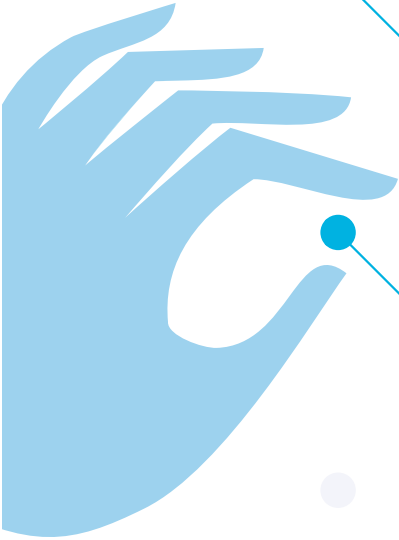




CFA Institute



# 2020 CFA<sup>®</sup> PROGRAM CURRICULUM CHANGES

MEMBERS' GUIDE TO  
PRACTITIONER-RELEVANT UPDATES

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# Expand Your Expertise



The CFA® charter remains distinctive and in demand in the global investment marketplace because it provides a uniquely rigorous, globally relevant body of investment knowledge. Each year, we advance that knowledge and make it available to our members in the form of these Refresher Readings. As an organization committed to professionalism, we believe lifelong learning is essential in the journey from credential to investment professional, and we are thrilled that members value these readings.

This year, we made important strides forward at all three levels of the curriculum. Factual references and data exhibits in Level I were updated to provide a more contemporary presentation. More substantively, we have added new content to Level II:

- The curriculum's first full reading on **machine learning (ML)**—a branch of artificial intelligence that is having a profound impact on the investment industry
- A segment on **big data projects**, which includes ML and natural language processing algorithms
- More on **corporate governance/ESG considerations in investment analysis**, addressing the investment analyst's needs to evaluate environmental, social, and governance factors related to potential investments
- Extended coverage of the **mechanics and applications of exchange-traded funds** and **trading costs and electronic markets**

The 2020 CFA Program curriculum also marks the completion of our multi-year overhaul of Level III. We introduced 14 new

readings, so roughly 30% of Level III content is new. Topics include capital market expectations, derivative strategies, alternative investments, private wealth management, and portfolio management for institutional investors, as well as trading, performance evaluation, and investment manager selection. The curriculum also includes the first portfolio management cases in more than 20 years.

Ethics case content for 2020 in Levels II and III is almost entirely fresh. The new cases make notable improvements in modern workplace relevance and global diversity. They also cover a broader range of standards than the retired cases.

As the investment profession evolves, the learning environment must keep pace. Our Learning Ecosystem (LES)—a cutting-edge digital platform that consolidates the entire curriculum and all study tools—features a personalized study plan that can adjust the learning path to individual strengths and weaknesses. We now offer the CFA Program Level I curriculum on the LES, which is an important step toward increasing accessibility of our programs globally, modernizing the learning experience, and better maintaining fidelity to practice.

Our future curriculum plans include wide-ranging updates to factual references and data exhibits for Level III. Several readings from the three levels will be developed and revised to reflect the input from Practice Analysis and the feedback from the Curriculum Level Advisers about the curriculum's gaps, overlaps, and weaknesses.

I hope that you benefit from this year's readings and use them as an opportunity to stay current.

Stephen Horan, CFA, CIPM  
Managing Director, Credentialing  
Interim Managing Director, Americas Region

# Financial Technology

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## Applicable Readings

### **Machine Learning (Level II)**

by Kathleen DeRose, CFA, and Christophe Le Lannou

2 CE credits

Access to full reading: <https://www.cfainstitute.org/membership/professional-development/refresher-readings/2020/machine-learning>

### **Big Data Projects (Level II)**

by Sreekanth Mallikarjun, PhD, and Ahmed Abbasi, PhD

2.5 CE credits

Access to full reading: <https://www.cfainstitute.org/membership/professional-development/refresher-readings/2020/big-data-projects>

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# What Changed in the 2020 Curriculum?

You may be curious to know the difference between neural networks and deep learning nets or how big data can enhance financial forecasting. If so, new additions to the curriculum are a great place to start.

Machine learning and big data have only recently entered the lexicon of the investment industry but have already become an integral part of the research and trading processes for some firms. A new reading delves into the mechanics of machine learning and highlights its potential value to investment firms and professionals. The reading tackles central issues, such as the difference between supervised and unsupervised machine learning and which problems machine learning can and cannot solve.

Meanwhile, the explosion in big data—especially unstructured data from social media, web traffic, electronic images, and so on—is a game-changer for investment analysts. A new reading discusses ongoing efforts in the investment industry to gather huge volumes of unstructured data and transform them into neat, structured data. These structured data are both measurable and comparable, thus driving next-generation modeling among investment professionals. The tantalizing prospect for those at the vanguard of this modeling is a decisive edge over competitors relying solely on traditional forecasting.

The new “Big Data Projects” reading moves the discussion from theory to practice, presenting a real-world study of how unstructured data can train a machine learning model to predict investor sentiment on stocks. The ability to scrape text-based information on companies, sectors, and markets from almost any source and transform it into positive or negative indicators is truly powerful.



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## Why Does It Matter to Members?

Much of the investment industry recognizes the potential of machine learning, but exploration of the topic can be frustrated by the complexity of existing written material. For non-specialists, the subject may seem impenetrable. The new machine learning reading demystifies the subject by taking a non-mathematical approach to it and using graphics and images to help readers visualize how machine learning algorithms actually work. The reading provides pointers for interpreting machine learning outputs and helps analysts define the problems that machine learning can help solve.

Machine learning is growing in importance among investment professionals but also plays a role in other core investment firm activities, such as risk management and trade execution. The reading quickly gets the generalist investment practitioner up to speed with the nuts and bolts as well as the relevant vocabulary to facilitate effective interaction with machine learning specialists.

Similarly, the big data reading represents an entry point to big-picture knowledge about fundamental change in the investment industry. For practitioners, acquisition of this knowledge could be essential for them to enhance their contribution to their firm's evolution. Although unstructured data have long been applied to investment research in an informal way, the datasets and computing power now available mean they can be systematically applied, transforming investment analysis.

As with machine learning, seizing the opportunity offered by big data should be helpful in a spectrum of roles and activities aside from the investment function. It will affect, for instance, the ways in which marketing and sales professionals target and onboard prospective clients and how risk and compliance functions operate.

# Machine Learning

by **Kathleen DeRose, CFA, and Christophe Le Lannou**

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## Learning Outcomes

The candidate should be able to:

- a. distinguish between supervised machine learning, unsupervised machine learning, and deep learning;
- b. describe overfitting and identify methods of addressing it;
- c. describe supervised machine learning algorithms—including penalized regression, support vector machine, k-nearest neighbor, classification and regression tree, ensemble learning, and random forest—and determine the problems for which they are best suited;
- d. describe unsupervised machine learning algorithms—including principal components analysis, k-means clustering, and hierarchical clustering—and determine the problems for which they are best suited;
- e. describe neural networks, deep learning nets, and reinforcement learning.

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## Introduction

Investment firms are increasingly using technology at every step of the investment management value chain—from improving their understanding of clients, to uncovering new sources of alpha, to executing trades more efficiently. Machine learning techniques, a central part of that technology, are the subject of this reading. These techniques first appeared in finance in the 1990s and have since flourished with the explosion of data and cheap computing power.

This reading provides a high-level view of machine learning (ML). It covers a selection of key ML algorithms and their investment applications. Investment practitioners should be equipped with a basic understanding of the types of investment problems that machine learning can address, an idea of how the algorithms work, and the vocabulary to interact with machine learning and data science experts. While investment practitioners need not master the details and mathematics of machine learning, as domain experts in investments they can play an important role by being able to source appropriate model inputs, interpret model outputs, and translate outputs into appropriate investment actions.

Section 2 gives an overview of machine learning in investment management. Section 3 defines machine learning and the types of problems that can be addressed by supervised and unsupervised learning. Section 4 describes evaluating machine learning algorithm performance. Key supervised machine learning algorithms are covered in Section 5, while Section 6 describes key unsupervised machine learning algorithms. Neural networks, deep learning nets, and reinforcement learning are covered in Section 7. The reading concludes with a summary.

## Summary

Machine learning methods are gaining usage at many stages in the investment management value chain. Among the major points made are the following:

- Machine learning aims at extracting knowledge from large amounts of data by learning from known examples to determine an underlying structure in the data. The emphasis is on generating structure or predictions without human intervention. An elementary way to think of ML algorithms is to “find the pattern, apply the pattern.”
- Supervised learning depends on having labeled training data as well as matched sets of observed inputs ( $X$ 's, or features) and the associated output ( $Y$ , or target). It can be divided into two categories: regression and classification. If the target variable to be predicted is continuous, then the task is one of regression. If the target variable is categorical or ordinal (e.g., determining a firm's rating), then it is a classification problem.
- With unsupervised learning, algorithms are trained with no labeled data, so they must infer relations between features, summarize them, or present an interesting underlying structure in their distributions that has not been explicitly provided. Two important types of problems well suited to unsupervised ML are dimension reduction and clustering.
- Another category of ML algorithm includes deep learning (based on neural networks) in which a computer learns from interacting with itself. Sophisticated algorithms address such highly complex tasks as image classification, face recognition, speech recognition and natural language processing, and reinforcement learning.

- Generalization describes the degree to which an ML model retains its explanatory power when predicting out-of-sample. Overfitting, a primary reason for lack of generalization, is the tendency of ML algorithms to tailor models to the training data at the expense of generalization to new data points.
- Bias error is the degree to which a model fits the training data. Variance error describes how much a model's results change in response to new data from validation and test samples. Base error is due to randomness in the data. Out-of-sample error equals bias error plus variance error plus base error.
- K-fold cross-validation is a technique for mitigating the holdout sample problem (excessive reduction of the training set size). The data (excluding test sample and fresh data) are shuffled randomly and then divided into  $k$  equal sub-samples, with  $k - 1$  samples used as training samples and one sample, the  $k$ th, used as a validation sample.
- Regularization describes methods that reduce statistical variability in high dimensional data estimation or prediction problems.
- LASSO (least absolute shrinkage and selection operator) is a popular type of penalized regression where the penalty term involves summing the absolute values of the regression coefficients. The greater the number of included features, the larger the penalty. So, a feature must make a sufficient contribution to model fit to offset the penalty from including it.
- Support vector machine (SVM) is a linear classifier that aims to seek the optimal hyperplane—the one that separates the two sets of data points by the maximum margin (and thus is typically used for classification).

- K-nearest neighbor (KNN) is a supervised learning technique most often used for classification. The idea is to classify a new observation by finding similarities (“nearness”) between it and its k-nearest neighbors in the existing data set.
- Classification and regression tree (CART) can be applied to predict either a categorical target variable, producing a classification tree, or a continuous target variable, producing a regression tree.
- A binary CART is a combination of an initial root node, decision nodes, and terminal nodes. The root node and each decision node represent a single feature ( $f$ ) and a cutoff value ( $c$ ) for that feature. The CART algorithm iteratively partitions the data into sub-groups until terminal nodes are formed that contain the predicted label.
- Ensemble learning is a technique of combining the predictions from a collection of models. It typically produces more accurate and more stable predictions than the best single model.
- A random forest classifier is a collection of many different decision trees generated by a bagging method or by randomly reducing the number of features available during training.
- Principal components analysis (PCA) is an unsupervised ML algorithm that reduces highly correlated features into fewer uncorrelated composite variables by transforming the feature covariance matrix. PCA produces eigenvectors that define the principal components (i.e., the new uncorrelated composite variables) and eigenvalues, which give the proportion of total variance in the initial data that is explained by each eigenvector and its associated principal component.
- K-means is an unsupervised ML algorithm that partitions observations into a fixed number ( $k$ ) of non-overlapping clusters. Each

cluster is characterized by its centroid, and each observation belongs to the cluster with the centroid to which that observation is closest.

- Hierarchical clustering is an unsupervised iterative algorithm that is used to build a hierarchy of clusters. Two main strategies are used to define the intermediary clusters (i.e., those clusters between the initial data set and the final set of clustered data).
- Agglomerative (bottom-up) hierarchical clustering begins with each observation being its own cluster. Then, the algorithm finds the two closest clusters, defined by some measure of distance, and combines them into a new, larger cluster. This process is repeated until all observations are clumped into a single cluster.
- Divisive (top-down) hierarchical clustering starts with all observations belonging to a single cluster. The observations are then divided into two clusters based on some measure of distance. The algorithm then progressively partitions the intermediate clusters into smaller clusters until each cluster contains only one observation.
- Neural networks consist of nodes connected by links. They have three types of layers: an input layer, hidden layers, and an output layer. Learning takes place in the hidden layer nodes, each of which consists of a summation operator and an activation function. Neural networks have been successfully applied to a variety of investment tasks characterized by non-linearities and complex interactions among variables.
- Neural networks with many hidden layers (at least 3 but often more than 20) are known as deep learning nets (DLNs) and are the backbone of the artificial intelligence revolution.

## *Financial Technology*

- The RL algorithm involves an agent that should perform actions that will maximize its rewards over time, taking into consideration the constraints of its environment.



The full reading, worth 2 CE credits, can be found at <https://www.cfainstitute.org/membership/professional-development/refresher-readings/2020/machine-learning>



# Big Data Projects

by **Sreekanth Mallikarjun, PhD, and Ahmed Abbasi, PhD**

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## Learning Outcomes

The candidate should be able to:

- a. state and explain steps in a data analysis project;
- b. describe objectives, steps, and examples of preparing and wrangling data;
- c. describe objectives, methods, and examples of data exploration;
- d. describe objectives, steps, and techniques in model training;
- e. describe preparing, wrangling, and exploring text-based data for financial forecasting;
- f. describe methods for extracting, selecting, and engineering features from textual data;
- g. evaluate the fit of a machine learning algorithm.

## Introduction

Big data (also referred to as alternative data) encompasses data generated by financial markets (e.g., stock and bond prices), businesses (e.g., company financials, production volumes), governments (e.g., economic and trade data), individuals (e.g., credit card purchases, social media posts), sensors (e.g., satellite imagery, traffic patterns), and the Internet of Things, or IoT (i.e., the network of interrelated digital devices that can transfer data among themselves without human interaction). A veritable explosion in big data has occurred over the past decade or so, especially in unstructured data generated from social media (e.g., posts, tweets, blogs), email and text communications, web traffic, online news sites, electronic images, and other electronic information sources. The prospects are for exponential growth in big data to continue.

Investment managers are increasingly using big data in their investment processes as they strive to discover signals embedded in such data that can provide them with an information edge. They seek to augment structured data with a plethora of unstructured data to develop improved forecasts of trends in asset prices, detect anomalies, etc. A typical example involves a fund manager using financial text data from 10-K reports for forecasting stock sentiment (i.e., positive or negative), which can then be used as an input to a more comprehensive forecasting model that includes corporate financial data.

Unlike structured data (numbers and values) that can be readily organized into data tables to be read and analyzed by computers, unstructured data typically require specific methods of preparation and refinement before being usable by machines (i.e., computers) and useful to investment professionals. Given the volume, variety, and velocity of available big data, it is important for portfolio managers and investment analysts to have a basic understanding of how

unstructured data can be transformed into structured data suitable as inputs to machine learning (ML) methods (in fact, for any type of modeling methods) that can potentially improve their financial forecasts.

This reading describes the steps in using big data, both structured and unstructured, in financial forecasting. The concepts and methods are then demonstrated in a case study of an actual big data project. The project uses text-based data derived from financial documents to train an ML model to classify text into positive or negative sentiment classes for the respective stocks and then to predict sentiment.

Section 2 of the reading covers a description of the key characteristics of big data. Section 3 provides an overview of the steps in executing a financial forecasting project using big data. We then describe in Sections 4–6 key aspects of data preparation and wrangling, data exploration, and model training using structured data and unstructured (textual) data. In Section 7, we bring these pieces together by covering the execution of an actual big data project. A summary in Section 8 concludes the reading.

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## Summary

In this reading, we have discussed the major steps in big data projects involving the development of machine learning (ML) models—namely, those combining textual big data with structured inputs.

- Big data—defined as data with volume, velocity, variety, and potentially lower veracity—has tremendous potential for various fintech applications, including several related to investment management.

- The main steps for traditional ML model building are conceptualization of the problem, data collection, data preparation and wrangling, data exploration, and model training.
- For textual ML model building, the first four steps differ somewhat from those used in the traditional model: Text problem formulation, text curation, text preparation and wrangling, and text exploration are typically necessary.
- For structured data, data preparation and wrangling entail data cleansing and data preprocessing. Data cleansing typically involves resolving incompleteness errors, invalidity errors, inaccuracy errors, inconsistency errors, non-uniformity errors, and duplication errors.
- Preprocessing for structured data typically involves performing the following transformations: extraction, aggregation, filtration, selection, and conversion.
- Preparation and wrangling text (unstructured) data involve a set of text-specific cleansing and preprocessing tasks. Text cleansing typically involves removing the following: html tags, punctuations, most numbers, and white spaces.
- Text preprocessing requires performing normalization that involves the following: lowercasing, removing stop words, stemming, lemmatization, creating bag-of-words (BOW) and n-grams, and organizing the BOW and n-grams into a document term matrix (DTM).
- Data exploration encompasses exploratory data analysis, feature selection, and feature engineering. Whereas histograms, box plots, and scatterplots are common techniques for exploring structured data, word clouds are an effective way to gain a high-level picture of the composition of textual content. These

visualization tools help share knowledge among the team (business subject matter experts, quants, technologists, etc.) to help derive optimal solutions.

- Feature selection methods used for text data include term frequency, document frequency, chi-square test, and a mutual information measure. Feature engineering for text data includes converting numbers into tokens, creating n-grams, and using name entity recognition and parts of speech to engineer new feature variables.
- The model training steps (method selection, performance evaluation, and model tuning) often do not differ much for structured versus unstructured data projects.
- Model selection is governed by the following factors: whether the data project involves labeled data (supervised learning) or unlabeled data (unsupervised learning); the type of data (numerical, continuous, or categorical; text data; image data; speech data; etc.); and the size of the dataset.
- Model performance evaluation involves error analysis using confusion matrixes, determining receiver operating characteristics, and calculating root mean square error.
- To carry out an error analysis for each model, a confusion matrix is created; true positives (TPs), true negatives (TNs), false positives (FPs), and false negatives (FNs) are determined. Then, the following performance metrics are calculated: accuracy, F1 score, precision, and recall. The higher the accuracy and F1 score, the better the model performance.
- To carry out receiver operating characteristic (ROC) analysis, ROC curves and area under the curve (AUC) of various models

are calculated and compared. The more convex the ROC curve and the higher the AUC, the better the model performance.

- Model tuning involves managing the trade-off between model bias error, associated with underfitting, and model variance error, associated with overfitting. A fitting curve of in-sample (training sample) error and out-of-sample (cross-validation sample) error on the y-axis versus model complexity on the x-axis is useful for managing the bias vs. variance error trade-off.
- In a real-world big data project involving text data analysis for classifying and predicting sentiment of financial text for particular stocks, the text data are transformed into structured data for populating the DTM, which is then used as the input for the ML algorithm.
- To derive term frequency (TF) at the sentence level and TF-IDF, both of which can be inputs to the DTM, the following frequency measures should be used to create a term frequency measures table: TotalWordsInSentence; TotalWordCount; TermFrequency (Collection Level); WordCountInSentence; SentenceCountWithWord; Document Frequency; and Inverse Document Frequency.



The full reading, worth 2.5 CE credits, can be found at <https://www.cfainstitute.org/membership/professional-development/refresher-readings/2020/big-data-projects>

# Institutional and Private Wealth Management

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## Applicable Readings

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### **Overview of Private Wealth Management (Level III)**

by Christopher J. Sidoni, CFP, CFA, and Vineet Vohra, CFA  
2 CE credits

Access to full reading: <https://www.cfainstitute.org/membership/professional-development/refresher-readings/2020/overview-private-wealth-management>

### **Portfolio Management for Institutional Investors (Level III)**

by Arjan Berkelaar, PhD, CFA, Kate Mistic, CFA, and Peter C. Stimes, CFA  
3.5 CE credits

Access to full reading: <https://www.cfainstitute.org/membership/professional-development/refresher-readings/2020/portfolio-management-institutional-investors>

### **Case Study in Portfolio Management: Institutional (Level III)**

by Gabriel Petre, CFA  
1 CE credit

Access to full reading: <https://www.cfainstitute.org/membership/professional-development/refresher-readings/2020/case-study-portfolio-management-institutional>

### **Case Study in Risk Management: Private Wealth (Level III)**

by Giuseppe Balocchi, PhD, CFA  
1.5 CE credits

Access to full reading: <https://www.cfainstitute.org/membership/professional-development/refresher-readings/2020/case-study-risk-management-private-wealth>

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# What Changed in the 2020 Curriculum?

Institutional and private wealth management clients are a well-established client segment for many investment firms. But the dynamics of these segments are changing rapidly: The combined size of these client segments has increased dramatically over the past decade, and needs are evolving. Accordingly, readings on both client groups get a full makeover.

The 10-year perspective is that the profile of institutional investors has mutated as defined contribution replaces defined benefit in the pension sphere, huge sovereign wealth funds with very long-term investment horizons have sprouted up, and an unprecedented interest rate environment has forced a rethinking of long-held investment beliefs. Amid these shifts, a new institutional investor reading discusses changing needs resulting from this growth, in particular how institutional investors manage liabilities, investment time horizons, liquidity needs, and their idiosyncratic legal, regulatory, and tax constraints.

Each investor type, alongside their unique constraints, is addressed in turn. A focused study of a university endowment highlights the challenges facing investors with ultra-long investment horizons. The study explores the interplay between strategic asset allocation and spending policies, looking at how endowments can use illiquid instruments while retaining sufficient liquidity and how derivatives can be used for tactical allocation.

Meanwhile, private wealth management is being driven by growing global affluence and by the desire of many wealthy individuals to manage their own finances. A fully updated reading discusses how



high-net-worth investors might design and execute an investment plan, as well as the tools and techniques used by private wealth managers.

A private wealth study applies these tools and techniques to a European setting, following a fictional married couple through multiple stages of their life until retirement. The family circumstances and risk exposures are assessed in light of changing objectives and the resetting of long-term goals at different phases of our notional couple's life. Relevant risk management solutions are suggested for each phase.

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## Why Does It Matter to Members?

The market and industry developments since the global financial crisis of 2007–2009 demand a fresh look at the institutional investing landscape.

The character and aims of the investment portfolios of defined benefit plans, banks, insurers, sovereign wealth funds, university endowments, and private foundations are simply not the same as they were a decade ago. The revised reading covers the key changes succinctly but in sufficient detail to provide meaningful context. The reading highlights that evaluation of the changes requires knowledge and understanding of the increasingly complicated array of risks facing institutions today.

The university endowment study is a practical illustration of how to integrate these risks into the investment process. In particular, the study takes a deep dive into the CFA Institute Code and Standards violations that have the potential to arise during the manager selection process.

These readings should enable the generalist to differentiate between the needs of private clients and institutional clients.

Although servicing of these needs may in practice be carried out by the same personnel, recognition of the unique demands of each and an adequate response may prove a key competitive advantage. In addition, in the private wealth segment, there are a number of sub-segments, each of which should be treated discretely. Given these profile differences, which include available wealth, risk tolerance, and cultural preferences, recognition of this segmentation is critical to protecting clients' wealth and the firm's reputation.

The private wealth study is set in a European context, but the risk management solutions advanced are applicable globally, so the study should be valuable to practitioners in a wide range of firms in a large number of jurisdictions.

# Overview of Private Wealth Management

**Christopher J. Sidoni, CFP, CFA, and Vineet Vohra, CFA**

*Christopher J. Sidoni, CFP, CFA, is at Gibson Capital, LLC (USA).*

*Vineet Vohra, CFA, is at Cognasia Talent (Singapore and Hong Kong SAR).*

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## Learning Outcomes

The candidate should be able to:

- a. contrast private client and institutional client investment concerns;
- b. discuss information needed in advising private clients;
- c. identify tax considerations affecting a private client's investments;
- d. identify and formulate client goals based on client information;
- e. evaluate a private client's risk tolerance;
- f. describe technical and soft skills needed in advising private clients;
- g. evaluate capital sufficiency in relation to client goals;
- h. discuss the principles of retirement planning;

### *Institutional and Private Wealth Management*

- i. discuss the parts of an investment policy statement (IPS) for a private client;
- j. prepare the investment objectives section of an IPS for a private client;
- k. evaluate and recommend improvements to an IPS for a private client;
- l. recommend and justify portfolio allocations and investments for a private client;
- m. describe effective practices in portfolio reporting and review;
- n. evaluate the success of an investment program for a private client;
- o. discuss ethical and compliance considerations in advising private clients;
- p. discuss how levels of service and range of solutions are related to different private clients.

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## Introduction

Private wealth management refers to investment management and financial planning for individual investors. The private wealth sector has grown considerably as global wealth has increased and as individuals have taken on more of the responsibility for managing their own financial resources. Private wealth managers can help individual investors seek the benefits as well as navigate the complexities of financial markets.

This reading introduces candidates to the process of designing and executing an investment plan or strategy for the individual investor. We discuss the tools and techniques used by private wealth managers and how the wealth manager interacts with the client to serve the client's needs. Section 2 examines the key differences between private clients and institutional clients. In Section 3, we discuss how the wealth manager gains an understanding of the client and identifies key attributes of the client's financial situation that are relevant to the wealth management process. Section 4 covers investment planning, including capital sufficiency and retirement planning. Section 5 discusses the investment policy statement, including its various underlying parts. Section 6 analyzes portfolio construction, portfolio reporting, and portfolio review. Finally, in Section 7, we discuss the practice of private wealth management, including ethical considerations for private wealth managers, compliance considerations, and the various client segments that private wealth managers encounter.

Reflecting the variation in industry terms, we use the terms "private wealth managers," "wealth managers," and "advisors" interchangeably. We also refer to "individual investors" as "private clients" or, simply, "clients." In practice, private wealth managers typically operate either independently or as representatives of organizations, such as wealth management firms, banks, and broker/dealers.

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## Summary

- Private clients and institutional clients have different concerns, primarily relating to investment objectives and constraints, investment governance, investment sophistication, regulation, and the uniqueness of individuals.

*Institutional and Private Wealth Management*

- Information needed in advising private clients includes personal information, financial information, and tax considerations.
- Basic tax strategies for private clients include tax avoidance, tax reduction, and tax deferral.
- A client's planned goals are those that can be reasonably estimated or quantified within an expected time horizon, such as retirement, specific purchases, education, family events, wealth transfer, and philanthropy.
- Unplanned goals are those related to unforeseen financial needs, such as property repairs and medical expenses.
- When establishing client goals, private wealth managers consider goal quantification, goal prioritization, and goal changes.
- Risk tolerance refers to the level of risk an individual is willing and able to bear. Risk tolerance is the inverse of risk aversion. Risk capacity is the ability to accept financial risk. Risk perception is an individual's subjective assessment of the risk involved in an investment decision's outcome.
- Wealth managers often utilize questionnaires to assess clients' risk tolerance. The result of a risk tolerance questionnaire, typically a numerical score, is often used as an input in the investment planning process.
- Wealth managers need both technical skills and non-technical ("soft") skills in their advisory roles. Technical skills include capital markets proficiency, portfolio construction ability, financial planning knowledge, quantitative skills, technology skills, and in some situations, foreign language fluency. Soft skills include communication skills, social skills, education/coaching skills, and business development and sales skills.

- Capital sufficiency analysis, also known as capital needs analysis, is the process by which a wealth manager determines whether a client has, or is likely to accumulate, sufficient financial resources to meet his or her objectives.
- Two methods for evaluating capital sufficiency are deterministic forecasting and Monte Carlo simulation.
- Wealth managers use several different methods to analyze a client's retirement goals, including mortality tables, annuities, and Monte Carlo simulation.
- An investment policy statement (IPS) for an individual includes the following parts: background and investment objective(s); investment parameters (risk tolerance and investment time horizon); asset class preferences; other investment preferences (liquidity and constraints); portfolio asset allocation; portfolio management (discretionary authority, rebalancing, tactical changes, implementation); duties and responsibilities; and an appendix for additional details.
- Two primary approaches to constructing a client portfolio are a traditional approach and a goals-based investing approach.
- Portfolio reporting involves periodically providing clients with information about their investment portfolio and performance. Portfolio review refers to meetings or phone conversations between a wealth manager and a client to discuss the client's investment strategy. The key difference between portfolio reporting and portfolio review is that the wealth manager is more actively engaged in a review.
- The success of an investment program involves achieving client goals, following a consistent process, and realizing favorable portfolio performance.

### *Institutional and Private Wealth Management*

- Ethical considerations for private wealth managers include “know your customer” (KYC), fiduciary duty and suitability, confidentiality, and conflicts of interest.
- Several global regulations have relevance for private wealth managers.
- Key private wealth segments include mass affluent, high net worth, and ultra high net worth.
- Robo-advisors have emerged in the mass affluent client segment. These advisors have a primarily digital client interface. Robo-advisor service providers generally charge lower fees than traditional wealth management firms. Scalability of technology has enabled robo-advisors to service investors with relatively small portfolios.



The full reading, worth 2 CE credits, can be found at <https://www.cfainstitute.org/membership/professional-development/refresher-readings/2020/overview-private-wealth-management>



# Portfolio Management for Institutional Investors

**Arjan Berkelaar, PhD, CFA, Kate Misic, CFA, and Peter C. Stimes, CFA**

*Arjan Berkelaar, PhD, CFA, is at KAUST Investment Management Company (USA). Kate Misic, CFA, is at Telstra Super Pty Ltd (Australia). Peter C. Stimes, CFA, is a private investor in Fallbrook, California (USA).*

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## Learning Outcomes

The candidate should be able to:

- a. discuss common characteristics of institutional investors as a group;
- b. discuss investment policy of institutional investors;
- c. discuss the stakeholders in the portfolio, the liabilities, the investment time horizons, and the liquidity needs of different types of institutional investors;
- d. describe the focus of legal, regulatory, and tax constraints affecting different types of institutional investors;
- e. evaluate risk considerations of private defined benefit (DB) pension plans in relation to 1) plan funded status, 2) sponsor financial strength, 3) interactions between the sponsor's business

- and the fund's investments, 4) plan design, and 5) workforce characteristics;
- f. prepare the investment objectives section of an institutional investor's investment policy statement;
  - g. evaluate the investment policy statement of an institutional investor;
  - h. evaluate the investment portfolio of a private DB plan, sovereign wealth fund, university endowment, and private foundation;
  - i. describe considerations affecting the balance sheet management of banks and insurers.

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## Introduction

Institutional investors are corporations, trusts, or other legal entities that invest in financial markets on behalf of groups or individuals, including both current and future generations. On a global basis, institutional investors represent more than US\$70 trillion in investable assets, and, as such, wield significant influence over capital markets.

The universe of institutional investors includes, but is not limited to, defined benefit and defined contribution pension plans, sovereign wealth funds, endowments, foundations, banks, and insurance companies. Pension plans, which account for approximately US\$35 trillion in investable assets or roughly half of global institutional assets under management, include both defined benefit plans, in which the sponsor (employer) assumes investment risk, and defined contribution plans, in which the individual makes investment decisions and assumes the investment risk. Sovereign wealth funds, which

account for about US\$7 trillion in assets as of the end of 2016, are government-owned investment funds that invest in financial and/or real assets. Endowments and foundations, which account for approximately US\$1.6 trillion in assets, manage assets on behalf of educational institutions, hospitals, churches, museums, and other charitable organizations. Banks and insurance companies, comprising net financial assets on the order of US\$9 trillion, are financial intermediaries that balance portfolios of securities, loans, and derivatives for the purposes of (i) meeting the claims of depositors, counterparties, policyholders, and creditors and (ii) providing adequate returns to their contractual capital holders. The universe of institutional investors is comprised of large, complex, and sophisticated investors that must contend with a multitude of investment challenges and constraints.

There has been an important shift in the asset allocation of institutional investors over the last half century. In the 1970s, most pensions and endowments invested almost exclusively in domestic, fixed-income instruments. In the 1980s, many institutional investors began to invest in equity markets and often pursued a long-term strategic allocation of 60% equities/40% fixed income. In the 1990s, investors recognized the benefits of diversification and many made their first forays into international equity markets. At the turn of the 21st century, many of the world's largest pension funds and endowments further diversified their portfolios and increased investments in alternative asset classes, including private equity, hedge funds, real estate, and other alternative or illiquid assets.

Meanwhile, institutional investors have seen broad shifts in their strategic investment behavior. The trend toward Liability Driven Investing (LDI), long a mainstay of banks and insurance companies, has taken hold among many defined benefit pension plans, particularly US corporate and public pension funds. Sovereign wealth funds have amassed significant assets over the past several decades, and many

have implemented innovative investment approaches characterized by active management. Many endowments have adopted the “Endowment Model” of investing that involves significant exposure to alternative investments. Meanwhile, banks and insurers must navigate a complex and ever-changing economic and regulatory environment.

In this reading, we endeavor to put the numerous factors that affect investment by institutional investors into context. Section 2 discusses common characteristics of institutional investors as a group. Section 3 provides an overview of investment policies for institutional investors. Detailed coverage by institutional investor type begins with Section 4, pension funds, where we discuss various factors that influence investments, including: stakeholders, liability streams, investment horizons, and liquidity needs; major legal, regulatory, accounting, and tax constraints; investment objectives and key components of Investment Policy Statements; and, finally, asset allocation and investment portfolios that emanate from the foregoing factors and constraints. Section 5 follows the same approach for sovereign wealth funds, and Section 6 does the same for university endowments and private foundations. Section 7 covers banks and insurers and includes balance sheet management considerations. A summary of key points concludes the reading.

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## Summary

This reading has introduced the subject of managing institutional investor portfolios. The key points made in this reading are as follows:

- The main institutional investor types are pension plans, sovereign wealth funds, endowments, foundations, banks, and insurance companies. Common characteristics among these investors

include a large scale (i.e., asset size), a long-term investment horizon, regulatory constraints, a clearly defined governance framework, and principal–agent issues.

- Institutional investors typically codify their mission, investment objectives, and guidelines in an Investment Policy Statement (IPS).
- Four common investment approaches to managing portfolios used by institutional investors are the Norway model, the Endowment model, the Canada model, and the Liability Driven Investing (LDI) model.
- There are two main types of pension plans: defined benefit (DB), in which a plan sponsor commits to paying a specified retirement benefit; and defined contribution (DC), in which contributions are defined but the ultimate retirement benefit is not specified or guaranteed by the plan sponsor.
- Pension plan stakeholders include the employer, employees, retirees, unions, management, the investment committee and/or board of directors, and shareholders.
- The key elements in the calculation of DB plan liabilities are as follows:
  - Service/tenure: The higher the service years, the higher the retirement benefit.
  - Salary/earnings: The higher the salary over the measurement period, the higher the retirement benefit.
  - Mortality/longevity: The longer the participant’s expected life span, the higher the plan sponsor’s liability.
  - Vesting: Lower turnover results in higher vesting, increasing the plan sponsor’s liabilities.

- Discount rate: A higher discount rate reduces the present value of the plan sponsor's liabilities.
- DB plan liquidity needs are driven by the following:
  - Proportion of active employees relative to retirees: More mature pension funds have higher liquidity needs.
  - Age of workforce: Liquidity needs rise as the age of the workforce increases.
  - Plan funded status: If the plan is well funded, the sponsor may reduce contributions, generating a need to hold higher balances of liquid assets to pay benefits.
  - Flexibility: Ability of participants to switch among the sponsor's plans or to withdraw from the plan.
- Pension plans are subject to significant and evolving regulatory constraints designed to ensure the integrity, adequacy, and sustainability of the pension system. Some incentives, such as tax exemption, are only granted to plans that meet these regulatory requirements. Notable differences in legal, regulatory, and tax considerations can lead to differences in plan design from one country to another or from one group to another (e.g., public plans vs. corporate plans).
- The following risk considerations affect the way DB plans are managed:
  - Plan funded status
  - Sponsor financial strength
  - Interactions between the sponsor's business and the fund's investments

- Plan design
- Workforce characteristics
- An examination of pension fund asset allocations shows very large differences in average asset allocations by country and within a country despite these plans seeking to achieve similar goals. Such inter- and intra-national differences are driven by many factors, including the differences in legal, regulatory, accounting, and tax constraints; the investment objectives, risk appetites, and investment views of the stakeholders; the liabilities to and demographics of the ultimate beneficiaries; the availability of suitable investment opportunities; and the expected cost of living in retirement.
- The major types of sovereign wealth funds (SWFs) follow:
  - Budget Stabilization funds: Set up to insulate the budget and economy from commodity price volatility and external shocks.
  - Development funds: Established to allocate resources to priority socioeconomic projects, usually infrastructure.
  - Savings funds: Intended to share wealth across generations by transforming non-renewable assets into diversified financial assets.
  - Reserve funds: Intended to reduce the negative carry costs of holding foreign currency reserves or to earn higher return on ample reserves.
  - Pension Reserve funds: Set up to meet identified future outflows with respect to pension-related, contingent-type liabilities on governments' balance sheets.

- Stakeholders of SWFs include the country's citizens, the government, external asset managers, and the SWF's management, investment committee and board of directors.
- Given their mission of intergenerational wealth transfer, SWFs do not generally have clearly defined liabilities, so do not typically pursue asset/liability matching strategies used by other institutional investor types.
- Sovereign wealth funds have differing liquidity needs. Budget stabilization funds require the most liquidity, followed by reserve funds. At the other end of the spectrum are savings funds with low liquidity needs, followed by pension reserve funds.
- The investment objectives of SWFs are often clearly articulated in the legislative instruments that create them. They are often tax free in their home country, though must take foreign taxation into consideration. Given their significant asset sizes and the nature of their stakeholders, SWFs have aimed to increase transparency regarding their investment activities. In this regard, the Santiago Principles are a form of self-regulation.
- The typical asset allocation by SWF type shows budget stabilization funds are invested mainly in bonds and cash given their liquidity needs. Reserve Funds invest in equities and alternatives but maintain a significant allocation of bonds for liquidity. Savings funds and pension reserve funds hold relatively higher allocations of equities and alternatives because of their longer-term liabilities.
- Endowments and foundations typically invest to maintain purchasing power while financing their supporting university (endowments) or making grants (foundations) in perpetuity—based on the notion of intergenerational equity. Endowments



and foundations usually have a formal spending policy that determines how much is paid out annually to support their mission. This future stream of payouts represents their liabilities. For endowments, other liability-related factors to be considered when setting investment policy are: 1) the ability to raise additional funds from donors/alumni, 2) the percentage of the university's operating budget provided by the endowment, and 3) the ability to issue debt.

- Foundations and endowments typically enjoy tax-exempt status and face relatively little regulation compared to other types of institutional investors.
- Foundations face less flexible spending rules compared to endowments; foundations in the US are legally mandated to pay out 5% of their assets annually to maintain tax-exempt status. Endowments and foundations have relatively low liquidity needs. However, foundations have somewhat higher liquidity needs (vs. endowments), because they 1) typically pay out slightly more as a percentage of assets, and 2) finance the entire operating budget of the organization they support.
- Endowments and foundations typically have a long-term real return objective of about 5% consistent with their spending policies. This real return objective, and a desire to maintain purchasing power, results in endowments and foundations making significant allocations to real assets. In general, endowments and foundations invest heavily in private asset classes and hedge funds and have relatively small allocations to fixed income.
- Banking and insurance companies manage both portfolio assets and institutional liabilities to achieve an extremely high probability that obligations on deposits, guarantees, derivatives, policyholder claims, and other liabilities will be paid in full and on time.

## *Institutional and Private Wealth Management*

- Banking and insurance companies have perpetual time horizons. Strategically, their goal is to maximize net present value to capital holders; tactically, this may be achieved by liability driven investing (LDI) over intermediate and shorter horizons.
- Financial institutions are highly regulated because of their importance to the non-financial, or real, sectors of the economy. Such institutions are also regulated in order to minimize contagion risk rippling throughout the financial and real sectors.
- The underlying premise of regulation is that an institution's capital must be adequate to absorb shocks to both asset and liability values. This implies limiting the volatility of value of the institution's shareholder capital.
- The volatility of shareholder capital can be managed by (a) reducing the price volatility of portfolio investments, loans, and derivatives; (b) lowering the volatility from unexpected shocks to claims, deposits, guarantees, and other liabilities; (c) limiting leverage; and (d) attempting to achieve positive correlation between changes in the value of assets and liabilities.
- Ample liquidity, diversification of portfolio and other assets, high investment quality, transparency, stable funding, duration management, diversification of insurance underwriting risks, and monetary limits on guarantees, funding commitments, and insurance claims are some of the ways management and regulators attempt to achieve low volatility of shareholder capital value.



The full reading, worth 3.5 CE credits, can be found at <https://www.cfainstitute.org/membership/professional-development/refresher-readings/2020/portfolio-management-institutional-investors>

# Case Study in Portfolio Management: Institutional

**Gabriel Petre, CFA**

*Gabriel Petre, CFA, is at World Bank (USA).*

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## Learning Outcomes

The candidate should be able to:

- a. discuss tools for managing portfolio liquidity risk;
- b. discuss capture of the illiquidity premium as an investment objective;
- c. analyze asset allocation and portfolio construction in relation to liquidity needs and risk and return requirements and recommend actions to address identified needs;
- d. analyze actions in asset manager selection with respect to the Code of Ethics and Standards of Professional Conduct;
- e. analyze the costs and benefits of derivatives versus cash market techniques for establishing or modifying asset class or risk exposures;
- f. demonstrate the use of derivatives overlays in tactical asset allocation and rebalancing.

## Introduction

The development of a strategic asset allocation (SAA) for long-horizon institutional investors like university endowments raises special challenges. These include supporting spending policies while ensuring the long-term sustainability of the endowment and establishing optimal exposure to illiquid investment strategies in the context of a diversified portfolio.

Large university endowments typically have significant exposure to illiquid asset classes. The exposure to illiquid asset classes impacts the portfolio's overall liquidity profile and requires a comprehensive liquidity management approach to ensure liquidity needs can be met in a timely fashion. In addition, capital market conditions and asset prices change, resulting in a need to change asset allocation exposures and/or rebalance the portfolio to maintain a profile close to the strategic asset allocation.

Derivatives are often used by institutions to manage liquidity needs and implement asset allocation changes. The cash-efficient nature of derivatives and their high levels of liquidity in many markets make them suitable tools for portfolio rebalancing, tactical exposure changes, and satisfying short-term liquidity needs—all while maintaining desired portfolio exposures.

This case study explores these issues from the perspective of a large university endowment undertaking a review of its asset allocation and then implementing proposed allocation changes and a tactical overlay program. Rebalancing needs for the endowment arise as market moves result in drift of the endowment's asset allocation.

The case is divided into two major sections. The first section addresses issues relating to asset allocation and liquidity management. The case introduces a framework to support management of liquidity and cash needs in an orderly and timely manner while

avoiding disruption to underlying managers and potentially capturing an illiquidity premium. Such concepts as time-to-cash tables and liquidity budgets are explored in detail. Aspects relating to rebalancing and maintaining a risk profile similar to the portfolio's strategic asset allocation over time are also covered.

The second section explores the use of derivatives in portfolio construction from a tactical asset allocation (TAA) overlay and rebalancing perspective. The suitability of futures, total return swaps, and exchange-traded funds (ETFs) is discussed based on their characteristics, associated costs, and desired portfolio objectives. The case also presents a cost-benefit analysis of derivatives and cash markets for implementing rebalancing decisions.

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## Summary

The QU endowment case study covers important aspects of institutional portfolio management involving the illiquidity premium capture, liquidity management, asset allocation, and the use of derivatives versus the cash market for tactical asset allocation and portfolio rebalancing. In addition, the case examines potential ethical violations in manager selection that can arise in the course of business.

From an asset allocation perspective, the case highlights potential risk and rewards associated with increasing exposure to illiquidity risk through investments like private equity and private real estate. Although this exposure is expected to generate higher returns and more-efficient portfolios in the long-run, significant uncertainties are involved both from a modeling and implementation perspective.

*Institutional and Private Wealth Management*



The full reading, worth 1 CE credit, can be found at <https://www.cfainstitute.org/membership/professional-development/refresher-readings/2020/case-study-portfolio-management-institutional>

# Case Study in Risk Management: Private Wealth

**Giuseppe Ballocchi, PhD, CFA**

*Giuseppe Ballocchi, PhD, CFA, is at Alpha Governance Partners (Switzerland).*

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## Learning Outcomes

The candidate should be able to:

- a. identify and analyze a family's risk exposures during the early career stage;
- b. recommend and justify methods to manage a family's risk exposures during the early career stage;
- c. identify and analyze a family's risk exposures during the career development stage;
- d. recommend and justify methods to manage a family's risk exposures during the career development stage;
- e. identify and analyze a family's risk exposures during the peak accumulation stage;
- f. recommend and justify methods to manage a family's risk exposures during the peak accumulation stage;

- g. identify and analyze a family's risk exposures during the early retirement stage;
- h. recommend and justify a plan to manage risks to an individual's retirement lifestyle goals.

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## Introduction

Giving advice on risk management to individuals and families raises a number of challenges. These challenges include the extent to which identified and evaluated risks can be reduced and/or addressed using insurance policies or self-insurance. Families' financial circumstances and risks evolve over time, and financial advisers should review and update the solutions addressing these risks accordingly. Risk management solutions recommended by advisers should consider the family's overall health, wealth, and long-term goals.

This case study explores some of the risk management issues for a married couple living in a hypothetical country in the Eurozone. The case spans several decades and follows the couple through different stages of life from their early career phase, when they are in their late twenties, all the way to retirement. We will show how risk management methods need to change as the family's circumstances evolve. Particularly important prior readings related to this case are the Level III readings "Risk Management for Individuals" and "Overview of Private Wealth Management."

The assumptions used are drawn from what is typical for many countries in Europe. The circumstances and risks that this married couple face are influenced by the environment in which they find themselves. Despite the differences between Europe and other parts of the world, however, their goals, the risks they face, and the assessment



of their circumstances, as well as the suggested methods, are by no means unique to the region. The risk analysis methodology and its application would therefore be valid in a much broader context.

For simplicity, we assume that economic conditions and tax rates remain unchanged throughout the four decades that this case study spans. The terms “adviser” and “wealth manager” are used interchangeably throughout this case study. The amounts that appear in exhibits throughout the case study are rounded.

The case is divided into six major sections. Section 2 provides background information about the hypothetical country in which the Schmitt family resides. Section 3 provides initial case facts relating to the family’s early career stage and risk management analysis, as well as solutions relevant to that stage. In Section 4, we revisit the couple in their career development stage when they are 45 years old. In Sections 5 and 6, we examine their lives at age 55, in peak accumulation phase, and age 64, when they are preparing to retire. The final section provides a summary of the case.

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## Summary

This case study follows a family from the early career to the retirement stage. It touches on a small and simplified selection of a wide range of issues and considerations that a family may face. A great range of skills and competencies is required to provide financial advice, ranging from the ability to conduct in-depth risk analysis, all the way to making recommendations on risk mitigation strategies, including the choice of insurance products, to perform asset allocation, tax optimization, retirement planning, and estate planning. All of this must be done with a clear understanding of the applicable legal environment and of the level of access and the cost of accessing

financial products. In practice, it is very unlikely that a single financial professional can master all the foregoing competencies. The key to success is to understand at what point the generalist needs to bring in, or refer the client to, a subject matter expert.

In this case study:

- We identify and analyze the Schmitts' risk exposures. We observed that the types of risk exposure change substantially from the early career stage to the early retirement stage. We conducted the analysis holistically, starting from the economic balance sheet, including human capital.
- We recommend and justify methods to manage the Schmitt family's risk exposures at different stages of their professional life. We use insurance, self-insurance, and adjustments to their investment portfolio.
- We prepare summaries of the Schmitts' risk exposures and the selected methods of managing those risk exposures.
- We recommend and justify modifications to the Schmitts' life and disability insurance at different stages of the income earners' lives.
- Finally, we recommend a justified a plan to manage risk to the Schmitts' retirement lifestyle goals.



The full reading, worth 1.5 CE credits, can be found at <https://www.cfainstitute.org/membership/professional-development/refresher-readings/2020/case-study-risk-management-private-wealth>

# Investment Asset Classes

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## Applicable Readings

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### **Corporate Governance and Other ESG Considerations in Investment Analysis (Level II)**

by Deborah S. Kidd, CFA, Young Lee, CFA, and Johan Vanderlugt  
1 CE and 1 SER credit

Access to full reading: <https://www.cfainstitute.org/membership/professional-development/refresher-readings/2020/corporate-governance-esg-considerations-investment-analysis>

### **Exchange Traded Funds: Mechanics and Applications (Level II)**

by Joanne M. Hill, PhD, and Dave Nadig  
1.5 CE credits

Access to full reading: <https://www.cfainstitute.org/membership/professional-development/refresher-readings/2020/exchange-traded-funds-mechanics-applications>

### **Options Strategies (Level III)**

by Adam Schwartz, PhD, CFA, and Barbara Valbuzzi, CFA  
2.5 CE credits

Access to full reading: <https://www.cfainstitute.org/membership/professional-development/refresher-readings/2020/options-strategies>

### **Swaps, Forwards, and Futures Strategies (Level III)**

by Barbara Valbuzzi, CFA  
1.5 CE credits

Access to full reading: <https://www.cfainstitute.org/membership/professional-development/refresher-readings/2020/swaps-forwards-futures-strategies>

*Investment Asset Classes*

**Hedge Fund Strategies (Level III)**

by Barclay T. Leib, CFE, CAIA, Kathryn M. Kaminski, PhD, CAIA, Mila Getmansky Sherman, PhD

3 CE credits

Access to full reading: <https://www.cfainstitute.org/membership/professional-development/refresher-readings/2020/hedge-fund-strategies>

**Asset Allocation to Alternative Investments (Level III)**

by Adam Kobor, PhD, CFA, and Mark D. Guinney, CFA

3 CE credits

Access to full reading: <https://www.cfainstitute.org/membership/professional-development/refresher-readings/2020/asset-allocation-alternative-investments>

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# What Changed in the 2020 Curriculum?

Changing markets and investor needs, new technology and platforms, and cultural developments are driving shifts in asset classes and how they are used in portfolios.

Environmental, social, and governance (ESG) investments are a prime example. Evolving investor preferences and increasing disclosure from companies on non-financial issues are creating an industry within an industry. Many investment funds now incorporate some level of ESG analysis. A new reading describes how ESG factors can be measured and assessed by analysts and how this may affect governance practices at investee companies.

Despite predictions that alternatives would suffer irreparable damage in the post-financial-crisis era, the alternatives sector is booming. But perceptions of alternatives have shifted: They are seen less as high-octane return enhancers and are increasingly used for downside protection and income replacement. An updated reading explains how alternatives can mitigate risk, discusses when allocations to alternatives are suitable, and reveals processes for unearthing opportunities.

A new reading solely devoted to hedge funds outlines advantages and disadvantages of using them, focusing on six major hedge fund strategies and how they can be incorporated into portfolios. Notably, there is a discussion of the growing penchant for investing in risk factors, such as value, small cap, and momentum. An innovation in this reading is a framework for analyzing and using the most common risk factors employed in equity and multi-manager hedge fund strategies.

Derivatives are growing in popularity in investment management as fund managers seek ways to enhance returns and manage downside risk. A new reading on options highlights the use of the “Greeks” (delta, gamma, theta, and vega) for understanding and analyzing the risks in option strategies. Practitioners are offered practical examples of how option strategies can enhance portfolios.

An updated reading adds new content on the analysis and portfolio applications of swap, forward, and futures strategies. The revised reading contains practical explanations of how and when to use cross-currency basis swaps, volatility derivatives, and federal funds futures.

Last, but by no means least, exchange-traded funds (ETFs) come under the microscope. Few investment practitioners will have failed to notice the astonishing rise in ETF trading volumes. An entire new reading dedicated to ETFs, explaining how they are constructed and applied to portfolios, represents an acknowledgement that ETFs have become an important allocation tool for investors of all types and sizes. Issues explored include why bid–ask spreads occur, when tracking error occurs, and how well the costs of ETF ownership are understood.

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## Why Does It Matter to Members?

The understanding and adoption of new asset classes and, consequently, investment strategies are principal duties of the investment practitioner.

Evaluating how ESG factors affect company behavior and performance provides analysts with a broader perspective on the risks and opportunities associated with a company’s securities. Failure to recognize corporate mismanagement of ESG issues, for example, has

been shown on a number of occasions to create unwelcome and negative portfolio surprises. Increasingly stringent regulatory regimes and investor demand for greater awareness of resource and climate risks in asset allocation require professional investors to effectively evaluate ESG risks and incorporate them in portfolios.

In regard to alternatives, the term “alternative” now understates the importance of non-traditional investments, as institutional and private clients increasingly seek not just to supplement traditional long-only stocks and bonds but to replace them altogether. However, investment professionals, especially those who deal directly with clients, should acknowledge that hedge fund strategies offer drawbacks as well as benefits. The reading addresses nuances of hedge fund investing, including the possibility that hedge funds fail to deliver during periods of market distress—just when investors most need them to perform.

Not all firms use derivatives, but many are seeking to replicate assets’ returns more cheaply and with greater liquidity by using options. Many investment generalists will wish to sharpen their understanding of how swaps, forwards, and futures can be incorporated in equity and fixed-income portfolio management. Creating meaningful investment objectives through using options and then structuring options so the risks and payoffs are well calibrated are critical to the successful use of these instruments.

Finally, although ETFs are simple to trade, they are not always straightforward to use meaningfully in a broad portfolio. Practitioners shouldn’t miss this new reading on how and when ETFs can add value to client portfolios.

# Corporate Governance and Other ESG Considerations in Investment Analysis

**Deborah S. Kidd, CFA, Young Lee, CFA, and Johan Vanderlugt**  
*Deborah S. Kidd, CFA (USA). Young Lee, CFA, is at MacKay Shields LLC (USA) and MacKay Shields UK LLP (United Kingdom). Johan Vanderlugt is at NN Investment Partners (Netherlands).*

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## Learning Outcomes

The candidate should be able to:

- a. describe global variations in ownership structures and the possible effects of these variations on corporate governance policies and practices;
- b. evaluate the effectiveness of a company's corporate governance policies and practices;
- c. describe how ESG-related risk exposures and investment opportunities may be identified and evaluated;
- d. evaluate ESG risk exposures and investment opportunities related to a company.



## Introduction

Environmental, social, and governance (ESG) considerations are increasingly being integrated into investment analysis. Evaluating how ESG factors potentially affect a company may provide analysts with a broader perspective on the risks and investment opportunities of a company's securities. Although corporate governance has long been recognized as having a significant impact on a company's long-term performance, investors have become increasingly concerned with environmental and social factors and how companies manage their resources and risk exposures that relate to such factors. Mismanagement of these resources has led to a number of high-profile corporate events that have negatively affected security prices. Increasingly stringent regulatory environments, potentially finite supplies of natural resources, and global trends toward energy conservation and waste reduction have led many investors to place a greater emphasis on the management of environmental risks. Similarly, such issues as worker health and safety policies, community impact, and marketing practices have increased the visibility of how a company manages its social capital.

This reading provides an overview of ESG considerations in investment analysis. Section 2 provides an overview of the global variations in corporate ownership structures, as well as how these ownership structures may affect corporate governance outcomes. In Section 3, we discuss company-specific factors that should be considered when evaluating corporate governance in the investment process. Section 4 discusses the identification of ESG-related risks and opportunities that are relevant to security analysis. Section 5 demonstrates the evaluation of ESG-related risks and opportunities through several examples. The reading concludes with a summary of the key points discussed.

## Summary

- Shareholder ownership structures are commonly classified as dispersed, concentrated, or a hybrid of the two.
- Dispersed ownership reflects the existence of many shareholders, none of which, either individually or collectively, has the ability to exercise control over the corporation. Concentrated corporate ownership reflects an individual shareholder or a group (controlling shareholders) with the ability to exercise control over the corporation.
- Controlling shareholders may be either majority shareholders or minority shareholders.
- Horizontal ownership involves companies with mutual business interests that have cross-holding share arrangements with each other. Vertical (or pyramid) ownership involves a company or group that has a controlling interest in two or more holding companies, which in turn have controlling interests in various operating companies.
- Dual-class (or multiple-class) shares grant one or more share classes superior or even sole voting rights while other share classes have inferior or no voting rights.
- Types of influential owners include banks, families, sovereign governments, institutional investors, group companies, private equity firms, foreign investors, managers, and board directors.
- A corporation's board of directors is typically structured as either one tier or two tier. A one-tier board consists of a single board of directors, composed of executive (internal) and non-executive

(external) directors. A two-tier board consists of a supervisory board that oversees a management board.

- CEO duality exists when the chief executive officer also serves as chairperson of the board.
- A primary challenge of integrating ESG factors in investment analysis is identifying and obtaining information that is relevant and useful.
- ESG information and metrics are inconsistently reported by companies, and such disclosure is voluntary, which provides additional challenges for analysts.
- In an ESG context, materiality typically refers to ESG-related issues that are expected to affect a company's operations or financial performance and the valuation of its securities.
- Corporate governance considerations, such as the structure of the board of directors, tend to be reasonably consistent across most companies. In contrast, environmental and social considerations often differ greatly.
- Analysts typically use three approaches to identify a company's (or industry's) ESG factors: (1) proprietary research, (2) ESG data providers, or (3) not-for-profit industry organizations and initiatives.
- In equity analysis, ESG integration is used to both identify potential opportunities and mitigate downside risk, whereas in fixed-income analysis, ESG integration is generally focused on mitigating downside risk.
- A typical starting point for ESG integration is the identification of material qualitative and quantitative ESG factors that pertain to a company or its industry.

## *Investment Asset Classes*



The full reading, worth 1 CE and 1 SER credit, can be found at <https://www.cfainstitute.org/membership/professional-development/refresher-readings/2020/corporate-governance-esg-considerations-investment-analysis>

# Exchange-Traded Funds: Mechanics and Applications

**Joanne M. Hill, PhD, and Dave Nadig**

*Joanne M. Hill, PhD (USA). Dave Nadig is at ETF.com (USA).*

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## Learning Outcomes

The candidate should be able to:

- a. explain the creation/redemption process of ETFs and the function of authorized participants;
- b. describe how ETFs are traded in secondary markets;
- c. describe sources of tracking error for ETFs;
- d. describe factors affecting ETF bid–ask spreads;
- e. describe sources of ETF premiums and discounts to NAV;
- f. describe costs of owning an ETF;
- g. describe types of ETF risk;
- h. identify and describe portfolio uses of ETFs.

## Introduction

Exchange-traded funds (ETFs) have grown rapidly since their invention in the early 1990s, in large part because of their low associated cost, exchange access, holdings transparency, and range of asset classes available. Growth in ETFs has also been driven by the increased use of index-based investing. ETF investors need to understand how these products work and trade and how to choose from the numerous options available. Although many ETFs are organized under the same regulation as mutual fund products, there are important differences related to trading and tax efficiency. ETFs have features that can make them more tax efficient than traditional mutual funds, and not all ETFs are organized like mutual funds. ETFs can be based on derivative strategies, use leverage and shorting, and be offered in alternate structures, such as exchange-traded notes (ETNs), which have their own unique risks.

Understanding how ETF shares are created and redeemed is key to understanding how these products can add value in a portfolio. Since so many ETFs track indexes, understanding their index tracking or tracking error is also critical. Investors should also understand how to assess an ETF's trading costs, including differences between the ETF's market price and the fair value of its portfolio holdings.

This reading is organized as follows: Section 2 discusses ETF primary and secondary markets, including the creation/redemption process. Section 3 covers important investor considerations, such as costs and risks, when choosing an ETF. Section 4 explains how ETFs are used in strategic, tactical, and portfolio efficiency applications. Section 5 concludes and summarizes the reading.

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## Summary

In this reading, we have examined important considerations for ETF investors, including how ETFs work and trade, tax efficient attributes, and key portfolio uses. The following is a summary of key points:

- ETFs rely on a creation/redemption mechanism that allows for the continuous creation and redemption of ETF shares.
- The only investors who can create or redeem new ETF shares are a special group of institutional investors called authorized participants.
- ETFs trade on both the primary market (directly between APs and issuers) and on the secondary markets (exchange-based or over-the-counter trades like listed equity).
- End investors trade ETFs on the secondary markets, like stocks.
- Holding period performance deviations (tracking differences) are more useful than the standard deviation of daily return differences (tracking error).
- ETF tracking differences from the index occur for the following reasons:
  - fees and expenses,
  - representative sampling/optimization,
  - use of depositary receipts and other ETFs,
  - index changes,
  - fund accounting practices,
  - regulatory and tax requirements, and

## *Investment Asset Classes*

- asset manager operations.
- ETFs are generally taxed like the securities they hold, with some nuances:
  - ETFs are more tax fair than traditional mutual funds, because portfolio trading is generally not required when money enters or exits an ETF.
  - Owing to the creation/redemption process, ETFs can be more tax efficient than mutual funds.
  - ETF issuers can redeem out low-cost-basis securities to minimize future taxable gains.
  - Local markets have unique ETF taxation issues that should be considered.
- ETF bid–ask spreads vary by trade size and are usually published for smaller trade sizes. They are tightest for ETFs that are very liquid and have continuous two-way order flow. For less liquid ETFs, the following factors can determine the quoted bid–ask spread of an ETF trade:
  - Creation/redemption costs, brokerage and exchange fees
  - Bid–ask spread of underlying securities held by the ETF
  - Risk of hedging or carry positions by liquidity provider
  - Market makers’ target profit spread
- ETF bid–ask spreads on fixed income relative to equity tend to be wider because the underlying bonds trade in dealer markets and hedging is more difficult. Spreads on ETFs holding international stocks are tightest when the underlying security markets are open for trading.



- ETF premiums and discounts refer to the difference between the exchange price of the ETF and the fund's calculated NAV, based on the prices of the underlying securities and weighted by the portfolio positions at the start of each trading day. Premiums and discounts can occur because NAVs are based on the last traded prices, which may be observed at a time lag to the ETF price, or because the ETF is more liquid and more reflective of current information and supply and demand than the underlying securities in rapidly changing markets.
- Costs of ETF ownership may be positive or negative and include both explicit and implicit costs. The main components of ETF cost are
  - the fund management fee;
  - tracking error;
  - portfolio turnover;
  - trading costs, such as commissions, bid–ask spreads, and premiums/discounts;
  - taxable gains/losses; and
  - security lending.
- Trading costs are incurred when the position is entered and exited. These one-time costs decrease as a portion of total holding costs over longer holding periods and are a more significant consideration for shorter-term tactical ETF traders.
- Other costs, such as management fees and portfolio turnover, increase as a proportion of overall cost as the investor holding period lengthens. These costs are a more significant consideration for longer-term buy-and-hold investors.

## *Investment Asset Classes*

- ETFs are different from exchange-traded notes, although both use the creation/redemption process.
  - Exchange-traded notes carry unique counterparty risks of default.
  - Swap-based ETFs may carry counterparty risk.
  - ETFs, like mutual funds, may lend their securities, creating risk of counterparty default.
  - ETF closures can create unexpected tax liabilities.
- ETFs are used for core asset class exposure, multi-asset, dynamic, and tactical strategies based on investment views or changing market conditions; for factor or smart beta strategies with a goal to improve return or modify portfolio risk; and for portfolio efficiency applications, such as rebalancing, liquidity management, completion strategies, and transitions.
- ETFs are useful for investing cash inflows, as well as for raising proceeds to provide for client withdrawals. ETFs are used for rebalancing to target asset class weights and for “completion strategies” to fill a temporary gap in an asset class category, sector, or investment theme or when external managers are underweight. When positions are in transition from one external manager to another, ETFs are often used as the temporary holding and may be used to fund the new manager.
- All types of investors use ETFs to establish low-cost core exposure to asset classes, equity style benchmarks, fixed-income categories, and commodities.
- For more tactical investing, thematic ETFs are used in active portfolio management and represent narrow or niche areas of the equity market not well represented by industry or sector ETFs.

- Systematic, active strategies that use rules-based benchmarks for exposure to such factors as size, value, momentum, quality, or dividend tilts or combinations of these factors are frequently implemented with ETFs.
- Multi-asset and global asset allocation or macro strategies that manage positions dynamically as market conditions change are also areas where ETFs are frequently used.
- Proper utilization requires investors to carefully research and assess the ETF's index construction methodology, costs, risks, and performance history.



The full reading, worth 1.5 CE credits, can be found at <https://www.cfainstitute.org/membership/professional-development/refresher-readings/2020/exchange-traded-funds-mechanics-applications>

# Options Strategies

**Adam Schwartz, PhD, CFA, and Barbara Valbuzzi, CFA**

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## Learning Outcomes

The candidate should be able to:

- a. demonstrate how an asset's returns may be replicated by using options;
- b. discuss the investment objective(s), structure, payoff, risk(s), value at expiration, profit, maximum profit, maximum loss, and breakeven underlying price at expiration of a covered call position;
- c. discuss the investment objective(s), structure, payoff, risk(s), value at expiration, profit, maximum profit, maximum loss, and breakeven underlying price at expiration of a protective put position;
- d. compare the delta of covered call and protective put positions with the position of being long an asset and short a forward on the underlying asset;
- e. compare the effect of buying a call on a short underlying position with the effect of selling a put on a short underlying position;

- f. discuss the investment objective(s), structure, payoffs, risk(s), value at expiration, profit, maximum profit, maximum loss, and breakeven underlying price at expiration of the following option strategies: bull spread, bear spread, straddle, and collar;
- g. describe uses of calendar spreads;
- h. discuss volatility skew and smile;
- i. identify and evaluate appropriate option strategies consistent with given investment objectives;
- j. demonstrate the use of options to achieve targeted equity risk exposures.

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## Introduction

Derivatives are financial instruments through which counterparties agree to exchange economic cash flows based on the movement of underlying securities, indexes, currencies, or other instruments or factors. A derivative's value is thus *derived* from the economic performance of the underlying. Derivatives may be created directly by counterparties or may be facilitated through established, regulated market exchanges. Direct creation between counterparties has the benefit of tailoring to the counterparties' specific needs but also the disadvantage of potentially low liquidity. Exchange-traded derivatives often do not match counterparties' specific needs but do facilitate early termination of the position, and, importantly, mitigate counterparty risk. Derivatives facilitate the exchange of economic risks and benefits where trades in the underlying securities might be less

advantageous because of poor liquidity, transaction costs, regulatory impediments, tax or accounting considerations, or other factors.

Options are an important type of contingent-claim derivative that provide their owner with the right but not an obligation to a payoff determined by the future price of the underlying asset. Unlike other types of derivatives (i.e., swaps, forwards, and futures), options have nonlinear payoffs that enable their owners to benefit from movements in the underlying in one direction without being hurt by movements in the opposite direction. The cost of this opportunity, however, is the upfront cash payment required to enter the options position.

Options can be combined with the underlying and with other options in a variety of different ways to modify investment positions, to implement investment strategies, or even to infer market expectations. Therefore, investment managers routinely use option strategies for hedging risk exposures, for seeking to profit from anticipated market moves, and for implementing desired risk exposures in a cost-effective manner.

The main purpose of this reading is to illustrate how options strategies are used in typical investment situations and to show the risk–return trade-offs associated with their use. Importantly, an informed investment professional should have such a basic understanding of options strategies to competently serve his investment clients.

Section 2 of this reading shows how certain combinations of securities (i.e., options, underlying) are equivalent to others. Section 3 discusses two of the most widely used options strategies, covered calls and protective puts. In Section 4, we look at popular spread and combination option strategies used by investors. The focus of Section 5 is implied volatility embedded in option prices and related volatility skew and surface. Section 6 discusses option strategy selection. Section 7 demonstrates a series of applications showing ways in which an investment manager might solve an investment problem with options. The reading concludes with a summary.

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## Summary

This reading on options strategies shows a number of ways in which market participants might use options to enhance returns or to reduce risk to better meet portfolio objectives. The following are the key points.

- Buying a call and writing a put on the same underlying with the same strike price and expiration create a synthetic long position (i.e., a synthetic long forward position).
- Writing a call and buying a put on the same underlying with the same strike price and expiration create a synthetic short position (i.e., a synthetic short forward position).
- A synthetic long put position consists of a short stock and long call position in which the call strike price equals the price at which the stock is shorted.
- A synthetic long call position consists of a long stock and long put position in which the put strike price equals the price at which the stock is purchased.
- Delta is the change in an option's price for a change in price of the underlying, all else equal.
- Gamma is the change in an option's delta for a change in price of the underlying, all else equal.
- Vega is the change in an option's price for a change in volatility of the underlying, all else equal.
- Theta is the daily change in an option's price, all else equal.

### *Investment Asset Classes*

- A covered call, in which the holder of a stock writes a call giving someone the right to buy the shares, is one of the most common uses of options by individual investors.
- Covered calls can be used to change an investment's risk–reward profile by effectively enhancing yield or reducing/exiting a position when the shares hit a target price.
- A covered call position has a limited maximum return because of the transfer of the right tail of the return distribution to the option buyer.
- The maximum loss of a covered call position is less than the maximum loss of the underlying shares alone, but the covered call carries the potential for an opportunity loss if the underlying shares rise sharply.
- A protective put is the simultaneous holding of a long stock position and a long put on the same asset. The put provides protection or insurance against a price decline.
- The continuous purchase of protective puts maintains the upside potential of the portfolio, while limiting downside volatility. The cost of the puts must be carefully considered, however, because this activity may be expensive. Conversely, the occasional purchase of a protective put to deal with a bearish short-term outlook can be a reasonable risk-reducing strategy.
- The maximum loss with a protective put is limited because the downside risk is transferred to the option writer in exchange for the payment of the option premium.
- With an option spread, an investor buys one option and writes another of the same type. This approach reduces the position cost but caps the maximum payoff.



- A bull spread expresses a bullish view on the underlying and is normally constructed by buying a call option and writing another call option with a higher exercise price (both options have same underlying and same expiry).
- A bear spread expresses a bearish view on the underlying and is normally constructed by buying a put option and writing another put option with a lower exercise price (both options have same underlying and same expiry).
- With either a bull spread or a bear spread, both the maximum gain and the maximum loss are known and limited.
- A long (short) straddle is an option combination in which the investor buys (sells) puts and calls with the same exercise price and expiration date. The long (short) straddle investor expects increased (stable/decreased) volatility and typically requires a large (small/no) price movement in the underlying asset in order to make a profit.
- A collar is an option position in which the investor is long shares of stock and simultaneously writes a call with an exercise price above the current stock price and buys a put with an exercise price below the current stock price. A collar limits the range of investment outcomes by sacrificing upside gain in exchange for providing downside protection.
- A long (short) calendar spread involves buying (selling) a long-dated option and writing (buying) a shorter-dated option of the same type with the same exercise price. A long (short) calendar spread is used when the investment outlook is flat (volatile) in the near term but greater (lesser) price movements are expected in the future.

## Investment Asset Classes

- Implied volatility is the expected volatility an underlying asset's price and is derived from an option pricing model (i.e., the Black–Scholes–Merton model) as the value that equates the model price of an option to its market price.
- When implied volatilities of OTM options exceed those of ATM options, the implied volatility curve is a volatility smile. The more common shape is a volatility skew, in which implied volatility increases for OTM puts and decreases for OTM calls, as the strike price moves away from the current price.
- The implied volatility surface is a 3-D plot, for put and call options on the same underlying, showing expiration time ( $x$ -axis), strike prices ( $y$ -axis), and implied volatilities ( $z$ -axis). It simultaneously displays volatility skew and the term structure of implied volatility.
- Options, like all derivatives, should always be used in connection with a well-defined investment objective. When using options strategies, it is important to have a view on the expected change in implied volatility and the direction of movement of the underlying asset.



The full reading, worth 2.5 CE credits, can be found at <https://www.cfainstitute.org/membership/professional-development/refresher-readings/2020/options-strategies>

# Swaps, Forwards, and Futures Strategies

**Barbara Valbuzzi, CFA**

*Barbara Valbuzzi, CFA (Italy).*

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## Learning Outcomes

The candidate should be able to:

- a. demonstrate how interest rate swaps, forwards, and futures can be used to modify a portfolio's risk and return;
- b. demonstrate how currency swaps, forwards, and futures can be used to modify a portfolio's risk and return;
- c. demonstrate how equity swaps, forwards, and futures can be used to modify a portfolio's risk and return;
- d. demonstrate the use of volatility derivatives and variance swaps;
- e. demonstrate the use of derivatives to achieve targeted equity and interest rate risk exposures;
- f. demonstrate the use of derivatives in asset allocation, rebalancing, and inferring market expectations.

There are many ways in which investment managers and investors can use swaps, forwards, futures, and volatility derivatives. The typical applications of these derivatives involve modifying investment positions for hedging purposes or for taking directional bets,

creating or replicating desired payoffs, implementing asset allocation and portfolio rebalancing decisions, and even inferring current market expectations. The following table shows some common uses of these derivatives in portfolio management and the types of derivatives used by investors and portfolio managers.

<b>Common Uses of Swaps, Forwards, and Futures</b>	<b>Typical Derivatives Used</b>
Modifying Portfolio Returns and Risk Exposures (Hedging and Directional Bets)	Interest Rate, Currency, and Equity Swaps and Futures; Fixed-Income Futures; Variance Swaps
Creating Desired Payoffs	Forwards, Futures, Total Return Swaps
Performing Asset Allocation and Portfolio Rebalancing	Equity Index Futures, Government Bond Futures, Index Swaps
Inferring Market Expectations for Interest Rates, Inflation, and Volatility	Fed Funds Futures, Inflation Swaps, VIX Futures

It is important for an informed investment professional to understand how swaps, forwards, futures, and volatility derivatives can be used and their associated risk–return trade-offs. Therefore, the purpose of this reading is to illustrate ways in which these derivatives might be used in typical investment situations. Section 2 of this reading shows how swaps, forwards, and futures can be used to modify the risk exposure of an existing position. Section 3 provides a discussion on derivatives on volatility. Section 4 demonstrates a series of applications showing ways in which a portfolio manager might solve an investment problem with these derivatives. The reading concludes with a summary.

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## Summary

This reading on swap, forward, and futures strategies shows a number of ways in which market participants might use these derivatives to enhance returns or to reduce risk to better meet portfolio objectives. Following are the key points.

- Interest rate, currency, and equity swaps, forwards, and futures can be used to modify risk and return by altering the characteristics of the cash flows of an investment portfolio.
- An interest rate swap is an OTC contract in which two parties agree to exchange cash flows on specified dates, one based on a floating interest rate and the other based on a fixed rate (swap rate), determined at swap initiation. Both rates are applied to the swap's notional value to determine the size of the payments, which are typically netted. Interest rate swaps enable a party with a fixed (floating) risk or obligation to effectively convert it into a floating (fixed) one.
- Investors can use short-dated interest rate futures and forward rate agreements or longer-dated fixed-income (bond) futures contracts to modify their portfolios' interest rate risk exposure.
- When hedging interest rate risk with bond futures, one must determine the basis point value of the portfolio to be hedged, the target basis point value, and the basis point value of the futures, which itself is determined by the basis point value of the cheapest-to-deliver bond and its conversion factor. The number of bond futures to buy or sell to reach the target basis point value is then determined by the basis point value hedge ratio:

$$BPVHR = \left( \frac{BPV_T - BPV_P}{BPV_{CTD}} \right) \times CF .$$

- Cross-currency basis swaps help parties in the swap to hedge against the risk of exchange rate fluctuations and to achieve better rate outcomes. Firms that need foreign-denominated cash can obtain funding in their local currency (likely at a more favorable rate) and then swap the local currency for the required foreign currency using a cross-currency basis swap.
- Equity risk in a portfolio can be managed using equity swaps and total return swaps. There are three main types of equity swap: (1) receive-equity return, pay-fixed; (2) receive-equity return, pay-floating; and (3) receive-equity return, pay-another equity return. A total return swap is a modified equity swap; it also includes in the performance any dividends paid by the underlying stocks or index during the period until the swap maturity.
- Equity risk in a portfolio can also be managed using equity futures and forwards. Equity futures are standardized, exchange-listed contracts, and when the underlying is a stock index, only cash settlement is available at contract expiration. The number of equity futures contracts to buy or sell is determined by

$$N_f = \left( \frac{\beta_T - \beta_S}{\beta_f} \right) \left( \frac{S}{F} \right).$$

- Cash equitization is a strategy designed to boost returns by finding ways to “equitize” unintended cash holdings. It is typically done using stock index futures and interest rate futures.
- Derivatives on volatility include VIX futures and options and variance swaps. Importantly, VIX option prices are determined from VIX futures, and both instruments allow an investor to implement a view depending on her expectations about the timing and magnitude of a change in implied volatility.

- In a variance swap, the buyer of the contract will pay the difference between the fixed variance strike specified in the contract and the realized variance (annualized) on the underlying over the period specified and applied to a variance notional. Thus, variance swaps allow directional bets on implied versus realized volatility.
- Derivatives can be used to infer market participants' current expectations for changes over the short term in inflation (e.g., CPI swaps) and market volatility (e.g., VIX futures). Another common application is using fed funds futures prices to derive the probability of a central bank move in the federal funds rate target at the FOMC's next meeting.



The full reading, worth 1.5 CE credits, can be found at <https://www.cfainstitute.org/membership/professional-development/refresher-readings/2020/swaps-forwards-futures-strategies>

# Hedge Fund Strategies

**Barclay T. Leib, CFE, CAIA, Kathryn M. Kaminski, PhD, CAIA, Mila Getmansky Sherman, PhD**

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## Learning Outcomes

The candidate should be able to:

- a. discuss how hedge fund strategies may be classified;
- b. discuss investment characteristics, strategy implementation, and role in a portfolio of *equity-related* hedge fund strategies;
- c. discuss investment characteristics, strategy implementation, and role in a portfolio of *event-driven* hedge fund strategies;
- d. discuss investment characteristics, strategy implementation, and role in a portfolio of *relative value* hedge fund strategies;
- e. discuss investment characteristics, strategy implementation, and role in a portfolio of *opportunistic* hedge fund strategies;
- f. discuss investment characteristics, strategy implementation, and role in a portfolio of *specialist* hedge fund strategies;
- g. discuss investment characteristics, strategy implementation, and role in a portfolio of *multi-manager* hedge fund strategies;



- h. describe how factor models may be used to understand hedge fund risk exposures;
- i. evaluate the impact of an allocation to a hedge fund strategy in a traditional investment portfolio.

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## Introduction

Hedge funds form an important subset of the alternative investments opportunity set, but they come with many pros and cons in their use and application across different asset classes and investment approaches. The basic tradeoff is whether the added fees typically involved with hedge fund investing result in sufficient additional alpha and portfolio diversification benefits to justify the high fee levels. This is an ongoing industry debate.

Some argue that investing in hedge funds is a key way to access the very best investment talent—those individuals who can adroitly navigate investment opportunities across a potentially wider universe of markets. Others argue that hedge funds are important because the alpha that may be produced in down markets is hard to source elsewhere.

The arguments against hedge funds are also non-trivial. In addition to the high fee levels, the complex offering memorandum documentation needs to be understood by investors (i.e., the limited partners). Other issues include lack of full underlying investment transparency/attribution, higher cost allocations associated with the establishment and maintenance of the fund investment structures, and generally longer-lived investment commitment periods with limited redemption availability.

In addition, each hedge fund strategy area tends to introduce different types of added portfolio risks. For example, to achieve meaningful return objectives, arbitrage-oriented hedge fund strategies tend to utilize significant leverage that can be dangerous to limited partner investors, especially during periods of market stress. Long/short equity and event-driven strategies may have less beta exposure than simple, long-only beta allocations, but the higher hedge fund fees effectively result in a particularly expensive form of embedded beta. Such strategies as managed futures or global macro investing may introduce natural benefits of asset class and investment approach diversification, but they come with naturally higher volatility in the return profiles typically delivered. Extreme tail risk in portfolios may be managed with the inclusion of relative value volatility or long volatility strategies, but it comes at the cost of a return drag during more normal market periods. In other words, some hedge fund strategies may have higher portfolio diversification benefits, while others may simply be return enhancers rather than true portfolio diversifiers.

Also, the hedge fund industry continues to evolve in its overall structure. Over the past decade, traditional limited partnership formats have been supplemented by offerings of liquid alternatives (liquid alts)—which are mutual fund, closed-end fund, and ETF-type vehicles that invest in various hedge fund-like strategies. Liquid alts are meant to provide daily liquidity, transparency, and lower fees while opening hedge fund investing to a wider range of investors. However, empirical evidence shows that liquid alts significantly underperform similar strategy hedge funds, which suggests that traditional hedge funds may be benefiting from an illiquidity premium phenomenon that cannot be easily transported into a mutual fund format.

Investors must understand the various subtleties involved with investing in hedge funds. Although secular bull market trends have arguably made “hedged” strategies less critical for inclusion in

portfolio allocations than they were during the mid-to-late 2000s, the overall popularity of hedge funds tends to be somewhat cyclical. Notably, as demonstrated by the endowment model of investing, placing hedge funds as a core allocation can increase net returns and reduce risk.

This reading presents the investment characteristics and implementation for the major categories of hedge fund strategies. It also provides a framework for classifying and evaluating these strategies based on their risk profiles. Section 2 summarizes some distinctive regulatory and investment characteristics of hedge funds and discusses ways to classify hedge fund strategies. Sections 3 through 8 present investment characteristics and strategy implementation for each of the following six hedge fund strategy categories: equity-related; event-driven; relative value; opportunistic; specialist; and multi-manager strategies. Section 9 introduces a conditional factor model as a unifying framework for understanding and analyzing the risk exposures of these strategies. Section 10 evaluates the contributions of each hedge fund strategy to the return and risk profile of a traditional portfolio of stocks and bonds. The reading concludes with a summary.

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## Summary

- Hedge funds are an important subset of the alternative investments space. Key characteristics distinguishing hedge funds and their strategies from traditional investments include the following: 1) lower legal and regulatory constraints; 2) flexible mandates permitting use of shorting and derivatives; 3) a larger investment universe on which to focus; 4) aggressive investment styles that allow concentrated positions in securities offering

exposure to credit, volatility, and liquidity risk premiums; 5) relatively liberal use of leverage; 6) liquidity constraints that include lock-ups and liquidity gates; and 7) relatively high fee structures involving management and incentive fees.

- Hedge fund strategies are classified by a combination of the instruments in which they are invested, the trading philosophy followed, and the types of risks assumed. Some leading hedge fund strategy index providers are Hedge Fund Research; Lipper TASS; Morningstar Hedge/CISDM; EurekaHedge; and Credit Suisse. There is much heterogeneity in the classification and indexes they provide, so no one index group is all-encompassing.
- This reading classifies hedge fund strategies by the following categories: equity-related strategies; event-driven strategies; relative value strategies; opportunistic strategies; specialist strategies; and multi-manager strategies.
- Equity L/S strategies take advantage of diverse opportunities globally to create alpha via managers' skillful stock picking. Diverse investment styles include value/growth, large cap/small cap, discretionary/quantitative, and industry specialization. Some equity L/S strategies may use index-based short hedges to reduce market risk, but most involve single name shorts for portfolio alpha and added absolute return.
- Equity L/S strategies are typically liquid and generally net long, with gross exposures at 70%–90% long vs. 20%–50% short (but they can vary).
- Equity L/S return profiles are typically aimed to achieve average annual returns roughly equivalent to a long-only approach but with standard deviations that are 50% lower. The more

market-neutral or quantitative the strategy approach, the more levered the strategy application to achieve a meaningful return profile.

- Dedicated short sellers only trade with short-side exposure, but they may moderate short beta by also holding cash. Short-biased managers are focused on short-side stock picking, but they typically moderate short beta with some value-oriented long exposure and cash.
- Dedicated short strategies tend to be 60%–120% short at all times, while short-biased strategies are typically around 30%–60% net short. The focus in both cases is usually on single equity stock picking, as opposed to index shorting, and using little if any leverage.
- Dedicated short-selling and short-biased strategies have return goals that are typically less than most other hedge fund strategies but with a negative correlation benefit. Returns are more volatile than a typical L/S equity hedge fund given short beta exposure.
- Equity market-neutral (EMN) strategies take advantage of idiosyncratic short-term mispricing between securities. Their sources of return and alpha do not require accepting beta risk, so EMN strategies are especially attractive in periods of market vulnerability/weakness. There are many types of EMN managers, but most are purely quantitative managers (vs. discretionary managers).
- As many beta risks (e.g., market, sector) are hedged away, EMN strategies generally apply relatively high levels of leverage in striving for meaningful return targets.
- Equity market-neutral strategies exhibit relatively modest return profiles. Portfolios are aimed at market neutrality and with differing constraints to other factor/sector exposures. Generally

high levels of diversification and liquidity with lower standard deviation of returns are typical due to an orientation toward mean reversion.

- Merger arbitrage is a relatively liquid strategy. Defined gains come from idiosyncratic, single security takeover situations, but occasional downside shocks can occur when merger deals unexpectedly fail.
- Cross-border M&A usually involves two sets of governmental approvals. M&A deals involving vertical integration often face antitrust scrutiny and thus carry higher risks and offer wider merger spread returns.
- Merger arbitrage strategies have return profiles that are insurance-like, plus a short put option, with relatively high Sharpe ratios; however, left-tail risk is associated with otherwise steady returns. Merger arbitrage managers typically apply moderate to high leverage to generate meaningful target return levels.
- Distressed securities strategies focus on firms in bankruptcy, facing potential bankruptcy, or under financial stress. Hedge fund managers seek inefficiently priced securities before, during, or after the bankruptcy process, which results in either liquidation or reorganization.
- In liquidation, the firm's assets are sold off and securities holders are paid sequentially based on priority of their claims—from senior secured debt, junior secured debt, unsecured debt, convertible debt, preferred stock, and finally common stock.
- In re-organization, a firm's capital structure is re-organized and terms for current claims are negotiated and revised. Debtholders either may agree to maturity extensions or to exchanging their

debt for new equity shares (existing shares are canceled) that are sold to new investors to improve the firm's financial condition.

- Outright shorts or hedged positions are possible, but distressed securities investing is usually long-biased, entails relatively high levels of illiquidity, and has moderate to low leverage. The return profile is typically at the higher end of event-driven strategies, but it is more discrete and cyclical.
- For fixed-income arbitrage, the attractiveness of returns is a function of the correlations between different securities, the yield spread pick-up available, and the high number and wide diversity of debt securities across different markets, each having different credit quality and convexity aspects in their pricing.
- Yield curve and carry trades within the US government space are very liquid but have the fewest mispricing opportunities. Liquidity for relative value positions generally decreases in other sovereign markets, mortgage-related markets, and across corporate debt markets.
- Fixed-income arbitrage involves high leverage usage, but leverage availability diminishes with trade and underlying instrument complexity.
- Convertible arbitrage strategies strive to extract “underpriced” implied volatility from long convertible bond holdings. To do this, managers will delta hedge and gamma trade short equity positions against their convertible positions. Convertible arbitrage works best in periods of high convertible issuance, moderate volatility, and reasonable market liquidity.
- Liquidity issues may arise from convertible bonds being naturally less-liquid securities due to their relatively small issue sizes

and inherent complexities as well as the availability and cost to borrow underlying equity for short selling.

- Convertible arbitrage managers typically run convertible portfolios at 300% long vs. 200% short. The lower short exposure is a function of the delta-adjusted exposure needed from short sales to balance the long convertibles.
- Global macro strategies focus on correctly discerning and capitalizing on trends in global financial markets using a wide range of instruments. Managed futures strategies have a similar aim but focus on investments using mainly futures and options on futures, on stock and fixed-income indexes, as well as on commodities and currencies.
- Managed futures strategies typically are implemented via more systematic approaches, while global macro strategies tend to use more discretionary approaches. Both strategies are highly liquid and use high leverage.
- Returns of managed futures strategies typically exhibit positive right-tail skewness during market stress. Global macro strategies generally deliver similar diversification in stress periods but with more heterogeneous outcomes.
- Specialist hedge fund strategies require highly specialized skill sets for trading in niche markets. Two such typical specialist strategies—which are aimed at generating uncorrelated, attractive risk-adjusted returns—are volatility trading and reinsurance/life settlements.
- Volatility traders strive to capture relative timing and strike pricing opportunities due to changes in the term structure of volatility. They try to capture volatility smile and skew by using various types of option spreads, such as bull and bear spreads, straddles,



and calendar spreads. In addition to using exchange-listed and OTC options, VIX futures, volatility swaps, and variance swaps can be used to implement volatility trading strategies.

- Life settlements strategies involve analyzing pools of life insurance contracts offered by third-party brokers, where the hedge fund purchases the pool and effectively becomes the beneficiary. The hedge fund manager looks for policies with the following traits: 1) The surrender value being offered to the insured individual is relatively low; 2) the ongoing premium payments are also relatively low; and 3) the probability is relatively high that the insured person will die sooner than predicted by standard actuarial methods.
- Funds-of-funds and multi-strategy funds typically offer steady, low-volatility returns via their strategy diversification. Multi-strategy funds have generally outperformed FoFs, but they have more variance due to using relatively high leverage.
- Multi-strategy funds offer potentially faster tactical asset allocation and generally improved fee structure (netting risk between strategies is often at least partially absorbed by the general partner), but they have higher manager-specific operational risks. FoFs offer a potentially more diverse strategy mix, but they have less transparency, slower tactical reaction time, and contribute netting risk to the FoF investor.
- Conditional linear factor models can be useful for uncovering and analyzing hedge fund strategy risk exposures. This reading uses such a model that incorporates four factors for assessing risk exposures in both normal periods and market stress/crisis periods: equity risk, credit risk, currency risk, and volatility risk.

## *Investment Asset Classes*

- Adding a 20% allocation of a hedge fund strategy group to a traditional 60%/40% portfolio (for a 48% stocks/32% bonds/20% hedge funds portfolio) typically decreases total portfolio standard deviation while it increases Sharpe and Sortino ratios (and also often decreases maximum drawdown) in the combined portfolios. This demonstrates that hedge funds act as both risk-adjusted return enhancers and diversifiers for the traditional stock/bond portfolio.



The full reading, worth 3 CE credits, can be found at <https://www.cfainstitute.org/membership/professional-development/refresher-readings/2020/hedge-fund-strategies>

# Asset Allocation to Alternative Investments

**Adam Kobor, PhD, CFA, and Mark D. Guinney, CFA**

*Adam Kobor, PhD, CFA, is at New York University (USA). Mark D. Guinney, CFA (USA).*

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## Learning Outcomes

The candidate should be able to:

- a. explain the roles that alternative investments play in multi-asset portfolios;
- b. compare alternative investments and bonds as risk mitigators in relation to a long equity position;
- c. compare traditional and risk-based approaches to defining the investment opportunity set, including alternative investments;
- d. discuss investment considerations that are important in allocating to different types of alternative investments;
- e. discuss suitability considerations in allocating to alternative investments;
- f. discuss approaches to asset allocation to alternative investments;
- g. discuss the importance of liquidity planning in allocating to alternative investments;

- h. discuss considerations in monitoring alternative investment programs.

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## Introduction

Asset allocation is a critical decision in the investment process. The mathematical and analytical processes inherent in contemporary asset allocation techniques are complicated by the idiosyncrasies of alternative investments. Approaches to incorporating alternative assets into the strategic asset allocation have developed rapidly as allocations to assets other than stocks and bonds have accelerated in the aftermath of the 2008 Global Financial Crisis. The term “alternative” understates the prominence of alternative investment allocations in many investment programs, because institutional and private clients have been increasingly turning to these investments not just to supplement traditional long-only stocks and bonds but also sometimes to replace them altogether. For example, the Yale Endowment and the Canada Pension Plan Investment Board both have close to 50% of their assets allocated to alternatives. Although these two funds are admittedly outliers, between 2008 and 2017 most of the pension funds around the world substantially expanded their allocations to alternative asset classes. On average, pension funds in developed markets increased their allocation from 7.2% to 11.8% of assets under management (AUM) in 2017, a 63% increase.<sup>2</sup>

“Alternative” investment has no universally accepted definition. For the purposes of this reading, alternative investments include private equity, hedge funds, real assets (including energy and commodity investments), commercial real estate, and private credit.

The reading begins with a discussion of the role alternative assets play in a multi-asset portfolio and explores how alternatives may serve to mitigate long-only equity risk, a role traditionally held by bonds. We then consider different ways investors may define the opportunity set—through the traditional asset class lens or, more recently, using a risk- or factor-based lens. An allocation to alternatives is not for all investors, so the reading describes issues that should be addressed when considering an allocation to alternatives. We then discuss approaches to asset allocation when incorporating alternatives in the opportunity set and the need for liquidity planning in private investment alternatives. Finally, the reading discusses the unique monitoring requirements for an alternatives portfolio.

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## Summary

- Allocations to alternatives are believed to increase a portfolio's risk-adjusted return. An investment in alternatives typically fulfills one or more of four roles in an investor's portfolio: capital growth, income generation, risk diversification, and/or safety.
- Private equity investments are generally viewed as return enhancers in a portfolio of traditional assets.
- Long/short equity strategies are generally believed to deliver equity-like returns with less than full exposure to the equity premium. Short-biased equity strategies are expected to lower a portfolio's overall equity beta while producing some measure of alpha. Arbitrage and event-driven strategies are expected to provide equity-like returns with little to no correlation with traditional asset classes.

### *Investment Asset Classes*

- Real assets (e.g., commodities, farmland, timber, energy, and infrastructure assets) are generally perceived to provide a hedge against inflation.
- Timber investments provide both growth and inflation-hedging properties.
- Commodities (e.g., metals, energy, livestock, and agricultural commodities) serve as a hedge against inflation and provide a differentiated source of alpha. Certain commodity investments serve as safe havens in times of crisis.
- Farmland investing may have a commodity-like profile or a commercial real-estate-like profile.
- Energy investments are generally considered a real asset as the investor owns the mineral rights to commodities that are correlated with inflation factors.
- Infrastructure investments tend to generate stable/modestly growing income and to have high correlation with overall inflation.
- Real estate strategies range from core to opportunistic and are believed to provide protection against unanticipated increases in inflation. Core real estate strategies are more income-oriented, while opportunistic strategies rely more heavily on capital appreciation.
- Bonds have been a more effective volatility mitigator than alternatives over shorter time horizons.
- The traditional approaches to defining asset classes are easy to communicate and implement. However, they tend to over-estimate portfolio diversification and obscure primary drivers of risk.

- Typical risk factors applied to alternative investments include equity, size, value, liquidity, duration, inflation, credit spread, and currency. A benefit of the risk factor approach is that every asset class can be described using the same framework.
- Risk factor-based approaches have certain limitations. A framework with too many factors is difficult to administer and interpret, but too small a set of risk factors may not accurately describe the characteristics of alternative asset classes. Risk factor sensitivities are highly sensitive to the historical look-back period.
- Investors with less than a 15-year investment horizon should generally avoid investments in private real estate, private real asset, and private equity funds.
- Investors must consider whether they have the necessary skills, expertise, and resources to build an alternative investment program internally. Investors without a strong governance program are less likely to develop a successful alternative investment program.
- Reporting for alternative funds is often less transparent than investors are accustomed to seeing on their stock and bond portfolios. For many illiquid strategies, reporting is often received well past typical monthly or quarter-end deadlines. Full, position-level transparency is rare in many alternative strategies.
- Three primary approaches are used to determine the desired allocation to the alternative asset classes:
  - Monte Carlo simulation may be used to generate return scenarios that relax the assumption of normally distributed returns.

## *Investment Asset Classes*

- Optimization techniques, which incorporate downside risk or take into account skew, may be used to enhance the asset allocation process.
- Risk factor-based approaches to alternative asset allocation can be applied to develop more robust asset allocation proposals.
- Two key analytical challenges in modelling allocations to alternatives include stale and/or artificially smoothed returns and return distributions that exhibit significant skewness and fat tails (or excess kurtosis).
- Artificially smoothed returns can be detected by testing the return stream for serial correlation. The analyst needs to unsmooth the returns to get a more accurate representation of the risk and return characteristics of the asset class.
- Skewness and kurtosis can be dealt with by using empirically observed asset returns because they incorporate the actual distribution. Advanced mathematical or statistical models can also be used to capture the true behavior of alternative asset classes.
- Applications of Monte Carlo simulation in allocating to alternative investments include:
  1. simulating skewed and fat-tailed financial variables by estimating the behavior of factors and/or assets in low-volatility regimes and high-volatility regimes, then generating scenarios using the different means and covariances estimated under the different regimes; and
  2. simulating portfolio outcomes (+/- 1 standard deviation) to estimate the likelihood of falling short of the investment objectives.



- Unconstrained mean–variance optimization (MVO) often leads to portfolios dominated by cash and fixed income at the low-risk end of the spectrum and by private equity at the high-risk end of the spectrum. Some investors impose minimum and maximum constraints on asset classes. Slight changes in the input variables could lead to substantial changes in the asset allocations.
- Mean–CVaR optimization may be used to identify allocations that minimize downside risk rather than simply volatility.
- Investors may choose to optimize allocations to risk factors rather than asset classes. These allocations, however, must be implemented using asset classes. Portfolios with similar risk factor exposures can have vastly different asset allocations.
- Some caveats with respect to risk factor-based allocations are that investors may hold different definitions for a given risk factor, correlations among risk factors may shift under changing market conditions, and some factor sensitivities are very unstable.
- Cash flow and commitment-pacing models enable investors in private alternatives to better manage their portfolio liquidity and set realistic annual commitment targets to reach the desired asset allocation.
- An alternative investment program should be monitored relative to the goals established for the alternative investment program, not simply relative to a benchmark. The investor must monitor developments in the relevant markets to ensure that the fundamental thesis underlying the decision to invest remains intact.
- Two common benchmarking approaches to benchmarking alternative investments—custom index proxies and peer group comparisons—have significant limitations.

### *Investment Asset Classes*

- IRRs are sensitive to the timing of cash flows into and out of the fund: Two managers may have similar portfolios but different return profiles depending on their capital call and distribution schedule.
- Pricing issues can distort reported returns and the associated risk metrics, such as betas, correlations, and Sharpe ratios.
- Monitoring of the firm and the investment process are particularly important in alternative investment structures where the manager cannot be terminated easily. Key elements to monitor include key person risk, alignment of interests, style drift, risk management, client/asset turnover, client profile, and service providers.



The full reading, worth 3 CE credits, can be found at <https://www.cfainstitute.org/membership/professional-development/refresher-readings/2020/asset-allocation-alternative-investments>

# Ethics, Rules, and Standards

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## Applicable Readings

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### **Ethics and Trust in the Investment Profession (Level I)**

by Bidhan L. Parmar, PhD, Dorothy C. Kelly, CFA, and David B. Stevens, CIMC, CFA

1 CE and 1 SER credit

Access to full reading: <https://www.cfainstitute.org/membership/professional-development/refresher-readings/2020/ethics-trust-investment-profession>

### **Application of the Code and Standards (Level II)**

1 CE and 1 SER credit

Access to full reading: <https://www.cfainstitute.org/membership/professional-development/refresher-readings/2020/application-code-standards-l2>

### **Economics of Regulation (Level II)**

by Chester S. Spatt, PhD

1 CE credit

Access to full reading: <https://www.cfainstitute.org/membership/professional-development/refresher-readings/2020/economics-regulation>

### **Application of the Code and Standards (Level III)**

2 CE and 2 SER credits

Access to full reading: <https://www.cfainstitute.org/membership/professional-development/refresher-readings/2020/application-code-standards-l3>

*Ethics, Rules, and Standards*

**Professionalism in the Investment Industry (Level III)**

by Bidhan L. Parmar, PhD, Dorothy C. Kelly, CFA, Colin McLean, MBA, FIA, FSIP, Nitin M. Mehta, CFA, and David B. Stevens, CIMC, CFA  
0.5 CE and 0.5 SER credit

Access to full reading: <https://www.cfainstitute.org/membership/professional-development/refresher-readings/2020/professionalism-investment-industry>

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# What Changed in the 2020 Curriculum?

The investment industry requires trust to function. However, trust is a nebulous subject, and the underlying issues are constantly shifting, which is why the readings devoted to maintaining or restoring trust have been reworked. Revised readings provide updates on current issues affecting the investment industry and showcase practical steps for addressing them.

An updated ethics reading introduces a framework for ethical decision making and for understanding the conflicts that challenge ethical conduct. The aim is to help minimize the likelihood of unethical actions that could result in CFA Institute Code and Standards violations, regulatory breaches, and even criminal prosecution.

What professionalism means in practice in an investment management context and the link between professionalism and trust are discussed in an updated professionalism reading. The expectations for investment professionals are fully explored and clearly set out to help guide behavior, particularly in ambiguous situations.

Standards also play their part in embedding trust. Practitioners are regularly faced with ethical and professional dilemmas that conflict with existing standards, so a range of new cases will help practitioners think through rational courses of action when challenges arise. The case studies clearly indicate how and when the CFA Institute Code and Standards apply.

No discussion of trust is complete without rules or, more precisely, regulation. The costs and effects of regulation receive less attention than the costs of investment management and operations

to investment returns, but they are most definitely material and should not be underestimated.

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## Why Does It Matter to Members?

Throughout their careers, investment practitioners are faced with ethically and morally ambiguous situations that lack clear rules on how to act. It will never be possible to anticipate all the potential circumstances and situations and reduce ethical risk to zero. Nevertheless, practitioners have an obligation to act as ethically as possible.

The new readings help practitioners identify potential ethical issues and think through possible solutions, even in the absence of clearly defined rules. Only by taking this responsibility as seriously as investment analysis, marketing, or processing can individuals play their part in curtailing unethical behavior and promoting trust in the investment industry. The readings also foster understanding of when and why violations of the CFA Institute Code and Standards occur, helping practitioners identify and avoid violations that can damage clients' interests, the firm, and the careers of practitioners.

The regulation reading, meanwhile, brings the reader up to date with structural industry shifts, picking through complicated new rules, such as the European Union's revised Markets in Financial Instruments Directive (MiFID II) and the General Data Protection Regulation (GDPR). Many firms have regulation specialists to inform investment professionals and support functions about changes in rules. But not all do, and it is incumbent on practitioners to take the initiative to get up to speed with the issues rather than waiting to be informed and, potentially, running afoul of standards, rules, and laws.

# Ethics and Trust in the Investment Profession

**Bidhan L. Parmar, PhD, Dorothy C. Kelly, CFA, and David B. Stevens, CIMC, CFA**

*Bidhan L. Parmar, PhD, is at the University of Virginia (USA). Dorothy C. Kelly, CFA, is at McIntire School of Commerce, University of Virginia (USA). David B. Stevens, CIMC, CFA, is at Wells Fargo Private Bank (USA).*

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## Learning Outcomes

The candidate should be able to:

- a. explain ethics;
- b. describe the role of a code of ethics in defining a profession;
- c. describe professions and how they establish trust;
- d. describe the need for high ethical standards in investment management;
- e. explain professionalism in investment management;
- f. identify challenges to ethical behavior;
- g. distinguish between ethical and legal standards;
- h. describe a framework for ethical decision making.

## Introduction

As a candidate in the CFA Program, you are both expected and required to meet high ethical standards. This reading introduces ideas and concepts that will help you understand the importance of ethical behavior in the investment industry. You will be introduced to various types of ethical issues within the investment profession and learn about the CFA Institute Code of Ethics.

The readings covering ethics and professional standards demonstrate that ethical behavior is central to creating trust. Professional behavior is equally important. Professions help maintain trust in an industry by establishing codes and setting standards that put a framework around ethical behavior and technical competence. Professions also set the wider goal of gaining and maintaining the trust of society as a whole. In this regard, professions have a sense of purpose that society values.

Imagine that you are employed in the research department of a large financial services firm. You and your colleagues spend your days researching, analyzing, and valuing the shares of publicly traded companies and sharing your investment recommendations with clients. You love your work and take great satisfaction in knowing that your recommendations can help the firm's investing clients make informed investment decisions that will help them meet their financial goals and improve their lives.

Several months after starting at the firm, you learn that an analyst at the firm has been terminated for writing and publishing research reports that misrepresented the fundamental risks of some companies to investors. You learn that the analyst wrote the reports with the goal of pleasing the management of the companies that were the subjects of the research reports. He hoped that these companies would hire your firm's investment banking division for its services and he would



be rewarded with large bonuses for helping the firm increase its investment banking fees. Some clients bought shares based on the analyst's reports and suffered losses. They posted stories on the internet about their losses and the misleading nature of the reports. When the media investigated and published the story, the firm's reputation for investment research suffered. Investors began to question the firm's motives and the objectivity of its research recommendations. The firm's investment clients started to look elsewhere for investment advice, and company clients begin to transfer their business to firms with untarnished reputations. With business declining, management is forced to trim staff. Along with many other hard-working colleagues, you lose your job—through no fault of your own.

Imagine how you would feel in this situation. Most people would feel upset and resentful that their hard and honest work was derailed by someone else's unethical behavior. Yet, this type of scenario is not uncommon. Around the world, unsuspecting employees at such companies as SAC Capital, Stanford Financial Group, Everbright Securities, Enron, Satyam Computer Services, Arthur Andersen, and other large companies have experienced such career setbacks when someone else's actions destroyed trust in their companies and industries.

Businesses and financial markets thrive on trust—defined as a strong belief in the reliability of a person or institution. In a 2016 study on trust, investors indicated that to earn their trust, the top two attributes of an investment manager should be that it (1) has transparent and open business practices, and (2) has ethical business practices. Although these attributes are valued by customers and clients in any industry, this reading will explore why they are of particular importance to the investment industry.

People may think that ethical behavior is simply about following laws, regulations, and other rules, but throughout our lives and careers we will encounter situations in which there is no definitive rule that specifies how to act, or the rules that exist may be unclear

or even in conflict with each other. Responsible people, including investment professionals, must be willing and able to identify potential ethical issues and create solutions to them even in the absence of clearly stated rules.

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## Summary

- Ethics refers to the study of making good choices. Ethics encompasses a set of moral principles and rules of conduct that provide guidance for our behavior.
- Situational influences are external factors that may shape our behavior.
- Challenges to ethical behavior include being overconfident in our own morality, underestimating the effect of situational influences, and focusing on the immediate rather than long-term outcomes or consequences of a decision.
- In any given profession, the code of ethics publicly communicates the established principles and expected behavior of its members.
- Members of a profession use specialized knowledge and skills to serve others; they share and agree to adhere to a common code of ethics to serve others and advance the profession.
- A code of ethics helps foster public confidence that members of the profession will use their specialized skills and knowledge to serve their clients and others.

- A profession is an occupational group that has specific education, expert knowledge, and a framework of practice and behavior that underpins community trust, respect, and recognition.
- The requirement to uphold high ethical standards is one clear difference between professions and craft guilds or trade bodies.
- A primary goal of professions is to establish trust among clients and among society in general.
- Common characteristics of professions include normalization of practitioner behavior, service to society, client focus, high entry standards, a body of expert knowledge, encouragement and facilitation of continuing education, monitoring of professional conduct, collegiality, recognized overseeing bodies, and encouragement of member engagement.
- The investment management profession has become increasingly global, driven by the opening of capital markets, coordination of regulation across borders, and the emergence of technology.
- Investment management professionals are trusted to draw on a body of formal knowledge and apply that knowledge with care and judgement. In comparison to clients, investment professionals are also expected to have superior financial expertise, technical knowledge, and knowledge of the applicable laws and regulations.
- As a professional body, CFA Institute gathers knowledge from practicing investment professionals, conducts rigorous examinations, and ensures practitioner involvement in developing its codes and values.
- Investment management professionals are likely to encounter dilemmas, including those with ethical implications. Professionals

## *Ethics, Rules, and Standards*

should consider carefully how to determine the facts of the issue and assess the implications.

- High ethical standards always matter and are of particular importance in the investment management profession, which is based almost entirely on trust. Clients trust investment professionals to use their specialized skills and knowledge to serve clients and protect client assets. All stakeholders gain long-term benefits when investment professionals adhere to high ethical standards.
- Legal standards are often rule based. Ethical conduct goes beyond legal standards, balancing self-interest with the direct and indirect consequences of behavior on others.
- A framework for ethical decision making can help people look at and evaluate a decision from different perspectives, enabling them to identify important issues, make wise decisions, and limit unintended consequences.



The full reading, worth 1 CE and 1 SER credit, can be found at <https://www.cfainstitute.org/membership/professional-development/refresher-readings/2020/ethics-trust-investment-profession>

# Application of the Code and Standards: Level II

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## Learning Outcomes

The candidate should be able to:

- a. evaluate practices, policies, and conduct relative to the CFA Institute Code of Ethics and Standards of Professional Conduct;
- b. explain how the practices, policies, and conduct do or do not violate the CFA Institute Code of Ethics and Standards of Professional Conduct.

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## Introduction

This reading presents cases to illustrate how the CFA Institute Code of Ethics and Standards of Professional Conduct (Code and Standards) can be applied in situations requiring professional and ethical judgment. **Exhibit 1** presents a useful framework to help guide individuals in their ethical decision-making process and application of the Code and Standards. By identifying where the Code and Standards might be relevant and considering actions and consequences within this framework, individuals can make more ethically sound decisions.

Although the framework's components do not need to be addressed in the sequence shown, a review of the outcome should

conclude the process. This review provides insights for improved decision making in the future.

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### **Exhibit 1. A Framework for Ethical Decision Making**

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- Identify: Relevant facts, stakeholders and duties owed, ethical principles, conflicts of interest
  - Consider: Situational influences, additional guidance, alternative actions
  - Decide and act
  - Reflect: Was the outcome as anticipated? Why or why not?
- 

This reading presents a number of scenarios involving individuals in private and institutional asset management. The first three cases focus on identifying whether violations of the Code and Standards occurred, with discussion and rationale as to why or why not a violation may have taken place. The last two cases focus on identifying violations of the Code and Standards, taking necessary corrective actions, and developing a policy statement to help prevent future violations by a firm's employees. As you read through these cases, consider how applying the framework might have helped each individual in his or her decision making.



The full reading, worth 1 CE and 1 SER credit, can be found at <https://www.cfainstitute.org/membership/professional-development/refresher-readings/2020/application-code-standards-12>

# Economics of Regulation

**Chester S. Spatt, PhD**

*Chester S. Spatt, PhD, is at Tepper School of Business at Carnegie Mellon University (USA).*

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## Learning Outcomes

The candidate should be able to:

- a. describe the economic rationale for regulatory intervention;
- b. explain the purposes of regulating commerce and financial markets;
- c. describe anticompetitive behaviors targeted by antitrust laws globally and evaluate the antitrust risk associated with a given business strategy;
- d. describe classifications of regulations and regulators;
- e. describe uses of self-regulation in financial markets;
- f. describe regulatory interdependencies and their effects;
- g. describe tools of regulatory intervention in markets;
- h. describe benefits and costs of regulation;
- i. describe the considerations when evaluating the effects of regulation on an industry.

## Introduction

Regulation can be described as a form of government intervention in markets that involves rules and their enforcement. It is an important topic because regulation not only has potential effects at the macro level on the economy but also has potential effects at the micro level on companies and individuals. Regulation may develop either proactively in anticipation of consequences of changes in the market environment or reactively in response to some occurrence(s). For example, changes that resulted from technological advances in the markets because of new means of communication and applications of computers have led to a variety of regulation, both proactive and reactive. Regulation has also developed in response to financial crises and undesirable behaviors or actions that have occurred in the past. Regulations are necessary because in some situations market solutions are not adequate. In other words, regulations exist to protect end users from market failings.

A significant challenge for financial regulators is how to deal with systemic risk (the risk of failure of the financial system) and the consequences of risk taking by financial institutions. Issues such as labor regulation, environmental regulation, and electronic privacy are also receiving increased attention.

How regulations are developed and applied can have significant impacts on businesses. Changes in regulatory framework and regulatory uncertainty can also have substantial effects on business decisions. So, one of the significant challenges facing professionals in the finance industry is to anticipate and understand the consequences of potential changes in the regulatory environment and of specific regulations.

Section 2 of this reading describes the economic rationale of regulation, including how regulation improves fairness in markets



and addresses the danger to society of financial system failure. Section 3 provides an overview of regulators, the tools at their disposal, and how the work of regulators around the globe is interdependent. Section 4 describes the assessment of costs and benefits of regulation and highlights practical issues that arise from the implementation of regulation. A summary and practice problems conclude the reading.

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## Summary

Knowledge of regulation is important because regulation has potentially far-reaching and significant effects. These effects can range from macro-level effects on the economy to micro-level effects on individual entities and securities.

Regulation originates from a variety of sources and in a variety of areas. A framework that includes types of regulators and regulation as well as areas of regulation that may affect the entity of interest (including the economy as an entity) is useful. The framework will help in assessing possible effects of new regulation. It can also help in assessing the effects of regulation on various entities.

More than one regulator may develop regulations in response to a particular issue. Each of the relevant regulators may have different objectives and choose to address the issue using different regulatory tools.

In developing regulations, the regulator should consider costs and benefits. In the analysis, the net regulatory burden (private costs less private benefits of regulation) may also be relevant. Potential costs and benefits, regardless of the perspective, may be difficult to assess. A critical aspect of regulatory analysis, however, is assessing the costs and benefits of regulation.

The following are some key points of the reading.

- The existence of informational frictions and externalities creates a need for regulation. Regulation is expected to have societal benefits and should be assessed using cost–benefit analysis.
- The regulation of securities markets and financial institutions is extensive and complex because of the consequences of failures in the financial system. These consequences include financial losses, loss of confidence, and disruption of commerce.
- The focus of regulators in financial markets includes prudential supervision, financial stability, market integrity, and economic growth.
- Regulatory competition is competition among different regulatory bodies to use regulation in order to attract certain entities.
- The breadth of regulation of commerce necessitates the use of a framework that identifies potential areas of regulation. This framework can be referenced to identify specific areas of regulation, both existing and anticipated, that may affect the entity of interest.
- Legislative bodies, regulatory bodies, and courts typically enact regulation.
- Regulatory bodies include government agencies and independent regulators granted authority by a government or governmental agency. Some independent regulators are self-regulating organizations.
- Typically, legislative bodies enact broad laws or statutes. Regulatory bodies issue administrative regulations, often implementing statutes. Courts interpret statutes and administrative regulations; these interpretations may result in judicial law.

- Interdependence in the actions and potentially conflicting objectives of regulators is an important consideration for regulators, regulated entities, and those assessing the effects of regulation.
- Regulation that arises to enhance the interests of regulated entities reflects regulatory capture.
- Regulators have responsibility for both substantive and procedural laws. The former focuses on rights and responsibilities of entities and relationships among entities. The latter focuses on the protection and enforcement of the former.
- Regulatory arbitrage is the use of regulation by an entity to exploit differences in economic substance and regulatory interpretation or in regulatory regimes to the entity's benefit.
- There are many regulatory tools available to regulators, including regulatory mandates and restrictions on behaviors, provision of public goods, and public financing of private projects.
- The choice of regulatory tool should be consistent with maintaining a stable regulatory environment. "Stable" does not mean unchanging but, rather, refers to desirable attributes of regulation, including predictability, effectiveness in achieving objectives, time consistency, and enforceability.
- In assessing regulation and regulatory outcomes, regulators should conduct ongoing cost-benefit analyses, develop techniques to enhance the measurement of these outcomes, and use economic principles to guide them.
- Net regulatory burden to the entity of interest is an important consideration for analysts.

*Ethics, Rules, and Standards*



The full reading, worth 1 CE credit, can be found at <https://www.cfainstitute.org/membership/professional-development/refresher-readings/2020/economics-regulation>

# Application of the Code and Standards: Level III

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## Learning Outcomes

The candidate should be able to:

- a. evaluate practices, policies, and conduct relative to the CFA Institute Code of Ethics and Standards of Professional Conduct;
- b. explain how the practices, policies, or conduct does or does not violate the CFA Institute Code of Ethics and Standards of Professional Conduct.

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## Introduction

The purpose of this reading is to provide examples of how the CFA Institute Code of Ethics and Standards of Professional Conduct (Code and Standards) can be applied in situations requiring professional and ethical judgment. **Exhibit 1** presents a useful framework to help navigate the ethical decision-making process and apply the Code and Standards. The framework's components do not need to be addressed in the sequence shown, but a review of the outcome should conclude the process. This review provides insights for improved decision making in the future.

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### Exhibit 1. A Framework for Ethical Decision Making

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- Identify: Relevant facts, stakeholders and duties owed, ethical principles, conflicts of interest
  - Consider: Situational influences, additional guidance, alternative actions
  - Decide and act
  - Reflect: Was the outcome as anticipated? Why or why not?
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These cases involve individuals in private wealth and institutional asset management settings and discussion as to whether actions, taken or not taken, are in violation of the Code and Standards. As you work through these cases, think about how applying the ethical decision-making framework might have changed the decisions and actions of those in the scenarios. Referencing the Code and Standards will help in identifying applicable ethical principles upon which sound decisions and appropriate behavior can be based. The reading concludes with practice problems in item-set format.



The full reading, worth 2 CE and 2 SER credits, can be found at <https://www.cfainstitute.org/membership/professional-development/refresher-readings/2020/application-code-standards-13>

# Professionalism in the Investment Industry

**Bidhan L. Parmar, PhD, Dorothy C. Kelly, CFA, Colin McLean, MBA, FIA, FSIP, Nitin M. Mehta, CFA, and David B. Stevens, CIMC, CFA**

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## Learning Outcomes

The candidate should be able to:

- a. describe how professions establish trust;
- b. explain professionalism in investment management;
- c. describe expectations of investment professionals;
- d. describe a framework for ethical decision-making.

## Introduction

The readings covering ethics and professional standards demonstrate that ethical behavior is central to creating trust. Professional behavior is equally important. Professions help maintain trust by establishing codes and setting standards that establish a framework for ethical behavior and technical competence. Professions also set wider goals of gaining and maintaining the trust of society as a whole. In this regard, professions have a sense of purpose that society values.

This reading explains attributes of professions and establishes what is expected of an investment professional. Professions are growing in size and number, partly as a result of government and regulator encouragement and requirement, but also owing to demand from clients. Practitioners in some new areas of expertise are also choosing to serve clients within the framework of a profession to protect standards and gain public trust. The concept of professionalism is based on cultural norms, and interpretation of these norms varies by region and country. Such variation is a challenge to defining professionalism globally, but some universal aspects are common to most professions.

Section 2 of this reading describes professions in general and how they establish trust. Section 3 describes professionalism in investment management. Section 4 addresses expectations of investment professionals, and Section 5 provides a high-level review of the framework for ethical decision-making. The reading concludes with Section 6, a summary of challenges for investment professionals. A listing of key points in Section 7 concludes the reading.



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## Summary

- A profession is an occupational group that has specific education, expert knowledge, and a framework of practice and behavior that underpins community trust, respect, and recognition.
- The requirement to uphold high ethical standards is one clear difference between professions and craft guilds or trade bodies.
- A primary goal of professions is to establish trust among clients and among society in general.
- Common characteristics of professions include normalization of practitioner behavior, service to society, client focus, high entry standards, a body of expert knowledge, encouragement and facilitation of continuing education, monitoring of professional conduct, collegiality, recognized overseeing bodies, and encouragement of member engagement.
- The investment profession has become increasingly global, driven by the opening of capital markets, coordination of regulation across borders, and the emergence of technology.
- Investment professionals are trusted to draw on a body of formal knowledge and apply that knowledge with care and judgment. In comparison to clients, investment professionals are also expected to have superior financial expertise, technical knowledge, and knowledge of the applicable laws and regulations.
- As a professional body, CFA Institute gathers knowledge from practicing investment professionals, develops high quality curricula, conducts rigorous examinations, contributes to new research in finance, and ensures practitioner involvement in developing its codes and values.

### *Ethics, Rules, and Standards*

- Legal standards are often rule based. Ethical conduct goes beyond legal standards, balancing self-interest with the direct and indirect consequences of behavior on others.
- Investment professionals are likely to encounter dilemmas, including those with ethical implications. Professionals should consider carefully how to determine the facts of the issue and assess the implications.
- A framework for ethical decision making can help people look at and evaluate a decision from different perspectives, enabling them to identify important issues, make wise decisions, and limit unintended consequences.
- Regulation has helped raise professional standards by making them a requirement for practice, although sometimes at the expense of autonomy and flexibility.
- Perhaps the greatest challenge for the investment management profession comes from technology. Rapid advances in computing power, data storage, and internet connectivity are changing the definition of professional expertise and how it is applied to serve investors.



The full reading, worth 0.5 CE and 0.5 SER credit, can be found at <https://www.cfainstitute.org/membership/professional-development/refresher-readings/2020/professionalism-investment-industry>

# Portfolio Management

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## Applicable Readings

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### **Trading Costs and Electronic Markets (Level II)**

by Larry Harris, PhD, CFA

1 CE credit

Access to full reading: <https://www.cfainstitute.org/membership/professional-development/refresher-readings/2020/trading-costs-electronic-markets>

### **Capital Markets Expectations, Part 1: Framework and Macro Considerations (Level III)**

by Christopher D. Piros, PhD, CFA

1.5 CE credits

Access to full reading: <https://www.cfainstitute.org/membership/professional-development/refresher-readings/2020/capital-market-expectations-framework-macro>

### **Capital Markets Expectations, Part 2: Forecasting Asset Class Returns (Level III)**

by Christopher D. Piros, PhD, CFA

2 CE credits

Access to full reading: <https://www.cfainstitute.org/membership/professional-development/refresher-readings/2020/capital-markets-expectations-asset-class-returns>

### **Trade Strategy and Execution (Level III)**

by Bernd Hanke, PhD, CFA, Robert Kissell, PhD, Connie Li, and Roberto Malamut

2 CE credits

Access to full reading: <https://www.cfainstitute.org/membership/professional-development/refresher-readings/2020/trade-strategy-execution>

**Portfolio Performance Evaluation (Level III)**

by Marc A. Wright, CFA

2.5 CE credits

Access to full reading: <https://www.cfainstitute.org/membership/professional-development/refresher-readings/2020/portfolio-performance-evaluation>

**Investment Manager Selection (Level III)**

by Jeffrey C. Heisler, PhD, CFA, and Donald W. Lindsey, CFA

1.5 CE credits

Access to full reading: <https://www.cfainstitute.org/membership/professional-development/refresher-readings/2020/investment-manager-selection>

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# What Changed in the 2020 Curriculum?

Portfolio management is part science, part art. It is never static, evolving in tandem with new research, with markets, and with technology.

Investment manager selection deserves particular attention within the portfolio management process given the time and resources dedicated to manager selection. A new reading dedicated to manager selection focuses on how to determine which managers offer the best way to implement or express strategic allocation and risk decisions.

Portfolio performance evaluation is addressed in a revised reading that examines a variety of approaches, including return and risk attribution. The reading reviews long-standing tests of benchmark quality and various ratios used in performance appraisal, considering the benefits and limitations of each.

Capital markets expectations are a key part of the portfolio construction jigsaw. An updated reading explains how analysts develop expectations around economic developments and the potential biases and pitfalls in how they do it. The generalist practitioner is introduced to “nowcasting,” a methodology for tracking the business cycle, and the reading sheds light on a range of other technological breakthroughs that are disrupting traditional industry analysis.

An accompanying reading focuses on how to forecast returns from fixed-income, equity, and real estate assets. The reading covers risks faced by investors in emerging and frontier markets and also highlights the challenges of forecasting exchange rate movements. It introduces the concept of forecasting volatility.

Trading can be overlooked as a portfolio enhancer. But trade strategy and implementation can add as much value as analyst research, depending on the type of fund. A new reading explains why and how portfolio managers trade equities, fixed income, derivatives, and foreign exchange. Trade cost measurement, critical to assessing and enhancing the value added by the trading function, is described in detail using real-world examples.

A second new reading focuses solely on trading costs. It highlights the possibility of lowering costs through electronic trading and illustrates potential pathways for navigating the trading venue fragmentation that digitalization brings.

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## Why Does It Matter to Members?

Portfolio construction plays a central role in the performance of a strategy. Matching the skill sets of outside investment managers to the desired outcome is essential to a successful strategy. Identifying manager skill, however, is not easy, and there is no single method for achieving it, so a framework for selection is helpful in identifying and evaluating managers. Quantitative and qualitative techniques are detailed to help guide the practitioner.

Setting expectations for returns, volatility, and relationships between assets or asset classes is also important in meeting investment aims. The capital market expectation readings should be helpful to generalists by providing them with the relevant economic “language” to engage meaningfully with strategists.

Knowledge of trading techniques and strategy is increasingly useful because the use of algorithmic trading, machine learning, and smart order routing for trade implementation is growing and maturing. Gaining a sense of the differences in trade implementation for

*What Changed in the 2020 Curriculum?*

each asset class is helpful for understanding the dynamics of the relevant market and also offers insights into good trade governance.

Because electronic trading now dominates trading in many asset classes, practitioners will want to understand who trades electronically, where they trade, and some of the common tactics used by traders. The reading encourages practitioners to take account of the risks of electronic trading and outlines how regulators are attempting to control these risks and stem the abusive trading practices that can occur in electronic markets.

# Trading Costs and Electronic Markets

**Larry Harris, PhD, CFA**

*Larry Harris, PhD, CFA, is at the USC Marshall School of Business (USA).*

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## Learning Outcomes

The candidate should be able to:

- a. explain the components of execution costs, including explicit and implicit costs;
- b. calculate and interpret effective spreads and VWAP transaction cost estimates;
- c. describe the implementation shortfall approach to transaction cost measurement;
- d. describe factors driving the development of electronic trading systems;
- e. describe market fragmentation;
- f. distinguish among types of electronic traders;
- g. describe characteristics and uses of electronic trading systems;
- h. describe comparative advantages of low-latency traders;



- i. describe the risks associated with electronic trading and how regulators mitigate them;
- j. describe abusive trading practices that real-time surveillance of markets may detect.

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## Introduction

Securities research, portfolio management, and securities trading support the investment process. Of the three, trading is often the least understood and least appreciated function. Among the questions addressed in this reading are the following:

- What are explicit and implicit trading costs, and how are they measured?
- How is a limit order book interpreted?
- How have trading strategies adapted to market fragmentation?
- What types of electronic traders can be distinguished?

This reading is organized as follows: Section 2 discusses the direct and indirect costs of trading. Section 3 discusses developments in electronic trading and the effects they had on transaction costs and market fragmentation. Section 4 identifies the most important types of electronic traders. Section 5 describes electronic trading facilities and some important ways traders use them. Section 6 discusses risks posed by electronic trading and how regulators control them. Finally, Section 7 summarizes the reading.

## Summary

This reading explains the implicit and explicit costs of trading as well as widely used methods for estimating transaction costs. The reading also describes developments in electronic trading, the main types of electronic traders, their needs for speed, and ways in which they trade. Electronic trading benefits investors through lower transaction costs and greater efficiencies but also introduces systemic risks and the need to closely monitor markets for abusive trading practices. Appropriate market governance and regulatory policies will help reduce the likelihood of events such as the 2010 Flash Crash. The reading's main points include:

- Dealers provide liquidity to buyers and sellers when they take the other side of a trade if no other willing traders are present.
- The bid–ask spread is the difference between the bid and the ask prices. The effective spread is two times the difference between the trade price and the midquote price before the trade occurred. The effective spread is a poor estimate of actual transaction costs when large orders have been filled in many parts over time or when small orders receive price improvement.
- Transaction costs include explicit costs and implicit costs. Explicit costs are the direct costs of trading. They include broker commissions, transaction taxes, stamp duties, and exchange fees. Implicit costs include indirect costs, such as the impact of the trade on the price received. The bid–ask spread, market impact, delay, and unfilled trades all contribute to implicit trading costs.
- The implementation shortfall method measures the total cost of implementing an investment decision by capturing all explicit

and implicit trading costs. It includes the market impact costs, delay costs, as well as opportunity costs.

- The VWAP method of estimating transaction costs compares average fill prices to average market prices during a period surrounding the trade. It tends to produce lower transaction cost estimates than does implementation shortfall because it often does not measure the market impact of an order well.
- Markets have become increasingly fragmented as venues trading the same instruments have proliferated. Trading in any given instrument now occurs in multiple venues.
- The advantages of electronic trading systems include cost and operational efficiencies, lack of human bias, extraordinarily fast speed, and infinite span and scope of attention.
- Latency is the elapsed time between the occurrence of an event and a subsequent action that depends on that event. Traders use fast communication systems and fast computer systems to minimize latency to execute their strategies faster than others.
- Hidden orders, quote leapfrogging, flickering quotes, and the use of machine learning to support trading strategies commonly are found in electronic markets.
- Traders commonly use advanced order types, trading tactics, and algorithms in electronic markets.
- Electronic trading has benefited investors through greater trade process efficiencies and reduced transaction costs. At the same time, electronic trading has increased systemic risks.
- Examples of systemic risks posed by electronic traders include: runaway algorithms that produce streams of unintended orders caused by programming mistakes, fat finger errors that occur

when a manual trader submits a larger order than intended, over-large orders that demand more liquidity than the market can provide, and malevolent order streams created deliberately to disrupt the markets.

- Real-time surveillance of markets often can detect order front running and various market manipulation strategies.
- Market manipulators use such improper activities as trading for market impact, rumormongering, wash trading, and spoofing to further their schemes.
- Market manipulation strategies include bluffing, squeezing, cornering, and gunning.



The full reading, worth 1 CE credit, can be found at <https://www.cfainstitute.org/membership/professional-development/refresher-readings/2020/trading-costs-electronic-markets>

# Capital Market Expectations, Part 1: Framework and Macro Considerations

**Christopher D. Piros, PhD, CFA**  
*Christopher D. Piros, PhD, CFA (USA).*

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## Learning Outcomes

The candidate should be able to:

- a. discuss the role of, and a framework for, capital market expectations in the portfolio management process;
- b. discuss challenges in developing capital market forecasts;
- c. explain how exogenous shocks may affect economic growth trends;
- d. discuss the application of economic growth trend analysis to the formulation of capital market expectations;
- e. compare major approaches to economic forecasting;
- f. discuss how business cycles affect short- and long-term expectations;
- g. explain the relationship of inflation to the business cycle and the implications of inflation for cash, bonds, equity, and real estate returns;

- h. discuss the effects of monetary and fiscal policy on business cycles;
- i. interpret the shape of the yield curve as an economic predictor and discuss the relationship between the yield curve and fiscal and monetary policy;
- j. identify and interpret macroeconomic, interest rate, and exchange rate linkages between economies.

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## Introduction

A noted investment authority has written that the “fundamental law of investing is the uncertainty of the future.” Investors have no choice but to forecast elements of the future because nearly all investment decisions look toward it. Specifically, investment decisions incorporate the decision maker’s expectations concerning factors and events believed to affect investment values. The decision maker integrates these views into expectations about the risk and return prospects of individual assets and groups of assets.

This reading’s focus is capital market expectations (CME): expectations concerning the risk and return prospects of asset classes, however broadly or narrowly the investor defines those asset classes. Capital market expectations are an essential input to formulating a strategic asset allocation. For example, if an investor’s investment policy statement specifies and defines eight permissible asset classes, the investor will need to have formulated long-term expectations concerning each of those asset classes. The investor may also act on short-term expectations. Insights into capital markets gleaned during CME setting should also help in formulating the expectations

concerning individual assets that are needed in security selection and valuation.

This is the first of two readings on capital market expectations. A central theme of both readings is that a disciplined approach to setting expectations will be rewarded. With that in mind, Section 2 of this reading presents a general framework for developing capital market expectations and alerts the reader to the range of problems and pitfalls that await investors and analysts in this arena. Section 3 focuses on the use of macroeconomic analysis in setting expectations. The second of the two CME readings builds on this foundation to address setting expectations for specific asset classes: equities, fixed income, real estate, and currencies. Various analytical tools are reviewed as needed throughout both readings.

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## Summary

This is the first of two readings on how investment professionals should address the setting of capital market expectations. The reading began with a general framework for developing capital market expectations followed by a review of various challenges and pitfalls that analysts may encounter in the forecasting process. The remainder of the reading focused on the use of macroeconomic analysis in setting expectations. The following are the main points covered in the reading:

- Capital market expectations are essential inputs for strategic as well as tactical asset allocation.
- The ultimate objective is a set of projections with which to make informed investment decisions, specifically asset allocation decisions.

- Undue emphasis should not be placed on the accuracy of projections for individual asset classes. Internal consistency across asset classes (cross-sectional consistency) and over various time horizons (intertemporal consistency) are far more important objectives.
- The process of capital market expectations setting involves the following steps:
  1. Specify the set of expectations that are needed, including the time horizon(s) to which they apply.
  2. Research the historical record.
  3. Specify the method(s) and/or model(s) that will be used and their information requirements.
  4. Determine the best sources for information needs.
  5. Interpret the current investment environment using the selected data and methods, applying experience and judgment.
  6. Provide the set of expectations and document the conclusions.
  7. Monitor outcomes, compare to forecasts, and provide feedback.
- Among the challenges in setting capital market expectations are:
  - *limitations of economic data* including lack of timeliness as well as changing definitions and calculations;
  - *data measurement errors and biases* including transcription errors, survivorship bias, and appraisal (smoothed) data;
  - *limitations of historical estimates* including lack of precision, nonstationarity, asynchronous observations, and distributional considerations such as fat tails and skewness;



- *ex post risk as a biased risk measure* such as when historical returns reflect expectations of a low-probability catastrophe that did not occur or capture a low-probability event that did happen to occur;
  - *bias in methods* including data-mining and time-period biases;
  - *failure to account for conditioning information*;
  - *misinterpretation of correlations*;
  - *psychological biases* including anchoring, status quo, confirmation, overconfidence, prudence, and availability biases;
  - *model uncertainty*.
- Losing sight of the connection between investment outcomes and the economy is a fundamental, and potentially costly, mistake in setting capital market expectations.
  - Some growth trend changes are driven by slowly evolving and easily observable factors that are easy to forecast. Trend changes arising from exogenous shocks are impossible to forecast and difficult to identify, assess, and quantify until the change is well established.
  - Among the most important sources of shocks are policy changes, new products and technologies, geopolitics, natural disasters, natural resources/critical inputs, and financial crises.
  - An economy's aggregate trend growth rate reflects growth in labor inputs and growth in labor productivity. Extrapolating past trends in these components can provide a reasonable initial estimate of the future growth trend, which can be adjusted based on observable information. Less developed economies may require

more significant adjustments because they are likely to be undergoing more rapid structural changes.

- The average level of real (nominal) default-free bond yields is linked to the trend rate of real (nominal) growth. The trend rate of growth provides an important anchor for estimating bond returns over horizons long enough for this reversion to prevail over cyclical and short-term forces.
- The trend growth rate provides an anchor for long-run equity appreciation. In the very long run, the aggregate value of equity must grow at a rate very close to the rate of GDP growth.
- There are three main approaches to economic forecasting:
  - *Econometric models*: structural and reduced-form statistical models of key variables generate quantitative estimates, impose discipline on forecasts, may be robust enough to approximate reality, and can readily forecast the impact of exogenous variables or shocks. However, they tend to be complex, time-consuming to formulate, and potentially misspecified, and they rarely forecast turning points well.
  - *Indicators*: variables that lead, lag, or coincide with turns in the economy. This approach is the simplest, requiring only a limited number of published statistics. It can generate false signals, however, and is vulnerable to revisions that may overfit past data at the expense of the reliability of out-of-sample forecasts.
  - *Checklist(s)*: subjective integration of information deemed relevant by the analyst. This approach is the most flexible but also the most subjective. It readily adapts to a changing environment, but ongoing collection and assessment

of information make it time-consuming and also limit the depth and consistency of the analysis.

- The business cycle is the result of many intermediate frequency cycles that jointly generate most of the variation in aggregate economic activity. This explains why historical business cycles have varied in both duration and intensity and why it is difficult to project turning points in real time.
- The business cycle reflects decisions that (a) are made based on imperfect information and/or analysis with the expectation of future benefits, (b) require significant current resources and/or time to implement, and (c) are difficult and/or costly to reverse. Such decisions are, broadly defined, investment decisions.
- A typical business cycle has a number of phases. We split the cycle into five phases with the following capital market implications:
  - **Initial Recovery.** Short-term interest rates and bond yields are low. Bond yields are likely to bottom. Stock markets may rise strongly. Cyclical/riskier assets such as small stocks, high-yield bonds, and emerging market securities perform well.
  - **Early Expansion.** Short rates are moving up. Longer-maturity bond yields are stable or rising slightly. Stocks are trending up.
  - **Late Expansion.** Interest rates rise, and the yield curve flattens. Stock markets often rise but may be volatile. Cyclical assets may underperform while inflation hedges outperform.
  - **Slowdown.** Short-term interest rates are at or nearing a peak. Government bond yields peak and may then decline sharply. The yield curve may invert. Credit spreads widen, especially

for weaker credits. Stocks may fall. Interest-sensitive stocks and “quality” stocks with stable earnings perform best.

- **Contraction.** Interest rates and bond yields drop. The yield curve steepens. The stock market drops initially but usually starts to rise well before the recovery emerges. Credit spreads widen and remain elevated until clear signs of a cycle trough emerge.
- At least three factors complicate translation of business cycle information into capital market expectations and profitable investment decisions. First, the phases of the cycle vary in length and amplitude. Second, it is not always easy to distinguish between cyclical forces and secular forces acting on the economy and the markets. Third, how, when, and by how much the markets respond to the business cycle is as uncertain as the cycle itself—perhaps more so.
- Business cycle information is likely to be most reliable/valuable in setting capital market expectations over horizons within the range of likely expansion and contraction phases. Transitory developments cloud shorter-term forecasts, whereas significantly longer horizons likely cover portions of multiple cycle phases. Information about the current cyclical state of the economy has no predictive value over very long horizons.
- Monetary policy is often used as a mechanism for intervention in the business cycle. This mechanism is inherent in the mandates of most central banks to maintain price stability and/or growth consistent with potential.
- Monetary policy aims to be countercyclical, but the ability to fine-tune the economy is limited and policy measures may exacerbate rather than moderate the business cycle. This risk is

greatest at the top of the cycle when the central bank may overestimate the economy's momentum and/or underestimate the potency of restrictive policies.

- Fiscal policy—government spending and taxation—can be used to counteract cyclical fluctuations in the economy. Aside from extreme situations, however, fiscal policy typically addresses objectives other than regulating short-term growth. So-called automatic stabilizers do play an important role in mitigating cyclical fluctuations.
- The Taylor Rule is a useful tool for assessing a central bank's stance and for predicting how that stance is likely to evolve.
- The expectation that central banks could not implement negative policy rates proved to be unfounded in the aftermath of the 2007–2009 global financial crisis. Because major central banks combined negative policy rates with other extraordinary measures (notably quantitative easing), however, the effectiveness of the negative rate policy is unclear. The effectiveness of quantitative easing is also unclear.
- Negative interest rates, and the environment that gives rise to them, make the task of setting capital market expectations even more complex. Among the issues that arise are the following:
  - It is difficult to justify negative rates as a “risk-free rate” to which risk premiums can be added to establish long-term “equilibrium” asset class returns.
  - Historical data and quantitative models are even less likely to be reliable.
  - Market relationships (e.g., the yield curve) are likely to be distorted by other concurrent policy measures.

- The mix of monetary and fiscal policies has its most apparent effect on the average level of interest rates and inflation. Persistently loose (tight) fiscal policy increases (reduces) the average level of real interest rates. Persistently loose (tight) monetary policy increases (reduces) the average levels of actual and expected inflation. The impact on nominal rates is ambiguous if one policy is persistently tight and the other persistently loose.
- Changes in the slope of the yield curve are driven primarily by the evolution of short rate expectations, which are driven mainly by the business cycle and policies. The slope of the curve may also be affected by debt management.
- The slope of the yield curve is useful as a predictor of economic growth and as an indicator of where the economy is in the business cycle.
- Macroeconomic linkages between countries are expressed through their respective current and capital accounts.
- There are four primary mechanisms by which the current and capital accounts are kept in balance: changes in income (GDP), relative prices, interest rates and asset prices, and exchange rates.
- In the short run, interest rates, exchange rates, and financial asset prices must adjust to keep the capital account in balance with the more slowly evolving current account. The current account, in conjunction with real output and the relative prices of goods and services, tends to reflect secular trends and the pace of the business cycle.
- Interest rates and currency exchange rates are inextricably linked. This relationship is evident in the fact that a country cannot simultaneously allow unfettered capital flows, maintain a fixed exchange rate, and pursue an independent monetary policy.

- Two countries will share a default-free yield curve if (and only if) there is perfect capital mobility and the exchange rate is credibly fixed *forever*. It is the lack of credibly fixed exchange rates that allows (default-free) yield curves, and hence bond returns, to be less than perfectly correlated across markets.
- With floating exchange rates, the link between interest rates and exchange rates is primarily expectational. To equalize risk-adjusted expected returns across markets, interest rates must be higher (lower) in a currency that is expected to depreciate (appreciate). This dynamic can lead to the exchange rate “overshooting” in one direction to generate the expectation of movement in the opposite direction.
- An investor cares about the real return that he or she expects to earn *in his or her own currency*. In terms of a foreign asset, what matters is the *nominal* return and the change in the exchange rate.
- Although real interest rates around the world need not be equal, they are linked through the requirement that global savings must always equal global investment. Hence, they will tend to move together.



The full reading, worth 1.5 CE credits, can be found at <https://www.cfainstitute.org/membership/professional-development/refresher-readings/2020/capital-market-expectations-framework-macro>

# Capital Market Expectations, Part 2: Forecasting Asset Class Returns

**Christopher D. Piros, PhD, CFA**

*Christopher D. Piros, PhD, CFA (USA).*

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## Learning Outcomes

The candidate should be able to:

- a. discuss approaches to setting expectations for fixed-income returns;
- b. discuss risks faced by investors in emerging market fixed-income securities and the country risk analysis techniques used to evaluate emerging market economies;
- c. discuss approaches to setting expectations for equity investment market returns;
- d. discuss risks faced by investors in emerging market equity securities;
- e. explain how economic and competitive factors can affect expectations for real estate investment markets and sector returns;
- f. discuss major approaches to forecasting exchange rates;
- g. discuss methods of forecasting volatility;



- h. recommend and justify changes in the component weights of a global investment portfolio based on trends and expected changes in macroeconomic factors.

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## Introduction

This is the second of two readings focusing on capital market expectations. A central theme of both readings is that a disciplined approach to setting expectations will be rewarded. After outlining a framework for developing expectations and reviewing potential pitfalls, the first reading focused on the use of macroeconomic analysis in setting expectations. This reading builds on that foundation and examines setting expectations for specific asset classes—fixed income, equities, real estate, and currencies. Estimation of variance–covariance matrices is covered as well.

The reading begins with an overview of the techniques frequently used to develop capital market expectations. The discussion of specific asset classes begins with fixed income in Section 3, followed by equities, real estate, and currencies in Sections 4–6. Estimation of variance–covariance structures is addressed in Section 7. Section 8 illustrates the use of macroeconomic analysis to develop and justify adjustments to a global portfolio.

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## Summary

The following are the main points covered in the reading.

- The choice among forecasting techniques is effectively a choice of the information on which forecasts will be conditioned and how that information will be incorporated into the forecasts.
- The formal forecasting tools most commonly used in forecasting capital market returns fall into three broad categories: statistical methods, discounted cash flow models, and risk premium models.
- Sample statistics, especially the sample mean, are subject to substantial estimation error.
- Shrinkage estimation combines two estimates (or sets of estimates) into a more precise estimate.
- Time-series estimators, which explicitly incorporate dynamics, may summarize historical data well without providing insight into the underlying drivers of forecasts.
- Discounted cash flow models are used to estimate the required return implied by an asset's current price.
- The risk premium approach expresses expected return as the sum of the risk-free rate of interest and one or more risk premiums.
- There are three methods for modeling risk premiums: equilibrium models, such as the CAPM; factor models; and building blocks.
- The DCF method is the only one that is precise enough to use in support of trades involving individual fixed-income securities.
- There are three main methods for developing expected returns for fixed-income asset classes: DCF, building blocks, and inclusion in an equilibrium model.
- As a forecast of bond return, YTM, the most commonly quoted metric, can be improved by incorporating the impact of yield

changes on reinvestment of cash flows and valuation at the investment horizon.

- The building blocks for fixed-income expected returns are the short-term default-free rate, the term premium, the credit premium, and the liquidity premium.
- Term premiums are roughly proportional to duration, whereas credit premiums tend to be larger at the short end of the curve.
- Both term premiums and credit premiums are positively related to the slope of the yield curve.
- Credit spreads reflect both the credit premium (i.e., additional expected return) and expected losses due to default.
- A baseline estimate of the liquidity premium can be based on the yield spread between the highest-quality issuer in a market (usually the sovereign) and the next highest-quality large issuer (often a government agency).
- Emerging market debt exposes investors to heightened risk with respect to both ability to pay and willingness to pay, which can be associated with the economy and political/legal weaknesses, respectively.
- The Grinold–Kroner model decomposes the expected return on equities into three components: (1) expected cash flow return, composed of the dividend yield minus the rate of change in shares outstanding, (2) expected return due to nominal earnings growth, and (3) expected repricing return, reflecting the rate of change in the P/E.
- Forecasting the equity premium directly is just as difficult as projecting the absolute level of equity returns, so the building

block approach provides little, if any, specific insight with which to improve equity return forecasts.

- The Singer–Terhaar version of the international capital asset pricing model combines a global CAPM equilibrium that assumes full market integration with expected returns for each asset class based on complete segmentation.
- Emerging market equities expose investors to the same underlying risks as emerging market debt does: more fragile economies, less stable political and policy frameworks, and weaker legal protections.
- Emerging market investors need to pay particular attention to the ways in which the value of their ownership claims might be expropriated. Among the areas of concern are standards of corporate governance, accounting and disclosure standards, property rights laws, and checks and balances on governmental actions.
- Historical return data for real estate is subject to substantial smoothing, which biases standard volatility estimates downward and distorts correlations with other asset classes. Meaningful analysis of real estate as an asset class requires explicit handling of this data issue.
- Real estate is subject to boom–bust cycles that both drive and are driven by the business cycle.
- The cap rate, defined as net operating income in the current period divided by the property value, is the standard valuation metric for commercial real estate.
- A model similar to the Grinold–Kroner model can be applied to estimate the expected return on real estate:

$$E(R_{re}) = \text{Cap rate} + \text{NOI growth rate} - \% \Delta \text{Cap rate.}$$

- There is a clear pattern of higher cap rates for riskier property types, lower-quality properties, and less attractive locations.
- Real estate expected returns contain all the standard building block risk premiums:
  - Term premium: As a very long-lived asset with relatively stable cash flows, income-producing real estate has a high duration.
  - Credit premium: A fixed-term lease is like a corporate bond issued by the leaseholder and secured by the property.
  - Equity premium: Owners bear the risk of property value fluctuations, as well as risk associated with rent growth, lease renewal, and vacancies.
  - Liquidity premium: Real estate trades infrequently and is costly to transact.
- Currency exchange rates are especially difficult to forecast because they are tied to governments, financial systems, legal systems, and geographies. Forecasting exchange rates requires identification and assessment of the forces that are likely to exert the most influence.
- Provided they can be financed, trade flows do not usually exert a significant impact on exchange rates. International capital flows are typically larger and more volatile than trade-financing flows.
- PPP is a poor predictor of exchange rate movements over short to intermediate horizons but is a better guide to currency movements over progressively longer multi-year horizons.

- The extent to which the current account balance influences the exchange rate depends primarily on whether it is likely to be persistent and, if so, whether it can be sustained.
- Capital seeks the highest risk-adjusted expected return. In a world of perfect capital mobility, in the long run, the exchange rate will be driven to the point at which the expected percentage change equals the “excess” risk-adjusted expected return on the portfolio of assets denominated in the domestic currency over that of the portfolio of assets denominated in the foreign currency. However, in the short run, there can be an exchange rate overshoot in the opposite direction as hot money chases higher returns.
- Carry trades are profitable on average, which is contrary to the predictions of uncovered interest rate parity.
- Each country/currency has a unique portfolio of assets that makes up part of the global “market portfolio.” Exchange rates provide an across-the-board mechanism for adjusting the relative sizes of these portfolios to match investors’ desire to hold them.
- The portfolio balance perspective implies that exchange rates adjust in response to changes in the relative sizes and compositions of the aggregate portfolios denominated in each currency.
- The sample variance–covariance matrix is an unbiased estimate of the true VCV structure; that is, it will be correct on average.
- There are two main problems with using the sample VCV matrix as an estimate/forecast of the true VCV matrix: It cannot be used for large numbers of asset classes, and it is subject to substantial sampling error.
- Linear factor models impose structure on the VCV matrix that allows them to handle very large numbers of asset classes. The

drawback is that the VCV matrix is biased and inconsistent unless the assumed structure is true.

- Shrinkage estimation of the VCV matrix is a weighted average of the sample VCV matrix and a target VCV matrix that reflects assumed “prior” knowledge of the true VCV structure.
- Failure to adjust for the impact of smoothing in observed return data for real estate and other private assets will almost certainly lead to distorted portfolio analysis and hence poor asset allocation decisions.
- Financial asset returns exhibit volatility clustering, evidenced by periods of high and low volatilities. ARCH models were developed to address these time-varying volatilities.
- One of the simplest and most used ARCH models represents today’s variance as a linear combination of yesterday’s variance and a new “shock” to volatility. With appropriate parameter values, the model exhibits the volatility clustering characteristic of financial asset returns.



The full reading, worth 2 CE credits, can be found at <https://www.cfainstitute.org/membership/professional-development/refresher-readings/2020/capital-markets-expectations-asset-class-returns>

# Trade Strategy and Execution

**Bernd Hanke, PhD, CFA, Robert Kissell, PhD, Connie Li, and Roberto Malamut**

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## Learning Outcomes

The candidate should be able to:

- a. discuss motivations to trade and how they relate to trading strategy;
- b. discuss inputs to the selection of a trading strategy;
- c. compare benchmarks for trade execution;
- d. select and justify a trading strategy (given relevant facts);
- e. describe factors that typically determine the selection of a trading algorithm class;
- f. contrast key characteristics of the following markets in relation to trade implementation: equity, fixed income, options and futures, OTC derivatives, and spot currency;
- g. explain how trade costs are measured and determine the cost of a trade;



- h. evaluate the execution of a trade;
- i. evaluate a firm's trading procedures, including processes, disclosures, and record keeping with respect to good governance.

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## Introduction

This reading discusses trading and execution from a portfolio manager's perspective. The reading covers a broad range of topics related to trade strategy selection and implementation and trade cost measurement and evaluation. Growth in electronic trading has led to increased automation in trading, including the use of algorithmic trading and machine learning to optimize trade strategy and execution. Various markets, including equities, fixed income, derivatives, and foreign exchange, are examined. Adequate trading processes and procedures are also discussed from a regulatory and governance perspective.

Portfolio managers need to work closely with traders to determine the most appropriate trading strategy given their motivation for trading, risk aversion, trade urgency, and other factors, such as order characteristics and market conditions. Trade execution should be well integrated with the portfolio management process, and although trading strategies will vary on the basis of market and security type, all trade activity should be evaluated for execution quality and to assess broker and trade venue performance consistent with the fund's objectives. Additionally, firms should have proper documentation of trade procedures in place to meet regulatory and governance standards.

This reading is organized as follows: Section 2 discusses portfolio manager motivations to trade. Section 3 discusses inputs to trade strategy selection and the trade strategy selection process. Section 4 covers the range of trade implementation choices and trading

algorithms and provides a comparison of various markets. Section 5 explains how trade costs are measured and how to evaluate trade execution. Section 6 provides guidance on evaluating a firm's trading procedures for good governance practices. Section 7 concludes and summarizes the reading.

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## Summary

- Portfolio manager motivations to trade include profit seeking, risk management (hedging), liquidity driven (fund flows), and corporate actions and index reconstitutions.
- Managers following a short-term alpha-driven strategy will trade with greater urgency to realize alpha before it dissipates (decays). Managers following a longer-term strategy will trade with less urgency if alpha decay is expected to be slower.
- Trading is required to keep portfolios at targeted risk levels or risk exposures, to hedge risks that may be outside a portfolio manager's investment objectives or that the portfolio manager does not have an investment view on.
- Trading may be liquidity driven resulting from client activity or index reconstitutions. In these cases, managers typically trade using end-of-day closing prices because these prices are used for fund and benchmark valuation.
- Inputs affecting trade strategy selection include the following types: order related, security related, market related, and user based.

- Order characteristics include the side (or trade direction) and size of an order. Percentage of average daily volume is a standardized measure used in trading that indicates what order size can realistically be traded. Large trades are generally traded over longer time horizons to minimize market impact.
- Security characteristics include security type, short-term (trade) alpha, security price volatility, and a security's liquidity profile.
- Market conditions at the time of trading (intraday trading volumes, bid–ask spreads, and security and market volatility) should be incorporated into trade strategy since they can differ from anticipated conditions.
- Market volatility and liquidity vary over time, and liquidity considerations may differ substantially during periods of crisis.
- Individuals with higher levels of risk aversion are more concerned with market risk and tend to trade with greater urgency.
- Market impact is the adverse price impact in a security caused from trading an order and can represent one of the largest costs in trading.
- Execution risk is the adverse price impact resulting from a change in the fundamental value of the security and is often proxied by price volatility.
- Reference price benchmarks inform order trading prices and include pre-trade, intraday, post-trade, and price target benchmarks.
- Managers seeking short-term alpha will use pre-trade benchmarks, such as the arrival price, when they wish to transact close to current market prices (greater trade urgency).

## *Portfolio Management*

- Managers without views on short-term price movements who wish to participate in volumes over the execution horizon typically use an intraday benchmark, such as VWAP or TWAP.
- Managers of index funds or funds whose valuation is calculated using closing prices typically select the closing price post-trade benchmark to minimize fund risk and tracking error.
- The primary goal of a trading strategy is to balance the expected costs, risks, and alpha associated with trading the order in a manner consistent with the portfolio manager's trading objectives, risk aversion, and other known constraints.
- Execution algorithms can be classified into the following types: scheduled, liquidity seeking, arrival price, dark aggregators, and smart order routers.
- Equities are traded on exchanges and other multilateral trading venues. Algorithmic trading is common, and most trades are electronic, except for very large trades and trades in illiquid securities.
- Fixed-income securities are generally traded not on exchanges but in a bilateral, dealer-centric market structure where dealers make markets in the securities. The majority of fixed-income securities are relatively illiquid, especially if they have been issued in prior periods, so-called off-the-run bonds.
- Most of the trading volume in exchange-traded derivatives is concentrated in futures. Electronic trading is pervasive, and algorithmic trading is growing.
- OTC derivative markets have historically been opaque, with little public data about prices, trade sizes, and structure details. In recent years, regulators have been placing pressure on OTC markets to introduce central clearing facilities and to display trades

publicly in an attempt to increase contract standardization and price discovery and reduce counterparty risk.

- There is no exchange or centralized clearing place for the majority of spot currency trades. Spot currency markets consist of a number of electronic venues and broker markets. The currency market is entirely an OTC market.
- The implementation shortfall measure is the standard for measuring the total cost of the trade. IS compares a portfolio's actual return with its paper return (where transactions are based on decision price).
- The IS attribution decomposes total trade cost into its delay, execution, and opportunity cost components.
- Delay cost is the cost associated with not submitting the order to the market at the time of the portfolio manager's investment decision.
- Execution cost is the cost due to the buying and/or selling pressure of the portfolio manager and corresponding market risk.
- Opportunity cost is the cost due to not being able to execute all shares of the order because of adverse price movement or insufficient liquidity.
- Trade evaluation measures the execution quality of the trade and the performance of the trader, broker, and/or algorithm used.
- Various techniques measure trade cost execution using different benchmarks (pre-trade, intraday, and post-trade).
- Trade cost analysis enables investors to better manage trading costs and understand where trading activities can be improved through the use of appropriate trading partners and venues.

## *Portfolio Management*

- Major regulators mandate that asset managers have in place a trade policy document that clearly and comprehensively articulates a firm's trading policies and escalation procedures.
- The objective of a trade policy is to ensure the asset manager's execution and order-handling procedures are in line with their fiduciary duty owed to clients for best execution.
- A trade policy document needs to incorporate the following key aspects: meaning of best execution, factors determining the optimal order execution approach, handling trading errors, listing of eligible brokers and execution venues, and a process to monitor execution arrangements.



The full reading, worth 2 CE credits, can be found at <https://www.cfainstitute.org/membership/professional-development/refresher-readings/2020/trade-strategy-execution>

# Portfolio Performance Evaluation

**Marc A. Wright, CFA**

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## Learning Outcomes

The candidate should be able to:

- a. explain the following components of portfolio evaluation and their interrelationships: performance measurement, performance attribution, and performance appraisal;
- b. describe attributes of an effective attribution process;
- c. distinguish between return attribution and risk attribution and between macro and micro return attribution;
- d. describe returns-based, holdings-based, and transactions-based performance attribution, including advantages and disadvantages of each;
- e. interpret the sources of portfolio returns using a specified attribution approach;
- f. interpret the output from fixed-income attribution analyses;
- g. discuss considerations in selecting a risk attribution approach;

- h. distinguish between investment results attributable to the asset owner versus those attributable to the investment manager;
- i. discuss uses of liability-based benchmarks;
- j. describe types of asset-based benchmarks;
- k. discuss tests of benchmark quality;
- l. describe problems that arise in benchmarking alternative investments;
- m. describe the impact of benchmark misspecification on attribution and appraisal analysis;
- n. calculate and interpret the Sortino ratio, the appraisal ratio, upside/downside capture ratios, maximum drawdown, and drawdown duration;
- o. describe limitations of appraisal measures and related metrics;
- p. evaluate the skill of an investment manager.

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## Introduction

Performance evaluation is one of the most critical areas of investment analysis. Performance results can be used to assess the quality of the investment approach and suggest changes that might improve it. They are also used to communicate the results of the investment process to other stakeholders and may even be used to compensate the investment managers. Therefore, it is of vital importance that practitioners who use these analyses understand how the results are generated. By gaining an understanding of the details of how these



analyses work, practitioners will develop a greater understanding of the insights that might be gathered from the analysis and will also be cognizant of the limitations of those approaches, careful not to infer more than what is explicit or logically implicit in the results.

We will first consider the broad categories of performance measurement, attribution, and appraisal, differentiating between the three and explaining their interrelationships. Next, we will provide practitioners with tools to evaluate the effectiveness of those analyses as we summarize various approaches to performance evaluation. We will cover returns-based, holdings-based, and transactions-based attribution, addressing the merits and shortcomings of each approach and providing guidance on how to properly interpret attribution results. Again, by reviewing how each approach generates its results, we reveal strengths and weaknesses of the individual attribution approaches.

Next, we will turn to the subject of benchmarks and performance appraisal ratios. We will review the long-standing tests of benchmark quality and differentiate market indexes from benchmarks. We will also review different ratios used in performance appraisal, considering the benefits and limitations of each approach.

Lastly, we will provide advice on using these tools to collectively evaluate the skill of investment managers. This advice relies heavily on understanding the analysis tools, the limitations of the approaches, the importance of data to the quality of the analysis, and the pitfalls to avoid when making recommendations.

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## Summary

Performance evaluation is an essential tool for understanding the quality of the investment process. Practitioners must take care,

however, to understand how performance results are generated. They need a good understanding of the performance methods used, the data inputs, and the limitations of those methods. They particularly need to be careful not to infer results beyond the capabilities of the methods or the accuracy of the data. In this reading, we have discussed the following:

- Performance measurement provides an overall indication of the portfolio's performance.
- Performance attribution builds on performance measurement to explain how the performance was achieved.
- Performance appraisal leverages both returns and attribution to infer the quality of the investment process.
- An effective attribution process must reconcile to the total portfolio return/risk, reflect the investment decision-making process, quantify the active portfolio management decisions, and provide a complete understanding of the excess return/risk of the portfolio.
- Return attribution analyzes the impact of investment decisions on the returns, whereas risk attribution analyzes the risk consequences of the investment decisions.
- Macro attribution considers the decisions of the fund sponsor, whereas micro attribution considers the decisions of the individual portfolio manager.
- Returns-based attribution uses returns to identify the factors that have generated those returns.
- Holdings-based attribution uses the holdings over time to evaluate the decisions that contributed to the returns.

- Transactions-based attribution uses both holdings and transactions to fully explain the performance over the evaluation period.
- There are various techniques for interpreting the sources of portfolio returns using a specified attribution approach.
- Fixed-income attribution considers the unique factors that drive bond returns, including interest rate risk and default risk.
- When selecting a risk attribution approach, practitioners should consider the investment decision-making process and the type of attribution analysis.
- Attribution is used to calculate and interpret the contribution to portfolio return and volatility from the asset allocation and within-asset-class active/passive decisions.
- Liability-based benchmarks focus on the cash flows that the assets are required to generate.
- Asset-based benchmarks contain a collection of assets to compare against the portfolio's assets.
- Valid benchmarks should be unambiguous, investable, measurable, appropriate, reflective of current investment opinions, specified in advance, and accountable.
- Benchmark misspecification creates subsequent incorrect performance measurement and invalidates the attribution and appraisal analyses.
- Alternative investments are difficult to benchmark because they are typically less liquid, have fewer available market benchmarks, and often lack transparency.

## *Portfolio Management*

- Investment performance appraisal ratios—including the Sortino ratio, upside/downside capture ratios, maximum drawdown, and drawdown duration—measure investment skill.
- Appraisal ratios must be used with care, noting the assumptions of each ratio and affording the appropriateness to the measured investment process, risk tolerance, and investor time horizon.
- Although appraisal ratios help identify manager skill (as opposed to luck), they often are based on investment return data, which are often limited and subject to error.
- Evaluation of investment manager skill requires the use of a broad range of analysis tools, with fundamental understanding of how the tools work, how they complement each other, and their specific limitations.



The full reading, worth 2.5 CE credits, can be found at <https://www.cfainstitute.org/membership/professional-development/refresher-readings/2020/portfolio-performance-evaluation>

# Investment Manager Selection

**Jeffrey C. Heisler, PhD, CFA, and Donald W. Lindsey, CFA**

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*Donald W. Lindsey, CFA (USA).*

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## Learning Outcomes

The candidate should be able to:

- a. describe the components of a manager selection process, including due diligence;
- b. contrast Type I and Type II errors in manager hiring and continuation decisions;
- c. describe uses of returns-based and holdings-based style analysis in investment manager selection;
- d. describe uses of the upside capture ratio, downside capture ratio, maximum drawdown, drawdown duration, and up/down capture in evaluating managers;
- e. evaluate a manager's investment philosophy and investment decision-making process;
- f. evaluate the costs and benefits of pooled investment vehicles and separate accounts;

- g. compare types of investment manager contracts, including their major provisions and advantages and disadvantages;
- h. describe the three basic forms of performance-based fees;
- i. analyze and interpret a sample performance-based fee schedule.

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## Introduction

Most investors do not hold securities directly but rather invest using intermediaries. Whether the intermediary is a separately managed account or a pooled investment vehicle, such as mutual funds in the United States, unit trusts in the United Kingdom, Undertakings for the Collective Investment of Transferable Securities (UCITS) in the European Union, hedge funds, private equity funds, or exchange-traded funds (ETFs), a professional investment manager is being entrusted with helping investors achieve their investment objectives. In all of these cases, the selection of appropriate investment managers is a challenge with important financial consequences.

Evaluating an investment manager is a complex and detailed process that encompasses a great deal more than analyzing investment returns. The investigation and analysis in support of an investment action, decision, or recommendation is called due diligence. In conducting investment manager due diligence, the focus is on understanding how the investment results were achieved and on assessing the likelihood that the investment process that generated these returns will produce superior or at least satisfactory investment results going forward. Due diligence also entails an evaluation of a firm's integrity, operations, and personnel. As such, due diligence involves both quantitative and qualitative analysis.

This reading provides a framework that introduces and describes the important elements of the manager selection process. Although it is important to have a well-defined methodology, this reading is not intended to be a rigid checklist, a step-by-step guide, or an in-depth analysis but rather to present a structure from which the reader can develop their own approach.

We assume that the investment policy statement (IPS) has been drafted, the asset allocation determined, and the decision to use an outside adviser has been made. As a result, the focus is on determining which manager offers the “best” means to implement or express those decisions. The discussion has three broad topics:

- Outlining a framework for identifying, evaluating, and ultimately selecting investment managers (Section 2).
- Quantitative considerations in manager selection (Section 3).
- Qualitative considerations in manager selection (Section 4).

The reading concludes with a summary of selected important points.

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## Summary

Evaluating an investment manager is a complex and detailed process. It encompasses a great deal more than analyzing investment returns. In conducting investment manager due diligence, the focus is on understanding how the investment results were achieved and assessing the likelihood that the manager will continue to follow the same investment process that generated these returns. This process also entails operational due diligence, including an evaluation of the integrity of the firm, its operations, and personnel, as well as

evaluating the vehicle structure and terms. As such, due diligence involves both quantitative and qualitative analysis.

This reading provides a framework that introduces and describes the important elements of the manager selection process:

- Investment manager selection involves a broad set of qualitative and quantitative considerations to determine whether a manager displays skill and the likelihood that the manager will continue to display skill in the future.
- The qualitative analysis consists of investment due diligence, which evaluates the manager's investment process, investment personnel, and portfolio construction; and operational due diligence, which evaluates the manager's infrastructure.
- A Type I error is hiring or retaining a manager who subsequently underperforms expectations—that is, rejecting the null hypothesis of no skill when it is correct. A Type II error is not hiring or firing a manager who subsequently outperforms, or performs in line with, expectations—that is, not rejecting the null hypothesis when it is incorrect.
- The manager search and selection process has three broad components: the universe, a quantitative analysis of the manager's performance track record, and a qualitative analysis of the manager's investment process. The qualitative analysis includes both investment due diligence and operational due diligence.
- Capture ratio measures the asymmetry of returns, and a ratio greater than 1 indicates greater participation in rising versus falling markets. Drawdown is the loss incurred in any continuous period of negative returns.
- The investment philosophy is the foundation of the investment process. The philosophy outlines the set of assumptions about



the factors that drive performance and the manager's beliefs about their ability to successfully exploit these sources of return. The investment manager should have a clear and concise investment philosophy. It is important to evaluate these assumptions and the role they play in the investment process to understand how the strategy will behave over time and across market environments. The investment process has to be consistent and appropriate for the philosophy, and the investment personnel need to possess sufficient expertise and experience to effectively execute the investment process.

- Style analysis, understanding the manager's risk exposures relative to the benchmark, is an important component of performance appraisal and manager selection, helping to define the universe of suitable managers.
- Returns-based style analysis is a top-down approach that involves estimating the risk exposures from an actual return series for a given period. Although RBSA adds an additional analytical step, the analysis is straightforward and should identify the important drivers of return and risk factors for the period analyzed. It can be estimated even for complicated strategies and is comparable across managers and through time. The disadvantage is that RBSA is an imprecise tool, attributing performance to an unchanging average portfolio during the period that might not reflect the current or future portfolio exposures.
- Holdings-based style analysis is a bottom-up approach that estimates the risk exposures from the actual securities held in the portfolio at a point in time. HBSA allows for the estimation of current risk factors and should identify all important drivers of return and risk factors, be comparable across managers and through time, and provide an accurate view of the manager's risk

exposures. The disadvantages are the additional computational effort, dependence on the degree of transparency provided by the manager, and the possibility that accuracy may be compromised by stale pricing and window dressing.

- The prospectus, private placement memorandum, and/or limited partnership agreement are, in essence, the contract between the investor and the manager, outlining each party's rights and responsibilities. The provisions are liquidity terms and fees. Limited liquidity reduce the investor's flexibility to adjust portfolio allocations in light of changing market conditions or investor circumstances. On the other hand, limited liquidity allows the funds to take long-term views and hold less liquid securities with reduced risk of having to divest assets at inopportune times in response to redemption requests. A management fee lowers the level of realized return without affecting the standard deviation, whereas a performance fee has the added effect of lowering the realized standard deviation. The preference is for more-linear compensation to reduce the incentives to change the portfolio's risk profile at inflection points.
- The choice between individual separate accounts and pooled (or commingled) vehicles is dependent upon the consistency with the investment process, the suitability for the investor IPS, and whether the benefits outweigh the additional costs.
- Investment management fees take one of two forms: a fixed percentage fee based on assets under management or a performance-based fee which charges a percentage of the portfolio's total return or excess return over a benchmark or hurdle rate. Performance-based fees work to align the interests of managers and investors because both parties share in investment results. Most managers that charge a performance fee also charge some

level of fixed percentage fee to aid business continuity efforts. Fee structures must be designed carefully to avoid favoring one party over the other.



The full reading, worth 1.5 CE credits, can be found at <https://www.cfainstitute.org/membership/professional-development/refresher-readings/2020/investment-manager-selection>

