

## 1. INTRODUCTION & FRAMEWORK FOR DEVELOPING CAPITAL MARKET EXPECTATIONS

**Capital market expectations (CME)** (also known as macro expectations) represent the investors' expectations regarding the risk and return prospects of broad asset classes. They help investors in formulating their strategic asset allocation, that is, in setting rational return expectations on a long-term basis for the asset classes of their portfolios.

Further, these formulated CME settings help investors in establishing the risk and return prospects of individual assets and facilitate investors in security selection and valuation.

Long-run portfolio performance is primarily determined by **asset allocation**. Realistic long-run return projections are crucial. For example, until the late 1990s, many institutional used to predict future returns by extrapolating historical returns. Inflated or unrealistic return projections may result in volatile (often underfunded) obligations and unrealistic goal settings. Now, majority of the institutions have chosen forward-looking methods to project returns.

Projecting accurate asset returns even using advanced methods is quite challenging. Therefore, the emphasis should not be on accuracy but on **limiting the forecast errors** and ensuring **cross-sectional consistency** (internal consistency across asset classes) and **intertemporal consistency** (across various time horizons).

### Framework and Challenges

#### A Framework for Developing Capital Market Expectations

A framework for developing Capital market expectations has the following seven steps.

**1. Specify the set of expectations needed, including the time horizon(s) to which they apply.** Analysts must specify the explicit list of asset classes and investment horizons on which they need to develop capital market expectations.

**2. Research the historical record:** For many forecasts, historical data provide some useful information on the

investment characteristics of the asset and factors that affect asset class returns.

Analysts are required to divide the data into multiple dimensions such as:

- Geographical area (e.g., global, regional, domestic, nondomestic, individual countries); or
- Broad asset class (e.g., equity, fixed-income, or real estate); or
- Sub-asset classes:
  - Equities: styles, sizes, sectors, industries;
  - Fixed Income: maturities, credit quality, fixed versus floating, nominal versus inflation protected etc.
  - Real Assets: real estate, commodities, timber.

**3. Specify the method(s) and/or model(s) to be used and their information requirements.** The analyst should clearly specify and justify the method(s) and/or model(s) that will be used to develop CME keeping in view the investment's time horizon e.g. a discounted cashflow method is most appropriate to use for developing long-term equity market forecasts.

**4. Determine the best sources for information needs.** The analysts/investors should search for the best and most relevant sources for the information needed and should be constantly aware of latest superior sources for their data needs; researching the quality of alternative data sources, avoiding flawed data, using commercially available and reputable financial publications.

In addition, the analysts must select the appropriate data frequency e.g., long-term data series should be used for setting long-term expectations or evaluating long-term volatility. In general:

- For setting long-term CME, monthly, quarterly or annual data series are useful.
- For setting shorter-term CME, daily data series are useful.

This step lays the foundation for 5<sup>th</sup> and 6<sup>th</sup> steps.

**5. Interpret the current investment environment using the selected data and methods, applying experience and judgement.** The analysts should carefully apply set of assumptions, compatible methodologies and judgement to interpret steady forecasts across asset classes and over time horizons.

**6. Provide the set of expectations needed, documenting conclusions.** Analysts should document reasoning and assumptions associated with their conclusions.

**7. Monitor actual outcomes and compare them with expectations, providing feed-back to improve the expectations-setting process.** This step involves monitoring and comparing actual outcomes against expected outcomes developed in step 6, to monitor and review outcomes and to identify weaknesses in the CME development process so

that the expectations-setting process or methods can be improved.

**Three Characteristics of Good Forecasts.** Good forecasts are:

- i) unbiased, objective and well researched;
- ii) efficient (lesser forecast errors)
- iii) internally consistent (cross-sectionally and intertemporally)

**Practice:** Example 1 from the CFA Institute's Curriculum



## 2. CHALLENGES IN FORECASTING

### 1. Limitations of Economic Data

The data and assumptions used in the forecasting model must be error free. The challenges associated with forecasting include:

- **Time lag** with which economic data are collected, processed, and disseminated. For example, the IMF sometimes provides macroeconomic data for developing economies with a lag of two years or more. The greater the time lag before information is reported (i.e. the older the data), the greater the risk that it provides irrelevant and uncertain information about the present situation.
- **Official revisions** to initial data. Sometimes only recent data points are revised. In some other cases all or portion of the historical data series is revised called 'benchmark revisions'.
- **Definitions and calculation methods may change over time.** This may affect the validity of time-series data.
- **Changes in the construction method of data.** The bases of indices of economic and financial data are changed on a periodic basis to reflect more current bases. This process is known as re-basing. Re-basing simply reflects

a mathematical change rather than substantive change in the composition of an index. Re-basing may result in risk of mixing data indexed to different base.

### 2. Limitations of Economic Data

The errors and biases in data measurement include:

- **Transcription errors:** Errors relating to gathering and recording of data are called transcription errors.
- **Survivorship bias:** Survivorship bias occurs when a data series reflects only data on surviving (or successful) entities. For example, hedge fund data are often subject to survivorship bias.
- **Appraisal (smoothed) data.** Infrequently traded and illiquid assets (e.g., real estate, private equity etc.) do not tend to have up-to-date market prices; rather, their values need to be estimated, known as appraised values. Appraised (smoothed) data represents less volatile asset values. As a result, the correlations of such assets with traditional assets (such as equities and fixed income) and risk (S.D.) of the assets are underestimated or biased downward.

### 3. The Limitations of Historical Estimates

Though historical data is used to forecast future outcomes, however, two primary challenges are notable:

- i) historical data may not be good predictors of future results.
  - ii) statistics from historical data may be poor estimate of desired metrics even when historical data fairly represent the future.
- **Changes in regime:** Risk/return characteristics of asset classes may change as a result of changes in technological, political, legal & regulatory environments and disruptions i.e., war or natural disaster. These shifts are called '**changes in regime**', which introduce the statistical problem of **non-stationarity** (where different parts of a data series exhibit different underlying statistical properties).

A sensible approach for determining whether to use a particular data series answer the following two questions:

1. Is there any reason to believe that selected data series exhibit fundamental regime change?
2. Do the data support the notion that the regime change has occurred?

If the answers to above questions are 'Yes', it means there is a change in regime in the sample period and the regime may change in future as well.

- **Frequency of data:** Generally, use of long-time series data increases the precision of estimates and assure stationarity to some extent. Using high frequency data improve the precision of sample variances, covariances and correlations but fail to improve the precision of sample mean.

The higher the frequency of observations (weekly, daily etc.), the higher the likelihood that data is asynchronous (not concurrent in time) across variables and causes lead-lag relationships e.g. issue of time-zone difference of daily data collected from various countries.

- **Data are not normally distributed:** The historical asset returns does not seem to be normally distributed and exhibit skewness and fat tails.

### 4. Ex Post Risk Can Be a Biased Measure of Ex Ante Risk

In general, looking backwards *ex ante* risks are underestimated and *ex ante* returns are overestimated because in looking back we underestimate the possibility of adverse event that did not materialize. This phenomenon is referred to as "peso problem".

The opposite situation i.e. 'overstating the likelihood of adverse event' might also occur when only one such observation (rare event) included in the data series substantially overestimate the likelihood of those adverse events.

### 5. Biases in Analysts' Methods

Data mining bias and time-period bias are among the preventable biases, analysts should consider for developing improved capital market expectations.

- **Data-mining bias** refers to over-using or overanalyzing the same data (i.e. mining the data) until some statistically significant pattern is found in the dataset. A sign that may indicate the existence of data-mining bias is that there is no plausible economic relationship among variables.

The data mining bias can be detected by

- providing economic rationale for the variable's usability
- using out-of-sample data to test the statistical significance of the patterns found in the dataset.

- **Time-period bias** occurs when outcomes are time-period specific. For example, a short time series may give period-specific results that may not be reflected in a longer time period.

### 6. The Failure to Account for Conditioning Information

Risk and return of an asset are conditional upon current as well as prospective economic and market environment. Estimates of expected risk and return based on unconditional forecasts (which dilute information by averaging) may generate erroneous outcomes.

**Example:** Suppose, an analyst is using CAPM to calculate unconditional expected return on an asset class.

- Beta of an asset class in economic expansion is 0.80 and in economic recession 1.2
- Expected return on market during expansion is 12% and during recession is 4%
- Risk-free rate (both recession & expansion) is 2%

Unconditional expected return calculation (using CAPM) by:

- Incorporating conditioning information (approach 1)
- Ignoring conditioning information (approach 2)

#### Approach 1- Incorporating conditioning information:

Expected return on market during:

- expansion =  $2\% + 0.80 (12\% - 2\%) = 10\%$
- recession =  $2\% + 1.20 (4\% - 2\%) = 4.4\%$

Unconditional expected return on the asset class (weighting by probabilities) =  $0.50 (10\%) + 0.50 (4.4\%) = 7.2\%$

#### Approach 2 - Ignoring conditioning information:

Unconditional beta =  $0.50 (0.80) + 0.50 (1.2) = 1.0$

Unconditional expected return on market =  $0.50 (12\%) + 0.50 (4\%) = 8\%$

Unconditional expected return on the asset class =  $2\% + 1.0 (8\% - 2\%) = 8\%$

Approach 2 is **wrong** as this approach **does not** take into account the fact that asset class return varies with business cycle (i.e. beta differs for expansion and recession).

## 7. Misinterpretation of Correlations

A significant correlation between variable A and B implies at least four possible explanations:

1. A predicts B
2. B predicts A
3. C (3<sup>rd</sup> variable) predicts A and B
4. The relationship between A and B is spurious

A thorough investigation is required before applying correlations in a model.

A seemingly significant correlation can be spurious. On the contrary, two variables may reflect weak or zero correlation despite strong but non-linear relationship.

## 8. Psychological Biases

Psychological traps can undermine the analyst's ability to make accurate and unbiased forecasts. There is a long list of psychological biases (under various names and descriptions) that can affect investment decisions. Some popular ones are given below:

1. **Anchoring bias:** It is a tendency of people to give undue emphasis to the initial information/values referred to as 'anchor', and then adjust their final decisions up or down based on that "anchor" value.

To mitigate anchoring bias, analysts should avoid making early judgements.

2. **Status quo bias:** It is a tendency of people to prefer to "do nothing" by maintaining the "status quo" instead of making a change.

- It is closely related with avoiding "error of commission" (regret from an action taken) and making "error of omission" (regret from not taking an action).

The status-quo bias can be overcome by following a disciplined approach in decision-making.

3. **Confirmation bias:** It is a tendency of people to seek information that confirms their beliefs and ignore or discount information that contradicts their beliefs. Confirmation bias implies assigning greater weight to information that supports one's beliefs. This bias can be reduced or mitigated by:

This bias can be reduced or mitigated by:

- collecting and examining complete information
- actively looking for contradictory information and contra-arguments.

4. **Overconfidence bias:** It is a bias in which people demonstrate unwarranted faith in their own intuitive reasoning, judgments, and/or abilities.

- This bias may result in using too narrow range of possibilities or scenarios in forecasting.
- Analysts with overconfidence bias are likely to ignore the possibility of uncertainties they are aware “known unknowns” as well as uncertainties they are unaware “unknown unknowns”.

This bias can be avoided by widening the range of possibilities around the primary target forecast.

5. **Prudence bias:** It is the tendency of analysts to be extremely cautious in forecasting in an attempt to avoid making any extreme forecasts which may adversely impact their career.

The prudence trap can be avoided by incorporating plausible scenarios that may result in more extreme results.

6. **Availability bias:** It is the tendency to assign higher weight to more easily available and/or easily recalled information e.g., information related to catastrophic or dramatic past events, recent events etc.

This bias can be avoided by using objective data and procedures in decision-making.

**Practice:** Example 5 from the CFA Institute’s Curriculum



## 9. Model Uncertainty

Investment analysis may be subject to three kinds of uncertainties:

- Model uncertainty**- whether model is structurally and/or conceptually correct.
  - potentially the most serious issue
  - as a result, analysts may draw fundamentally faulty conclusions
- Parameter uncertainty**- whether model’s parameters are fitting.
  - analysts should be careful about estimation errors.
- Input uncertainty**-whether inputs are correct.
  - mostly occurs when using a proxy for an unobservable variable.
  - is *critical* when analyst’s focus is proof of concept or theory
  - is *less critical* when analyst’s focus is merely drawing valuable empirical relationships.

### ECONOMIC AND MARKET ANALYSIS: THE ROLE OF 3. ECONOMIC ANALYSIS AND ANALYSIS OF ECONOMIC GROWTH: EXOGENOUS SHOCKS TO GROWTH

This section illustrates the significance of economic and market analysis in developing capital market expectations.

#### 1. The Role of Economic Analysis

Historically, there has been a correlation among actual realized asset returns, expected future asset returns and economic activity.

An analyst who has greater ability to predict a change in trend or point of inflection in economy activity and ability to identify economic variables relevant to the current economic

environment is considered to have a competitive advantage. The inflection points are indicators of both unique investment opportunities and source of latent risk.

#### Two major components of Economic Output:

- **Trend Growth:** It identifies the long-term component of growth in an economy. It is relevant for setting long-term return expectations for asset classes.
- **Cyclical Variation:** It measures short-term fluctuations in an economy such as corporate profits and interest rates etc.

## 2. Analysis of Economic Growth

**Economic Growth Trend:** The long-term, average growth path of GDP around which the economy rotates (i.e., slows down or grows) in response to business cycles. Economic trend though related but is independent of business cycle.

Trends are long-term averages whereas cycles are short-term fluctuations. It is comparatively easy to forecast trends than cycles.

Some trends are predictable especially those trends that evolve slowly and are based on easily observable factors e.g. *demographics*. However, some trends such as “*exogenous shocks*” are impossible to forecast.

### Exogenous Shocks to Growth

Shocks may originate from domestic or global sources. Some shocks may enhance potential growth while others may reduce it. Some major types of economic shocks are given below:

- **Policy change:** Pro-growth government policies include sound fiscal policy, competition within private sector, minimal government interference in private sector, sound tax reforms, reduction of trade barriers, support for infrastructure and human capital development etc.
- **New products and technologies:** Technology, innovations and new products plays a greater role in improving potential growth.
- **Geopolitics:** Geopolitical conflicts (trade barriers, using resources to acquire weapons, defense spending) reduce potential growth. Sometimes geopolitical

tensions encourage innovation and introduce growth-enhancing technologies.

- **Natural disasters:** Natural catastrophes destroy production capacity and shrink economic growth in the short run. Overtime growth may increase if old systems are replaced by efficient ones.
- **Natural resources/critical inputs:** Discovery of new natural resources or improved methods to recover them (through lower cost of production) may boost potential growth. On the other hand, persistent supply shortage of resources shrinks growth.
- **Financial crises:** Financial shocks reduce economic growth through decrease in bank lending and investor confidence, and consequently affect the level of output and trend growth rate. Extensive study of 2008 financial crises identified the following *three* types of financial crises with regards to the level of output and trend growth rate:

### Exhibit: Trend Growth after a Financial Crises

	Persistent Drop in Level of output (permanent, one time drop)	Subsequent Trend Rate of Growth
Type 1	Yes	Unchanged
Type 2	No	Reduced
Type 3	Yes	Reduced

Post 2008, Eurozone experienced the Type 3 financial crises.

**Practice:** Example 6 & 7 from the CFA Institute's Curriculum



## 4. APPLYING OF GROWTH ANALYSIS TO CAPITAL MARKET EXPECTATIONS

The expected trend rate of economic growth is applicable in a variety of ways such as:

- It is a key input in discounted cash flow models of expected return.

- The higher the trend rate of economic growth of a country, the more attractive returns are for equity investors.
- The higher the trend rate of economic growth of a country, the faster an economy can grow without any unsustainable increase in inflation.

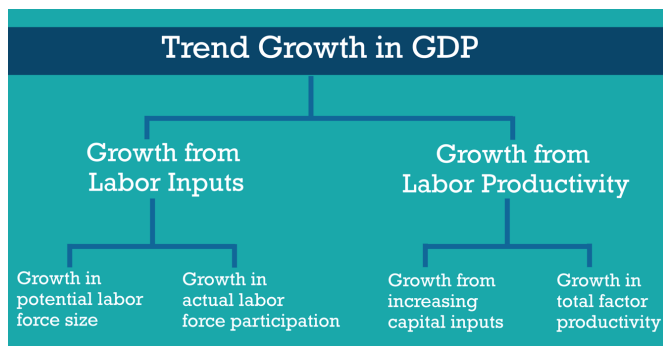


- Level of real government bond yields and trend growth rate are interrelated.

## 1. A Decomposition of GDP Growth and Its Use in Forecasting

### Trend growth in GDP:

- Growth from labor inputs
  - growth in potential labor force size
  - growth in actual labor force participation
- Growth from labor productivity
  - growth from increasing capital inputs
  - growth in total factor productivity (TFP).



### Where,

- **Labor inputs** includes both number of workers and average number of hours they work.
- **Growth in the potential labor force size** is directed by demographics (e.g. population age distribution, net migration, workplace norms etc.). Demographics usually tend to change slowly but not always as the impact of some structural changes is quick.
- **Labor force participation** indicates workers' 'labor versus leisure' decisions. Factors that affect labor force participation includes social norms, rise/fall of real wages, government policies, whether country is getting richer etc.
- **Growth from increasing capital inputs** – investment in additional capital per worker called "capital deepening".
- **Total factor productivity (TFP)** – captures impacts from technological improvements, increase in skilled labor, government regulations.

**Trend growth rate** is considered to be relatively stable in mature developed markets therefore extrapolating past trends can be a reasonable initial estimate of the future growth trend. Same approach with significant adjustments to past trends is applied for less developed markets.

## 2. Anchoring Asset Returns to Trend Growth

Trend growth rate provides a baseline value for estimating:

- bond yields over long horizons** i.e. average level of real (nominal) bond yields is linked to trend rate of real (nominal) growth.
- long-run equity appreciations** i.e. aggregate market value of equity is a product of the following three factors.

$$\text{Aggregate market value of equity } V_t^e = GDP_t \times S_t^k \times PE_t$$

Where,

$GDP$  is a level of nominal GDP

$S_t^k$  is the share of profits in the economy

$PE_t$  is the P/E ratio.

In the long run, growth rate of value of equity (capital appreciation component) in an economy is linked to the growth rate of GDP i.e.  $V_t^e \rightarrow GDP_t$  as the other two factors cannot persistently increase or decrease over long periods.

Forecasting stock market price changes – in short to medium term can be achieved by analyzing expected changes in P/E multiple **and** share of capital (in GDP).

Forecasting dividend yield can be achieved by dividing dividend payout ratio by profit multiple.

High economic growth rate does not necessarily mean high equity market returns because of i) and ii).

**Practice:** Example 5 from the CFA Institute's Curriculum



## 5. APPROACHES TO ECONOMIC FORECASTING

Basic difference between Trend Growth & Econometric Forecasting

	Focuses on	Attributed to
<i>Trend growth rate</i>	long-term average	supply side of economy
<i>Macroeconomic forecasting</i>	Primarily short-to-intermediate term fluctuations (business cycle)	Primarily demand side of economy i.e. (shifts in aggregate demand, but also to short-term aggregate supply curve)

Following are the three economic forecasting approaches:

- Econometric models: the most formal and mathematical
- Economic indicators: variables that lead, lag or coincide with economic turns.
- Checklist approach: subjective

These approaches are not mutually exclusive.

### 1. Econometric Modeling

Econometric models apply statistical methods (comprising of equations) to model the relationships among economic variables to forecast the future.

- **Structural models:** analyze structural relationships among variables based on economic theory.
- **Reduced-form models:** have less detailed knowledge. May range from simple compact form of underlying structural models to data driven models with only a heuristic rationale for choice of variables.
- Econometric models vary from small models to complex models with hundreds of equations.

- Econometric models forecast future values of economic variables (endogenous variable explained by the equation) while modeler supplies the exogenous variables (e.g. exchange rates, interest rates, commodity prices) to the model.

#### Strengths:

- Econometric variable is useful for simulating the effects of fluctuations in key variables.
- Econometric models restrict the forecaster to a certain degree of consistency.
- Econometric models help modelers to reassess the views based on the model's prior conclusion.

#### Limitations:

- Econometric models require measures from the real-world activities and relationships, data on which may not be easily available.
- Variables in the models may be measured with error.
- The model may have faulty assumptions
- Relationships may be wrongly specified due to structural changes in the economy overtime.

Therefore, modelers are required to incorporate past forecast errors into the model and conduct careful analysis of output.

### 2. Economic Indicators

Economic indicators are economic statistics provided by government and established private organizations on an economy's recent past activity or its current or future position in the business cycle.

**Types of Economic Indicators:** Following are the three types of economic indicators.

- Lagging economic indicator:** indicators that reflect recent past economic activity (i.e. change with some time lag with the change in the economy).



- II. **Coincident economic indicators:** indicators that reflect current economic activity (i.e. change simultaneously with the economy).
- III. **Leading Economic Indicator (LEI):** LEIs are indicators that reflect future economic activity (i.e. change before the change in the economy) and therefore help to predict the future performance of the economy. They are regarded as the most important type of economic indicators for analysts.

#### LEI-based analysis:

- is the simplest forecasting approach because it involves only a limited number of variables
- does not require analysts to make assumptions about the path of exogenous variables.

**Composite LEIs or Individual LEI index:** Both individual and composite LEIs are used in analysis. Composite LEIs are a collection of economic data releases that reflect an overall future performance of the economy.

**Diffusion index:** Diffusion index is a measure that reflects number of upward trending indicators and downward trending indicators. E.g., if 8 out of 10 indicators are exhibiting downward trend, it indicates that an economy is likely to contract.

- Composite LEIs are subject to 'look ahead bias' (relying on data that is not yet available) as entire history may be revised each month.
- LEIs are considered to be less effective in assessing the outlook of an economy.

### 3. Checklist Approach

This method involves subjective integration of a range of economic data. The information gathered can be extrapolated into forecasts in two ways i.e. objective statistical methods (i.e. time series analysis) or subjective or judgmental means to assess the outlook for the economy.

#### Strengths:

- It is a simple and straightforward method.

- It provides flexibility as the forecaster is allowed to quickly incorporate structural changes in the economy by changing the variables or the weights assigned to variables within the analysis.

#### Limitations:

- It is time-consuming because it requires analysis of broad range of data.
- It depends on subjective judgment.

### 4. Economic Forecasting Approaches: Summary of Strengths & Weaknesses

Econometric Models Approach	
Strengths	Weaknesses
<ul style="list-style-type: none"> <li>• models can be quite robust and may provide forecasts close to reality.</li> <li>• can be modified readily to accommodate changing conditions.</li> <li>• imposes discipline/consistency on analysis.</li> <li>• provide quantitative estimates of the effects of changes in exogenous variables on the economy.</li> </ul>	<ul style="list-style-type: none"> <li>• complex &amp; time consuming</li> <li>• inputs not easy to forecast</li> <li>• model may be mis-specified</li> <li>• may give false sense of precision</li> <li>• rarely forecast turning points</li> </ul>

Leading Indicator – Based Approach	
Strengths	Weaknesses
<ul style="list-style-type: none"> <li>• intuitive</li> <li>• simple in construction</li> <li>• focuses primarily on identifying turning points</li> <li>• may be available from 3<sup>rd</sup> parties</li> <li>• easy to track</li> </ul>	<ul style="list-style-type: none"> <li>• History subject to frequent revision</li> <li>• Current data not reliable as input for historical analysis</li> <li>• Overfitted in-sample</li> <li>• Can provide false signals</li> <li>• May provide little more than binary guidance</li> </ul>

Checklist Approach	
Strengths	Weaknesses
<ul style="list-style-type: none"> <li>• limited complexity</li> <li>• flexible</li> </ul>	<ul style="list-style-type: none"> <li>• subjective</li> <li>• time-consuming</li> </ul>

<ul style="list-style-type: none"> <li>○ to incorporate structural changes</li> <li>○ to add/drop items</li> <li>○ to draw information from various sources</li> <li>• breadth (can include any topics, perspectives, theories, assumptions).</li> </ul>	<ul style="list-style-type: none"> <li>• manual process limits depth of analysis</li> <li>• may allow inconsistent &amp;/or biased views, theories, assumptions.</li> </ul>
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Reference: Exhibit 4 of the respective reading from the CFA Institute's Program Curriculum.

**Practice:** Example 9 from the CFA Institute's Curriculum



## BUSINESS CYCLE ANALYSIS, PHASES OF THE 6. BUSINESS CYCLE AND MARKET EXPECTATIONS AND THE BUSINESS CYCLE

### Business Cycle Analysis

**Trend rate of economic growth** identifies long-term return expectations for asset classes.

**Business cycle analysis** stipulates short-term fluctuations in an economy. These cyclical variations may vary in duration and intensity (from few days to very long horizons i.e. decades)) and may contain many intermediate frequency cycles.

The **business cycle** *arises* due to uncertainties in the economy, expectational errors and incompetence to adjust rapidly to unexpected events; hence, they are difficult to forecast.

**Sources of uncertainties** may be exogenous or endogenous to the system.

- Endogenous uncertainties** include behaviors of competitors, suppliers, employers, creditors, customers and policy makers; price-quantity adjustments.
- Exogenous uncertainties** include technological developments, political & geopolitical shifts, weather patterns, major shocks, natural disasters etc.

The business cycle can be **monitored** using the following **variables**:

- GDP growth

- Industrial production (IP)
- Employment/unemployment
- Purchasing manager indexes
- Orders for Durable goods
- Output gap (difference between potential GDP and actual GDP)
- Leading indicator indexes

### 1. Phases of Business Cycle

Phases of business cycles can be described by various manners.

#### Two phase segmentation of the business cycle:

One primary (and fairly easy to identify) segmentation of the business cycle is "*the expansion and the contraction*" with key turning points at which growth changes signs are the peak and the trough respectively.

#### Five phase segmentation of the business cycle:

A finer subdivision of a typical business cycle (for the purpose of setting expectations for capital markets) comprised of the following five phases.

- Initial Recovery:** In this phase, the economy starts to grow from its slowdown or trough part of the cycle. This is a short phase that usually lasts for few months.

#### Characteristics:

- economy picks up
- business confidence starts to increase
- monetary policy is still stimulatory
- output gap is still large

- inflation is decelerating
- improvement in spending on houses and consumer durables

#### Capital Market Effects:

- short-term rates and Government bond yields continue to fall in expectation of falling inflation, and then start bottoming;
- stock markets may rise briskly (as fears of recession fade away);
- attractive investments include cyclical assets and riskier assets i.e. small stocks higher-yield corporate bonds, emerging market equities & bonds.

- 2. Early Expansion** During this phase, the economy starts gaining momentum.

#### Characteristics:

- the economy gains some momentum
- unemployment starts to fall
- output gap is still negative
- consumers borrow and spend
- business increase production and investment
- profits rise rapidly
- strong demand for housing and consumer durables

#### Capital Market Effects:

- short-term interest rates trend upward; longer-term bond yields may be stable or increase slightly; as a result, yield curve is flattening
- stock markets trend upward

- 3. Late Expansion:** During this phase, an economy tends to grow rapidly and is likely to be overheated and face inflationary pressures due to closing of output gap.

#### Characteristics:

- output gap has closed
- economy is exposed to overheating
- low unemployment
- strong profits
- rise in inflation, wages and investment spending
- debt coverage ratio may deteriorate as balance sheets expand and interest rates rise.

central bank may aim for soft landing as fiscal balances improves

#### Capital Market Effects:

- interest rates tend to rise due to restrictive monetary policy;
- bond yields also tend to rise however, yield curve continues to flatten.
- stock markets may rise but it is highly volatile.
- cyclical assets underperform and inflation hedges (e.g. commodities) outperform.

- 4. Slowdown:** The economy starts slowing down primarily due to rising interest rates. During this phase, an economy is highly in danger of going into recession.

#### Characteristics:

- the economy approaches its peak and starts slowing
- confidence among businesses starts falling;
- inflation is still rising despite slowdown in growth mainly due to increase in prices by businesses.

#### Capital Market Effects:

- short-term interest rates are high & rising but, after reaching some peak point, they start falling → indicating inverted yield curve;
- as the yields fall afterwards, bonds prices rally sharply;
- credit spreads widen
- stock market may fall, however, quality stocks and interest-sensitive stocks (such as utilities) may perform well.

- 5. Contraction:** Recession typically lasts for 12 to 18 months.

#### Characteristics:

- investment spending typically leads to contraction.
- business cut production and profits drop sharply
- unemployment rises
- credit tightens
- often associated with major bankruptcies, incidents of uncovered fraud, or a financial crisis;
- central bank ease monetary policy

#### Capital Market Effects:

- both Short-term interest rates & longer-term bond yields start falling;
- yield curve steepens significantly
- in the early stages, stock market declines

- in the later stages of the recession, stock market starts to improve
- credit spread widens until signs of trough emerges

## 2. Market Expectations and the Business Cycle

It is quite difficult to identify the current phase of the cycle and correctly predict the starting time of the next phase because:

- the phases of the business cycle vary substantially in length (duration) and amplitude (intensity): for example,
  - recessions can be steep with a huge decline in output and a substantial rise in unemployment; or it can be short lived with

- only a small decline in output and only a modest rise in unemployment.
- weak phase of the business cycle may involve only a slower economic growth or a “growth recession” rather than a recession.
- it is difficult to distinguish between cyclical forces and secular forces playing on the economy and the markets.
- the connection between real economy and capital market returns is quite uncertain.

**Practice:** Example 10 from the CFA Institute's Curriculum



## 7. INFLATION AND DEFLATION: TRENDS AND RELATION TO THE BUSINESS CYCLE

Typically, central bank's policy tools are more effective in decelerating economic activity than in accelerating the economic activity.

**Deflation** negatively affects the economy in two ways. Deflation tends to:

- reduce the value of debt-financed investments
- undermine central bank's ability to affect monetary policy to control the economy. (as interest rates are close to zero therefore central bank is unable to stimulate the economy with monetary policy).

**Inflation** is procyclical and tends to:

- increase during late stages of a business cycle when there is no output gap which puts upward pressure on prices.
- fall during recessions and the early stages of recovery when there is a large output gap which puts downward pressure on prices.

Similar to inflation, **inflation expectations** are also procyclical. However, with regards to timeframe (provided investors maintain confidence in the central bank's target):

- *very long-term* inflation expectations are unaffected by periodic fluctuations.
- short-term inflation expectations turn up with actual inflation.
- intermediate-term inflation expectations interweave with different phases of cycles.

Therefore, horizon structure of inflation expectation is countercyclical i.e. upward sloping during contraction phase and downward sloping during expansion phase.

### Effect of Inflation on Asset Classes

#### 1. Cash:

- means short-term interest-bearing instrument, not currency or zero-interest deposit.
- functions as zero-duration, inflation protected asset (i.e. earns floating real rate) considering short-term interest rates adjust with expected inflation.
- is attractive(unattractive) in rising(declining) rate environment.
- is attractive investment in deflationary environment.

## 2. Bonds:

- When inflation  $\uparrow(\downarrow)$ , nominal bond price  $\downarrow(\uparrow)$ ; holding bonds incur capital losses(gains).
- When inflation remains within expected cyclical range, short-term yields rise/fall more than long-term yield (but have less price impact due to shorter duration.).
- When inflation moves out of the expected range, longer-term yields may rise/fall more sharply than short-term yields.
- Persistent deflation favors high quality bonds and damages the creditworthiness of lower-quality debt.

## 3. Stocks:

- When inflation remains within expected range, neutral effect on stocks as both expected future cashflows (earnings + dividends) and discount rates change in line with the horizon structure.
- Unexpected rise in inflation is negative for financial assets. Less negative for companies or industries able to pass on inflated costs.
- Deflation negatively affect asset-intensive, commodity-producing and highly levered companies.

## 4. Real estate:

- When inflation remains within expected range  $\rightarrow$  rental income rises with expected inflation and asset values remain stable.
- Unexpected rise in inflation,  $\uparrow$  demand for real estate, as a result rental income  $\uparrow$  faster than inflation and asset values  $\uparrow$ .
- Unexpected fall in inflation (or deflation) puts downward pressure on expected rental income and asset prices (particularly for less than prime properties).
- **Note:** The impact on real estate rental income (cashflows) and adjustments depends on the

length of lease, existing supply of similar properties, type of real estate asset held.

### Important Note:

Above discussion is based on TWO assumptions.

- 1) Supply is available without any problem (i.e. as demand grows, supply of goods and services will be available – though at slightly higher prices).

This means that either there is unutilized capacity in the economy and/or that globalization allows importing items when needed.

- 2) As supply is not a problem (assumption 1 above) – business cycles are caused by changes in demand – too high or too low demand creates imbalances.

These two assumptions imply direct relationship between prices and production of goods and services. At higher prices (which is because of higher demand) more goods and services are produced, and economy overheats. Thus inflation is pro-cyclical.

Sometimes inflation is caused by supply shock. This will lead to higher prices AND low production, known as *stagflation*. Inflation will be countercyclical in such situation (inverse relation between inflation and production). This situation is assumed to arise very rarely in future.

**Practice:** Example 11 from the CFA Institute's Curriculum



## 8. ANALYSIS OF MONETARY AND FISCAL POLICY

### Monetary Policy:

Central banks use **monetary policy** (primarily interest rates) as a tool to intervene in the business cycle to manage the cyclical behavior of the economy and to prevent it from

either overheating or suffering from a recession for too long. Therefore, the purpose of monetary policy is to be countercyclical.

Each central bank sets its own mandate and objectives; and selects its own mix of tools (policy rates, liquidity etc.).

### Drawbacks of Monetary Policy

Central bank's capacity to regulate the economy is limited amid substantial uncertainty as well as long- and variable-time lags. Thus, there are risks that central banks' actions may create more economic instability instead of resolving the issue.

Central bank's monetary policy can be like pulling or pushing on a string. Pulling(pushing) on a string is similar to restrictive(expansionary) monetary policy.

### Fiscal Policy:

Fiscal policy influences the economy by adjusting government spending and taxation.

Fiscal policy focus is NOT on short term growth because:

- 1) Implementation delay
- 2) frequent changes will be problematic for supplying dependable government services.

Exception to above: Automatic fiscal stabilizers (progressive tax (a pro-cyclical measure) and means-based transfer payments (a counter-cyclical measure)) work as breaks on rising and as cushion for falling economy.

Except for a major structural change in fiscal stance, following applies:

To establish market expectations for	Primary Focus	Secondary Focus
Short-term	Monetary	Fiscal
Long-term	Fiscal	Monetary

## Monetary Policy

**Taylor Rule** relates a central bank's target short-term interest rate to the rate of growth of the economy and inflation.

Taylor Rule Equation:

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

where,

- $i^*$  = target nominal policy rate
- $r_{\text{neutral}}$  = real policy rate that would be targeted if GDP growth were on trend and inflation on target
- $\pi_e, \pi_{\text{target}}$  = respectively the expected and target inflation rates
- $\hat{Y}_e, \hat{Y}_{\text{trend}}$  = respectively the expected and trend real GDP growth rates

By readjusting the above equation:

Real inflation adjusted target rate =

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

Monetary policy is unlikely to be determined by a single equation as many judgments will be involved in estimating inputs.

Practice: Example 12 from the CFA Institute's Curriculum



## WHAT HAPPENS WHEN INTEREST RATES ARE ZERO OR NEGATIVE? 9. AND IMPLICATIONS OF NEGATIVE RATES FOR CAPITAL MARKET EXPECTATIONS

Prior to 2007-2009 financial crisis, it was assumed that zero lower bound (when rates are close to zero) would limit central bank's ability to stimulate growth. Individuals' preference to hold currency (when facing negative interest rates) would lower bank's reserves and deposits causing credit contraction. The contraction of credit would further

put upward pressure on interest rates leading to slow down in economic growth which would in turn require additional stimulative policies.

After 2007-2009 financial crisis (due to the above-mentioned reasons) central banks sought some unconventional measures.

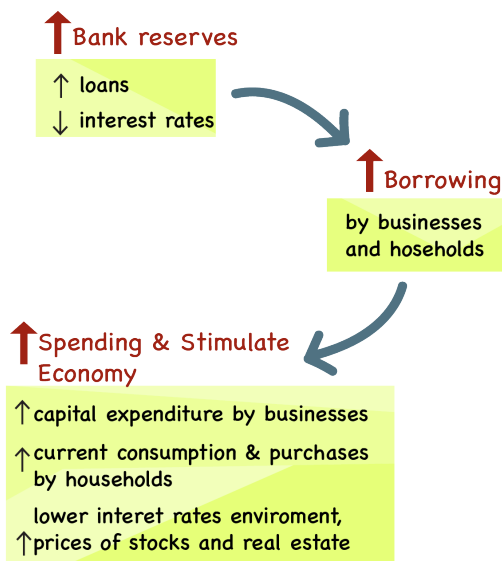


One such measure was **QE (quantitative easing)** in which central banks purchased high-quality government securities at a large scale. This action boosted banks' excess reserves and lowered sovereign bond yields. QE was widely used by many central banks such as the US Federal Reserve, the European central bank, the Bank of Japan and the Bank of England.

Ideally, the execution of QE should have attained the desired level of economic growth through spending as displayed in the exhibit below.

### Theoretically How QE works

when central banks buy government securities



In reality, as a result of QE, though asset prices rose but businesses borrowed to fund dividends and stock buyback instead of capital expenditure and individuals' spending ability remained significantly lower because of 2007 financial crisis.

Benefit of use of QE and negative interest rates is still debatable. However, negative rates didn't result in feared negative consequences.

Households and business continued to use bank services (did not hoard cash) – even in presence of negative interest rates. This happened as modern economy requires transactions with large size and large frequency; cash cannot serve this purpose.

In theory, negative rates should stimulate economy in the same manner as low but positive rates.

Changes in monetary policy appears to be more effective in stimulating/countering economic growth in high interest rate environment – compared to low/negative rate situations.

### Implications of Negative Interest Rates for Capital Market Expectations

When interest rates are negative, in forming capital market expectations for:

- i) **Longer time horizons,**  
'long-term equilibrium short-term rate' is used as a baseline rate in models. This rate is estimated using Taylor rule's  $r_{\text{neutral}}$  rate.
- ii) **Shorter time horizons,**  
'expected path of interest rates' (possible scenarios weighted by probability) should be considered. The path starts from negative interest rates values and usually converge to the long-run equilibrium rate estimate.

Asset class returns amid negative interest rate expectations are similar to returns in contraction and early recovery phases of a normal business cycle. However, compared to the normal business cycle phases, in negative interest rate environment there may be severe economic distress and greater uncertainty regarding timing and strength of economic outlook.

### Key considerations when forming capital market expectations in a negative interest rate environment

- i) **Historical Data are less likely to be reliable because:**
  - of fundamental and structural changes in markets and the economy.
  - information about historical data rarely includes situations of negative rates.
  - of quantitative (especially statistical) models' discrepancies. Additionally, forecasting must account for differences in current and historical values.
- ii) **Effects of other monetary policy measures appearing simultaneously**

**Note:** Developing capital market expectation in negative interest rates is challenging because asset prices are not only determined by investor expectations regarding long-term equilibrium levels but also on how to reach those levels.

## 10. THE MONETARY AND FISCAL POLICY MIX AND THE SHAPE OF THE YIELD CURVE AND THE BUSINESS CYCLE

### i) Level of Interest Rates:

#### Effect of Persistent Policy Mix on the Average Level of Rates

Fiscal Policy		Monetary Policy		Nominal Rates
Loose $\Rightarrow$ $\uparrow$ Real Rates	+	Loose $\Rightarrow$ $\uparrow$ Expected Inflation	=	$\uparrow$
Tight $\Rightarrow$ $\downarrow$ Real Rates	+	Tight $\Rightarrow$ $\downarrow$ Expected Inflation	=	$\downarrow$
Loose $\Rightarrow$ $\uparrow$ Real Rates	+	Tight $\Rightarrow$ $\downarrow$ Expected Inflation	=	Mid
Tight $\Rightarrow$ $\downarrow$ Real Rates	+	Loose $\Rightarrow$ $\uparrow$ Expected Inflation	=	Mid

The mix of fiscal and monetary policies affect the:

- level of interest rates
- shape of the yield curve
- relative supply of government bonds of various maturities

- risk premium (inherent in longer maturity bonds)

**Note:** Risk premium justifies why rates are typically upward sloping whereas flattening or steepening of the yield curve is affected by expected future path of short-term rates which are mainly driven by business cycles and policies.

As represented in the table above, all else equal:

- loose fiscal policies increase levels of real rates as households and private businesses save more/invest and attract foreign capital.
- persistently loose (tight) monetary policies results in higher(lower) actual and expected inflation.
- the combined impact of loose and tight policies could be resulted in higher or lower nominal rates and are labelled as mid-levels.

### ii) Slope of the Yield Curve

The slope of the yield curve mainly depends on:

- expected future path of short-term rates

### iii) “The relative supply of government bonds at various maturities”

is the third factor, the importance of which has become crucial after 2008-2009 financial crisis mainly due to the following two reasons.

- No clear lower bound on nominal interest rates
- Persistent large government deficits due to massive quantitative easing by central banks. If the relative supply of debt along the yield curve matters, then the shape of the yield curve and financial markets will be affected by how in future governments will fund their deficits and central banks will manage the maturity of their holdings.

Issue of bonds in large quantity for a specific maturity (e.g. 5y) by the government can cause a temporary increase in

yield for that particular maturity. The impact disappears over time as investors move up or down the yield curve to exploit yield differences.

Very-long-maturity bonds are an exception to the above-mentioned paragraph.

Keeping rates very low in huge-and-rising government debt environment can be politically attractive for governments (this may happen if central banks is not independent). This can have two impacts:

- A. Risk that B. (below) happens will cause yield curve to steepen.
- B. Inflation spiral may happen (i.e. higher inflation → higher nominal rates → more fiscal deficit → more government debt → central bank forced to run more accommodative monetary policy → more inflation).

	Initial Recovery	Early Expansion	Late Expansion	Slowdown	Contraction
<b>Monetary Policy &amp; Automatic Stabilizers</b>	<ul style="list-style-type: none"> <li>stimulative stance</li> <li>moving towards tightening</li> </ul>	<ul style="list-style-type: none"> <li>dropping stimulus</li> </ul>	<ul style="list-style-type: none"> <li>becoming restrictive</li> </ul>	<ul style="list-style-type: none"> <li>tight</li> <li>tax revenue may ↑</li> </ul>	<ul style="list-style-type: none"> <li>increasingly more stimulative</li> </ul>
<b>Money Market Rates</b>	<ul style="list-style-type: none"> <li>low/ bottoming</li> <li>expected to rise over progressively shorter horizons</li> </ul>	<ul style="list-style-type: none"> <li>rise and speed up</li> </ul>	<ul style="list-style-type: none"> <li>above average &amp; rising</li> <li>expectations may be moderated by eventual peak / decline</li> </ul>	<ul style="list-style-type: none"> <li>approaching peak</li> </ul>	<ul style="list-style-type: none"> <li>declining</li> </ul>
<b>Bond Yields &amp; the Yield Curve</b>	<ul style="list-style-type: none"> <li>long rates bottoming</li> <li>shortest rates start to ↑.</li> <li>Curve is steep</li> </ul>	<ul style="list-style-type: none"> <li>yields ↑</li> <li>stable at longer maturities</li> <li>yield curve's 1<sup>st</sup> half ⇒steepening, last half ⇒flattening</li> </ul>	<ul style="list-style-type: none"> <li>yields rise at slow pace</li> <li>curve flattening from longest maturities inward</li> </ul>	<ul style="list-style-type: none"> <li>yields peak, then may decline sharply</li> <li>curve flat to inverted</li> </ul>	<ul style="list-style-type: none"> <li>yields declining</li> <li>curve steepening.</li> <li>steepest at the tip of initial recovery phase</li> </ul>

Reference: Exhibit 7 of the respective reading from the CFA Institute's Program Curriculum.

### The Shape of the Yield Curve and the Business Cycle

The shape of the yield curve is useful to predict economic growth and the economy's position in the business cycle.

As mentioned in the exhibit above, yield curve flattens during the expansion phase, at the peak it is completely flat or even inverted and then steepens at the bottom of the cycle.

The curvature of the yield curve is primarily determined by the expected future path of the short-term rates. Analyzing the curve can give us information about market participants perception of future changes in short-term interest rates.

Analysts need to be careful as shape of yield curve at T0 may predict economic growth in T1 and economic growth in T1 may predict shape of yield curve at T2.

**Practice:** Example 13 from the CFA Institute's Curriculum



## 11. INTERNATIONAL INTERACTIONS

Currently, the significance of international interactions for an economy has increased due to the increase in globalization of trade, capital flows and direct investments.

A country's international interactions depend on the country's:

- relative size
- degree of specialization

Compared to smaller economies, large and diverse countries are less influenced by developments in other economies.

### 1. Macroeconomic Linkages

Current and capital account levels signify the macroeconomic linkages between two countries.

1. Current account represents:

- Net exports of goods and services
- Net investment income flows
- Unilateral transfers

2. Capital account (financial account) represents:

- Net investment flows for foreign direct investment (FDI) - buying/selling of productive assets across borders
- Portfolio Investment flows (PI) involving transactions in financial assets

Current and capital accounts are counterparts. Any surplus (deficit) in one account is matched and cancelled by equal deficit (surplus) in the other account.

**Net exports** (the component of current account) is considered to be the most important element that links a country's current and capital accounts to the broader economy and contribute directly to the aggregate demand for the country's output.

According to National Income accounting,

Net exports = Net Private Savings + Government Surplus  
 $(X-M) = (S-I) + (T-G)$

Net private savings = Domestic private Savings – Investment spending

Government Surplus = Taxes – Government spending

Four primary tools used to balance the current and capital accounts are:

- i) changes in income (GDP)
- ii) Relative prices
- iii) Interest rates
- iv) Asset prices

These tools are used to adjust the real economy (current account and FDI) and financial markets. However, investment markets adjust more quickly than the real economy.

Current account changes are slow to occur and reflect secular trend.

When a country is running huge current account imbalance (e.g. deficit); capital account should generate surplus to bring balance back. This can be achieved by quick change in

- 1) exchange rate
- 2) interest rate
- 3) financial asset prices.

For example, higher interest rates, currency devaluation and low financial asset prices will attract foreign investors and generate surplus in capital account.

**Practice:** Example 14 from the CFA Institute's Curriculum



### 2. Interest Rate/Exchange Rate Linkages

The link between interest rates and exchange rates is crucial for investors. A country can achieve at maximum **only two** of the following:

- free movement of capital
- fixed exchange rate
- independent monetary policy

Why? When a central bank pushes interest rate **Down** (loose monetary policy) → investors will flee from capital markets (no one likes low returns when they can get better return somewhere else – assuming same risk) → exchange rates will decline → central bank will have to buy its own currency → low capital availability will push interest rates back **UP** (offsetting earlier loose monetary policy).

If currencies of two countries are pegged, assuming perfect capital mobility and fixed exchange rates → countries should have equivalent interest rates.

We can extend this rationale to **yield curve**.

**Two countries share a yield curve when:**

- **perfect** capital mobility (to balance risk-adjusted capital returns)
- **credibly** fixed exchange rates (forever)  
If investors believe that the exchange rates will change in future, the risk-return expectations will change and both countries would no longer share the same yield curve.

If exchange rates between two countries are **not credible fixed**, then the bond yields of weaker currency will almost

always be higher. However, in the event of imminent threat of devaluation, the yields of devaluing currency declines sharply and yield curve inversion happens (spreads widen more at shorter maturities).

When exchange rates float freely, the link between interest rates and exchange rates is primarily **expectational**.

If a country's currency is expected to depreciate (appreciate), its bond yields will tend to rise (fall) to balance risk-adjusted expected return.

**Note:** Capital mobility alone is insufficient factor to adjust bond yields across two countries.

**Investors care about:**

- domestic asset's real return.
- non-domestic asset's nominal returns and exchange rate change.

***“Global savings must always equal global investments”*** on the basis of which real interest rates across countries are linked. Capital flows towards more productive usage and excess savings in one country lead to excess investments in another country.

**Practice: End of Chapter Questions  
+ FinQuiz Questions & Item-sets.**

