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Asset Allocation

Level III Book 1

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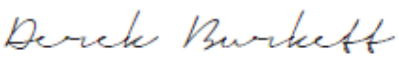

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Book 1: Asset Allocation

SchweserNotes™ 2025

Level III CFA®

SCHWESERNOTES™ 2025 2025 LEVEL III CFA® BOOK 1: ASSET ALLOCATION

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Learning Outcome Statements (LOS)

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The candidate should be able to:

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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.
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h. discuss the effects of monetary and fiscal policy on business cycles.
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READING 1

CAPITAL MARKET EXPECTATIONS, PART 1: FRAMEWORK AND MACRO CONSIDERATIONS

EXAM FOCUS

Combining capital market expectations with the investor's objectives and constraints leads to the portfolio's strategic asset allocation. A variety of economic tools and techniques are useful in forming capital market expectations for return, risk, and correlation by asset class. Unfortunately, no one technique works consistently, so be prepared for any technique and its issues as covered here.

MODULE 1.1: FORMULATING CAPITAL MARKET EXPECTATIONS

Video covering this content is available online.

LOS 1.a: Discuss the role of, and a framework for, capital market expectations in the portfolio management process.

Capital market expectations are risk and return expectations regarding classes of assets. Investors should establish long-term expectations for each allowable asset class specified in the investment policy statement. They can also create short-term expectations for making active investment decisions. Using a disciplined approach to set short- and long-term expectations leads to more effective security selection, asset allocation, and risk management.

Achieving long-term investment objectives is largely dependent on constructing proper asset allocations. Although projecting asset class returns may be subject to forecasting errors, investors should ensure that portfolios are internally consistent. **Cross-sectional consistency** refers to consistency across asset classes regarding portfolio risk and return characteristics. **Intertemporal consistency** refers to consistency over various investment horizons regarding portfolio decisions over time.

To formulate capital market expectations, an analyst should use the following seven-step process:

Step 1: Determine the specific capital market expectations needed according to the investor's allowable asset classes and investment horizon(s). Time horizon is particularly important in determining the set of capital market expectations that are needed.

Step 2: Investigate assets' historical performance to determine the drivers that have affected past performance and to establish some range for plausible future performance. With the drivers of past performance established, the analyst can

use these to forecast expected future performance as well as compare the forecast to past results to see if the forecast appears reasonable.

Step 3: Identify the valuation model to be used and its requirements. For example, a comparables-based, relative value approach used in the United States may be difficult to apply in an emerging market analysis.

Step 4: Collect the best data possible. The use of faulty data will lead to faulty conclusions. Financial publications and commercial databases are likely the best sources for reliable information on asset classes.

Step 5: Use experience and judgment to interpret current investment conditions and decide what values to assign to the required inputs. Verify that the inputs used for the various asset classes are consistent across classes.

Step 6: Formulate capital market expectations. Any assumptions and rationales used in the analysis should be recorded.

Step 7: Monitor performance and use it to refine the process for setting expectations. If actual performance varies significantly from forecasts, the process and model should be refined.

Information needed to support the investment process includes:

- Geography—individual countries, economic blocks (e.g., EU), non-domestic vs. domestic, regional, and global.
- Major asset classes such as fixed income, equity, and real assets.
- Sub-asset classes:
  - Equity—industries, sectors, size, style
  - Fixed income—nominal vs. TIPS, floating vs. fixed, credit quality, maturities
  - Real assets—commodities, real estate, timber

Good forecasts are unbiased, objective, well researched, efficient (small forecasting error), and internally consistent. A general guideline is that at least 30 observations are needed to test a hypothesis.

Problems in Forecasting

LOS 1.b: Discuss challenges in developing capital market forecasts.

Poor forecasts can result in inappropriate asset allocations. Analysts should be aware of potential problems in data, models, and the resulting capital market expectations. Nine problems encountered in producing forecasts are (1) limitations to using economic data, (2) data measurement error and bias, (3) limitations of historical estimates, (4) the use of ex-post risk and return measures, (5) non-repeating data patterns, (6) failing to account for conditioning information, (7) misinterpreting of correlations, (8) psychological bias, and (9) model uncertainty.

1. There are several **limitations to using economic data**:

- The time lag between collection and distribution is often quite long. The International Monetary Fund, for example, reports data with a lag of as much as two years.
- Data are often revised and the revisions are not made at the same time as the publication. Additionally, data definitions and methodology change over time. For example, the basket of goods in the Consumer Price Index (CPI) is updated every few years.
- Data indexes are often rebased over time (i.e., the base upon which they are calculated is changed). Although a rebasing is not a substantial change in the data itself, the unaware analyst could calculate changes in the value of the indexes incorrectly if she does not make an appropriate adjustment.

2. There are numerous possible **data measurement errors and biases**. *Transcription errors* are the misreporting or incorrect recording of information and are most serious if they are biased in one direction. *Survivorship bias* commonly occurs if a manager or a security return series is deleted from the historical performance record of managers or firms. Deletions are often tied to poor performance and bias the historical return upward. *Appraisal data* for illiquid and infrequently priced assets makes the path of returns appear smoother than it actually is. This biases downward the calculated standard deviation and makes the returns seem less correlated (closer to 0) with more liquid priced assets. This is a particular problem for some types of alternative assets such as real estate.
3. The **limitations of historical estimates** can also hamper the formation of capital market expectations. Values from historical data must often be adjusted going forward as economic, political, regulatory, and technological environments change. This is particularly true for volatile assets such as equity. These changes are known as *regime changes* and result in *nonstationary* data. For example, the global financial crisis in 2007–2009 resulted in returns data that were markedly different than those from the previous five years. Nonstationarity would mean different periods in the time series have different statistical properties and create problems with standard statistical testing methods.

   Two questions can be used to help resolve the issue of which time period to select:
   a. Is there a reason to believe the entire (longer) time period is not appropriate?
   b. If the answer to the first question is yes, does a statistical test confirm there is a regime change and the point in the time series where it occurs?

   If both answers are yes, the analyst must use judgment to select the relevant subperiod.

   Historical data are a starting point for estimating expected returns, standard deviations, and correlations. A long time period is preferable for several reasons:

   - It may be statistically required. To calculate historical covariance (and correlation), the number of data points must exceed the number of covariances to be calculated.
   - A larger data set (time period) provides more precise statistical estimates with smaller variance to the estimates.
   - Using a short time period creates a temptation to use more frequent data, such as weekly data, rather than monthly data points in order to have a larger sample size. Unfortunately, more frequent data points are often more likely to have missing or outdated values (this is called *asynchronous* data) and can result in distorted correlation calculations. Also, it has been found that more frequent data will not improve the precision of expected returns.

However, long time periods also create the potential problem of including regime changes, which are shifts in underlying fundamentals. Each regime change creates a subperiod with distinctly different characteristics.

In addition to selecting time periods, caution should be exercised when data are assumed to be normally distributed. Asset returns have historically exhibited "fat tails" and skewness, which adds complexity to statistical tests. In some cases, the benefits of accounting for non-normality might not outweigh the costs of introducing complexity to a model.

4. Using **ex post data** (after the fact) to determine **ex ante** (before the fact) risk and return can be problematic. For example, suppose that several years ago investors were fearful that the Federal Reserve was going to have to raise interest rates to combat inflation. This situation would cause depressed stock prices. If inflation abated without the Fed's intervention, then stock returns would increase once the inflation scenario passed. Looking back on this situation, the researcher would conclude that stock returns were high while being blind to the prior risk that investors had faced. The analyst would then conclude that future (ex ante) returns for stocks will be high. In sum, the analyst would underestimate the risks that equity investors face and overestimate their potential returns.

   This issue could also lead to an overestimation of risk when sample data include rare negative events. Using a data subset that includes outliers will likely distort the estimation of value at risk (VaR). This would suggest that rare negative events are expected with more frequency than would be observed in practice.

5. Using historical data, analysts can also uncover patterns in security returns that are unlikely to occur in the future and can produce biases in the data. One such bias is *data mining*. Just by random chance, some variables will appear to have a relationship with security returns, when, in fact, these relationships are unlikely to persist. For example, if the analyst uses a 5% significance level and examines the relationship between stock returns and 40 randomly selected variables, two (5%) of the variables are expected to show a statistically significant relationship with stock returns just by random chance. Another potential bias results from the time span of data chosen (*time period bias*). For example, small-cap U.S. stocks are widely thought to outperform large-cap stocks, but their advantage disappears when data from 2000 to 2010 are excluded.

   To avoid these biases, an analyst should first ask if there is any economic basis for the variables found to be related to stock returns. Second, he should scrutinize the modeling process for susceptibility to bias. Third, the analyst should test the discovered relationship with out-of-sample data to determine if the relationship is persistent. This would be done by estimating the relationship with one portion of the historical data and then reexamining it with another portion.

6. Analysts' forecasts may also fail to account for **conditioning information**. The relationship between security returns and economic variables is not constant over time. Historical data reflect performance over many different business cycles and economic conditions. Thus, analysts should account for current conditions in their

forecasts. As an example, suppose a firm's beta is estimated at 1.2 using historical data. If, however, the original data are separated into two ranges by economic expansion or recession, the beta might be 1.0 in expansions and 1.4 in recessions. Going forward, the analyst's estimate of the firm's beta should reflect whether an expansion is expected (i.e., the expected beta is 1.0) or a recession is expected (i.e., the expected beta is 1.4).

7. Another problem in forming capital market expectations is the **misinterpretation of correlations** (i.e., causality). Suppose the analyst finds that corn prices were correlated with rainfall in the midwestern United States during the previous quarter. It would be reasonable to conclude that rainfall influences corn prices. It would not be reasonable to conclude that corn prices influence rainfall. Rainfall is an exogenous variable (i.e., it arises outside the model), whereas the price of corn is an endogenous variable (i.e., it arises within the model).

   It is also possible that the correlation between two variables is spurious or that a third variable influences both variables. In addition, two variables may have a nonlinear relationship that is missed by the correlation statistic, which measures linear relationships.

8. Analysts are susceptible to **psychological biases**:
   - In the **anchoring bias** (cognitive), the first information received is overweighted. If, during a debate on the future of the economy, the first speaker forecasts a recession, that forecast is given greater credence.
   - In the **status quo bias** (emotional), predictions are highly influenced by the recent past. If inflation is currently 4%, that becomes the forecast, rather than choosing to be different and potentially making an active error of commission.
   - In the **confirmation bias** (cognitive), only information supporting the existing belief is considered, and such evidence may be actively sought while other evidence is ignored. To counter these tendencies, analysts should give all evidence equal scrutiny and seek out contrary opinions.
   - In the **overconfidence bias** (emotional), past mistakes are ignored, the lack of comments from others is taken as agreement, and the accuracy of forecasts is overestimated. To counter this bias, consider a range of potential outcomes.
   - In the **prudence bias** (cognitive), forecasts are overly conservative to avoid the regret from making extreme forecasts that could end up being incorrect. This bias can also be mitigated by considering a range of potential outcomes.
   - In the **availability bias** (cognitive), what is easiest to remember (often an extreme event) is overweighted. Many believe that the U.S. stock market crash of 1929 may have depressed equity values in the subsequent 30 years. To counter this bias, base predictions on objective data rather than emotions or recollections of the past.

9. **Model uncertainty** refers to selecting the correct model. An analyst may be unsure whether to use a discounted cash flow (DCF) model or a relative value model to evaluate an expected stock return. *Parameter uncertainty* refers to estimation errors in model parameters. *Input uncertainty* refers to knowing the correct input values for the model. For example, even if the analyst knew that the DCF model was appropriate, the correct growth and discount rates are still needed. Among the three types of uncertainty, model uncertainty is the most serious given that an incorrect model will likely lead to invalid conclusions.

MODULE QUIZ 1.1

1. An analyst uses a variety of valuation approaches for different asset classes and collects the necessary data from multiple sources. The analyst does not make any effort to systematically compare the data used. As a result, the analyst uses relatively low discount rates for equity analysis (overestimating theoretical value) and high discount rates for fixed income (underestimating theoretical value). **Discuss** the likely effect on the analyst's asset allocation recommendations.

2. An analyst would like to forecast U.S. equity returns. He is considering using either the last 3 years of historical annual returns or the last 50 years of historical annual returns. **Provide** an argument for and against each selection of data length.

3. **Explain** why smoothed data may be present for some types of alternative investments and the consequences for their risk and correlation with other assets from using such data.

MODULE 1.2: THE TREND RATE OF GROWTH

Video covering this content is available online.

LOS 1.c: Explain how exogenous shocks may affect economic growth trends.

Identifying problems in developing forecasts is important when setting capital market expectations. However, a far greater concern is the connection between investment outcomes and economic output. In general, economic growth can be partitioned into cyclical variations and growth trends. The former is more short-term focused whereas the latter is more relevant for determining long-term return expectations. Later in this topic review, we will discuss how the business cycle influences short- and long-term expectations. In this section, we will discuss the application of growth trends when formulating expectations.

Economic growth trends are subject to unexpected surprises or shocks that are exogenous to the economy. Many shocks and their impact on capital markets cannot be predicted. For example, turmoil in the Middle East may change the long-term trend for oil prices, inflation, and economic growth in the developed world. Shocks may also arise through the banking system. An extreme example is the U.S. banking crisis of the 1930s, when a severe slowdown in bank lending paralyzed the economy.

Exogenous shocks are unanticipated events that occur outside the normal course of an economy. Because the events are unanticipated, they are not already built into current market prices, whereas normal trends in an economy, which would be considered endogenous, are built into market prices. Note that the impact of these

events will likely produce statistical regime changes. Exogenous shocks can be caused by several factors:

- **Changes in government policies.** Government policies that can encourage long-term growth include sound fiscal policy, minimal government interference with free markets, facilitating competition in the private sector, development of infrastructure and human capital, and sound tax policies.
- **Political events.** Geopolitical tensions that divert resources to less productive uses may lead to decreases in growth. Conversely, cuts in defense spending due to higher levels of world peace may lead to increases in growth.
- **Technological progress.** The creation of new and innovative markets, products, and technologies has the potential to improve growth.
- **Natural disasters.** Natural disasters likely reduce short-term growth, but may (arguably) encourage long-term growth if more efficient capacity replaces previous capacity.

PROFESSOR'S NOTE

The counterargument here is that the owners of capital already replace old facilities with newer and more efficient ones when the time is right.

- **Discovery of natural resources.** Production of new natural resources or the introduction of new ways to recover existing resources can enhance growth. In addition, decreases in resource production costs will improve growth while decreases in resource supply will restrict growth.
- **Financial crises.** Shocks to the financial system will lead to a crisis of confidence among market participants. Financial crises may reduce the level of economic output in the short term and may also decrease the trend rate of growth.

LOS 1.d: Discuss the application of economic growth trend analysis to the formulation of capital market expectations.

The trend rate of growth is an important input when setting capital market expectations. Some of the key considerations of economic growth trend analysis are as follows:

- Forecasting returns with DCF models incorporate the trend rate of growth. The need to keep these forecasts consistent with long-term economic growth imposes discipline on the models. The trend rate of growth acts as an anchor for long-term bond and equity returns.
- Higher trend growth rates may lead to higher stock returns assuming the growth is not already reflected in stock prices.
- When we speak of higher trend growth rates, we mean the economy can grow at a faster pace before inflation becomes a major concern. This consideration influences monetary policy and the level of bond yields.
- Higher trend growth rates tend to generate higher government bond yields.

Overall, the trend rate of growth is relatively stable in developed economies. In emerging economies, that growth rate can be less predictable and include longer periods of rapid growth as those economies catch up with developed economies.

A basic model for forecasting the economic growth rate focuses on the following:

- *Labor input,* based on growth in the labor force and labor participation. Growth in the labor force depends on population growth and demographics. Labor participation refers to the percentage of the population working and is affected by real wages, work/leisure decisions, and social factors.
- *Capital per worker,* which increases labor productivity.
- *Total factor productivity,* which is reflected in technological progress and changes in government policies.

EXAMPLE: Forecasting the long-term economic growth rate

Assume that the population is expected to grow by 2% and that labor force participation is expected to grow by 0.25%. If spending on new capital inputs is projected to grow at 2.5% and total factor productivity will grow by 0.5%, what is the long-term projected growth rate?

Answer:

The sum of the components equals 2% + 0.25% + 2.5% + 0.5% = 5.25%, so the economy is projected to grow by this amount.

Asset Returns and the Trend Rate of Growth

The trend rate of growth can also provide an estimate for long-term equity returns. The market value of equity can be expressed as the product of three terms: nominal GDP, earnings/GDP (which is the share of profits in the economy), and the P/E ratio.

Over long periods, the share of profits in the economy (earnings/GDP) and the P/E ratio cannot continually increase or decrease thus, in the long-term, the growth rate of the total value of equity in an economy is linked to the growth rate of GDP.

This applies to the capital appreciation component of equity returns but not the dividend yield. The dividend yield (annual dividends/market value) can be derived from the dividend payout ratio (dividends/profit) divided by the profit multiple (market value/profit).

EXAMPLE: Forecasting long-run equity return

Cindy Navaro is an equity analyst for Evergreen Asset Management. She has been asked to produce capital market expectations for asset classes in several different markets relevant to the company's Renewable Green Energies fund. Navaro is aware that long-term GDP trend forecasting is considered the starting point to form capital market expectations. In order to make a forecast of trend GDP growth in the domestic economy, Navaro collects the following data displayed in Exhibit 1.

Exhibit 1: Domestic Economy Information

Annual labor input growth	0.4%
Annual labor productivity growth	1.4%
Annual inflation	3.8%
Dividend yield	2.6%
Long-term change in profits as a share of GDP	0%
Long-term change in PE multiples	0%

Based on the data in Exhibit 1, **calculate** the projected long-term domestic market equity return.

Answer:

The correct answer is 8.2%.

Real GDP growth = labor input growth + labor productivity growth = 0.4% + 1.4% = 1.8%

Nominal GDP growth = real GDP growth + inflation = 1.8% + 3.8% = 5.6%

Long-term capital gains in equity markets = %Δ nominal GDP + %Δ profits/GDP + %Δ PE = 5.6% + 0% + 0% = 5.6%

Long-term total domestic market equity return = capital gains + dividend yield = 5.6% + 2.6% = 8.2%

High rates of growth in capital investment are associated with high rates of growth in the economy. However, these high growth rates are not necessarily linked to favorable equity returns. This may be the case because growth rates are already factored into equity prices. An additional explanation is that the source of equity returns is related to the rate of return on capital. If the rate of growth of capital is faster than the rate of economic growth, return on capital may decrease and equity returns may become less attractive.

Market Forecasting

LOS 1.e: Compare major approaches to economic forecasting.

Three approaches to economic forecasting are econometric modeling, use of economic indicators, and a checklist approach.

Econometric analysis uses statistical methods to explain economic relationships and formulate forecasting models. *Structural models* are based on economic theory while *reduced-form models* are compact versions of structural approaches. These types of models range from being quite simple to very complex, involving several or hundreds of relationships. For example, an analyst may want to forecast GDP using current and lagged consumption and investment values. Ordinary least squares regression is most often used, but other statistical methods are also used to develop these models.

Advantages

- Modeling can incorporate many variables.
- Once the model is specified, it can be reused.
- Output is quantified and based on a consistent set of relationships.

Disadvantages

- Models are complex and time-consuming to construct.
- The data may be difficult to forecast and the relationships can change.
- Output may require interpretation or be unrealistic.
- It does not work well to forecast turning points.

Economic indicators are available from governments, international organizations (e.g., the Organization of Economic Cooperation and Development), and private organizations (e.g., the Conference Board in the United States).

Many analysts use a combination of publicly available indicators and their own proprietary indicators. The most useful indicators are **leading indicators** that move ahead of the business cycle with a reasonable stable lead time. These can be used to predict what will happen next. The leading indicators can be used individually or as a **composite**. For example, the Conference Board provides 10 leading indicators for the United States, which they combine into an index. Traditionally, three consecutive months of increase (decrease) for the index are expected to signal the start of an economic expansion (contraction) within a few months. A composite can also be interpreted as a **diffusion index** by observing the number of indicators pointing toward expansion versus contraction in the economy.

There are also **coincident** and **lagging indicators** that move with and after changes in the business cycle. These can be used to confirm what is happening in the economy.

Advantages

- Economic indicators are simple, intuitive, and easy to interpret.
- Data are often readily available from third parties.
- Indicator lists can be tailored to meet specific forecasting needs.

Disadvantages

- Forecasting results have been inconsistent.
- Economic indicators have given false signals.
- Indicators are revised frequently, which can make them appear to fit past business cycles better than they did when the data were first released.

A **checklist approach** is more subjective. In this approach, an analyst considers a series of questions. For example, to forecast GDP, the analyst may consider, "What was the latest employment report? What is the central bank's next move, given the latest information released? What is the latest report on business investment?" Then the analyst uses judgment and perhaps some statistical modeling to interpret the answers

and formulate a forecast. Judgment is required both in determining which factors to consider and how to interpret them.

Advantages

- Less complex than econometrics.
- Flexible in mixing objective statistical analysis with judgment to incorporate changing relationships.

Disadvantages

- Subjective.
- Time-consuming.
- Complexity must be limited due to manual process.

MODULE 1.3: THE BUSINESS CYCLE

Video covering this content is available online.

LOS 1.f: Discuss how business cycles affect short- and long-term expectations.

As mentioned, the trend rate of growth provides guidance on setting long-term expectations. Any deviations from this trend tend to cancel out over the long run; however, identifying these deviations can be very useful when making shorter-term projections. Fluctuations in economic growth over short to intermediate time horizons are often associated with the business cycle.

A fundamental reason why economic activity is cyclical is the nature of business decisions. Decision makers allocate resources to what they believe are their highest valued uses, but can only do so with imperfect information. Adjustments to unexpected events take time to implement and reversing incorrect decisions can be costly.

Understanding business cycle phases is important for forming capital market expectations, but their relationship is not straightforward for the following reasons:

1. Business cycles vary in duration and intensity, and their turning points are difficult to predict. Their variations may be thought of as resulting from the interactions of many subcycles with a wide range of frequencies.
2. Although we typically think of and model economic activity in terms of cycles fluctuating around a long-term trend, it can be difficult to distinguish which effects result from shorter-term factors that arise from the business cycle and which are related to longer-term factors that affect the trend rate of economic growth.
3. Returns in the capital market are strongly related to activity in the real economy, but they also depend on factors such as investors' expectations and risk tolerances.

Business cycle analysis is most useful for identifying opportunities within the time horizon of a typical business cycle. For longer investment horizons that are likely to include one or more full business cycles, information about the current state of the economy is less valuable.

Business Cycle Phases

> **For the Exam:** Have a working knowledge of, and be able to explain, the general relationships between interest rates, inflation, stock and bond prices, et cetera, as you progress over the business cycle. For example, as the peak of the cycle approaches, everything is humming along. Confidence and employment are high, but inflation is starting to have an impact on markets. As inflation increases, bond yields increase and both bond and stock prices start to fall.

The business cycle can be subdivided into five phases: (1) initial recovery, (2) early expansion, (3) late expansion, (4) slowdown, and (5) contraction. The phases have the following characteristics:

Initial Recovery

- Duration of a few months.
- Business confidence rising.
- Government stimulus provided by low interest rates and/or budget deficits.
- Decelerating inflation.
- Large output gap.
- Low or falling short-term interest rates.
- Bond yields bottoming out.
- Rising stock prices.
- Cyclical, riskier assets such as small-cap stocks and high yield bonds doing well.

Early Expansion

- Duration of a year to several years.
- Increasing growth with low inflation.
- Increasing confidence.
- Rising short-term interest rates.
- Output gap is narrowing.
- Stable or rising bond yields.
- Rising stock prices.

Late Expansion

- High confidence and employment.
- Output gap eliminated and economy at risk of overheating.
- Increasing inflation.
- Central bank limits the growth of the money supply.
- Rising short-term interest rates.
- Rising bond yields.

- Rising/peaking stock prices with increased risk and volatility.

Slowdown

- Duration of a few months to a year or longer.
- Declining confidence.
- Inflation still rising.
- Short-term interest rates at a peak.
- Bond yields peaking and possibly falling, resulting in rising bond prices.
- Possible inverting yield curve.
- Falling stock prices.

Contraction

- Duration of 12 to 18 months.
- Declining confidence and profits.
- Increase in unemployment and bankruptcies.
- Inflation topping out.
- Falling short-term interest rates.
- Falling bond yields, rising prices.
- Stock prices increasing during the latter stages, anticipating the end of the recession.

Inflation Implications

LOS 1.g: Explain the relationship of inflation to the business cycle and the implications of inflation for cash, bonds, equity, and real estate returns.

Inflation means generally rising prices. For example, if the CPI increases from 100 to 105, inflation is 5%. Inflation typically accelerates late in the business cycle (near the peak).

Disinflation means a deceleration in the rate of inflation. For example, if the CPI then increases from 105 to 108, the rate of inflation decreases to approximately 3%. Inflation typically decelerates as the economy approaches and enters recession.

Deflation means generally falling prices. For example, if the CPI declines from 108 to 106, the rate of inflation is approximately –2%. Deflation is a severe threat to economic activity for the following reasons:

- It encourages default on debt obligations. Consider a homeowner who has a home worth $100,000 and a mortgage of $95,000; the homeowner's equity is only $5,000. A decline of more than 5% in home prices leads to negative equity and can trigger panic sales (further depressing prices), defaulting on the loan, or both.
- With negative inflation, interest rates decline to near zero and this limits the ability of central banks to lower interest rates and stimulate the economy. Following the financial crisis of 2007–2009 and the resulting very low interest rates, several

central banks tried a new monetary policy of **quantitative easing (QE)** to stimulate the economies of their countries. Traditionally, central banks have used open market operations to increase the money supply and decrease short-term interest rates on a temporary basis by buying high quality fixed-income instruments. QE was different in that it was larger in scale, the purchases included other security types such as mortgage-backed securities and corporate bonds, and the intent was a long-term increase in bank reserves.

Monetary policy and inflation levels will vary over the business cycle. In general, moderate levels of inflation only create moderate costs for the economy. As a result, central banks tend to target a slightly positive inflation rate. Investors generally expect that equity and bond prices will reflect some level of positive inflation.

Figure 1.1 summarizes the relationship of inflation to the business cycle.

Figure 1.2 describes the typical behavior of asset class returns in different inflation scenarios.

Figure 1.1: Inflation and the Business Cycle

The Business Cycle	Inflation	Economic Policy	Markets
Initial recovery	Initially declining inflation	Stimulative	Short-term rates low or declining
			Long-term rates bottoming and bond prices peaking
			Stock prices increasing
Early expansion	Low inflation and good economic growth	Becoming less stimulative	Short-term rates increasing
			Long-term rates bottoming or increasing with bond prices beginning to decline
			Stock prices increasing
Late expansion	Inflation rate increasing	Becoming restrictive	Short-term and long-term rates increasing with bond prices declining
			Stock prices peaking and volatile
Slowdown	Inflation continues to accelerate	Becoming less restrictive	Short-term and long-term rates peaking and then declining with bond prices starting to increase
			Stock prices declining
Contraction	Real economic activity declining and inflation peaking	Easing	Short-term and long-term rates declining with bond prices increasing
			Stock prices begin to increase later in the recession

Figure 1.2: Inflation Expectations and Asset Classes

Inflation within expectations	Cash equivalents: Earn the real rate of interest Bonds: Shorter-term yields more volatile than longer-term yields Equity: No impact given predictable economic growth Real estate: Neutral impact with typical rates of return
Inflation above or below expectations	Cash equivalents: Positive (negative) impact with increasing (decreasing) yields Bonds: Longer-term yields more volatile than shorter-term yields Equity: Negative impact given the potential for central bank action or falling asset prices, though some companies may be able to pass rising costs on to customers Real estate: Positive impact as real asset values increase with inflation
Deflation	Cash equivalents: Positive impact if nominal interest rates are bound by 0% Bonds: Positive impact as fixed future cash flows have greater purchasing power (assuming no default on the bonds) Equity: Negative impact as economic activity and business declines Real estate: Negative impact as property values generally decline

PROFESSOR'S NOTE

These generalizations will not hold in every case. They are a good starting point for a forecaster taking a macro approach. Even if the generalizations always held, it is not easy to determine when a business cycle phase starts, how long it will last, or when it ends.

MODULE QUIZ 1.2, 1.3

1. An analyst believes that GDP is best forecasted using a system of equations that can capture the fact that GDP is a function of many variables, both current and lagged values. Which economic forecasting method is she *most likely* to use?
2. The phase of the business cycle in which we *most likely* expect to observe rising short-term interest rates and stable bond yields is:
   A. late expansion.
   B. initial recovery.

C. early expansion.

3. **Describe** how bonds and equities typically perform during deflationary periods.

MODULE 1.4: MONETARY AND FISCAL POLICY

Video covering this content is available online.

LOS 1.h: Discuss the effects of monetary and fiscal policy on business cycles.

Monetary Policy

Central banks often use monetary policy as a countercyclical force, attempting to optimize the economy's performance. Most central banks strive to balance price stability against economic growth. The ultimate goal is to keep growth near its long-run sustainable rate, because growth faster than the long-run rate usually results in increased inflation. As discussed previously, the later stages of an economic expansion are often characterized by increased inflation. As a result, central banks usually resort to restrictive policies toward the end of an expansion. The risk at this stage is that they may overtighten and cause a recession.

To spur growth, a central bank can take actions to reduce short-term interest rates. This results in greater consumer spending, greater business spending, higher stock prices, and higher bond prices. Lower interest rates also usually result in a lower value of the domestic currency, which is thought to increase exports. In addition to the direction of change, the level of interest rates is important. If, for example, rates are increased to 4% to combat inflation, but this is still low compared to the average of 6% in a country, then this absolute rate may still be low enough to allow growth while the rise in rates may begin to dampen inflation. The equilibrium interest rate in a country (the rate at which a balance between growth and inflation is achieved) is referred to as the neutral rate. It is generally thought that the neutral rate is composed of an inflation component, a real growth component, and judgment from policy makers. If, for example, inflation is targeted at 3% and the economy is expected to grow by 2%, then the neutral rate would be 5%.

The neutral rate is the rate that most central banks strive to achieve as they attempt to balance the risks of inflation and recession. If inflation is too high, the central bank should increase short-term interest rates. If economic growth is too low, it should decrease interest rates. The **Taylor rule** embodies this concept. Thus, it is used as a prescriptive tool (i.e., it states what the central bank should do). It also is fairly accurate at predicting central bank action.

The Taylor rule determines the target interest rate using the neutral rate, expected GDP relative to its long-term trend, and expected inflation relative to its targeted amount. It can be formalized as follows:

$$n_{target} = r_{neutral} + i_{expected} + [0.5(GDP_{expected} - GDP_{trend}) + 0.5(i_{expected} - i_{target})]$$

where:

n_{target} = target nominal short-term interest rate

$r_{neutral}$ = neutral real short-term interest rate

$GDP_{expected}$ = expected GDP growth rate

GDP_{trend} = long-term trend in the GDP growth rate

$i_{expected}$ = expected inflation rate

i_{target} = target inflation rate

EXAMPLE: Calculating the short-term interest rate target

Given the following information, **calculate** the nominal short-term interest rate target.

Neutral rate	3%
Inflation target	2%
Expected inflation	4%
GDP long-term trend	2%
Expected GDP growth	0%

Answer:

$$n_{target} = 3\% + 4\% + [0.5(0\% - 2\%) + 0.5(4\% - 2\%)]$$
$$= 7\% + (-1\% + 1\%) = 7\%$$

In this example, weak projected economic growth would call for cutting interest rates if inflation were not a consideration. If the central bank was only concerned with growth, the target interest rate would be 1% lower than the neutral rate. However, the higher projected inflation overrides the growth concern because projected inflation is 2% greater than the target inflation rate. In net, the target rate is 7% because the concern over high inflation overrides the weak growth concern.

PROFESSOR'S NOTE

The Taylor rule can also be expressed in terms of the real inflation-adjusted target rate by moving expected inflation to the left-hand side of the equation.

$$n_{target} - i_{expected} = r_{neutral} + [0.5(GDP_{expected} - GDP_{trend}) + 0.5(i_{expected} - i_{target})]$$

Negative Interest Rates

Negative interest rates were generally considered a hypothetical curiosity before the 2007–2009 financial crisis. A *negative rate* is defined as a net payment made to keep money on deposit at a financial institution or payment of a net fee to invest in short-term instruments.

Zero was regarded as the sustainable lower rate of interest because investors could hold physical cash instead (earning no interest). As investors withdrew funds from banks to hold cash, bank balance sheets would shrink as they paid out funds and

stopped making loans. Simple supply and demand analysis should dictate that with a smaller supply of funds available to lend, the price paid (interest rate) to borrow increases.

The flaw in this analysis was that negative interest rates did not cause the expected large move into physical cash. The daily exchange of funds in modern economies is too large. The implicit advantages of being able to quickly transfer large amounts of money held on deposit to settle transactions outweighed the explicit cost of holding those deposits at negative rates. Without the exit of funds from the banking system, it turned out that negative interest rates were sustainable for extended periods.

As mentioned earlier, the slowdown in economic activity during the crisis and already very low interest rates led some central banks to experiment with less-tested monetary policy—QE approach. QE led to larger injections of funds by central banks into the commercial banking system with the announced intent that these injections were long term in nature. The hope was this would stimulate bank lending and increase economic activity.

Negative interest rates should, in theory, have similar effects. Holders of funds would find it more desirable to spend the money, stimulating economic activity; or, they would invest in longer-term stocks and bonds, driving up prices and creating a wealth effect. Or, negative rates would lead consumers and businesses to borrow at zero or negative rates to spend now.

How these new policies actually end up working remains to be seen. For the policies to work, consumers, investors, and businesses have to believe the risk of spending now is worth it. Purchases and investments made now provide positive economic benefit in the future. But negative interest rates also signal uncertainty as to what the future holds.

Negative interest rates complicate the process of forming capital market expectations:

- The risk-free rate is the starting point for buildup models used to estimate long-run returns for asset classes. When the risk-free rate is negative, a sustainable expected risk-free rate, such as the policy neutral rate in the Taylor rule, is more appropriate as that starting point. That rate is generally not regarded as fully risk free, so a modest default premium can be removed.
- Forming capital market expectation over shorter time horizons is further complicated by a need to forecast the time path over which negative rates will converge to a long-run sustainable risk-free rate. Multiple path projections should be considered to allow for uncertainty regarding how the convergence will occur.
- Another approach to shorter-term projections of asset class returns is to interpret negative risk-free rates as being consistent with contraction or early recovery stages of the business cycle.
- Using historical data as a starting point for forecasting is more problematic because few comparable periods exist, and the negative rates suggest significant structural economic changes are occurring. This kind of regime change makes statistics based on historical data less reliable, requiring more subjective assessments. Anticipating

the effects of negative rates when combined with less-tested QE makes forecasting even more challenging.

Fiscal Policy

Another tool at the government's disposal for managing the economy is fiscal policy. If the government wants to stimulate the economy, it can implement loose fiscal policy by decreasing taxes or increasing spending, thereby increasing the budget deficit. If they want to rein in growth, the government does the opposite to implement fiscal tightening.

There are two important aspects to fiscal policy. First, it is not the level of the budget deficit that matters—it is the change in the deficit. For example, a deficit by itself does not stimulate the economy, but increases in the deficit are required to stimulate the economy. Second, changes in the deficit that occur naturally over the course of the business cycle are not stimulative or restrictive. In an expanding economy, deficits will decline because tax receipts increase and disbursements to the unemployed decrease. The opposite occurs during a recession. Only changes in the deficit directed by government policy will influence growth.

The Yield Curve

LOS 1.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.

The yield curve demonstrates the relationship between interest rates and the maturity of debt securities. The curve is sensitive to government actions as well as current and expected economic conditions. When both fiscal and monetary policies are expansive, for example, the yield curve is sharply upward sloping (i.e., short-term rates are lower than long-term rates), and the economy is likely to expand in the future. When fiscal and monetary policies are restrictive, the yield curve is downward sloping (i.e., it is *inverted*, as short-term rates are higher than long-term rates), and the economy is likely to contract in the future.

Fiscal and monetary policies may reinforce or conflict with each other. If the policies reinforce each other, the implications for the economy are clear. In all cases, there are likely implications for the yield curve:

- If both policies are stimulative, the yield curve is steep and the economy is likely to grow.
- If both policies are restrictive, the yield curve is inverted and the economy is likely to contract.
- If monetary policy is restrictive and fiscal policy is stimulative, the yield curve is flat and the implications for the economy are less clear.
- If monetary policy is stimulative and fiscal policy is restrictive, the yield curve is moderately steep and the implications for the economy are less clear.

In terms of the business cycle, the yield curve is typically steep at the bottom of the cycle. As the cycle moves toward expansion, the curve tends to flatten. At the top of the cycle, the yield curve will likely be flat to inverted. During contraction, the curve will begin to re-steepen. Given these expectations, analysts can use the yield curve as a predictor of the state of the economy as well as the future path of interest rates. However, analysts should also exercise caution that these relationships may not always hold.

International Considerations

LOS 1.j: Identify and interpret macroeconomic, interest rate, and exchange rate linkages between economies.

Economic links between countries have become increasingly important with globalization, especially for small countries with undiversified economies. Larger countries with diverse economies, such as the United States, are less affected but still influenced by globalization.

Macroeconomic links can produce convergence in business cycles among economies. International trade produces one such link, as a country's exports and economy are depressed by a slowdown in a trading partner's economy and level of imports. International capital flows produce another link if cross-border capital investing by a trading partner declines as its economy contracts.

A country's current account and capital account are measures of macroeconomic linkages. The current account largely consists of a country's net exports while the capital account reflects net investment flows. The two accounts are opposites of each other in that a surplus in one account will produce a deficit in the other.

A useful relationship for understanding how the current account influences economic activity is the following formula:

net exports = net private saving + government surplus

$$(X - M) = (S - I) + (T - G)$$

where:

X = exports
M = imports
S = private saving
I = investment spending
T = tax
G = government spending

Interest rates and currency exchange rates can also create linkages. A strong link is created when a smaller economy "pegs" its currency to that of a larger and more developed economy. The peg is a unilateral declaration by the pegging country to maintain the exchange rate. In general, the linkage between the business cycles of the two economies will increase, as the pegged currency country must follow the economic