CFA Institute

ASSET ALLOCATION

CFA® Program Curriculum
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How to Use the CFA Program Curriculum

The CFA® Program exams measure your mastery of the core knowledge, skills, and abilities required to succeed as an investment professional. These core competencies are the basis for the Candidate Body of Knowledge (CBOK™). The CBOK consists of four components:

- A broad outline that lists the major CFA Program topic areas (www.cfainstitute.org/programs/cfa/curriculum/cbok/cbok)
- Topic area weights that indicate the relative exam weightings of the top-level topic areas (www.cfainstitute.org/en/programs/cfa/curriculum)
- Learning outcome statements (LOS) that tell you the specific knowledge, skills, and abilities you should gain from each curriculum topic area. You will find these statements at the start of each learning module and lesson. We encourage you to review the information about the LOS on our website (www.cfainstitute.org/programs/cfa/curriculum/study-sessions), including the descriptions of LOS "command words" on the candidate resources page at www.cfainstitute.org/-/media/documents/support/programs/cfa-and-cipm-los-command-words.ashx.
- The CFA Program curriculum that candidates receive access to upon exam registration.

Therefore, the key to your success on the CFA exams is studying and understanding the CBOK. You can learn more about the CBOK on our website: www.cfainstitute.org/programs/cfa/curriculum/cbok.

The curriculum, including the practice questions, is the basis for all exam questions. The curriculum is selected/developed specifically to provide candidates with the knowledge, skills, and abilities reflected in the CBOK.

CFA INSTITUTE LEARNING ECOSYSTEM (LES)

Your exam registration fee includes access to the CFA Institute Learning Ecosystem (LES). This digital learning platform provides access to all the curriculum content and practice questions. The LES is organized as a series of learning modules consisting of short online lessons and associated practice questions. This tool is your source for all study materials, including practice questions and mock exams. The LES is the primary method by which CFA Institute delivers your curriculum experience. Here, you will find additional practice questions to test your knowledge, including some interactive questions.

DESIGNING YOUR PERSONAL STUDY PROGRAM

An orderly, systematic approach to exam preparation is critical. You should dedicate a consistent block of time every week to reading and studying. Review the LOS both before and after you study curriculum content to ensure you can demonstrate

the knowledge, skills, and abilities described by the LOS and the assigned learning module. Use the LOS as a self-check to track your progress and highlight areas of weakness for later review.

Successful candidates report an average of more than 300 hours preparing for each exam. Your preparation time will vary based on your prior education and experience, and you will likely spend more time on some topics than on others.

ERRATA

The curriculum development process is rigorous and involves multiple rounds of reviews by content experts. Despite our efforts to produce a curriculum that is free of errors, we must make corrections in some instances. Curriculum errata are periodically updated and posted by exam level and test date on the Curriculum Errata webpage (www.cfainstitute.org/en/programs/submit-errata). If you believe you have found an error in the curriculum, you can submit your concerns through our curriculum errata reporting process found at the bottom of the Curriculum Errata webpage.

OTHER FEEDBACK

Please send any comments or suggestions to info@cfainstitute.org, and we will review your feedback thoughtfully.

Asset Allocation

LEARNING MODULE

1

Capital Market Expectations, Part 1: Framework and Macro Considerations

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

LEARNING OUTCOMES

Mastery	*The candidate should be able to:*
☐	discuss the role of, and a framework for, capital market expectations in the portfolio management process
☐	discuss challenges in developing capital market forecasts
☐	explain how exogenous shocks may affect economic growth trends
☐	discuss the application of economic growth trend analysis to the formulation of capital market expectations
☐	compare major approaches to economic forecasting
☐	discuss how business cycles affect short- and long-term expectations
☐	explain the relationship of inflation to the business cycle and the implications of inflation for cash, bonds, equity, and real estate returns
☐	discuss the effects of monetary and fiscal policy on business cycles
☐	interpret the shape of the yield curve as an economic predictor and discuss the relationship between the yield curve and fiscal and monetary policy
☐	identify and interpret macroeconomic, interest rate, and exchange rate linkages between economies

Parts of this reading have been adapted from a former Capital Market Expectations reading authored by John P. Calverley, Alan M. Meder, CPA, CFA, Brian D. Singer, CFA, and Renato Staub, PhD

1 INTRODUCTION & FRAMEWORK FOR DEVELOPING CAPITAL MARKET EXPECTATIONS

☐ discuss the role of, and a framework for, capital market expectations in the portfolio management process

A noted investment authority has written that the "fundamental law of investing is the uncertainty of the future."[1] 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, Sections 1 and 2 of this reading present a general framework for developing capital market expectations and alert the reader to the range of problems and pitfalls that await investors and analysts in this arena. Sections 3–11 focus 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.

Framework and Challenges

In this section, we provide a guide to collecting, organizing, combining, and interpreting investment information. After outlining the process, we turn to a discussion of typical problems and challenges to formulating the most informed judgments possible.

Before laying out the framework, we must be clear about what it needs to accomplish. The ultimate objective is to develop a set of projections with which to make informed investment decisions, specifically asset allocation decisions. As obvious as this goal may seem, it has important implications.

Asset allocation is the primary determinant of long-run portfolio performance.[2] The projections underlying these decisions are among the most important determinants of whether investors achieve their long-term goals. It thus follows that it is vital to get the long-run *level* of returns (approximately) right. Until the late 1990s, it was standard practice for institutional investors to extrapolate historical return

1 Peter L. Bernstein in the foreword to Rapaport and Mauboussin (2001), p. xiii.
2 See Brinson, Hood, and Beebower (1986) and Ibbotson and Kaplan (2000).

data into forecasts. At the height of the technology bubble,[3] this practice led many to project double-digit portfolio returns into the indefinite future. Such inflated projections allowed institutions to underfund their obligations and/or set unrealistic goals, many of which have had to be scaled back. Since that time, most institutions have adopted explicitly forward-looking methods of the type(s) discussed in our two CME readings, and return projections have declined sharply. Indeed, as of the beginning of 2018, consensus rate of return projections seemed to imply that US private foundations, which must distribute at least 5% of assets annually, could struggle to prudently generate long-run returns sufficient to cover their required distributions, their expenses, and inflation. To reiterate, projecting a realistic overall level of returns has to be a top priority.

As appealing as it is to think we could project asset returns with precision, that idea is unrealistic. Even the most sophisticated methods are likely to be subject to frustratingly large forecast errors over relevant horizons. We should, of course, seek to limit our forecast errors. We should not, however, put undue emphasis on the precision of projections for individual asset classes. Far more important objectives are to ensure internal consistency across asset classes (**cross-sectional consistency**) and over various time horizons (**intertemporal consistency**). This emphasis stems once again from the primary use of the projections—asset allocation decisions. Inconsistency across asset classes is likely to result in portfolios with poor risk–return characteristics over any horizon, whereas intertemporal inconsistency is likely to distort the connection between portfolio decisions and investment horizon.

Our discussion adopts the perspective of an analyst or team responsible for developing projections to be used by the firm's investment professionals in advising and/or managing portfolios for its clients. As the setting of explicit capital market expectations has become both more common and more sophisticated, many asset managers have adopted this centralized approach, enabling them to leverage the requisite expertise and deliver more consistent advice to all their clients.

A Framework for Developing Capital Market Expectations

The following is a framework for a disciplined approach to setting CME.

1. *Specify the set of expectations needed, including the time horizon(s) to which they apply.* This step requires the analyst to formulate an explicit list of the asset classes and investment horizon(s) for which projections are needed.
2. *Research the historical record*. Most forecasts have some connection to the past. For many markets, the historical record contains useful information on the asset's investment characteristics, suggesting at least some possible ranges for future results. Beyond the raw historical facts, the analyst should seek to identify and understand the factors that affect asset class returns.
3. *Specify the method(s) and/or model(s) to be used and their information requirements.* The analyst or team responsible for developing CME should be explicit about the method(s) and/or model(s) that will be used and should be able to justify the selection.
4. *Determine the best sources for information needs*. The analyst or team must identify those sources that provide the most accurate and timely information tailored to their needs.

3 Explosive growth of the internet in the late 1990s was accompanied by soaring valuations for virtually any internet-related investment. The NASDAQ composite index, which was very heavily weighted in technology stocks, nearly quintupled from 1997 to early 2000, then gave up all of those gains by mid-2002. A variety of names have been given to this episode including the tech or technology bubble.

5. *Interpret the current investment environment using the selected data and methods, applying experience and judgment*. Care should be taken to apply a common set of assumptions, compatible methodologies, and consistent judgments in order to ensure mutually consistent projections across asset classes and over time horizons.
6. *Provide the set of expectations needed, documenting conclusions.* The projections should be accompanied by the reasoning and assumptions behind them.
7. *Monitor actual outcomes and compare them with expectations, providing feedback to improve the expectations-setting process*. The most effective practice is likely to synchronize this step with the expectations-setting process, monitoring and reviewing outcomes on the same cycle as the projections are updated, although several cycles may be required to validate conclusions.

The first step in the CME framework requires the analyst to define the universe of asset classes for which she will develop expectations. The universe should include all of the asset classes that will typically be accorded a distinct allocation in client portfolios. To put it another way, the universe needs to reflect the key dimensions of decision making in the firm's investment process. On the other hand, the universe should be as small as possible because even pared down to minimum needs, the expectations-setting process can be quite challenging.

Steps 2 and 3 in the process involve understanding the historical performance of the asset classes and researching their return drivers. The information that needs to be collected mirrors considerations that defined the universe of assets in step 1. The more granular the classification of assets, the more granular the breakdown of information will need to be to support the investment process. Except in the simplest of cases, the analyst will need to slice the data in multiple dimensions. Among these are the following:

- Geography: global, regional, domestic versus non-domestic, economic blocs (e.g., the European Union), individual countries;
- Major asset classes: equity, fixed-income, real assets;
- Sub-asset classes:
  - Equities: styles, sizes, sectors, industries;
  - Fixed income: maturities, credit quality, securitization, fixed versus floating, nominal or inflation-protected;
  - Real assets: real estate, commodities, timber.

How each analyst approaches this task depends on the hierarchy of decisions in their investment process. One firm may prioritize segmenting the global equity market by Global Industry Classification Standard (GIC) sector, with geographic distinctions accorded secondary consideration, while another firm prioritizes decisions with respect to geography considering sector breakdowns as secondary.[4]

In Step 3, the analyst needs to be sensitive to the fact that both the effectiveness of forecasting approaches and relationships among variables are related to the investor's time horizon. As an example, a discounted cash flow approach to setting equity market expectations is usually considered to be most appropriate to long-range forecasting. If forecasts are also to be made for shorter, finite horizons, intertemporal consistency dictates that the method used for those projections must be calibrated so that its projections converge to the long-range forecast as the horizon extends.

4 There is extensive literature on the relative importance of country versus industry factors in global equity markets. Marcelo, Quiros, and Martins (2013) summarized the evidence as "vast and contradictory."

Executing the fourth step—determining the best information sources—requires researching the quality of alternative data sources and striving to fully understand the data. Using flawed or misunderstood data is a recipe for faulty analysis. Furthermore, analysts should be alert to new, superior data sources. Large, commercially available databases and reputable financial publications are likely the best avenue for obtaining widely disseminated information covering the broad spectrum of asset classes and geographies. Trade publications, academic studies, government and central bank reports, corporate filings, and broker/dealer and third-party research often provide more specialized information. Appropriate data frequencies must be selected. Daily series are of more use for setting shorter-term expectations. Monthly, quarterly, or annual data series are useful for setting longer-term CME.

The first four steps lay the foundation for the heart of the process: the fifth and sixth steps. Monitoring and interpreting the economic and market environment and assessing the implications for relevant investments are activities the analyst should be doing every day. In essence, step five could be labelled "implement your investment/research process" and step six could be labelled "at designated times, synthesize, document, and defend your views." Perhaps what most distinguishes these steps from the day-to-day investment process is that the analyst must make simultaneous projections for all asset classes and all designated, concrete horizons.

Finally, in step 7 we use experience to improve the expectations-setting process. We measure our previously formed expectations against actual results to assess the level of accuracy the process is delivering. Generally, good forecasts are:

- unbiased, objective, and well researched;
- efficient, in the sense of minimizing the size of forecast errors; and
- internally consistent, both cross-sectionally and intertemporally.

Although it is important to monitor outcomes for ways in which our forecasting process can be improved, our ability to assess the accuracy of our forecasts may be severely limited. A standard rule of thumb in statistics is that we need at least 30 observations to meaningfully test a hypothesis. Quantitative evaluation of forecast errors in real time may be of limited value in refining a process that is already reasonably well constructed (i.e., not subject to obvious gross errors). Hence, the most valuable part of the feedback loop will often be qualitative and judgmental.

EXAMPLE 1

Capital Market Expectations Setting: Information Requirements

1. Consider two investment strategists charged with developing capital market expectations for their firms, John Pearson and Michael Wu. Pearson works for a bank trust department that runs US balanced separately managed accounts (SMAs) for high-net-worth individuals. These accounts' mandates restrict investments to US equities, US investment-grade fixed-income instruments, and prime US money market instruments. The investment objective is long-term capital growth and income. In contrast, Wu works for

a large Hong Kong SAR–based, internationally focused asset manager that uses the following types of assets within its investment process:

Equities	Fixed Income	Alternative Investments
Asian equities	Eurozone sovereign	Eastern European
Eurozone	US government	venture capital
US large-cap		New Zealand timber
US small-cap		US commercial real
Canadian large-cap		estate

Wu's firm runs SMAs with generally long-term time horizons and global tactical asset allocation (GTAA) programs. Compare and contrast the information and knowledge requirements of Pearson and Wu.

Guideline Answer:

Pearson's in-depth information requirements relate to US equity and fixed-income markets. By contrast, Wu's information requirements relate not only to US and non-US equity and fixed-income markets but also to three alternative investment types with non-public markets, located on three different continents. Wu has a more urgent need to be current on political, social, economic, and trading-oriented operational details worldwide than Pearson. Given their respective investment time horizons, Pearson's focus is on the long term whereas Wu needs to focus not only on the long term but also on near-term disequilibria among markets (for GTAA decisions). One challenge that Pearson has in US fixed-income markets that Wu does not face is the need to cover corporate and municipal as well as government debt securities. Nevertheless, Wu's overall information and knowledge requirements are clearly more demanding than Pearson's.

2 CHALLENGES IN FORECASTING

☐ discuss challenges in developing capital market forecasts

A range of problems can frustrate analysts' expectations-setting efforts. Expectations reflecting faulty analysis or assumptions may cause a portfolio manager to construct a portfolio that is inappropriate for the client. At the least, the portfolio manager may incur the costs of changing portfolio composition without any offsetting benefits. The following sections provide guidance on points that warrant special caution. The discussion focuses on problems in the use of data and on analyst mistakes and biases.

Limitations of Economic Data

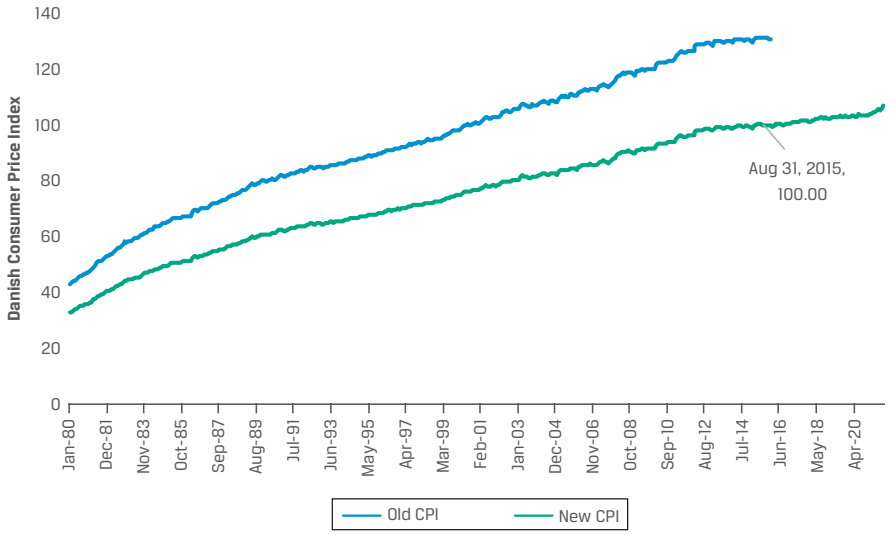
The analyst needs to understand the definition, construction, timeliness, and accuracy of any data used, including any biases. The time lag with which economic data are collected, processed, and disseminated can impede their use because data that are not timely may be of little value in assessing current conditions. Some economic data may be reported with a lag as short as one week, whereas other important data may be reported with a lag of more than a quarter. The International Monetary Fund

sometimes reports data for developing economies with a lag of two years or more. Older data increase the uncertainty concerning the current state of the economy with respect to that variable.

Furthermore, one or more official revisions to initial data values are common. Sometimes these revisions are substantial, which may give rise to significantly different inferences. Often only the most recent data point is revised. Other series are subject to periodic "benchmark revisions" that simultaneously revise all or a portion of the historical data series. In either case—routine updating of the most recent release or benchmark revision—the analyst must be aware that using revised data as if it were known at the time to which it applies often suggests strong historical relationships that are unreliable for forecasting.

Definitions and calculation methods change too. For example, the US Bureau of Labor Statistics (BLS) made significant changes to the Consumer Price Index for All Urban Consumers (CPI-U) in 1983 (treatment of owner-occupied housing) and again in 1991 (regression-based product quality adjustments). Analysts should also be aware that suppliers of economic and financial indexes periodically **re-base** these indexes, meaning that the specific period used as the base of the index is changed. Analysts should take care to avoid inadvertently mixing data relating to different base periods. Exhibit 1 illustrates the impact of re-basing a time series: Statistics Denmark announced that beginning January 2016, the Danish Consumer Price Index (CPI) was revised and the new base year is 2015. The CPI series based on the old base was no longer published, and the new series was computed back to 1980 retrospectively, such that the CPI took a value of 100.00 on 31 August 2015.

Exhibit 1: Danish CPI before and after Re-Basement (31 August 2015 = 100)



Sources: Statistics Denmark; Bloomberg

Data Measurement Errors and Biases

Analysts need to be aware of possible biases and/or errors in data series, including the following:

- Transcription errors. These are errors in gathering and recording data.

- Survivorship bias. This bias arises when a data series reflects only entities that survived to the end of the period. Without correction, statistics from such data can be misleading. Data on alternative assets such as hedge funds are notorious for survivorship bias.
- Appraisal (smoothed) data. For certain assets without liquid public markets, notably but not only real estate, appraisal data are used in lieu of transaction data. Appraised values tend to be less volatile than market-determined values. As a result, measured volatilities are biased downward and correlations with other assets tend to be understated.

The Limitations of Historical Estimates

Although history is often a helpful guide, the past should not be extrapolated uncritically. There are two primary issues with respect to using historical data. First, the data may not be representative of the future period for which an analyst needs to forecast. Second, even if the data are representative of the future, statistics calculated from that data may be poor estimates of the desired metrics. Both of these issues can be addressed to some extent by imposing structure (that is, a model) on how data is presumed to have been generated in the past and how it is expected to be generated in the future.

Changes in technological, political, legal, and regulatory environments; disruptions such as wars and other calamities; and changes in policy stances can all alter risk–return relationships. Such shifts are known as changes in **regime** (the governing set of relationships) and give rise to the statistical problem of **nonstationarity** (meaning, informally, that different parts of a data series reflect different underlying statistical properties). Statistical tools are available to help identify and model such changes or turning points.

A practical approach for an analyst to decide whether to use the whole of a long data series or only part of it involves answering two questions.

1. Is there any reason to believe that the entirety of the sample period is no longer relevant? In other words, has there been a fundamental regime change (such as political, economic, market, or asset class structure) during the sample period?
2. Do the data support the hypothesis that such a change has occurred?

If the answer to both questions is yes, the analyst should use only that part of the time series that appears relevant to the present. Alternatively, he may apply statistical techniques that account for regime changes in the past data as well as the possibility of subsequent regime changes. Example 2 illustrates examples of changes in regime.

EXAMPLE 2

Regimes and the Relevance of Historical Bond Returns

In the 1970s, oil price shocks combined with accommodative monetary policy by the US Federal Reserve fueled sharply rising inflation. In 1980, the Fed abruptly shifted to an aggressively tight stance. After the initial shock of sharply higher interest rates, US bond yields trended downward for roughly 35 years as the Fed kept downward pressure on inflation. Throughout the 1980s and 1990s, the Fed eased monetary policy in the aftermath of the technology bubble. Then, switching to an extraordinarily expansionary policy in the midst of the 2008–2009 global financial crisis, the Fed reduced its policy rate to 0% in December 2008. Subsequently, it aggressively bought Treasury bonds and mortgage-backed