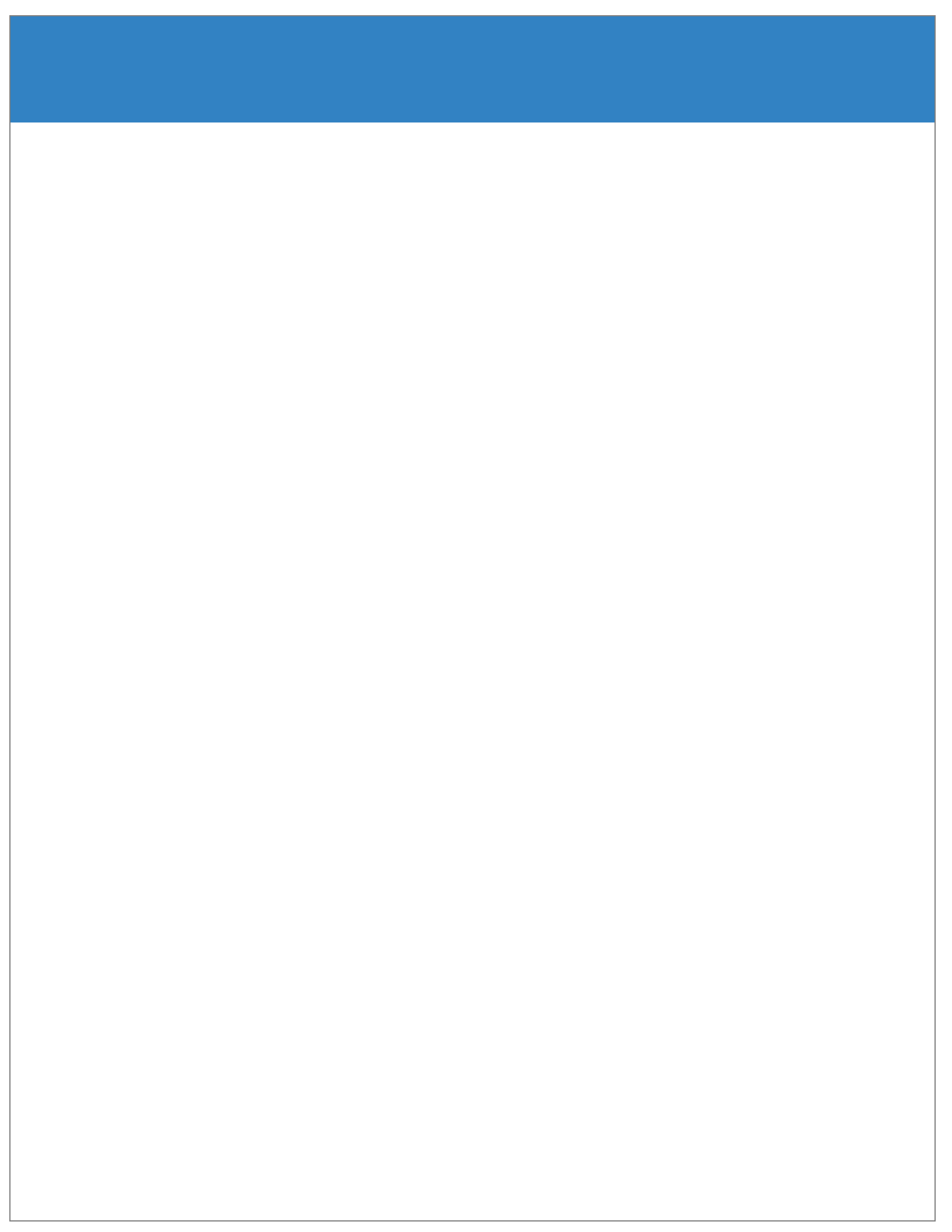




Asset Allocation



Learning Module 1

Capital Market Expectations, Part 1: Framework and Macro Considerations



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

LOS: Discuss challenges in developing capital market forecasts.

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

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

LOS: Compare major approaches to economic forecasting.

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

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

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

LOS: Interpret the shape of the yield curve as an economic predictor and discuss the relationship between the yield curve and fiscal and monetary policy.

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

A Framework for Developing Capital Market Expectations



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

LOS: Discuss challenges in developing capital market forecasts.

The expected risk and return properties of investor-defined asset classes are known as **capital market expectations** (CME). CME are a critical input to an investor's strategic asset allocation; therefore, analysts must properly form the CME set with realistic risk and return projections to help investors reach their goals.

The technology bubble of the 1990s showed how using risk and return projections based on historical data can result in overoptimistic CME inputs that can put investor goals at risk. As a result, most institutions now use forward-looking rather than historical estimation for developing CME.

Although it's not always possible to have precise estimates of the future, it's important to ensure internal consistency across asset classes (**cross-sectional consistency**) and over time (**intertemporal consistency**) in order to best determine the strategic asset allocation likely to achieve risk–return objectives.

The following approach helps add discipline to setting CME:

1. Specify the expectations set (i.e., asset classes) and time horizons.
2. Research the historical record to develop some possible ranges for future results.
3. Specify the methods/models and their required inputs.
4. Determine the best information sources.
5. Implement the research and investment process. Apply experience and judgment to interpret the current investment environment. Make sure to apply consistent assumptions, compatible methods, and consistent judgments to ensure cross-sectional and intertemporal consistency.
6. Provide the necessary expectations set along with documented conclusions.
7. Use actual outcomes as feedback to the expectations-setting process.

While several cycles may be necessary to validate longer-term conclusions, the actual data may inform the current expectations-setting cycle.

Asset classification detail should guide formation of the input set for CME, but some general ways to slice the data include:

- Geographic, regional or country; political; economic bloc (e.g., European Union)
- Major asset class and subclasses
 - Equity—style, size, sector, industry
 - Fixed income—issuer, maturity, credit quality, securitization, fixed versus floating, nominal versus inflation-protected
 - Real assets—real estate, commodities, timber
 - Other alternative assets

Longer time horizons generally suggest using a discounted cash flow approach. Analysts should make sure to seamlessly integrate shorter-period estimates with longer time frame projections in order to maintain intertemporal consistency.

Good forecasts are generally:

- Objective, unbiased, and well researched;
- Efficient in minimizing forecast errors; and
- Cross-sectionally and intertemporally consistent.

Limitations of the Data Used

Analysts need to understand the limitations of the data they use with respect to accuracy, timeliness, variable definition, and series construction.

Data from some sources may be reported at **lags** of up to two years, impairing its usefulness for assessing current market conditions. Analysts must also be careful when using data that was subsequently subject to revision—models should not assume that the revision was known when the data was initially released, as this can lead to spurious relationships. Analysts must be aware of when indexes are **rebased** (i.e., resetting the index constituents and value to a particular time period) and should be careful not to compare data relating to different base periods. Data may also be subject to **survivorship bias**, in which only successful entities are included in the reporting, or **smoothing**, in which the use of appraisal-based data in illiquid markets understates true asset price volatility.

It is generally assumed that the more data used in analysis, the better the resulting forecast. However, this can be problematic when using historical data for forecasting. The further back in time an analyst goes in the collection of data, the less relevant the data is likely to be to current market conditions. Changes in

risk/return relationships (known as **non-stationarity**) due to shifts in technological, political, or regulatory environments are referred to as a change in **regime** and are more likely to occur over longer time periods. An analyst should use as much data as possible, but only data that is unlikely to have experienced a regime change with respect to current market conditions (e.g., a policy switch to negative interest rates or emergency monetary policy such as quantitative easing).

Using more *frequent* observations in a particular time period tends to improve variance, covariance, and correlation estimates; it does *not* necessarily result in greater forecast accuracy for the sample mean. For statistical reasons, the number of observations required to estimate covariance must exceed the number of variables (e.g., assets) in the analysis. In cases with many variables, **factor models** may be used to reduce the number of variables to keep data requirements reasonable. For example, the returns of 30 assets being explained by three or four systematic factors plus an uncorrelated idiosyncratic (asset-specific) factor for each asset requires only that correlations of factors be estimated rather than the pairwise correlations that exist between all 30 assets.

Increasing the frequency of observations increases the chance that data becomes **asynchronous**, meaning that data for different variables labeled as relevant to the same period may not truly relate to the same time period. For example, data for the same day may not overlap due to the variables relating to different time zones.

Ex post (historical) risk/return may be very different than **ex ante** (expected) risk/return. For example, historical analysis of central bank monetary policy decisions might observe a decision to keep interest rates unchanged which led to a market rally. However, the market rallied because *prior* to the decision, the market expected (ex ante) the central bank to raise rates. Ignoring this expectation of a negative event would lead to overestimating current ex ante returns. Conversely, historical data that includes a crash may be overly pessimistic for the current period if a similar event is not likely to occur.

When using risk measures that only consider the subset of worst case outcomes, data that includes rare events can overstate the likelihood of such events happening in the future. For example, the decline in the shares of Facebook (not Meta) during March 2020 (related to COVID-19) overstate the probability of similar downturns occurring in the future.

Biases in Methods Employed

Analysts should be wary of looking through a data set in search of relationships that have no economic rationale (**data mining bias**). Analysts should also be aware that relationships may be time-period specific (**time-period bias**), and should check that any forecasted relationship works well on data that was *not* used to establish the model (“out of sample” data).

Forecasts should reflect **conditioning information**, that is, how relationships are likely to behave in the current period, given the current market conditions. For example, it may be assumed that the average beta for a security over a full market cycle is 1. However, it is also well established by the data that the beta is 1.2 in falling markets and 0.8 in rising markets. An analyst who ignores the fact that the current period is expected to see a rising market would overestimate the beta, and the returns, of the security.

Analysts should be aware that correlation does not always equal **causation**. Conversely, a lack of correlation may not indicate a complete lack of relationship between two variables since correlation only measures the strength of *linear* relationships. There may still exist a *nonlinear* relationship between variables that exhibit zero correlation.

Psychological Biases of Individuals Involved

Behavioral biases that could lead to forecast errors include:

- **Anchoring bias**—Giving too much weight to initial information with insufficient adjustment when new information is received.
- **Availability bias**—Overemphasizing recent or extreme events because they have a stronger impression than other possible outcomes.

- **Confirmation bias**—Seeking and overweighting evidence that confirms existing or preferred beliefs.
- **Status quo bias**—Perpetuating initial information through a desire to avoid errors involved with change.
- **Overconfidence bias**—Overestimating the ability to understand and use information, which often results in failing to consider all possible outcomes, especially in the “unknown unknowns” category.
- **Prudence bias**—Avoiding forecasts that appear extreme so as not to damage one’s reputation if the forecast is wrong. This may lead to underweighting the expectation of a non-consensus outcome.

Uncertainty

Forecasts generally are subject to three kinds of uncertainty:

1. **Model uncertainty**—Choosing the conceptually and structurally incorrect model. For example, an analyst could choose to model expected returns through a single factor model such as CAPM, when in reality there are multiple relevant factors that explain an asset’s return.
2. **Input uncertainty**—Related to the errors in the underlying data. For example, if the analyst chooses to use the CAPM, he or she needs to estimate the market risk premium as an input to the model.
3. **Parameter uncertainty**—Related to the errors in estimated parameters. For example, the analyst using CAPM must estimate the relative systematic risk (i.e., beta) of the security being analyzed.

Economic and Market Analysis (Part 1)



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

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

LOS: Compare major approaches to economic forecasting.

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

LOS: Explain the relationship of inflation to the business.

Trends are related to long-term rates of change; cycles are shorter-term fluctuations around the longer-run trend. Some series, such as demographic trends, may be easy to forecast based on slowly evolving data. However, trends may be interrupted by regime change, described earlier, or by some other exogenous shock.

Exogenous shocks involve changes from outside the existing system, such as policy changes, geopolitics, natural disasters, or financial crises. For our purposes, exogenous shocks may also include disruptive changes in technology or impacts to a supply chain.

Financial crises may be grouped into three types:

- Type 1—A permanent, one-time decline with resumption of the trend rate after the initial shock.
- Type 2—No persistent one-time decline but continuing at a lower trend rate.
- Type 3—Both a permanent, one-time decline and continuation at a lower trend rate.

In some cases, policy missteps result in the one-time shock whereas new structural considerations may contribute to continuation at a lower trend rate.

Long-term economic trend analysis is generally based on the *inputs* to economic growth:

- Labor input growth
 - Increase in hours worked
 - Increase in labor force size (population growth)
 - Increase in labor force participation rate
- Labor productivity growth
 - Increase in capital inputs
 - Total factor productivity (TFP) increase (i.e., technology improvement)

These components of growth can be summed together to attain an estimate of the long-term trend real growth rate of an economy. Expected inflation would be added to this to estimate the long-term nominal growth rate of the economy.

Default-free bond rates (e.g., U.S. Treasuries) are both theoretically and empirically observed to be linked to the trend rate of GDP growth. That is, countries with high trend growth tend to also have high bond yields.

Similarly, aggregate equity market value is also directly related to long-term trend GDP growth. This is best demonstrated by viewing the value of the stock market (V_e) as a combination of GDP, corporate earnings as a percentage of GDP (E/GDP), and the price-to-earnings multiple (P/E) as follows:

$$V_e = GDP \times \frac{E}{GDP} \times \frac{P}{E}$$

The key insight here is that corporate earnings as a percentage of GDP (E/GDP) and the price-earnings multiple (P/E) *cannot* continually rise over the long term (it would not make sense for workers to work in a world where all GDP wealth flowed to corporate earnings (E/GDP), or for valuations (P/E) to increase without bound). Hence, the only way the value of the stock market can increase over the long term is through long-term growth in GDP. Note that this analysis explains the long-term *capital appreciation* of the stock market; expected dividend yield would need to be added to this to estimate the total returns of the equity market.



Example 1

An analyst compiles the following estimates for her domestic economy:

- Labor input growth = 1.4%
- Labor productivity growth = 1.5%
- Inflation = 3.0%
- Dividend yield = 2.5%

The analyst considers the current market to be significantly overvalued due to unsustainable central bank actions. She forecasts that a recent expansion in P/E of 20% on a continuously compounded basis, which occurred over the last 5 years, will likely be followed by a 20% fall over the next 10 years.

What is the analyst's projection for annual continuously compounded domestic market equity returns over the next 10 years?

Solution

Real long-term trend GDP growth = Labor input growth + Labor productivity growth = 1.4% + 1.5% = 2.9%.

Nominal GDP growth = Real GDP growth estimate + Expected inflation = 2.9% + 3.0% = 5.9%.

The analyst also expects P/E ratios to fall by 20% over the next 10 years on a continuously compounded basis. This implies an annual contraction in P/E ratios of $-20\% \div 10 = -2\%$.

Capital appreciation of stock market = Nominal GDP + (E/GDP) + P/E = 5.9% + 0% - 2% = 3.9%.

Note that with no mention of change in earnings as a share of GDP, this would be assumed to be zero.

Annual domestic market equity returns = Capital appreciation + Dividend yield = 3.9% + 2.5% = 6.4%.

There are three distinct approaches to forecast economic change (illustrated in Table 1):

1. **Econometrics**—Uses statistical methods to model relationships among economic variables
 - **Structural models**—Use underlying economic theory to develop a functional form and parameters for the model. For example, a structural credit risk model would theorize that borrowers default when their assets fall below the payments required on their debt, and attempt to model the likelihood of this happening.
 - **Reduced-form models**—Less closely tied to economic theory and more driven by empirical data. For example, a reduced-form credit risk model would model relationships between market conditions and default probabilities based on historical data.
2. **Economic indicators**—Economic statistics representing information on an economy’s past (**lagging economic indicator**), concurrent, or likely future activity (**leading economic indicator**). A diffusion index compiles many leading economic indicators and determines a direction based on how many point up and how many point down.
3. **Checklist approach**—A more subjective approach in which an analyst examines a broad spectrum of economic data and checks which data point in one direction or the other.

Table 1: Strengths and weaknesses of economic forecasting approaches

Forecast Type	Strengths	Weaknesses
Econometric	<ul style="list-style-type: none"> • Many factors help represent reality; robust (valid statistical relationship) • Quickly updated using new data • Provides quantitative estimates • Imposes analytical discipline/consistency 	<ul style="list-style-type: none"> • Complex, time-consuming to formulate • Forecasting inputs difficult • Model may be misspecified due to changing relationships • False precision impression • Turning points hard to forecast
Leading indicators	<ul style="list-style-type: none"> • Intuitive and simple • Focuses on turning points • Available from third parties • Easy to track 	<ul style="list-style-type: none"> • Can provide false signals • Binary (yes/no) directional guidance • Subject to frequent revision <ul style="list-style-type: none"> ○ Current data might not be relevant to historical returns ○ Overstates accuracy due to overfitting in sample

Forecast Type	Strengths	Weaknesses
Checklist approach	<ul style="list-style-type: none"> • Not overly complex • Can include a wide variety of check points (breadth) • Flexible <ul style="list-style-type: none"> ◦ Easily incorporates structural changes ◦ Items easily added/dropped 	<ul style="list-style-type: none"> • Arbitrary, judgmental, and subjective • Manual process that limits ability to combine different types of information • Time consuming

© CFA Institute

A **business cycle** results from short- to medium-term cycles that cause oscillations around the longer-term trend growth rate of an economy. Business cycles represent differences between expectations underlying business decisions and what really happens that affects investment outcomes. The business cycle is not well defined; it varies in both intensity and duration and thus turning points become difficult to forecast.

Business cycles are often characterized into expansion and contraction phases marked by changes in direction at the peak or trough of the phase. Changes in capital market expectations tend to correlate with the economic indicators present during each phase (see Table 2).

Table 2: Phases of the business cycle

Phase	Economic Features	Capital Market Features
Initial recovery (a few months)	<ul style="list-style-type: none"> • After the low point, the output gap is large, inflation is decelerating, stimulative policies remain in place, and the economy starts to grow. 	<ul style="list-style-type: none"> • S-T and L-T government bond yields are likely to be bottoming but may still decrease. • Stock markets may begin to rise quickly as recession fears subside. • Riskier small-cap stocks, high-yield bonds, and emerging market securities start to do well.
Early expansion	<ul style="list-style-type: none"> • Output gap remains negative, but unemployment starts to fall. • Consumers start to borrow to spend; housing and consumer durable demand increases. • Businesses step up production; profits begin to expand rapidly. • Central bank begins to remove stimulus. 	<ul style="list-style-type: none"> • Short rates begin to increase; long rates remain stable or increase slightly. • Flattening yield curve. • Stock prices trend upward.

Phase	Economic Features	Capital Market Features
Late expansion	<ul style="list-style-type: none"> • Positive output gap and danger of inflation; capacity pressures boost investment spending. • Low unemployment, strong profits, rising wages and prices (inflation). • Debt coverage ratios may deteriorate as business borrows to fund growth. • Monetary policy becomes more restrictive. 	<ul style="list-style-type: none"> • Private sector borrowing causes rates to rise. • Yield curve continues to flatten as short rates rise faster than long rates. • Stocks are volatile as investors watch for deceleration. • Inflation hedges (e.g., commodities) may begin to outperform other cyclical assets.
Slowdown	<ul style="list-style-type: none"> • Fewer viable investment projects and overleveraging cause slowing growth; business confidence wavers. • Inflation continues to rise as business pricing attempts to outpace rising input costs. • The economy is vulnerable to shocks. 	<ul style="list-style-type: none"> • L-T bonds may top but S-T rates continue to rise or may peak; yield curve may invert. • Credit spread widens, depressing bond prices for lower credit issues. • Stocks may fall; utilities and quality stocks are likely to outperform.
Contraction (12 to 18 months)	<ul style="list-style-type: none"> • Firms cut investment spending, then decrease production; unemployment can rise quickly (which hinders household formation). • Profits drop sharply; credit markets tighten, accounting transgressions are uncovered, and bankruptcies can result. 	<ul style="list-style-type: none"> • S-T and L-T rates begin to fall; yield curve steepens • Credits spread widens; remains wide until trough. • Stock market <ul style="list-style-type: none"> ○ Early phase—Declining ○ Late phase—Begins to rise

Forecasting the market based on economic cycles is not as easy as this may suggest. While the relationship between the real economy and capital markets is strong, different investors tend to have different viewpoints on the outlook for the phase of the business cycle.

While business cycle analysis sometimes sends a noisy signal, it is likely to be strongest during the one to three years of the expansion or contraction phase. Beyond that range, returns increasingly reflect averaging of an expectation of a turning point.

Deflation (falling prices) is widely considered damaging to the economy because it increases the real value of fixed-rate corporate debt, whilst at the same time corporate income flows are likely to be falling. Also, in periods of persistent deflation it is likely that interest rates fall to very low levels close to (or even below) zero, removing a key monetary policy tool of the central bank to stimulate the economy.

In contrast, moderate inflation imposes only small costs while allowing the flexibility for the economy to grow. Central banks, then, target low inflation and investors consider this in their capital market expectations. Credible central bank targets will tend to result in larger output gaps during the beginning of a recession and greater inflation as the peak approaches, with average inflation near the target over the cycle.

Analysts should assess both the discount rates and cash flows of investments to determine the effects of inflation on asset class returns:

- **Cash equivalents** (short-term interest-bearing instruments)—Relatively attractive when rates rise and unattractive when rates fall, due to their short duration. Inflation protected as long as short-term rates move in line with inflation. May be very attractive in a deflationary environment if interest rates are not allowed to go negative.
- **Bonds**—Due to fixed nominal cash flows, inflation effects are transmitted through yield into price changes:
 - Inflation within the expected inflation range—Shorter-term yields rise or fall more than longer-term yields, but the price impact is small due to the lower duration impact at shorter-term maturities.
 - Inflation above the expected inflation range—Longer-term yields may rise more than expected as investors incorporate higher expected inflation into required returns, causing capital losses to bondholders.
- Persistent deflation can benefit higher-credit issues because issuers will likely still be able to service their debt and these cash flows will have a higher real value to investors. Lower-credit issues, however, may find deflation impairs the creditworthiness of their debt as they struggle to meet the higher real debt payments as prices and income fall.
- **Stocks**—The valuation process considers inflation in the discount rate applied to cash flows; inflation within an expectation range will have little impact on stock prices. Unexpectedly high inflation raises the discount rate and decreases valuations; however, it can benefit companies that can pass on higher costs to customers.
- **Real estate**—Lease rates include an inflation expectation, and inflation expectations within an expectation range will have little impact on asset prices. The effect on lease income of higher-than-expected inflation will depend on the length of underlying leases; shorter leases may increase rent at a faster rate, hence, have more protection against rising inflation. Prime property values will likely increase in line with inflation. Less-than-prime properties are most adversely affected by deflation, as they may have to cut rents to attract tenants.

Implications of Negative Interest Rates for Capital Market Expectations

When interest rates are negative, the long-run equilibrium short-term rate can be used as the baseline rate (upon which we add risk premiums). This rate can be estimated using the neutral rate in the Taylor rule.

In forming capital market expectations for shorter time horizons, investors must consider the expected path of interest rates, which are expected to converge to the long-run equilibrium rate estimate.

Negative policy rates are expected to produce asset class returns similar to those occurring in the contraction and early recovery stage of a more “normal” business/policy cycle.

Economic and Market Analysis (Part 2)



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

LOS: Interpret the shape of the yield curve as an economic predictor and discuss the relationship between the yield curve and fiscal and monetary policy.

Most central banks have the mandate to achieve low inflation and unemployment consistent with the economy’s potential growth. Toward that end, central banks employ monetary policy to help offset the business cycle and maintain a more stable growth environment.

A central bank's ability to counter business cycles will be adversely affected, however, by the lag in deciding and implementing monetary policy. The result of such policy also tends to be uncertain. Therefore, central banks find it difficult to fine-tune the economy based on monetary policy and, in fact, they may reinforce rather than mediate the cycle.

The government may also use fiscal policy (government spending and taxation) to mediate business cycles, however, this is usually used for longer-term objectives rather than short-term fine-tuning for two reasons. First, it takes a long time to decide and implement fiscal policy changes (the decision/implementation time lags involved are longer than those for monetary policy). Second, short-term changes large enough to make a meaningful change endanger ongoing government services due to the large swings in budget deficits that this may cause.

Therefore, monetary policy shoulders most of the responsibility for cyclical mediation, although the government may have some fiscal features in place with countercyclical consequences. For example, countries with a progressive income tax regime—where taxes increase as income rises—automatically slow the economy as people make more money. Also, means-based transfer payments essentially provide an earnings floor if people become unemployed.

Central banks may use the Taylor rule to establish an interest rate target that maintains stable growth:

$$i^* = r_{\text{neutral}} + \pi_e + 0.5(\hat{Y}_e - \hat{Y}_{\text{trend}}) + 0.5(\pi_e - \pi_{\text{target}})$$

where:

i^* = target nominal policy rate

r_{neutral} = *real* policy rate targeted with trend growth and target inflation

$\hat{Y}_e - \hat{Y}_{\text{trend}}$ = expected and trend *real* GDP growth rates

$\pi_e, \pi_{\text{target}}$ = expected and target inflation rates

Subtracting expected inflation from both sides of the equation gives:

$$i - \pi_e = r_{\text{neutral}} + 0.5(\hat{Y}_e - \hat{Y}_{\text{trend}}) + 0.5(\pi_e - \pi_{\text{target}})$$

This expression shows that the *real* target interest rate should be set equal to the real neutral rate *plus* the equally weighted (0.5) adjustments for GDP growth being above trend, and inflation being above target.



Example 2

An analyst has collected the following data regarding the domestic economy:

- Current central bank short-term target rate: 4.5%
- Estimated neutral real policy rate = 2.0%
- Central bank target inflation = 2.5%
- Estimated long-term GDP trend growth = 1.5%

The analyst expects the economy to enter a period where inflation is expected to be 3.0% and GDP is expected to contract by 1.0%.

Use the Taylor rule to assess whether, according to the analyst's expectations, the central bank is likely to increase or decrease its short-term target rate. Briefly discuss the reasons for the move.

Solution

Using the expectations of the analyst for inflation and GDP growth, the Taylor rule predicts a central bank target rate of 4.0% as calculated below:

$$i^* = r_{\text{neutral}} + \pi_e + 0.5(\hat{Y}_e - \hat{Y}_{\text{trend}}) + 0.5(\pi_e - \pi_{\text{target}})$$

$$i^* = 2\% + 3\% + 0.5(-1\% - 1.5\%) + 0.5(3\% - 2.5\%) = 4.0\%$$

Given the current central bank target rate of 4.5%, the Taylor rule suggests that the central bank's next move will be to cut interest rates. This is primarily due to the expected contraction in GDP of 1% versus the long-term trend of 1.5%. Even though inflation is higher than the target, which would suggest higher interest rates should be targeted, this is more than outweighed by the need to cut interest rates due to the expected contraction in GDP.

Although this method of targeting interest rates provides a sense of security, it demands considerable judgment in the choice of targets and measurement of inputs. In fact, none of the variables are observable! It is unlikely that monetary policy can be reduced to a simple equation such as the Taylor rule, however, the rule plays a role in informing policymakers in their decision-making.

Capital market expectations are sometimes made by adding various risk premiums to the risk-free rate under the assumption that it is at its long-term equilibrium level. Under a scenario of negative interest rates (which may be implemented in times of financial crisis), however, analysts may use the long-run equilibrium *short-term* rate in place of an observed negative interest rate. Estimating this rate involves the Taylor rule r_{neutral} , adjusted for the difference between policy rates and default-free rates available to investors.

The path of short-term rates under negative interest rate scenarios may require starting from a negative rate. The shorter the horizon, the more important it becomes to consider variances from the most likely path.

Monetary and fiscal policy should be viewed as affecting both the (1) interest rate *level* and (2) yield curve *shape*.

Everything else equal, large deficits (loose fiscal policy) crowd out domestic private borrowing and raise the *real* interest rate level as available capital diminishes. Tight fiscal policy lowers the *real* interest rate.

Persistently loose monetary policy causes higher actual and expected inflation, which the central bank will eventually be unable to control, which will result in higher *nominal* interest rates. Persistently tight monetary policy reduces actual and expected inflation, resulting in lower *nominal* rates.

Table 3 shows the interaction of the effects.

Table 3: Effects of persistent monetary-fiscal policy mixes

		Fiscal Policy	
		Loose	Tight
Monetary Policy	Loose	High real rates + High expected inflation = High nominal rates	Low real rates + High expected inflation = Mid nominal rates
	Tight	High real rates + Low expected inflation = Mid nominal rates	Low real rates + Low expected inflation = Low nominal rates

The business cycle and fiscal/monetary policy mixes also affect the yield curve slope, which depends on:

1. Expected short-term rates—The business cycle and government policies drive short-term rates and cause the yield curve to flatten or steepen.
2. A risk premium that increases with maturity—The risk premium explains the normally upward slope.
3. The bond supply at various maturities—Government debt issued at specific maturities (due to demand/funding costs) may affect the yield curve shape.

Further, a government with persistently high debt and debt service may use accommodative monetary policy to “inflate away” the real cost of the debt. This will result in lower nominal rates.

In general, however, the yield curve steepens as the business cycle bottoms, flattens during expansion, becomes flat to inverted toward the peak as interest rates rise, and re-steepens during contraction (see Table 4).

Table 4: Policy, rates, and the yield curve over the business cycle

Phase	Money Market Rates	Bond Yield and Curve Effects
Initial recovery	<ul style="list-style-type: none"> • Low/bottoming due to stimulative transition to tightening 	<ul style="list-style-type: none"> • Steep yield curve initially • Shortest yields rise first • Longer yields bottom
Early expansion	<ul style="list-style-type: none"> • Rising, starting to accelerate 	<ul style="list-style-type: none"> • Rising; longer may be stable • Short maturities steepen; longer maturities flatten
Late expansion	<ul style="list-style-type: none"> • Change to restrictive monetary policy; automatic stabilizers • Above average; rising 	<ul style="list-style-type: none"> • Rising at a slower pace • Curve flattening inward from longest maturities
Slowdown	<ul style="list-style-type: none"> • Approaching peak under tight monetary policy 	<ul style="list-style-type: none"> • Peak; may decline sharply • Flat to inverted curve
Contraction	<ul style="list-style-type: none"> • Declining as policy becomes more stimulative 	<ul style="list-style-type: none"> • Declining • Curve steepening

© CFA Institute

International Interactions



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

International Interactions – Macroeconomic Linkages

Relative size and degree of specialization determine the effects of international interactions on a country. For example, a large economy like that of the United States will be less affected by business cycles in other countries. On the other hand, a country with a single raw materials export that dominates its economy may be deeply affected by a slowdown in economies of large, developed countries with falling demand for the export.

A country's **current account** reflects exports and imports of goods and services, investment income flows, and unilateral transfers. Its **capital account** reflects foreign direct investment (FDI), involving productive asset purchases and sales, and portfolio investment (PI), involving financial asset transactions.

The current account and capital account of a country are linked through the **balance of payments**. For a country with a floating exchange rate, the primary buyers and sellers of the country's currency will be represented by the current account and the capital account. In order for a floating exchange rate to be in equilibrium (i.e., for every buyer to have a corresponding seller), a *surplus* on the current account (usually driven by a trade surplus where exports, X , are greater than imports, M) where there are net buyers of a currency, must be offset by a *deficit* on the capital account (i.e., investment overseas) where there are net sellers of the currency. The capital required to invest overseas comes from domestic savings (S) in excess of domestic investment (I), or a government budget surplus where taxes raised (T) are higher than government spending (G). This gives rise to the important macroeconomic relationship:

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

Because financial markets react more quickly to change than the real markets, changes to the current account are reflected quickly in the capital account via short-term interest rates, exchange rates, and financial asset prices.



Example 3

A country with trade and budget deficits embarks on a program of tax refunds and government spending to stabilize the economy after a recent pandemic-related shock.

Determine the most likely impact of this policy on the country's:

- Current account
- Capital account
- Growth versus other countries

Note: Assume that there is no major change to private domestic net savings.

Solution

- A. The government deficit will increase due to aggressive fiscal policy, causing $(T - G)$ to become more negative. With private net domestic savings $(S - I)$ remaining constant, this implies the current account $(X - M)$ balance must also fall, increasing the existing current account deficit.
- b. The increase in the current account deficit will cause an increase in the capital account surplus of the country. The increase in the government budget deficit will need to be financed, and with no change in private net domestic savings, this will have to come from overseas, increasing the capital account surplus.
- c. The growth of the country is likely to be lower than that of other countries, due to the worsening trade deficit. The country will be importing more from overseas, promoting growth overseas, and exporting less, which will have a negative impact on domestic growth.

International Interactions – Interest Rate/Exchange Rate Linkages

A country *cannot* simultaneously:

- Allow capital to flow freely with other countries (high capital mobility)
- Maintain a fixed (pegged) exchange rate
- Set its own monetary policy (interest rates, money supply)

To see why this *cannot* occur, imagine a country trying to simultaneously achieve all three. If the country tightened monetary policy by raising interest rates, with unrestricted capital flow, investment would flow into the country to earn the higher interest rate. To stop the exchange rate from strengthening, the central bank would be forced to sell its domestic currency, thereby increasing the money supply. This increase in the money supply would act as a stimulus to the domestic economy, thereby counteracting the original intention of tightening monetary policy.

Given that these three conditions cannot simultaneously be met, it can be concluded that countries with high capital mobility and a fixed exchange rate must have the same interest rates (i.e., monetary policy). Note that, for interest rates across all maturities of the yield curve to be the same, the country must have a credible policy of fixing the exchange rate *forever*, not just in the short term. If currencies are pegged without full credibility, then sovereign bond yields will be higher to compensate investors in the weaker currency.

In a floating exchange rate regime, the link between interest rates and exchange rates is expectational: interest rates should in theory be higher in a currency that is expected to depreciate to compensate investors for foreign exchange losses.

An investor will earn a foreign *real* interest rate if exchange rate movements are driven by inflation differentials alone (i.e., a weakening exchange simply reflects inflation in the country—this is the theory of Purchasing Power Parity, PPP). Empirical evidence dictates that PPP tends not to hold over the investment horizons relevant to many investors, which in turn implies that investors *cannot* earn real risk-free rate differentials across countries. Instead, investors should focus on expected *nominal* interest rate differentials.

Although real rates across the world can be different, they remain linked by the fact that global savings must equal global investment, and that, subject to capital mobility restrictions, capital will flow to the country where it is expected to be most productive.

Learning Module 2

Capital Market Expectations, Part 2: Forecasting Asset Class Returns



LOS: Discuss approaches to setting expectations for fixed-income returns.

LOS: Discuss risks faced by investors in emerging market fixed-income securities and the country risk analysis techniques used to evaluate emerging market economies.

LOS: Discuss approaches to setting expectations for equity investment market returns.

LOS: Discuss risks faced by investors in emerging market equity securities.

LOS: Explain how economic and competitive factors can affect expectations for real estate investment markets and sector returns.

LOS: Discuss major approaches to forecasting exchange rates.

LOS: Discuss methods of forecasting volatility.

LOS: Recommend and justify changes in the component weights of a global investment portfolio based on trends and expected changes in macroeconomic factors.

Forecasting Fixed Income Returns



LOS: Discuss approaches to setting expectations for fixed-income returns.

Applying Discounted Cash Flow (DCF) to Fixed Income

The **discounted cash flow (DCF) approach** to setting expectations assumes that the value of an asset is the present value of its cash flows discounted at investor's the required rate of return. Through the analysis of yield curves, the approach works well for setting return expectations for fixed-income securities. It also allows detailed return decomposition and attribution, as discussed in the curriculum sections on fixed income and performance attribution.

The starting point for the return expectations of a bond is its yield to maturity (YTM), the single discount rate equating the present value of the bond's cash flows to its price. The YTM is only actually earned if the following three conditions are met:

1. The cash flows of the bond are received in full and on time.
2. The bond is held to maturity. If the bond is sold prior to maturity, the investor will underperform the YTM if interest rates have risen over the investment horizon, causing bond prices to fall.
3. Cash flows are reinvested at the YTM. The investor will underperform the YTM if interest rates fall, causing early cash flows received on the bond to be reinvested at a rate lower than that of the original YTM of the bond.

Generally, the effects of conditions 2 and 3 offset each other, and if the investment horizon is equal to the (Macaulay) duration of the bond or portfolio, they will roughly cancel out. If the investment horizon is less than the duration of the portfolio, then condition 2 will dominate and the investor will underperform the YTM when interest rates rise. Conversely, if the investment horizon is greater than the portfolio's duration, condition 3 will dominate and the investor will underperform the YTM when interest rates fall.

Note that the timing of an expected interest rate move *does* matter, since earlier shifts in longer investment horizons will have a larger impact on reinvestment return.

The Building Block Approach

The building block approach breaks the expected return for a fixed-income security into the following four components: the short-term nominal default-free rate, a term premium (to compensate investors for duration risk), a credit premium, and a liquidity premium.

Short-Term, Nominal Default-Free Rate

The short-term nominal default-free rate is usually proxied by the government zero-coupon bill with the shortest maturity (e.g., three months). This is the only directly observable component of expected return and is closely tied to the central bank's policy rate, which will rise and fall in line with the business cycle. Short-term default-free rates that reflect a negative policy rate are likely to underrepresent investment risk and may require normalization to more usual non-negative values. Alternatively, other risk premiums may be increased to reflect elevated willingness to pay for safety.

Term Premium

The term premium is based on the instrument's horizon—it is usually positive, increases with maturity, and varies over time. The term premium is driven by:

- **Level-dependent inflation uncertainty**—Arguably the main driver of term premium. High levels of inflation tend to lead to higher levels of inflation *uncertainty*. Hence, high inflation increases the term premium due to both the high expected inflation and an increased inflation risk (i.e., less accuracy in forecasting inflation).
- **Supply and demand**—High demand and undersupply for longer-dated bonds will lead to lower long-term yields and a flatter yield curve.
- **Cyclical effects**—The yield curve slope varies substantially over the business cycle—steep at the trough of the cycle and flat or even inverted around the peak. This is mainly due to short-term policy rates moving in line with the business cycle.
- **Ability to hedge recession risk**—If a type of asset performs well when the economy is weak, then its term premiums will be lower. A **demand shock** is likely to see risky assets underperform and bonds act as a safe haven, implying a relatively low term premium. However, a **supply shock** to economic activity would likely be inflationary, leading to higher interest rates and lower bond prices. In this situation, a high term premium would be warranted.

Credit Premium (Default Risk)

The credit premium is based on issuer creditworthiness, including both expected losses and additional risk of unexpected losses. Primary drivers are:

- **Downgrade bias** (the chance of downgrade exceeding the chance of upgrade) for AAA and AA bonds
- **Cyclical risk** affecting spreads for A and BBB bonds
- **Default risk** for below-investment-grade bonds

Although a longer maturity would suggest greater opportunity for loss, and therefore larger credit premiums, historical evidence suggests that shorter-dated credit premiums are surprisingly attractive, relative to

longer-dated credit premiums. This may be due to lower prices resulting from illiquidity at the short end, since old issues become less liquid as they approach maturity. It may also be related to the “event risk” of large proportional losses due to default remaining on short-dated instruments with only a few years of returns left as compensation. Either way, the high credit spreads at the shorter end of the yield curve have given rise to the **credit barbell** trade, which involves taking credit exposure at the short end of the curve and duration exposure through longer-maturity government bonds.

Liquidity Premium

The liquidity premium is based on the ability to trade a bond with little market impact and transaction cost. The most liquid bonds are recently issued sovereign bonds, current-coupon mortgage-backed securities (MBS), and the largest high-quality corporate bonds. Outside of these issues, liquidity depends on the inventories of securities held by bond dealers, which will be higher for bonds that are of higher quality, more recently issued, larger in issue size, priced closer to par, issued by a well-known issuer, or simple in structure.

Risks in Emerging Market Bonds



LOS: Discuss risks faced by investors in emerging market fixed-income securities and the country risk analysis techniques used to evaluate emerging market economies.

Investors in emerging market debt face the same fixed-income risks as those in developed markets (e.g., duration and default), plus the risks outlined below, which are broadly categorized as “ability to pay” and “willingness to pay.”

Economic Risks/Ability to Pay

Relative to developed markets, emerging markets’ sovereign fixed-income markets may have:

- A less diverse tax base due to greater concentration of wealth
- Vulnerability to capital flight during a crisis (i.e., capital being withdrawn from the economy)
- Less educated/skilled workforce, limited infrastructure, and/or less technological sophistication
- Greater dependence on commodities and agriculture (i.e., cyclical industries with low pricing power)
- Small, less sophisticated financial institutions and markets
- Restrictions on trade, capital flows, and exchange rates
- Poor monetary discipline and fiscal control
- Reliance on foreign borrowing, especially from developed countries with hard currency

Political and Legal Risks/Willingness to Pay

- Unstable coalition governments unwilling to honor promises by previous/current regimes
- Sovereign immunity can make it difficult or impossible to get the government to pay debt
- Weak property rights laws and enforcement, leading to the inability to enforce claims or recover capital

Warning signs of potential inability or unwillingness to pay might include:

- Debt/GDP ratio greater than 70–80%
- Foreign debt greater than 50% of GDP or 200% of current account receipts
- Annual real growth less than 4%

- Persistent current account deficits greater than 4% of GDP
- Foreign exchange reserves less than 100% of short-term debt

Access to the International Monetary Fund (IMF) or the World Bank may slightly reduce concerns about ability or willingness to pay.

Analysts should consider looking at how the market has historically responded to problems associated with this list, understanding that past performance is no guarantee of future results.

Forecasting Equity Returns



LOS: Discuss approaches to setting expectations for equity investment market returns.

Historical Statistics Approach

Sample averages, even over very long histories, provide imprecise estimates for mean return unless the variance of the data is small relative to the mean. Different countries have different characteristics, but equity returns generally do not have small variance relative to the mean. Confidence intervals for the true mean returns of different countries therefore largely overlap, meaning there is little statistical support for believing that true mean equity returns differ much across countries.

Discounted Cash Flow (DCF) Approaches to Equity Returns

The Gordon growth model can be used to isolate the expected return in equity markets in order to set capital market expectations. This model links long-term changes in equity market value to changes in economic growth. The relatively noisy, in terms of volatility, impact of the P/E ratio and the ratio of earnings-to-GDP can fortunately be ignored in this model.

The **Grinold-Kroner model** extends the Gordon growth model to consider the effects of share repurchases and changes in valuation levels through the forecast horizon. Under this model, the expected return on an equity market, $E(R_e)$, is given by the formula:

$$E(R_e) = \frac{D}{P} + (\% \Delta E - \% \Delta S) + \% \Delta P/E$$

where

$$\frac{D}{P} = \text{Dividend yield}$$

$\% \Delta E$ = Nominal earnings growth rate

$\% \Delta S$ = Expected percentage change in shares outstanding

$\% \Delta P/E$ = Growth rate of the P/E ratio (the “repricing return”)

Some points of note:

1. The term $-\% \Delta S$ is referred to as the “rate of net share repurchases” and represents income from company buybacks. Hence, the “income” component of expected return is $D/P - \% \Delta S$.
2. Expected capital gains are composed of the nominal earnings growth rate, $\% \Delta E$, plus the repricing return, $\% \Delta P/E$.
3. The term $(\% \Delta E - \% \Delta S)$ represents the estimated rate of change of earnings *per share*.