

The following is a review of the Equity Investments principles designed to address the learning outcome statements set forth by CFA Institute®. This topic is also covered in:

EQUITY VALUATION: APPLICATIONS AND PROCESSES

Study Session 10

EXAM FOCUS

This review is simply an introduction to the process of equity valuation and its application. Many of the concepts and techniques introduced are developed more fully in subsequent topic reviews. Candidates should be familiar with the concepts introduced here, including intrinsic value, analyst perception of mispricing, going concern versus liquidation value, and the difference between absolute and relative valuation techniques.

LOS 35.a: Define valuation and intrinsic value, and explain possible sources of perceived mispricing.

Valuation is the process of determining the value of an asset. There are many approaches and estimating the inputs for a valuation model can be quite challenging. Investment success, however, can depend crucially on the analyst's ability to determine the values of securities.

The general steps in the equity valuation process are:

1. Understand the business.
2. Forecast company performance.
3. Select the appropriate valuation model.
4. Convert the forecasts into a valuation.
5. Apply the valuation conclusions.

When we use the term **intrinsic value** (IV), we are referring to the value of an asset or security by someone who has complete understanding of the characteristics of the asset or issuing firm. To the extent that stock prices are not perfectly (informationally) efficient, they may diverge from the intrinsic values.

Analysts seeking to produce positive risk-adjusted returns do so by trying to identify securities for which their estimate of intrinsic value differs from current market price. One framework divides mispricing perceived by the analyst into two sources: the difference between market price and the intrinsic value (actual mispricing) and the difference between the analyst's estimate of intrinsic value and actual intrinsic value (valuation error). We can represent this relation as follows:

$$IV_{\text{analyst}} - \text{price} = (IV_{\text{actual}} - \text{price}) + (IV_{\text{analyst}} - IV_{\text{actual}})$$

LOS 35.b: Explain the going concern assumption, contrast a going concern value to a liquidation value, and identify the definition of value most relevant to public company valuation.

The **going concern assumption** is simply the assumption that a company will continue to operate as a business, as opposed to going out of business. The valuation models we will cover are all based on the going concern assumption. An alternative, when it cannot be assumed that the company will continue to operate (survive) as a business, is a firm's **liquidation value**. The liquidation value is the estimate of what the assets of the firm would bring if sold separately, net of the company's liabilities.

LOS 35.c: Discuss the uses of equity valuation.



Professor's Note: This is simply a list of the possible scenarios that may form the basis of an equity valuation question. No matter what the scenario is, the tools you will use are the same.

Valuation is the process of estimating the value of an asset by (1) using a model based on the variables the analyst believes influence the fundamental value of the asset or (2) comparing it to the observable market value of "similar" assets. Equity valuation models are used by analysts in a number of ways. Rather than an end unto itself, valuation is a tool that is used in the pursuit of other objectives like those listed in the following paragraphs.

Stock selection. The most direct use of equity valuation is to guide the purchase, holding, or sale of stocks. Valuation is based on both a comparison of the intrinsic value of the stock with its market price and a comparison of its price with that of comparable stocks.

Reading the market. Current market prices implicitly contain investors' expectations about the future value of the variables that influence the stock's price (e.g., earnings growth and expected return). Analysts can estimate these expectations by comparing market prices with a stock's intrinsic value.

Projecting the value of corporate actions. Many market professionals use valuation techniques to determine the value of proposed corporate mergers, acquisitions, divestitures, management buyouts (MBOs), and recapitalization efforts.

Fairness opinions. Analysts use equity valuation to support professional opinions about the fairness of a price to be received by minority shareholders in a merger or acquisition.

Planning and consulting. Many firms engage analysts to evaluate the effects of proposed corporate strategies on the firm's stock price, pursuing only those that have the greatest value to shareholders.

Communication with analysts and investors. The valuation approach provides management, investors, and analysts with a common basis upon which to discuss and evaluate the company's performance, current state, and future plans.

Valuation of private business. Analysts use valuation techniques to determine the value of firms or holdings in firms that are not publicly traded. Investors in nonpublic firms rely on these valuations to determine the value of their positions or proposed positions.

Portfolio management. While equity valuation can be considered a stand-alone function in which the value of a single equity position is estimated, it can be more valuable when used in a portfolio management context to determine the value and risk of a portfolio of investments. The investment process is usually considered to have three parts: planning, execution, and evaluation of results. Equity valuation is a primary concern in the first two of these steps.

- *Planning.* The first step of the investment process includes defining investment objectives and constraints and articulating an investment strategy for selecting securities based on valuation parameters or techniques. Sometimes investors may not select individual equity positions, but the valuation techniques are implied in the selection of an index or other preset basket of securities. Active investment managers may use benchmarks as indicators of market expectations and then purposely deviate in composition or weighting to take advantage of their differing expectations.
- *Executing the investment plan.* The valuation of potential investments guides the implementation of an investment plan. The results of the specified valuation methods determine which investments will be made and which will be avoided.

LOS 35.d: Explain the elements of industry and competitive analysis and the importance of evaluating the quality of financial statement information.

The five **elements of industry structure** as developed by Professor Michael Porter are:

1. Threat of new entrants in the industry.
2. Threat of substitutes.
3. Bargaining power of buyers.
4. Bargaining power of suppliers.
5. Rivalry among existing competitors.

The attractiveness (long-term profitability) of any industry is determined by the interaction of these five competitive forces (Porter's five forces).



Professor's Note: These factors are covered in detail in the topic review titled "The Five Competitive Forces that Shape Industry."

There are three generic strategies a company may employ in order to compete and generate profits:

1. *Cost leadership:* Being the lowest-cost producer of the good.
2. *Product differentiation:* Addition of product features or services that increase the attractiveness of the firm's product so that it will command a premium price in the market.

3. *Focus:* Employing one of the previous strategies within a particular segment of the industry in order to gain a competitive advantage.

Once the analyst has identified a company's strategy, she can evaluate the performance of the business over time in terms of how well it executes its strategy and how successful it is.

The basic building blocks of equity valuation come from accounting information contained in the firm's reports and releases. In order for the analyst to successfully estimate the value of the firm, the financial factors must be disclosed in sufficient detail and accuracy. Investigating the issues associated with the accuracy and detail of a firm's disclosures is often referred to as a **quality of financial statement information**. This analysis requires examination of the firm's income statement, balance sheet, and the notes to the financial statements. Studies have shown that the quality of earnings issue is reflected in a firm's stock price, with firms with more transparent earnings having higher market values.

An analyst can often only discern important results of management discretion through a detailed examination of the footnotes accompanying the financial reports. Quality of earnings issues can be broken down into several categories and may be addressed only in the footnotes and disclosures to the financial statements.

Accelerating or premature recognition of income. Firms have used a variety of techniques to justify the recognition of income before it traditionally would have been recognized. These include recording sales and billing customers before products are shipped or accepted and bill and hold schemes in which items are billed in advance and held for future delivery. These schemes have been used to obscure declines in operating performance and boost reported revenue and income.

Reclassifying gains and nonoperating income. Firms occasionally have gains or income from sources that are peripheral to their operations. The reclassification of these items as operating income will distort the results of the firm's continuing operations, often hiding underperformance or a decline in sales.

Expense recognition and losses. Delaying the recognition of expenses, capitalizing expenses, and classifying operating expenses as nonoperating expenses is an opposite approach that has the same effect as reclassifying gains from peripheral sources, increasing operating income. Management also has discretion in creating and estimating reserves that reflect expected future liabilities, such as a bad debt reserve or a provision for expected litigation losses.

Amortization, depreciation, and discount rates. Management has a great deal of discretion in the selection of amortization and depreciation methods, as well as the choice of discount rates in determination of pension plan obligations. These decisions can reduce the current recognition of expenses, in effect deferring recognition to later periods.

Off-balance-sheet issues. The firm's balance sheet may not fully reflect the assets and liabilities of the firm. Special purpose entities (SPEs) can be used by the firm to increase sales (by recording sales to the SPE) or to obscure the nature and value of assets or liabilities. Leases can be structured as operating, rather than finance, leases in order to reduce the total liabilities reported on the balance sheet.

LOS 35.e: Contrast absolute and relative valuation models, and describe examples of each type of model.

Absolute valuation models. An absolute valuation model is one that estimates an asset's intrinsic value, which is its value arising from its investment characteristics without regard to the value of other firms. One absolute valuation approach is to determine the value of a firm today as the *discounted* or *present value* of all the cash flows expected in the future. *Dividend discount models* estimate the value of a share based on the present value of all expected dividends discounted at the opportunity cost of capital. Many analysts realize that equity holders are entitled to more than just the dividends and so expand the measure of cash flow to include all expected cash flow to the firm that is not payable to senior claims (bondholders, taxing authorities, and senior stockholders). These models include the free cash flow approach and the residual income approach.

Another absolute approach to valuation is represented by *asset-based* models. This approach estimates a firm's value as the sum of the market value of the assets it owns or controls. This approach is commonly used to value firms that own or control natural resources, such as oil fields, coal deposits, and other mineral claims.

Relative valuation models. Another very common approach to valuation is to determine the value of an asset in relation to the values of other assets. This is the approach underlying relative valuation models. The most common models use market price as a multiple of an individual financial factor of the firm, such as earnings per share. The resulting ratio, price-to-earnings (P/E), is easily compared to that of other firms. If the P/E is higher than that of comparable firms, it is said to be *relatively* overvalued, that is, overvalued relative to the other firms (not necessarily overvalued on an intrinsic value basis). The converse is also true: if the P/E is lower than that of comparable firms, the firm is said to be relatively undervalued.

LOS 35.f: Illustrate the broad criteria for choosing an appropriate approach for valuing a given company.

When selecting an approach for valuing a given company, an analyst should consider whether the model:

- Fits the characteristics of the company (e.g., Does it pay dividends? Is earnings growth estimable? Does it have significant intangible assets?).
- Is appropriate based on the quality and availability of input data.
- Is suitable given the purpose of the analysis.

The purpose of the analysis may be, for example, valuation for making a purchase offer for a controlling interest in the company. In this case, a model based on cash flow may be more appropriate than one based on dividends because a controlling interest would allow the purchaser to set dividend policy.

One thing to remember with respect to choice of a valuation model is that the analyst does not have to consider only one. Using multiple models and examining differences in estimated values can reveal how a model's assumptions and the perspective of the analysis are affecting the estimated values.

KEY CONCEPTS

LOS 35.a

Intrinsic value is the value of an asset or security estimated by someone who has complete understanding of the characteristics of the asset or issuing firm. To the extent that market prices are not perfectly (informationally) efficient, they may diverge from intrinsic value. The difference between the analyst's estimate of intrinsic value and the current price is made up of two components: the difference between the actual intrinsic value and the market price, and the difference between the actual intrinsic value and the analyst's estimate of intrinsic value:

$$IV_{\text{analyst}} - \text{price} = (IV_{\text{actual}} - \text{price}) + (IV_{\text{analyst}} - IV_{\text{actual}})$$

LOS 35.b

The going concern assumption is simply the assumption that a company will continue to operate as a business as opposed to going out of business. The liquidation value is the estimate of what the assets of the firm would bring if sold separately, net of the company's liabilities.

LOS 35.c

Equity valuation is the process of estimating the value of an asset by (1) using a model based on the variables the analyst believes influence the fundamental value of the asset or (2) comparing it to the observable market value of "similar" assets. Equity valuation models are used by analysts in a number of ways. Examples include stock selection, reading the market, projecting the value of corporate actions, fairness opinions, planning and consulting, communication with analysts and investors, valuation of private business, and portfolio management.

LOS 35.d

The five elements of industry structure as developed by Professor Michael Porter are:

1. Threat of new entrants in the industry.
2. Threat of substitutes.
3. Bargaining power of buyers.
4. Bargaining power of suppliers.
5. Rivalry among existing competitors.

Quality of earnings issues can be broken down into several categories and may be addressed only in the footnotes and disclosures to the financial statements:

- Accelerating or premature recognition of income.
- Reclassifying gains and nonoperating income.
- Expense recognition and losses.
- Amortization, depreciation, and discount rates.
- Off-balance-sheet issues.

Study Session 10

Cross-Reference to CFA Institute Assigned Reading #35 – Equity Valuation: Applications and Processes

Study Session 10

LOS 35.e

An absolute valuation model is one that estimates an asset's intrinsic value (e.g., the discounted dividend approach). Relative valuation models estimate an asset's investment characteristics compared to the value of other firms (e.g., comparing P/E ratios to those of other firms in the industry).

LOS 35.f

When selecting an approach for valuing a given company, an analyst should consider whether the model fits the characteristics of the company, is appropriate based on the quality and availability of input data, and is suitable, given the purpose of the analysis.

CONCEPT CHECKERS

1. Susan Weiber, CFA, has noted that even her best estimates of a stock's intrinsic value can differ significantly from the current market price. The *least likely* explanation is:
 - A. differences between her estimate and the actual intrinsic value.
 - B. differences between the actual intrinsic value and the market price.
 - C. differences between the intrinsic value and the going concern value.
2. An appropriate valuation approach for a company that is going out of business would be to calculate its:
 - A. residual income value.
 - B. dividend discount model value.
 - C. liquidation value.
3. Davy Jarvis, CFA, is performing an equity valuation as part of the planning and execution phase of the portfolio management process. His results will also be useful for:
 - A. communication with analysts and investors.
 - B. technical analysis.
 - C. benchmarking.
4. The five elements of industry structure, as outlined by Michael Porter, include:
 - A. the threat of substitutes.
 - B. product differentiation.
 - C. cost leadership.
5. Tom Walder has been instructed to use absolute valuation models, and not relative valuation models, in his analysis. Which of the following is *least likely* to be an example of an absolute valuation model? The:
 - A. dividend discount model.
 - B. price-to-earnings market multiple model.
 - C. residual income model.
6. Davy Jarvis, CFA, is performing an equity valuation and reviews his notes for key points he wanted to cover when planning the valuation. He finds the following questions:
 - Does the company pay dividends?
 - Is earnings growth estimable?
 - Does the company have significant intangible assets?

Which of the following general questions is Jarvis trying to answer when planning this phase of the valuation?

- A. Does the model fit the characteristics of the investment?
- B. Is the model appropriate based on the availability of input data?
- C. Can the model be improved to make it more suitable, given the purpose of the analysis?

ANSWERS – CONCEPT CHECKERS

1. C The difference between the analyst's estimate of intrinsic value and the current price is made up of two components:

$$IV_{\text{analyst}} - \text{price} = (IV_{\text{actual}} - \text{price}) + (IV_{\text{analyst}} - IV_{\text{actual}})$$

2. C The liquidation value is the estimate of what the assets of the firm will bring when sold separately, net of the company's liabilities. It is most appropriate because the firm is not a going concern and will not pay dividends. The residual income model is based on the going concern assumption and is not appropriate for valuing a firm that is expected to go out of business.
3. A Communication with analysts and investors is one of the common uses of an equity valuation. Technical analysis and benchmarking do not require equity valuation.
4. A The five elements of industry structure as developed by Professor Michael Porter are:
1. Threat of new entrants in the industry.
 2. Threat of substitutes.
 3. Bargaining power of buyers.
 4. Bargaining power of suppliers.
 5. Rivalry among existing competitors.
5. B Absolute valuation models estimate value as some function of the present value of future cash flows (e.g., dividend discount and free cash flow models) or economic profit (e.g., residual income models). Relative valuation models estimate an asset's value relative to the value of other similar assets. The price-to-earnings market multiple model is an example of a relative valuation model.
6. A Jarvis is most likely trying to be sure the selected model fits the characteristics of the investment. Model selection will depend heavily on the answers to these questions.

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EQUITY: MARKETS AND INSTRUMENTS

Study Session 10

EXAM FOCUS

This topic review addresses the structure of international equity markets and the mechanics of investing in those markets. Focus your attention on the costs of investing directly in international equity markets (taxes and execution costs), as well as the advantages and disadvantages of various alternatives to direct investing, such as American Depositary Receipts, closed-end country funds, and exchange traded funds. This topic review is the only place in the Level 2 curriculum where equity markets and instruments are discussed in detail.

LOS 36.a: Explain the historical differences in market organization.

Most modern stock exchanges (or *bourses*) have their origins in one of three basic historical types: private bourses, public bourses, and bankers' bourses.

1. **Private bourses** were originally established by individuals for the purpose of securities trading. They are privately owned but publicly regulated with a strong bias toward self-regulation. Many private bourses today were directly influenced by and developed from the early British exchanges. This is the most popular model today.
 2. **Public bourses** were first developed in France during the early 1800s. Public bourses are public institutions with brokers appointed by the government. Public brokerage firms' commissions and memberships are regulated by government officials. Most public bourses have converted to private bourses over the years.
 3. **Bankers' bourses** developed out of the German Banking Act, which granted a brokerage monopoly to banks. In a bankers' bourse, banks play the primary role in securities trading. Most bankers' bourses had developed into private bourses by the 1990s.
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LOS 36.b: Differentiate between an order-driven market and a price-driven market, and explain the risks and advantages of each.

The Paris Bourse, Frankfurt DAX (XETRA), and Tokyo Nikkei operate as **order-driven markets** (a.k.a. auction markets). Order-driven markets do not have active market makers. Instead, the auction market matches the supply and demand for securities directly. Order-driven markets function as electronic order-driven systems in which all transactions flow through a computer. Prices are determined by the supply and demand for the securities. The central order book is the focus of the markets' operations.

A **price-driven market** (a.k.a. a dealer market or quote-driven market) is a market in which market makers maintain an inventory of securities and continuously quote prices at which they will buy (the bid price) and sell (the ask price). Customers choose the best quotes, and competition among the market makers promotes the best prices. The U.S. NASDAQ is an example of a price-driven market.



Professor's Note: Unfortunately, these definitions are not consistent with what you learned at Level 1. The Level 1 curriculum says that a pure auction market, a price-driven market, and an order-driven market are all the same (and that a dealer market is equivalent to a quote-driven market). Discrepancies like this are rare in the CFA curriculum, but they do exist. For the Level 2 exam, use the definitions provided in the discussion related to this LOS: an auction market is an order-driven market; a dealer market is a price-driven market or a quote-driven market.

Figure 1: Features of Order-Driven and Price-Driven Markets

Differentiating Factors	Order-Driven Market	Price-Driven Market
Markets	<ul style="list-style-type: none"> Paris Bourse, Frankfurt XETRA, Tokyo Nikkei. 	<ul style="list-style-type: none"> U.S. NASDAQ.
Type	<ul style="list-style-type: none"> Continuous market. Periodic call markets to improve liquidity. 	<ul style="list-style-type: none"> Continuous market; trades occur anytime the market is open.
Definition	<ul style="list-style-type: none"> All trades are entered into a central order book, and new orders are matched with limit orders previously submitted. 	<ul style="list-style-type: none"> Market makers stand ready to buy and sell at listed prices. Market makers publicly post bid-ask prices to encourage orders.
Elements/components	<ul style="list-style-type: none"> Electronic order driven. Central order book maintains all limit orders posted. 	<ul style="list-style-type: none"> Automated system posts firm quotes by market makers.
Advantages	<ul style="list-style-type: none"> Traders view all standing orders, and trades are executed via the central order book. Traders can monitor and provide liquidity at lower cost. High speed and low cost of trading. Little human intervention. Efficient system for small security trades. 	<ul style="list-style-type: none"> Purchases are made at the lowest offering price, and sales occur at the highest bid price. More efficient for large block trades.
Risks/disadvantages	<ul style="list-style-type: none"> Inability to execute large trades quickly due to lack of market depth. Lack of developed market making requires placing market orders as opposed to limit orders (transparency risk). Both expose traders to the risk of getting “picked off” or forced to trade at an unattractive price. 	<ul style="list-style-type: none"> No centralized book of limit orders. Market maker does not know what trades will be generated when posting a quote, which reduces the anonymity of the trade.



Professor's Note: The New York Stock Exchange (NYSE) is a combination of an order-driven and price-driven system.

LOS 36.c: Calculate the impact of different national taxes on the return of an international investment.

Taxes can be imposed by the governments of both the investor's country and the foreign country in which the investment is made. There are three different forms of tax:

1. **Capital gains** are taxed in the country where the investor resides.
2. **Income tax** creates a jurisdictional conflict between the two countries. The international convention is to make sure the tax is paid in at least one country. This is accomplished by the foreign country applying a withholding tax to dividends, and the investor receiving the net amount. The home country then taxes the gross amount of the dividends but gives the investor a tax credit equal to the foreign country's withholding. The result is that the investor pays the percentage tax rate that applies in the investor's home country.
3. **Transaction taxes** are taxes imposed on trades. They have been eliminated or significantly reduced in most countries.

All of these taxes add to the cost of international investing and ultimately reduce the total return.

Example: Calculating return with different national taxes

Suppose a U.S. investor buys 100 shares of SAP Systems (SAP), listed in Germany on the XETRA, quoted at €14.5 per share (including commissions) for a total trade cost of €1,450. The current exchange rate is \$0.90 per euro. The U.S. currency cost is \$1,305 for the entire trade, including commissions charged by the U.S. broker.

Three months later, a dividend of €1 is paid for each share owned. Dividends are subject to a 15% withholding tax in Germany, and there is a 28% tax on short-term capital gains and dividends in the United States. At this point, the investor decides to sell the 100 shares of SAP, now worth €16 per share. The current exchange rate is \$0.95 per euro. Calculate the impact of taxes on the total return.

Answer:

Capital gains:

$$\text{U.S. dollar proceeds from sale (100 shares)} = €16 \times 100 \times \$0.95/€ = \$1,520$$

$$\text{pretax capital gain} = \$1,520 - \$1,305 = \$215$$

$$\text{taxes paid to U.S. tax authority} = \$215 \times 0.28 = \$60.20$$

Dividends:

$$\text{pretax dividends} = 100 \text{ shares} \times 1 \text{ €/share} \times \$0.95/€ = \$95$$

$$\text{taxes paid to U.S. tax authority} = \$95 \times 0.28 = \$26.60$$

$$\text{tax withholding to German tax authority} = \$95 \times 0.15 = \$14.25$$

$$\text{tax credit received from U.S. tax authority} = \$14.25$$

Notice that the investor pays the U.S. income tax rate of 28% (\$26.60) on the dividend of \$95: \$14.25 goes to the German tax authority and \$12.35 (\$26.60 – \$14.25) to the U.S. tax authority.

The impact of taxes on total return is 6.7%:

$$\text{total pretax return} = \frac{\$310}{\$1,305} = 23.8\%$$

$$\text{total after-tax return} = \frac{\$223.20}{\$1,305} = 17.1\%$$

$$\text{impact of taxes on total return} = 23.8\% - 17.1\% = 6.7\%$$

LOS 36.d: Discuss components of execution costs (including commissions and fees, market impact, and opportunity cost) and approaches to reducing these costs.

Execution costs include both tangible and intangible trading costs. The three primary execution costs are as follows:

1. **Commissions, fees, and taxes** are tangible execution costs, such as negotiated broker fees to handle and clear a trade, taxes imposed by various governments, fees for post-trade settlement, and soft dollars.

2. **Market impact** is an intangible cost equal to the price adjustment needed to purchase liquidity. The size of the impact depends on the order size, market liquidity, and desired execution speed. This price adjustment is defined as the price difference between the time the order is submitted and when the actual trade occurs. The bid-ask spread is the largest component of the market impact cost in a price-driven market.
3. **Opportunity cost** is an intangible cost associated with the delay in or failure to complete an individual trade. Opportunity costs are significant for investors in order-driven markets (where adverse price movements and information leakage are common) and crossing networks. Non-execution may result in high costs because failure to fulfill the order can leave the portfolio manager without the security.

There is a cost trade-off between market impact and opportunity costs. Executing large orders tends to slowly incur higher opportunity costs, especially in an information-sensitive market. On the other hand, rushing large trades incurs higher market impact costs. None of these execution costs can be observed independently except for commissions.

Figure 2: Components of Execution Costs

<i>Cost</i>	<i>Definition</i>	<i>Practical Measurement</i>	<i>Influencing Factors</i>
Commissions	Explicit fee charged by broker for services.	Negotiated and quoted for listed trades.	Liquidity, stock, and order size.
Market impact	Cost of immediate execution or cost of buying liquidity.	Difference between the average execution price and the price at the time the order is revealed to the broker.	Large orders, market liquidity, quicker executions incur higher costs.
Opportunity	Cost of failing to find liquidity or failure to execute trade.	15-day return for unexecuted shares.	Slower order executions incur higher costs.



Professor's Note: Best execution occurs when the total tangible and intangible costs are minimized, given the trading circumstances. This is not the same thing as minimizing tangible trading costs like commissions.

Reducing Execution Costs

Program trading: In order to avoid large execution costs associated with the liquidation of several positions within a portfolio, a manager can offer the entire basket of securities rather than trade security by security.

- *Advantage:* Program trading reduces execution costs by trading large baskets of securities that are deemed less risky due to the underlying portfolio diversification. In contrast, a large single security trade may be inherently more risky due to the unique motivation for buying or selling that individual security.
- *Disadvantage:* It can be costly and time-consuming to locate a counterparty for the large diversified basket of securities.

Internal crossing occurs when a portfolio manager executes a buy order for one client and simultaneously executes a sell order for a different client for the same security within the firm.

- *Advantage:* Utilizing internal crossing networks (if an offsetting trade is available) minimizes execution costs.
- *Disadvantage:* The opportunity to offset trades between clients of the same firm is relatively rare. Establishing a fair transaction price is difficult because the trade occurred not in the market but between clients of the same firm. This process also raises the question of why a portfolio manager would buy and sell the same security at the same time. For that reason, it is usually applied for passive investment strategies.

External crossing utilizes an electronic crossing network (ECN), which matches buy and sell market orders. The orders are “crossed” at prespecified times at the market price prevailing in the primary market.

- *Advantage:* There are very low execution costs, and trades are anonymous, which means no exposure risk.
- *Disadvantage:* The opportunity cost can increase if the trade grows stale without an opposing order to execute. In an ECN, many orders are not executed.

Principal trades occur when a principal acts as dealer and pledges to take the opposite side of an order for a firm price. The dealer guarantees full execution at the specified price, through buying or selling out of inventory.

- *Advantage:* Opportunity costs are reduced because liquidity is assured by the dealer.
- *Disadvantage:* The entire execution cost can be large because the dealer, acting in a principal capacity, takes an inventory position in the security and is compensated for the trade. Knowledge of the party executing the trade is known, which limits the benefit of anonymous trades.

Agency trades are negotiated trades executed through a broker who searches the market for the best execution price available. The broker acts not in a principal capacity but as an agent for the portfolio manager.

- *Advantage:* The broker searches for the best execution price, thereby minimizing opportunity costs and price impact costs.
- *Disadvantage:* The commission paid to the broker for the trade can be large.

Futures contracts include buying and selling contracts on a market index while simultaneously selling and buying securities for the portfolio in order to gain fast exposure to a market while minimizing opportunity costs.

- *Advantage:* It reduces opportunity costs because futures contracts are highly liquid.
- *Disadvantage:* Basis risk can be introduced should the correlation between the market index and the portfolio differ significantly from 1.0. This strategy is not well-suited for single stock trades.

Indications of interest involve dealers who search the market for counterparties willing to engage in an opposing trade. A survey of dealers can identify those counterparties and execute less costly trades. This method is most appropriate for passive strategies.

- *Advantage:* Execution costs are lower.
- *Disadvantage:* The search for liquidity leads to less anonymity in the trading process.

LOS 36.e: Describe an American Depositary Receipt (ADR), and differentiate among the various forms of ADRs in terms of trading and information supplied by the listed company.

An **American Depositary Receipt (ADR)** is a dollar-denominated negotiable certificate representing a specified number of shares in a foreign corporation. ADRs are issued by U.S. banks and consist of a bundle of foreign corporation shares that are being held in custody overseas. ADRs are traded in U.S. markets and are traded like shares of stock on the NYSE, AMEX, and NASDAQ. The foreign entity must provide financial information to the sponsor bank. The ADR can be cancelled and redeemed for its underlying shares at anytime.

The advantage of ADRs is that they reduce administration and duty costs on each transaction. The disadvantage of ADRs is that they do not eliminate the inherent currency and economic risks associated with the shares of a foreign country.

There are three different types of ADR issues:

1. *Level I:* This is the most basic type of ADR, used by foreign companies that either don't qualify or don't wish to have their ADR listed on an exchange. Level I ADRs trade solely on the over-the-counter market and are an easy and inexpensive way for a company to gauge interest for its securities in North America. Level I company ADRs are not required to comply with SEC registration and reporting requirements.
2. *Level II:* The main difference from Level I is that this type of ADR is listed on an exchange or quoted on the NASDAQ. Level II ADRs must adhere to the registration requirements of the SEC, but the offsetting benefit is the higher visibility and increased trading volume that results from being exchange-traded. The company must provide annual reports that include a reconciliation of earnings and shareholders' equity from its country's national accounting standards to U.S. GAAP, as well as quarterly financial statements.
3. *Level III:* This is the most prestigious of the three types, one in which an issuer floats a public offering of ADRs on a U.S. exchange to raise new equity capital and gain increased visibility in the U.S. financial markets. The reporting requirements for Level III ADRs are the same as for Level II ADRs.

LOS 36.f: Explain why companies choose to be listed abroad, and calculate the cost difference between buying shares listed abroad and buying ADRs.

There are four reasons why a company may want to list its securities abroad:

1. It may desire a broader diversification of its capital sources across international boundaries.
2. Concern about takeovers by domestic competitors is reduced by global distribution of the company's shareholders.
3. In the case in which a company wants to raise additional external financing, exposure to broader capital markets provides access to additional resources.

4. Listing a company abroad provides additional advertising opportunities for and recognition of the company's products and services.

ADRs provide a means of obtaining international diversification with relative ease. Generally, it is more costly for large institutional investors to purchase ADRs than to directly purchase the securities in the local markets because the local market may provide more liquidity. When evaluating the cost trade-off of using ADRs or directly purchasing the shares in the primary market, the investor should look at price levels, transaction costs, taxes, and administrative expenses.

Example: Trading costs of listed shares and ADRs

Unilever NV (UN) shares are listed in Frankfurt (XETRA) and on the NYSE. A German investor purchases 100 shares of UN in Frankfurt at €51.45 per share. The broker in Germany charges a 0.10% commission. Simultaneously, the investor's U.S. broker quotes Unilever NV ADRs on the NYSE at an ask price of \$60.60, net of commissions. The exchange rate in U.S. dollars per euro is 1.1700. Determine whether it is cheaper to purchase the shares of UN in New York or in Frankfurt.

Answer:

The purchase price of 100 shares listed on the NYSE is \$6,060.00. To pay for the purchase, the investor will need to exchange euros for U.S. dollars at a rate of \$1.1700 per euro for a total euro purchase of 5,179:

$$\frac{\$6,060}{\$1.1700/\text{€}} = \text{€}5,179$$

The cost of purchasing the 100 shares of UN directly in Frankfurt is the purchase price plus the 0.10% commission:

$$\text{€}51.45 \times 1.0010 \times 100 = \text{€}5,150$$

A savings of €29 per 100 shares would be realized if the shares were purchased directly in Frankfurt as opposed to buying the ADRs in New York.

WARM-UP: CLOSED-END FUNDS

A mutual fund is a fund that invests in a portfolio of securities. The fund's net asset value (NAV) is equal to the market value of the portfolio divided by the number of shares outstanding. Investors in an open-end fund can buy or sell shares at the NAV. The shares of a closed-end fund trade in a market (like shares of stock), and the market price of the closed-end fund shares is determined by the supply and demand for the shares. A closed-end fund usually trades at a market price that represents a premium or discount to NAV:

$$\begin{aligned} \text{closed-end fund market price} &= \text{NAV} + \text{premium} \\ \text{or} \\ \text{closed-end fund market price} &= \text{NAV} - \text{discount} \end{aligned}$$

LOS 36.g: State the determinants of the value of a closed-end country fund.

A **closed-end country fund** is a closed-end fund that invests in stocks from a single country. As with most closed-end funds, the market price of a country fund is usually not equal to the fund's NAV. The size of the premium or discount is determined by foreign investment restrictions, management fees and lack of liquidity, and its correlation with U.S. markets.

- **Foreign investment restrictions.** For countries that impose restrictions on foreign investment, country funds enable investors to invest indirectly in the otherwise inaccessible equity markets of that country. Funds investing in countries with investment restrictions tend to trade at a premium to NAV.
- **Management fees and lack of liquidity.** For developed countries with alternative methods of direct investments, country funds are not as attractive as an investment vehicle because of added volatility of the premium. The result is that many investors prefer open-end to closed-end funds, which results in higher management fees, lower liquidity, and larger discounts.
- **Correlation with U.S. markets.** Empirical evidence suggests that closed-end country funds' returns are more strongly positively correlated with returns on U.S. equities than the correlation between the overall equity returns between the country's equities and U.S. equities. Market prices of closed-end funds react somewhat slowly to changes in fund NAV. Researchers have developed a number of behavioral finance explanations for this apparent market inefficiency.

LOS 36.h: Describe exchange-traded funds (ETFs), and explain the pricing of international ETFs in relation to their net asset value (NAV).

Exchange traded funds (ETFs) are shares of a portfolio (which tracks an index) and trades on an exchange. There are several advantages to investors in utilizing international ETFs.

- ETFs achieve international diversification with high levels of liquidity at a minimal cost. ETFs are tax-efficient due to very low portfolio turnover that reduces realized taxable gains.
- An ETF can be shorted and margined.
- ETFs allow a domestic portfolio manager to pursue an international investment strategy without engaging in direct international security purchases.
- ETFs are specially designed to be utilized in active asset allocation strategies. The portfolio manager can own an international index and enhance the active returns with additional individual security selections.

Exchange specialists act as market makers for ETFs and are considered authorized participants by the ETF-sponsored fund companies. Acting as an authorized agent, the specialist can engage in arbitrage trades, which will ensure that the ETF's NAV and its market price are approximately equal.

The pricing of international ETFs and their relation to their net asset value is influenced by the effect of nonoverlapping time zones. When the time zones between the U.S. market and other international markets do not overlap, the NAV can become “stale” in its pricing. The ETF will reflect changes in exchange rates between the time the market closes in one country and opens in the United States. The ETF’s NAV pricing may also change before the market opens to reflect expectations about future stock market movements.

LOS 36.i: Discuss the advantages and disadvantages of alternatives to direct international investing.

ADRs are claims on securities issued by foreign corporations that trade on U.S. exchanges.

- *Advantages:* ADRs save retail customers considerable costs by reducing administration and duty costs. Also, they provide access to foreign securities and the benefits of international diversification.
- *Disadvantages:* ADRs do not eliminate the currency and economic risks of the foreign country associated with the shares. The number of foreign companies with actively traded ADRs is relatively small, and trading ADRs can be more costly than direct investing for institutional investors.

Closed-end country funds specialize in investing in the stock markets of a specific country.

- *Advantages:* Closed-end country funds provide a simple way to access foreign markets while achieving international diversification. Many nations restrict foreign investment. However, in nations that allow country funds, investors have greater access to these emerging markets. International portfolio managers do not have to worry about redemptions because the outstanding shares of a closed-end fund are fixed.
- *Disadvantages:* Closed-end country funds may trade at a significant premium or discount to their NAV. Volatility in the NAV premium can increase the uncertainty and risk of holding the shares. The closed-end fund’s market price may be highly correlated with the United States or other developed country stock markets, which reduces the benefit of international diversification.

Open-end funds are publicly traded mutual funds that can be purchased or redeemed at their NAV.

- *Advantages:* Open-end shares trade at their NAV with no discount or premium. The multitude of choices in open-end funds for various countries, regions, and international industries is an additional benefit.
- *Disadvantages:* Open-end fund investors must redeem their shares by noon EST due to international market closings. The settlement for the redeemed shares occurs once the NAV for the fund is determined at the close of the domestic market exchange. The time lag between the international market closings, redemptions, and NAV determination creates cash flow problems for managers. The fund may need several days to execute transactions in order to meet large redemptions. Open-end fund shares cannot be sold short or margined.

ETFs are special open-end funds that trade on stock exchanges.

- *Advantages:* ETFs are designed to track the performance of a market index, trade during market hours, can be sold short and margined, offer the benefits of international diversification with high levels of liquidity, and have a lower cost structure than mutual funds because they do not have shareholder accounting expenses. Other ETF benefits include tax efficiency, which results from the very low portfolio turnover. ETFs can be utilized effectively in active asset allocation strategies.
- *Disadvantages:* ETFs are created to mirror the performance of market indices but incur a management fee, which prevents them from achieving a return greater than the index.

KEY CONCEPTS

LOS 36.a

Most modern stock exchanges (or bourses) have their origins in one of three basic historical types: private bourses, public bourses, and bankers' bourses.

LOS 36.b

A price-driven market has market makers who are prepared to purchase or sell securities at posted prices. Order-driven markets function around the central order book where orders are matched with other market and limit orders.

LOS 36.c

International investments often face capital gains taxes, income taxes, and transaction taxes. The total return on the investment is reduced by the combination of these taxes.

LOS 36.d

There are three different types of execution costs faced by a portfolio manager: commissions, price impact, and opportunity cost. Price impact refers to the cost to purchase liquidity and is increased by larger order size, less market liquidity, and higher execution speed. Opportunity cost is an intangible cost associated with the delay in, or failure to complete, a trade.

There are various ways to reduce execution costs: program trading, internal and external crossing networks, principal and agency trades, futures contracts, and solicitation of indications of interest. Each method has its advantages and disadvantages.

LOS 36.e

ADRs are dollar-denominated negotiable certificates representing a specified number of shares in a foreign corporation. There are three levels of ADRs, which have varying degrees of SEC regulation and trading availability.

Level I ADRs trade solely on the over-the-counter market and are not required to comply with SEC registration and reporting requirements.

Level II ADRs are listed on an exchange and must adhere to the registration requirements of the SEC. The company must provide a reconciliation of earnings and shareholders' equity from its local accounting standards to U.S. GAAP.

Level III ADRs refer to those in which the local issuer sells newly issued ADRs on a U.S. exchange to raise new equity capital. Reconciliation is required.

LOS 36.f

Firms list abroad to gain global distribution of their securities, reduce the threat of takeover by domestic competitors, gain access to foreign capital markets, and provide additional advertising for the company in foreign markets.

The cost differential between purchasing ADRs and direct investment in the shares in foreign markets is a function of the price levels between the two markets, transaction costs, taxes, and administrative expenses.

LOS 36.g

Value is best approximated by NAV. The determinants of the price of a closed-end fund also include investment restrictions imposed by governments, management fees and lack of liquidity, and the correlation between the return on the country fund portfolio returns and U.S. market returns.

LOS 36.h

ETFs provide several advantages: international diversification, tax efficiency, and a very low cost structure. ETFs can be shorted and margined and are often utilized in active asset allocation strategies in combination with an international index.

LOS 36.i

ADRs provide access to foreign securities but are only available for a relatively small number of foreign stocks. Closed-end funds also provide access to foreign markets, even some that restrict direct foreign investment. However, closed-end funds may trade at a premium or discount to NAV. Open-end funds provide easy and cost-efficient diversification, but international funds are not very liquid. Exchange-traded funds provide international diversification opportunities at a low cost, but because they are intended as index funds, they can't (and don't) beat their benchmark portfolios.

CONCEPT CHECKERS

1. Which of the following *best* describes the differences between order-driven markets and price-driven markets?
 - A. Order-driven markets pose very little risk to traders. Price-driven market traders face significant risks associated with large trades because of a lack of market depth.
 - B. Price-driven markets utilize market makers who stand ready to buy and sell at posted prices. Order-driven markets use a central order book where all trades are matched with limit orders of previously issued trades.
 - C. Order-driven markets utilize market makers who stand ready to buy and sell at posted prices. Price-driven markets use a central order book where all trades are matched with limit orders of previously issued trades.
2. Execution costs can be *best* minimized by utilizing:
 - A. principal trades in order to maintain market anonymity.
 - B. program trading because the trade is not motivated by a single security but rather by the need to trade a basket of securities.
 - C. internal crossing networks because buying and selling the same security is common practice for large institutional money managers.
3. Which of the following statements *best* describes why firms list their securities abroad?
 - A. Obtain greater access to capital markets to raise capital and provide worldwide advertising opportunities.
 - B. Obtain favorable tax treaty treatment and achieve diversification of their securities in the domestic market to prevent hostile takeovers.
 - C. Obtain broader diversification of their securities across international boundaries and achieve a concentration of their security in the domestic market to prevent hostile takeovers.
4. Which of the following is an advantage of exchange traded funds (ETFs)? ETFs achieve:
 - A. international diversification and provide low levels of liquidity.
 - B. lower transaction costs and improved tax efficiency.
 - C. high levels of liquidity and lower tax efficiency.
5. Schmetterling AG American Depositary Receipt (ADR) trades both in Frankfurt and on the NYSE. As a German investor, you can purchase Schmetterling shares for €54.30 plus a 0.20% commission with a German broker. A U.S. broker quotes \$63.60 net for the Schmetterling ADR. The exchange rate in \$ per € is 1.15 net. Is it better to purchase the shares in Frankfurt or on the NYSE, and what is the approximate savings for that respective market? Purchase Schmetterling in:
 - A. Frankfurt and save €0.89 per share.
 - B. New York and save \$1.35 per share.
 - C. No savings is possible.

6. Silver Cambodia Inc. (SC) is interested in having an ADR for its shares on a U.S. exchange, provided there is sufficient trading volume. Because SC does not need new capital, SC will *most likely* issue a:
- A. Level I ADR.
 - B. Level II ADR.
 - C. Level III ADR.
7. Wanda Brunner, CFA, is analyzing historical price movements using multiple regression techniques and observes that closed-end country funds often have higher correlations with U.S. markets than they do with their own NAVs. This is *most likely* a result of:
- A. investment restrictions.
 - B. low liquidity.
 - C. market inefficiency.

CHALLENGE PROBLEM

8. Davey Jarvis, CFA, is calculating the impact of different national taxes on the return of an international investment. A stock is purchased in Germany for €33 per share (including commissions) for a total trade cost of €3,300. The current exchange rate is \$0.95 per euro. The U.S. currency cost is \$3,135 for the entire trade, including commissions charged by the U.S. broker.

Three months later, a dividend of €1.25 is paid for each share owned. Dividends are subject to a 15% withholding tax in Germany, and there is a 33% tax on short-term capital gains and dividends in the United States. At this point, Jarvis decides to sell the 100 shares, now worth €38 per share. The current exchange rate is \$0.97 per euro. The impact of taxes on the total return is *closest* to:

- A. 5.0%.
- B. 6.0%.
- C. 7.0%.

ANSWERS – CONCEPT CHECKERS

1. **B** Price-driven markets utilize market makers who stand ready to buy/sell at posted prices. Order-driven markets use a central order book where all trades are matched with limit orders of previously issued trades. Order-driven market traders face significant risks associated with large trades due to lack of market depth. The trading procedures differ significantly between the two markets.
2. **B** Utilizing program trading can minimize execution costs since the trade is not motivated by a single security but rather by the need to trade a basket of securities. Principal trades do not maintain market anonymity. Internal crossing networks can be difficult to execute because a willing counterparty may not be easily located.
3. **A** Firms list abroad to gain broader diversification of their securities, prevent acquisitions from domestic competitors, gain access to worldwide capital markets, and provide additional advertising for the company across additional markets.
4. **B** ETFs provide several advantages, such as international diversification, tax efficiency, and a low-cost structure.
5. **A** The cost in Frankfurt is $\text{€}54.30 \times 1.0020 = \text{€}54.41$. The cost in New York is $\text{\$}63.60 / 1.15 = \text{€}55.30$. It is better to purchase Schmetterling in Frankfurt and save $\text{€}0.89$ per share.
6. **B** Level II ADRs are listed on an exchange or quoted on the NASDAQ. Level I ADRs trade only in over-the-counter markets, not on exchanges. Level III ADRs represent new shares issued by the underlying company to raise capital.
7. **C** Empirical evidence suggests that country funds' market returns are strongly positively correlated with U.S. equity market returns, whereas market prices of closed-end funds react slowly to changes in their NAVs. Researchers have developed a number of behavioral finance models to explain this apparent market inefficiency.

ANSWER – CHALLENGE PROBLEM

8. **C** Capital gains:

U.S. dollar proceeds from sale (100 shares) = $\text{€}38 \times 100 \times \$0.97/\text{€} = \$3,686$
 pretax capital gain = $\$3,686 - \$3,135 = \$551$
 taxes paid to U.S. tax authority = $\$551 \times 0.33 = \181.83

Dividends:

pretax dividends = $100 \text{ shares} \times 1.25 \text{ €/share} \times \$0.97/\text{€} = \$121.25$
 taxes paid to U.S. tax authority = $\$121.25 \times 0.33 = \40.01
 tax withholding to German tax authority = $\$121.25 \times 0.15 = \18.19
 tax credit received from U.S. tax authority = $\$18.19$

Notice that the investor pays the U.S. income tax rate of 33% ($\$40.01$) on the dividend of $\$121.25$: $\$18.19$ goes to the German tax authority and $\$21.82$ ($\$40.01 - \18.19) to the U.S. tax authority.

The impact of taxes on total return:

$$\text{total pretax return} = (\$551 + 121.25) / \$3,135 = 21.4\%$$

$$\text{total after-tax return} = (\$551 - \$181.83 + \$121.25 - \$40.01) / \$3,135 = 14.4\%$$

$$\text{impact of taxes on total return} = 21.4\% - 14.4\% = 7.0\%$$

The following is a review of the Equity Investments principles designed to address the learning outcome statements set forth by CFA Institute®. This topic is also covered in:

RETURN CONCEPTS

Study Session 10

EXAM FOCUS

Much of this material builds on concepts covered elsewhere in the Level 2 curriculum. Be able to distinguish among return concepts such as holding period return, realized return, expected return, required return, and discount rate. Understand the concept of convergence of price to intrinsic value. Be able to explain the equity risk premium, the various methods and models used to calculate the equity risk premium, and the strengths and weaknesses of those methods. The review also covers the weighted average cost of capital (WACC). You must be able to explain and calculate the WACC and be able to select the most appropriate discount rate for a given cash flow stream.

LOS 37.a: Distinguish among expected holding period return, realized holding period return, required return, return from convergence of price to intrinsic value, discount rate, and internal rate of return.

Holding Period Return

Holding period return is the increase in price of an asset plus any cash flow received from that asset, divided by the initial price of the asset. The measurement or *holding period* can be a day, a month, a year, and so on. In most cases, we assume the cash flow is received at the end of the holding period, and the equation for calculating holding period return is:

$$\text{holding period return} = r = \frac{P_1 - P_0 + CF_1}{P_0} = \frac{P_1 + CF_1}{P_0} - 1$$

The subscript 1 simply denotes one period from today. P stands for price and CF stands for cash flow. For a share of common stock, we might think of this in terms of:

$$r = \frac{CF_1}{P_0} + \frac{P_1 - P_0}{P_0}$$

where:

$$\frac{CF_1}{P_0} = \text{the cash flow yield}$$

$$\frac{P_1 - P_0}{P_0} = \text{the return from price appreciation}$$

If the cash flow is received before the end of the period, then CF_1 would equal the cash flow received during the period plus any interest earned on the reinvestment of the cash flow from the time it was received until the end of the measurement period.

In most cases, holding period returns are annualized. For example, if the return for one month is 1% (0.01), then the analyst might report an annualized holding period return of $(1 + 0.01)^{12} - 1 = 0.1268$ or 12.68%. Annualized holding period returns should be scrutinized to make sure that the return for the actual holding period truly represents what could be earned for an entire year.

Realized and Expected Holding Period Return

A **realized return** is a historical return based on past observed prices and cash flows. An **expected return** is based on forecasts of future prices and cash flows. Such expected returns can be derived from elaborate models or subjective opinions.

Required Return

An asset's **required return** is the minimum return an investor requires given the asset's risk. A more risky asset will have a higher required return. Required return is also called the *opportunity cost* for investing in the asset. If expected return is greater (less) than required return, the asset is undervalued (overvalued).

Price Convergence

If the *expected return* is not equal to required return, there can be a “return from convergence of price to intrinsic value.” Letting V_0 denote the true intrinsic value, and given that price does not equal that value (i.e., $V_0 \neq P_0$), then the return from convergence of price to intrinsic value is $(V_0 - P_0) / P_0$. If an analyst expects the price of the asset to converge to its intrinsic value by the end of the horizon, then $(V_0 - P_0) / P_0$ is also the difference between the expected return on an asset and its required return:

$$\text{expected return} = \text{required return} + \frac{(V_0 - P_0)}{P_0}$$

It is possible that there are chronic inefficiencies that impede price convergence. Therefore, even if an analyst feels that $V_0 \neq P_0$ for a given asset, the convergence yield may not be realized.

Discount Rate

The **discount rate** is the rate used to find the present value of an investment. While it is possible to estimate a discount rate subjectively, a much sounder approach is to use a market determined rate.

Internal Rate of Return

For publicly traded securities, the **internal rate of return** (IRR) is a market-determined rate. It is the rate that equates the value of the discounted cash flows to the current price of the security. If markets are efficient, then the IRR represents the required return.

LOS 37.b: Calculate and interpret an equity risk premium using historical and forward-looking estimation approaches.

The **equity risk premium** is the return in excess of the risk-free rate that investors require for holding equity securities. It is usually defined as the difference between the required return on a broad equity market index and the risk-free rate:

$$\text{equity risk premium} = \text{required return on equity index} - \text{risk-free rate}$$

An estimate of a future equity risk premium, based on historical information, requires the following preliminary steps:

- Select an equity index.
- Select a time period.
- Calculate the mean return on the index.
- Select a proxy for the risk-free rate.

The risk-free return should correspond to the time horizon for the investment (e.g., T-bills for shorter-term and T-bonds for longer-term horizons). The broad market equity risk premium can be used to determine the required return for individual stocks using beta:

$$\text{required return for stock } j = \text{risk-free return} + \beta_j \times (\text{equity risk premium})$$

where:

β_j = the “beta” of stock j and serves as the adjustment for the level of systematic risk inherent in the stock.

If the systematic risk of stock j equals that of the market, then $\beta_j = 1$. If systematic risk is greater (less) than that of the market, then $\beta_j > 1$ (< 1). A more general representation is:

$$\text{required return for stock } j = \text{risk-free return} + (\text{equity risk premium}) + \text{other risk premia/discounts appropriate for } j$$

The general model is used in the build-up method (discussed later) and is typically used for valuation of private businesses. It does not account for systematic risk.

Note that an equity risk premium is an estimated value and may not be realized. Also keep in mind that these estimates can be derived in several ways. An analyst reading a report that discusses a “risk premium” should take note to see how the author of the report has arrived at the estimated value.



Professor's Note: As you work through this topic review, keep in mind that the risk premiums, including the equity risk premium, are differences in rates—typically a market rate minus the risk-free rate.

ESTIMATES OF THE EQUITY RISK PREMIUM: STRENGTHS AND WEAKNESSES

There are four types of estimates of the equity risk premium: historical estimates, forward-looking estimates, macroeconomic model estimates, and survey estimates.

HISTORICAL ESTIMATES

A **historical estimate** of the equity risk premium consists of the difference between the historical mean return for a broad-based equity-market index and a risk-free rate over a given time period. Its strength is its objectivity and simplicity. Also, if investors are rational, then historical estimates will be unbiased.

A weakness of the approach is the assumption that the mean and variance of the returns are constant over time (i.e., that they are stationary). This does not seem to be the case. In fact, the premium actually appears to be countercyclical—it is low during good times and high during bad times. Thus, an analyst using this method to estimate the current equity premium must choose the sample period carefully. The historical estimate can also be upward biased if only firms that have survived during the period of measurement (called *survivorship bias*) are included in the sample.

Other considerations include the method for calculating the mean and which risk-free rate is most relevant to the analysis. Because a geometric mean is less than or equal to the corresponding arithmetic mean, the risk premium will always be lower when the geometric mean is used instead of the arithmetic mean. If the yield curve is upward sloping, the use of longer-term bonds rather than shorter-term bonds to estimate the risk-free rate will cause the estimated risk premium to be smaller.

FORWARD-LOOKING ESTIMATES

Forward-looking or **ex ante estimates** use current information and expectations concerning economic and financial variables. The strength of this method is that it does not rely on an assumption of stationarity and is less subject to problems like survivorship bias. There are three main categories of forward-looking estimates: those based on the Gordon growth model, supply-side models, and estimates from surveys.

Gordon Growth Model

The **constant growth model** (a.k.a. the **Gordon growth model**) is a popular method to generate forward-looking estimates. The assumptions of the model are reasonable when applied to developed economies and markets, wherein there are typically ample sources of reliable forecasts for data such as dividend payments and growth rates. This method estimates the risk premium as the expected dividend yield plus the expected growth rate

minus the current long-term government bond yield. Denoting each component by (D_1 / P) , \hat{g} , and $r_{LT,0}$, respectively, the forward-looking equity risk premium estimate is:

$$(D_1 / P) + \hat{g} - r_{LT,0}$$

A weakness of the approach is that the forward-looking estimates will change through time and need to be updated. During a typical economic boom, dividend yields are low and growth expectations are high, while the opposite is generally true when the economy is less robust. For example, suppose that during an economic boom (bust) dividend yields are 2% (4%), growth expectations are 6% (3%), and long-term bond yields are 6% (3%). The equity risk premia during these two different periods would be 2% during the boom and 4% during the bust. And, of course, there is no assurance that the capital appreciation realized will be equal to the earnings growth rate during the forecast period.

Another weakness is the assumption of a stable growth rate, which is often not appropriate in rapidly growing economies. Such economies might have three or more stages of growth: rapid growth, transition, and mature growth. In this case, another forward-looking estimate would use the required return on equity derived from the IRR from the following equation:

$$\text{equity index price} = PV_{\text{rapid}}(r) + PV_{\text{transition}}(r) + PV_{\text{mature}}(r)$$

where:

PV_{rapid} = present value of projected cash flows during the rapid growth stage

$PV_{\text{transition}}$ = present value of projected cash flows during the transitional growth stage

PV_{mature} = present value of projected cash flows during the mature growth stage

The forward-looking estimate of the equity premium would be the r from this equality minus the corresponding government bond yield.

Supply-Side Estimates (Macroeconomic Models)

Macroeconomic model estimates of the equity risk premium are based on the relationships between macroeconomic variables and financial variables. A strength of this approach is the use of proven models and current information. A weakness is that the estimates are only appropriate for developed countries where public equities represent a relatively large share of the economy, implying that it is reasonable to believe there should be some relationship between macroeconomic variables and asset prices.

One common model¹ for a supply-side estimate of the risk premium is:

$$\text{equity risk premium} = [1 + \hat{i}] \times [1 + \widehat{rEg}] \times [1 + \widehat{PEg}] - 1 + \hat{Y} - \widehat{RF}$$

where:

\hat{i} = expected inflation

\widehat{rEg} = expected real growth in GDP

\widehat{PEg} = expected changes in the P/E ratio

\hat{Y} = the expected yield on the index

\widehat{RF} = the expected risk-free rate

The analyst must determine appropriate techniques with which to compute values for these inputs. For example, a market-based estimate of expected inflation can be derived from the differences in the yields for T-bonds and Treasury Inflation Protected Securities (TIPS) having comparable maturities:

$$\hat{i} = (\text{YTM of 20-year T-bonds}) - (\text{YTM of 20-year TIPS})$$



Professor's Note: TIPS are inflation-indexed securities paying interest every six months and principal at maturity. The coupon and principal are automatically increased by the consumer price index (CPI).

Growth in GDP can be estimated as the sum of labor productivity growth and growth in the labor supply:

\widehat{rEg} = real GDP growth

\widehat{rEg} = labor productivity growth rate + labor supply growth rate

The \widehat{PEg} would depend upon whether the analyst thought the market was over or undervalued. If the market is believed to be overvalued, P/E ratios would be expected to decrease, and the opposite would be true if the market were believed to be undervalued. The \hat{Y} can be estimated using estimated dividends on the index.

Survey Estimates

Survey estimates of the equity risk premium use the consensus of the opinions from a sample of people. If the sample is restricted to people who are experts in the area of equity valuation, the results are likely to be more reliable. The strength is that survey results are relatively easy to obtain. The weakness is that, even when the survey is restricted to experts in the area, there can be a wide disparity between the consensus obtained from different groups.

1. Ibbotson-Chen (2003)

LOS 37.c: Demonstrate the use of the capital asset pricing model (CAPM), the Fama-French model (FFM), the Pastor-Stambaugh model (PSM), macroeconomic multifactor models, and the build-up method (for example, bond yield plus risk premium) for estimating the required return on an equity investment.

Capital Asset Pricing Model

The **capital asset pricing model (CAPM)** estimates the required return on equity using the following formula:

$$\text{required return on stock } j = \text{risk-free rate} + \text{equity risk premium} \times \text{beta of } j$$

Example: Using the CAPM to calculate the required return on equity

The current expected risk-free rate is 4%, the equity risk premium is 3.9%, and the beta is 0.8. Calculate the required return on equity.

Answer:

$$7.12\% = 4\% + (3.9\% \times 0.8)$$

Multifactor Model

Multifactor models can have greater explanatory power than the CAPM, which is a single-factor model. The general form of an n -factor multifactor model is:

$$\text{required return} = \text{RF} + (\text{risk premium})_1 + (\text{risk premium})_2 + \dots + (\text{risk premium})_n$$

$$(\text{risk premium})_i = (\text{factor sensitivity})_i \times (\text{factor risk premium})_i$$

The factor sensitivity is also called the *factor beta*, and it is the asset's sensitivity to a particular factor, all else being equal. The factor risk premium is the expected return above the risk-free rate from a unit sensitivity to the factor and zero sensitivity to all other factors.

Fama-French Model

The **Fama-French model** is a multifactor model that attempts to account for the higher returns generally associated with small-cap stocks. The model is:

$$\text{required return of stock } j = RF + \beta_{\text{mkt},j} \times (R_{\text{mkt}} - RF) + \beta_{\text{SMB},j} \times (R_{\text{small}} - R_{\text{big}}) + \beta_{\text{HML},j} \times (R_{\text{HBM}} - R_{\text{LBM}})$$

where:

$(R_{\text{mkt}} - RF)$ = return on a value-weighted market index minus the risk-free rate

$(R_{\text{small}} - R_{\text{big}})$ = a small-cap return premium equal to the average return on three small-cap portfolios minus the average return on three large-cap portfolios

$(R_{\text{HBM}} - R_{\text{LBM}})$ = a value return premium equal to the average return on two high book-to-market portfolios minus the average return on two low book-to-market portfolios

The baseline value (i.e., the expected value for the variable) for $\beta_{\text{mkt},j}$ is one, and the baseline values for $\beta_{\text{SMB},j}$ and $\beta_{\text{HML},j}$ are zero.

The latter two of these factors corresponds to the return of a zero-net investment in the corresponding assets [e.g., $(R_{\text{small}} - R_{\text{big}})$ represents the return on a portfolio that shorts large-cap stocks and invests in small-cap stocks]. The goal is to capture the effect of other underlying risk factors. Many developed economies and markets have sufficient data for estimating the model.

Example: Applying the CAPM and the Fama-French Model

Assume that market data provides the following values for the factors:

$$(R_{\text{mkt}} - RF) = 4.8\%$$

$$(R_{\text{small}} - R_{\text{big}}) = 2.4\%$$

$$(R_{\text{HBM}} - R_{\text{LBM}}) = 1.6\%$$

$$\text{risk-free rate} = 3.4\%$$

An analyst estimates that stock j has a CAPM beta equal to 1.3. Stock j is a small-cap, growth stock that has traded at a low book to market in recent years. Using the Fama-French model, an analyst estimates the following betas for stock j:

$$\beta_{\text{mkt},j} = 1.2$$

$$\beta_{\text{SMB},j} = 0.4$$

$$\beta_{\text{HML},j} = -0.2$$

Calculate the required return on equity using the CAPM and the Fama-French models:

Answer:

$$\text{CAPM estimate:} \quad \text{required return} = 3.4\% + (1.3 \times 4.8\%) = 9.64\%$$

$$\text{Fama-French model estimate:} \quad \text{required return} = 3.4\% + (1.2 \times 4.8\%) + (0.4 \times 2.4\%) + (-0.2 \times 1.6\%) = 9.8\%$$

Pastor-Stambaugh Model

The **Pastor-Stambaugh model** adds a liquidity factor to the Fama-French model. The baseline value for the liquidity factor beta is zero. Less liquid assets should have a positive beta, while more liquid assets should have a negative beta.

Example: Applying the Pastor-Stambaugh model

Assume a liquidity premium of 4%, the same factor risk premiums as before, and the following sensitivities for stock k:

$$\beta_{\text{mkt},k} = 0.9$$

$$\beta_{\text{SMB},k} = -0.2$$

$$\beta_{\text{HML},k} = 0.2$$

$$\beta_{\text{liquidity},k} = -0.1$$

Calculate the cost of capital using the Pastor-Stambaugh model.

Answer:

$$\text{cost of capital} = 3.4\% + (0.9 \times 4.8\%) + (-0.2 \times 2.4\%) + (0.2 \times 1.6\%) + (-0.1 \times 4\%) = 7.16\%$$

Macroeconomic Multifactor Models

Macroeconomic multifactor models use factors associated with economic variables that can be reasonably believed to affect cash flows and/or appropriate discount rates. The Burmeister, Roll, and Ross model incorporates the following five factors:

1. *Confidence risk*: unexpected change in the difference between the return of risky corporate bonds and government bonds.
2. *Time horizon risk*: unexpected change in the difference between the return of long-term government bonds and Treasury bills.
3. *Inflation risk*: unexpected change in the inflation rate.
4. *Business cycle risk*: unexpected change in the level of real business activity.
5. *Market timing risk*: the equity market return that is not explained by the other four factors.

As with the other models, to compute the required return on equity for a given stock, the factor values are multiplied by a sensitivity coefficient (i.e., beta) for that stock; the products are summed and added to the risk-free rate.

Example: Applying a multifactor model

Assume the following values for the factors:

confidence risk	=	2.0%
time horizon risk	=	3.0%
inflation risk	=	4.0%
business cycle risk	=	1.6%
market timing risk	=	3.4%

Assume the following sensitivities for stock j: 0.3, -0.2, 1.1, 0.3, 0.5, respectively. Using the risk-free rate of 3.4%, calculate the required return using a multifactor approach.

Answer:

$$\text{required return} = 3.4\% + (0.3 \times 2\%) + (-0.2 \times 3\%) + (1.1 \times 4\%) + (0.3 \times 1.6\%) + (0.5 \times 3.4\%) = 9.98\%$$

Build-Up Method

The **build-up method** is similar to the risk premium approach. It is usually applied to closely held companies where betas are not readily obtainable. One popular representation is:

$$\text{required return} = \text{RF} + \text{equity risk premium} + \text{size premium} + \text{specific-company premium}$$

The size premium would be scaled up or down based on the size of the company. Smaller companies would have a larger premium.

As before, computing the required return would be a matter of simply adding up the values in the formula. Some representations use an estimated beta to scale the size of the company-specific equity risk premium but typically not for the other factors.

The formula could have a factor for the level of controlling versus minority interests and a factor for marketability of the equity; however, these latter two factors are usually used to adjust the value of the company directly rather than through the required return.

Bond-Yield Plus Risk Premium Method

The **bond-yield plus risk premium method** is a build-up method that is appropriate if the company has publicly traded debt. The method simply adds a risk premium to the yield to maturity (YTM) of the company's *long-term* debt. The logic here is that the yield to maturity of the company's bonds includes the effects of inflation, leverage, and the firm's sensitivity to the business cycle. Because the various risk factors are already taken into account in the YTM, the analyst can simply add a premium for the added risk arising from holding the firm's equity. That value is usually estimated at 3–5%, with the specific estimate based upon some model or simply from experience.

Example: Applying the bond-yield plus risk premium approach

Company LMN has bonds with 15 years to maturity. They have a coupon of 8.2% and a price equal to 101.70. An analyst estimates that the additional risk assumed from holding the firm's equity justifies a risk premium of 3.8%. Given the coupon and maturity, the YTM is 8%. Calculate the cost of equity using the bond-yield plus risk premium approach.

Answer:

$$\text{cost of equity} = 8\% + 3.8\% = 11.8\%$$



Professor's Note: Although most of our examples in this section have focused on the calculation of the return using various approaches, don't lose sight of what information the components of each equation might convey. The betas tell us about the characteristics of the asset being evaluated, and the risk premia tell us how those characteristics are priced in the market. If you encounter a situation on the exam where you are asked to evaluate style and/or the overall impact of a component on return, separate out each factor and its beta—paying careful attention to whether there is a positive or negative sign attached to the component—and work through it logically.

LOS 37.d: Discuss beta estimation for public companies, thinly traded public companies, and nonpublic companies.

Beta Estimates for Public Companies

Up to this point, we have concerned ourselves with methods for estimating the equity risk premium. Now we turn our attention to the estimation of beta, the measure of the level of systematic risk assumed from holding the security. For a public company, an analyst can compute beta by regressing the returns of the company's stock on the returns of the overall market. To do so, the analyst must determine which index to use in the regression and the length and frequency of the sample data.

Popular choices for the index include the S&P 500 and the NYSE Composite. The most common length and frequency are five years of monthly data. A popular alternative is two years of weekly data, which may be more appropriate for fast-growing markets.

Adjusted Beta for Public Companies

When making forecasts of the equity risk premium, some analysts recommend adjusting the beta for **beta drift**. Beta drift refers to the observed tendency of an estimated beta to revert to a value of 1.0 over time. To compensate, an often-used formula to adjust the estimate of beta is:

$$\text{adjusted beta} = (2/3 \times \text{regression beta}) + (1/3 \times 1.0)$$

Example: Calculating adjusted beta

Assume an analyst estimates a beta equal to 0.8 using regression and historical data and adjusts the beta as described previously. Calculate the adjusted beta and use it to estimate a forward-looking required return.

Answer:

$$0.867 = (2/3 \times 0.8) + (1/3 \times 1.0)$$

Note that this adjusted beta is closer to one than the regression beta.

If the risk-free rate is 4% and the equity risk premium is 3.9%, then the required return would be:

$$7.38\% = 4\% + (3.9\% \times 0.867)$$

Note that the required return is higher than the 7.12% derived using the unadjusted beta. Naturally, there are other methods for adjusting beta to compensate for beta drift. Statistical services selling financial information often report both unadjusted and adjusted beta values.



Professor's Note: Note that some statistical services use reversion to a peer mean rather than reversion to one.

Beta Estimates for Thinly Traded Stocks and Nonpublic Companies

Beta estimation for thinly traded stocks and nonpublic companies involves a 4-step procedure. If ABC is the nonpublic company the steps are:

- Step 1:* Identify a benchmark company, which is publicly traded and similar to ABC in its operations.
- Step 2:* Estimate the beta of that benchmark company, which we will denote XYZ. This can be done with a regression analysis.
- Step 3:* Unlever the beta estimate for XYZ with the formula:

$$\text{unlevered beta for XYZ} = (\text{beta of XYZ}) \times \frac{1}{\left[1 + \frac{\text{debt of XYZ}}{\text{equity of XYZ}}\right]}$$

- Step 4:* Lever up the unlevered beta for XYZ using the debt and equity measures of ABC to get an estimate of ABC's beta for computing the required return on ABC's equity:

$$\text{estimate of beta for ABC} = (\text{unlevered beta of XYZ}) \times \left[1 + \frac{\text{debt of ABC}}{\text{equity of ABC}}\right]$$



Professor's Note: The unlevering process isolates systematic risk. It assumes that ABC's debt is high grade. It also assumes that the mix of debt and equity in the capital structure stays at the target weights.

The procedure is the same if ABC is a thinly traded company. With the beta estimate for ABC in hand, the analyst would then use that value in the CAPM.

LOS 37.e: Analyze the strengths and weaknesses of methods used to estimate the required return on an equity investment.

The CAPM has the advantage of being very simple in that it uses only one factor. The weakness is choosing the appropriate factor. If a stock trades in more than one market, for example, there can be more than one market index, and this can lead to more than one estimate of required return. Another weakness is low explanatory power in some cases.

A strength of multifactor models is that they usually have higher explanatory power, but this is not assured. Multifactor models have the weakness of being more complex and expensive.

A strength of build-up models is that they are simple and can apply to closely held companies. The weakness is that they typically use historical values as estimates that may or may not be relevant to current market conditions.

LOS 37.f: Discuss international considerations in required return estimation.

Additional considerations when investing internationally include exchange rate risk and data issues. The availability of good data may be severely limited in some markets. Note that these issues are of particular concern in emerging markets.

International investment, if not hedged, exposes the investor to exchange rate risk. To compensate for anticipated changes in exchange rates, an analyst should compute the required return in the home currency and then adjust it using forecasts for changes in the relevant exchange rate. Two methods for building risk premia into the required return are discussed in the following.

Country Spread Model

One method for adjusting data from emerging markets is to use a corresponding developed market as a benchmark and add a premium for the emerging market. One premium to use is the difference between the yield on bonds in the emerging market minus the yield on corresponding bonds in the developed market.

Country Risk Rating Model

A second method is the country risk rating model. This model estimates an equation for the equity risk premium for developed countries and then uses the equation and inputs associated with the emerging market to estimate the required return for the emerging market.

LOS 37.g: Explain and calculate the weighted average cost of capital for a company.

The **cost of capital** is the overall required rate of return for those who supply a company with capital. The *suppliers* of capital are equity investors and those who lend money to the company. An often-used measure is the weighted average cost of capital (WACC):

$$\text{WACC} = \frac{\text{market value of debt}}{\text{market value of debt and equity}} \times r_d \times (1 - \text{tax rate}) + \frac{\text{market value of equity}}{\text{market value of debt and equity}} \times r_e$$

In this representation, r_d and r_e are the required return on debt and equity, respectively. In many markets, corporations can take a deduction for interest expense. The inclusion of the term $(1 - \text{tax rate})$ adjusts the cost of the debt so it is on an after-tax basis. Since the measure should be forward-looking, the tax rate should be the marginal tax rate, which better reflects the future cost of raising funds. For markets where interest expense is not deductible, the relevant tax rate would be zero, and the pre- and after-tax cost of debt would be equal.

WACC is appropriate for valuing a total firm. To obtain the value of equity, first use WACC to calculate the value of a firm and then subtract the market value of long-term debt. We typically assume that the market value weights of debt and equity are equal to their target weights. When this is not the case, the WACC calculation should use the target weights for debt and equity.

LOS 37.h: Evaluate the appropriateness of using a particular rate of return as a discount rate, given a description of the cash flow to be discounted and other relevant facts.

The discount rate should correspond to the type of cash flow being discounted. Cash flows to the entire firm should be discounted with the WACC. Alternatively, cash flows in excess of what is required for debt service should be treated as cash flows to equity and discounted at the required return to equity.

An analyst may wish to measure the present value of real cash flows, and a real discount rate (i.e., one that has been adjusted for expected inflation) should be used in that case. In most cases, however, analysts discount nominal cash flows with nominal discount rates.

KEY CONCEPTS

LOS 37.a

Return concepts:

- Holding period return is the increase in price of an asset plus any cash flow received from that asset, divided by the initial price of the asset. The holding period can be any length. Usually, it is assumed the cash flow comes at the end of the period:

$$\text{holding period return} = r = \frac{P_1 - P_0 + CF_1}{P_0} = \frac{P_1 + CF_1}{P_0} - 1$$

- An asset's required return is the minimum expected return an investor requires given the asset's characteristics.
- If expected return is greater (less) than required return, the asset is undervalued (overvalued). The mispricing can lead to a return from convergence of price to intrinsic value.
- The discount rate is a rate used to find the present value of an investment.
- The internal rate of return (IRR) is the rate that equates the discounted cash flows to the current price. If markets are efficient, then the IRR represents the required return.

LOS 37.b

The equity risk premium is the return over the risk-free rate that investors require for holding equity securities. It can be used to determine the required return for specific stocks:

$$\text{required return for stock } j = \text{risk-free return} + \beta_j \times \text{equity risk premium}$$

where:

$$\beta_j = \text{the "beta" of stock } j \text{ and serves as the adjustment for the level of systematic risk}$$

A more general representation is:

$$\text{required return for stock } j = \text{risk-free return} + \text{equity risk premium} + \text{other adjustments for } j$$

A historical estimate of the equity risk premium consists of the difference between the mean return on a broad-based, equity-market index and the mean return on U.S. Treasury bills over a given time period.

Forward-looking or ex ante estimates use current information and expectations concerning economic and financial variables. The strength of this method is that it does not rely on an assumption of stationarity and is less subject to problems like survivorship bias.

There are four types of estimates of the equity risk premium: historical estimates, forward-looking estimates, macroeconomic model estimates, and survey estimates.

- The historical estimates are straightforward to compute, but they are not current.
- Forward-looking estimates use current information, but that information needs to be updated periodically as new estimates are generated.
- Macroeconomic models use current information, but they are only appropriate for developed countries where public equities represent a relatively large share of the economy.
- Survey estimates are easy to obtain, but there can be a wide disparity between opinions.

LOS 37.c

Models used to estimate the equity risk premium:

- CAPM:

$$\text{required return on stock } j = \text{current risk-free return} + (\text{equity risk premium} \times \text{beta of } j)$$

- Multifactor model:

$$\text{required return} = \text{RF} + (\text{risk premium})_1 + \dots + (\text{risk premium})_n$$

- Fama-French model:

$$\text{required return of stock } j = \text{RF} + \beta_{\text{mkt},j} \times (\text{R}_{\text{mkt}} - \text{RF}) + \beta_{\text{SMB},j} \times (\text{R}_{\text{small}} - \text{R}_{\text{big}}) + \beta_{\text{HML},j} \times (\text{R}_{\text{HBM}} - \text{R}_{\text{LBM}})$$

where:

$$(\text{R}_{\text{mkt}} - \text{RF}) = \text{market risk premium}$$

$$(\text{R}_{\text{small}} - \text{R}_{\text{big}}) = \text{a small-cap risk premium}$$

$$(\text{R}_{\text{HBM}} - \text{R}_{\text{LBM}}) = \text{a value risk premium}$$

- The Pastor-Stambaugh model adds a liquidity factor to the Fama-French model.
- Macroeconomic multifactor models use factors associated with economic variables that would affect the cash flows and/or discount rate of companies.
- The build-up method is similar to the risk premium approach. One difference is that this approach does not use betas to adjust for the exposure to a factor. The bond yield plus risk premium method is a type of build-up method.

LOS 37.d

Beta estimation:

- A regression of the returns of a publicly traded company's stock returns on the returns of an index provides an estimate of beta. For forecasting required returns using the CAPM, an analyst may wish to adjust for beta drift using an equation such as:

$$\text{adjusted beta} = (2/3) \times (\text{regression beta}) + (1/3) \times (1.0)$$

- For thinly traded stocks and non-publicly traded companies, an analyst can estimate beta using a 4-step process: (1) identify publicly traded benchmark company, (2) estimate the beta of the benchmark company, (3) unlever the benchmark company's beta, and (4) relever the beta using the capital structure of the thinly traded/nonpublic company.

LOS 37.e

Each of the various methods of estimating the required return on an equity investment has strengths and weaknesses.

- The CAPM is simple but may have low explanatory power.
- Multifactor models have more explanatory power but are more complex and costly.
- Build-up models are simple and can apply to closely held companies, but they typically use historical values as estimates that may or may not be relevant to the current situation.

LOS 37.f

In making estimates of required return in the international setting, an analyst should adjust the required return to reflect expectations for changes in exchange rates.

When dealing with emerging markets, a premium should be added to reflect the greater level of risk present. Two methods for estimating the size of the risk premium:

- The country spread model uses a corresponding developed market as a benchmark and adds a premium for the emerging market risk. The premium can be estimated by taking the difference between the yield on bonds in the emerging market minus the yield of corresponding bonds in the developed market.
- The country risk rating model estimates an equation for the equity risk premium for developed countries and then uses the equation and inputs associated with the emerging market to estimate the required return for the emerging market.

LOS 37.g

The weighted average cost of capital (WACC) is the required return averaged across all suppliers of capital (i.e., the debt and equity holders). The formula for WACC is:

WACC =

$$\frac{\text{market value of debt}}{\text{market value of debt and equity}} \times r_d \times (1 - \text{tax rate}) + \frac{\text{market value of equity}}{\text{market value of debt and equity}} \times r_e$$

where:

r_d and r_e = the required return on debt and equity, respectively

The term $(1 - \text{tax rate})$ is an adjustment to reflect the fact that, in most countries, corporations can take a tax deduction for interest payments. The tax rate should be the marginal rate.

LOS 37.h

The discount rate should correspond to the type of cash flow being discounted: cash flows to the entire firm at the WACC and those to equity at the required return on equity.

An analyst may wish to measure the present value of real cash flows, and a real discount rate should be used in that case. In most cases, however, analysts discount nominal cash flows with nominal discount rates.

CONCEPT CHECKERS

1. A positive return from convergence of price to intrinsic value would *most likely* occur if:
 - A. expected return is greater than required return.
 - B. required return is greater than expected return.
 - C. required return equals expected return.
2. For a particular stock, the required return can be determined by:
 - A. multiplying the equity risk premium times the risk-free rate.
 - B. multiplying an appropriate beta times the equity risk premium and adding a risk-free rate.
 - C. multiplying an appropriate beta times the equity risk premium and subtracting the risk-free rate.
3. In computing a historical estimate of the equity risk premium, with respect to possible biases, choosing an arithmetic average of equity returns and Treasury bill rates would *most likely*:
 - A. have an indeterminate effect because using the arithmetic average would tend to increase the estimate, and using the Treasury bill rate would tend to decrease the estimate.
 - B. have an indeterminate effect because using the arithmetic average would tend to decrease the estimate, and using the Treasury bill rate would tend to increase the estimate.
 - C. bias the estimate upwards because using the arithmetic average would tend to increase the estimate, and using the Treasury bill rate would tend to increase the estimate.
4. Which of the following is included in the Pastor-Stambaugh model but not the Fama-French model?
 - A. A liquidity premium.
 - B. A book-to-market premium.
 - C. A market capitalization premium.
5. An analyst wishes to estimate a beta for a public company and use it to compute a forward-looking required return. The analyst would *most likely*:
 - A. delever the market beta and relever that value for the company.
 - B. regress the returns of the company on returns on an equity market index and adjust the estimated beta for leverage.
 - C. regress the returns of the company on returns on an equity market index and adjust the estimated beta for beta drift.

6. Consider the following statements with respect to international considerations in determining the cost of capital.

Statement 1: Exchange rates are an issue.

Statement 2: The country risk rating model uses a corresponding developed market as a benchmark and adds a premium for the emerging market.

Are the statements correct?

- A. Yes.
 - B. No, because exchange rates are not an issue.
 - C. No, because the country risk rating model estimates an equation for the equity risk premium for developed countries and then uses the equation and inputs associated with the emerging market to estimate the required return for emerging markets.
7. An analyst wishes to calculate the WACC for a company. The company's debt is twice that of the equity. The required returns on the company's debt and equity are 8% and 10%, respectively. The company's marginal tax rate is 30%. The WACC is *closest* to:
- A. 6.07%.
 - B. 7.07%.
 - C. 8.67%.

ANSWERS – CONCEPT CHECKERS

1. **A** In this case, the asset is underpriced. If market participants recognize the mispricing, the correction in price will generate additional return.
2. **B** Required return for stock j = risk-free return + $\beta_j \times$ (equity risk premium).
3. **C** When using the historical method, the other choices are using the geometric average and a long-term bond rate. The geometric mean is less than the arithmetic average, which results in a lower risk premium. The long-term bond rate is usually greater than the Treasury bill rate, which also results in a lower risk premium. So, using the arithmetic average and the shorter-term Treasury bill rate would likely bias the equity risk premium estimate upwards.
4. **A** The Pastor-Stambaugh model adds a liquidity factor to the Fama-French model. The average liquidity premium for equity should be zero. Less liquid assets should have a positive liquidity beta, and more liquid assets should have a negative beta.
5. **C** For a public company, an analyst can usually compute beta by regressing the returns of the company's stock on the returns of an appropriate market index. This requires a choice of the index to use in the regression and the length and frequency of the sample. When making forecasts of the equity risk premium, some analysts recommend adjusting the beta for beta drift. Beta drift refers to the observed tendency of a computed beta to revert to a value of 1.0 over time.
6. **C** Statement 1 is correct; exchange rates are an issue. Statement 2 is incorrect because it explains the country spread model.
7. **B** The first step is to determine the percentage debt and equity in the capital structure. With a debt-to-equity ratio of 2 to 1, there is $2/3 = 66.7\%$ debt and $1/3 = 33.3\%$ equity. Then, $WACC = 0.667 \times (1 - 0.3) \times 8\% + 0.333 \times 10\% = 7.07\%$.