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CFA Institute

Level III – Capital Market Expectations

Capital Market Expectations, Part 1: Framework and Macro Considerations

2020 Exam

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Contents and Introduction

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2. Framework and Challenges

- Capital market expectations are essential inputs for strategic as well as tactical asset allocation
- Need forecasts and projections before making investment decisions
- Asset allocation is the primary determinant of long-run portfolio performance
- Forecasting is not an exact science
- Cross-sectional consistency and intertemporal consistency is important

1. A Framework for Developing Capital Market Expectations

2. Challenges in Forecasting

2.1 A Framework for Developing Capital Market Expectations

1. Specify the set of expectations that are needed, including the time horizon(s) to which they apply.
2. Research the historical record.
3. Specify the method(s) and/or model(s) that will be used and their information requirements.
4. Determine the best sources for information needs.
5. Interpret the current investment environment using the selected data and methods, applying experience and judgment.
6. Provide the set of expectations and document the conclusions.
7. Monitor outcomes, compare to forecasts, and provide feedback.

Generally, good forecasts are:

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

Example 1: Capital Market Expectations Setting: Information Requirements

Consider two investment strategists charged with developing capital market expectations for their firms, John Pearson and Michael Wu. Pearson works for a bank trust department that runs US balanced separately managed accounts (SMAs) for high-net-worth individuals. These accounts' mandates restrict investments to US equities, US investment-grade fixed-income instruments, and prime US money market instruments. The investment objective is long-term capital growth and income. In contrast, Wu works for a large Hong Kong SAR-based, internationally focused asset manager that uses the following types of assets within its investment process:

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

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

2.2 Challenges in Forecasting (1/2)

- Limitations of economic data
 - lack of timeliness
 - changing definitions and calculations
- Data measurement errors and biases
 - transcription errors
 - survivorship bias
 - appraisal (smoothed) data
- Limitations of historical estimates
 - lack of precision
 - nonstationarity
 - asynchronous observations
 - distributional considerations such as fat tails and skewness
- Ex post risk as a biased risk measure

2.2 Challenges in Forecasting (2/2)

- Bias in methods
 - data-mining bias
 - time-period bias
- Failure to account for conditioning information
- Misinterpretation of correlations
- Psychological biases
 - Anchoring
 - Status quo
 - Confirmation
 - Overconfidence
 - Prudence
 - Availability biases
- Model uncertainty

Example 2: Ignoring Conditioning Information

Noah Sota uses the CAPM to set capital market expectations. He estimates that one asset class has a beta of 0.8 in economic expansions and 1.2 in recessions. The expected return on the market is 12% in an expansion and 4% in a recession. The risk-free rate is assumed to be constant at 2%. Expansion and recession are equally likely. Sota aims to calculate the unconditional expected return for the asset class.

The conditional expected returns on the asset are $10\% = 2\% + 0.8 \times (12\% - 2\%)$ in an expansion and $4.4\% = 2\% + 1.2 \times (4\% - 2\%)$ in a recession. Weighting by the probabilities of expansion and recession, the unconditional expected return is $7.2\% = [(0.5 \times 10\%) + (0.5 \times 4.4\%)]$.

Following on from the scenario in Exhibit 2, one of Noah Sota's colleagues suggests an alternative approach to calculate the unconditional expected return for the asset class. His method is to calculate the unconditional beta to be used in the CAPM formula, $1.0 = (0.5 \times 0.8) + (0.5 \times 1.2)$. He then works out the unconditional expected return on the market portfolio, $8\% = (0.5 \times 12\%) + (0.5 \times 4\%)$. Finally, using the unconditional beta and the unconditional market return, he calculates the unconditional expected return on the asset class as $8.0\% = 2.0\% + 1.0 \times (8\% - 2\%)$.

Explain why the alternative approach is right or wrong.

Example 3: Biases in Forecasting and Decision Making

Cynthia Casey is a London-based investment adviser with a clientele of ultra-high-net-worth individuals in the UK, the US, and the EU. Within the equity portion of her portfolios, she rarely deviates significantly from the country weightings of the MSCI World Index, even though more often than not she tilts the allocation in the right direction. Hence, she can claim a good tactical track record despite having added little value in terms of return through tactical allocation. Because most investors have an implicit “home bias,” her European clients tend to view their portfolios as significantly overweight the US (nearly 50% of the World index) and are happy because the US market outperformed the MSCI World ex-US Index by about 4% per year over the 10 years ending September 2018. Conversely, her US clients are unhappy because Casey persistently projected US outperformance but maintained what they instinctively perceive as a significant underweight in the United States. Citing year-to-date performance as of 28 September 2018—US up 9%, World ex-US down 1%, with 10 of 15 European markets down in local currencies—Casey’s US clients are pressuring her to aggressively increase allocations to US equities. Although experience has taught her to be wary of chasing a strong market, Casey vividly remembers losing clients in the late 1990s because she doubted that the explosive rally in technology stocks would be sustained. With that in mind, she has looked for and found a rationale for a bullish view on US stocks—very robust year-to-date earnings growth.

What psychological biases are Casey and her clients exhibiting?

Guideline answer

Casey’s clients are implicitly anchoring their expectations on the performance of their respective domestic markets. In pressing Casey to increase the allocation to US stocks based on recent outperformance, her US clients are clearly projecting continuation of the trend, a status quo bias. Casey herself is exhibiting several biases. Prudence bias is apparent in the fact that she has a good record of projecting the correct direction of relative performance among markets but has not translated that into reallocations large enough to add meaningful value. We cannot assess whether that bias affects the magnitude of her forecasts, the extent to which she responds to the opportunities, or both. Losing clients when she doubted the sustainability of the late 1990s technology rally made a very strong impression on Casey, so much so that she has apparently convinced herself to look for a reason to believe the recent relative performance trends will persist. This is indicative of availability bias. Searching for evidence to support a favored view (continued strength of the US market) is a clear sign of confirmation bias, whereas finding support for that view in the recent strength of earnings growth reflects status quo bias.

3. Economic and Market Analysis

1. The Role of Economic Analysis
2. Analysis of Economic Growth
3. Approaches to Economic Forecasting
4. Business Cycle Analysis
5. Analysis of Monetary and Fiscal Policy
6. International Interactions

3.1 The Role of Economic Analysis

Investment outcomes depend on the economy

Need to understand relationship between economic variables and capital market returns

Need to understand which economic variables are most relevant in a given market environment

Economic output has cyclical and trend growth components

3.2 Analysis of Economic Growth (1/2)

- Economic growth trend: long-term average growth path of GDP around which economy experiences semi-regular business cycles
- Trend growth rates change and hence forecasting is necessary
 - Some growth trend changes are easy to forecast
 - Growth trend changes arising from exogenous shocks are impossible to forecast
- The most important sources of shocks are:
 - Policy changes
 - New products and technologies
 - Geopolitics
 - Natural disasters
 - Natural resources/critical inputs
 - Financial crises

Exhibit 3. Trend Growth after a Financial Crisis

An extensive study of growth and debt dynamics in the wake of the 2007–2009 global financial crisis identified three types of crises:

- Type 1: A persistent (permanent, one-time) decline in the level of output, but the subsequent trend rate of growth is unchanged.
- Type 2: No persistent decline in the level of output, but the subsequent trend rate of growth is reduced.
- Type 3: Both a persistent decline in the level of output and a reduction in the subsequent trend rate of growth.

Example 4: Impact of Exogenous Shocks on Trend Growth

Philippe Leblanc, an analyst focusing on economic forecasting, recently read about a discovery by scientists at a major university that may allow the efficiency of solar panels to double every two to three years, a result similar to Moore's Law with respect to computer chips. In further reading, he found new research at Tsinghua University that may rapidly increase the distance over which electricity can be transmitted.

What implications should Leblanc draw with regard to growth trends if either, or both, of these developments come to fruition? What government policy changes might offset the impact?

Either of these developments would be expected to increase trend growth. They would be especially powerful together. Rapid increases in solar panel efficiency would drive down the cost of energy over time, especially in areas with long days and intense sunlight. The closer to the equator, the larger the potential effect. The developments would also make it increasingly possible to bring large-scale power production to remote areas, thereby expanding the range and scale of economically viable businesses in those areas. Extending the range of electrical transmission would allow moving lower-cost energy (regardless of how it is generated) to where it is most efficiently used. A variety of government actions could undermine the pro-growth nature of these developments; for example, tariffs on solar panels, restrictions on electrical transmission lines, subsidies to support less efficient energy sources, failure to protect intellectual property rights, or prohibition on transfer of technology.

3.2 Analysis of Economic Growth (2/2)

Trend rate of economic growth is an important input to DCF models

Higher trend rate of growth allows actual growth to be faster before accelerating inflation becomes a major concern

Decomposition of GDP growth

- Growth from labor inputs
 - Potential labor force size
 - Actual labor force participation
- Growth from labor productivity
 - Capital inputs
 - Total factor productivity

Anchoring asset returns to trend growth

- Average level of real government bond yields is linked to trend economic growth
- Aggregate market value of equity = Nominal GDP x share of profits in economy x P/E ratio

High economic growth does not necessarily imply high equity returns

- Economic growth estimates might already be priced
- Return on invested capital may be slowing down

Example 5: Long-Run Equity Returns and Economic Growth

In January 2000, Alena Bjornsdottir, CFA, was updating her firm's projections for US equity returns. The firm had always used the historical average return with little adjustment. Bjornsdottir was aware that historical averages are subject to large sampling errors and was especially concerned about this fact because of the sequence of very high returns in the late 1990s. She decided to examine whether US equity returns since World War II had been consistent with economic growth. For the period 1946–1999, the continuously compounded (i.e., logarithmic) return was 12.18% per annum, which reflected the following components:

Real GDP Growth	Inflation	EPS/GDP (Chg)	P/E (Chg)	Dividend Yield
3.14%	4.12%	0.00%	0.95%	3.97%

Questions

- 1 What conclusion was Bjornsdottir likely have drawn from this analysis?
- 2 If she believed that in the long run that the US labor input would grow by 0.9% per annum and labor productivity by 1.5%, that inflation would be 2.1%, that the dividend yield would be 2.25%, and that there would be no further growth in P/E, what is likely to have been her baseline projection for continuously compounded long-term US equity returns?
- 3 In light of her analysis, how might she have adjusted her baseline projection?

3.3 Approaches to Economic Forecasting

Econometric Models

Structural models specify functional relationships among variables based on economic theory.

Reduced form models are more compact versions of underlying structural models.

Econometric Indicators

Economic statistics published by official agencies and/or private organizations.

Checklist Approach

Subjective integration of information deemed relevant by the analyst.

Strengths

Econometric Models Approach

- Models can be quite robust, with many factors included to approximate reality.
- New data may be collected and consistently used within models to quickly generate output.
- Delivers quantitative estimates of impact of changes in exogenous variables.
- Imposes discipline/consistency on analysis.

Leading Indicator–Based Approach

- Usually intuitive and simple in construction.
- Focuses primarily on identifying turning points.
- May be available from third parties. Easy to track.

Checklist Approach

- Limited complexity.
- Flexible.
 - Structural changes easily incorporated.
 - Items easily added/dropped.
 - Can draw on any information, from any source, as desired.
- Breadth: Can include virtually any topics, perspectives, theories, and assumptions.

Weaknesses

- Complex and time-consuming to formulate.
- Data inputs not easy to forecast.
- Relationships not static. Model may be mis-specified.
- May give false sense of precision.
- Rarely forecasts turning points well.
- History subject to frequent revision.
 - “Current” data not reliable as input for historical analysis.
 - Overfitted in-sample. Likely overstates forecast accuracy.
- Can provide false signals.
- May provide little more than binary (no/yes) directional guidance.
- Subjective. Arbitrary. Judgmental.
- Time-consuming.
- Manual process limits depth of analysis. No clear mechanism for combining disparate information.
- Imposes no consistency of analysis across items or at different points in time. May allow use of biased and/or inconsistent views, theories, assumptions.

Example 6: Approaches to Forecasting

Sara Izek and Adam Berke are members of the asset allocation committee at Cycle Point Advisors, which emphasizes the business cycle within its tactical asset allocation process. Berke has developed a time series model of the business cycle that uses a published LEI series as a key input. He presents forecasts based on the model at each asset allocation meeting. Izek is eclectic in her approach, preferring to sample research from a wide variety of sources each month and then focus on whatever perspectives and results seem most interesting. She usually brings a stack of charts she has copied to the asset allocation meeting.

- 1 Which of the main forecasting approaches (or combination of approaches) best describe(s) each analyst's own practice?
- 2 What strength(s) are likely to have appealed to each analyst?
- 3 What weaknesses might each analyst be overlooking?

- 1 Berke uses the econometric modeling approach in conjunction with the LEI approach. Izek's practice is essentially a checklist approach.
- 2 Berke is probably attracted to the quantitative output provided by a model, the consistency and discipline it imposes on the process, and the ability to generate explicit forecasts. He may have included the LEI in the model because it is designed to capture cyclical turning points or simply because doing so improves the model's statistical fit of the model.

Izek is probably drawn to the flexibility of the checklist approach with respect to what is included/excluded and how to evaluate the information.

- 3 Berke may be overlooking potential mis-specification of his model, which is apt to make his forecasts systematically inaccurate (i.e., biased). He may also be failing to recognize the likely magnitude of the forecast errors that will be present even if the model is unbiased (i.e., overestimating the precision of the forecasts). By using the historical LEI series as an input to the model, he may be incorporating look-ahead bias into the model.

Izek is likely overlooking the subjective, judgmental, and idiosyncratic nature of her approach. Her practice of basing her "checklist" on what seems most interesting in other analysts' current research makes her process especially vulnerable to inconsistency and cognitive biases.

3.4 Business Cycle Analysis

- Business cycle overview
- Phases of the business cycle
- Market expectations and the business cycle
- Inflation and deflation: trends and relation to the business cycle
- Effect of inflation on asset classes

Business Cycle Overview

The business cycle is the result of many intermediate frequency cycles

These cycles collectively generate variations in aggregate economic activity around the trend

Business cycles vary in duration and intensity.

The business cycle reflects decisions that:

- a. are made based on imperfect information and/or analysis with the expectation of future benefits
- b. require significant current resources and/or time to implement
- c. are difficult and/or costly to reverse

Business cycles are also impacted by exogenous factors

Variables used to monitor the business cycle include GDP growth, industrial production, employment/unemployment, purchasing managers indexes, orders for durable goods, output gap, leading indicator indexes

Phases of The Business Cycle

Initial Recovery	Early Expansion	Late Expansion	Slowdown	Contraction
Business confidence rises, stimulative policies in place. Recovery supported by upturn in spending on housing and consumer durables.	Economy gaining momentum, unemployment starts to fall, output gap remains negative. Consumer demand rises. Business production and investment rises. Demand for housing and consumer durables is strong.	Output gap closed. Boom mentality. Low unemployment. High profits. Rising wages and inflation. Capacity pressures boost investment spending. Debt ratios may deteriorate.	Economy approaches peak level in response to rising interest rates, fewer investment opportunities and accumulated debt. Business confidence wavers. Inflation continues to rise.	Firms cut production sharply. Central banks ease monetary policy. Profits drop. Tightening credit magnifies downward pressure on economy. Unemployment rises.
Short-term interest rates and bond yields are low. Stock markets may rise strongly. Cyclical/riskier assets perform well.	Short rates are moving up. Longer-maturity bond yields are stable or rising slightly. Yield curve starts flattening. Stocks are trending up.	Interest rates rise, and the yield curve flattens. Stock markets often rise but may be volatile. Cyclical assets may underperform. Inflation hedges outperform.	Short-term interest rates are at or nearing a peak. Government bond yields peak and may then decline sharply. The yield curve may invert. Credit spreads widen, especially for weaker credits. Stocks may fall. Interest-sensitive stocks and "quality" stocks with stable earnings perform best.	Interest rates and bond yields drop. The yield curve steepens. Credit spreads widen and remain elevated until clear signs of a cycle trough emerge. The stock market drops initially but usually starts to rise well before the recovery emerges.

Market Expectations and the Business Cycle

Making predictions about the business cycle is not simple

1. Phases of the cycle vary in length and amplitude.
2. Not easy to distinguish between cyclical forces and secular forces.
3. How, when, and by how much the markets respond to the business cycle is uncertain.

Market expectations based on a business cycle analysis will have a high level of uncertainty

1. Business cycle analysis generates a noisy signal with respect to prospective opportunities
2. Signals are more reliable over horizons within the range of likely expansion and contraction phases

Example 7: Cycles, Horizons, and Expectations

Lee Kim uses a statistical model that divides the business cycle into two “regimes”: expansion and contraction. The expected (continuously compounded) return on equities is +2% per month during expansions and –2% per month during contractions. Consistent with NBER’s historical record (see earlier sidebar), the probabilities of transitioning between regimes imply that expansions last 39 months on average, whereas contractions average 20 months. Correspondingly, over the long run, the economy expands roughly two-thirds of the time and contracts one-third of the time. Hence, the long-term expected equity return is $0.67\% = [(2\% \times 2/3) + (-2\% \times 1/3)]$ per month, or 8% per year. Kim’s model indicates that the economy recently transitioned into contraction. For the upcoming asset allocation committee meeting, he will prepare equity return forecasts for horizons of 3 months, 1 year, 5 years, and 10 years.

Explain how you would expect the choice of time horizon to affect Kim’s projections.

The longer the horizon, the more likely that one or more transitions will occur between contraction and expansion; more generally, the more likely it is that the horizon spans more than one business cycle phase or even more than one full cycle. As a result, the longer the horizon, the more Kim’s forecast should reflect averaging over periods of expansion and contraction and the closer it will be to the “information-less” average of 8% per year.

Over the next three months, it is highly likely that the economy will remain in contraction, so Kim’s forecast for that period should be very close to –2% per month [cumulatively –6%]. Because contractions last 20 months on average in the model, Kim’s forecast for a one-year horizon should reflect only a modestly higher probability of having transitioned to expansion at some point within the period. So, his forecast might be –18% (an average of –1.5% per month) instead of –24% (–2% per month). Over a five-year horizon, it is very likely that the economy will have spent time in both contraction and expansion. As a result, Kim’s forecast will put significant weight on each phase. Because the economy starts in contraction (i.e., the starting point is not random), the weight on that phase will probably be somewhat higher than its long-term frequency of 1/3, say 0.40. This assumption implies a forecast of 4.8% per year $[= 12 \times [(0.6 \times 2\%) + (0.4 \times -2\%)]]$. Over a 10-year horizon, the frequency of expansion and contraction months is likely to be very close to the 2-to-1 long-run ratio. So, Kim’s forecast should be very close to 8% per year.

Inflation and Deflation: Trends and Relation to the Business Cycle

Deflation damages the economy because it undermines debt-financed investments and the power of central banks

Most central banks like to maintain a moderate level of inflation

Inflation is procyclical

- Accelerates in the later stages of the business cycle when the output gap has closed
- Decelerates during a recession or right after the recession → downward pressure on wages and prices.

Given the cyclical pattern of inflation, inflation expectations are also procyclical, but the time horizon matters

Effect of Inflation on Asset Classes

To assess the effect of inflation on asset classes, we must consider both the cash flows and the discount rates.

Cash: Short-term interest-bearing instruments	Bonds	Stocks	Real Estate
<p>Earn a floating real rate as long as short-term interest rates adjust with expected inflation.</p> <p>Inflation-protected asset. Zero-duration.</p> <p>Attractive in a rising rate environment.</p>	<p>Rising inflation leads to capital losses.</p> <p>If inflation remains within expected range, short-term yields rise/fall more than longer-term yields.</p> <p>If inflation moves out of expected range, longer-term yields rise/fall more sharply.</p> <p>Persistent deflation benefits highest-quality bonds.</p>	<p>If inflation stays within expected cyclical range, there is little effect on stocks.</p> <p>Unexpectedly high inflation might cause central bank to slow the economy.</p> <p>Low/falling inflation might imply a recession.</p> <p>High inflation benefits companies that can pass on inflation.</p> <p>Deflation is detrimental for asset-intensive, commodity-producing and/or highly leveraged firms.</p>	<p>If inflation stays within expected cyclical range, rental income and property values will rise with inflation.</p> <p>Higher than expected inflation will lead to high demand for real estate.</p> <p>Lower than expected inflation (or deflation) will put downward pressure on expected rental income and property values.</p>

Example 8: Inflation

Kesia Jabari believes the quantitative easing undertaken by major central banks in the wake of the global financial crisis is finally about to induce a surge in inflation. She believes that without extraordinary policy actions from the central banks, the inflation rate will ultimately rise to the upper end of central banks' tolerance ranges at the peak of the current business cycle.

Assuming Jabari is correct, discuss the likely implications for floating-rate instruments ("cash"), bonds, stocks, and real estate if:

- a** the market shares Jabari's view, or
- b** once inflation begins to rise, the market doubts that the central banks will be able to contain it.

- a** If the market agrees with Jabari, then the relationship of inflation and the asset classes to the business cycle should be fairly normal. Short-term rates and bond yields will rise with inflation expectations. The yield curve should flatten because long-term inflation expectations should remain well anchored. Floating-rate instruments (cash) will be relatively attractive, and intermediate maturities ("the belly of the curve") will be the most vulnerable. In general, the rise in inflation should not have much independent impact on stocks or real estate because both cash flows and discount rates will be expected to rise. Firms with pricing power and real estate with relatively short lease-renewal cycles are set to perform best.
- b** If the market doubts that central banks can contain inflation within previously perceived tolerances, then long-run inflation expectations will rise and the yield curve may steepen rather than flatten, at least initially. Floating-rate instruments will still be relatively attractive, but now it is the longest maturities that will be the most vulnerable. Stocks are likely to suffer because the market expects central banks to be aggressive in fighting inflation. Real estate with long-term leases and little long-term, fixed-rate debt will suffer. Real estate with substantial long-term, fixed-rate debt should do relatively well, especially high-quality properties with little new supply nearby, which are likely to avoid significant vacancies even in a recession.

3.5 Analysis of Monetary and Fiscal Policy (1/4)

- Generally fiscal policy is focused on the long term; however, aspects of fiscal policy can be used to counteract cyclical fluctuations in the economy
 - Progressive tax regimes
 - Means-based transfer payments
- Monetary policy is used as a mechanism for intervention in the business cycle
 - Maintain price stability and/or growth consistent with potential
 - “Long and variable lags”
 - Ability to fine-tune the economy is limited
- The **Taylor Rule** is a useful tool for assessing a central bank’s stance and for predicting how that stance is likely to evolve

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

Example 9: Policies and the Business Cycle

Albert Grant, CFA, is an institutional portfolio strategist at Camford Advisors. After a period of trend growth, inflation at the central bank's target, and neutral monetary policy, the economy has been hit by a substantial deflationary shock.

Questions

- 1 How are monetary and fiscal policies likely to respond to the shock?

Camford's economics department estimates that growth is now 1% below trend and inflation is 2% below the central bank's target. Camford's chief investment officer (CIO) has asked Grant to put together a projection of the likely path of policy rates for the next five years.

- 2 If Grant believes the central bank will respond in accordance with the Taylor Rule, what other information will he need in order to project the path of policy rates?
- 3 What pattern should Grant expect for growth, inflation, and market interest rates if the central bank does *not* respond to the shock?
- 4 Assuming the central bank does respond and that its reaction function is well approximated by the Taylor Rule, how will this alter Grant's expectations regarding the paths of growth, inflation, and short-term rates over the next five years?

- 1 A countercyclical response can be expected from both monetary and fiscal policy. Assuming the central bank uses a policy rate target as its primary tool, it will cut that rate. On the fiscal side, there may be no explicit expansionary policy action (tax cut or spending increase), but automatic stabilizers built into tax and transfer programs can be expected to cushion the shock's impact on private sector disposable incomes.
- 2 Grant will need to know what values the central bank uses for the neutral real rate, trend growth rate, and inflation target. He will also need to know how the central bank forms its expectations of growth and inflation. Finally, he will need to know how growth and inflation are likely to evolve, including how they will be affected by the path of policy rates.
- 3 The deflationary shock is very likely to induce a contractionary phase of the business cycle, putting additional downward pressure on growth and inflation. Short-term market interest rates will be dragged downward by weak demand and inflation. Risky asset prices are likely to fall sharply. A deep and/or protracted recession may be required before conditions conducive to recovery are in place. Grant should therefore expect a deep "U-shaped" path for growth, inflation, and short-term rates.
- 4 If the central bank responds as expected, it will push short-term rates down farther and faster than they would otherwise fall in an effort to mitigate the downward momentum of growth and inflation. If the central bank correctly calibrates its policy, growth and inflation should decline less, bottom out sooner, and recover more quickly toward trend growth and the target inflation level, respectively, than in the absence of a policy response. Whereas the central bank is virtually certain to drive short rates down farther and faster, it may be inclined to let the market dictate the pace at which rates eventually rise. That is, it may simply "accommodate" the need for higher rates rather than risk unduly restraining the recovery once it is established.

3.5 Analysis of Monetary and Fiscal Policy (2/4)

What Happens When Interest Rates Are Zero or Negative?

The theory: Negative nominal rates stimulate the economy. Businesses and consumers are encouraged to hold fewer deposits. Investors are encouraged to seek higher returns. Businesses are encouraged to invest in profitable projects.

The reality: Consumers, investors, businesses and banks must believe they will be adequately rewarded. In a negative interest rate environment the level of uncertainty is high. The effectiveness of expansionary monetary policy is more tenuous at low and negative interest levels than at higher interest rate levels.

Implications of Negative Interest Rates for Capital Market Expectations

Negative interest rates, and the environment that gives rise to them, make the task of setting capital market expectations even more complex than usual.

This is because:

- It is difficult to justify negative rates as a “risk-free rate” to which risk premiums can be added to establish long-term “equilibrium” asset class returns.
- Historical data and quantitative models are less likely to be reliable.
- Effects of other monetary policy measures occurring simultaneously may distort market relationships such as the shape of the yield curve or the performance of specific sectors.

3.5 Analysis of Monetary and Fiscal Policy (3/4)

The Monetary and Fiscal Policy Mix

Effect of Persistent Policy Mix on the Average Level of Rates

		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

3.5 Analysis of Monetary and Fiscal Policy (4/4)

Rates, Policy and Yield Curve over the Business Cycle

Cycle Phase	Monetary Policy & Automatic Stabilizers	Money Market Rates	Bond Yields and the Yield Curve
Initial Recovery	Stimulative stance. Transitioning to tightening mode.	Low/bottoming. Increases expected over progressively shorter horizons.	Long rates bottoming. Shortest yields begin to rise first. Curve is steep.
Early expansion	Withdrawing stimulus	Moving up. Pace may be expected to accelerate.	Yields rising. Possibly stable at longest maturities. Front section of yield curve steepening, back half likely flattening.
Late expansion	Becoming restrictive	Above average and rising. Expectations tempered by eventual peak/decline.	Rising. Pace slows. Curve flattening from longest maturities inward.
Slowdown	Tight. Tax revenues may surge as accumulated capital gains are realized.	Approaching/reaching peak.	Peak. May then decline sharply. Curve flat to inverted.
Contraction	Progressively more stimulative. Aiming to counteract downward momentum.	Declining.	Declining. Curve steepening. Likely steepest on cusp of Initial Recovery phase.

The Shape of the Yield Curve and the Business Cycle

Changes in the slope of the yield curve are driven primarily by the evolution of short rate expectations, which are driven mainly by the business cycle and policies.

The slope of the curve may also be affected by debt management.

The slope of the yield curve is useful as a predictor of economic growth and as an indicator of where the economy is in the business cycle.

Example 10: The Business Cycle and the Yield Curve

Camford's quantitative analysis team helped Albert Grant incorporate the central bank's reaction function into a reduced-form model of growth and inflation. With this model, he will be able to project the path of short-term rates in the wake of the deflationary shock described in Example 9. Camford's CIO has now asked him to extend the analysis to project the path of bond yields as well.

Questions

- 1 What will Grant need in order to project the path of bond yields?
- 2 Even before he can undertake the formal analysis, a large client asks Grant to explain the likely implications for the yield curve. What can he say?

1 Grant will need a model linking bond yields to the policy rate. In essence, he needs a model of the yield curve.

2 Following the deflationary shock, the economy is very likely to enter into the contraction phase of the business cycle. The central bank will be cutting the policy rate, perhaps sharply. Long-term yields could drop even faster initially as the market anticipates that policy, but then the curve will steepen as the central bank cuts rates because long-maturity yields will incorporate the expectation of short-term rates rising again once the economy gains sufficient traction. The curve will likely reach its steepest point near the trough of the policy cycle and then gradually flatten as the economy gains strength and the central bank begins to tighten policy.

3.6 International Interactions (1/2)

- Macroeconomic linkages between countries are expressed through their respective current and capital accounts
 - Current account: Net export of goods and services, net investment income inflows, unilateral transfers
 - Capital account: Net investment flows (FDI and PI)
- Net exports always equal net private saving plus government surplus
 - $(X - M) = (S - I) + (T - G)$
- Four primary mechanisms by which the current and capital accounts are kept in balance
 - Changes in income (GDP), relative prices, interest rates and asset prices, and exchange rates
- In the short run, interest rates, exchange rates, and financial asset prices must adjust to keep the capital account in balance with the more slowly evolving current account
- The current account, in conjunction with real output and the relative prices of goods and services, reflects secular trends and the pace of the business cycle

Example 11: International Macroeconomic Linkages

A large, diversified economy recently instituted a substantial tax cut, primarily aimed at reducing business taxes. Some provisions of the new law were designed to stem the tide of domestic firms moving production facilities abroad and encourage an increase in corporate investment in the domestic economy. There was no reduction in government spending. Prior to the tax cut, the country had both a current account deficit and a government deficit.

Questions:

- 1 What impact is this tax cut likely to have on
 - a the country's current account balance?
 - b the country's capital account balance?
 - c growth in other countries?
 - d the current and capital accounts of other countries?
- 2 What adjustments is the tax cut likely to induce in the financial markets?

- 1
 - a The deficit on current account will almost certainly increase. The government deficit will increase which, all else the same, will result in a one-for-one increase in the current account deficit. If the tax cut works as intended, domestic investment will increase, reducing net private saving and further increasing the current account deficit. Private saving will increase as a result of rising income (GDP), which will diminish the impact on the current account somewhat. Unless saving increases by the full amount of the tax cut plus the increase in investment spending, however, the net effect will be an increase in the current account deficit. In principle, this increase could be thwarted by movements in the financial markets that make it impossible to fund it, but this is unlikely.

- b Because the current account deficit will increase, the country's capital account surplus must increase by the same amount. In effect, the tax cut will be funded primarily by borrowing from abroad and/or selling assets to non-domestic investors. Part of the adjustment is likely to come from a reduction in FDI by domestic firms (i.e., purchases of productive assets abroad) provided the new tax provisions work as intended.
 - c Growth in other countries is likely to increase as the tax cut stimulates demand for their exports and that increase in turn generates additional demand within their domestic economies.
 - d In the aggregate, other countries must already be running current account surpluses and capital account deficits matching the balances of the country that has cut taxes. Their aggregate current account surplus and capital account deficit will increase by the same amount as the increase in current account deficit and capital account surplus of the tax-cutting country.
- 2 The country must attract additional capital flows from abroad. This endeavor is likely to be facilitated, at least in part, by the expectation of rising after-tax profits resulting from the business taxes. Equity values should therefore rise. The adjustment may also require interest rates and bond yields to rise relative to the rest of the world. The impact on the exchange rate is less clear. Because the current account and the capital account represent exactly offsetting flows, there is no *a priori* change in demand for the currency. The net impact will be determined by what investors *expect* to happen. (See the following section for a discussion of exchange rate linkages.)

3.6 International Interactions (2/2)

- Interest rates and currency exchange rates are linked
- Two countries will share a default-free yield curve if (and only if) there is perfect capital mobility and the exchange rate is credibility fixed forever
- If there is lack of credibility about fixed exchange rates, yield curves will not have perfect correlation across markets
- With floating exchange rates, the link between interest rates and exchange rates is primarily expectational
 - Interest rates should be higher in a currency that is expected to depreciate
 - Interest rates should be lower in a currency that is expected to appreciate
- An investor cares about the real return that he or she expects to earn in his or her own currency
- With foreign assets, what matters is the nominal return and the change in the exchange rate
- Although real interest rates around the world need not be equal, they are linked through the requirement that global savings must always equal global investment → hence they will tend to move together

Summary

- Framework for developing capital market expectations
- Challenges in forecasting
- Analysis of economic growth
 - Exogenous Shocks
 - Labor input and labor productivity
- Approaches to economic forecasting
- Business cycle analysis
- Inflation and the business cycle
- Impact of inflation on different asset classes
- Analysis of monetary and fiscal policy
 - Taylor rule
 - Yield curve as an economic predictor
 - Monetary and fiscal policy mix
- International interactions