Abstract
Two competing approaches are used in practice to build portfolios: bottom-up and top-down. The bottom-up approach is the older and the more traditional, focusing on individual stock picking. The top-down approach gives more importance to the choice of different markets as opposed to individual security selection and, as such, emphasises the importance of asset allocation.

Asset allocation consists of choosing the spread of different asset classes within the portfolio. There are two separate steps in the asset allocation process. One first defines the long-term allocation, based on estimates of risk and return for each asset class. This is known as "strategic allocation". Then, one can subsequently carry out dynamic adjustments based on short-term anticipations. This is known as "tactical allocation".

EDHEC is one of the top five business schools in France. Its reputation is built on the high quality of its faculty and the privileged relationship with professionals that the school has cultivated since its establishment in 1906. EDHEC Business School has decided to draw on its extensive knowledge of the professional environment and has therefore focused its research on themes that satisfy the needs of professionals.

EDHEC pursues an active research policy in the field of finance. EDHEC-Risk Institute carries out numerous research programmes in the areas of asset allocation and risk management in both the traditional and alternative investment universes.
Strategic Asset Allocation
Strategic allocation is the first stage in the investment process. It involves choosing an initial portfolio allocation consistent with the investor’s objectives and constraints. This is equivalent to defining the benchmark, or reference, portfolio.

Optimal asset allocation, which is based on long-term estimates of risk and return for each asset class, can be based on a quantitative approach, with the help of different methods that we now describe.

Applying Markowitz’s Model to Asset Allocation
The most widely quoted quantitative model in the strategic allocation literature is Markowitz’s (1952) optimisation model. The input data is the means and the variances, estimated for each asset class, and the covariances between the asset classes. The model provides the optimal percentage to assign to each asset class to obtain the highest return for a given level of risk, measured by portfolio volatility. The set of all optimal portfolios is known as the “efficient frontier” (see Figure below).

This quadratic optimisation can be subject to a number of constraints, for example, holding a minimum or maximum allocation in a given asset class. This model turns out to be particularly appropriate for handling the problem of asset allocation, because the number of asset classes is limited and therefore efficient estimation of the variance-covariance matrix becomes more tractable.

New Developments
Even though Markowitz’s optimal portfolio selection method provides, in theory, a satisfactory response to the problem of determining strategic allocation, it is actually not very widely used in practice for the following two reasons. Firstly, the optimal proportions are very sensitive to the estimates of expected return values; secondly, statistical estimates of expected returns are very noisy (see Merton (1980)). As a result, the model often allocates the most significant proportion to the asset class with the largest estimation error.

A pragmatic response to the problem of optimal strategic allocation in the presence of estimation risk involves focusing on the only portfolio on the efficient frontier for which the estimation of mean returns is not necessary, namely the minimum variance portfolio. Using appropriate statistical techniques to improve the estimation of the variance-covariance matrix, one can actually select an efficient portfolio with a volatility significantly lower than that of a naïvely diversified portfolio for a mean return that is not necessarily lower (see for example Chan, Karceski and Lakonishok (1999) or Amenc and Martellini (2002a)).
Black and Litterman (1990) have proposed an original approach that allows investors to directly address the problem of estimating expected returns. They first suggest generating implicit values for mean returns that are consistent with Sharpe's (1964) CAPM equilibrium allocations (i.e. allocations proportional to the market capitalisation). Then, they suggest that investors optimally combine these reference values with their own "views" (forward-looking bets on mean returns for each asset class).4

Another shortcoming of Markowitz's approach is that it is based on volatility as a measure of risk, which can only be rationalised at the cost of very simplifying assumptions, either on investors' preferences (quadratic preferences) or on return distribution (Gaussian distribution). To address this shortcoming of traditional mean-variance analysis, several authors have suggested adding a Value-at-Risk constraint in the mean-variance optimisation for investors with non-trivial preferences about higher moments of returns distributions (see for example Alexander and Baptista (2001) or Sentana (2001)). Amenc and Martellini (2002b) argue that this is particularly needed when alternative asset classes, such as hedge funds, are included in an investor's asset allocation, as they are well known to exhibit fat tails (see for example Brooks and Kat (2001)).

**Tactical Asset Allocation**5

Tactical Asset Allocation (TAA) broadly refers to active strategies that seek to enhance portfolio performance by opportunistically shifting the asset mix in a portfolio in response to the changing patterns of return and risk.

There is now a consensus in empirical finance that expected asset returns, and also variances and covariances, are, to some extent, predictable. Pioneering work on the predictability of asset class returns in the U.S. market was carried out by Keim and Stambaugh (1986), Campbell (1987), Campbell and Shiller (1988), Fama and French (1989), and Ferson and Harvey (1991). More recently, some authors started to investigate this phenomenon on an international basis by studying the predictability of asset class returns in various national markets (see, for example, Bekaert and Hodrick (1992), Ferson and Harvey (1993, 1995) or Harvey (1995)).

The literature on optimal portfolio selection has recognised that these insights can be exploited to improve on existing policies based upon unconditional estimates. Roughly speaking, the prescriptions of these models are that investors should increase their allocation to risky assets in periods of high expected returns (market timing) and decrease their allocation in periods of high volatility (volatility timing). Kandel and Stambaugh (1996) argue that even a low level of statistical predictability can generate economic significance and abnormal returns may be attained even if the market is successfully timed only 1 out of 100 times.

TAA can be regarded as a 3-step process:
- **Step 1:** forecast asset returns by asset classes
- **Step 2:** build portfolios based on forecasts (i.e. turn signals into bets)
- **Step 3:** conduct out-of-sample performance tests.

TAA strategies were traditionally concerned with allocating wealth between two asset classes, typically shifting between stocks and bonds. More recently, more complex style timing strategies have been successfully tested and implemented. In particular, Kao and Shumaker (1999) and Amenc, El Bied and Martellini (2002) have built upon the seminal work by Fama and French (1992), who emphasise the relevance of size and book/market factors, to address the concept of **tactical style allocation** that involves dynamic trading in various investment styles within a given asset class (see also Fan (1995), Sorensen and Lazzara (1995), and Avramov (2000) for evidence of predictability in equity style returns).

---

4 - This approach has been extended by Cvitanic et al. (2002) to a dynamic setting with power preferences, correlated priors and learning
5 - We refer the reader to the essay on Tactical Asset Allocation by Martellini and Sfeir in this Encyclopedia for more detail.
Conclusion

Today, asset allocation tends to play a larger role in the investment management process. The interest in asset allocation can be explained by important results established by modern portfolio theory. In particular, Brinson, Hood and Beebower (1986) and Brinson, Singer and Beebower (1991) argue that a significant share (90%) of portfolio performance can be attributed to the initial allocation decision. On the other hand, in a context of liquid, efficient, markets, the possibility of obtaining substantial gains through stock picking alone is severely reduced.

References

- Cvitanic, J., A. Lazrak, L. Martellini, and F. Zapatero, 2002, Revisiting Treynor and Black (1973) – An Intertemporal Model of Active Portfolio Management, working paper, USC.

6 - On this subject, see the introduction of Brown and Harlow (1990), who also discuss the role of modern portfolio theory in asset allocation.
7 - The result of this study should however be considered with care, because it has often been incorrectly interpreted (see Amenc and Martellini (2001) and Nutall and Nutall (1998)).


• Sentana, E., 2001, Mean-Variance Portfolio Allocation with a Value-at-Risk Constraint, SEMFI, working paper 0105.


• Sorensen, E., and C. Lazzara, 1995, Equity Style Management: the Case of Growth and Value, chapter 4 from Equity Style Management, Irwin Publishing.
EDHEC Business School offers management education at undergraduate, graduate, post-graduate and executive levels. Holding the AACSB, AMBA and EQUIS accreditations and regularly ranked among Europe’s leading institutions, EDHEC Business School delivers degree courses to over 6,000 students from the world over and trains 5,500 professionals yearly through executive courses and research events. The School’s ‘Research for Business’ policy focuses on issues that correspond to genuine industry and community expectations.

Established in 2001, EDHEC-Risk Institute has become the premier academic centre for industry-relevant financial research. In partnership with large financial institutions, its team of ninety permanent professors, engineers, and support staff, and forty-eight research associates and affiliate professors, implements six research programmes and sixteen research chairs and strategic research projects focusing on asset allocation and risk management. EDHEC-Risk Institute also has highly significant executive education activities for professionals. It has an original PhD in Finance programme which has an executive track for high level professionals. Complementing the core faculty, this unique PhD in Finance programme has highly prestigious affiliate faculty from universities such as Princeton, Wharton, Oxford, Chicago and CalTech.

In 2012, EDHEC-Risk Institute signed two strategic partnership agreements with the Operations Research and Financial Engineering department of Princeton University to set up a joint research programme in the area of risk and investment management, and with Yale School of Management to set up joint certified executive training courses in North America and Europe in the area of investment management.

Copyright © 2015 EDHEC-Risk Institute

For more information, please contact: Carolyn Essid on +33 493 187 824 or by e-mail to: carolyn.essid@edhec-risk.com

EDHEC-Risk Institute
393 promenade des Anglais
BP 3116 - 06202 Nice Cedex 3
France
Tel: +33 (0)4 93 18 78 24

EDHEC Risk Institute—Europe
10 Fleet Place, Ludgate
London EC4M 7RB
United Kingdom
Tel: +44 207 871 6740

EDHEC Risk Institute—Asia
1 George Street
#07-02
Singapore 049145
Tel: +65 6438 0030

ERI Scientific Beta—Japan
East Tower 4th Floor, Otemachi First Square
1-5-1 Otemachi, Chiyoda-ku
Tokyo 100-0004 — Japan
Tel: +81 352 191 418

ERI Scientific Beta—North America
One Boston Place, 201 Washington Street
Suite 2608/2640
Boston — MA 02108 — USA
Tel: +1 857 239 8891

ERI Scientific Beta—Japan
East Tower 4th Floor, Otemachi First Square
1-5-1 Otemachi, Chiyoda-ku
Tokyo 100-0004 — Japan
Tel: +81 352 191 418

ERI Scientific Beta—North America
One Boston Place, 201 Washington Street
Suite 2608/2640
Boston — MA 02108 — USA
Tel: +1 857 239 8891

EDHEC Risk Institute—France
16-18 rue du 4 septembre
75002 Paris
France
Tel: +33 (0)1 53 32 76 30

www.edhec-risk.com