questioned.

Finally, turning to the separation of alpha and beta exposures, the rationale is clear: beta exposures are taken because of their contribution to the portfolio in terms of risk (diversification) and return (risk premium). Alpha exposures are taken because of their contribution to the excess return and for tracking-error reasons (via the breadth). Considering that the likelihood of achieving a given excess return is not the same for all asset classes, this makes a case for separating the decision on the strategic and tactical asset allocation from the decision to allocate a risk budget to a specific, actively managed asset class. The systematic exposure (directional risk) to this asset class can be hedged out to the extent needed and derivative instruments can be used to establish the optimal exposure in terms of asset allocation. Notwithstanding the appeal of this approach, the challenges shouldn't be underestimated: can one find or generate consistent alpha? What about the availability and cost of hedging instruments? What are the pitfalls in proxy hedging at the portfolio level whereby the hedge is imperfect? Do frequent in and outflows create an issue?

Conclusion

In recent years, we have witnessed several new trends in asset allocation. The emphasis on liabilities has increased, either because of regulatory changes (Liability Driven Investments of pension funds following IFRS) or because of economic developments (the rise in inflation has definitely raised the awareness of inflation as a liability, a tax on real spending power). The number of asset classes has risen significantly and there has been an increased willingness to invest in illiquid asset classes (private equity, infrastructure,…). The focus on the return distribution has increased as well (skewness, tail risk) and underpins the interest in hedge funds, alternative beta and investments with a convex return pay-off. The growth of derivatives, in terms of market liquidity and diversity of instruments (including credit derivatives) has boosted the trend towards the separation of alpha and beta: an asset class is now held because of its risk premium and an actively managed portfolio of idiosyncratic risk is held for the alpha or excess return it can procure in the hands of a skilled manager. The complexity of these developments has given rise to the growth of fiduciary management. In terms of tactical asset allocation, the interest in quantitative approaches to expected return modelling continues to rise, underpinned by an effort to reduce the influence of psychological factors and to increase the number of de-correlated positions (breadth) whereby the returns of pair

9. See GRINOLD and KAHN, (1999).
10. This refers to the idea that by adding a sufficient number of active managers, one may very well end up with the return of a passive portfolio (despite having paid fees for active portfolio management).
11. See CLARKE *et al.* (2001).

trades are easier to model compared to using a qualitative approach.

Despite all these developments, the increased instrument sophistication and the computing power, the "search for the holy grail" is still on, and the basic challenges of the simple, old-fashioned asset allocation are as high as ever. They concern the need to estimate the expected return vector of the asset classes over short and long horizons, to calculate the correlation structure and anticipate its evolution, and to find a way of dealing with fluctuations in risk aversion and risk appetite. Developments since the summer of 2007 have added to this list dealing with the question of instrument liquidity.

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