

Advanced Topics in Business Valuation

204





iiBV 204: Advanced Topics in Business Valuation

Course Manual

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About This Course

The International Institute of Business Valuers emphasizes that these course materials are not authoritative. They are intended to be used as a foundation for course lectures and discussions, in conjunction with observations by the course instructors.

The valuations process and approaches presented in the course are:

- A. Not the only valuation processes and approaches used by competent valuers;
- B. Not the only way that valuation analysis may be completed;
- C. Not to be taken as a rote process or approach that should be used in any valuation analysis;

Valuations should be based on a full knowledge of the facts and circumstances of the subject company, its industry, and the economic environment. A particular valuation process or approach that is relevant for one company at a particular point in time may not be appropriate for the same or another company at another point in time.

The terminology and standards in this course are based on in this course are based on the International Valuation Standards (“IVS”) published by the International Valuation Standards Council (“IVSC”). The IVSC is an independent organization committed to building the public’s trust in the valuation profession by issuing universal standards and seeking their adoption around the world.

The IVS are referenced from the publication, *International Valuation Standards 2017*, Copyright @ 2017 International Valuation Standards Council. Copies of the publication can be purchased from the following website: <https://www.ivsc.org/news/article/ivsc-launches-new-global-standards-for-valuation-profession>. In contexts where the IVS does not specifically address a valuation topic, references to other standards and sources will be made such as the *International Glossary of Business Valuation Terms* (“the International Glossary”) from the American Institute of Certified Public Accountants’ (AICPA’s) *Statement on Standards for Valuation Services No. 1*.

Business valuation, as with many other areas of professional knowledge, is a changing discipline: it is subject to constant evolution, based on analysis of the capital markets, the results of academic research and developing professional best practice. Continuing professional education is an essential component of the professional responsibilities of those engaged in business valuation.

This manual includes details of the IVSC core competencies covered by each chapter. The iiBV core courses cover the IVSC competencies other than those which relate to the specific circumstances of the tax and legal regimes in various countries.

COURSE OBJECTIVES

This course covers five topics:

1. Discounts & premiums
2. Valuing early-stage companies
3. The valuation of intangible assets
4. International cost of capital
5. The Saudi Arabian economic and valuation environment

By the end of the course, the candidate should be familiar with the following topics:

1. Discounts and premiums
 - A. Control premiums
 - (1) When to apply and the shortcomings of supporting data
 - (2) Differences between control and synergistic levels of value
 - B. Discounts for lack of control (DLOC) and lack of marketability (DLOM)
 - (1) Understand the levels of value chart
 - (2) Differentiate between the DLOC and the DLOM
 - (3) Understand the empirically-based databases and mathematically-based models which are used to quantify and support the discounts.
2. Valuing early-stage companies
 - A. Understand the differences between early-stage companies and operating companies and the valuation challenges inherent in valuing early-stage companies
 - B. Understand and be able to deploy the common models for valuing the securities of early-stage companies including:

- (1) The current value method (CVM)
- (2) The option pricing model (OPM)
- (3) The probability weighted expected return method (PWERM)
- (4) The Hybrid Method

3. Valuing Intangible Assets

- A. Understand the difference between tangible and intangible assets
- B. Learn the major categories of intangible assets and specific types of intangible assets within each category
- C. Understand the common models used to value different types of intangible assets
- D. Understand the financial reporting context in which intangible assets are most often valued which includes the purchase price allocation process
- E. Appreciate how and why the firm's weighted average cost of capital, its weighted average return on assets, and internal rate of return should approximate each other

4. International Cost of Capital

- A. Know the commonly applied models used to develop international cost of capital
- B. Understand the source data required for each model, its availability
- C. Understand the shortcomings of each model in terms of its ability to capture the systematic and unsystematic risk in a subject company

5. The Kingdom of Saudi Arabia's (KSA) Economic Environment

- A. Know the basic structure of the KSA's economy
- B. Know the basic metrics surrounding the KSA valuation profession
- C. Understand the current tax structure in KSA and how it affects the valuation of closely-held companies

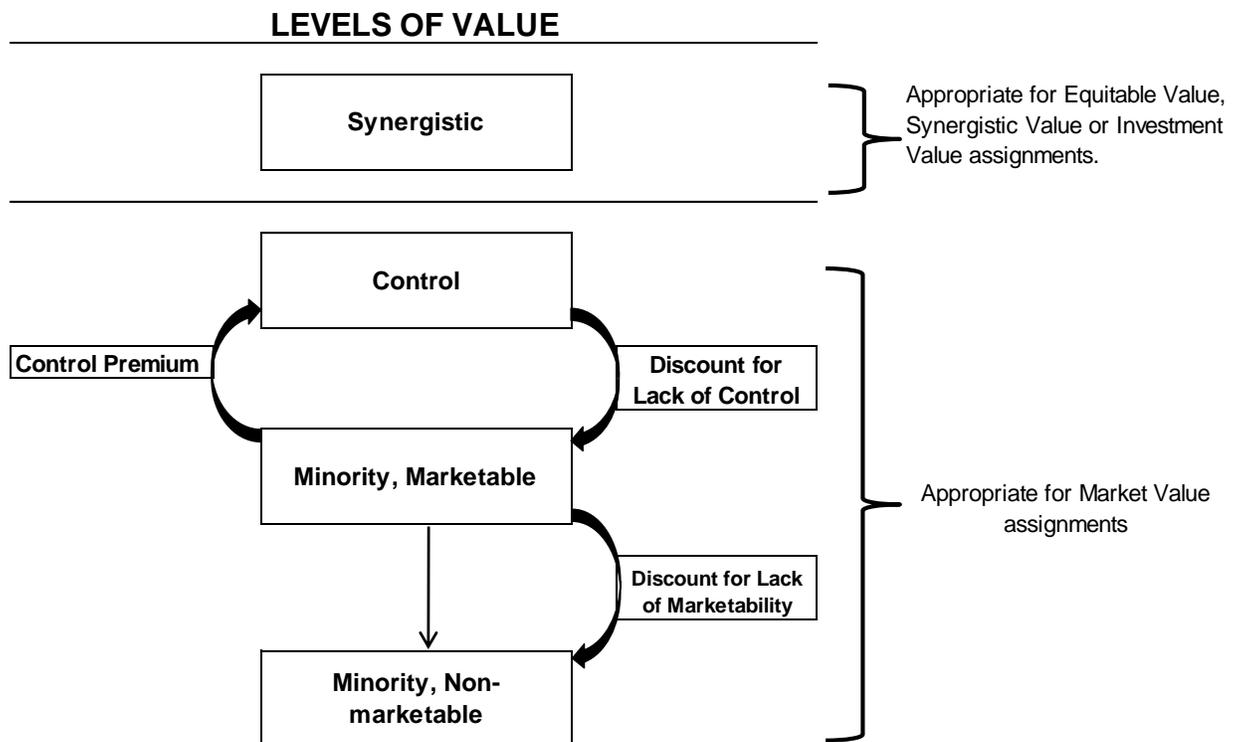
Chapter 1. Valuing Minority Interests

Section A. Introduction

1. What is a minority interest?
 - A. A minority interest is defined in the International Valuation Standards (“IVS”) glossary as “*An ownership interest less than 50% of the voting interest in a business enterprise*”.
 - B. A minority investor does not have unilateral control over the operations of a company. The term ‘minority’ actually has three levels. The degree of control in each level will influence the amount of the discount(s) taken:
 - (1) **50% standoff** – This level is usually referred to as ‘non-control’ since the owner technically is not in the minority. Both shareholders need the other to control operations; however both shareholders can block the other 50% shareholder from pursuing an undesired path, depending on local business law and the company’s shareholders’ agreement.
 - (2) **Swing block** – This level can access control with one other interest. For example, assume a company is owned by three investors, two of whom own 49% and one who owns 2%. All three blocks of stock are considered swing blocks since each can access control by combining votes with one other investor.
 - (3) **True minority** – This is a block of stock in which the owner has no access to control. Assume one investor owns 98% and the minority investor owns 2%. The 2% investor has no way to unilaterally control operations or to access control.
2. Why are minority interests discounted from their pro rata control value?
 - A. Investors usually see two disincentives to acquiring a minority interest relative to a control interest: 1) a lack of control; and 2) a lack of marketability. These two issues are conceptually linked but are measured separately. A lack of control regards all of the powers that the acquiring investor would be deprived of after purchasing the minority stock. A lack of liquidity regards the potential that after acquiring the stock, the investor would not receive annual dividends and/or not be able to re-sell the stock in the market.
 - (1) The disincentives are linked since both are derived from the block’s minority status.
 - (a) A minority interest owner cannot conduct operations as wants to increase the value of the stock, which is a control issue.

- (b) A minority investor cannot sell his stock in the market at the pro rata value of the control price since investors recognize that they may not receive the dividends assumed in the control price.
 - (2) In both cases the valuer should remember that he is measuring the differences between two separate levels of value. The levels of value are discussed below.
- B. Lack of control – There are numerous prerogatives of control that investors desire. When the target investment does not convey these prerogatives, then investors will likely pay less than the investment's pro rata control value. These powers include, but are not limited to the following:
- (1) Sell all or part of the company or liquidate its assets
 - (2) Declare dividends
 - (3) Control personnel, especially in upper management
 - (4) Set compensation, especially among company officers
 - (5) Direct the strategic direction of operations
 - (6) Buy and sell fixed assets
 - (7) Direct the company to engage in contracts with vendors
 - (8) Enter new markets or expand product line
 - (9) Change the company's by-laws or articles of incorporation
 - (10) Take the company public
 - (11) Block any of the above actions
- C. Lack of marketability – If the investor does not see his interest enjoying the following characteristics he will require a discount for lack of marketability:
- (1) Lack of periodic dividends assumed in the control value
 - (2) Inability to liquidate the minority investment at the pro rata control value
3. Levels of Control
- A. There are four levels of control. The valuer must define the appropriate level desired by the client during the 'Defining the Assignment' phase of the analysis. Those levels are:

- (1) **Synergistic Value** – Defined as “the result of a combination of two or more assets or interests where the combined value is more than the sum of the separate values” (IVS 2017)
- (2) **Control Level** – Defined as “The power to direct the management and policies of a business enterprise value”. (International Glossary of Business Valuation Terms). A control block of stock consists of more than 50% of the voting stock of the business enterprise.
- (3) **Minority, Marketable** – A minority interest in an enterprise that does not suffer from illiquidity. The interest is usually liquid because the business enterprise is traded on a public market. However, the owner does not share in the prerogatives of control.
- (4) **Minority, Non-marketable** – An ownership interest consisting of less than 50% of the voting interest in a business enterprise



- B. The Synergistic Level pertains to assignments in which two distinct parties are identified in the valuation. The buyer and seller are not hypothetical and therefore such an assignment is outside the context of a Market Value analysis. Synergistic Value requires the identification and measurement of synergies or economies of scale involved in the transaction.

- (1) Synergistic value will usually be worth more than a control value since it considers expense categories that may be eliminated when two companies merge. Control value does not consider such synergies since it is a hypothetical concept and the subject company is not considered to be merging with another entity.
- C. Control, Minority-Marketable, and Minority-Non-marketable each pertain to hypothetical or notional valuations. They therefore should be considered for an assignment which calls for a Market Value basis.
4. When should a premium or discount be considered?
- A. The initial level of value is determined by the approach to value used and the assumptions applied in that approach. A premium or discount should be considered depending on the required level of value and the initial level of value reached in the valuation approach.
- (1) A control level of cash flow can only be accessed by a control shareholder.
- (2) A minority level of cash flow represents the cash flow that the minority shareholder expects to receive. An example:

Sample Company Income Statement

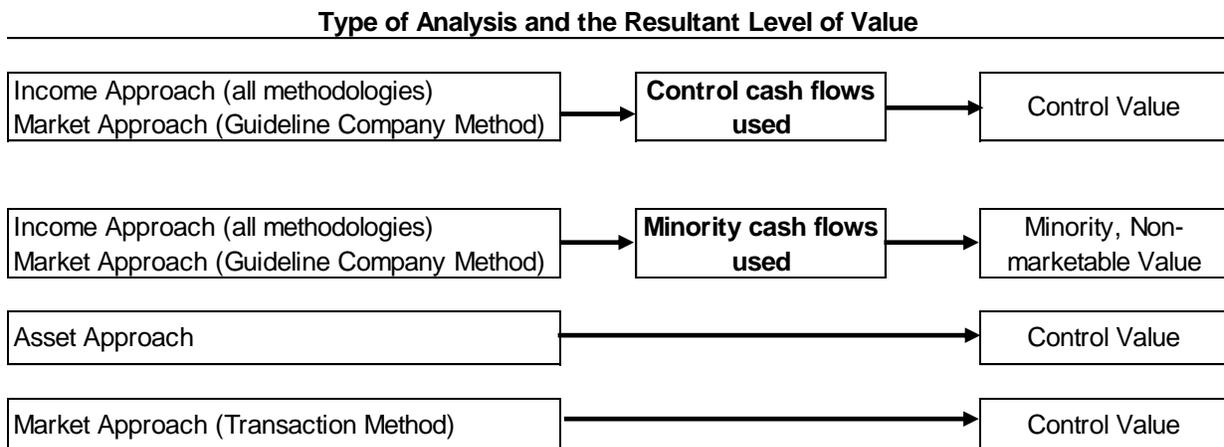
Revenue	€ 10,500,000	
Cost of sales	<u>6,125,000</u>	
Gross profit	4,375,000	
Overhead		
Officer compensation	2,450,000	
Other overhead	<u>1,750,000</u>	
Total overhead	4,200,000	
Operating income	<u>€ 175,000</u>	= Minority cash flow

Adjustments

Reported officer comp	2,450,000	
Reasonable officer comp	<u>(550,000)</u>	
Total adjustments	1,900,000	
Adjusted operating income	<u>€ 2,075,000</u>	= Control cash flow

- (a) If the valuer in the above example uses the €175,000 as the basis for his income approach to value, then the resultant value is expressed on a minority, non-marketable level.

- (b) If the valuer uses the €2,075,000 as the basis for his income approach, then the resultant value is expressed on a control level since only the control shareholder can access this value, either through setting his own compensation or through generation of profits which he can invest back into the company.
- (c) There are several types of income statement adjustments that are considered control level adjustments including officer compensation, above-market rent, related party transactions, and other perquisites.
- (d) This discussion is depicted in the following graph.



- B. Four steps to arrive at an appropriate level of value conclusion:
- (1) Determine which level of value was determined in each approach to value and each methodology used.
 - (2) Determine what level of value is called for in the engagement.
 - (3) Apply appropriate premiums or discounts to place each approach/methodology on the same level.
 - (4) Conclude on the value based on appropriate weighting.
5. Common assignments which call for minority interest valuations
- A. Most Fair Value assignments under International Financial Reporting Standards (IFRS) or Generally Accepted Accounting Principles (GAAP) accounting require control level determinations. Hence, some valuers who operate in these markets may not be familiar with the challenges in valuing minority interests.

- B. Some valuation markets include litigation and transaction analyses which often require minority interest valuations. In the U.S., valuation for litigation and tax purposes often require minority interest valuations.
- (1) **Inheritance tax** – Business owners seek to minimize inheritance tax by gifting minority shares in a closely-held company each year over a long period of time. Each gift is considered a hypothetical valuation and therefore discounts for lack of control and marketability are considered. These valuations, especially the level of discounting, is usually reviewed and often challenged by the taxing authorities.
 - (2) **Dissenting shareholder lawsuits** – A minority shareholder who is deprived of his pro rata interest upon a sale of a company may sue a control shareholder in some venues. Such assignments may require a minority interest valuation.
 - (3) **Equitable distribution** – The laws of some countries require businesses to be valued and distributed among a married couple upon divorce regardless of which party legally owned the company's stock.
 - (4) **Transaction** – A minority investor in a closely-held company who wishes to sell his shares, and is allowed to do so under the terms of his Shareholders' Agreement, may request a formal minority interest valuation.
- C. The U.S. valuation market is the most advanced in requiring minority interest valuations and in measuring the relevant amounts of premiums and discounts. These measurement norms are the subject for the rest of Module 1.
- (1) Valuers unfortunately cannot measure control and liquidity in the private market by looking directly at the private markets. Therefore, control and liquidity are measured by finding proxies for control and liquidity in the public markets. Those measurable proxies are applied to the subject stock values.
 - (a) The valuer should remember that the use of a proxy to measure any metric involves assumptions. Those assumptions may not universally apply to all subject companies.
 - (b) The valuer should also remember that the application of a premium or discount will effectively add or remove cash value from an originally determined valuation. The valuer is obligated to review the final value for reasonableness.
 - (c) Finally, the measurement of premiums and discounts is one of the most researched and published topics in the valuation field. It is also the area in which some of the most egregious errors are made.

Section B. Measuring the Control Premium and Discount for Lack of Control

It is axiomatic that control shares in a closely-held corporation are worth more than minority shares. The benefits of control that were discussed in the prior Section (e.g., the ability to sell all or part of the company, declare dividends, hire/fire personnel, etc.) have an impact on value which makes a controlling interest worth more than a minority interest. The topic of this Section is how to quantify that cash value and by default also quantify the related discount for lack of control (DLOC).

1. The Control Premium

A. The control premium is defined in the IVS Glossary as follows:

“An amount or a percentage by which the pro rata value of a controlling interest exceeds the pro rata value of a non-controlling interest in a business enterprise, to reflect the power of control.”

B. The valuer should conduct an analysis of several factors before deciding if a control premium is warranted, and if so, how much the premium should be.

- (1) The control premium can only be applied to a Minority, Marketable level value. The valuer should be sure that the valuation analysis has concluded at this level. See the Levels of Value chart in Section A above.
- (2) The valuer should assess the actual prerogatives of control that are present in the subject interest. If forecasted profits are minimal, the power to declare dividends may not be worth much. If the company is small with a small staff, the ability to hire and fire personnel may not appeal to an investor. This analysis should be documented.
- (3) The degrees of control, also discussed in Section A, should be assessed in conjunction with (1) and (2) above. These degrees are repeated here:
 - (a) True control (or unilateral control) – the control shareholder owns more than 50% of the company’s stock. The valuer should note if local business laws require a super-majority block (i.e., a block greater than 51%) to exert control.
 - (b) Standoff position – two 50% shareholders. No shareholder has unilateral control. No shareholder is true minority.
 - (c) Swing block – there are only minority blocks of stock but two shareholders can combine together to exert control over one or more other shareholders (e.g., 2%-49%-49%; or 41%-10%-10%-

10%-10%-10%-9%, etc.). The degree of control will affect the quantification of the control premium and the DLOC.

- (d) Shareholders' Agreement - The Agreement may specify how control is apportioned among the shareholders which may differ from the mathematics of the blocks owned. The valuer must also decide if the Shareholders' Agreement is pertinent to the analysis.

C. Measuring the Control Premium

- (1) Historically, the control premium has been measured by looking at transactions in the public market in which whole companies have been acquired. These transactions include a marketable, minority trading price (i.e., the stock's trading price on the market prior to the transaction) and a control price, the price paid in the transaction. Since the transactions almost always include a premium over the daily trading amount, the difference has been assumed by the profession (rightly or wrongly) to be a reflection of a control premium.

- (a) Remember, the empirical evidence in these public transactions has been assumed to be a valid proxy for what valuers are trying to measure, which is a quantification of the benefits of control (e.g., the ability to declare dividends, hire/fire personnel, etc.)

(2) The Factset Mergerstat/BVR Control Premium Study

- (a) This database includes data on 10,780 transactions since 1998. Each transaction has up to 57 data points. Control premiums are measured as the ultimate price paid divided by varying minority trading prices:

- ◆ 1 day prior to transaction
- ◆ 1 week prior to transaction
- ◆ 1 month prior to transaction
- ◆ 2 months prior to transaction

The historical trading prices give the valuer the option of removing the effect of upward movement in stock prices in anticipation of a takeover. Mergerstat also provides what they call the "unaffected stock price" which is the price on the day before the transaction rumors were determined to start.

- (b) This study can be accessed at

www.bvresources.com

- (c) The control premium is measured as follows:
- (d) $(\text{Transaction Price}/\text{Prior Trading Price}) - 1$
- (e) Example A: Public-A Company was acquired by Public-B Company for €12.45 per share. One month prior to the transaction, Public-A Company was trading at €9.10 per share. The control premium is calculated as follow:
- (f) $36.81\% = (12.45/9.10) - 1$
- (g) The valuer can search the Factset Mergerstat/BVR study by the following characteristics:
- ◆ Industry code
 - ◆ Financial performance ratios
 - ◆ Transaction characteristics
 - ◆ Strategic or Financial buyers
- ⇒ Strategic buyers are defined as buyers which operate in the same business or industry as the target company.
- ⇒ Financial buyers are defined as buyers which are acquiring the target company for investment purposes, such as private equity funds, buyout funds or other finance related entities.
- (h) Example B: NAICS 511110 – Newspaper Publishing

Factset Mergerstat/BVR Control Premium Study
NAICS Code 511110
Newspaper Publishing

Summary Results

# Transactions: 24	Median
Mergerstat Control Premium	21.4%
Implied Minority Discount	17.6%

The valuer searched all 10,780 transactions on the Mergerstat database under the NAICS industry code 511110 and found 24 transactions. In this example, the median control premium from the transactions was 21.4%. The valuer needs to use judgment in applying this data though. First, transactions took place between 1998 and 2017. Of

the 24 transactions though only one deal occurred after 2008 (a fact which would be shown in the full report which is provided on the website), possibly due to the rapidly changing conditions in the newspaper industry. Also, the valuer should assess whether 24 transactions provides a robust enough data set to extract meaningful conclusions.

- (3) The valuer can apply the Factset Mergerstat/Study by isolating the desired search criteria and evaluating the resultant data points to determine whether she wants to apply an average or median control premium or some other premium based on a subset of the data.

2. The Discount for Lack of Control

A. The DLOC is a discount applied to a control value to reflect the fact that the block of stock being valued does not contain the powers of control outlined in Section A. Again, the amount of the discount is affected by the degree of the lack of control. The valuer should be aware of the following:

- (1) The valuation approaches used arrive at a control value and the assignment is to value a minority or lack of control block of stock.
- (2) The degree to which the owner of the minority block lacks control or access to control (Does a true control shareholder own the rest of the company? Is the minority block of stock a swing vote?).

B. Measuring the DLOC

- (1) The DLOC uses the same data from above in the Factset Mergerstat/BVR Study and reverses the process in the following calculation:

$$\text{DLOC} = 1 - [1 / (1 + \text{control premium})]$$

Continuing the Example A from above, the relevant DLOC from the control premium paid by Public-A Company would be:

$$26.91\% = 1 - [1 / (1 + 36.81\%)]$$

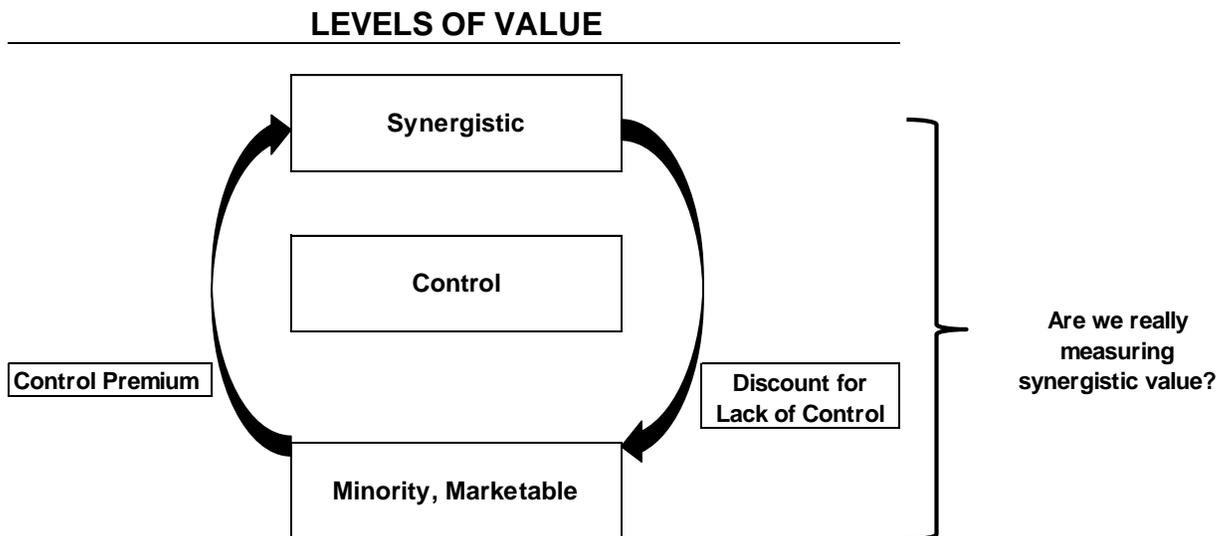
Therefore if the valuer had a control value equal to **€12.45**, she would apply a DLOC of 26.91% to arrive at the minority, marketable level value.

- (2) The DLOC is measured based on the same data in the Factset Mergerstat Study. Once a representative control premium is determined based on the valuer's selection criteria, the above formula is applied to determine the relevant DLOC.

- (3) Example B (from above): Newspaper publishing company, NAICS code 511110. The Factset Mergerstat Study provides the implied DLOC, given the control premium data, which is 17.6%. The same advice applies though. The valuer needs to use judgment given the number of transactions in the search results, the dates of transactions in the search results, the range of premiums paid, and if the economic conditions surrounding the transactions are similar to the economic conditions at the valuation date.

3. Critique of Using Control Premium Studies

- A. As discussed, the control premium studies are intended as a proxy measurement for the cash value of the prerogatives of control in a closely-held company. In other words, how much is it worth to an investor to be able to control dividends, hire and fire personnel, etc? The arrows on the levels of value chart in the prior section are therefore between the minority, marketable level and the control level.
- (1) The main critique of the control premium studies though is that the premium data really measures the premium and discount between the synergistic level and minority, marketable levels.



- B. The Eric Nath Arguments – The levels of value chart was taught with little review or controversy throughout the 1980s and 1990s. In a series of articles Eric Nath provided a critique of many of the assumptions that have been discussed in this section.

- (1) Nath argues that the differences between the private and public market preclude using the assumptions behind the levels of value chart.¹ We assume that the premiums paid for “control” in the public market are paid for the same elements of control that we are trying to measure in the private market. They are not. He posits that the premiums paid for control as observed in the Mergerstat Study are more likely for the following items:
 - (a) Synergies
 - (b) Auction competition
 - (c) Tax motivations
 - (d) Greed, ego
 - (e) Regulatory factors
 - (2) The ‘minority-marketable’ level of value is in effect close to a control concept from the private market perspective since the minority investor in the public market has total liquidity. The key disincentive to acquiring a minority interest in a closely-held company is illiquidity – either by being deprived of dividends or an inability to sell. If these worries go away (as in the case with a public stock in a minority-marketable level) then what else is there to be gained?
 - (3) Nath argues that minority investors in public companies exert a form of control in their ability to liquidate their investments easily. He also argues that most minority investors do not want the so-called ‘preogatives of control’ as have been delineated in this chapter.
 - (4) Most public companies already trade at or near their control value (as we define control in the private market). If most or all public companies have a control value that exists above the level of the daily trading price then the market would see far more transactions that it does.
 - (a) If there is no real demand for this definition of control then how can it exist?
- C. There are significant differences between the public and private markets. What is most relevant here is that in many venues, business law protects the minority investor in public companies against abuses from controlling parties. Also Boards of Directors bear similar responsibility to curb management. Therefore,

¹ Eric Nath, “A Tale of Two Markets”, *Business Valuation Review*, September 1994.

minority owners in public companies do not have to worry about a control owner committing abuses that are linked to the control prerogatives.

- D. Research shows that 80% to 90% of public company takeovers fail either in that they do not achieve the forecasted returns to shareholders or literally collapse with the break-up of the companies. This fact would tend to argue that the control premiums are not representative of Market Value since the buyers are either uneducated or not acting in their own best economic interest.

4. The Market Participant Acquisition Premium

A. Background

- (1) In the Fair Value context, control premiums are sometimes referred to as “market participant acquisition premiums” (MPAP). Users of valuation analyses in the financial reporting context were concerned that control premiums applied to the minority, marketable level of value were potentially overstated as discussed in the critiques above.
- (a) The U.S. SEC was especially concerned that the unsupported application of control premiums in the range of 35.0% to 40.0% in goodwill impairment analyses were being used by public companies to avoid recognizing impairment.
- (b) The principal support for the control premiums (the control premium studies discussed in the prior section) do not provide sufficient data to adequately measure what market participants would pay above the so-called minority, marketable level of value.
- (c) The terms used are control value, foundation value, and MPAP. The foundation value is equivalent to the minority, marketable level of value.
- (2) The Appraisal Foundation’s Appraisal Practices Board released its final publication on this issue, *The Measurement and Application of Market Participant Acquisition Premiums* on September 6, 2017. This document is the basis for discussion and research on the MPAP. (The Appraisal Foundation in the U.S. is a Congressionally recognized authority on valuation which issues standards, qualifications, and guidance in the valuation disciplines. It is sponsored by 11 different Valuation Professional Organizations [“VPOs”] in the United States.)
- (3) The MPAP is defined as the premium that describes the price paid by market participants in order to acquire a controlling interest.
- (4) There are two main distinctions between the discussion of the MPAP and the control premium discussion in the prior section:

- (a) From a market participant perspective, synergistic value may be included in the premium if they are available to the defined group of market participants.
 - ◆ The valuer must distinguish between synergies that are available to the group of market participants versus the synergies that would be available to one specific buyer.
- (b) Best practice dictates identifying what these synergies are and explicitly accounting for them either in the projected cash flows, the discount rate used, or the control premium.
 - ◆ For example, if the synergistic value is encompassed in the closure of warehouse facilities which would save the equivalent of one million euros – *and the whole group of market participants would recognize these savings* – then the valuer would increase projected cash flows by one million euros.
 - ⇒ Alternatively, the valuer could decrease the discount rate used or increase the control premium to capture the synergies, but this would be a less precise approach.

B. Relationship between cash flow and control premium

- (1) The main principles discussed in the prior section apply to the MPAP discussion in terms of control and minority cash flows and adjustments made that distinguish one from the other.
- (2) The Appraisal Foundation indicates that best practice in determining the MPAP is to model the perceived control synergies into the projected cash flows which would preclude a separate application of the MPAP.
 - (a) A distinction is made between traditional cash flow modeling and expected cash flow modeling. With expected cash flow modeling, the valuer would present a range of expected cash flows from a worst case to optimum case scenario and apply weights to each.
 - (b) In either case, the valuer should identify the specific source(s) of the higher cash flows that market participants may extract from the company.
 - ◆ Revenue-based synergies
 - ⇒ New distribution channels
 - ⇒ Wider customer base
 - ⇒ New product/service markets

- ⇒ Enhanced pricing power
 - ◆ Expense-based synergies
 - ⇒ Elimination of duplicative labor
 - ⇒ Elimination of surplus capacity
 - ◆ Cost of Capital Synergies
 - ⇒ Optimal capital structure imposed on target company
 - ⇒ Lower the cost of debt
- (c) The prerogatives of control discussed in the last section only have value if it can be determined that a market participant would pay for them.
- ◆ The Appraisal Foundation allows for these prerogatives of control to be captured as either an increase in projected cash flows or a lower discount rate.
- (d) The valuer should identify the extent to which these or other synergies exist.
- ◆ Are these synergies available to the market participant group or just to one or two specific buyers?
 - ◆ To the extent the synergies are available to the market participant group, how much would the market participants benefit from them?
 - ◆ To the extent the synergies are available and market participants would benefit, how much would they pay for them? The valuer must remember that no buyer will pay for a benefit unless he absolutely has to.
- (3) If the benefits of control are modeled into the cash flows in the income approach, then no separate control premium would be necessary.
- (a) DCF – If synergies are projected in cash flows then no premium would be necessary.
- (b) GPC method – If synergies are reflected in target company cash flow, then no separate control premium is necessary. If not, then a premium should be considered.
- (c) Transaction method – not often applied because transaction multiples already reflect synergies and any premium for control

- C. The Appraisal Foundation recommends that the control premium be applied to the invested capital value, not an equity value. Common practice in financial reporting is to conduct valuations on the invested capital basis.
 - (1) Valuers should only apply a premium from the control premium studies in rare circumstances (and even then in the company of other support), but if such data is used, the valuer should remember that the control premiums from the studies are an equity premium. They cannot be directly applied to an invested capital value.
- D. IVS 2017 uses the term “Market Participant Acquisition Premium” and is planning to undertake further work in this area.

Section C. Measuring the Discount for Lack of Marketability (DLOM)

The DLOM is applied to a Minority, Marketable level value to obtain a Minority, Non-marketable level value. Generally there are five different tools that are used in best practice to quantify the DLOM. The valuer can select any or all of these tools to measure the DLOM, depending on the circumstances. The valuer should remember that there is disagreement in the profession as to the propriety of some of the tools and manner in which they are applied.

- 1. Difference in Bond Yields
 - A. The premium paid above the yield on short-term government bills for long-term bonds has always been a simple and straightforward way of viewing relative illiquidity in the marketplace. Investors in long term government bonds must be compensated for the risk of inflation and loss of value over a longer holding period relative to investors in short term bills. This premium is easily observable over time.
 - (1) The yield spreads are not presented here as an option for actually measuring the DLOM for the following reasons:
 - (a) The spreads are representative of the liquidity of debt instruments, not equity investments.
 - (b) Various economic factors can skew the yield spreads in ways that would not have a similar effect on equity investments.
 - ◆ The yield spreads between 2008 and 2017 are abnormally high due to the effects of the 2008-09 recession.

- (c) The variance in spreads on a year-to-year basis and the range of spreads over time suggests that a central tendency conclusion would not be relevant.
 - (d) The percentage difference in yields (i.e., the premium paid) is not the arithmetical equivalent of a DLDM.
- (2) However, the yields below do show a consistent trend in the market in which a premium is required for investing in a longer term security which lacks the liquidity of an investment in a similar entity which has a shorter holding period.

United States Government Bond Yields, 1982-2017			
Year	3-Month Treasury Bill Yield	LT Treasury Bill Yield	% Difference
1982	11.87%	13.87%	16.8%
1983	8.17%	10.39%	27.2%
1984	9.35%	11.93%	27.6%
1985	8.10%	11.69%	44.3%
1986	7.33%	9.28%	26.6%
1987	5.70%	7.44%	30.5%
1988	6.09%	8.95%	47.0%
1989	8.43%	9.09%	7.8%
1990	7.83%	8.00%	2.2%
1991	6.66%	8.14%	22.2%
1992	3.96%	7.46%	88.4%
1993	3.19%	7.33%	129.8%
1994	3.16%	6.54%	107.0%
1995	5.95%	8.07%	35.6%
1996	5.20%	6.03%	16.0%
1997	5.19%	6.85%	32.0%
1998	5.32%	5.94%	11.7%
1999	4.49%	5.42%	20.7%
2000	5.48%	6.94%	26.6%
2001	5.87%	5.46%	-7.0%
2002	1.74%	5.86%	236.8%
2003	1.22%	5.05%	313.9%
2004	0.93%	5.21%	460.2%
2005	2.32%	4.84%	108.6%
2006	4.16%	4.62%	11.1%
2007	5.07%	4.87%	-3.9%
2008	3.26%	4.39%	34.7%
2009	0.08%	3.22%	3925.0%
2010	0.08%	4.60%	5650.0%
2011	0.15%	4.18%	2686.7%
2012	0.02%	2.67%	13250.0%
2013	0.08%	2.63%	3187.5%
2014	0.07%	3.68%	5157.1%
2015	0.02%	2.41%	11950.0%
2016	0.22%	2.64%	1100.0%
2017	0.53%	2.78%	424.5%
		Median, 1982-2008	27.6%
		Median, 1982-2017	40.0%

Note: LT Treasury is 30-year bond 1982-93. After 1993 is 20-year bond.

2. Option Theory

- A. A put option is a contract in which an investor purchases the right to sell a stock at a predetermined price. The cost of the option contract is the amount that the investor is willing to pay for the right to sell, which is called a 'put.' In buying the put option, the investor safeguards himself against the possibility that the stock will decline in value below the exercise price which is the predetermined price at which he can sell the stock. If that happens, the investor can purchase shares

of stock at the market price and then exercise his option to sell those shares at the predetermined, higher amount.

(1) Example:

ABC Company price per share @ 9/30/17 **\$ 10.00**

Put Option Contract

# shares	100,000
Exercise price per share	\$ 10.00
Time period	3 years

ABC Company price per share @12/31/18 **\$ 6.50**

Investor exercises put option

Cost of buying shares	\$ (650,000)
Exercise of put	1,000,000
Proceeds from exercise of put option =	<u>\$ 350,000</u>

Net gain = proceeds less cost of option

In this example, the investor buys the right to sell 100,000 shares of a stock for \$10.00 per share. The stock is also trading at \$10.00 per share on the date that the contract is signed. Fifteen months later the stock value has declined to \$6.50 per share and the investor decides to exercise the put option. He purchases 100,000 shares (using his own money) for a cost of \$650,000. He then sells those shares to the investor on the other side of the contract, who must pay \$10.00 per share, or \$1,000,000. The option holder gets a profit of \$350,000, less whatever the original cost of the put option was.

The principle behind the use of options to measure the DLOM is that the cost of the option represents what the investor was willing to pay to ensure liquidity at \$10.00 per share. Therefore the cost of the option, divided by the value of the company will provide an indication of the DLOM.

- B. In 1993 David Chaffe was the first person to link the concept of lack of marketability in the private markets with the price of stock options in the public markets.² Chaffe used the Black Scholes option pricing model (see below) to determine the DLOM.

² David Chaffe, "Option Pricing as a Proxy for Discount for Lack of Marketability in Private Company Valuations", *Business Valuation Review*, December, 1993.

- C. In 1995, Francis Longstaff, head of fixed income derivative research at Salomon Brothers in New York City (now a finance professor at UCLA's Anderson School of Management) published research on the value of marketability in stock pricing.³ Although his research did not make it into mainstream valuation practice for ten years, his research formed the basis for what is now a group of quantitative models which are applied to measure the DLOM.

Longstaff likened the issue of illiquidity to an option scenario in which an investor receives a stock which is restricted from trading for "x" number of years. Assume the investor also has perfect foresight in the market and knows when the stock's price peak will occur.

- (1) The value of the illiquidity would therefore equal the present value of the difference between the proceeds from that sale at the market's peak and the proceeds from a sale of the stock at the end of the restriction period. That is the value that the investor has lost due to the restriction.
- (2) Longstaff referred to this as the "upper bound" of the value of marketability since no investor has perfect timing or foresight. There is the possibility that the investor might sell at a value below the peak or even sell at a value below the price at the end of the restriction.
- (3) The Longstaff Model quantifies the time period of the restriction and the stock's volatility in determining the lost value. This lost value is then taken as a percentage of overall value and a discount is determined. Longstaff's research yields the following results when varying time periods and varying volatilities are entered:

³ Francis A. Longstaff, "How Much Can Marketability Affect Security Values?", *Journal of Finance*, December, 1995

Francis Longstaff
Percentage Discounts for Lack of Marketability

Restriction Period	STANDARD DEVIATION		
	0.10	0.2	0.3
1 day	0.42%	0.84%	1.27%
5 days	0.94%	1.89%	2.85%
10 days	1.34%	2.69%	4.05%
20 days	1.89%	3.82%	5.77%
30 days	2.32%	4.69%	7.10%
60 days	3.30%	6.68%	10.15%
90 days	4.05%	8.23%	12.54%
180 days	5.77%	11.79%	18.08%
1 year	8.23%	16.98%	26.28%
2 years	11.79%	24.64%	38.61%
5 years	19.13%	40.98%	65.77%

Source: *Journal of Finance*, December 1995

- (a) As shown, the amount of the implied DLOM increases as the restriction time period increases. Also the implied DLOM increases as the volatility increases.
- ◆ It is not unusual to have stock volatilities in the 20% to 30% range, or even higher. It is also not unusual for closely-held stock to have anticipated holding periods (i.e. restriction periods) of five years or more. At face value therefore, this research suggests DLOMs in the 40% to 65% range.
 - ◆ It should be remembered though that Longstaff refers to this model as the 'upper bound' of the DLOM since it assumes perfect market timing which, in reality, investors do not possess.
- (4) Chaffe and Longstaff's research provides the basis for using option models to measure the DLOM since the two input variables, time period of restriction and stock volatility, are the two key inputs into option pricing models. Theoretically, the price an investor is willing to pay for a put option, as a percentage of a stock's overall value, is comparable to the DLOM:
- (a) When a put option is purchased, the investor is guaranteeing liquidity since the seller of the option must purchase the stock if the option is exercised.
- (b) The amount that the investor is willing to pay for the option contract is a proxy for how he prices liquidity.

(c) The valuer can therefore divide the cost of the option contract into the total value of the company to reach a determination of the DLOM.

(5) It should be remembered that Longstaff's research was not focused on the closely-held market. He was trying to measure the decline in value caused by the market's halting of trading in a stock or in investments in public stock that for a variety of reasons did not enjoy instant liquidity.

D. Option Model Example

(1) The Black-Scholes Model has become a common tool for measuring the DLOM. The model was developed by Fisher Black, Myron Scholes, and Robert Merton in 1973 at the University of Chicago. The model is used to price European call options (it was not developed to measure the discount for lack of marketability). In addition to put options (the right to sell a stock) and call options (the right to buy a stock), there are two general types of options in the market:

(a) European option – typically can only be exercised at the end of the contract period.

(b) American option – typically can be exercised during the contract period.

(c) Since the European option provides less versatility to the investor, the European option will usually sell at a discount to an American option with similar characteristics. Therefore the Black-Scholes model is usually seen as setting the low end of the range for the DLOM.

(d) The Black-Scholes model has the following inputs:

- ◆ Current stock price
- ◆ Exercise price
- ◆ Risk-free rate
- ◆ Time to expiration
- ◆ Stock volatility

(2) Example: A valuer is appraising ABC Company, a closely-held software development firm that generates \$110 million revenues. A control value was determined at \$210 million and the valuer needs to determine an appropriate DLOM since he is valuing a 5% interest (the other 95% is owned by a sole controlling shareholder).

the volatilities for a larger group of publicly held software firms. In the above data, the standard deviation is measured across all the data points and the annual volatility equals the standard deviation times $\text{SQRT}(12)$ – this is necessary to convert the monthly measurement to an annual measurement.

- (c) The current price and exercise price are set at the same value which would equal the appraised value of the stock after a discount for lack of control is taken, if necessary.
- (d) The risk-free rate is set at the yield on long-term Treasuries at the valuation date. The term of the Treasuries should match the time to expiration in the model. The time to expiration should match the expected holding period of the stock.

ABC Company Valuation of Put Option - Marketability Discount

Class per share - net of minority discount	\$	210,000,000	INPUT - current value
Put Price		210,000,000	INPUT - current value
Euler's Constant		2.7183	
Annual Risk-Free Rate		2.31%	INPUT - 20-yr Treasury Rate
Years to Exit		20.00	INPUT - expected holding period
Annual Deviation		0.291	INPUT - Volatility from GPCs
d1 =	1.00570	N(-d1) =	0.1573
d2 =	(0.29569)	N(-d2) =	0.6163
Value per Put Option	\$	48,506,249	
Implied DLOM (48.5/210)		23.1%	

- (e) In the above case, the indicated DLOM is 23.1% given the parameters, which is a 20-year time period and a volatility of 29.1%. The DLOM is determined by dividing the option price of \$48.5 million into the value of the company on a minority-marketable level at \$210 million. Theoretically, the \$48.5 million is the amount an investor would be willing to pay to avoid illiquidity over the twenty year time period.
- (f) The model is very sensitive to the volatility measure. If the volatility were increased to 0.40 (with all other variables remaining the same) the DLOM increases to 34.0%. If it is decreased to 0.20, the DLOM declines to 13.0%.

- (g) The model is less sensitive to the time to expiration variable. If the time period is extended to 30 years, the DLOM increases to 21.2%. If it is decreased to 10 years, the DLOM decreases to 22.4%.
- (h) There is a relationship in the model between holding period and volatility.
- (i) The example above replicates what Chaffe presented in his original 1993 paper. The Black-Scholes model though, as discussed, assumes a European style option and therefore is not the best model to use which mimics the conditions of liquidity in closely-held stock. Chaffe suggests that closely-held stock should have, at a minimum, a 50% volatility variable. In the above case this would set the DLOM at 42.3%.
- (j) The Black-Scholes model has become a common quantitative tool to measure the DLOM due to its simplicity relative to other option models and its availability.

E. Asian Options

- (1) Asian options have a payoff that is determined based on an average price over the term of the contract. The cost of an Asian option is typically less since the volatility factor is somewhat mitigated by taking an average price.
- (2) John Finnerty, a Professor of Finance at Fordham University, continued the research of Francis Longstaff but replaced the perfect-timing element of Longstaff's "lookback" option with an Asian option in which the payoff is set at the average price.⁴ The Finnerty option model yields the following results over short holding periods
 - (a) The discounts in the Table below are relatively lower due to the shorter holding periods. In practice many industries and guideline public companies would have volatility rates at least in the 20% to 30% range during normal times. This suggests DLOMs above 25.0% when longer holding periods are considered.

⁴ John Finnerty, Ph.D., "Using Put Option-Based DLOM Models to Estimate Discounts for Lack of Marketability", *Business Valuation Review*, Winter, 2013.

John Finnerty
Percentage Discounts for Lack of Marketability

Restriction Period	STANDARD DEVIATION		
	0.10	0.2	0.3
90 days	2.30%	5.70%	8.50%
180 days	3.30%	8.00%	11.90%
270 days	4.00%	9.80%	14.40%
1 year	4.60%	11.20%	16.30%
2 years	6.50%	15.50%	21.80%
3 years	7.50%	18.50%	25.30%
4 years	9.10%	20.90%	27.50%

- (b) Researchers have found that the results of Finnerty's Asian Put model more closely mimic results from the Stout Restricted Stock Studies which are discussed below.
- (c) Despite the likelihood that Asian Put Models are more appropriate tools to measure the DLOM, the traditional Black-Scholes Model has retained a great deal of popularity, probably due to its easy availability and the fact that it is part of mainstream business school education.

F. Long-Term Equity Anticipation Securities (LEAPs)

- (1) A LEAP is a derivative in public companies in which an investor can ensure protection against a price decline by purchasing a long-term contract which locks in a price. LEAPs contracts have been continuously studied by Robert Trout, Ph.D. (in the initial study) and Ronald Seaman, ASA (in subsequent studies).
- (2) Seaman's studies between 2006 and 2013 stratified the companies by market size, risk, profitability, growth and dividend yield and found that the size of the implied DLOM increased with smaller size, higher beta, lower growth and lower profitability.
- (3) Four of the Seaman studies are summarized below in which LEAPs in public companies are stratified by risk (as measure by beta) and size (as measured by revenue). Size as measured by revenues has a strong impact on the prices paid in the market for LEAPs.

LEAPS Study - 2009**Implied DLOM on LEAPS by Beta**

Beta	2009 LEAPS Implied DLOM	
	Average	Median
0.6 to .80	14.00%	12.40%
0.9 to 1.1	16.50%	14.30%
1.2 to 1.4	19.20%	17.30%
1.5 to 1.7	21.50%	19.60%
above 1.8	24.40%	23.00%

Ronald Seaman, FASA

Source, BVR, Spring 2008

LEAPS Study - 2011**Implied DLOM on LEAPS by Revenue**

Revenues	2011 LEAPS Implied DLOM	
	Average	Median
Above \$10b	37.10%	35.00%
\$1b to \$10b	43.90%	41.40%
Under \$500m	53.70%	50.10%
Under \$100m	64.60%	61.50%

Source, BVR, Spring 2008

LEAPS Study - 2013**Implied DLOM on LEAPS by Revenue****LEAPS due in 14 months (2014)**

Avg Revenue (mil)	2014 LEAPs Implied DLOM	
	Average	Median
\$ 67,964	14.60%	13.00%
13,060	14.90%	13.70%
5,091	18.10%	16.50%
1,815	22.00%	18.20%
332	31.00%	26.20%

Ronald Seaman, FASA

Source, BVR, September, 2013

LEAP Study - 2013**Implied DLOM on LEAPS by Revenue****LEAPS due in 26 months (2015)**

Avg Revenue (mil)	2015 LEAPs Implied DLOM	
	Average	Median
\$ 72,686	21.30%	19.30%
14,582	22.20%	20.70%
5,746	25.80%	23.80%
2,057	32.70%	26.70%
379	44.50%	37.20%

Source, BVR, September, 2013

- (4) Both the LEAPs issued in 2008 and 2013 that are stratified by revenue show that the smallest revenue size category reflects an implied DLOM that is approximately double the largest size category.
- (5) The implied DLOM data based on LEAPs is also sensitive to time since the price of LEAPs as a percentage of the company's stock can change depending on market movements, industry and company developments. The Table below shows the results from a study Seaman conducted in which LEAPs' implied DLOMS changed throughout the year 2010.

LEAPS STUDY - 2013

Volatility in Implied DLOMS

2010	BP	CAL	GPS	KBR	MYGN
January	17.6%	29.4%	19.5%	23.3%	25.5%
February	18.6%	31.1%	18.8%	23.3%	27.8%
March	16.9%	29.0%	17.2%	20.6%	23.8%
April	16.3%	27.1%	15.6%	20.3%	23.1%
May	19.7%	31.1%	19.8%	21.6%	24.8%
June	28.5%	29.0%	18.8%	21.2%	23.6%
July	24.1%	29.3%	19.6%	20.8%	22.5%
August	19.5%	27.5%	18.6%	20.2%	23.4%
September	22.4%	25.3%	17.3%	19.0%	24.9%

Notes: BP = British Petroleum; CAL = Continental Airlines; GPS = GAP, Inc.;
KBR - KBR, Inc.; MYGN = Myriad Genetics

Excerpted from Ron Seaman 2010 LEAPS Study
BVR, January, 2011

- (a) The valuer should match her support data for the DLOM to the valuation date since the underlying data will change. In the example above, BP's LEAP prices and stock price changed after the Gulf of Mexico oil spill which began in April of 2010. In each case shown above though, the implied DLOMS showed material change over a ten-month period.

G. Critique of Using Option Models to Measure the DLOM

- (1) Some of the option models yield unrealistic DLOMs at the upper range of volatility.
- (2) Option models were never derived to price illiquidity in closely-held companies. They are derivatives in which investors are trying to make a profit based on assumptions about the future price of a stock. Therefore, the assumption that the price of an option represents an investor's quantification of closely-held illiquidity may not always be the case.

- (3) Option models are seen by novices as being a more reliable and objective source for the DLOM since it is a quantification. In reality, the valuer can exert significant influence over the outcome of the option calculation, especially in the quantification of volatility which, for private companies, depends on which GPCs are included. By editing the list of GPCs the valuer can influence the most sensitive variable.
- (4) The model has weaknesses: for example an illiquid investment with no volatility would have no DLOM according to the model. There is also no variation according to the size of the holding in the private company.

3. Initial Public Offering Studies

- A. An initial public offering occurs when a closely-held company is listed on a public exchange for the first time. Before the offering, underwriters value the stock and negotiate an offering price. Usually much of the stock is acquired at the outset by institutional investors and very few shares are available for purchase by individuals. However, once public, the stock price is subject to market forces.

In the U.S. private companies that plan to go public must first register their stock (on the Form S-1) with the Securities and Exchange Commission (SEC). This document provides extensive information on the company's history, industry, financial statements, management, etc. The company must also provide details on all private transactions of its stock that occurred in the three year before the IPO.

The pre-IPO Studies that are discussed in this section observe the potential DLOM by measuring the difference between the price of the stock in the company transactions before going public and the IPO price, with the former being the illiquid value and the latter being the liquid value.

Several institutions have conducted periodic pre-IPO studies over the years. Some of the more often cited entities include the following:

- (1) Willamette Management Associates pre-IPO Studies
 - (a) Willamette Management Associates conducted studies between 1975 and 2000. WMA included transactions for a full three years before the IPO and they adjusted for significant differences in the company between the pre-IPO transaction and the IPO date.
 - (b) The WMA Studies are summarized below:

Willamette Management Pre-IPO Studies

Time Period	# of Prospectuses	# of Transactions	Mean DLOM	Median DLOM
1975-78	17	31	34.0%	52.5%
1979	9	17	55.6%	62.7%
1980-82	58	113	48.0%	56.5%
1983	85	214	50.1%	60.7%
1984	20	33	43.2%	73.1%
1985	18	25	41.3%	42.6%
1986	47	74	38.5%	47.4%
1987	25	40	36.9%	43.8%
1988	13	19	41.5%	51.8%
1989	9	19	47.3%	50.3%
1990	17	23	30.5%	48.5%
1991	27	34	24.2%	31.8%
1992	36	75	41.9%	51.7%
1993	51	110	46.9%	53.3%
1994	31	48	31.9%	42.0%
1995	42	66	32.2%	58.7%
1996	17	22	31.5%	44.3%
1997	34	44	28.4%	35.2%
1998	14	21	35.0%	49.4%
1999	22	28	26.4%	27.7%
2000	13	15	18.0%	31.9%

(c) As seen in the Table above, the mean DLOMs tend to understate the median DLOMs indicating that the dispersion of data may be high. This would lessen confidence in a reliance on the mean or the median as a representative DLOM.

(d) There has been a tendency among practitioners to gravitate toward a central tendency statistic when citing support for the DLOM since that is less time consuming. However, the above data does not support using an average or median. Over the years studied, the mean ranged from 18.0% in 2000 to 55.6% in 1979 and the median ranges from 27.7% in 1999 to 73.1% in 1984. There also is no trend upward or downward over time.

(e) The above data suggests little more than the likelihood that a DLOM does exist for closely-held companies. The amount of the DLOM though will rely on the valuer placing the subject company's characteristics among the range of data points in these studies.

(2) John Emory Studies

(a) John Emory conducted pre-IPO studies for twenty years between 1980 and 2000.

(b) The studies look at transactions that occurred within five months of the IPO.

(c) The results of his studies are shown in the Table below:

John Emory Pre-IPO Studies

Time Period	# of Prospectuses	# of Transactions	Mean DL0M	Median DL0M
1980-81	97	12	59.0%	68.0%
1985-86	130	19	43.0%	43.0%
1987-89	98	21	38.0%	43.0%
1989-90	157	17	46.0%	40.0%
1990-91	266	30	34.0%	33.0%
1992-93	443	49	45.0%	43.0%
1994-95	318	45	45.0%	47.0%
1995-97	732	84	43.0%	41.0%
1997-00	1,847	266	50.0%	52.0%

John D. Emory, Emory & Co. Milwaukee, Wisconsin

(3) Valuation Advisors Lack of Marketability Discount Study

(a) The Valuation Advisors Studies provide a searchable database of pre-IPO transactions going back to 1985. The database is available via a subscription from www.bvresources.com. The Valuation Advisors Studies have the following criteria:

- ◆ Includes studies back three years from the IPO
- ◆ Includes insider transactions
- ◆ Does not make adjustments for material events
- ◆ The IPO price is the initial price set; it is not adjusted for fluctuations later in the initial trading day or weeks of trading.
- ◆ Covers 13,300 transactions which are searchable by SIC and NAICS codes, revenues, asset size, operating income, time period and type of security.
- ◆ The transaction database includes deals from 28 countries outside the U.S.

(b) A summary of the Valuation Advisors studies from 1985 is shown below:

Valuation Advisors Pre-IPO Studies

Year	Time Period Prior to IPO					Number of Transactions
	0 - 3 mos.	4 - 6 mos.	7 -9 mos.	10 - 12 mos.	1 - 2 years	
1995	37.82%	28.62%	60.40%	50.33%	60.64%	34
1996	30.83%	52.97%	56.37%	69.38%	71.81%	270
1997	34.18%	50.00%	67.12%	76.01%	80.00%	212
1998	23.35%	46.67%	68.93%	71.41%	71.91%	212
1999	30.77%	53.89%	75.00%	76.92%	82.00%	694
2000	28.70%	45.08%	61.51%	68.92%	76.64%	453
2001	14.74%	33.17%	33.38%	52.06%	51.61%	115
2002	6.15%	17.33%	21.88%	39.51%	55.00%	81
2003	28.77%	22.30%	38.36%	39.71%	61.37%	123
2004	16.67%	22.68%	40.00%	56.25%	57.86%	334
2005	14.75%	26.10%	41.68%	46.11%	45.45%	296
2006	23.47%	20.69%	40.23%	46.51%	56.27%	264
2007	12.67%	32.55%	43.69%	56.00%	54.17%	459
2008	20.00%	24.21%	45.85%	52.17%	41.18%	41
2009	6.16%	31.85%	26.82%	41.00%	34.87%	108
2010	15.81%	29.89%	44.42%	47.54%	51.88%	358
2011	23.27%	34.62%	43.26%	50.78%	62.10%	281
2012	18.86%	24.07%	28.90%	35.48%	44.78%	3
AVG - All	21.50%	33.15%	46.54%	54.23%	58.86%	
AVG - 2008-12	16.82%	28.93%	37.85%	45.39%	46.96%	

Source: Valuation Advisors Pre-IPO Study, BV Resources, Inc.

- ◆ As is shown, the discounts generally appear to increase in size the further back from the IPO date. This makes intuitive sense since the closer the investor is to the IPO, the more likely she will know that an IPO, a liquidity event, is imminent.
- ◆ The implied DLOMs appear to have declined over the five years between 2008 and 2012 at least in terms of averages. These averages are slightly skewed by 2012 which only has three data points.

(c) Example

- ◆ A valuer has a software publishing company for which he is trying to determine a DLOM. He searched the Valuation Advisors Lack of Marketability Study on www.bvresources.com. He limited his search to NAICS code 511210 which is the industry code for software publishing. He also limited the search to deals between 2010 and 2017 and limited the revenue size to between \$0 and \$250,000,000. The search results yielded 520 pre-IPO transactions with the following metrics:

Valuation Advisors Pre-IPO Studies**Software Publishers****Search Results**

	# deals		Mean		Median
IPO price per share	520	\$	15.13	\$	15.00
Transaction price per share	520	\$	8.40	\$	7.89
DLOM for pre-IPO <= 2 years	367		31.7%		32.7%
DLOM for pre-IPO > 2 years	153		66.3%		76.3%

source: www.bvresources.com

- ◆ The search results show the mean and median IPO price and pre-IPO transaction price for the 520 transactions in the subset given the parameters entered by the valuer. The results separate the deals into transactions that occurred less than two years before the IPO and greater than two years before the IPO. There is clearly a material difference between the less than and greater than two-year window.
- ◆ The pre-IPO studies have historically suggested DLOMs higher than the restricted stock studies which are discussed below.

(d) Typically the valuer will not search all transactions in the database. He will extract the transactions that are most relevant to his subject based on the industry and operating metrics in the Study.

B. Critique of the pre-IPO Studies

- (1) The IPO prices in the first day of trading on which some of the studies are based often overstate the value of the stock relevant to the stabilized price that the market sees weeks or months after the IPO. Since the IPO price on the first day or week of trading is often higher than the stabilized price then the inferred DLOM may be overstated.
- (2) The market tends to know which companies are in the pipeline to go public for some time before the actual IPO. Therefore 'private' transactions actually anticipate a liquidity event (the IPO) and therefore the values in those transactions are overstated. This may understate the inferred DLOM.
- (3) The Studies may not account for the time difference between the private transaction and the IPO, which could be more than a year. With longer periods of time, operational differences may explain the price differential rather than illiquidity.

- (4) There may be a success bias in the data. Only the successful IPOs are included in the studies for obvious reasons. By excluding the the companies that planned IPOs but did not proceed, the critique is that the IPO side of the calculations may be overstated and the implied DLOMs may be overstated.
- (5) Some of the pre-IPO transactions are related party deals. These may not be reflective of market value.

4. Restricted Stock Studies

- A. Restricted stock is a security which is commonly used in the United States either in an acquisition or as a form of compensation. The term 'restricted stock' refers to unregistered stock of a public company. This stock is usually given to company officers, directors or to the former owners of an acquired company.
 - (1) Restricted stock in publicly-held companies is registered under Rule 144 of the U.S. Securities and Exchange Commission (SEC). It is restricted from trading in the market during a vesting period.
 - (a) Company officers may receive restricted stock as a form of compensation. It is also often used as part of a purchase price in a transaction. Instead of an all-cash purchase price, a selling shareholder may receive restricted stock to incentivize her to enhance the value of the acquiring firm.
 - (b) As of 2017, the holding period lasts six months under Rule 144. Historically, the holding period was longer. Prior to 1997, the holding period under the law was two years. Between 1997 and 2008, the holding period was one year. It was shortened to six months after February of 2008.
 - (c) Public companies which issue restricted stock therefore have both a freely-traded security (i.e. their common shares that are traded on the market) and a non-marketable security (i.e. the restricted stock).
 - (d) There are limited circumstances under which restricted stock can be traded, even during the vesting periods. When these trades occur, the parties must report the terms of the transaction to the SEC, which makes the data available to the public.
 - ◆ Trades of restricted stock therefore present an opportunity to measure illiquidity since the buyer of restricted stock is acquiring a stock that still has a restriction period. By comparing the transaction price to

the price of the freely-traded stock in the same company, the valuer can observe an implied DLOM.

(e) Example:

Restricted stock example

Public company ABC price per share = \$ 12.00

ABC restricted stock trade = 9.00

Implied DLOM = $[1 - (\$9.00/\$12.00)]$ 25.0%

- ◆ In the example above, the difference between the freely traded price and the restricted price is a proxy for the illiquidity that the valuer is trying to measure in the closely-held market. In this case, the implied DLOM is 25.0%.

(f) Numerous studies have been conducted on restricted stock trades over the past 50 years. A summary of the early studies is shown below.

- ◆ Practitioners tended to draw simple conclusions from these studies, some of which were erroneous.
- ◆ One assumption has been that the discounts appear to decline over the years which is commensurate with the decline in the holding period from two years to one year.
- ◆ Another assumption is that the data indicates that a discount for lack of marketability should at least be in the 35% range. Even though the Studies' discounts declined to the 13% to 20% range by the late 1990s, the assumption was that since a closely-held company has, at the very least, a much longer non-marketable period, then the DLOM should still be at least in the 35.0% range. This assumption is based on the results of the original studies in the 1960s and 1970s when the discounts were higher with the longer holding periods.

Restricted Stock Studies Summary of Pre-2000 Research	Time Period	Number of Deals	Average DLOM
SEC Overall Average	1966-69	398	25.8%
SEC non-reporting OTC companies	1966-69		32.6%
Gelman Study	1968-70	89	33.0%
Trout Study	1968-72	60	33.5%
Moroney Study	1991-99	148	35.6%
Maher Study	1969-73	33	35.4%
Standard Research Consultants Study	1978-82	28	45.0%
Willamette Management Associates Study	1981-84		31.2%
Silber Study	1981-88	69	33.8%
Management Planning, Inc. Study	1980-96	53	27.1%
FMV Opinions, Inc. Study	1979-97	253	23.0%
Bruce Johnson Study	1991-95	70	20.0%
Columbia Financial Advisors Study (1)	1996-97	23	21.0%
Columbia Financial Advisors Study (2)	1997-98	15	13.0%

Source: Pratt, Reilly and Schweih, *Valuing a Business*, 5th Edition

B. Restricted Stock Data after 2000

(1) China's Split Stock Studies

(a) China used to have a split share system similar to restricted stock in the U.S. in which companies had one class of stock trading on a public exchange and another class of stock that could not trade that was held by governments and institutions. Similar to U.S. restricted stock, the Chinese private stock sometimes traded in an auction market.

- ◆ Both classes of stock had the same voting rights and dividend rights.
- ◆ Prior to 2005, the non-tradable shares accounted for two-thirds of the Chinese market.

(b) Prior to 2005, the observed discounts in this market were in the 77.9% to 85.6% range.

(2) Canadian Studies

(a) Canada has non-tradable shares similar to the U.S. In 2001, Canada shortened its holding period from 12 months to 4 months. The implied DLOM declined from 19.0% to 8.25%.

(3) Stout Restricted Stock Study (Stout Study)

(a) The Stout Restricted Stock Study (formerly known as the FMV Opinions Study) has analyzed 784 transactions of restricted stock

since 1980. The research is conducted by the financial services firm, Stout Risius Ross, LLC (“Stout”) in conjunction with BV Resources, Inc. (BVR). This database is available from BVR at the following site:

www.bvresources.com

- (b) To be included in the Stout Study, the transaction must meet strict selection criteria which eliminate about 95% of the potential transactions over time. Private placements of restricted stock are eliminated from the Stout Study for the following reasons:
- ◆ The transaction included debt, preferred stock or a hybrid security
 - ◆ The transaction had warrants attached
 - ◆ The transaction did not close
 - ◆ The related stock was not a U.S. company
 - ◆ The related stock traded below \$1.00 per share
 - ◆ There was information missing from the deal terms
 - ◆ There was an ulterior strategic motivation for the deal
 - ◆ The deal involved related parties
- (c) The remaining 784 transactions analyzed in the Stout Study and discussed in this course occurred between 1980 and 2016. One premise of the Stout Study is that the mean or median discounts, if relevant to a subject company, will possibly understate the real DLOM relevant to the subject since the liquidity characteristics of a private placement of restricted stock differ greatly from the liquidity characteristics of a subject closely-held company.
- ◆ Therefore additional steps should be considered to account for the additional illiquidity of the subject.
- (d) A summary of the Stout Study transactions over the past 36 years is shown below:

Stout Restricted Stock Study 2017 Transaction Summary

Statistic	Count	Range	Mean	Median
Transaction Date	784	7/1/1980 - 10/7/2016	N/A	N/A
Total Revenues (\$000s)	784	\$0 - \$14,255,000	\$119,101	\$15,008
Total Assets (\$000s)	784	\$0 - \$39,261,000	\$355,647	\$33,059
Market Value (\$000s)	784	\$2,020 - \$7,784,015	\$226,667	\$89,499
Book Value (\$000s)	784	(\$159,997) - \$4,583,000	\$68,662	\$13,369
MTB Ratio	784	-26,067.19 - 2,428.69	-58.02	4.01
Transaction Discount	784	-1.289	19.10%	14.80%
EBIT Margin	693	-123,181.5% - 309.1%	-844.20%	-14.80%
Net Profit Margin	731	-136,403.7% - 536.4%	-803.20%	-12.70%
Volatility	755	2.8% - 2,024.7%	88.40%	74.50%
Z-Score	643	-1,227.33 - 14,135.33	165.03	4.62
VIX (Volatility Index)	710	11.20 - 51.89	19.41	17.81

Source: www.bvresources.com

- (e) The average implied DLOM during all the years is 19.1% and the median is 14.80%.
- (f) The objective of the Stout Study is to help the valuer identify a subset of transactions that identify with the subject company more closely and also to measure a potential premium above the implied discount to account for differences between the subject company and the securities in the Study. Under the Stout Study, the determination of the DLOM involves a three-step process:

Stout Restricted Stock Study Process

Step 1.

**Determine Restricted Stock
Equivalent Discount (RSED)**

Step 2.

**Adjust RSED for Market
Volatility**

Step 3.

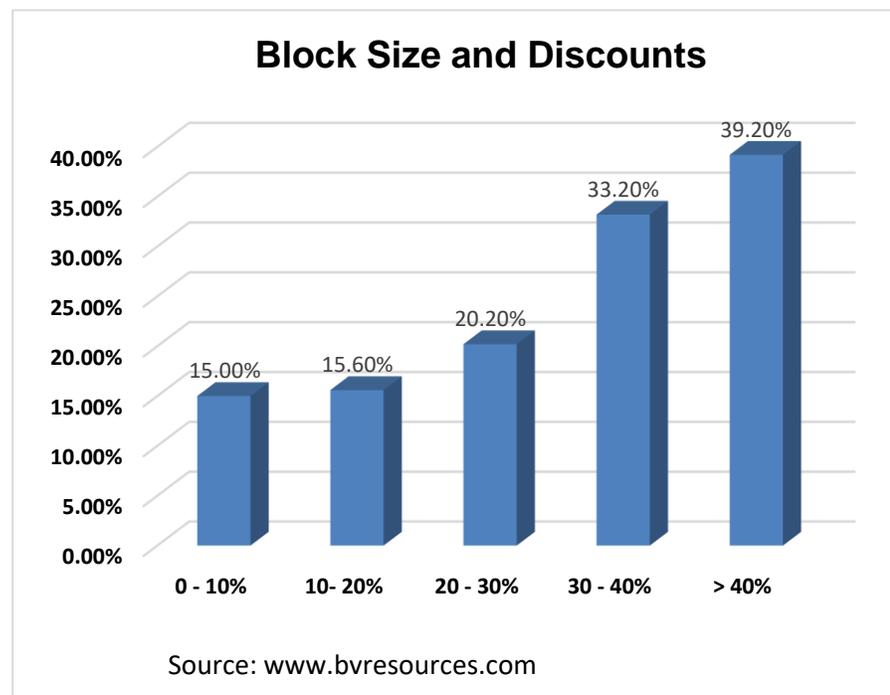
**Adjust for Privately-Held Entity
Illiquidity**

- ◆ Step 1. Determine the RSED – After identifying the most relevant metrics for comparison to the subject company, the valuer searches the Stout database and derives the initial DLOM based on restricted stock discounts. The valuer has options for creating a subset of transactions

that best represents his subject stock. Rather than taking a central tendency discount such as the 19.81% or the 14.8%, the following characteristics are suggested for comparison:

- ⇒ Market value
- ⇒ Revenue size
- ⇒ Total assets
- ⇒ Book value
- ⇒ Market to book ratio
- ⇒ Profit margin

- ◆ Stout recommends that the industry not be used as a point of comparison
- ◆ Researchers have found that larger blocks of restricted shares require larger discounts due to the limitations on selling restricted stock and the market's demand for larger blocks.



- ◆ Step 2. Adjust RSED for market volatility. The DLOM will be higher if the valuation date falls during a period of higher market volatility.
 - ⇒ The Stout Study uses the VIX which is the ticker symbol for the Chicago Options Board Volatility Index. Stout assigns a multiplier for the relative

volatility of historical markets. If the valuation date falls within a period of relatively higher volatility then a higher multiplier would be applied to the DLOM determined in Step 1 above.

- ⇒ Stout recommends comparing the six-month trailing average VIX at the valuation date to the baseline VIX metrics in the Study. If the six-month trailing VIX is higher, then an adjustment is warranted. See baseline VIX metrics below.

The volatility issue picks up on one of the material variables in the option pricing models discussed above. In the options models, the more volatile the underlying stock (or the underlying stock of the guideline companies), the higher the DLOM.

Stout Restricted Stock Study Multiplicative Adjustment Factors for Volatility

VIX Percentile Group	VIX Range	Median Multiplicative Adjustment Factor
0 - 60th	11.2 - 23.1	1.00
60 - 80th	23.1 - 25.2	1.16
80 - 100th	25.2 - 32.9	1.23

Source: www.bvresources.com
Stout Restricted Stock Study

- ◆ **Step 3. Adjust for privately-held equity status** – Stout links the liquidity of closely-held companies with that of larger blocks of restricted stock in the public market and applies a multiplier to Step 2 based on historical observations of the discounts for large blocks of stock.
 - ⇒ When this multiplier is applied, the relevant discount is brought closer to what a closely-held company would experience.
 - ⇒ Stout recommends using an adjustment for the large blocks of stock above 30.0% to 40.0% to equate the relative illiquidity of the private placements of large blocks of restricted stock to closely held companies.

⇒ The median adjustment factor for block sizes of 30% to 50% of total shares outstanding falls in the range of 1.70x to 1.80x.

(g) Example

- ◆ In the example below, the valuer selected four variables to isolate a restricted stock equivalent discount: market value, market to book ratio, total assets and operating margin. Four searches were conducted on the total database of 784 transactions which inserted the criteria for each of these metrics, plus the requirement that the block size of the private placements not exceed 30%.

STOUT RESTRICTED STOCK STUDY ANALYSIS

Financial Characterist	Company Metric	Block Size	# Transactions	Stout Study Median DLOM	Weight	Weighted Values
Market Value	\$100m - \$500m	< 30.0%	280	10.9%	40.0%	0.0436
Market to Book Ratio	4.0 - 6.0	< 30.0%	87	14.3%	10.0%	0.0143
Total Assets	\$25m - \$75m	< 30.0%	184	12.8%	40.0%	0.0512
Operating Margin	15.0% - 35.0%	< 30.0%	57	10.3%	10.0%	0.0103
Restricted Stock Equivalent Discount =						11.94%
Volatility Adjustment Factor					<u>1.00</u>	
Private Equity Equivalent Discount =						11.94%
Private Equity Discount Factor					<u>1.79</u>	
Indicated DLOM						21.37%

- ◆ The valuer placed heavier weight on the operating variables that had more transactions (market value and total assets). The weighted restricted stock equivalent discount is 11.94%.
- ◆ The valuer did not adjust the restricted stock equivalent discount because the volatility factor at the valuation date which was 13.66 (in this case assume December 31, 2016) fell into the baseline volatility category which is 11.2 to 23.1 (see data above).

	CBOE Volatility Index[®] VIX[®]
1-Jul-2016	14.77
5-Jul-2016	15.58
6-Jul-2016	14.96
7-Jul-2016	14.76
8-Jul-2016	13.20
11-Jul-2016	13.54
	↓
22-Dec-2016	11.43
23-Dec-2016	11.44
27-Dec-2016	11.99
28-Dec-2016	12.95
29-Dec-2016	13.37
30-Dec-2016	14.04
Average VIX = 13.66	

- ◆ Finally, the valuer applied a 1.79 private equity adjustment to arrive at a discount for lack of marketability equal to 21.37%.

C. Critiques of Restricted Stock Studies

- (1) Restricted stock studies, especially prior to 2000, published only central tendency data which were then applied by valuers as the default DLOM. Many practitioners either did not acquire access to the data in the Study or were deprived of the data (the ubiquitous 35% discount). The reality is that the dispersion of the data in the studies is quite wide which suggests that a mean or median DLOM is not relevant.
- (2) Restricted stock is not the same as closely-held stock. Among other differences, the holding periods are different and it is difficult to extrapolate from one to the other. The assumption that a private placement of a restricted stock presents a floor for the measurement of the DLOM (i.e., the DLOM must be higher than 20.89% since closely-held stock has a holding period longer than 6 months) may be true but there is no empirical research which proves this.
- (3) The assumption is that the difference between the stock trading price and the restricted stock transaction is entirely due to a lack of marketability. Research shows that other factors such as volatility may influence the discount.

- (4) In the Stout Study the assumption that block size in the public market is a valid proxy for the relevant marketability of the closely-held market has not been proven.

5. Sanity Check

- A. It is important for the valuer to maintain a skeptical perspective while using the models and studies described above to arrive at the DLOM. It is easy to get so immersed in the data that the valuer forgets that the DLOM is measuring a loss in cash value to the minority investor.
- B. A rule of thumb sanity check is to conduct an internal rate of return analysis by determining what the required rate of return would be with the minority value set to equal the original cash flows. The valuer can then evaluate if the revised rate of return is appropriate to a minority investor contemplating the control cash flows.
- C. This calculation can be determined using the Goal/Seek function in Excel (Under the *Data* tab, go to the *What If* option).
- (1) Three inputs are required using Goal/Seek.
- (a) Set cell – enter the cell reference which contains the concluded market value in the internal rate of return DCF
- (b) To Value – enter the fully discounted concluded market value from the original DCF.
- (c) By changing cell – enter the cell that contains the cost of equity (required rate of return) in the internal rate of return DCF.
- D. Example – A valuer conducted a DCF analysis and arrived at a ‘control’ value of **€58.37** million for a subject company using a 17.1% required rate of return.

Sanity Check on DLOM

Internal Rate of Return Analysis - Goal Seek Cost of Equity

Cost of Equity using Goal Seek Function =	26.8%	Set cell	D39
		Equal to	35,024,033
		By changing cell	D37

Market Value, Equity € 35,024,033

	2018	2019	2020	2021	2022	Perpetuity
Equity Cash Flow	€ 6,250,000	€ 7,115,000	€ 7,835,000	€ 8,160,000	€ 9,050,000	€ 9,321,500
Cost of Equity	26.8%	26.8%	26.8%	26.8%	26.8%	26.8%
Cash Flow in Period	100.00%					
Period to Discount	0.50	1.50	2.50	3.50	4.50	
PV of Free Cash Flow	€ 5,551,045	€ 4,984,931	€ 4,330,247	€ 3,557,569	€ 3,112,442	
						Perpetuity Value at start of Year 6
						PV of Perpetuity
						€ 39,218,272
						€ 13,487,799

- (5) The internal rate of return analysis above shows that the originally forecasted cash flows would equal a net present value of **€35.02** million if the discount rate is 26.8%.

(a) The valuer needs to decide if the required rate of return of 26.8% is reasonable given the circumstances of the subject company.

- (6) A rule of thumb states that the required rate of return in the internal rate of return analysis should not be more than 35% higher than the original discount rate.

(a) In this case, the revised rate is 57% higher than the original rate (26.8% versus 17.1%). The suggestion therefore is for the valuer to revisit his assumptions in the 40% DLOM since the implied rate of return is above a normal range of adjustment.

(b) It should be remembered that the 35% range is a rule of thumb and does not apply to all situations. There are many reasons why a minority investor may require a 40% or higher DLOM in this case. For example, the projected returns may not apply to the minority investor since the control shareholder aggrandizes them to himself, such as in above-market rent and higher compensation.

(c) The valuer should though calculate the implied rate of return and be able to defend why a minority investor would apply the return to the actual projected cash flows.

E. Project Minority Cash Flows

- (1) Another sanity check is to project minority cash flows if such information can be reasonably obtained. The risk factor would be lower than in the

above example since the risk of achieving minority cash flows is lower than control cash flows. In some extreme cases, the minority investor has no hope of receiving annual dividends and the valuer would have to make an assumption when the company would be sold.

Section D. Chapter Review Questions

1. An assignment asks the valuer to determine a control value for a subject business. In her income approach, the valuer discounted future earnings based on growth from reported earnings. The valuer did not adjust for the fact that the company's controlling shareholder was overpaying himself by £1 million per year. What is the best course of action for the valuer to take to determine an appropriate value given the level of value requested?
 - A. Apply a control premium of 35%
 - B. Use a put option model to assess a DLOM
 - C. Redo the income approach after making the compensation adjustment**
 - D. Use the IPO studies to determine a DLOC

2. A valuer is appraising a subject company in which there is one 95% shareholder and one 5% shareholder. The company is highly profitable and has paid out dividends each year to both shareholders in accordance with their respective ownership interests. The assignment is to value the 5% interest. What is the best course of action?
 - A. Apply a DLOC and ignore a DLOM**
 - B. Ignore the DLOC and apply a DLOM
 - C. Ignore both the DLOC and DLOM
 - D. Apply both the DLOC and DLOM

3. A common critique of the IPO empirical studies is:
- A. Investors will pay a premium over a normal closely-held value since they anticipate the company going public. This understates the amount of the implied DLOM
 - B. Restricted stock in a public company becomes liquid much sooner than closely-held stock
 - C. Investors will pay a premium over a normal closely-held value since they anticipate the company going public. This may overstate the amount of the implied DLOM
 - D. IPO prices usually understate what the value of the public stock becomes after it stabilizes. This may overstate the implied DLOM.
4. Which of the following statements best summarizes the research of Eric Nath?
- A. Investors who buy put options are not seeking to avoid the disincentives of owning minority interests. Therefore it is inappropriate to use put options to measure DLOMS.
 - B. If there is a meaningful difference between the daily 'minority' trading prices of stocks on public exchanges and the 'control level' value of those companies, then there would be far more takeover transactions in which investors seek to acquire that value.
 - C. Put options models such as Black-Scholes are inherently subjective since the valuer has great leeway in assigning volatility metrics. This undermines the commonly held perception that put option models are more objective than empirical studies.
 - D. Long term equity anticipation securities are a preferable way to deploy the option concept since the stratification of implied discounts is already measured by the market.
5. All of the following are ways to measure the DLOM, EXCEPT:
- A. Restricted stock studies
 - B. Put options
 - C. Credit default swaps
 - D. IPO Studies

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Chapter 2. Valuing Early-Stage Companies

Section A. Introduction

This chapter provides an overview of the common techniques used to value securities in companies before they reach mature stages of development. Early-stage companies are characterized by a lack of revenues, lack of profits, and difficult-to-predict commercial operations. In many cases traditional valuation approaches would indicate that such companies have zero or little value. The framework of this chapter relies on the accounting guidance under IFRS and GAAP which discusses how to value share-based payments. The valuation methods used to value securities issued as compensation are more specifically designed to measure the speculative characteristics of early-stage companies.

There are two general concepts discussed in this Chapter: 1) assessing the entity value of an early-stage company; and 2) assigning value to the typical equity and debt securities that are found in early-stage companies.

1. Accounting Guidance

A. IFRS 2 - Share-based Payment

- (1) IFRS 2 provides guidance for valuing shares issued as payment for goods and services. The accounting standard does not specifically address early-stage companies. Share-based payments are issued by companies at all stages of development.
 - (a) Measurement is based either on the value of goods and services received for the payment or, if such a measurement is not possible, then based on the Fair Value of the equity instrument granted.
 - (b) Vested options are measured and recognized periodically over the vesting period.

B. FASB ASC 718 – Stock Compensation

- (1) ASC 718 provides the accounting guidance under GAAP for measuring and recording stock options, warrants, and other share-based payments. The guidance is generally the same as IFRS 2 with some differences in how the values of the shares are recorded.

- C. The objective of this chapter is not to study the specifics of accounting for share-based payments. The objective is to reference the guidance for insight into how early-stage entities can be valued.

- (1) Early-stage companies rely heavily on share-based awards and preferred stock to attract financing.
- (2) There is a difference between valuing an early-stage entity and valuing the individual securities within that entity. This difference is noted in the different Fair Value definitions discussed below.

D. Definitions of Fair Value

- (1) The accounting guidance under both IFRS and GAAP provide alternative definitions of value when valuing securities of early-stage companies. The definitions are similar and the guidance suggests that there is significant overlap, but the valuer should be aware of the difference.
- (2) Fair Value defined under IFRS 13 and FASB ASC 820
 - (a) “the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date.”
- (3) Fair Value defined under IFRS 2
 - (a) “the amount for which an asset could be exchanged, a liability settled, or an equity instrument granted could be exchanged, between knowledgeable, willing parties in an arms-length transaction.”
- (4) Fair Value defined under ASC 718
 - (a) “the amount at which an asset (or liability) could be bought (or incurred) or sold (or settled) in a current transaction between willing parties, that is, other than in a forced or liquidation sale.”
- (5) Fair Value under share-based payments are considered *fair value-based* measurements as opposed to *fair value* measurements. An example of this difference is provided in the GAAP guidance:
 - (a) When valuing restricted stock under IFRS 2 or ASC 820 the restrictions on transfer of restricted stock to non-qualified buyers would be considered in the valuation since the restriction would carry over to market participants. This restriction would not be considered under the share-based definition in ASC 718 since the limited population of buyers is assumed to acquire the security.
 - (b) The concept of market participants under IFRS 13 and ASC 820 is altered under IFRS 2

- ◆ Under IFRS 2 the valuer is concerned with the inside investor(s) in the security, not the traditionally defined market participant.
 - ◆ The context of the valuation is the sale of the securities within the enterprise, not the sale of the enterprise to a market of willing and able buyers.
- (6) There is significant overlap between the definitions and the general concepts behind Fair Value under IFRS 13 generally apply to the valuations of share-based payments.

Section B. Stages of Company Development

Six stages of company development are outlined below to provide a reference point for the different types of financing which typically occur at each stage and the most appropriate valuation methodologies that are used to measure the securities at each stage. Depending on the industry and the economic environment, a subject company may develop faster or slower than what is outlined below. Early-stage investors, which include venture capital firms and private equity firms (other than company insiders), typically plan for a liquidity event in a three to five year time frame after their investment. The liquidity event could be an initial public offering, a strategic sale or a financial sale. The common denominator is that the typical outside investors want to get their money out of the investment within a defined time window. These stages of development are not part of a defined body of knowledge; they are provided here for reference only.

1. Stage 1 – Birth
 - A. The company exists as a business plan in its first stage of development. Management is likely the originator of the product or idea and the company likely has only a few other employees.
 - (1) Financing exists as seed capital from the founder(s), the founder(s) friends and relatives and possibly a venture capital firm.
 - (2) Financing is in the form of common stock or a first round of preferred stock.
2. Stage 2 – Infancy
 - A. The company has made progression in product development with investments in production and personnel. Despite this the company is still not close to commercialization. There are no revenues yet.

- (1) A second and possibly third round of financing occurs at this level.
 - (2) Financing is mostly from venture capital firms and the successive rounds are in preferred stock.
3. Stage 3 – Youth
 - A. The company has met milestones in its business plan and is on course to commercializing its product or service. Capacity has been developed with the hiring of personnel and the development of productive assets. The company has still not launched its product/service and no revenues have been recorded.
 - (1) Fourth, fifth and additional rounds of financing occur at this stage.
 - (2) Financing comes from venture capitalists and strategic business partners through preferred stock.
4. Stage 4 – Commercialization
 - A. The company has launched its product/service and operations are underway with the first revenue production. Additional milestones are met. The Company is still recording losses as it gains market share.
 - (1) Mezzanine rounds of financing from venture capitalists and private equity firms.
 - (2) Plans for an initial public offering begin at this stage.
5. Stage 5 – Profitability
 - A. The company achieves either its breakeven point or profitability.
 - (1) Additional financing would be in the form of common stock.
 - (2) A liquidity event such as an IPO or sale to a larger industry competitor could occur. Preferred shares would convert to common upon certain liquidity events, depending on the preferred rights.
6. Stage 6 – Stabilization
 - A. The company has established a history of generating revenues and positive cash flows.
 - (1) The company has the ability to finance operations internally. An IPO or sale could occur at this stage. The company may remain private according to the wishes of its common shareholders.

Section C. Characteristics of Early-Stage Companies

1. Business Plan
 - A. Stages 1 through 4 above normally constitute early-stage companies. If the early-stage company is requesting a formal valuation, then it likely has a business plan and has already reached several key objectives, or milestones in that plan.
 - (1) Milestones
 - (a) Develop business plan with milestones and financing needed for each stage of development
 - (b) Attract financing based on plan from arms-length investors
 - (c) Product or service viability – Product should be demonstrated as workable and commercially viable
 - (d) Establish managerial staff and personnel
 - (e) Establish distribution network
 - (f) Obtain licensing (some approval processes, such as drug approval in the U.S., are a multi-stage process which might have started earlier in the business plan. For example, in the U.S. the process of getting a drug approved by the U.S. Food and Drug Administration can take 10-15 years from the initial lab testing to being approved for sale.)
 - (g) Develop an operations plan for product manufacturing or service refinement
 - (h) Establish sales network and customer base
 - (i) Achieve positive cash flow
 - (j) Liquidity event – Principal owners of early-stage companies usually have set timelines for liquidating their positions. For both venture capital and private equity firms, depending on the industry, the desired liquidity event usually falls within a five to ten-year window from initial investment.
 - (2) Financing rounds will depend on how successfully the company meets the milestones in its business plan. Examples:
 - (a) Life sciences firm – Is the drug effective? Has it been approved by the relevant government agency? Is the drug commercially viable?

- (b) Software – Does the product work? Are there comparable products on the market that are as or more effective? What additional costs will be required to bring the product to market?

2. Economic Environment

- A. The macroeconomic and microeconomic environments affect the risk assessment for all companies. The economic cycles can be particularly harsh on business start-ups.
 - (1) What is the subject industry's exposure to economic cycles?
 - (a) A life sciences start-up firm may have little to no exposure while a software start-up may be fully exposed.
 - (2) Is there a consolidation trend in the industry?
 - (a) In certain hi-tech markets the big players try to acquire smaller companies at attractive prices to limit competition. (e.g., Google, Microsoft, Facebook.)
 - (3) How will the economic cycle affect the availability of venture capital and private equity financing?
 - (4) How will the economic cycle affect the ability of the company to attract labor?
 - (5) What is the effect of government regulation on the company's growth curve (e.g., heavy U.S. regulation on food, drugs, and overall business environment)?

3. Required Rates of Return

- A. The risks born by early-stage investors are, as one might assume, well above the rates discussed in iiBV 102 which pertain to established close-held companies.
 - (1) Required returns would have to be higher than the typical 12% to 20% equity rates for established companies.
 - (a) Projected cash flows may be speculative.
 - (b) Risk of failing at any stage of early development is high.
 - (2) Venture capitalists sometimes refer to the one-third rule. They expect one third of their investments to fail, one-third to return their initial investment and nothing more, and one-third to become commercially successful.

- (a) The returns from the successful third of the companies needs to reimburse the venture capitalist for the entire portfolio of early-stage investments.
- (3) Venture capital required returns have been estimated as follows:

Sampling of Venture Capital Required Rates of Return			
	QED Report (1)	Harvard Bus. School (2)	Sahlman (3)
Start-up	50% to 70%	50% to 70%	50% to 100%
Early development	40% to 60%	40% to 60%	40% to 60%
Expansion	35% to 50%	30% to 50%	30% to 40%
Bridge/IPO	25% to 35%	20% to 35%	20% to 30%
Source: AICPA Practice Guide: <i>Valuation of Privately-Held-Company Equity Securities Issues as Compensation</i> , Wiley, 2013			

1. James L. Plummer, QED Report on Venture Capital Financial Analysis (Palo Alto: QED Research, Inc. 1987)
2. Daniel R. Scherlis and William Sahlman, A Method for Valuing High Risk, Long Term Investments: The Venture Capital Method," Harvard Business School Publishing, 1989
3. William A. Sahlman and others, *Financing Entrepreneurial Ventures, Business Fundamentals* (Boston:Harvard Business School Publishing, 1998)

- (a) This sampling of returns is intended to convey the band of discount rates that would be attached to the projected cash flows of an early-stage company.
- (b) The gradation of risk rates reflects the extreme risk that investors accept at the earliest stages of a company's development. Preferred investors (discussed below) will usually ensure that they are guaranteed a return of their investment in addition to participation rights which give them a significant share of value above their initial investment.
- (c) Actual returns will change with different industries and will change over time with varying economic conditions.
- B. Venture capitalists normally do not value prospective investments by discounting future cash flows at a required rate of return, as suggested in the above chart. The rates of return are presented here to reflect the relative risk between an early-stage company and a stable operating company.

4. Financing Early-Stage Companies

A. Early-stage companies are often financed by venture capital firms. During its development an early-stage company may see multiple rounds of financing from venture capitalists depending on how successfully it achieves its milestones and how fast it burns through cash. These financing rounds are usually made through the issuance of successive rounds of preferred stock, discussed below.

(1) More developed firms and some early-stage companies may be financed by private equity firms. Private equity firms usually acquire an entire existent firm (many are commercially viable and operating) and set up a holding company to own it. The intention is to eliminate inefficiencies, enhance value, and sell the company within a defined time frame.

B. Debt

(1) Traditional bank financing is usually not an option for early-stage companies.

(a) Early-stage companies usually lack any type of collateral that would support the level of financing that they would need to reach commercialization.

(b) Banks seek an interest rate return on debt investment over a specified period of time. Bank covenants on long-term debt allow the creditor to call the loan if certain financial ratios fall outside a specified range.

(c) This type of financing is relevant only for commercially viable operating entities which generate positive cash flow.

(d) Conditions in most early-stage companies would immediately force a bank to call a loan. Essentially, traditional debt financing is not conducive to the risk levels of early-stage companies, nor are banks in the market for the levels of risk and return that early-stage companies present.

C. Preferred stock

(1) Types of stock rights – stock rights are memorialized in shareholder agreements in which the rights of each class of shareholder are detailed. These stock rights generally fall into two categories, economic rights and control rights.

(a) Economic rights

- ◆ Economic rights refer to the shareholders' cash flow rewards in terms of dividend rights and liquidation rights.

(b) Control rights

- ◆ Control rights refer to the shareholders' ability to influence the day-to-day operations of the firm.

(2) Categories of economic rights

(a) Preferred liquidation

- ◆ Non-participating, preferred – the preferred shareholder is entitled to only the fixed liquidation proceeds defined in the preferred stock.
- ◆ Participating, preferred – the preferred shareholder is entitled to the fixed liquidation proceeds plus the ability to share in any further proceeds at a specified rate with the common stockholders. Depending on the contract, the preferred shareholder may want to convert the preferred into common stock.
- ◆ IPO events usually require the conversion of preferred stock into common stock. The rights of preferred stockholders in relation to an IPO versus another liquidity event and their ability to steer the company in one direction to maximize their return should be considered.

(b) Preferred dividends

- ◆ Cumulative dividends – usually are expressed as a percentage of a stock's price. For example, a 5% preferred dividend on preferred shares set at 100 per share would receive \$5 per share if dividends are declared. If dividends are declared but not paid, the dividends remain payable in subsequent years.
- ◆ Non-cumulative dividends – unpaid dividends are not payable in subsequent years.

(c) Mandatory redemption rights

- ◆ Guarantees the right of the preferred shareholder to redeem shares and get return of capital.

(d) Conversion rights

- ◆ The right of the shareholder to convert preferred stock into common stock. The preferred shareholder will convert to common when the common share outcome exceeds the preferred outcome. This is an important break point in the modeling section that follows.

(e) Participation rights

- ◆ As discussed above, after the return of initial preferred investment (including any accreted dividends, if existent), the preferred stock may have the right to additional returns from the remaining proceeds, which it would share with common shareholders.

(f) Anti-dilution rights

- ◆ In case of a “down round” of financing (in which additional investors are brought in at a price below prior rounds) the preferred shareholder with anti-dilution rights would see an increase in the number of shares of common stock into which the preferred can be converted, as if the preferred stock had converted to common stock.

(g) Registration rights

- ◆ The right to force a company to register its shares as a public company.

(3) Liquidation waterfall example:

- ◆ Preferred stock was issued on January 1, 2015 with an 8% accretion right (meaning that it has cumulative dividends at 8% of value) and it participates at 70%. A waterfall of the proceeds to preferred and common shareholders upon three different liquidation scenarios is shown below assuming a measurement date of December 31, 2017:

ABC Company, LTD
(€ 000)

Preferred stock	€ 75,000
Date of Issue	01/01/15
Annual accretion @	8.0%
Participating preferred @	70.0%

	Scenario 1	Scenario 2	Scenario 3		
Liquidation, 12/31/17	€ 90,000	€ 500,000	€ 1,000,000		
Preferred stock accreted value at 12/31/17	90,000	94,478	94,478		
Proceeds available for distribution	-	405,522	905,522		
Preferred participates at	70.0%	283,865	633,865		
Common proceeds	-	121,656	271,656		
Total Proceeds to Preferred Stock	90,000	100.0%	378,344	75.7%	728,344 72.8%
Total Proceeds to Common Stock	0	0.0%	121,656	24.3%	271,656 27.2%

- ◆ At all scenarios the preferred will receive more than 70% of proceeds since it participates above 70% after distribution of the accreted value.
- ◆ The next example shows the same company but with the preferred shares participating at 30%.

ABC Company, LTD
(€ 000)

Preferred stock	€ 75,000
Date of Issue	01/01/15
Annual accretion @	8.0%
Participating preferred @	30.0%

	Scenario 1	Scenario 2	Scenario 3		
Liquidation, 12/31/17	€ 90,000	€ 500,000	€ 1,000,000		
Preferred stock accreted value at 12/31/17	90,000	94,478	94,478		
Proceeds available for distribution	-	405,522	905,522		
Preferred participates at	30.0%	121,656	271,656		
Common proceeds	-	283,865	633,865		
Total Proceeds to Preferred Stock	€ 90,000	100.0%	€ 216,135	43.2%	€ 366,135 36.6%
Total Proceeds to Common Stock	0	0.0%	283,865	56.8%	633,865 63.4%

- ◆ In the second scenario, the common shareholders enjoy a much better upside with higher liquidation scenarios.
- ◆ Preferred shareholders will try to negotiate a migration from being in a fixed benefit position to a variable benefit position in which they share at a higher percentage of the liquidations at higher values above their fixed liquidation preference.

(4) Categories of control rights

(a) Voting rights

- ◆ The ability to participate in operational control of the company. With preferred shareholders, even if they may own a minority of the total outstanding shares, they usually get disproportionate voting rights that give them control over the company. The right is conferred through straight voting rights and board seats.

(b) Protective provisions

- ◆ See anti-dilution rights above

(c) Drag-along rights

- ◆ The right of a control shareholder to force a minority shareholder to acquiesce to the sale of the company at the same terms the control shareholder receives from the deal.

(d) Participation rights (see above)

(e) First refusal rights

- ◆ The right to acquire shares from a selling shareholder before the shareholder sells to a third party. Typically the right of first refusal is held by the company and/or the venture capital investors. If the common shareholder wants to sell shares to a third party, the company, and then the preferred shareholders have the right to demand to buy the stock at the proposed transaction terms.

(f) Tag-along rights

- ◆ A minority shareholder's right to participate in a control shareholder's transaction under the same terms.

- (g) Management rights
 - ◆ The right to participate in managerial control
 - (h) Information rights
 - ◆ Access to company operating and financial data upon request
- D. Options and warrants
- (1) Stock options
 - (a) A derivative security. A call option is the right to purchase a stock at a predetermined price; the right lasts for a specified period of time. A put option is the right to sell a stock at a predetermined price for a set period of time. (see below)
 - (2) Warrants
 - (a) A derivative security. A warrant is the right to purchase a stock at a predetermined price; the right lasts for a specified period of time.
 - (3) The difference between a warrant and a call option is that a call option is the right to purchase existing shares of the company from a stockholder. A warrant is the right to purchase shares that would have to be issued by the company.

Section D. Estimating Equity Value for Early-Stage Companies

1. Traditional valuation methods are usually not feasible for early-stage companies.
 - A. Forecasting cash flows may be too speculative if the company has no history of commercial operations.
 - B. Market multiples from a group of publicly-held guideline companies cannot be applied to a company that has no operations. Also, the companies would be fundamentally incomparable since the market would not perceive an established mature company the same way it would perceive a start-up company.
 - (1) For the same reasons, the market transaction method usually cannot be applied.

2. Alternative methods

A. The asset accumulation method

- (1) The asset accumulation method is the cost approach in which each asset and liability on the balance sheet is marked to its market value.
- (2) With early-stage companies the valuer should consider adjusting the balance sheet to capture intangible value.
 - (a) If intangible assets can be identified and valued, this should be completed.
 - (b) Most early-stage companies do not have fully developed intangible assets yet and those assets that do exist might be hard to value separately. For example, many early-stage companies may have intellectual property that shows promise:
 - ◆ Patents
 - ◆ In-process research and development (IPR&D)
 - ◆ Software
 - (c) These assets might be analyzed by using a cost approach which captures the costs invested to date in the asset.
 - (d) In the example below, the company has \$7.18 million in reported equity. Reported assets consists of \$4.76 million in current assets and \$4.45 million of fixed assets.
 - (e) The asset accumulation method requires that the valuer assess the reported assets and if they do not represent market value, then they must be appraised and marked to market.
 - (f) The valuer must also consider assets that exist that are not shown on the reported balance sheet.
 - ◆ In the example below, the appraiser has identified two intangible assets, patents and software, which have value. These assets were appraised separately at \$2.25 million and were added to the balance sheet.
 - ◆ This results in an adjusted book value of \$9.43 million.
 - ◆ This value would be used as the estimated market value of equity.

Early-Stage Company Adjusted Balance Sheet

	December 31, 20XX	Adjustments	Adjusted Balance Sheet
ASSETS			
Current Assets			
Cash	\$ 4,750,000		\$ 4,750,000
Prepaid assets	9,800		9,800
Total current assets	<u>4,759,800</u>	-	<u>4,759,800</u>
Net property, plant & equipment	4,450,000	-	4,450,000
Patents	-	1,500,000	1,500,000
Software	-	750,000	750,000
Total other assets	<u>-</u>		<u>2,250,000</u>
Total Assets	<u>9,209,800</u>	2,250,000	<u>11,459,800</u>
Current liabilities			
Accounts payable	1,750,000		
Security deposits	103,000		
Prepaid rent liabilities	175,000		
Total current liabilities	<u>2,028,000</u>	-	<u>2,028,000</u>
Long term debt	<u>-</u>		<u>-</u>
Total liabilities	2,028,000	-	2,028,000
Shareholders' Equity			
Preferred stock	9,000,000		
Common stock	500,000		
Retained earnings	<u>(2,318,200)</u>		-
Total Equity	7,181,800	2,250,000	\$ 9,431,800
Total liabilities and capital	<u>\$ 9,209,800</u>		<u>11,459,800</u>

- (g) Sometimes the intangible assets are difficult to identify and if they are identified, the valuer may find it difficult to obtain the necessary information to reliably assess value.
- (h) An alternative simpler model is to assume that the company's investment to date represents built-up intangible value that can be posted to the balance sheet. In the example below, the valuer has added intangible value equal to the amount of retained losses to date.

Early-Stage Company Adjusted Balance Sheet

	December 31, 20XX	Adjustments	Adjusted Balance Sheet
ASSETS			
Current Assets			
Cash	\$ 4,750,000		\$ 4,750,000
Prepaid assets	9,800		9,800
Total current assets	<u>4,759,800</u>	-	<u>4,759,800</u>
Net property, plant & equipment	4,450,000	-	4,450,000
Total other - intangibles	<u>-</u>	2,318,200	<u>2,318,200</u>
Total Assets	<u>9,209,800</u>	2,318,200	<u>11,528,000</u>
Current liabilities			
Accounts payable	1,750,000		
Security deposits	103,000		
Prepaid rent liabilities	175,000		
Total current liabilities	<u>2,028,000</u>	-	<u>2,028,000</u>
Long term debt	<u>-</u>		<u>-</u>
Total liabilities	2,028,000	-	2,028,000
Shareholders' Equity			
Preferred stock	9,000,000		
Common stock	500,000		
Retained earnings	<u>(2,318,200)</u>		<u>-</u>
Total Equity	7,181,800	2,318,200	\$ 9,500,000
Total liabilities and capital	<u>\$ 9,209,800</u>		<u>11,528,000</u>

- (i) In this example, the adjusted market value equals \$9.5 million.
- (j) This simpler version of the asset accumulation method would not be appropriate unless the company has made progress in its business plan and the intangibles likely do exist, but are just not easily measured.

B. The back-solve method

- (1) "Back-solve" is a term used for what is formally part of the market approach to value. Under the market approach the valuer is obligated to consider prior transactions in the subject company's own stock as a potential indicator of its current value.
- (2) The transaction should be arms-length

- (3) The transaction should be timely. If too much time has elapsed then the transaction should be adjusted to the current time, or if adjustments are too speculative then the transaction should be discarded.
- (4) Back-solve with simple common stock
- (a) In this example, the company has issued three tranches of common stock at successively higher per share values. The value of all the shares equals the cumulative number of shares multiplied by the latest share price.

Back-Solve Example 1. Common Stock

Capital Structure	Issued	# Shares	\$ Per Share
Common stock (first offering)	12/31/14	2,500,000	\$ 1.00
Common stock (second)	06/30/16	5,000,000	2.50
Common stock (third)	12/31/16	5,000,000	3.00

Value using back-solve method = 12,500,000 shares x \$3.00 per share
= \$37,500,000

- (b) This method is feasible assuming not too much time has passed between the issuance of the \$3.00 per share common stock and the measurement date. If a number of years has passed without additional issuance of equities, then the valuer may need to opt for another methodology.
- (5) Back-solve method with complex capital structure
- (a) Assume a company has the following capital structure:
- ◆ 2,000,000 shares of common stock
 - ◆ 2,500,000 shares of preferred stock
 - ⇒ Liquidation preference at \$1.00/share
 - ⇒ Non-participating
 - ⇒ Converts to common upon liquidation event at 2:1 ratio
 - ⇒ Recent round of preferred indicates total value for preferred stock equals \$12,000,000
 - ⇒ Valuer needs to estimate the entity value

Sample Company**Back Solve Calculation**

(\$000)

	Tier 1	Tier 2	Tier 3	
Current Price - Valuation	\$ 100.0	\$ 100.0	\$ 100.0	
Exercise Price	-	2,500,000.0	7,000,000.0	
Annual Risk-Free Rate	2.50%	2.50%	2.50%	
Life of Option (years)	3.00	3.00	3.00	
Annual Volatility	0.600	0.600	0.600	
Option Value	\$ 100.0	\$ -	\$ -	Total Fair Value
Tier Value	100.0	-	-	
Preferred A	100.0	-	-	100.0
Common	-	-	-	-
Total Value				\$ 100.0

(b) The valuer has set up an option pricing model (“OPM”) to value the preferred and common stock but needs an estimate of entity value (the model above is more fully explained in Appendix B). As a start he has inserted a dummy value of \$100 into the model.

- ◆ The risk-free rate is 2.5% based on government bond returns
- ◆ The estimated time to liquidity is 3 years
- ◆ The volatility based on an industry analysis of market participants is .60.

(c) Using the back-solve method the valuer can now solve for an entity value (i.e. the “Current Price - Valuation” cell under Tier 1) given the known values for all other variables in the option model. The valuer can use the “Goal-Seek” function in excel to solve for the entity value since she knows the preferred value from the latest round of financing and has reliably estimated the other variables.

Sample Company**Back Solve Calculation**

(\$000)

	Tier 1	Tier 2	Tier 3		
Current Price - Valuation	\$ 100	\$ 100	\$ 100	CELL F6	
Exercise Price	-	2,500,000	7,000,000		
Annual Risk-Free Rate	2.50%	2.50%	2.50%		
Life of Option (years)	3.00	3.00	3.00		
Annual Volatility	0.600	0.600	0.600		
				Total Fair Value	
Option Value	\$ 100	\$ 0	\$ 0	CELL I27	
Tier Value	100	0	0		
Preferred A	100	-	0		100
Common	-	0	0		0
Total Value					\$ 100

- Go to DATA tab on the Menu Bar in Excel
- Select 'What-If Analysis'
- Select 'Goal Seek'
SET CELL: I27
TO VALUE: 12,000,000
BY CHANGING CELL: F6

(d) Once entering these variables in the what-if analysis, the following solution will be presented.

Sample Company**Back Solve Calculation**

(\$000)

	Tier 1	Tier 2	Tier 3		
Current Price - Valuation	\$ 19,303,706	\$ 19,303,706	\$ 19,303,706	CELL F6	
Exercise Price	-	2,500,000	7,000,000		
Annual Risk-Free Rate	2.50%	2.50%	2.50%		
Life of Option (years)	3.00	3.00	3.00		
Annual Volatility	0.600	0.600	0.600		
Option Value	\$ 19,303,706	\$ 17,032,127	\$ 13,619,789	Total Fair Value CELL I27	
Tier Value	2,271,579	3,412,337	13,619,789		
Preferred A	2,271,579	-	9,728,421		12,000,000
Common	-	3,412,337	3,891,368		7,303,706
Total Value					\$ 19,303,706

- Go to DATA tab on the Menu Bar in Excel
- Select 'What-If Analysis'
- Select 'Goal Seek'
SET CELL: I27
TO VALUE: 12,000,000
BY CHANGING CELL: F6

- (e) If the latest round of financing indicates a value for the preferred stock at \$12 million, then, given the company's overall capitalization and the other variables in the option model, then the indicated value for equity would be \$19.3 million (rounded).

Section E. Modeling Complex Capital Structures

1. On the surface, it would appear that the common stock in many early-stage companies which have complex capital structures has no value. For example, consider a company that has not reached Stage 3 or 4 of its development, has no revenues or profits, and has preferred stock that has a priority claim on millions in value even if value did exist. How can the common stock have value? Forecasted cash flows are still highly speculative, and if they were projected the discount rate would need to be so high that the present value would likely not cover the priority claims of the preferred

shareholders. Also, if many early-stage companies were liquidated on a measurement date, the existent assets would come nowhere close to covering the preferred claims.

- A. This presents a paradox to valuers since by other measures, common stock does appear to have value, especially since managers and other stakeholders in early-stage firms recognize common stock grants as a form of payment. Also, venture capitalists appear willing to invest significant sums of money in ventures which are a long way from profitability.
- (1) If common stock in an early-stage company with a complex capital structure does have value, but that value cannot be measured with traditional valuation approaches, then how should it be accounted for?
- B. The finance profession addressed this problem by likening the position of a common shareholder in an early-stage firm to the buyer of a call option. Consider these similarities between the two positions:
- (1) Both investors are “under water” or “out of the money.” This means that if their securities were liquidated on the current day, neither would receive any value.
- (a) A holder of a call option, for example, purchases the right to buy 100,000 shares of stock in X Company for €13.00 over the following three years. The stock though is trading at €10.00 per share on the day he buys the option. The option is out of the money in the sense that no one would see value in the right to buy at €13.00 when they could buy at a market price of €10.00.
- (b) Similarly, a manager receives common stock in an early-stage company with no cash flows. There appears to be no value since the amount of assets in the company are well below the preferred shareholders’ priority claims on the company.
- (c) Yet, people purchase call options in the market every day, and stakeholders in early-stage companies accept common stock for the value of their services. Why?
- (2) Both investors see value in two variables that might not be appreciated by a novice.
- (a) Time
- ◆ Although both securities are out of the money, the investors have long periods of time to wait in which events may occur which bestow significant value on the security.

- ⇒ The option holder may see the stock value increase to €20.00 in two years. That's worth €700,000.
- ⇒ The common stock holder may see product viability and material growth in cash flows in Stage 5 and 6 of development.
- ⇒ The time period relevant to the common stockholders in an early-stage company relates to the anticipated liquidity event of the venture capitalists or private equity firm, which is an IPO or company sale.

(b) Volatility

- ◆ The more volatile a stock, the greater the chance that its price will move appreciably from its current value. The combination of volatility and long lead time may contribute a significant amount to value.
 - ⇒ Does volatility assume though that the stock price will only increase in value? Couldn't volatility just as easily lead to a decline in value?
 - ⇒ This is true, but investors in both a call option and common stock have no downside risk. Neither investor can lose more money if the stock declines in value (or the early-stage company collapses). Both investors have material upside gains if the opposite occurs.

2. The current value method (CVM)

- A. The CVM assumes that a company is liquidated on the measurement date. It does not allow for any future possibilities.
- B. The CVM is the simplest to apply and easiest method to understand. It is also rarely relevant to early-stage companies.
- C. In the context of a call option, value would only exist if it were "in-the-money" meaning that the proceeds from the transaction would have to exceed the current claims on the assets for value to exist.
- D. When is the CVM appropriate?

- (1) When the company has little upside beyond its current performance, meaning that it is in a liquidation scenario.
 - (2) When the company for any reason is anticipating an imminent closure (poor performance, government intervention, management decision, etc.)
- E. Benefits of the CVM
- (1) Easy to understand and appealing to non-practitioners
 - (2) Easy to calculate
- F. Drawbacks of the CVM
- (1) Does not capture upside value due to the interplay between volatility and time.
 - (2) Negates the concept that the common shares of most early-stage companies have some value, even if minimal.
- G. See Appendix 1 for an example of the CVM
3. The Option Pricing Model (OPM)
- A. The tools used to measure the value of call options, namely the Black-Scholes model, lattice models and binomial models are applied to measure securities in early-stage companies. These models capture the distribution of possibilities that early-stage investors contemplate and avoid the idea that early-stage companies are valueless prior to becoming commercially viable.
- B. Steps in the OPM
- (1) Use any relevant method to value the company.
 - (2) The initial value measurement should consider interim cash flows (positive or negative) through the liquidity event.
 - (3) Create a payoff diagram which reflects the payoff points to each class of stock (also called “breakpoints”).
 - (a) For each priority claim, at what value point does it make sense for them to cash in?
 - ◆ A priority claim refers to a shareholder’s ability to claim value to the exclusion of another shareholder. For example, if the company liquidates at \$7,500,000 and the preferred shareholders have a redemption right at

\$7,500,000, they have a priority claim over the common shareholders. The preferred shareholders will take \$7,500,000 and the common shareholders will take \$0.

- (b) Set the exercise price equal to the breakpoints.
- ◆ The value above each breakpoint (and before reaching a subsequent breakpoint) can be thought of as a call option with the exercise price equal to that breakpoint.
 - ◆ For example, assume an investor has the right to 100% of the proceeds of a company transaction three years from now on a value above \$10,000,000. How would the investor value that right? The OPM measures that right by assessing the volatility of the underlying stock, the time to the exercise of that right, and the risk-free rate.
 - ◆ The common stock is a call option with a claim on equity at an exercise price equal to the remaining value immediately after the preferred stock is liquidated.
- (c) Set the risk-free rate equal to the Treasury yield on a time period relevant to the time period used in the model.
- (d) Set the time period as the assumed time to liquidity event.
- ◆ Discuss with management. What is the most likely liquidity event? (IPO, strategic sale, financial sale)
- (e) Measure volatility using market participant volatilities.
- ◆ The volatility of most early-stage companies is not comparable to the volatility of mature operating public companies, even in the same industry.
 - ◆ Volatility measurements should place a heavier emphasis on the more volatile companies in a set of guideline companies. Alternatively, the valuer might place more emphasis on the fastest growing companies.
 - ◆ Levered companies should use the volatility measurement on an invested capital basis, not an equity basis.
- ⇒ Most early-stage companies do not have traditional debt, as was discussed above.

⇒ Companies in stage 5 or 6 though may have debt that would need to be considered.

(f) A series of option calculations are made with the company's price remaining the same, but with the exercise price changing with each breakpoint. The first breakpoint is set at zero.

- ◆ The first claim on value equals a range between \$0 and the first breakpoint.
- ◆ The value in each option, or tier, equals the value of that option less the value of the subsequent option.
- ◆ The value in each tier is then apportioned over the percentage claim from each security.
- ◆ Future rounds of preferred, future issuances of options and warrants, etc. are not considered.

(g) A discount for lack of marketability may be considered for common stock. Common stock will normally be less liquid than preferred stock in the same company.

C. Benefits of the OPM

- (1) Provides a quantitative measurement of value which is seen in the market as more easily supportable and auditable.

D. Drawbacks of the OPM

- (1) The Black-Scholes model assumes a lognormal distribution of outcomes which does not necessarily mirror reality.
- (2) Highly sensitive to key assumptions such as volatility

E. When to use the OPM

- (1) The OPM is more useful when measuring a company whose outcomes are more speculative; generally this is interpreted as companies that are further away from a liquidity event.

F. See an example of the OPM is Appendix 2 of this chapter

4. Probability weighted expected return method (PWERM)

- A. An array of future outcomes for the business is modeled and a probability is applied to each outcome in accordance with the likelihood of its occurrence.

The type of outcomes in the model will vary depending on the subject company's circumstances. Typical outcomes include:

- (1) IPO, sale, continue as private company, and dissolution
- (2) Within each scenario there may be sub-possibilities
 - (a) IPO at varying prices
 - (b) Sales with different exit multiples

B. Application of the PWERM:

- (1) Under each outcome, the waterfall of returns must be modeled for each security depending on its rights given the available proceeds.
 - (a) Are any additional rounds of financing necessary for the existent company to reach the modeled outcome? How are these rounds modeled into the payoff?
 - (b) What is the preferred redemption price for each class of preferred stock?
 - ◆ Does the class of preferred include cumulative dividends (accretion of value after issuance)?
 - (c) Does the preferred stock participate in proceeds after its redemption?
 - (d) At what point does it make economic sense for the preferred stock to convert to common? At what point does the preferred stock have to convert to common stock?
 - (e) Does the company have warrants or options that would be exercised given the outcome?
 - (f) Model in the proceeds and the dilution from the exercise of stock options and warrants.
- (2) Discount the value of each class of stock back to present value at a rate which reflects the risk of the security.
- (3) Assign probabilities to each outcome according to the likelihood of its occurrence.
- (4) Calculate the per share values for each class.
- (5) Assign adjustments if necessary (discount for lack of marketability)

- C. Special Considerations
 - (1) The PWERM is best applied when the subject company's liquidity event can be most accurately predicted (that is to say, when the liquidity event is imminent or a short time away)
 - (2) As a check, the backsolve method should be applied to ensure that there is no conflict between the value in a recent financing round and the value implied by the PWERM. Inconsistencies can occur due to unsafe assumptions regarding:
 - (a) The time to liquidity
 - (b) The assigned probabilities
 - (c) The discount rates applied
 - D. Benefits of the PWERM
 - (1) Conceptually easy to understand and more straightforward than other methods
 - (2) Considers several potential outcomes rather than a single measurement of value
 - (3) If probabilities constructed carefully, the model apportionment of value to preferred and common stock should not be sensitive to changes in the probabilities assigned
 - E. Drawbacks of the PWERM
 - (1) Difficult and potentially expensive to implement accurately
 - (2) Difficult to justify the probabilities with objective evidence
 - (3) Less applicable for companies that require additional rounds of financing
 - (4) Measures an identified array of outcomes instead of a full distribution of outcomes
 - F. See an example of the PWERM in Appendix 3 of this chapter
5. Hybrid Model
- A. A hybrid model is a combination of the models discussed above. Hybrid models are useful in situations in which two or more distinct possibilities can be identified and probabilities assigned to each.

- (1) For example assume a company is in Phase IV of clinical trials on a promising pharmaceutical. If the drug is approved for sale, the Company would likely go public for an anticipated amount of \$500 million in a six month time frame. Due to the success of the clinical trials to date, the company expects an 80% likelihood that the IPO will occur. If the drug is not approved, the company would need to refocus on several other research lines and the assumption is that they would lead to a strategic sale of the company in a four year time frame.
 - (2) In this case, the valuer would apply a PWERM to model the IPO scenario and use an OPM to model the alternative strategic sale.
- B. See Appendix 4 for an example of the Hybrid Model.

Section F. Chapter Review Questions

- A. Ajax Company is developing software for applications in the solar energy industry. The Company has had one round of preferred financing but estimates that it is still at least five years before becoming commercially viable. Its software promises to be unique and, if successful, will likely become widely accepted. Which of the following methods should be applied to value Ajax?
- (1) PWERM
 - (2) OPM
 - (3) Discounted cash flow
 - (4) Current Value Method
- B. A right of first refusal is:
- (1) The ability to participate in a transaction on the same terms as a control shareholder
 - (2) The right to deny common shareholders participation in remaining proceeds after the redemption of preferred stock
 - (3) The ability to require a common shareholder to sell his stock to other shareholders on the same terms as a proposed external sale
 - (4) The right to deny lower rounds of preferred shareholders the ability to participate in a liquidity event

- C. Oasis Company issued one round of participating preferred stock on December 31, 2014 for €20,000,000. The company's only other stock is the founder's common stock issued in 2012. The preferred stock accretes annually at 8% and participates at 65%. You are assigning value to Oasis's common stock assuming a liquidation of the company for €30,000,000 on December 31, 2017. The value of the common stock (rounded) is:
- (1) €1,682,000
 - (2) €3,124,000
 - (3) €25,194,000
 - (4) €28,318,000
- D. A drawback of applying an OPM to value early-stage common stock is:
- (1) Option models are not an appropriate method for valuing companies in their earliest stages
 - (2) Options models were not designed to value common stock
 - (3) The options model is not equipped to capture additional proceeds from an exercise of warrants
 - (4) A small change in the volatility measurement can lead to a material change in value.
- E. Call options and common stock in an early-stage company have which of the following characteristics in common?
- (1) Drag-along rights
 - (2) Accretion
 - (3) Volatility
 - (4) Participation rights

F. Sansome Company is an early-stage life sciences firm in the United States that was formed five years ago to research genetic treatments to compromise the growth of brain tumors. The Company's principal treatment program made it to Phase II of the U.S. Food & Drug Administration trials. Unfortunately, the company recently discovered that the treatment caused heart failure in 12% of animals in the study and the company plans to liquidate imminently. Which of the following methods should be used to value the company?

(1) Hybrid method

(2) OPM

(3) CVM

(4) PWERM

APPENDIX 1: Current Value Method Case Study

Bismarck Construction GmbH is a construction firm that started at the end of 2014. Its capitalization table is shown below. The company has 15 million shares of common stock. The first round of preferred stock included 10 million shares at \$3.00 per share redemption value. The Preferred B round included 5 million shares with liquidation rights at \$7.50 per share, subordinate to the Preferred A shares.

Assuming a liquidation of the Company at \$59 million a CVM would indicate:

Bismarck Construction GmbH

CVM

Capitalization Table

Capital Structure	Issued	# Shares	Liquidation Preference	Claim	Participating
Common stock	12/31/14	15,000,000	\$ -		
Preferred A	12/31/15	10,000,000	3.00	Senior	0.0%
Preferred B	06/30/16	5,000,000	7.50	Sub-1	0.0%
Total Capitalization					

Transaction Price	\$ 59,000,000
Preferred A liquidation	30,000,000
Remaining Proceeds	29,000,000
Preferred B liquidation	29,000,000
Available to common	\$ -

	Total	Expected	Percent
Return to Preferred A	\$ 30,000,000	\$ 30,000,000	100.0%
Return to Preferred B	29,000,000	37,500,000	77.3%
Return to Common	-	-	-

Under the CVM, there is no consideration of a future distribution of outcomes for growth or alternative liquidation scenarios.

For the above valuation to be valid the valuer would have concluded that the company has no upside potential above the \$59 million value and thus the transaction on the table represents the maximum value attainable.

- The Series A Preferred is senior to the other securities and therefore receives its redemption value first, which is 10 million shares times \$3.00 per share, or \$30 million.

- The Series B preferred shares are subordinate to Series A preferred but senior to the common shares, so the Series B investors receive their redemption rights after the Series A is paid off (if available). The Series B redemption right is \$37,500,000 (5 million shares x \$7.50 per share). However, given the transaction amount, there are not enough proceeds to pay the full Series B redemption right. There is only \$29 million remaining, all of which goes to the Series B shareholders.
- The common shareholders receive no proceeds since the \$59 million transaction amount was not sufficient to pay off both the Series A and B preferred.
- Therefore, given a transaction at \$59 million the Series A preferred shareholders would receive 100% of their redemption rights, Series B preferred shareholders would receive 77.3% of their redemption rights and the common shareholders would receive nothing.

As was discussed in the outline, such an analysis precludes a consideration of the upside scenarios that are possible. The accounting guidance suggests that common stock, even in early-stage companies where current assets are not enough to cover all of the preferred rights, would most likely be appropriated some value, even if minimal.

First, consider the fact that managers and other stakeholders regularly accept common stock as payment for services rendered in early-stage companies, indicating the fact that personnel see value in such stock.

Second, as the outline suggests, common stock in early-stage companies can be equated to call options. Call options that are out-of-the-money are purchased in the market every day. Consider an option in which an investor purchases the right to buy a stock at \$13.00 that is currently trading at \$10.00 per share. If liquidated on the day of purchase, the option would be obviously worthless. However, given time and volatility, the call option may deliver substantial value to the investor.

Such is the case with early-stage company common stock. Given time and volatility, the common stock could deliver substantial value. Therefore, the only situation in which the CVM should be applied is when neither time nor volatility are possible for the subject company. That is to say, a liquidation of the company, for one reason or another, is imminent.

APPENDIX 2: OPM Case Study

Al Bartawi Group was formed on December 31, 2015 with 15 million shares of common stock. The preferred stock characteristics are below:

- 10 million shares of preferred stock with a liquidation preference at \$1.00/share
- The shares receive a paid-in-kind (PIK) dividend at 8% per year. This means that instead of receiving \$800,000 as a cash dividend, the preferred shareholders receive 800,000 additional shares of preferred in the first year, and so on.
- Preferred stock converts to common stock upon any kind of liquidation event on a 1:1 ratio.

The measurement date is December 31, 2017 (i.e., one year after the preferred stock was issued). The valuer estimated the Group's fair value at \$18,000,000 as of that date. As of the measurement date, the Group anticipates a liquidity event three years later, on or around December 31, 2020. The first step in the OPM analysis is to model the breakpoints at which the preferred shareholders receive value.

Al Bartawi Group

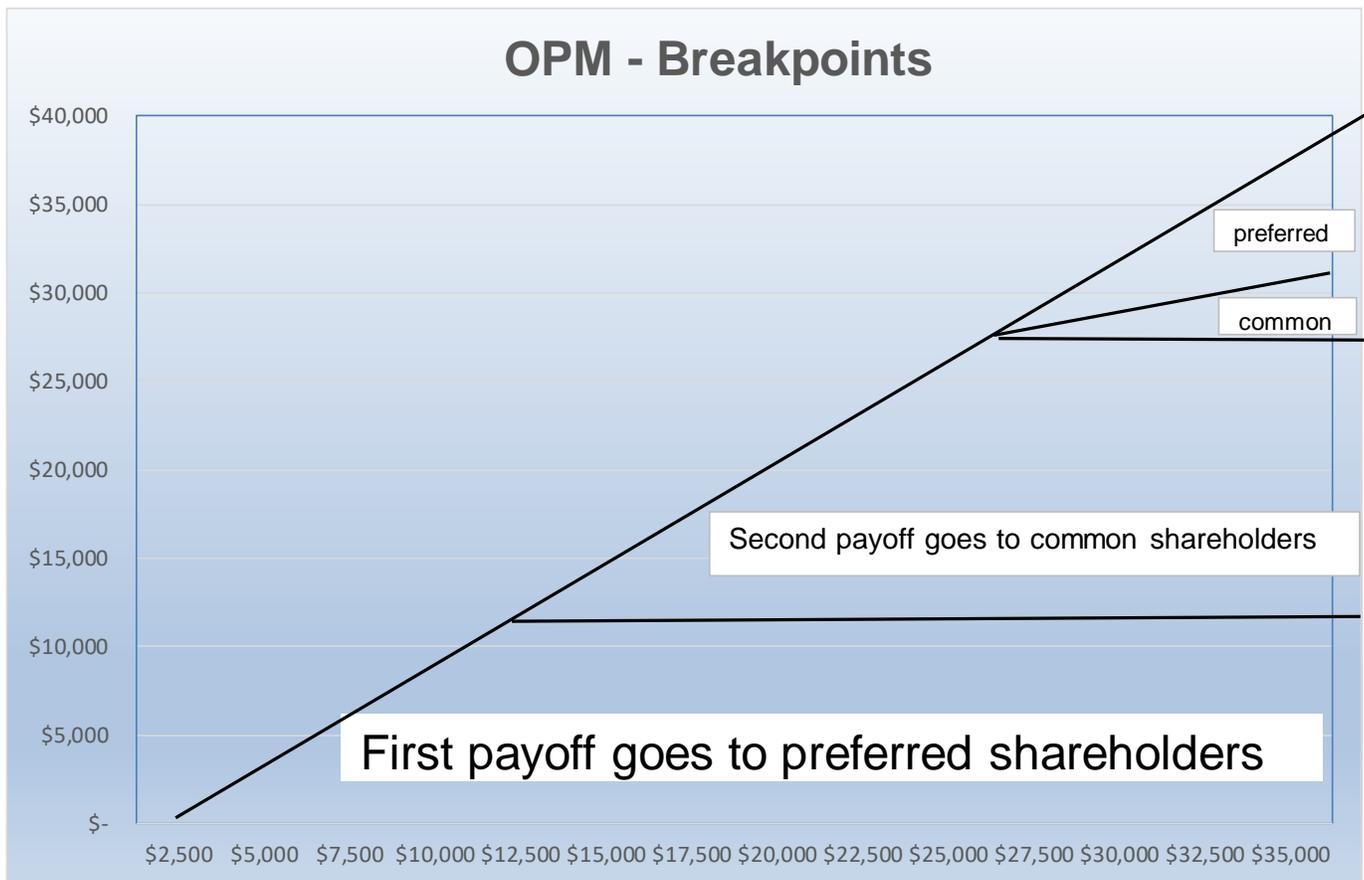
OPM Analysis

Capitalization Table

Capital Structure	Issued	# Shares	PIK Rate	Face	Per share	Preferred Stock Accreted Value		
						2016	2017	2018
Common stock	12/31/15	15,000,000						
Preferred Stock	12/31/16	10,000,000	8.00%	10,000,000	\$1.00/sh	\$ 10,000,000	\$ 10,800,000	\$ 11,664,000

Preferred stock receives a paid-in-kind dividend at 8% per year

Preferred stock converts at 1:1 ratio



Payoff #1 – Preferred shareholders' liquidation preference

At December 31, 2017 the preferred shareholders would have a liquidation preference at \$1.00 per share. Since they would have received an additional 800,000 PIK shares during 2017, the redemption value equals \$10,800,000 (10 million shares plus 800,000 shares times \$1.00). As the graph above shows, the preferred shareholders would receive 100% of the value below the \$10,800 on the Y axis.

The first option calculation sets the strike price at zero (the derived values are relative to each other so the first option calculation is set at zero since the preferred shareholders receive all value between \$0 and \$10,800,000). The second option sets the exercise price at \$10,800,000 since the preferred shareholders are entitled to 100% of the measured value between \$0 and the first payoff point of \$10,800,000.

Payoff #2 – Value between \$10,800,000 and \$15,800,000

The common shareholders receive all value between \$10,800,000 and \$25,800,000.

The preferred shareholders have two options: 1) liquidate at the \$10.8 million redemption value (at which they receive \$1.00 per share) or convert their shares to common and receive proceeds with all other common shareholders. It would not make sense to convert to common until the conversion value of their common shares would be above \$1.00 per share.

If the preferred shareholders converted at values below \$25,800,000, they would receive less than \$1.00 per share. Let's assume the value of the company were \$20,000,000 and the preferred shareholders converted their shares into common stock. After converting, there would be a total of 25,800,000 common shares (the original 15 million shares plus the 10,800,000 converted shares). The value per share would equal \$0.78 cents per share. It is not until the value reached \$25,800,000 that the fully diluted value of common would reach \$1.00 per share.

Therefore, the original common shareholders receive all value up to \$25,800,000, as the graph above depicts.

Breakpoint #3 – Value above \$25,800,000

As stated above, it would be economically advantageous for the preferred shareholders to convert to common at a value of \$25,800,000 (15,000,000 original common + 10,800,000 converted shares, all at \$1.00/share) which equals the total number of shares at the measurement date at \$1.00 per share. At that point, all the shares in the company would be common shares. The original preferred shareholders would own 41.9% of the stock (their converted 10.8 million shares divided by a total of 25.8 million shares) and the original common shareholders would own 58.1%.

Calculation of Value using Black-Scholes

Al Bartawi's capitalization table calls for a three-tiered option model in which three separate option calculations are made to measure the three ranges of relevant payoffs:

1. Payoff 1 = Value between \$0.00 and \$10,800,000
2. Payoff 2 = Value between \$10,800,000 and \$25,800,000
3. Payoff 3 = Value above \$25,800,000

The Black-Scholes calculations below calculate the relevant values for the preferred and common shares.

Assumptions:

Time Period – As per the discussion with management the liquidity event is assumed to be three years after the measurement date.

Risk-free rate – The risk-free rate represents the yield to maturity on a developed country bond that matches the assumed time period.

Volatility – As discussed in this chapter, the volatility would need to be measured from a group of guideline companies, or assumed from some other industry measure since Al Bartawi Group is closely-held. It is recommended that if volatilities are taken from an established group of GPCs, then the valuer select a volatility rate from the upper quartile since it is assumed that an early-stage private company would be more volatile than the mature GPCs in the same industry.

The option values are calculated as follows:

Al Bartawi Group

Option Pricing Method

(\$000)

	Tier 1	Tier 2	Tier 3	
Current Price - Valuation	\$ 18,000,000	\$ 18,000,000	\$ 18,000,000	
Exercise Price	-	10,800,000	25,800,000	
Annual Risk-Free Rate	2.50%	2.50%	2.50%	
Life of Option (years)	3.00	3.00	3.00	
Annual Standard Deviation	0.400	0.400	0.400	
Option Value	\$ 18,000,000	\$ 8,975,345	\$ 3,165,266	Total Fair Value
Tier Value (1)	9,024,655	5,810,079	3,165,266	
Preferred	9,024,655	-	1,324,995	10,349,650
Common	-	5,810,079	1,840,271	7,650,350
Total Value				\$18,000,000.0

Notes:

(1) Tier value equals the total option value minus the subsequent option value.

The value in each tier is calculated as the difference in option values between the tiers.

Tier 1 – The preferred shareholders receive a liquidation preference of \$1.00 per share. The exercise price in the first calculation is set at \$0. The exercise price of the second option calculation is set at \$10,800,000 which is the accreted number of the preferred shares at the measurement date. The value of the liquidation preference equals the difference between the

company value and the option value in the first breakpoint, \$8,975,345; this equals \$18,000,000 minus \$8,975,345 or \$9,024,655. The preferred shareholders receive 100% of this value since they have a priority claim between \$0 and \$10,800,000. Given the volatility of the company and other economic assumptions, this value equals \$9,024,655.

Tier 2 – Above a value of \$10,800,000 and below a value of \$25,800,000, the common shareholders receive 100% of the value. Between these values it would make no sense for the preferred shareholders to convert their shares since they would receive less than \$1.00 per share, or less than their liquidation preference.

The second tier option value is calculated with a strike price of \$10,800,000 and the third tier option calculation is calculated with a strike price of \$25,800,000. This equals the total number of shares (15,000,000 common plus 10,800,000 converted preferred) multiplied by \$1.00. The two option calculations equal \$8.975 million and \$3.165 million. The value of this tier therefore equals the difference between the two values, \$5.81 million. The common shareholders receive 100% of this value due to the logic described above.

Tier 3 – The preferred shareholders convert their shares to common shares because the value of the company will yield them value above \$1.00 per share. At that point there would be \$25,800,000 shares. There is no breakpoint above that range since there is only one class of stock. Technically, therefore, all the value belongs to the common shareholders. However, the point of the exercise is to attribute value to the original preferred shareholders. Therefore the value of the last tiered option is allocated according to the percentage of common stock owned by the original preferred shareholders ($10,800,000/25,800,000 = 41.9\%$; the original common shareholders are apportioned the remaining 58.1%).

As a result of the above OPM, the values per share at the measurement date are calculated as follows:

OPM Preferred Value	
Tier 1	\$ 9,024,655
Tier 2	-
Tier 3	1,324,995
Total Preferred Value	10,349,650
Preferred per share at value date	10,800,000 \$ 0.96

Note that the per share value of the preferred is based on the 10,800,000 shares existent at the valuation date.

The fair value of the preferred is \$0.96 as of December 31, 2017.

The value of the common shares is shown below:

OPM Common Value		
Tier 1		\$ -
Tier 2		5,810,079
Tier 3		1,840,271
Total Common Value		7,650,350
Common per share at value date	15,000,000	0.51
Less: DLOM @	20.0%	(0.10)
FV, Common Stock per share		\$ 0.41

Note that the common shares have no value from the first tier. The second tier goes 100% to the common shareholders, and the third tier represents its 58.1% of the diluted common shares.

The valuer deducted a 20% discount for lack of marketability to reflect the disincentive to purchasing the common stock of an early-stage closely held company. The resultant Fair Value of the common equals \$0.41 per share as of December 31, 2017.

APPENDIX 3: PWERM Case Study

Salalah Ltd. is a software company formed with 10 million shares of common stock on December 31, 2012. The company issued 10 million shares of preferred stock at \$10.00 per share on December 31, 2013. The preferred stock has the right to receive cumulative dividends at a rate of 7.0% per year. The preferred also participates in liquidation proceeds at an 80% rate after redemption. Upon an IPO, the preferred converts to common stock automatically at an 80% pro rata rate.

A valuation is required as of December 31, 2016 for the common and preferred stock for financial reporting purposes. Salalah anticipates an IPO at the end of 2017, one year from the valuation date. Salalah management has been told by its investment bankers that the company would most likely go public at an invested capital price ranging between \$200 million and \$230 million. Since the company was running short on cash, management obtained a \$10 million bridge loan to ensure liquidity through the IPO. The bridge loan carries an interest rate of 8.0%.

In case the IPO does not occur, management plans to sell the Company during 2018. Management anticipates that the company's invested capital would be valued at an EV/EBITDA multiple (enterprise value/EBITDA) between 8.0x and 11.0x, dependent on market conditions and the company's operations at that time. Management expects that a sale, should it become a possibility, would occur around June 30, 2018, one and a half years from the valuation date.

Salalah's capitalization table below reflects the three forms of financing, the loan, the preferred stock and the common stock.

Salalah Ltd.
PWERM Analysis
 Capitalization Table

(\$000)

Capital Structure	Issued	# Shares	Stated Rate	Face	2013	2017	30-Jun 2018
Bridge Note	12/31/16		8.00%	\$ 10,000	\$ -	\$ 10,800	\$ 11,222
Preferred A	12/31/13	10,000,000	7.00%	100,000	100,000	131,080	
Common stock	12/31/12	10,000,000					

Preferred Stock accretes at 7% per year

Preferred stock participates at 80% and converts into 80% of common stock upon an IPO.

As is shown, the amount owed on the bridge loan is \$10,800 at the end of 2017. However, the transaction is assumed to be June 30, 2018 so the accrued interest on the loan and the loan balance would have increased to \$11,222.

Three possible scenarios were determined for the IPO exit, a pessimistic outcome of \$200 million, a base case of \$215 million and an optimistic outcome of \$230 million. Upon an IPO the preferred shareholders must convert to common stock, at which point they are guaranteed an 80.0% pro rata share of the fully diluted common stock. As is shown below, after the payoff of the bridge loan, there would be a range of \$189.1 million to \$219.2 million available for payout to the preferred (now converted to common) and the original common shareholders.

Upon conversion, the preferred shareholders would receive 80% of these proceeds. The original common shareholders would receive 20% of the proceeds after the preferred redemption.

Salalah Ltd.

Initial Public Offering Analysis

(000)

<u>Proceeds Analysis</u>	<u>Initial Public Offering Scenario</u>		
	<u>Pessimistic</u>	<u>Base</u>	<u>Optimistic</u>
IPO Proceeds	\$ 200,000.0	\$ 215,000.0	\$ 230,000.0
Less: Bridge Loan	10,800.0	10,800.0	10,800.0
Available for Equity Payout	189,200.0	204,200.0	219,200.0

Preferred Stock Conversion

Available proceeds		189,200.0	204,200.0	219,200.0
Preferred conversion to	80.0%	151,360.0	163,360.0	175,360.0
Proceeds accruing to original common shareholders		37,840.0	40,840.0	43,840.0

<u>Preferred Stock Value</u>		<u>Pessimistic</u>	<u>Base</u>	<u>Optimistic</u>
		<u>Total Proceeds to Preferred Stockholders</u>		
		151,360.0	163,360.0	175,360.0
Present value at discount rate of	18.0%	128,271.2	138,440.7	148,610.2
<u>Common Stock Value</u>		<u>Pessimistic</u>	<u>Base</u>	<u>Optimistic</u>
		<u>Total Proceeds to Common Stockholders</u>		
		37,840.0	40,840.0	43,840.0
Present value at discount rate of	25.0%	30,272.0	32,672.0	35,072.0

The total proceeds to the original preferred shareholders equals the value of their converted stock which is 80% of the amount available for an equity payout. The total value to the common shareholders equals 20% of the proceeds. The proceeds to both preferred and common are discounted back one year at an appropriate discount rate. In the above case, the analyst selected an 18% rate of return for the preferred stock and a 25% rate of return for the common stock.

In addition to the IPO scenario, management has considered the potential that the IPO may fail for a number of reasons. In this case, management would move to sell the company as

soon as possible. Management anticipates that the company would sell quickly in the market and anticipate a sale by the middle of 2018, only six months after the IPO.

Salalah Ltd.

Transaction Analysis

(000)

	Sale Scenario		
	Pessimistic	Base	Optimistic
Proceeds Analysis			
EBITDA	\$ 15,750.0	\$ 15,750.0	\$ 15,750.0
Exit Multiple	8.0	9.5	11.0
Transaction Price for invested capital	126,000.0	149,625.0	173,250.0
Less: Bridge Loan	(11,222.2)	(11,222.2)	(11,222.2)
Available for Distribution to Preferred & Common	114,777.8	138,402.8	162,027.8
Accreted Value of Preferred at 12/31/17	114,777.8	131,079.6	131,079.6
Preferred Hurdle IRR Met (1=Yes and 0=No)	0	1	1

Preferred Stock Conversion

Available proceeds to common after preferred redemption	0.0	7,323.2	30,948.2
Preferred conversion to common @ 80.0%	0.0	5,858.6	24,758.6
Proceeds accruing to original common shareholders	0.0	1,464.6	6,189.6

Preferred Stock Value		Pessimistic	Base	Optimistic
Total Proceeds to Preferred Stockholders				
		114,777.8	136,938.2	155,838.2
Present value at discount rate of	18.0%	89,543.7	106,832.1	121,576.9
Common Stock Value		Pessimistic	Base	Optimistic
Total Proceeds to Common Stockholders				
		0.0	1,464.6	6,189.6
Present value at discount rate of	25.0%	0.0	1,048.0	4,429.0

The transaction waterfall of proceeds to preferred and common shareholders is similar to the IPO analysis with a few exceptions. Instead of IPO proceeds, an analysis of the market indicates that EBITDA multiples in a transaction would range between 8.0x and 11.0x. Management projects an LTM EBITDA at that time equal to \$15.75 million. This results in transaction proceeds ranging from \$126.0 million to \$173.25 million. For this example we ignored the transaction fees that would normally be accounted for.

The bridge loan, including accrued interest, is deducted from the transaction proceeds. The pessimistic transaction outcome does not generate enough cash to cover the entire preferred stock liquidation preference. After receiving the preferred liquidation redemption, the preferred shareholders share in the remaining proceeds at 80%. One other difference from the IPO scenario is that the above proceeds are brought back to present value at 1.5 years since the anticipated transaction does not occur until mid-2018.

A summary of the allocated values and a weighting of the outcomes is shown in the table below.

Salalah Ltd.

PWERM Analysis Summary

(\$000)

		Preferred Stock						
		Initial Public Offering Scenario			Transaction Scenario			Fair Value
		Pessimistic	Base	Optimistic	Pessimistic	Base	Optimistic	
Probability		15.0%	25.0%	10.0%	15.0%	25.0%	10.0%	
Preferred Stock Indication		128,271	138,441	148,610	89,544	106,832	121,577	
Preferred Weighted Value		19,241	34,610	14,861	13,432	26,708	12,158	\$ 121,009
					# Preferred shares =			10,000
					Preferred FV per share =			\$ 12.10
		Common Stock						
		Initial Public Offering Scenario			Transaction Scenario			Fair Value
		Pessimistic	Base	Optimistic	Pessimistic	Base	Optimistic	
Probability		15.0%	25.0%	10.0%	15.0%	25.0%	10.0%	
Common Stock Indication		30,272	32,672	35,072	-	1,048	4,429	
Common Weighted Value		4,541	8,168	3,507	-	262	443	16,921
					# Common shares =			10,000
					Common FV per share =			\$ 1.69

The IPO scenario was appropriated a 50% probability and the transaction scenario was appropriated a 50% probability. Within each outcome, the pessimistic outcome was given a 15.0% probability, the base case a 25.0% probability, and the optimistic outcome was given a 10.0% probability. Each outcome was weighted and the weights added to arrive at the Fair Value estimate.

After per share values are calculated, the resultant conclusion is that the preferred stock is worth \$12.10 per share and the common stock is worth \$1.69 per share.

The above sample is a very basic example of the PWERM. Most early-stage companies will have more tranches of preferred stock with varying economic rights that would have to be modeled. These models can become extremely complicated.

An analysis like this would be reviewed by Salalah's management team and by their accounting firm. The auditors would have many questions regarding the assumptions made in the analysis. For example:

- (1) What is the support for the range in IPO price outcomes?
- (2) What is the support for the range of EBITDA multiples?
- (3) What is the support for the 50%/50% probability between the two outcomes and what is the support for the 25%/15%/10% breakdown within each scenario.
- (4) Why was no discount for lack of marketability considered?

- (5) Was any thought given to what happens if the company does not sell as easily or quickly as assumed herein? Should there be another scenario which allows for a transaction later, or another form of exit?
- (6) Should there have been a failure scenario in which neither the IPO nor the transaction occur?

APPENDIX 4: Hybrid Method Case Study: Salalah, Ltd. Part II

After a review of the PWERM analysis with Salalah's management, it was decided that if an IPO were unsuccessful, it would be highly unlikely that a transaction would occur within 1-2 years. It was decided that the probability of an IPO occurring within one year was 75%. However, if the IPO failed, then the company would probably take much longer to sell in a transaction. They estimated the transaction would occur five years from the measurement date, or 2021.

Under the accounting guidance the PWERM is appropriate for liquidation events that can be forecasted over the short-term. The OPM is appropriate in situations where a liquidation event is further out on the horizon. In this case, it is appropriate to apply a hybrid model which considers both a PWERM analysis and an OPM. The PWERM is appropriate to measure the IPO and the OPM is appropriate to measure the transaction scenario.

The case facts are taken from the prior PWERM analysis for Salalah, Ltd. The capitalization table below shows the bridge note and preferred stock taken out to 2021.

Salalah Ltd. Hybrid Model

Capitalization Table (000)

Capital Structure	Issued	# Shares	Stated Rate	Face	2016	2017	2018	2019	2020	2021
Bridge Note	12/31/16		8.00%	10,000.0		\$ 10,800	\$ 11,664	\$ 12,597	\$ 13,605	\$ 14,693
Preferred A	12/31/13	10,000	7.00%	100,000.0	122,504	131,079	140,255	150,073	160,578	171,818
Common stock	12/31/12	10,000								

Preferred Stock accretes at 7% per year

Preferred stock participates at 80% and converts into 80% of common stock upon an IPO.

The PWERM analysis for the IPO is presented below as it was considered in the prior case. The only change is that the transaction scenario was removed from the analysis.

Step 1. Use PWERM analysis on the IPO**Salalah Ltd.****Hybrid Model**Initial Public Offering Analysis
(000)

	Initial Public Offering Scenario		
	Pessimistic	Base	Optimistic
Proceeds Analysis			
IPO Proceeds	\$ 200,000.0	\$ 215,000.0	\$ 230,000.0
Less: Bridge Loan	10,800.0	10,800.0	10,800.0
Available for Equity Payout	189,200.0	204,200.0	219,200.0
Preferred Stock Conversion			
Available proceeds to common after preferred redemption	189,200.0	204,200.0	219,200.0
Preferred conversion to common 80.0%	151,360.0	163,360.0	175,360.0
Proceeds accruing to original common shareholders	37,840.0	40,840.0	43,840.0

Preferred Stock Value		Pessimistic	Base	Optimistic
		Total Proceeds to Preferred Stockholders		
		151,360.0	163,360.0	175,360.0
Present value at discount rate of	18.0%	128,271.2	138,440.7	148,610.2

Common Stock Value		Pessimistic	Base	Optimistic
		Total Proceeds to Common Stockholders		
		37,840.0	40,840.0	43,840.0
Present value at discount rate of	25.0%	30,272.0	32,672.0	35,072.0

The results of the PWERM IPO scenario are the same but since there is no transaction analysis, the weights appropriate to the pessimistic, base, and optimistic scenarios have been scaled up to 30%, 50%, and 20% respectively. This results in preferred market value of \$13.74 per share and a common market value of \$3.24 per share.

Salalah Ltd.
Hybrid Model

PWERM scenario - Initial Public Offering
 (000)

		Preferred Stock			
		Initial Public Offering Scenario			Fair Value
		Pessimistic	Base	Optimistic	
Probability		30.0%	50.0%	20.0%	
	Preferred Stock Indication	128,271	138,441	148,610	
	Preferred Weighted Value	38,481	69,220	29,722	\$ 137,424
		# Preferred shares =			10,000
		Preferred FV per share =			\$ 13.74
		Common Stock			
		Initial Public Offering Scenario			Fair Value
		Pessimistic	Base	Optimistic	
Probability		30.0%	50.0%	20.0%	
	Common Stock Indication	30,272	32,672	35,072	
	Common Weighted Value	9,082	16,336	7,014	32,432
		# Common shares =			10,000
		Common FV per share =			\$ 3.24

Step 2. Use OPM Analysis on Transaction

The OPM is then applied to consider the effect of the transaction five years from the valuation date (four years after the projected IPO). A current value for the company was determined to be \$180 million. The following breakpoints are considered:

The bridge loan is deducted to arrive at proceeds of \$169.2 million. The preferred shareholders have a priority claim on the net projected invested capital.

Breakpoint 1 – The preferred stock liquidation preference would be \$131,079 (accrued value through 2017). Preferred shareholders receive 100% of the liquidation value and participate at 80% above the liquidation value.

Breakpoint 2 – The preferred shareholders would convert to common when their shares exceed the liquidation preference \$13.11 (\$131,079,000/10,000,000). On a fully diluted basis, the shares would need to exceed \$262,159,000 (\$13.11 x 20 million shares). This equals their preferred share value multiplied by the fully diluted number of shares (preferred shares plus common shares). Preferred shareholders convert to 80% of the common stock so the original preferred shareholders receive 80% of this value.

Salalah Ltd.
Hybrid Model

Option Pricing Method
(000)

	Tier 1	Tier 2	Tier 3	
Enterprise Value	\$ 180,000	\$ 180,000	\$ 180,000	
Bridge loan	(10,800)	(10,800)	(10,800)	
Current Price - Valuation	169,200	169,200	169,200	
Exercise Price	-	131,079	262,159	
Annual Risk-Free Rate	2.50%	2.50%	2.50%	
Life of Option (years)	5.00	5.00	5.00	
Annual Standard Deviation	0.400	0.400	0.400	
Option Value	\$ 169,200.0	\$ 79,976.9	\$ 41,951.1	Total Fair Value
Tier Value (1)	89,223.1	38,025.8	41,951.1	
Preferred	89,223.1	30,420.7	33,560.9	153,204.6
Common	-	7,605.2	8,390.2	15,995.4
Total Value				\$ 169,200.0

Preferred shares at 80%

OPM Preferred Value

Total Preferred Value		153,205
Preferred per share at value date	10,000	\$ 15.32

OPM Common Value

Total Common Value		15,995
Common per share at value date	10,000	1.60
Less: DLOM @	20.0%	(0.32)
FV, Common Stock per share		\$ 1.28

The conclusion below weights the IPO-PWERM results at an 80% probability and weights the transaction results at a 20% probability.

Salalah Ltd.
Hybrid Model

Conclusion

(000)

	Scenario		Fair Value
	IPO	Transaction	
Probability	80.0%	20.0%	
Preferred Stock Indication	\$ 13.74	\$ 15.32	\$ 14.06
Common Stock Indication	3.24	1.28	2.85
Preferred Fair Value =	\$ 14.06		
Common Fair Value =	\$ 2.85		

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Chapter 3. The Valuation of Intangible Assets

Section A. Introduction

1. Overview

- A. The purpose of this chapter is to introduce the valuer to the basic concepts of valuing intangible assets and show the common models used to appraise the more frequently encountered intangibles. Intangible asset valuation is presented here within the structure of a purchase price allocation for an IFRS 3 – Business Combination assignment.

By the end of this Chapter, the valuer should be familiar with the following:

- (1) The reasons for valuing intangible assets
- (2) The VPO and accounting guidance for valuing intangible assets
- (3) Identification of intangible assets
- (4) The categories of intangible assets
- (5) Common valuation methods used
 - (a) Income methods, market methods, cost methods
 - (b) Contributory asset charges and their role in the intangible asset valuation
 - (c) Tax amortization benefits and their role in the intangible asset valuation
- (6) Documentation that should be maintained during the valuation process
- (7) Basic models for valuing the following intangible assets:
- (8) Reconciliation of the separate analyses within the overall entity valuation
 - (a) Weighted average cost of capital (WACC)
 - (b) Weighted average return on assets (WARA)
 - (c) Internal rate of return (IRR)

- B. Intangible versus Tangible Assets
 - (1) The distinction between tangible and intangible assets is often inaccurately described as 'tangible assets can be touched and felt, while intangible assets cannot'.
 - (2) Actually tangible assets derive value from their physical properties. We can touch inventory and machinery. But we cannot touch accounts receivable or prepaid assets. Then why are receivables and prepaid assets considered tangible assets? These are tangible assets since value is derived from the cash value that they represent.
 - (3) The value of intangibles derives not from their physical ability to generate cash flow, but from the rights associated with them.
 - (a) The value of the McDonald's trademark is derived from the mental process that a customer goes through when he sees the trademark, not from the physical sign. This is the characteristic that makes it an intangible asset.
 - C. Case Study – A case study inclusive of an excel model is presented to exemplify the topic at the end of this chapter.
2. Reasons for Valuing Intangible Assets
- A. General Valuation – Identification of value drivers
 - B. Purchase price allocation in financial reporting
 - (1) The case study below presents an example of valuing intangible assets in the context of a purchase price allocation.
 - (2) Guidance for purchase price allocations can be found in IFRS 3 or ASC 805
 - C. Taxation
 - D. Bank financing
3. Guidance for valuing intangible assets
- A. VPO Guidance
 - (1) IVSC 210 addresses intangible assets. The standard does not address how to value each class of assets but does define intangibles in the context of valuation for financial reporting.
 - B. Accounting Guidance

- (1) IFRS 3 – Business Combinations, IAS 38 – Intangible Assets
 - (a) The transaction price does not necessarily equal fair value. The valuer must assess whether a market participant would pay that amount for the company on the measurement date. It could be a case in which the acquirer overpaid or underpaid for the target company.
- (2) FASB ASC 805 – Business Combinations
- (3) FASB ASC 820 – Fair Value Measurements and Disclosures
- (4) FASB ASC 350 – Intangibles, Goodwill and Other
- (5) CEIV training

Section B. Identification of Intangible Assets

A. Distinction between tangible and intangible assets

- (1) Tangible assets are usually recognized on a balance sheet using the historical cost recognition in which the asset is booked at its original costs and depreciated or amortized over time if it is depleting asset.
- (2) Intangible assets are typically not booked to the balance sheet unless a transaction has taken place and certain intangibles are identified as being acquired in the transaction. These assets are booked on the acquiring company's financial statement.
 - (a) In a business combination accounted for under IFRS or US GAAP, an intangible asset is only recognized to the extent that it:
 - ◆ is separable, i.e. capable of being separated or divided from the entity and sold, transferred, licensed, rented or exchanged, either individually or together with a related contract, identifiable asset or liability, regardless of whether the entity intends to do so, or
 - ◆ arises from contractual or other legal rights, regardless of whether those rights are transferable or separable from the entity or from other rights and obligations. (IVS 20.7)
 - (b) Goodwill – Goodwill is not separable from the company but is booked as an asset under financial reporting rules and tested periodically for impairment. Goodwill is defined in the IVS as:

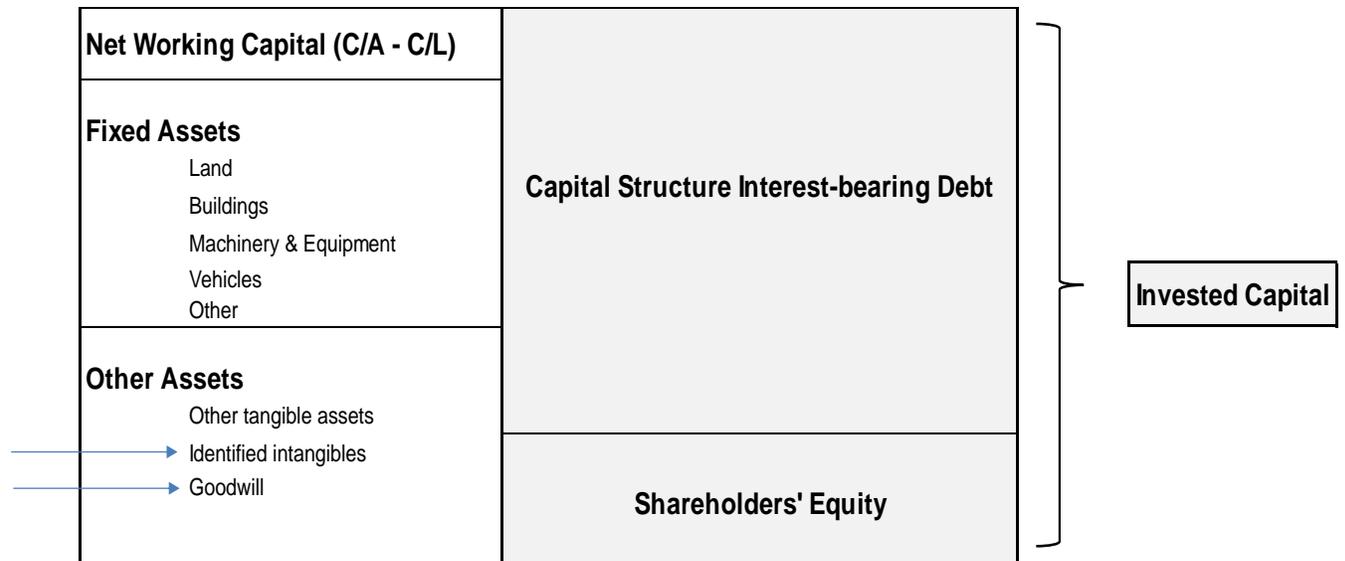
- ◆ Goodwill is any future economic benefit arising from a business, an interest in a business or from the use of a group of *assets* which has not been separately recognized in another *asset*. The value of goodwill is typically measured as the residual amount remaining after the values of all identifiable tangible, intangible and monetary *assets*, adjusted for actual or potential liabilities, have been deducted from the value of a business. It is often represented as the excess of the price paid in a real or hypothetical acquisition of a company over the value of the company's other identified *assets* and liabilities. (IVS 20.6)

B. Transaction documents

- (1) In a purchase price allocation as part of a business combination, the purchase agreement and other transaction documentation will possibly refer to the specific assets that were part of the deal. These documents should be scrutinized to determine which intangibles exist.
- (2) For financial reporting purposes the key determination will be if the assets are seen by market participants as separable and valuable subsequent to the business combination.

C. Management discussions

- (1) According to the accounting guidance, it is management, not the valuer, who bears responsibility for the identification of the intangible assets.
 - (a) The valuer should have discussions with management to determine which assets were part of the transaction or, in the absence of a transaction, which intangible value drivers contribute to value.
 - (b) The graph below depicts the two sides of the balance sheet. In the context of a transaction, the invested capital value, or business enterprise value may be depicted by the fair value. That fair value is then allocated across the left side of the balance sheet.



D. Documentation for identification of intangible assets

- (1) Discussions with management including the rationale for the transaction price
- (2) Description of each intangible asset
- (3) Explanation for how each intangible asset meets the requirements under IFRS 3 as being separable, legal or contractual
- (4) Explanation as to why certain assets were excluded
- (5) If outside experts or subcontractors were used the valuer should keep their valuations or calculations with an explanation as to how they affect the valuer's work.
- (6) Identification of the market participants

E. Categories of Intangible Assets

- (1) Customer related intangibles
 - (a) Customer list/ customer relationship – the knowledge of the company on the part of the customer; the likelihood that the customer's knowledge will lead to further patronization in the future. The customer relationship does not need to be in the form of a legal agreement such as a supply contract.
 - (b) Customer backlog – orders for goods or services which exist at the measurement date. This asset is usually valued separately from the customer list since it may have a different discount rate.

- (c) Customer/supplier contracts
 - (2) Technology related intangibles
 - (a) Software/database – Not all software has intangible value. The asset must generate some competitive advantage or unique quality which distinguishes it from similar software.
 - (b) Patents – Usually a patent provides the owner with protection from competition for a defined period of time which represents the patent's defined life.
 - (c) In-process research & development
 - (d) Management processes/ trade secrets
 - (3) Contract-oriented intangibles
 - (a) Franchise agreements
 - (b) License agreements
 - (c) Broadcast rights
 - (d) Non-compete agreement
 - (e) Employment agreement
 - (f) Supplier contract
 - (4) Marketing related intangibles
 - (a) Brand name
 - (b) Trademark, trade name
 - (c) Domain names
 - (d) Non-competition agreement
 - (5) Artistic related intangibles
 - (a) Copyright
 - (b) Artistic works (literary, musical, etc.)
- F. Intellectual Property (IP)
- (1) Intellectual property refers to assets which are created through an owner's intellectual efforts, such as designs, artwork, trademarks, patents, copyrights, inventions, etc.

- (2) IP carries legal rights in some jurisdictions which distinguish the asset from similar assets that may not be protected under the law. IP rights provide the owner with protection against infringement by a competitor who seeks to use the property for his own gain.
- (3) The protection that IP enjoys will vary from country to country. In countries without legal protection it is not unusual for companies or individuals to infringe on IP rights.
- (4) Due to the legal protection many IP assets will have a higher royalty rate (or lower discount rate) due to the lower risk.
- (5) Not all intangible assets constitute intellectual property. Some patents, trade names, trademarks, copyrights, etc. may have legal protection that expired or for another reason never had legal protection. These are still considered intangible assets.

Section C. Valuation Methodologies for Intangible Assets

1. Introduction

A. For an intangible asset to have value, it must have the following characteristics:

- (1) Legally permissible – A patent on a new pharmaceutical may be worthless in the United States since the U.S. Food & Drug Administration has not approved the drug for sale. However, the drug may be legal outside the U.S. which provides patent value in that jurisdiction.
- (2) Physically possible – A design for a new product will not have value if the materials for the design are rare or in short supply.
- (3) Financially feasible – A new drug may be proven to effectively treat a disease but if its cost is €1 million per dose, it will not be commercially viable.
- (4) The use of the asset must be its highest and best use
 - (a) The value can be external (i.e. it can be sold outside the company) or it can be internal (i.e. the company's cash flows are higher by owning the asset versus not owning the asset - or it decreases its costs).

2. Defining the Asset's Life (IVS 210, prg. 100)

A. Types of lives

- (1) Legal life – the asset may have an indefinite life but if it will lose value after its legal protection expires, then this must be considered.
 - (a) Example: patents – a patent will expire and lose its value with the loss of its legal protection, although the underlying technology may continue to have value.
 - (2) Contractual life – if a legal agreement gives rise to the asset, the asset may have value only for the duration of the time line in the agreement.
 - (a) Example: Supply contract
 - (3) Technological/ functional life – The valuer must consider all obsolescence factors which will deplete the value of the asset.
 - (a) Example: Software, technology
 - (4) Economic life – theoretically, all assets have an economic life. To the extent the intangible asset generates above market cash flows, competition will, sooner or later, erode the value of the asset.
 - (5) Some intangible assets may have indefinite lives. This is not to say that the asset will provide value forever, but it is expected to last for a discrete period long enough that the out years of the forecast have an immaterial present value.
- B. Attrition (IVS 210, prg.100.5)
- (1) Attrition applies to the analysis of a customer list's useful life. There are several ways to measure customer attrition, some of which may include the use of complex modeling. The following factors should be considered:
 - (a) Attrition may be based on revenues or on the number of customers lost over time.
 - (b) Customers may need to be divided into separate groups and measured separately.
 - ◆ A security/alarm company may have individual residential customers as well as corporate customers. The two groups might have different attrition rates.
 - (c) Attrition may be expressed as a constant rate of loss or a variable rate of loss depending on the age of the customer.

- (2) Usually, a mid-year convention is used in projecting customer cash flow since not all the customers projected to be lost during the period would disappear on the first day of the period.
- (3) The customer revenues may grow at the same time the number of customers is declining. Growth and attrition may be separately expressed in the attrition model.
- (4) See the Case Study example for the customer list valuation at the end of this chapter.

3. Income Approach

A. Multi-Period Excess Earning Method (MPEEM)

- (1) The MPEEM is a form of the excess earnings method. The income attributable to the intangible asset being valued is isolated by projecting the entity's entire cash flow and deducting a contributory asset charge (see below) on the other assets in the enterprise. The cash flows (or excess earnings) are brought back to present value by applying a discount rate appropriate for the subject asset.
- (2) Information required for MPEEM:
 - (a) Fair values for all classes of tangible assets
 - (b) Required rates of return for all classes of tangible assets
 - (c) Fair values and rates of return for intangible assets not being valued.
- (3) An example of a customer list MPEEM is shown below:

Sample Company Customer List MPEEM Model

In Thousands

BASE YEAR CUSTOMER CASH FLOW ANALYSIS

EXISTING CUSTOMER REVENUE ESTIMATE	\$100,000.0	← Enter the amount of revenue attributed to the customer list being valued.
EBITDA	5,600.0	← Enter the company's EBITDA margin, adjusted to remove sales and marketing costs that would be expended to attract new customers
CAPEX TO MAINTAIN EXISTING RELATIONSHIPS	93.3	
OPERATING INCOME	5,506.7	← If there are capital expenditures that are necessary to maintaining existing customers these should be deducted.
TAXES	1,927.4	
AFTER-TAX INCOME	3,579.4	← Represents the returns to all tangible and intangible assets in the company except the customer list.
AFTER-TAX CONTRIBUTORY ASSET RETURNS	\$2,400.0	
EXISTING CUSTOMER CASH FLOW	\$1,179.4	
ATTRITION RATE	5.0%	← Percentage decline in customer list per year. Represents the percentage of customers who leave the company annually.
GROWTH RATE	4.0%	

Cash Flow from Customer List

Year	Total Cash Flow	Remaining %	Remaining Cash Flow	Discount Rate	PV Factor	Present Value	Time Period
1	\$1,226.5	97.5%	\$1,195.9	17.0%	0.9245	\$1,105.6	0.5000
2	1,275.6	92.6%	1,181.5	17.0%	0.7902	933.6	1.5000
3	1,326.6	88.0%	1,167.4	17.0%	0.6754	788.4	2.5000
4	1,379.7	83.6%	1,153.3	17.0%	0.5772	665.7	3.5000
5	1,434.9	79.4%	1,139.5	17.0%	0.4934	562.2	4.5000
6	1,492.3	75.4%	1,125.8	17.0%	0.4217	474.7	5.5000
7	1,552.0	71.7%	1,112.3	17.0%	0.3604	400.9	6.5000
8	1,614.0	68.1%	1,099.0	17.0%	0.3080	338.5	7.5000
9	1,678.6	64.7%	1,085.8	17.0%	0.2633	285.9	8.5000
10	1,745.8	61.4%	1,072.8	17.0%	0.2250	241.4	9.5000
11	1,815.6	58.4%	1,059.9	17.0%	0.1923	203.8	10.5000
12	1,888.2	55.5%	1,047.2	17.0%	0.1644	172.1	11.5000
13	1,963.7	52.7%	1,034.6	17.0%	0.1405	145.4	12.5000
14	2,042.3	50.1%	1,022.2	17.0%	0.1201	122.7	13.5000
15	2,124.0	47.5%	1,009.9	17.0%	0.1026	103.7	14.5000
16	2,208.9	45.2%	997.8	17.0%	0.0877	87.5	15.5000
17	2,297.3	42.9%	985.8	17.0%	0.0750	73.9	16.5000
18	2,389.2	40.8%	974.0	17.0%	0.0641	62.4	17.5000
19	2,484.8	38.7%	962.3	17.0%	0.0548	52.7	18.5000
20	2,584.1	36.8%	950.8	17.0%	0.0468	44.5	19.5000
21	2,687.5	35.0%	939.3	17.0%	0.0400	37.6	20.5000
22	2,795.0	33.2%	928.1	17.0%	0.0342	31.7	21.5000
23	2,906.8	31.5%	916.9	17.0%	0.0292	26.8	22.5000
24	3,023.1	30.0%	905.9	17.0%	0.0250	22.6	23.5000
25	3,144.0	28.5%	895.1	17.0%	0.0214	19.1	24.5000

Note that an entire attrition percentage is not taken in first year since not all customer will leave on the first day of the year. Similar to mid-year convention concept.

TOTAL PRESENT VALUE \$7,003.6
Tax Benefit Cash Flow Factor 1.166x

Economic Value	8,166.8
Less: Backlog Value	Enter
Adjusted Economic Value	\$8,166.8
Rounded Value	\$8,200.0

Footnote(s):

[1] Remaining % Year 1 (Average) = [100% (Year 0) + ___% (Year 1)] / 2, where ___% = 100% - ___% (Attrition Rate)]

Remaining % Year 2 (Average) = [___% (Year 1) + ___% (Year 2)] / 2, where ___% = ___% x (1 - ___%) (Attrition Rate)]

[2] Tax Benefit Cash Flow Factor = 1 / [1 - Tax Rate x ((1 - (1 / (1 + WACC) ^ 15)) / WACC) / 15]

(4) Discount rate

(a) The rates of return for intangible assets are usually discerned after deriving an appropriate weighted average cost of capital for the entity and comparing the riskiness of the intangible asset to the risk of the entity's overall capital.

- ◆ Each class of tangible and intangible asset is assigned a rate of return.

⇒ Individual tangible assets will have a rate of return lower than the WACC

⇒ Individual intangible assets will likely have a rate of return higher than the WACC

- ◆ After valuing each tangible and intangible asset the valuer can reconcile his work by comparing a weighted average return on the assets (WARA) to the WACC. The two rates should approximate each other

- ◆ If the assignment is being performed as part of a purchase price allocation after a transaction – and the transaction price has been determined as the appropriate indication of Fair Value – then the internal rate of return (IRR) from the transaction can also be compared to the WACC and WARA.

(b) Documentation requirements for the derivation of the discount rates:

- ◆ Rationale for market participant tax rate used to estimate rates of return for each asset
- ◆ Rationale for the after-tax rates of return for each asset used in the WARA
- ◆ Explanation of any discrepancies between the WARA, IRR, and WACC
- ◆ All adjustments in the WARA calculation in the event of a non-taxable transaction

(5) Contributory Asset Charges (CAC)

(a) The CAC is a charge that is assessed against the revenues of the firm for the use of the all the other assets other than the asset being valued. An example of a model to calculate the contributory asset charge is shown below:

**ABC Company
Contributory Asset Return Calculation**

(000)

Contributory Asset	Fair Value Estimate	Required After-tax Return Estimate	Required Cash Return	Corresponding Revenue Level	Required After-tax Cash Return as % of Revenue
Debt-free Net Working Capital	\$648.0	5.2%	\$33.7	\$25,000.0	0.13%
Fixed Assets	3,505.0	6.2%	217.3	25,000.0	0.87%
Work Force	945.0	12.0%	113.4	25,000.0	0.45%
Non-Competition	250.0	13.0%	32.5	25,000.0	0.13%
Software	1,100.0	15.0%	165.0	25,000.0	0.66%
Trade Name	2,975.0	(3.0% on pre-tax basis)			1.95%
Total Contributory Asset Cash Return (as a % of Rev.)					4.20%

(b) In the above model, each of the Company's assets has been valued with the exception of the customer list. The required cash return of each asset is calculated as a percentage of sales. These returns are summed to a total of 4.2%. This CAC is deducted from ongoing

revenues to isolate the remaining income which is attributable to the customer list.

(c) Documentation Required for the CAC calculation

- ◆ Identification of all assets included in the CAC
- ◆ Working capital – level, required rate of return, the charge and how calculated
- ◆ Land – FV, required rate of return, charge on land and how calculated
- ◆ Other fixed assets
 - ⇒ Return ON fixed asset charge –
 - ⇒ Return OF fixed asset charge (e.g., depreciation, amortization or in expense structure)
- ◆ Intangibles
 - ⇒ Each intangible asset and its required rate of return is included (with the obvious exception of the asset being valued)
- ◆ Royalty rate on the patent or trademark – if different from the rate used to value trade name, explain. Rate should be expressed net of taxes
- ◆ Assembled workforce
 - ⇒ Assumptions used to value assembled workforce
 - ⇒ Required rate of return

(d) Explanation of the number of years the CAC charges applied are different from the economic life of the asset, and an explanation if the CAC changes from year to year.

(e) Identification of all assets in valuation not included in CAC

(6) Tax amortization benefit (TAB)

(a) In jurisdictions where corporate taxes are assessed and where identified intangible assets can be amortized for tax purposes (that is, written off over a period of time), then the value of the intangible asset should include the tax benefit from the amortization. The TAB

equals the present value of the taxes that will be saved over the amortizable life of the asset.

- (b) Appropriate when estimating the FV of an entity using an income approach for a presumed taxable transaction. When a cost or market approach is used the TAB is not appropriate: 1) under a non-taxable transaction, and 2) when pre-tax costs are expended, or 3) when the price paid reflects the full fair value of the entity.
- (c) FV is not determined or affected by the taxable or non-taxable nature of the transaction. The FV of the asset should include the TAB if it is amortizable and tax benefits are to be had.
- (d) CAC is generally based on FV of intangible assets inclusive of the TAB because the resulting value would be the basis for economic rent.
- (e) If a pre-tax cost approach is used to estimate FV the addition of a TAB is not considered appropriate, although the TAB is considered appropriate with a cost savings method (which is a form of the income approach).
- (f) Documentation required:
 - ◆ Understanding of the market participant's tax jurisdiction to determine:
 - ⇒ The appropriateness of the TAB
 - ⇒ The amortization method, whether a straight line or accelerated method used
 - ⇒ Explanation for the number of years used in the calculation (e.g., 15 years in the U.S.)
 - ⇒ The rationale for the market participant tax rate
 - ⇒ The rationale for the discount rate – could be the discount rate used to estimate FV of the intangible, or the WACC, or other
 - ⇒ Consideration of the TAB in either a taxable or nontaxable transaction when doing a DCF or IRR
 - ⇒ The interaction with the WARA
 - ⇒ Foreign transactions and TAB

(g) An example of the TAB is shown in the case study at the end of this chapter in connection with the trade name valuation.

B. Greenfield Method (IVS 210, prg.60.29)

- (1) The Greenfield Method assumes that the asset being valued is the only asset in the Company. Cash flow is projected which captures start-up costs over a ramp-up period until the asset reaches a period of stabilized cash flows.
- (2) A Greenfield model is the same as an MPEEM model except that instead of a CAC all the other assets are assumed to be bought, built, or rented.
 - (a) The other assets are derived usually using the replacement cost method.
- (3) The Greenfield Method is often used for franchise rights and broadcast rights.

C. Relief from Royalty Method

- (1) The Relief from Royalty method depends on finding market evidence of royalty rates on similar assets to the one being valued.
 - (a) The asset is valued based on the income that is saved by owning the asset and not having to rent the asset from a third party
 - (b) The valuer usually bases the income saved on observed royalty rates in the market on similar assets.
 - ◆ Royalty rates can be found by researching filings of public companies which may lease their trademarks or trade names.
 - ◆ Rates are usually researched on databases which are made available by data providers.
- (2) An example of a trade name valuation using the relief from royalty method is shown below.

**Sample Company
TradeName Valuation**

In Thousands

	20XX	20XX	20XX	20XX	20XX		
TOTAL COMPANY REVENUES	\$100,000.0	\$102,000.0	\$105,060.0	\$110,313.0	\$113,070.8		
Revenue Growth	20.1%	2.0%	3.0%	5.0%	2.5%		
% of Revenues Related to Trade Name	40.0%	40.0%	40.0%	40.0%	40.0%		
TRADE NAME ASSOCIATED REVENUES	40,000.0	40,800.0	42,024.0	44,125.2	45,228.3		
FAIR MARKET ROYALTY RATE	2.5%	2.5%	2.5%	2.5%	2.5%		
ROYALTY SAVINGS	1,000.0	1,020.0	1,050.6	1,103.1	1,130.7	Long-Term	
TAXES	250.0	255.0	262.7	275.8	282.7	Growth Rate	Perpetuity
AFTER-TAX CASH FLOW	750.0	765.0	788.0	827.3	848.0	3.0%	873.5
PRO-RATA ADJUSTMENT FACTOR	100.0%	100.0%	100.0%	100.0%	100.0%		100.0%
PRO-RATA AFTER-TAX CASH FLOW	750.0	765.0	788.0	827.3	848.0		873.5
						Capitalization Rate	11.0%
						Perpetuity Value	7,940.7
DISCOUNT RATE	14.0%						
Time Remaining in 1st Period	1.0000						
Years to Discount	0.5000	1.5000	2.5000	3.5000	4.5000		4.5000
PV FACTOR	0.9366	0.8216	0.7207	0.6322	0.5545		0.5545
PV CASH FLOW	\$702.4	\$628.5	\$567.9	\$523.0	\$470.3		\$4,403.4
Sum of Interim Period Present Value	\$2,892.1						
Present Value of Terminal Value	4,403.4						
TOTAL PRESENT VALUE	\$7,295.4						
Tax Benefit Cash Flow Factor	[1] 1.128x						
Economic Value	\$8,229.6						
Rounded	\$8,230.0						

Footnote(s):

[1] Tax Benefit Cash Flow Factor = $1 / [1 - \text{Tax Rate} \times ((1 - (1 / (1 + \text{WACC})^{15})) / \text{WACC}) / 15]$

Assuming WACC = 12% and tax rate = 25%

- (3) The above example is a valuation of a trade name using the relief from royalty method. If the company did not own the trade name, it would have to bear the cost of leasing the name from another owner. The valuer estimated that 40% of Sample Company's total revenue is attributable to this particular trade name. He also determined that an appropriate royalty rate is 2.5%.
- (4) The annual savings from owning the name (\$750,000 in year one, \$765,000 in year two, etc.) is brought to present value in a typical discounted cash flow analysis at a 14.0% discount rate which is the risk rate on the trade name.
- (5) After calculating the TAB the value of the trade name is \$8.23 million.

D. Profit Split Method

- (1) An alternative to the Relief from Royalty Method is the Profit Split Method in which the licensor of the trade name or trademark receives a percentage of profits, not sales.
 - (a) The licensee's profit before royalties is analyzed.
 - (b) The profit split principle states that the royalty rate that a licensee is willing to pay (that is, a royalty rate on sales) depends on the profits that the licensee earns from licensing the trade name.
 - (2) The rule of thumb in the industry is that the profit split that the licensee is willing to pay is between 20% and 33% of total profits.
 - (a) In the RFR example shown above, the \$1,000,000 royalty rate would be checked against the firm's profits from the segment's sales. If it fell within the rule of thumb range, then there would be a greater comfort level in the analysis.
 - (3) The profit split method has received the same criticism as any rule of thumb over the years.
- E. Some form of the income approach is most commonly used to value the following assets:
- (1) Trade names
 - (2) Customer lists
 - (3) Technology
 - (4) Licenses
 - (5) Non-competition agreements
4. Market Approach
- A. Transaction method
- (1) If an asset that is similar in nature to the subject intangible asset can be found, the transaction is arms-length and sufficient data is available to analyze the deal, then this approach might be applied.
 - (2) Since it is rare that such transactions can be found, the market approach is seldom applied in the direct valuation of intangible assets.
 - (3) This method is sometimes possible when valuing internet domain names since deal data on these assets can be found.

5. Cost Approach

A. The Cost Approach provides an indication of value using the economic principle that a buyer will pay no more for an asset than the cost to obtain an asset of equal utility, whether by purchase or by construction, unless undue time, inconvenience, risk or other factors are involved (see IVS 105 pg.60.1 and 60.2).

- (1) The cost approach is valid when the alternative income, market, or hybrid approaches cannot be applied.
- (2) The cost approach is most commonly used for the following intangible assets:
 - (a) Internally developed software/technology
 - (b) Acquired software/technology
 - (c) Assembled workforce

B. Replacement Cost Method

- (1) Considers the direct and indirect costs of replacing the utility of the asset.
 - (a) Labor – all salaries, bonuses, etc. of internal and subcontracted workers
 - (b) Materials
 - (c) Other overhead costs
- (2) Technological and economic obsolescence should also be considered.
- (3) A profit mark-up on the costs may be considered.
- (4) Opportunity costs during period of replacement should be considered if the asset cannot be replaced in a short period of time.
- (5) See example in case study for software.

C. Reproduction Cost Method

- (1) Reproduction cost considers the same process as the Replacement Cost Method except that it produces an exact duplicate of the asset in question. Since this is rarely the case, the more common cost method is the Replacement Cost Method.

Section D. Case Study – Wahmi Limited

Company Background

Wahmi Limited is an auto parts distributor and retailer which sells a broad range of aftermarket automobile parts to auto part retail chains, auto repair shops and individual customers throughout southern Europe, Eastern Europe and Turkey. The Company began operations in 1971 in Padua, Italy and has remained in the same location since that time. The company distributes a wide range of engine, chassis, and add-on parts for several European makes including Audi, Peugeot, Volvo, Opel, Renault, Skoda, Dacia, and Japanese carmakers such as Toyota, Honda, and Nissan.

Since 1971, the company has been doing business as “Trazione” and is known in the market as Trazione Company and Trazione Parts. Over nearly a half century in business the Company has established its name as being a reliable supplier of quality aftermarket products. Although its base customer list is comprised of company clients, about \$10 million to \$15 million of its annual revenues come from individual customers throughout Europe who either make one-time purchases or return on an intermittent basis.

The Company markets its inventory primarily to retail chain stores which sell auto parts to individuals as well as local repair shops. The company also sells directly to repair shops and to individual buyers. Some of the retail chains and repair chains also buy direct from manufacturers; Wahmi competes with manufacturers by focusing on speed and efficiency which is a mandatory requirement for repair shops looking to turn around repair jobs in one to two days.

Between 1971 and 2010, Wahmi printed and sold catalogues which it distributed to its customer base. Repair mechanics could look up the needed part and place an order by phone and the needed part was sent out via overnight or same day delivery service. The Company also sold lines of personalized auto parts for do-it-yourselfers who worked on their own automobiles.

In 2011, the company began a transformation to an online ordering system. Its entire inventory was placed online so that customers could find and order the needed part with the click of a button. All orders are shipped within 24 hours. The transformation took six years and was only completed at the end of 2017.

The majority of Wahmi’s customer base is located in northeastern Italy. The Company’s largest customers are autopart retail chain stores with multiple locations and three of the larger repair shop chains in southeastern Europe. Wahmi supplies these customers with a relatively large volume of mainstream parts. The bulk of the customer base is comprised of repair shops which order parts on an as need basis. Often, Wahmi receives the order because other

local suppliers do not have the part. In all cases, Wahmi's customers require the needed inventory to be delivered within 48 hours and often within 24 hours after the order is placed.

Transaction

Effective December 31, 2017, Wahmi was purchased for €68 million euros by a larger competitor in the market, WendeWerks, GmbH, a privately-owned company located in Graz, Austria. The purchase price included the assumption of all Wahmi's third party debt.

You have been retained to allocate the purchase price to the Company's tangible and intangible assets under IFRS 3, Business Combinations.

Assume the following facts:

- In your discussions with WendeWerks management and your review of the transaction documents, you have identified the following intangible assets as having potential value:
 - Your support staff has completed due diligence on Wahmi's tangible assets and they have documented the following:
 - Net operating working capital (current assets minus non-interest bearing debt) represents Fair Value as is stated on the balance sheet. Your staff considered the potential for an inventory step-up but discovered that the firm moves inventory fast enough that any step-up calculations would be immaterial.
 - The fixed asset values expressed on the balance sheet also reflect the fair value of the assets. Tangible asset appraisers (real estate and machinery/equipment appraisers) were consulted and expressed conclusions that the reflected values are representative of fair value.
 - Management provided prospective financial information (PFI) for the Company. For the purposes of this assignment you will assume that the PFI accurately reflects market participants' expectations for the Company's performance going forward. However, take note of the PFI component of the exercise instructions, below.
 - Trade name – "Trazione" – Wahmi has been using this name since 1971 and the market identifies the Company's products and services with the trade name.
 - Customer list – Wahmi's Management was able to provide historical sales information for the Company's top 65 customers over the past five years.

- Software – the Company developed its own internal software as part of its modernization effort which converted the Company from a catalogue-based marketer to an online marketer. Management believes the software is state-of-the-art and comprises a significant competitive advantage over the company's competitors.
- Assembled workforce is not a separable identified asset, but it is valued separately since it must be included in the contributory asset charge.
- You have received an excel file labelled "Wahmi.Ltd" which contains the Company's financial spreadsheets, prospective financial information, and basic model for valuing the identified intangible assets.

Exercise 1.

Exhibits 1 – 7 on the following pages (as well as in the excel file) reflect the following:

1. Historical balance sheets for Wahmi, Ltd. (Exhibit 2)
2. Historical income statements for Wahmi Ltd. (Exhibit 3)
3. Projected income statements for Wahmi, Ltd. (Exhibit 4)
4. Financial data for seventeen guideline public companies which are assumed to represent the market participants for Wahmi's industry. Most of the companies are U.S. based and some are based in Europe. For the purposes of this exercise assume that all companies are comparable to Wahmi regardless of the country of origin. (Exhibit 5)
5. A spreadsheet which reflects the derivation of Wahmi's WACC as well as the derivation of individual returns for Wahmi's tangible assets, which include net working capital and fixed assets. (Exhibit 6)
6. A spreadsheet which reflects the raw data to determine the rates of returns for each of the intangible assets that have been identified and will be valued as part of this assignment as well as intangible assets that will be valued as part of the contributory asset charge (Exhibit 6, continued), including:
 - a. Customer list
 - b. Trade name
 - c. Software
 - d. Assembled workforce
 - e. Goodwill

7. A spreadsheet which contains the calculations for Wahmi's internal rate of return from the transaction. (Exhibit 7)

Given the information provided thus far, complete the following tasks:

- Review the historical financial information in Exhibits 2-3, noting historical growth, profitability, capital structure, etc. Document your observations.
- As stated above, the PFI provided by management is assumed to be accurate (Exhibit 4). Nonetheless, create a list of questions for management that you would have about the PFI if this were a real-life assignment.
- Review the Market Participant Analysis in Exhibit 5 and make note of data that you will need to reference in the ensuing analysis.
- The WACC and required rates of return have been provided in Exhibit 6. Given the information you have been provided, fill in the discount rates in the spreadsheet for Customer Lists, Trade Name, Software, Assembled Workforce, and Goodwill in the yellow-shaded cells in the excel file provided in the "Assumptions" tab.
- Fill in the desired trademark rate in the yellow shaded cell in the "Assumptions" tab.
- Using the Goal-Seek Function, complete the Transaction Internal Rate of Return analysis. The transaction amount was **€68 million** (remember that the excel file is in thousands). The excel file as shown contains dummy values for the firm. The prospective cash flows are correct.

Exhibit 1
Wahmi, Limited
Intangible Asset Valuation
Summary of Values

(€ 000)

<u>Tangible Asset</u>	<u>Indicated Fair Value</u>
Operating Working Capital	
Fixed Assets	
<u>Intangible Asset</u>	<u>Indicated Fair Value</u>
Trade Name	
Software	
Assembled Workforce	
Customer List	
Goodwill	

Exhibit 2**Wahmi, Limited****Historical Balance Sheets**

For the fiscal period ending December 31,

(€ 000)

	2014	2015	2016	2017	CAGR 2014 - 2017	Percent of Total Assets			
						2014	2015	2016	2017
ASSETS									
CURRENT ASSETS									
Cash	€ 1,061.3	€ 1,357.2	€ 1,180.4	€ 967.5	-3.0%	4.7%	5.7%	4.7%	3.8%
Receivables	3,875.1	4,135.5	4,841.9	4,610.2	6.0%	17.3%	17.5%	19.4%	18.3%
Inventory	6,844.0	7,107.5	7,387.8	7,657.8	3.8%	30.5%	30.1%	29.6%	30.4%
Prepaid Expenses	765.0	1,129.5	1,237.7	1,871.3	34.7%	3.4%	4.8%	5.0%	7.4%
TOTAL CURRENT ASSETS	12,545.4	13,729.7	14,647.8	15,106.8	6.4%	56.0%	58.1%	58.7%	60.0%
NET FIXED ASSETS	9,467.0	9,650.0	10,156.0	10,005.0	1.9%	42.2%	40.8%	40.7%	39.7%
OTHER ASSETS									
Deferred Financing Costs	397.8	265.2	159.0	71.0	-43.7%	1.8%	1.1%	0.6%	0.3%
TOTAL OTHER ASSETS	397.8	265.2	159.0	71.0	-43.7%	1.8%	1.1%	0.6%	0.3%
TOTAL ASSETS	€ 22,410.2	€ 23,644.9	€ 24,962.8	€ 25,182.8	4.0%	100.0%	100.0%	100.0%	100.0%
LIABILITIES & EQUITY									
CURRENT LIABILITIES									
Accounts Payable	€ 4,335.3	€ 4,397.6	€ 3,277.7	€ 3,618.0	-5.9%	19.3%	18.6%	13.1%	14.4%
Accrued Liabilities	2,814.4	2,267.1	1,712.6	1,290.2	-22.9%	12.6%	9.6%	6.9%	5.1%
Revolving Credit	1,883.6	1,100.8	1,838.9	2,015.0	2.3%	8.4%	4.7%	7.4%	8.0%
Current Portion of Long-Term Debt	3,029.8	2,797.3	2,680.6	2,148.0	-10.8%	13.5%	11.8%	10.7%	8.5%
TOTAL CURRENT LIABILITIES	12,063.1	10,562.8	9,509.8	9,071.2	-9.1%	53.8%	44.7%	38.1%	36.0%
LONG TERM LIABILITIES									
Long-Term Debt	6,795.2	8,503.3	9,815.0	9,515.0	11.9%	30.3%	36.0%	39.3%	37.8%
TOTAL LONG-TERM LIABILITIES	6,795.2	8,503.3	9,815.0	9,515.0	11.9%	30.3%	36.0%	39.3%	37.8%
EQUITY									
TOTAL EQUITY	3,551.9	4,578.8	5,638.0	6,596.6	22.9%	15.8%	19.4%	22.6%	26.2%
TOTAL LIABILITIES & EQUITY	€ 22,410.2	€ 23,644.9	€ 24,962.8	€ 25,182.8	4.0%	100.0%	100.0%	100.0%	100.0%
Net Operating Working Capital	€ 4,334.4	€ 5,707.8	€ 8,477.1	€ 9,231.1					
Net OWC as % of Revenue	6.0%	8.3%	11.8%	12.5%					

Exhibit 3
Wahmi, Limited
Historical Income Statements

For the period ended December 31,
(€ 000)

	2014	2015	2016	2017	CAGR	Percent of Total Revenues			
						2014	2015	2016	2017
NET SALES	€ 72,466.5	€ 68,758.8	€ 71,675.8	€ 73,991.1	0.7%	100.0%	100.0%	100.0%	100.0%
COST OF GOODS SOLD	46,474.1	45,120.5	46,773.1	47,947.1	1.0%	64.1%	65.6%	65.3%	64.8%
GROSS PROFIT	25,992.4	23,638.3	24,902.7	26,044.0	0.1%	35.9%	34.4%	34.7%	35.2%
Labor and Other Employee Costs	7,904.8	7,373.9	7,187.0	7,491.6		10.9%	10.7%	10.0%	10.1%
Catalog and Postage Expense	4,519.8	1,429.3	685.2	112.1		6.2%	2.1%	1.0%	0.2%
Web & computer expense	1,299.0	2,915.8	4,122.2	4,988.6		1.8%	4.2%	5.8%	6.7%
Selling and Marketing Expenses	1,173.9	1,184.3	1,381.2	1,882.1		1.6%	1.7%	1.9%	2.5%
Occupancy Expenses	1,149.7	1,243.0	1,212.5	1,255.2		1.6%	1.8%	1.7%	1.7%
General and Administrative	3,099.6	2,908.1	2,685.4	2,718.1		4.3%	4.2%	3.7%	3.7%
OPERATING EXPENSES	19,146.9	17,054.5	17,273.5	18,447.7	-1.2%	26.4%	24.8%	24.1%	24.9%
Reported EBITDA	6,845.5	6,583.8	7,629.2	7,596.3	3.5%	9.4%	9.6%	10.6%	10.3%
Depreciation & Amortization	657.4	633.3	510.7	603.8		0.9%	0.9%	0.7%	0.8%
Reported EBIT	€ 6,188.1	€ 5,950.5	€ 7,118.4	€ 6,992.5	4.2%	8.5%	8.7%	9.9%	9.5%

Exhibit 4**Wahmi, Limited****Projected Income Statements***For the period ending December 31,**(€ 000)*

	2018	2019	2020	2021	2022
NET SALES	€ 78,301.0	€ 82,230.0	€ 86,305.0	€ 90,705.0	€ 95,200.0
COST OF GOODS SOLD	50,800.0	53,410.0	56,005.0	58,800.0	61,800.0
GROSS PROFIT	27,501.0	28,820.0	30,300.0	31,905.0	33,400.0
OPERATING EXPENSES	19,300.0	20,300.0	21,300.0	22,305.0	23,540.0
EBITDA	8,201.0	8,520.0	9,000.0	9,600.0	9,860.0
Depreciation & Amortization	700.0	700.0	800.0	800.0	800.0
EBIT	€ 7,501.0	€ 7,820.0	€ 8,200.0	€ 8,800.0	€ 9,060.0
<i>Sales growth</i>	5.8%	5.0%	5.0%	5.1%	5.0%
<i>Gross profit margin</i>	35.1%	35.0%	35.1%	35.2%	35.1%
<i>EBITDA margin</i>	10.5%	10.4%	10.4%	10.6%	10.4%
<i>Operating margin</i>	9.6%	9.5%	9.5%	9.7%	9.5%
<i>Capital Expenditures</i>	€ 400.0	€ 400.0	€ 500.0	€ 650.0	€ 790.0

EBITDA Calcs for Customer Relationships

Wahmi EBITDA	€ 8,201.0	
Less : allocated depreciation	700.0	
WAHMI EBIT	7,501.0	
Add: Overhead to attract new customers	50.0	mgt estimate of €50 customer expense on new customers.
Wahmi Customer EBIT (for customer list)	7,551.0	

Exhibit 5

Wahmi, Limited

Intangible Asset Valuation

Market Participant Analysis

(\$ in millions, except stock price)

Guideline Company	Stock Price	Shares Outstanding	Equity Value	L-T Debt	Preferred Equity	Market Value of Invested Capital	Debt & Preferred / MVIC	Effective Tax Rate	Levered Beta	Business Risk Index	Financial Risk Index	EBIT Margin
Advance Auto Parts, Inc.	\$95.80	73.860	\$7,075.8	\$1,043.0	\$0.0	\$8,118.8	12.8%	37.8%	0.70	0.64	0.06	7.4%
Autonation, Inc.	42.41	100.44	4,259.66	4,261.00	-	8,520.66	50.0%	38.5%	1.02	0.63	0.39	3.6%
Autozone, Inc.	511.63	28.030	14,341.0	4,924.0	0.0	19,265.0	25.6%	35.1%	0.51	0.42	0.09	19.3%
Copart, Inc.	31.97	230.330	7,363.7	640.5	0.0	8,004.1	8.0%	31.6%	1.04	0.98	0.06	32.6%
Group 1 Automotive	54.84	20.110	1,102.8	2,362.0	0.0	3,464.8	68.2%	35.2%	1.76	0.74	1.02	3.3%
Autoliv, Inc.	105.30	86.910	9,151.6	1,544.0	0.0	10,695.6	14.4%	30.1%	1.17	1.05	0.12	8.5%
BorgWarner, Inc.	44.76	211.060	9,447.0	2,220.0	0.0	11,667.0	19.0%	20.4%	1.94	1.63	0.31	12.4%
Eaton Corp.	71.04	444.800	31,598.6	8,277.0	0.0	39,875.6	20.8%	9.5%	1.39	1.12	0.27	11.6%
Gentex Corp.	17.94	285.550	5,122.8	186.0	0.0	5,308.8	3.5%	31.9%	1.35	1.32	0.03	29.9%
Genuine Parts Co.	83.30	146.830	12,230.9	875.0	0.0	13,105.9	6.7%	36.0%	1.07	1.02	0.05	6.8%
Lear Corp.	144.54	68.010	9,830.2	1,942.0	0.0	11,772.2	16.5%	27.7%	1.37	1.20	0.17	8.2%
Magna International, Inc.	47.76	372.530	17,792.0	2,582.0	0.0	20,374.0	12.7%	26.8%	1.45	1.31	0.14	7.5%
Modine Manufacturing Co.	16.10	50.120	806.9	511.0	0.0	1,317.9	38.8%	28.4%	1.20	0.83	0.37	4.4%
Standard Motor Products, Inc.	9.95	19.850	197.5	113.8	0.0	311.3	36.6%	31.0%	0.65	0.47	0.18	4.7%
Superior Industries Int'l, Inc.	14.90	24.900	371.0	0.0	0.0	371.0	0.0%	24.4%	0.63	0.63	0.00	4.9%
Tenneco, Inc.	52.68	53.200	2,802.6	1,384.0	0.0	4,186.6	33.1%	0.0%	1.79	1.20	0.59	4.9%
Visteon Corp.	112.10	31.170	3,494.2	382.0	0.0	3,876.2	9.9%	18.6%	1.08	0.99	0.09	8.3%
High			\$31,598.6	\$8,277.0	\$0.0	\$39,875.6	68.2%	38.5%	1.9	1.6	1.0	32.6%
Low			197.5	0.0	0.0	311.3	0.0%	0.0%	0.5	0.4	0.0	3.3%
Mean			8,119.5	2,012.8	0.0	10,132.3	22.7%	26.6%	1.2	1.0	0.2	10.7%
Median			6,243.2	1,464.0	0.0	8,262.4	17.8%	29.2%	1.2	1.0	0.2	7.8%

Exhibit 6**Wahmi, Limited****Assumptions***Summary of Values*

(€ 000)

WEIGHTED AVERAGE COST OF CAPITAL

Risk-Free Rate	[1]	2.1%
Business Risk Index	[2]	1.00
Market Risk Premium	[3]	5.5%
Size Risk Premium	[4]	5.0%
Company Specific Risk Premium		0.0%
Unlevered Cost of Equity		12.6%
% Debt Capital	[5]	20.0%
% Equity Capital		80.0%
Tax Rate	[6]	24.0%
Levered Cost of Equity		13.6%
Pre-tax Cost of Debt		7.7%
WEIGHTED AVERAGE COST OF CAPITAL		12.1%

REQUIRED RETURN ON WORKING CAPITAL

Enter Base Rate Proxy	[7]	4.4%
Risk Premium		3.0%
Pre-Tax Required Return		7.4%
Taxes		-1.8%
REQUIRED RETURN ON WORKING CAPITAL		5.6%

REQUIRED RETURN ON FIXED ASSETS

Enter Base Rate Proxy	[8]	5.5%
Risk Premium		4.0%
Pre-Tax Required Return		9.5%
Taxes		-2.3%
REQUIRED RETURN ON FIXED ASSETS		7.2%

Tangible Assets

NORMAL NET WORKING CAPITAL	[9]	€ 10,198.60
NORMAL LEVEL OF FIXED ASSETS	[10]	€ 10,005.00
CORRESPONDING REVENUE LEVEL		€ 78,301.00

Footnote(s):

[1] Utilized the long term treasury yield on German bonds at measurement date .

[2] Based on the average business risk index as observed in the market participant group.

[3] Utilized the long horizon expected equity risk premium as presented in Duff & Phelps Risk Premium Study and in Aswath Damodaran analysis

[4] Based upon the Duff & Phelps size risk premium study.

[5] Based upon a review of the capital structure composition of the market participant group.

[6] Based on Italian statutory corporate tax rate.

[7] Based upon the Baa Composite yield (4.39%) at the measurement date as presented in Reuters.

[8] Utilized the bank prime rate and the Baa corporate composite rate at the measurement date .

[9] Normal net working capital = net working capital prior to the transaction. No inventory step-up was deemed required.

[10] Normal level of fixed assets equals balance sheet book value as determined by tangible asset appraisers.

Exhibit 6 (continued)**Wahmi, Limited****Assumptions***Summary of Values*

(€ 000)

Intangible Assets**CUSTOMER LISTS**

Revenue Projection	€ 78,301.0
EBIT Margin	9.6%
Tax Rate	24.0%
Discount Rate	
Attrition Rate	5.9%
Growth Rate	3.0%

TRADE NAME

Revenue Allocation	100.0%
Royalty Rate	
Tax Rate	24.0%
Discount Rate	
Long-term Growth Rate	3.0%

SOFTWARE

Tax Rate	24.0%
Discount Rate	

WORKFORCE INTANGIBLE

Required Return	
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GOODWILL

Required Return	
-----------------	--

Exhibit 7

Wahmi, Limited

Transaction Internal Rate of Return

(€ 000)

	2017	2018	2019	2020	2021	2022	Perpetuity
REVENUE	€ 73,991.1	€ 78,301.0	€ 82,230.0	€ 86,305.0	€ 90,705.0	€ 95,200.0	€ 98,056.0
OPERATING INCOME	6,992.5	7,501.0	7,820.0	8,200.0	8,800.0	9,060.0	9,609.5
TAXES		1,800.2	1,876.8	1,968.0	2,112.0	2,174.4	2,306.3
NET INCOME		5,700.8	5,943.2	6,232.0	6,688.0	6,885.6	7,303.2
PLUS (MINUS):							
Dep. & Amort.		700.0	700.0	800.0	800.0	800.0	0.0
Net Working Capital Additions		(517.2)	(471.5)	(489.0)	(528.0)	(539.4)	(342.7)
Capx		(400.0)	(400.0)	(500.0)	(650.0)	(790.0)	0.0
FREE CASH FLOW		5,483.6	5,771.7	6,043.0	6,310.0	6,356.2	6,960.5
As % of Rev.		7.0%	7.0%	7.0%	7.0%	6.7%	7.1%
PRO-RATA ADJUSTMENT FACTOR		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
PRO-RATA AFTER-TAX CASH FLOW		€ 5,483.6	€ 5,771.7	€ 6,043.0	€ 6,310.0	€ 6,356.2	€ 6,960.5
DISCOUNT RATE		9.0%					6.0%
Time Remaining in 1st Period		1.0000					Perpetuity Value
Years to Discount		0.5000	1.5000	2.5000	3.5000	4.5000	4.5000
PV FACTOR		0.9578	0.8787	0.8062	0.7396	0.6785	0.6785
PV CASH FLOW		€ 5,252.31	€ 5,071.84	€ 4,871.77	€ 4,666.99	€ 4,312.99	€ 78,717.15
Sum of Interim Period Present Value		€ 24,175.9					
Present Value of Terminal Value		78,717.2					
Market Value of Invested Capital		€ 102,893.0					

Assumptions

Revenue Growth	5.8%	5.0%	5.0%	5.1%	5.0%	3.0%
EBIT Margin	9.6%	9.5%	9.5%	9.7%	9.5%	9.8%
Tax Rate	24.0%	24.0%	24.0%	24.0%	24.0%	24.0%
Dep & Amort. (% of rev.)	0.9%	0.9%	0.9%	0.9%	0.8%	n/a
Net Working Capital (% of rev.)	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%

Exercise 2.

Complete the trade name valuation by determining the appropriate royalty rate for the 'Trazione' trade name given the market evidence in Exhibit 8 below and what you know about the Company. Enter the royalty rate in the appropriate cell in Exhibit 6 – Assumptions. Also insert the appropriate discount rate. The trade name valuation in Exhibit 9 will automatically be completed.

Exhibit 8**Wahmi, Limited****Guideline Royalty Rates**

Trademark Related Licensing Agreements

Business Name/Description	Product or Service Licensed	Royalty Range	Upfront Fees/Comments
AAF MSQuery, Inc.	"McQuay" trademark	2.0% to 5.0%	In connection with sale and marketing of HVAC products.
Goodyear Tires	Use of "Goodyear" name	3.5%	Licensee is independent chaing of tire retail stores and repair shops
Cable and Wireless Plc	Trademark and logo	8.0%	Licensee Hong Kong Telecommunications Ltd.
Carnival Corp.	"Carnival" trademark	1.0%	Licensee is Carnival hotels & casinos. Royalty is greater of \$100,000 or 1% of revenues.
Casino Magic Corp.	"Casino Magic" trade name and service r	2.0%	Licensee is Casino Magic Neuquen S.A.
Century 21 Real Estate	"Century 21" trademark	3.0%	Exclusive use in connection with home improvements.
Rock Auto Parts	Use of "Rock Parts" trade name and mark	3.0%	Licensee is subsidiary retal chain
HFS Inc.	"Avis" trademark	3.0%	Base rate of 3.0% plus 1.0% supplemental.
KPMG Peat Marwick, LLP	"KPMG" name	5.0%	Licenses is KPMG BayMark, LLC an investment bank
Lufthansa German Airlines	"DHL" trademark	0.8%	Licensee DHL Airways Inc.
Minnegasco	Utility's name	1.0%	Licensed to affiliate.
Nextel	"Nextel" brand name	1.0%	0.5% first year, 1.0% thereafter.
Southwestern Bell Telephone	"Southwestern Bell" name	5.0%	Licensed to affiliate.
SUSA Partnership, LP	"Storage USA" trademark	5.0%	Operation of self-storage facilities.
Washington Natural Gas Company	Washington's name	1.5%	Licensed to affiliate.
Western Union Corp.	"Western Union" trade and service marks	5.0%	Licensee is Financial Services, Inc.
	Average =	3.2%	
	Median =	3.0%	

Exhibit 9
Wahmi, Limited
Trade Name Valuation

(€ 000)						
	2018	2019	2020	2021	2022	
TOTAL COMPANY REVENUES	€ 78,301.0	€ 82,230.0	€ 86,305.0	€ 90,705.0	€ 95,200.0	
Revenue Growth		5.0%	5.0%	5.1%	5.0%	
% of Revenues Related to Trade Name	100.0%	100.0%	100.0%	100.0%	100.0%	
TRADE NAME ASSOCIATED REVENUES	78,301.0	82,230.0	86,305.0	90,705.0	95,200.0	
FAIR MARKET ROYALTY RATE						
ROYALTY SAVINGS	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	Long-Term
TAXES	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	Growth Rate
AFTER-TAX CASH FLOW	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	3.0%
PRO-RATA ADJUSTMENT FACTOR	100.0%	100.0%	100.0%	100.0%	100.0%	
PRO-RATA AFTER-TAX CASH FLOW	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	100.0%
						#VALUE!
						#VALUE!
						#VALUE!
DISCOUNT RATE						Capitalization Rate
Time Remaining in 1st Period	1.0000					Perpetuity Value
Years to Discount	0.5000	1.5000	2.5000	3.5000	4.5000	
PV FACTOR	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	
PV CASH FLOW	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	
Sum of Interim Period Present Value	#VALUE!					
Present Value of Terminal Value	#VALUE!					
TOTAL PRESENT VALUE	#VALUE!					
Tax Benefit Cash Flow Factor	[1] 1.122x					
Economic Value	#VALUE!					
Rounded	#VALUE!					

The trade name valuation is completed automatically in the excel spreadsheet once the variables are entered. The tax amortization benefit is also automatically calculated. The actual tax benefit can also be expressed as follows:

Mechanics of the Tax Amortization Benefit			
Year	\$ Amortized	Tax Saved	Present Value at 14.0%
1	€ 1,227.5	€ 294.6	€ 262.8
2	1,227.5	294.6	234.4
3	1,227.5	294.6	209.1
4	1,227.5	294.6	186.6
5	1,227.5	294.6	166.4
6	1,227.5	294.6	148.5
7	1,227.5	294.6	132.4
8	1,227.5	294.6	118.1
9	1,227.5	294.6	105.4
10	1,227.5	294.6	94.0
11	1,227.5	294.6	83.9
12	1,227.5	294.6	74.8
13	1,227.5	294.6	66.7
14	1,227.5	294.6	59.5
15	1,227.5	294.6	53.1
	Present Value of Tax Shield =		1,995.8

Exercise 3.

Complete the software valuation using the replacement cost method as contained in Exhibit 10 (see tab "E10.Software" in the excel file). Assume the following facts:

- There are four programmers needed to complete the software asset. The two lead programmers are paid 145,000 euros per year in addition to a 21,000 bonus each, the third programmer is paid 100,000 euros plus a 17,500 bonus, and the fourth programmer is paid 75,000 euros per year with a 15,000 bonus. The rest of the data has been entered.

Exhibit 10
Wahmi, Limited
Internally Developed Software

Cost Approach

(€ 000)

Personnel	Employee Costs				Contractor Costs				
	Average Annual Salary	Bonus	Replacement Cost New (RCN)	Estimated Man Years to Re-create	Total Employee Cost	Average Annual Salary	Replacement Cost New (RCN)	Estimated Man Years to Re-create	Total Contractor Cost
Programmer 1			€ 0.0	3.0	€ 0.0	€ 150,000.0	€ 150,000.0	2.0	€ 300,000.0
Programmer 2			0.0	3.0	0.0	125,000.0	125,000.0	2.0	250,000.0
Programmer 3			0.0	3.0	0.0	0.0	0.0	0.0	0.0
Administrative support			0.0	0.5	0.0	0.0	0.0	0.0	0.0

Exhibit 10
Wahmi, Limited
Internally Developed Software

Cost Approach

(€ 000)

Personnel	Total Costs		Obsolescence Factor	Adjusted Total Cost	Economic Life			Replacement Cost
	One Time Costs	Total Costs			New	Remaining		
Programmer 1	€ 265,000.0	€ 565,000.0	10.0%	€ 508,500.0	10.0 yrs	8.0 yrs	80.0%	€ 406,800.0
Programmer 2	0.0	250,000.0	10.0%	225,000.0	10.0 yrs	8.0 yrs	80.0%	180,000.0
Programmer 3	0.0	0.0	10.0%	0.0	10.0 yrs	8.0 yrs	80.0%	0.0
Administrative support	0.0	0.0	10.0%	0.0	10.0 yrs	8.0 yrs	80.0%	0.0
TOTAL REPLACEMENT COST								586,800.0
TAX SAVINGS								0.0%
AFTER-TAX REPLACEMENT COST								586,800.0
Tax Benefit Cash Flow Factor								[1] 1.122x

Analysis of the assembled workforce

The Assembled Workforce calculations have been completed and entered into the spreadsheets below. The assembled workforce is not a separable, identified asset. It is considered part of the final goodwill asset. However, for purposes of the Contributory Asset Charge (CAC) it must be separately valued since it has a different rate of return than goodwill and is included as a separate asset in the CAC calculation. The Assembled workforce is calculated from the perspective of having to replace the existing workforce. The model below is an example of the replacement cost method. All hiring costs, incremental salaries and bonuses, training costs and unproductive ramp-up inefficiencies are captured in the calculations below.

Exhibit 11

Wahmi, Limited

Assembled Workforce Analysis

Cost Approach

(€ 000)

Employee Classification/Grade	Executive	Managerial	Clerk & Automotive	Shipping
<u>Average Compensation/Employee</u>				
Total Base Salary	€ 782,226	€ 647,837	€ 1,023,235	€ 568,818
Number of Employees (FTE)	6.0	12.0	42.0	25.0
Base Salary	130,371	53,986	24,363	22,753
Bonus/Other	28,682	4,859	0	0
As % of Base Salary	22.0%	9.0%	0.0%	0.0%
Total Compensation	159,053	58,845	24,363	22,753
Benefits/Other	31,289	12,957	5,847	5,461
As % of Base Salary	24.0%	24.0%	24.0%	24.0%
Fully Burdened Total Compensation	190,342	71,802	30,210	28,213
Fully Burdened Compensation/Hour	92	35	15	14
<u>Incremental Compensation Cost</u>				
Base Salary	130,371	53,986	24,363	22,753
Incremental Base Salary	15,000	5,000	7,500	5,000
As % of Base Salary	0.0%	0.0%	0.0%	0.0%
New Hire Base Salary	145,371	58,986	31,863	27,753
Bonus/Other	35,000	5,000	0	0
As % of Base Salary	24.1%	8.5%	0.0%	0.0%
New Hire Total Compensation	180,371	63,986	31,863	27,753
Benefits/Other	31,289	12,957	5,847	5,461
As % of Base Salary	21.5%	22.0%	18.4%	19.7%
New Hire Fully Burdened Total Compensation	211,660	76,943	37,710	33,213
Fully Burdened Compensation/Hour	102	37	18	16
Incremental Total Compensation	€ 21,318	€ 5,141	€ 7,500	€ 5,000

Exhibit 11
Wahmi, Limited
Assembled Workforce Analysis

Cost Approach

(€ 000)

Interviewing/Recruiting Cost	Executive	Managerial	Clerk &	Shipping
First Round Interview				
Number of Candidates	8.0	5.0	5.0	3.0
Total Interviewing Time	1.0	1.0	1.0	0.5
Total First Interview Time	8.0	5.0	5.0	1.5
Interviewer's Cost/Hour	€ 60.00	€ 60.00	€ 60.00	€ 60.00
Second Round Interview				
Number of Candidates	2.0	3.0	3.0	2.0
Total Interviewing Time	3.0	2.0	1.5	1.0
Total Second Interview Time	6.0	6.0	4.5	2.0
Interviewer's Cost/Hour	€ 60.00	€ 50.00	€ 25.00	€ 25.00
Total Interviewing Time	14.0	11.0	9.5	3.5
Blended Cost/Hour	60.00	54.55	43.42	40.00
Total Interviewing Cost	840	600	413	140
New Hire Base Salary	145,371	58,986	31,863	27,753
Headhunter Fee as % of Hiring Base Salary	25.0%	0.0%	0.0%	0.0%
Headhunter Fee	36,343	-	-	-
Interviewing/Recruiting Costs				
Interviewing Costs	840	600	413	140
Headhunter Fees	36,343	-	-	-
Other Costs	-	-	-	-
Total Interviewing/Recruiting Costs	€ 37,183	€ 600	€ 413	€ 140

Exhibit 11**Wahmi, Limited****Assembled Workforce Analysis***Cost Approach*

(€ 000)

Training/Productivity Costs	Executive	Managerial	Clerk &	Shipping
Internal Training Time	80.0	40.0	20.0	16.0
Instructor Cost/Hour	€ 30.00	€ 20.00	€ 12.00	€ 8.00
Total In-House Training Cost	2,400	800	240	128
Outside/Formal	-	-	-	-
Total Training Costs	2,400	800	240	128
Fully Burdened Compensation	211,660	76,943	37,710	33,213
Average Unproductive Factor	75.0%	50.0%	25.0%	25.0%
Loss of Productivity/Year	158,745	38,472	9,427	8,303
Loss of Productivity/Week	3,053	740	181	160
Number of Weeks to Full Productivity	8.0	6.0	2.0	1.0
Total Productivity Costs	€ 24,422	€ 4,439	€ 363	€ 160
REPLACEMENT COST SUMMARY				
Incremental Compensation Costs	€ 21,318	€ 5,141	€ 7,500	€ 5,000
Interviewing/Recruiting Costs	37,183	600	413	140
Training/Loss of Productivity Costs	24,422	4,439	363	160
Total Cost/Employee	82,923	10,180	8,275	5,300
Number of Employees (FTE)	6.0	12.0	42.0	25.0
REPLACEMENT COST/EMPLOYEE GRADE	€ 497,541	€ 122,163	€ 347,554	€ 132,492
TOTAL REPLACEMENT COST	€ 1,099,750			
TAX SAVINGS	24.0%	263,940		
AFTER-TAX REPLACEMENT COST		835,810		
Tax Benefit Cash Flow Factor	[1]	1.122x		
Economic Value		€937,550		

Analysis of the Contributory Asset Charge

The Contributory Asset Charge is shown below in Exhibit 12 (also see excel file, tab “E12.Cont.Asset.Ch”). This calculation equals the after-tax return that is required for all assets in the business other than the customer list, including working capital, fixed assets, the trade name, software, and assembled workforce. These returns will be deducted from total income to isolate the customer list returns in the following exercise.

$$(\text{FV of Asset} \times \text{after-tax return}) = \text{Required Cash Return on Asset};$$

$$(\text{Required Cash Return}/\text{Revenue}) = \text{Net profit margin on asset}$$

The sum total of each net margin of each individual asset equals the CAC. The CAC is deducted from total revenue to determine the profit which is attributable to the sole remaining asset which is the customer list.

Exhibit 12

Wahmi, Limited

Contributory Asset Returns

Summary of Values

(€ 000)

Contributory Asset		Fair Value Estimate	Required After-tax Return Estimate	Required Cash Return	Corresponding Revenue Level	Required After-tax Cash Return as % of Revenue
Debt-free Net Working Capital	[1]	€ 10,198.6	5.6%	€ 572.8	€ 78,301.0	0.7%
Fixed Assets	[1]	10,005.0	7.2%	722.4	78,301.0	0.9%
Work Force		937.6	12.1%	113.2	78,301.0	0.1%
Tradenname	[2]	20,700.0				2.3%
Software		1,784.0	15.0%	267.6	78,301.0	0.3%
Total Contributory Asset Cash Return (as a % of Rev.)						4.4%

Footnote(s)

[1] Working capital and fixed assets are valued based on their balance sheet reported amounts.

[2] Tradenname required after-tax cash return as a % of revenue = fair market royalty rate * (1 - tax rate), or 3.0% * (1 - 24%)

The return on sales that is attributable to the aggregate assets (other than the customer list) is therefore equal to 4.4%.

Exercise 4. Valuation of the Customer List

This exercise includes three tabs in the excel file:

- Exhibit 13. Revenues by Customer
- Exhibit 14. Attrition Estimate
- Exhibit 15. Customer List

Using the information in Exhibit 12 (CAC) and Exhibits 13 and 14, complete the yellow shaded cells in Exhibit 15, Customer List. The two variables that need to be entered include the contributory asset charge and the attrition estimate.

Exhibit 13
Wahmi, Limited
Revenues by Customer
(€ 000)

	12/31/2013	12/31/2014	12/31/2015	12/31/2016	12/31/2017
Customer 1	€ 8,147.5	€ 8,249.1	€ 8,414.5	€ 8,512.2	€ 8,600.8
Customer 2	7,777.3	7,518.6	7,605.3	7,598.0	7,815.1
Customer 3	5,948.0	6,855.3	6,752.2	6,419.5	6,653.2
Customer 4	4,917.4	5,013.5	5,009.3	5,551.2	5,216.0
Customer 5	3,918.5	4,002.3	4,189.0	4,089.3	4,159.0
Customer 6	3,908.4	4,187.2	4,186.0	4,216.2	0.0
Customer 7	2,611.0	2,900.0	3,008.0	2,915.0	3,050.5
Customer 8	1,556.9	1,956.2	2,850.0	3,201.8	3,359.6
Customer 9	0.0	0.0	621.0	1,774.1	2,926.3
Customer 10	1,422.0	0.0	0.0	0.0	0.0
Customer 11	1,189.0	987.0	1,096.0	0.0	0.0
Customer 12	1,086.3	1,288.5	985.0	956.1	156.8
Customer 13	998.0	995.0	655.9	615.9	0.0
Customer 14	951.2	948.7	755.0	715.8	722.8
Customer 15	0.0	0.0	0.0	701.0	705.2
Customer 16	0.0	22.0	148.3	189.2	699.2
Customer 17	950.1	1,080.3	1,186.0	1,212.1	1,414.4
Customer 18	929.0	944.0	1,245.0	1,308.4	1,209.5
Customer 19	918.4	821.3	255.0	486.1	0.0
Customer 20	877.2	50.2	89.3	0.0	0.0
Customer 21	851.2	655.1	701.2	548.1	559.5
Customer 22	0.0	0.0	858.1	257.6	528.8
Customer 23	800.8	129.8	156.3	229.2	288.6
Customer 24	751.8	0.0	0.0	0.0	0.0
Customer 25	706.5	1,099.5	885.3	649.5	654.4
Customer 26	664.2	758.6	269.5	317.7	321.8
Customer 27	0.0	255.0	159.5	305.2	333.2
Customer 28	608.5	699.9	709.6	855.3	828.9
Customer 29	0.0	0.0	214.0	0.0	801.0
Customer 30	587.6	678.2	715.6	679.1	798.5
Customer 31	555.3	594.5	665.8	159.8	0.0
Customer 32	501.9	422.0	487.9	333.6	685.5
Customer 33	458.2	319.5	0.0	0.0	0.0
Customer 34	0.0	451.0	0.0	298.2	569.2
Customer 35	0.0	0.0	0.0	158.3	497.7
Customer 36	422.5	29.6	0.0	0.0	0.0
Customer 37	348.8	0.0	0.0	0.0	0.0
Customer 38	333.7	318.9	415.9	214.9	547.6
Customer 39	292.6	588.4	669.5	671.9	698.8
Customer 40	246.5	648.5	714.4	717.8	798.5
Customer 41	222.1	298.5	316.9	399.2	509.5
Customer 42	209.9	152.2	189.5	98.5	487.5
Customer 43	0.0	124.0	299.8	326.3	397.7
Customer 44	0.0	0.0	100.5	199.7	380.2
Customer 45	197.8	122.5	156.2	198.3	201.5
Customer 46	192.8	296.5	154.3	164.5	218.8
Customer 47	185.3	288.2	150.0	128.3	178.9
Customer 48	0.0	111.0	222.3	383.1	490.0
Customer 49	179.9	215.6	222.2	233.6	299.0
Customer 50	0.0	0.0	0.0	0.0	643.1
Customer 51	160.5	178.5	187.6	198.2	228.0
Customer 52	154.6	166.2	174.6	0.0	0.0
Customer 53	141.3	128.5	145.2	0.0	0.0
Customer 54	140.2	89.0	0.0	0.0	0.0
Customer 55	135.5	0.0	0.0	0.0	0.0
Customer 56	0.0	587.5	0.0	288.8	456.2
Customer 57	130.9	158.6	66.3	0.0	0.0
Customer 58	129.8	0.0	0.0	0.0	0.0
Customer 59	124.4	255.0	259.3	269.3	312.7
Customer 60	0.0	109.6	108.6	102.5	0.0
Customer 61	0.0	65.5	121.4	89.5	65.3
Customer 62	120.2	198.5	201.5	272.7	377.0
Customer 63	119.2	129.6	134.8	189.6	157.9
Customer 64	111.1	201.0	205.9	297.5	301.0
Customer 65	105.5	89.0	0.0	0.0	0.0
Total	€ 58,997.3	€ 59,432.7	€ 60,090.3	€ 60,697.7	€ 61,304.7

Exhibit 14
Wahmi, Limited
Attrition Calculation
(€ 000)

	12/31/2013	12/31/2014	12/31/2015	12/31/2016	12/31/2017
Customer 1	€ 8,147.5	€ 8,147.5	€ 8,147.5	€ 8,147.5	€ 8,147.5
Customer 2	7,777.3	7,777.3	7,777.3	7,777.3	7,777.3
Customer 3	5,948.0	5,948.0	5,948.0	5,948.0	5,948.0
Customer 4	4,917.4	4,917.4	4,917.4	4,917.4	4,917.4
Customer 5	3,918.5	3,918.5	3,918.5	3,918.5	3,918.5
Customer 6	3,908.4	3,908.4	3,908.4	3,908.4	0.0
Customer 7	2,611.0	2,611.0	2,611.0	2,611.0	2,611.0
Customer 8	1,556.9	1,556.9	1,556.9	1,556.9	1,556.9
Customer 9	0.0	0.0	0.0	0.0	0.0
Customer 10	1,422.0	0.0	0.0	0.0	0.0
Customer 11	1,189.0	1,189.0	1,189.0	0.0	0.0
Customer 12	1,086.3	1,086.3	1,086.3	1,086.3	1,086.3
Customer 13	998.0	998.0	998.0	998.0	0.0
Customer 14	951.2	951.2	951.2	951.2	951.2
Customer 15	0.0	0.0	0.0	0.0	0.0
Customer 16	0.0	0.0	0.0	0.0	0.0
Customer 17	950.1	950.1	950.1	950.1	950.1
Customer 18	929.0	929.0	929.0	929.0	929.0
Customer 19	918.4	918.4	918.4	918.4	0.0
Customer 20	877.2	877.2	877.2	0.0	0.0
Customer 21	851.2	851.2	851.2	851.2	851.2
Customer 22	0.0	0.0	0.0	0.0	0.0
Customer 23	800.8	800.8	800.8	800.8	800.8
Customer 24	751.8	0.0	0.0	0.0	0.0
Customer 25	706.5	706.5	706.5	706.5	706.5
Customer 26	664.2	664.2	664.2	664.2	664.2
Customer 27	0.0	0.0	0.0	0.0	0.0
Customer 28	608.5	608.5	608.5	608.5	608.5
Customer 29	0.0	0.0	0.0	0.0	0.0
Customer 30	587.6	587.6	587.6	587.6	587.6
Customer 31	555.3	555.3	555.3	555.3	0.0
Customer 32	501.9	501.9	501.9	501.9	501.9
Customer 33	458.2	458.2	0.0	0.0	0.0
Customer 34	0.0	0.0	0.0	0.0	0.0
Customer 35	0.0	0.0	0.0	0.0	0.0
Customer 36	422.5	422.5	0.0	0.0	0.0
Customer 37	348.8	0.0	0.0	0.0	0.0
Customer 38	333.7	333.7	333.7	333.7	333.7
Customer 39	292.6	292.6	292.6	292.6	292.6
Customer 40	246.5	246.5	246.5	246.5	246.5
Customer 41	222.1	222.1	222.1	222.1	222.1
Customer 42	209.9	209.9	209.9	209.9	209.9
Customer 43	0.0	0.0	0.0	0.0	0.0
Customer 44	0.0	0.0	0.0	0.0	0.0
Customer 45	197.8	197.8	197.8	197.8	197.8
Customer 46	192.8	192.8	192.8	192.8	192.8
Customer 47	185.3	185.3	185.3	185.3	185.3
Customer 48	0.0	0.0	0.0	0.0	0.0
Customer 49	179.9	179.9	179.9	179.9	179.9
Customer 50	0.0	0.0	0.0	0.0	0.0
Customer 51	160.5	160.5	160.5	160.5	160.5
Customer 52	154.6	154.6	154.6	0.0	0.0
Customer 53	141.3	141.3	141.3	0.0	0.0
Customer 54	140.2	140.2	0.0	0.0	0.0
Customer 55	135.5	0.0	0.0	0.0	0.0
Customer 56	0.0	0.0	0.0	0.0	0.0
Customer 57	130.9	130.9	130.9	0.0	0.0
Customer 58	129.8	0.0	0.0	0.0	0.0
Customer 59	124.4	124.4	124.4	124.4	124.4
Customer 60	0.0	0.0	0.0	0.0	0.0
Customer 61	0.0	0.0	0.0	0.0	0.0
Customer 62	120.2	120.2	120.2	120.2	120.2
Customer 63	119.2	119.2	119.2	119.2	119.2
Customer 64	111.1	111.1	111.1	111.1	111.1
Customer 65	105.5	105.5	0.0	0.0	0.0
Total	€ 58,997.3				€ 46,209.9

Estimated Compound Annual Loss Rate	-5.9%
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Exhibits 13 and 14 determine an estimation of customer attrition. Management provided historical sales by customer for the Company's top 65 customers between 2013 and 2017. That information is contained in Exhibit 13. Exhibit 14 isolates only the customers that existed in 2013. The model reflects the 2013 sales amount for each year in which that customer bought goods from the company.

For example, Customer #1 purchased €8,147,500 of goods from Wahmi in 2013 and the customer bought goods all five years. Exhibit 14 attributes €8.147 million in sales to that customer in all five years of the study (even Customer #1 bought higher amounts of goods in ensuing years) since the model is measuring customer activity in ensuing years *relative* to 2013. If the customer left the company, then the sales level is reduced to zero as is the case with Customers #10 and #11.

Also, customers that did not exist in 2013 but came in to the company in later years are attributed zero sales in all years since the objective of the model is to measure customer attrition in 2017, *relative to the customers that existed in 2013*.

Exhibit 15
Wahmi, Limited
Customer List Valuation
MPEEM

(€ 000)

BASE YEAR CUSTOMER CASH FLOW ANALYSIS

CUSTOMER REVENUE ESTIMATE		€ 78,301.0
EBIT	9.64%	7,551.0
TAXES	24.0%	1,812.2
AFTER-TAX INCOME		5,738.8
AFTER-TAX CONTRIBUTORY ASSET RETURNS		#VALUE!
CUSTOMER CASH FLOW		#VALUE!
ATTRITION RATE		
GROWTH RATE		3.0%

Year	Total Cash Flow	Remaining %	Remaining Cash Flow	Discount Rate	PV Factor	Present Value	Discounting Period
1	#VALUE!	#VALUE!	#VALUE!	14.0%	0.9366	#VALUE!	0.5000
2	#VALUE!	#VALUE!	#VALUE!	14.0%	0.8216	#VALUE!	1.5000
3	#VALUE!	#VALUE!	#VALUE!	14.0%	0.7207	#VALUE!	2.5000
4	#VALUE!	#VALUE!	#VALUE!	14.0%	0.6322	#VALUE!	3.5000
5	#VALUE!	#VALUE!	#VALUE!	14.0%	0.5545	#VALUE!	4.5000
6	#VALUE!	#VALUE!	#VALUE!	14.0%	0.4864	#VALUE!	5.5000
7	#VALUE!	#VALUE!	#VALUE!	14.0%	0.4267	#VALUE!	6.5000
8	#VALUE!	#VALUE!	#VALUE!	14.0%	0.3743	#VALUE!	7.5000
9	#VALUE!	#VALUE!	#VALUE!	14.0%	0.3283	#VALUE!	8.5000
10	#VALUE!	#VALUE!	#VALUE!	14.0%	0.2880	#VALUE!	9.5000
11	#VALUE!	#VALUE!	#VALUE!	14.0%	0.2526	#VALUE!	10.5000
12	#VALUE!	#VALUE!	#VALUE!	14.0%	0.2216	#VALUE!	11.5000
13	#VALUE!	#VALUE!	#VALUE!	14.0%	0.1944	#VALUE!	12.5000
14	#VALUE!	#VALUE!	#VALUE!	14.0%	0.1705	#VALUE!	13.5000
15	#VALUE!	#VALUE!	#VALUE!	14.0%	0.1496	#VALUE!	14.5000

TOTAL PRESENT VALUE #VALUE!
Tax Benefit Cash Flow Factor [2] 1.122x

Economic Value #VALUE!
Rounded Value #VALUE!

Reconciliation of Values

After valuing the customer list, the valuer has assigned values to all of the Company's tangible and identifiable intangible assets. The only asset that has not been directly valued is the remaining goodwill. By definition the goodwill equals the Fair Value of the firm (in the case the fair value equals the transaction price) less the value of each tangible asset and each identified intangible asset.

In addition to calculating goodwill value in this way, the valuer should perform a check to his analysis by calculating the weighted average return on assets ("WARA"). This calculation is shown in Exhibit 16 (see excel file, tab E16.WARA).

Exhibit 16 **Wahmi, Limited** **Weighted Average Return on Assets**

(€ 000)					
Asset	Fair Value	% of Total Assets	Required After-tax Return Estimate	Contribution to Weighted Return	
Debt-free Net Working Capital	€ 10,198.6	15.0%	5.6%	0.8%	
Fixed Assets	10,005.0	14.7%	7.2%	1.1%	
Trade Name	20,700.0	30.4%	14.0%	4.3%	
Software	1,784.0	2.6%	15.0%	0.4%	
Work Force	937.6	1.4%	12.1%	0.2%	
Customer List	14,130.0	20.8%	14.0%	2.9%	
Goodwill	10,244.8	15.1%	16.0%	2.4%	
BUSINESS ENTERPRISE VALUE	€ 68,000.0	100.0%	WARA	12.0%	
			WACC	12.1%	
			TRANSACTION IRR	12.1%	

The fair value amount of €68 million is entered into the business enterprise value cell and the goodwill amount is calculated by subtracting all the valued assets. The goodwill amount equals 68 million less the other values.

The percentage weight of each asset is then calculated as a percentage of business enterprise value (BEV). The required after tax rate of return for each asset is then multiplied by the weight to determine the portion that each weight has in the total value. The summed weights equal the WARA.

If the valuation was completed with a consistent assessment of risk for each asset and no errors were made in calculation, then the WARA, the WACC and the IRR should approximate

each other. The amounts do not have to equal, but there should not be a material difference since each of the metrics indicates the same variable, Wahmi's cost of capital.

Section E. Chapter Review Questions

1. Sample Company has the following assets with the following returns. You are valuing Sample's customer list.

Asset	Fair Value	Required Return
Net working capital	\$ 2,400,000	5.5%
Fixed Assets	8,750,000	6.5%
Software	2,300,000	13.5%
Trade name	7,100,000	

Additional information		
Trade name royalty rate		3.00%
Tax rate		25.00%
Company revenue		35,000,000

What is Sample's contributory asset charge given the above information?

- A. 27.5%
- B. 5.1%**
- C. 20.6%
- D. 5.9%
2. You are valuing the trade name for Cowboy Jeans, an American-based manufacturer of pants and casual clothing. Royalty rate research has uncovered the following data:

Business	Product Licensed	Royalty Rate
Apple Computer	Mac trade name	7.0%
The Gap	The Gap apparel trademark	4.0%
Coca-Cola	Coke trade name	9.0%
Disney	Mickey Mouse cartoon image	6.5%
Abercrombie & Fitch	A&F apparel trademark	3.0%
Izod Lacoste polo shirts	Alligator trademark	3.5%
Mercedes Benz	Mercedes trademark	8.0%
Bostonian shoes	Bostonian tradename	3.0%
Alibaba	Alibaba name	10.0%
	Average	6.0%
	Median	6.5%

What would be an appropriate royalty rate for Cowboy Jeans?

- A. 3.4%
 - B. 6.0%
 - C. 10.0%
 - D. 6.5%
3. Which of the following intangible assets is an example of a contractual type of asset?
- A. Customer list
 - B. Net working capital
 - C. Non-competition agreement
 - D. Trade name
4. Which of the following statements best describes the tax amortization benefit?
- A. The value a long term leasehold interest where market lease rates have increased above the contractual rent being paid by the lessee
 - B. The present value of the tax amortization from the identified intangible asset over its tax life
 - C. The present value of a lease amortization over the life of the lease contract
 - D. The present value of the tax savings on the amortization from the identified intangible asset over its tax life
5. A company's annual customer attrition rate is 6.0%. The Company's annual growth rate is 3.5%. Assuming that the prior year's cash flow attributable to its customer list was \$100,000, the cash flow in the first year of the forecast would equal:
- A. \$97,000
 - B. \$100,395
 - C. \$97,290
 - D. \$94,000

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Chapter 4. Advanced International Cost of Capital

Section A. Introduction

iiBV 202 introduced the topic of estimating the cost of capital for developing and undeveloped countries. Basic underlying international macroeconomic principles were discussed as well as several general models for deriving the cost of equity. This chapter takes a closer look at four models for developing the cost of equity in developing economies. Three sources provide the annually updated information that is needed to use these models:

- 2016 International Valuation Handbook; *Guide to Cost of Capital*, Duff & Phelps, Wiley, 2016 (referred to throughout this chapter as “the *Handbook*”)
- 2016 International Valuation Handbook: *Industry Cost of Capital*, Duff & Phelps, Wiley, 2016
- www.damodaran@nyu.edu

These texts are not required for the student in this course. The classroom material and the examination are based on the material in this outline. However, it is highly recommended that the valuation practitioner obtain a copy of the two texts above for reference in practice. The Damodaran website contains the research from Aswath Damodaran, Ph.D. from New York University. This information, as well as excerpts from the Duff & Phelps Guide, are needed for using the Damodaran model which is one of the models discussed below.

Four Models were selected for further analysis in this Chapter:

- Relative Volatility Model
- Erb-Harvey-Viskanta Country Credit Rating Model
- Country Yield Spread Model
- Damodaran Model

All four international cost of capital models covered in this chapter were introduced in iiBV 202, The Income Approach. Although the models have been discussed, the information that is needed to actually apply the models was not discussed. This chapter reviews the information sources that allow the valuer to actually use these models.

In the development of a cost of equity outside North America, it is best practice to use as many of these models as data sources and practicality allow. After reviewing the relevance and limitations of each model the valuer can then decide on an appropriate cost of equity.

Section B. Review

1. Capital Asset Pricing Model

A. The modified capital asset pricing model is shown below:

$$K_e = R_f + \beta(\text{ERP}) + A$$

Where:

K_e = Cost of equity

R_f = Risk-free rate

β = Beta (systematic risk)

ERP = Equity risk premium

A = Alpha (size and specific risk)

- (1) The CAPM estimates the cost of equity.
- (2) The above model is the modified CAPM, which estimates the cost of equity for a single stock.
 - (a) The original CAPM excluded the Alpha variable since it did not include unsystematic risk. The original CAPM was derived to assess the cost of equity for a portfolio of stocks in which all unsystematic risk was assumed to be diversified away.

B. Risk-free rate (R_f)

- (1) The yield to maturity on a country's long-term government bond is used as a proxy for the risk-free rate.
- (2) The risk-free rate should capture the long-term inflation in the subject country's economy. If a developed country's government bond is applied in the valuation of a subject company in a developing economy, then the inflation differential must be captured elsewhere.
- (3) If, for example, a U.S. government bond is used, the valuer should be aware that he is building a discount rate based in U.S. dollars.

C. Beta (β)

- (1) The beta is a proxy for systematic risk. Systematic risk represents risk that cannot be diversified away. Natural disasters, civil unrest, climate change are all examples of systematic risk.
- (2) A stock's beta represents the volatility of the stock's excess returns in relation to the excess returns in the stock market.

- (3) A beta above 1.0 indicates a greater degree of volatility relative to the market and a beta below 1.0 indicates a lower degree of volatility.
 - (4) The beta is multiplied by the equity risk premium in the CAPM.
- D. Equity risk premium (ERP)
- (1) Represents the premium that an investor requires for investing in a portfolio of large publicly held stocks above the return on a developed country's yield on its long-term government bonds.
 - (2) In the past most practitioners used the arithmetic average of historical returns on the market over a period of time (the most common time period in U.S. measurements was 1926 to the measurement date).
 - (a) The Dimson Marsh and Staunton studied measure the ERP from 1900 to the present.
 - (3) Best practice today requires the use of forward-looking models such as the supply side models or IRR models available from Damodaran or Duff & Phelps.
- E. Size risk premium (part of Alpha)
- (1) Size risk is specific to the subject company and therefore part of unsystematic risk.
 - (2) Studies have consistently shown that the smaller a company is the greater its risk. For smaller companies, a size premium is added to the CAPM to capture this risk.
 - (a) The size risk though has not been measured to exist in other countries with the same consistency as in the United States. This is not to say that the size premium does not exist – it is just difficult to measure. See Section G of this chapter.
 - (3) The Duff & Phelps Risk Premium Study breaks the U.S. market down into eight different definitions of size (market value of equity, book value, total assets, market value of invested capital, sales, average historical EBITDA, average historical net income, and # of employees).
 - (a) Total market returns for each size definition are broken down by size into 25 portfolios with size premiums measured for each portfolio.
 - (b) The subject company's size risk premium should be derived from as many of the eight size definition studies as feasible.

(c) There are two size premium studies published by Duff & Phelps. The original study is relevant for the U.S. market.

- ◆ There is a separate study based on the research of Professor Erik Peek of the Rotterdam School of Management at Erasmus University. This study provides the size premium over the risk-free rate under seven different size definitions. This study is discussed further below in Section G.

F. Specific risk premium (part of Alpha)

(1) There are no quantitative models which objectively measure specific risk (above size risk). The specific risk premium is a subjective premium which is based on the valuer's professional discretion.

(2) There is potential that the valuer may double count risk factors if a specific risk adjustment is made above a size risk premium.

(a) Example: A valuer derives the cost of equity as follows:

$$19.05\% = 2.5\% + 1.10(5.5\%) + 7.0\% + 3.5\%$$

(b) The size risk is 7.0% based on the size premium studies. The valuer justifies the specific risk premium of 3.5% by saying it is risk due to lack of management depth, lack of access to capital markets, and lack of geographic diversification.

(c) The valuer could be criticized for double counting since the support used to justify the specific risk are all size factors that would normally be captured in the size premium of 7.0%.

(3) Accounting guidance frowns on specific risk adjustments that are not based on objective facts.

2. Country Risk

A. Country risk is attributed in large part to an undeveloped or developed economy's isolation from global markets. The more isolated the country is from global markets, the greater the volatility of its markets. This volatility causes higher variability in earnings, which is the equivalent of risk. This segmentation of a country from global markets is traced to factors in three areas:

(1) Financial

- (a) Currency risk – risk of a detrimental change in exchange rate will lower the returns when profits are converted back to the investor's home currency.
 - ◆ Currency risk is usually captured by building anticipated exchange rate fluctuations into the forecasted cash flow rather than a separate currency risk premium in the discount rate.
 - (b) Leverage
- (2) Economic
- (a) Inflation rate – Global inflation has increased to approximately 3.5% as of 2017, the highest rate in five years. However, some countries due to a variety of economic factors are well above the average.
 - (b) Government debt to GDP ratios – The higher the ratio, the riskier the economy. As the amount of the debt increases a larger portion of the government budget goes to debt service and less is devoted to the public good.
 - ◆ Economists generally agree that debt to GDP ratios above 80% place a country in an increasingly precarious position.
 - ◆ The chart below shows that some of the world's largest economies have debt/GDP ratios in a high risk range. This can lead to higher inflation and a devalued currency.

20 Largest Economies by GDP		
Country	Inflation Rate @ 2017	Debt/GDP Ratio
Japan	0.6%	248.0%
Italy	1.3%	133.0%
United States	1.9%	106.0%
Spain	1.9%	99.0%
France	1.2%	97.0%
Canada	1.8%	91.0%
U.K.	2.7%	89.0%
Brazil	3.8%	74.0%
Germany	1.6%	71.0%
Netherlands	1.1%	68.0%
India	3.9%	67.0%
Mexico	5.7%	54.0%
Switzerland	0.5%	46.0%
China	1.9%	44.0%
Australia	2.2%	37.0%
South Korea	1.9%	36.0%
Turkey	10.3%	33.0%
Indonesia	4.3%	27.0%
Russia	4.1%	18.0%
Saudi Arabia	1.1%	6.0%

Sources: *The Economist*
2016 International Valuation Handbook

- (3) Political
 - (a) Corruption
 - (b) Government expropriation of assets
 - (c) Military conflict
 - (d) Rule of law
 - (e) Terrorism

- B. One common approach in the international models is to first measure the cost of equity for a developed country and then add a premium for the subject company's country.
 - (1) The valuer must remember to match the discount rate currency with the cash flow currency in the numerator of the DCF model.
 - (2) If the model develops the risk-free rate, beta, and ERP based on a developed economy's metrics and adds a country risk premium relative to the developed economy, then the cash flows must be forecast in the developed economy's currency.

3. Although many of the models are theoretically sound they are difficult to apply since they require inputs of information which either does not exist or is too costly for the valuer to accumulate.
 - A. Some models require the local country to have a well-developed and diversified stock market from which information can be derived. Most developing and undeveloped nations do not have such markets.
 - B. Other information, such as an individual company's exposure to the local market relative to other companies can be difficult to obtain.

Section C. Relative Volatility Model (RVM)

1. This model was developed in various forms at the Massachusetts Institute of Technology by Professor Donald Lessard and by analysts at Goldman Sachs and Bank of America.
2. Similar to the reasoning used by other models the RVM develops a cost of equity based on a developed economy's metrics and inserts a factor to recognize the additional risk of operating in a developed or undeveloped economy.
3. The model is presented as follows:

$$K_{el} = R_{fd} + (\beta_d \times ERP_d \times RV) + A$$

Where:

- K_{el} = Cost of equity in local country
- R_{fd} = Risk-free rate for developed economy
- β_d = Beta from developed economy
- ERP_d = Equity risk premium for developed economy
- RV = Relative Volatility
- A = Alpha (size and specific risk) for subject company

Notes: Duff & Phelps data has options for United States or Germany as the developed economy

- A. The resultant cost of equity in the local country captures the risk of the local country but is expressed in the currency of the developed country since the variables (risk-free rate, beta, equity risk premium) are derived from the developed market.
- B. The relative volatility (RV) variable can be thought of as an adjustment to the beta. It represents the incremental risk of investing in the local country by

measuring the relative volatility of the local market against the developed country's market.

- (1) It is calculated as the ratio of the annualized monthly standard deviation of the local country's equity returns on the market relative to the annualized monthly standard deviation of the developed country's equity returns.
- (2) The model uses trailing 60 months of equity returns to measure monthly standard deviation. The standard deviation from the local market is divided by the standard deviation of the developed market to arrive at the RV factor.

C. Limitations of the Model

- (1) If the local country's stock market is not well-diversified (most developing country's stock markets are not well-diversified), then the volatility of that market might not reflect country risk, but the risk of the industry or industries that dominate that stock market.
- (2) If the subject company is a large company with access to global markets, then the country risk may not be relevant since the subject can mitigate the risk by shifting production elsewhere.

4. RV Model adapted for industry risk

A. The original RV model shown above measures country risk relative to a developed economy, either the U.S. or Germany, as exemplified below.

- (1) Since only country risk is captured, the valuer must still account for the subject company industry, size, and specific risk.

B. The model can be adapted to capture not just country risk, but industry risk as well to include some or all of the risk of the subject company.

- (1) Industry betas are available to measure some of the specific company risk. The model would be adapted as follows:

$$K_{el} = R_{fd} + (\beta_{di} \times ERP_d \times RV) + A$$

Where:

- K_{el} = Cost of equity in local country
- R_{fd} = Risk-free rate for developed economy
- β_{di} = Industry beta from developed economy
- ERP_d = Equity risk premium for developed economy
- RV = Relative Volatility
- A = Alpha (size and specific risk) for subject company

Notes: Industry betas for world, Eurozone, European Union, and United Kingdom are available from International Valuation Handbook; Industry Cost of Capital, Duff & Phelps

- (2) The only change in this model relative to the base model is the β_{di} variable, which represents the industry-specific beta from the developed economy.
- (3) Industry betas can be found in a variety of sources. For the regions noted above, one suggested source is:
 - (a) Duff & Phelps, "2016 International Valuation Handbook, Industry Cost of Capital", Wiley, 2016
 - ◆ This source provides betas by industry for the world, the United Kingdom, the Eurozone, the European Union, in euros, pounds and dollars
 - (b) Duff & Phelps, "2016 Valuation Handbook – Industry Cost of Capital, Wiley, 2016
 - ◆ This source provides betas by industry for the U.S. in dollars

5. Duff & Phelps data support

- A. Duff & Phelps publishes the RV factors relevant to the United States market and the German Market in its International Valuation Handbook.

**Duff & Phelps RV Factors relevant to the United States and Germany -Selected Countries
as of March 31, 2016**

Country	U.S. RV Factor \$	German RV Factor €	S&P Sovereign Credit Rating	MSCI Market Classification
Bahrain	1.2	0.8	BB	Frontier
Croatia	1.0	0.5	BB	Frontier
Czech Republic	1.6	0.9	AA-	Emerging
Egypt	2.3	1.5	B-	Emerging
Jordan	1.3	0.9	BB-	Frontier
Kuwait	1.0	0.7	AA-	Frontier
Oman	1.0	0.8	BBB-	Frontier
Qatar	1.4	1.0	AA	Emerging
Russia	2.1	1.3	BB+	Emerging
Saudi Arabia	1.5	0.9	A-	
Serbia	2.0	1.1	BB-	Frontier
United Arab Emirates	2.5	1.6	AA	Emerging

Source: 2016 International Valuation Handbook; Guide to Cost of Capital, Duff & Phelps

- (1) If the U.S. factor is used then the rest of the model's variables should be expressed in U.S. metrics and the cost of equity would be relevant to dollars.
- (2) If the German factor is used then the rest of the model's variables should be expressed in German metrics and the cost of equity would be relevant to euros.

B. The difference in relative volatility factors reflects a potential limitation in the model, as noted above. Many of the emerging countries are less volatile than the German market, as per the RV factors; if the model were applied, then the cost of equity would be lower for the subject company in, say, Croatia, than the same company in Germany.

- (1) This is unlikely the case. It is more likely that the Croatian market is not active or diverse enough for a valid comparison.
- (2) Conversely, the emerging market might be dominated by a single industry which is not volatile.

6. Example

A. A valuer is deriving a cost of equity for a auto parts manufacturer in Serbia. The valuer operates in Germany and is developing a cost of equity in euros. He consulted the 2016 International Valuation Handbook and determined that the beta for auto components manufacturers (GIC 251010) for the Eurozone, in euros, was 1.5. The cost of equity is therefore derived as:

$$= 3.0\% + (1.5 \times 5.0\% \times 1.1)$$

= 11.25%

- (1) In this example, the 3.0% represents the German risk-free rate, the 1.5 is the industry beta for auto parts manufacturers in the Eurozone, the 5.0% is the ERP in Germany, and 1.1 is the RV factor for Germany.
- (2) The 11.25% is the derived cost of equity assuming the following:
 - (a) It is from a German investor's perspective and the cash flows are in euros.
 - (b) The cost of equity captures the country risk of operating in Serbia.
 - (c) The industry risk for auto parts manufacturing in the Eurozone is captured; if there are factors which make this industry more or less risky in Serbia relative to the Eurozone, they would need to be accounted for.
 - (d) Specific company risks due to size and other factors have not theoretically been captured. In reality, they may have been captured in the industry beta and RV factor above, but they have not been specifically addressed.

Section D. Erb-Harvey-Viskanta Country Credit Rating Model

1. The model develops country risk premiums in a 2-step process:
 - A. Country credit ratings are regressed against country market returns. For those undeveloped or developing countries without market returns, their credit rating can be entered into the regression to derive the implied returns.
 - B. Country risk premiums for any country relative to any other country can be derived by subtracting one country's return from the other.
2. STEP A:
 - A. Each country's credit rating is based on information from *Institutional Investor*, a bi-annual publication of country credit ratings.
 - (1) Institutional Investor bases its CCRs on input from international bankers, money managers, and securities firms which rank each country on a scale of 0 to 100 with 0 being the riskiest and 100 being the safest.
 - B. Each country's market returns (to the extent they exist) are regressed against the country credit rating as per the following regression model:

$$K_{el} = \alpha + \beta \times [\text{natural log}(\text{CCR}_L)] + \varepsilon$$

Where:

- K_{el} = Cost of equity in local country
- α = Regression constant
- β = Regression coefficient
- CCR_L = Country credit rating of local country
- ε = Regression error term

- (1) The model works as follows:
 - (a) All available country credit ratings (i.e. 0 to 100 for each country) from 1979 through 2016 are matched with each country's following monthly equity returns (for example, a CCR for Saudi Arabia for January, 1980 would be matched with the Saudi Arabian equity return for February of 1980, etc.). As of 2016, this resulted in 20,477 matched monthly pairs.
- (2) The model regresses all the country credit ratings for all countries in a given month against all equity returns for countries in the following month. The regression inputs are as follows:
 - (a) The natural log of the CCRs is the independent variable.
 - (b) The equity returns is the dependent variable.
 - (c) The latest CCR for the country whose cost of equity is being sought.
- (3) The Model uses the predictive ability of the regression model to predict the expected rate of return. The example below is for demonstration purposes as to how the regression works. The data used is not actual CCR data.

Sample Regression Analysis

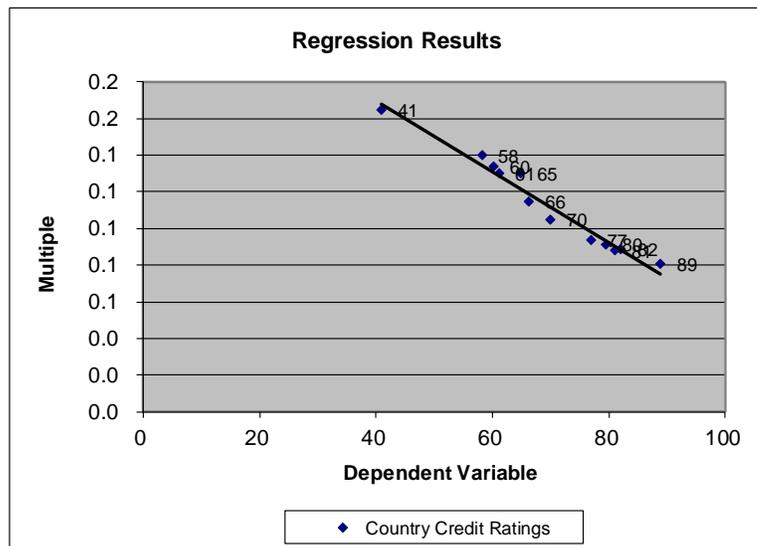
(for demonstration purposes - not actual data)

	Y - Dependent Variable	X - Independent Variable		
	Equity Returns	Country Credit Rating	Predicted Equity Return	Residual
Country A	8.1%	88.9	7.5%	0.01
Country B	14.0%	58.2	13.5%	0.01
Country C	13.0%	61.1	12.9%	0.00
Country D	9.2%	79.5	9.4%	(0.00)
Country E	13.4%	60.2	13.1%	0.00
Country F	16.5%	41.0	16.8%	(0.00)
Country G	11.5%	66.3	11.9%	(0.00)
Country H	8.8%	81.1	9.0%	(0.00)
Country I	8.9%	82.1	8.9%	0.00
Country J	9.4%	76.9	9.9%	(0.00)
Country K	13.0%	64.9	12.2%	0.01
Country L	10.5%	70.0	11.2%	(0.01)
Subject Country		75.0	10.2%	

Intercept 0.25
Coefficient (0.002)

R-Squared 0.97 R-Squared is interpreted as the proportion of the variance in MVIC/Sales attributable to the variance in EBIT/Sales

- (4) The subject country’s CCR can be entered into the regression to derive the predicted equity return.
- (5) In this example, the equity returns are expressed in a specific currency, say the U.S. dollar. Therefore the 10.2% equity return would represent the cost of equity of the subject country *from the perspective of a U.S. investor.*



- (a) The regressions are repeated for each of the 56 country perspectives presented in the Handbook (data on equity returns is taken from the MSCI Global Equity Indices, which includes a total of 72 countries).
3. STEP B:
 - A. Once total equity returns are found for each country, relative country risk premiums can be derived by subtracting any country's return from any other country's return.
4. Country Risk Premium Data
 - A. The Erb-Harvey-Viskanta country risk premiums can be used in the context of a CAPM.
 - B. Data is presented from the perspective of 56 different countries providing country risk premiums for 179 countries.
 - (1) This country risk premium data presents the risk of investing in 179 countries from the perspective of investors in each of 56 other countries. In other words, there are 56 sets of country risk premium data, one for each country perspective (approximately half of the total *Handbook* is comprised of this premium data presentation).
 - (2) The data is presented quarterly by the *Handbook*. For each quarter, each country's base cost of equity capital is presented. To determine the relevant cost of equity, one merely adds or subtracts the premium to determine the appropriate return for the investment in question.
 - (3) An example for one of the 56 countries presented in the *Handbook*, Saudi Arabia, is shown below. This sampling includes 7 countries – the actual data set includes 179 countries (that is, an investment in 179 different countries from the perspective of an investor in Saudi Arabia):

	Base Cost of Equity	
	12/31/2015	3/31/2016
Saudi Arabia =	10.3%	10.6%

Investor Perspective: Saudi Arabia

Country	Country Risk Premium 3/31/16
Albania	7.5
China	(0.8)
Egypt	10.1
Hungary	2.8
Latvia	0.6
Russia	3.5
Spain	0.7

Source: 2016 International Valuation Handbook

- (4) The base cost of equity for Saudi Arabia (prior to consideration of unsystematic risk) was 10.6% as of March 31, 2016 (this variable is provided in the *Handbook*). Therefore, for an investor in Saudi Arabia developing a cost of capital for an investment in Russia, a country risk premium of 3.5% would be added to the capital asset pricing model to capture the risk of investing in Russia relevant to Saudi Arabia. The cost of equity inclusive of the Russian country risk would therefore be 14.1% (10.6% + 3.5%).
- (a) If the Saudi investor were making an investment in China, the cost of equity would be 9.8%, or [10.6% - (-.8%)].
- (5) Remember that the model renders the cost of equity prior to consideration of the subject company's risk. The country risk premiums when added to the country cost of equity render a cost of equity for investing in that market as a whole, not for an investment in a specific company or industry in that market.
- C. If the valuer concludes that the country's original cost of equity (i.e. the 10.6% above) is different than the cost of equity published in the *Handbook*, then the authors recommend adding the assigned premium to the valuer's cost of equity.
- (1) For example, assume the valuer concludes that the appropriate cost of equity for Saudi Arabia is 12.0%, not the 10.6% shown above. If valuing a Russian investment from the perspective of a Saudi investor, then they would use a cost of equity equal to 15.5% (12.0% + 3.5%).

5. As discussed, the above model captures country risk from the perspective of an investor in one identified country. It does not capture industry risk, company size risk, or other specific risks of a subject company.
 - (1) Industry risk and specific risk must be separately dealt with by the valuer.
 - (2) Industry risk in the home country can be estimated using the Industry Cost of Capital Handbook. The valuer would add the industry premium to the home country cost of equity and then proceed to capture the country's cost of capital as described above.

Section E. Country Yield Spread Model

1. The country yield spread model adds a country risk premium to the CAPM based on the difference in yield on the long term sovereign bond of a developed economy versus the yield on a long term sovereign bond of an emerging economy. The model is shown below:

$$K_{el} = R_{fd} + (\beta_d \times ERP_d) + CRP$$

Where:

K_{el} = Cost of equity in local country

R_{fd} = Risk-free rate for developed economy

β_d = Beta from developed economy

ERP_d = Equity risk premium for developed economy

CRP = Country Risk Premium

- A. The result of the above equation is a cost of equity for a company in a developing economy (i.e. "local country") but expressed in terms of a developed country's cash flows; therefore it would be used to discount future cash flows that are stated in the developed economy's currency.
 - B. The CRP represents the country risk premium which is measured as the yield spread between the developed country's government bond and the emerging economy's bond of an equal maturity.
 - (1) This concept works only if the emerging economy has government bonds of the same maturity that are expressed in the same currency as the developed economy.
 - (a) For example, if the model is developed in U.S. dollars, the emerging country must offer bonds denominated in dollars.
 - (b) If the model is developed from a German perspective, the emerging country must have bonds expressed in euros.
2. The *Handbook* provides a methodology for applying the model in circumstances where the emerging economy either: a) has no bonds expressed in dollars or euros; or 2) the emerging economy has no bonds.
 - A. Four levels of countries (or economies) are referenced in this model:
 - (1) Tier 1 countries – These are the developed countries with AAA credit ratings. Each of these countries has sovereign bonds and a sovereign credit rating.

- (2) Tier 2 countries – These countries are developing economies that have sovereign bonds denominated in the currency of a Tier 1 country.
 - (3) Tier 3 countries – These are developing countries that do not have publicly-traded sovereign bonds traded in dollars or euros but they do have an S&P sovereign credit rating.
 - (4) Tier 4 countries – These countries have neither publicly-traded sovereign bonds in dollars or euros nor an S&P sovereign credit rating.
- B. The original country yield spread model works easily with Tier 1 and Tier 2 countries. Additional steps though are necessary to make the model work with Tier 3 and 4 countries.
- (1) Tier 3 countries
 - (a) D&P conduct a regression using the observed Tier 2 country risk premiums as the dependent variable and the numerical equivalent of that country's S&P sovereign credit rating as the independent variable. The regression equation is used to estimate a Tier 3 CRP using its S&P sovereign credit rating. A similar concept was used in the Sample Regression Equation applied above in the Country Credit Rating Model.
 - (2) Tier 4 countries
 - (a) For Tier 4 countries, the Handbook uses Euromoney Country Risk Score (ECR scores) which are available through subscription from the provider (the Handbook provides the regression results). The Tier 2 CRPs are entered as the dependent variable and are regressed against the Tier 2 countries' ECR score. Since ECR scores are produced for all countries, the subject country's ECR score can be entered into the regression model to obtain its implied country risk premium.
3. The data sets for the Country Yield Spread Model are presented in the *Handbook* under Data Exhibit 2. Country risk premiums are presented for 188 countries from two perspectives:
- A. A U.S. investor investing in any of the 188 countries
 - B. A German investor investing in any of the 188 countries
 - C. For each country, the country risk premium, the Tier method used to derive the country risk premium and the S&P credit rating is shown.

4. Example

A. A German investor is valuing a company located in Argentina. The cash flows will be expressed in euros but the valuation must capture the risk of the operations in Argentina relevant to Germany.

(1) The valuer consults the *Handbook's* cost of equity for Germany, which is shown in the Germany section under Data Exhibit 4. As of March, 2016, this cost of equity was 6.5%.

(a) Note that the valuer can develop his or her own cost of equity based on alternative German macro variables and proceed with the following steps. If there is a material difference between the valuer's cost of equity and the one shown in the Handbook, the valuer should understand the variance.

(2) Under the Germany section of Data Set 2, the CRP for Argentina is 30.3%. Note that the information shows that the Tier 3 method was used to derive the premium, meaning that Argentina did not have publicly-traded sovereign bonds, but did have an S&P credit rating that could be used in the Tier 3 regression.

(3) The cost of equity is therefore 36.8% (6.5% + 30.3%). (note that Argentina has been plagued by government corruption, high unemployment, and has one of the highest inflation rates in the world, which explains its relatively high required rate of return).

(4) This cost of equity does not include subject company size or specific risk or industry risk. Those must be calculated separately.

5. Limitations of the Country Yield Spread Model

A. The model's key assumption is that the country's sovereign debt risk is an adequate proxy for that country's business risk.

(1) One of these variables is a debt measurement and the other is an equity measurement.

(2) There are instances when a country's sovereign debt is affected by macroeconomic variables that do not have the same affect on business cash flows.

B. If the valuer captures some or all of the country risk in the cash flow projection then the risk will be double counted.

C. The model may not yield relevant results during periods of global economic crises.

- D. As is true with other models this model may be less relevant with a multi-national company that can shift production to safer countries at will.

Section F. The Damodaran Model

1. Aswath Damodaran is a Professor of Finance at New York University. He is an authoritative figure in the field of finance and business valuation. His research, valuation models, and the data needed to deploy his models available on his website:

<http://pages.stern.nyu.edu/~adamodar/>

2. Damodaran's Original Model
 - A. The original Damodaran model applies a country risk premium, calculated either with credit default swaps or through the difference in sovereign bond yields. The model is shown as follows:

$$K_L = R_{fUS} + \beta_{US}(ERP_{US}) + \lambda(CRP)$$

Where:

K_L =	Cost of equity in local country
R_{fUS} =	U.S. Risk Free Rate
β_{US} =	U.S. Beta
ERP_{US} =	U.S. Equity Risk Premium
λ =	Company's exposure to local country risk
CRP =	Country Risk Premium
	= Country Default Spread x ($\sigma_{stock}/\sigma_{bond}$)
σ_{Stock} =	standard deviation of local country's stock market
σ_{Bonds} =	standard deviation of local country's bond market

- (1) A beta is applied to the U.S. equity risk premium which conforms to the original capital asset pricing model.
- (2) The country risk premium is multiplied by lambda (λ) which represents the subject company's exposure to the local country risk. Although this variable makes logical sense, it is difficult to measure. Damodaran recommends the following:
 - (a) Lambda is a relative variable. The country's exposure to country risk is measured relative to the average company's exposure in the country. At least three factors, according to Damodaran, affect this:
 - ◆ Revenue from the country

- ◆ Location of facilities
- ◆ Level of usage of risk-management products

(b) If the average company derives 75% of its revenues from the country, then the local company's revenue percentage would be measured relative to the 75%.

- ◆ While this is conceptually understandable it would be very difficult to document and difficult to deploy especially if other criteria are brought into the calculation.

3. A commonly applied adaption of Dr, Damodaran's model for international cost of capital is as follows:

$$K_L = R_{fUS} + \delta(CDS_L - CDS_{US}) + (ERP_{US}) + \text{Alpha}$$

Where:

K_L = Cost of equity in local country
 R_{fUS} = Risk-free rate of developed market

$$\delta = \frac{\sigma_e}{\sigma_b}$$

Where:

σ_e = Standard deviation of the equities market

σ_b = Standard deviation of the bond market

CDS_L = Credit default swap spread on local government bond

CDS_{US} = Credit default swap spread on developed country government bond

ERP_{US} = Equity risk premium in the developed market

Alpha = Unsystematic risk (size and specific risk)

A. Credit Default Swaps (CDS)

- (1) A credit default swap is a derivative instrument on debt securities. It can be thought of as an insurance contract in which one party obtains insurance against the default of a debt security.
- (2) If the loan defaults or experiences other types of credit problems, the buyer of the CDS receives the face amount of the security.
- (3) The buyer of the CDS does not actually have to own the debt security (called a "naked CDS"). Anyone who bets that a debt security will default can acquire a CDS on that security.

- (4) The market for credit default swaps is mostly unregulated.
- (5) The Credit Default Swap Spread
 - (a) The CDS spread is expressed in percentage terms and is equivalent to the insurance premium on the debt.
 - (b) It represents the annual amount the buyer of the CDS must pay as a percentage of the 'insured' amount (i.e. the face value of the debt security) to the seller of the CDS.
 - (c) Example:
 - ◆ Debt security = £100,000,000
 - ◆ CDS spread = 1.25%
 - ◆ Annual payment made by the CDS buyer = £1,250,000
- (6) The CDS spread therefore represents a market perception of the underlying riskiness of a debt security.
 - (a) Credit default swaps on most government bonds are traded on markets around the world.
 - (b) Analysts are therefore able to compare the CDS spreads on different government long term bonds as a comment on the country risk of the government selling the bonds.
 - (c) Example
 - ◆ Suppose the 5-year CDS spread for an Egyptian government bond is 8.01% and the spread for a U.S. bond is 0.50%. The country risk spread is the difference between the two spreads, or 7.51%.

B. The Delta variable (δ)

- (1) Damodaran recognizes that the CDS market is a debt market and therefore not equivalent to the equities market. Debt securities are inherently less volatile than the equities market.
- (2) The delta variable represents an adjustment to the CDS spread to make it relevant to the cost of equity.
- (3) Damodaran measures the relative volatility of the debt securities market to the volatility of the equities market by dividing one into the other. The result is the delta adjustment to the CDS spread.

- (a) Damodaran updates the delta variable on his website each year.
 - (b) As of 2017, the delta variable equaled 1.23x.
 - C. The valuer still needs to account for the equity risk premium and the alpha, or the risk factors specific to the subject company.
 - (1) If the risk-free rate is taken from the U.S. economy, then the equity risk premium should be taken from there as well.
 - (2) The specific risk is a matter of the valuer's professional judgment
 - D. It is important to remember that the cost of equity that results from Damodaran's model should be applied to cash flows that are in the developed economy's currency. In this case, that would be dollars.
4. An example of the application of the Damodaran model is shown below. These costs of equity are for selected countries from the Damodaran website as of August 31, 2017.

Damodaran Model: Derivation of Cost of Equity for Companies in Selected Countries

Country	Moody's	U.S.	CDS Spread	Country Risk		U.S.	Alpha		
	Rating	Rf rate	(Local-U.S.)	$\bar{\sigma}$	Premium	ERP	Raw K_e	(example)	K_e
	a	b	c	d	e	f	g	h	i
					(c x d)	(b + e + f)			(g + h)
Australia	Aaa	2.47%	0.00%	1.23	0.00%	5.69%	8.16%	2.00%	10.16%
Brazil	Ba2	2.47%	3.47%	1.23	4.27%	5.69%	12.43%	2.00%	14.43%
China	Aa3	2.47%	0.70%	1.23	0.86%	5.69%	9.02%	2.00%	11.02%
Croatia	Ba2	2.47%	3.47%	1.23	4.27%	5.69%	12.43%	2.00%	14.43%
Egypt	B3	2.47%	7.51%	1.23	9.24%	5.69%	17.40%	2.00%	19.40%
France	Aa2	2.47%	0.57%	1.23	0.70%	5.69%	8.86%	2.00%	10.86%
Greece	Caa3	2.47%	11.55%	1.23	14.21%	5.69%	22.37%	2.00%	24.37%
Jordan	B1	2.47%	5.20%	1.23	6.40%	5.69%	14.56%	2.00%	16.56%
Kuwait	Aa2	2.47%	0.57%	1.23	0.70%	5.69%	8.86%	2.00%	10.86%
Oman	Baa1	2.47%	1.84%	1.23	2.26%	5.69%	10.42%	2.00%	12.42%
Philippines	Baa2	2.47%	2.20%	1.23	2.71%	5.69%	10.87%	2.00%	12.87%
Poland	A2	2.47%	0.98%	1.23	1.21%	5.69%	9.37%	2.00%	11.37%
Russia	Ba1	2.47%	2.89%	1.23	3.55%	5.69%	11.71%	2.00%	13.71%
Saudi Arabia	A1	2.47%	0.81%	1.23	1.00%	5.69%	9.16%	2.00%	11.16%
Serbia	B1	2.47%	5.20%	1.23	6.40%	5.69%	14.56%	2.00%	16.56%
Spain	Baa2	2.47%	2.20%	1.23	2.71%	5.69%	10.87%	2.00%	12.87%
Turkey	Ba1	2.47%	2.89%	1.23	3.55%	5.69%	11.71%	2.00%	13.71%
United Arab Emirates	Aa2	2.47%	0.57%	1.23	0.70%	5.69%	8.86%	2.00%	10.86%
United Kingdom	Aa1	2.47%	0.46%	1.23	0.57%	5.69%	8.73%	2.00%	10.73%
United States	Aaa	2.47%	0.00%	1.23	0.00%	5.69%	8.16%	2.00%	10.16%
Vietnam	A2	2.47%	5.20%	1.23	6.40%	5.69%	14.56%	2.00%	16.56%

Source: <http://pages.stern.nyu.edu/~adamodar/>

Column a	Moody's rating on government debt. For countries with no Moody's rating, Damodaran uses S&P. If country has no government debt, he applies the average CDS spreads per rating.
Column b	The model calls for a developed country risk-free rate. In this example, the U.S. risk-free rate as of 8/31/17 was used.
Column c	Damodaran provides this data which is the country CDS spread less the U.S. CDS spread.
Column d	This is the delta variable, which represents as of 2016-17, the volatility of the equities market over the debt market. This metric is updated and provided by Damodaran on the website.
Column e	The country risk premium is the CDS spread multiplied by the delta variable.
Column f	The equity risk premium from a developed economy. Damodaran's calculated U.S. ERP is used here.
Column g	This is the cost of equity prior to adjustment for unsystematic risk. It equals the risk-free rate, plus the country risk premium, plus the U.S. ERP.
Column h	The valuer must insert any size or specific risks that are appropriate for the subject company. An example of 2.0% was applied here for expositive purposes.
Column i	The final cost of equity equals the unadjusted cost of equity plus alpha.

5. Limitations of the adapted Damodaran Model

- A. The model shown above is an example of a build-up model. It is not a derivation of the CAPM since there is no beta applied to the ERP.
- B. Research suggests that the credit default swap spreads are not purely the market's perception of country risk.

- (1) As stated above, the risk of government debt does not equal country risk.
- (2) CDS spreads may fluctuate due to short-term market manipulations. These are not solely a market comment on country risk.

Section G. Special Topics

The following sections address three topics of interest to international valuers. These topics are not directly tied to each other but are presented here since they are relevant to the development of the cost of capital in an international environment. The final three topics in the Chapter are:

- Size risk premium studies outside the United States
- Total beta and the industry risk premium
- How to use the International Valuation Handbook; *Industry Cost of Capital*

1. Size Risk Premium Studies Outside the United States

- A. The size risk premium was presented in iiBV 202 as an element of unsystematic risk in the capital asset pricing model. The size premium is quantitatively measured by comparing returns on the market for eight different definitions of size.
- (1) This study is based on the United States market and does not necessarily apply to markets outside the United States.
 - (2) Similar studies have been done on markets outside the United States but have been hindered by several factors:
 - (a) Very few markets have the historical data and the diversification which make the U.S. studies more robust.
 - (b) There is a lack of integration in some stock markets outside the United States; if multiple markets are studied this presents measurement problems.
 - (c) In a stand-alone market, investors do not have the same opportunities for diversification wherein a small stock's risk can be mitigated by larger stocks in the portfolio. Therefore, smaller companies in segmented markets might see higher required rates of return relative to similar small companies in a large market like the United States.
- B. The only comprehensive study (outside the United States) of company size in relation to market returns has been conducted by Professor Erik Peek at the Rotterdam School of Management at Erasmus University.
- (1) Professor Peek has stratified market returns by size on the stock markets in the following European countries between 1990 and 2015:

- (a) Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom
- (2) Although the studies have shown a statistically significant size effect, the effect was not uniform throughout the markets studied.
 - (a) The size effect was limited to the smallest companies and was not uniform throughout the portfolios, as was seen in the U.S. studies.
 - (b) The size effect was not uniform throughout the 17 European countries in the study.
- (3) The *Handbook* provides the results of Professor Peek's work in the context of two sets of size premium data:
 - (a) Premia over the Risk-Free Rate
 - ◆ In these studies, the valuer would not use the CAPM, but rather a build-up model to develop the cost of equity. The size premium is added to the risk-free rate. The ERP is already included in the added premium.
 - (b) Premia over the CAPM
 - ◆ In these studies the size premium is added as part of a traditional capital asset pricing model.
- (4) The size studies include 7 different size definitions:
 - (a) Market capitalization
 - (b) Book value of equity
 - (c) Market value of invested capital
 - (d) Total assets
 - (e) Sales
 - (f) Number of employees
 - (g) Size factor
- (5) Each size definition includes 16 different size portfolios. The valuer would consult the appropriate portfolio(s) relevant to the subject company and apply the Smoothed Adjusted Risk Premium to either the Build-up Model or the CAPM, whichever is being used.

- (6) The valuer should note that although there is convincing evidence that a size risk premium exists in the European markets, there is statistical noise in these studies, so much so that best practice in Germany requires valuers to ignore adding a size risk premium.
- (7) It goes without saying that if the valuer is considering a size premium outside the context of the two studies that are available (in the United States and Europe) the size premiums contained therein may be considered but not taken as direct evidence of a size premium in the local market.

2. Industry Risk Premium and Total Beta

- A. Most valuers outside the United States rely on the CAPM to develop a cost of equity. Within the United States a significant number of valuers use the Build-up Method, which was discussed in iiBV 202. The build-up method develops a cost of equity by adding the risk-free rate, the equity risk premium, the size risk premium and specific risk. There is no separate consideration of the beta or systematic risk in the original build-up model.
- B. There is a form of the build-up model in which a variable called the “full information beta” is used to derive an industry risk premium. The industry risk premium is added to the other variables to come up with the cost of equity as per the following formula:

$$K_e = R_f + ERP + SP + IRP$$

Where:

- K_e = Cost of equity
- R_f = Risk-free rate
- ERP = Equity risk premium
- SP = Size premium
- IRP = Industry risk premium

C. Full information beta

- (1) Many publicly-held guideline companies are discarded from the market approach since, although they have sales in the subject industry, those sales are only a small part of the overall operation. Some of these excluded companies may actually be market leaders in the subject industry.
- (2) The full information beta develops a beta using all the betas from public companies with segment sales in the industry (regardless of how small those segment sales may be to the entire company). The betas are

weighted according to the relative market capitalization to the total industry capitalization) and are applied as the dependent variable. The sales of the companies are applied as the independent variable.

D. The Industry Risk Premium

- (1) The industry risk premium is a measure of systematic risk in the subject industry which is applied to the regular equity risk premium, as follows:

(a)

$$\text{IRP} = (\beta_i \times \text{ERP}) - \text{ERP}$$

Where:

IRP = Industry risk premium

β_i = Full information beta for industry

ERP = Equity risk premium

- (b) The industry risk premium equals the full information beta multiplied by the ERP, minus the ERP. This variable can be added if the analyst is using the build-up model.

- ◆ If the industry beta is below 1.0, then the industry risk premium will be negative.

(c) A separate size or specific risk premium can be added if appropriate.

(d) The industry risk premium cannot be used in the capital asset pricing model.

- (2) Example: A valuer is using the build-up model to derive a cost of equity for a company involved in the oil and gas field service industry. The following information has been developed:

(a) U.S. risk-free rate = 2.5%

(b) U.S. ERP = 5.0%

(c) Size premium relevant to the subject = 2.0%

(d) Full information beta for oil/gas field = 1.36

(e) The cost of equity = 11.3%

- ◆ $2.5\% + 5.0\% + 2.0\% + [(1.36 \times 5.0\%) - 5.0\%]$

- ◆ The IRP = 1.8%

- E. The Industry Risk Premia are calculated by Duff & Phelps and presented in the U.S. version of their Valuation *Handbook*. The text provides the full information beta and the industry risk premia (calculated with both an historical ERP as well as a supply-side ERP) for approximately 270 different industries. As of 2018, there is no separate calculation of an industry premium in the International version.
3. The International Valuation Handbook; *Industry Cost of Capital*
- A. As of 2015 a new resource is available for developing growth rates and the cost of capital by geographic region and by industry around the world, *2016 International Valuation Handbook, Industry Cost of Capital* (Duff & Phelps, published by Wiley).
- (1) This text provides the following data by industry, by region:
- (a) Financial ratios
- ◆ Return on assets
 - ◆ Return on equity
 - ◆ Dividend yield
 - ◆ Liquidity ratios
 - ◆ Profitability ratios
 - ◆ Leverage ratios
 - ◆ Growth rates
- (b) Betas (levered and unlevered)
- (c) Valuation multiples
- ◆ Price/sales
 - ◆ Price/earnings
 - ◆ Market/book
 - ◆ Enterprise Value/Sales
 - ◆ EV/EBITDA
- (d) Cost of equity

- (e) Cost of debt
 - (f) Weighted average cost of capital
- (2) Each of the above metrics is broken down into the following 5 categories:
- (a) Median
 - (b) GICS composite
 - (c) Large composite
 - (d) Small composite
 - (e) High financial risk
- (3) Regions covered – the following regions are covered in the text through three currencies, euros, pounds and dollars. That is, each region has three sections, one for each currency.
- (a) World
 - ◆ Includes companies in the MSCI (Morgan Stanley Capital International Index) investable market index that meet the text's requirements. The regions included in the 2016 *Handbook* come from the following regions:
 - ⇒ European Union – 15.8%
 - ⇒ United States – 23.9%
 - ⇒ Asia – 40.7%
 - ⇒ Other – 19.7%
 - (b) European Union
 - ◆ Austria, Belgium, Cyprus, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Portugal, Slovakia, Slovenia, Spain, Bulgaria, Croatia, Czech Republic, Hungary, Poland, Romania, Sweden, Denmark, United Kingdom
 - (c) Eurozone
 - ◆ Includes the 19 countries that have adopted the euro: Austria, Belgium, Cyprus, Estonia, Finland, France,

Germany, Greece, Ireland, Italy, Latvia, Lithuania,
Luxembourg, Malta, Netherlands, Portugal, Slovakia,
Slovenia, Spain

- (d) United Kingdom
- (4) Industries Covered
 - (a) For each of the twelve sections (that is, one section for each of the 3 currencies in each of the 4 geographic regions), the data outlined above is presented for 70 to 90 industry categories.
 - ◆ The text used the Global Industry Classification Standard (GICS) codes. These codes range from a two-digit broad categories (e.g., consumer supplied) to an 8-digit specific category (soft drinks).
- (5) Applications of the Text
 - (a) Financial analysis of the subject company – as discussed in iiBV 201, a key determinant of the valuer's risk and growth assessment is a comparison of the subject company to industry financial ratios. The financial ratios broken down by industry provide a barometer for comparison.
 - (b) If the valuer defines an industry group as the 'market participants' then the capital structure ratios could potentially be used as a subject company's target capital structure.
 - (c) Levered and unlevered betas by industry can be used in the development of a subject company's cost of equity.
 - (d) Analyst's growth estimates by industry can provide a basis for supporting growth in a discounted cash flow analysis.

Section H. Chapter Review Questions

1. A valuer is appraising a Jordan-based pharmaceutical company for a U.S. investor. The following information is available to develop a cost of equity using the relative volatility model:

U.S. risk-free rate	4.0%
Company beta	1.2
Pharma industry beta	1.1
U.S. ERP	5.0%
RV factor	1.3
Alpha	3.5%

The appropriate cost of equity to apply to the cash flows is:

- A. 11.15%
 - B. 7.15%
 - C. 15.3%**
 - D. 12.5%
2. In the above question, the discount rate that is derived should be applied to which of the following cash flows?
- A. The Jordanian company's projected cash flows expressed in U.S. dollars**
 - B. The Jordanian company's projected cash flows expressed in Jordaniain dinars
 - C. The Jordanian company's projected cash flows expressed in dollars, but adjusted downward to account for the relative risk of Jordan to the U.S.
 - D. The Jordanian company's projected cash flows expressed in dinars, but adjusted upward to account for the relative risk of Jordan to the U.S.

3. One relative weakness of the size premium studies conducted by Professor Peek on the European market as compared to the size premium studies done in the United States is:
- A. The European markets are older than the U.S. market and therefore contain outdated information.
 - B. The unification of all the separate European markets into a single Eurozone stock market skews the data.
 - C. The European stock markets do not enjoy the same level of integration as exists in the United States market.
 - D. The European stock markets trade under different currencies which renders the return information less meaningful.
4. Which of the following is a criticism of the Country Yield Spread Model?
- A. The sovereign yield spread is an equity risk measurement and the CAPM requires a debt risk measurement.
 - B. Debt premiums are not the equivalent to a volatility measurement.
 - C. Most country's have sovereign bonds denominated in U.S. dollars, but the bonds are not rated by a rating agency.
 - D. If the valuer has captured the country risk in the cash flow projection, then applying a country risk premium would double count the risk.
5. A valuer is considering using the following model to apply in his valuation of a company in Turkey for an investor in the United Kingdom:

$$K_L = R_{fUS} + \delta(CDS_L - CDS_{US}) + (ERP_{US}) + \text{Alpha}$$

One limitation of this model is:

- A. The δ factor represents the subject company's relevant exposure to the country risk, which is a very difficult variable to measure efficiently.
- B. The credit default swap spreads do not necessarily represent the market's comment on country risk.
- C. The risk-free rate and ERP are based on United States metrics while the credit default metrics are based in the local country's metrics.
- D. Alpha has already been captured in the CDS measurement.

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Chapter 5. Saudi Valuation Market

Section A. Saudi Valuation Market Overview

1. Macroeconomic Profile

A. As was discussed in BV 201, the macroeconomic and microeconomic environments of the subject company should be assessed for their contribution to the company's overall risk profile.

(1) This part of the analysis should not be a mere list of macro and micro variables of the subject country's economy.

(2) The data should be discussed in light of how it affects the sales growth potential and operating risk of the subject business.

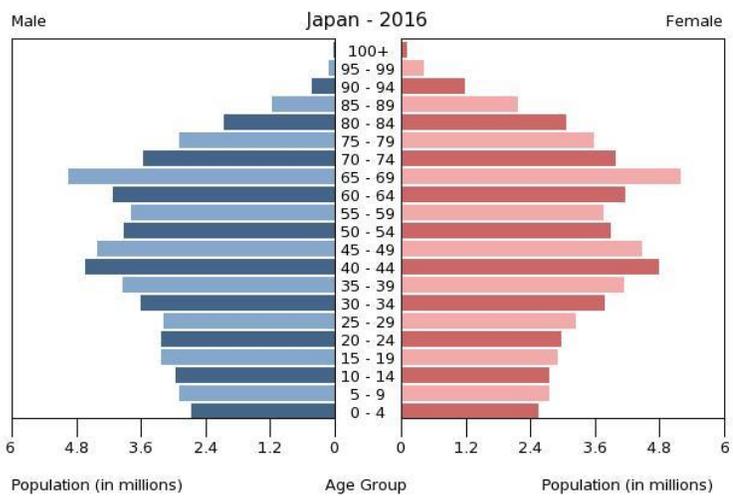
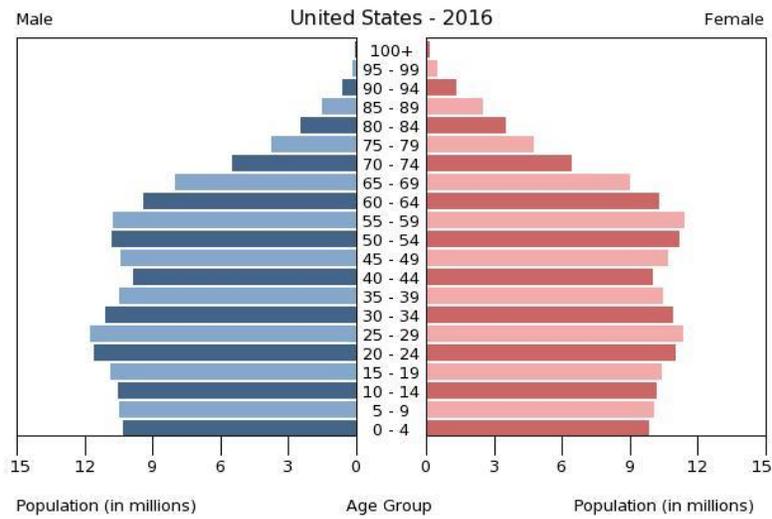
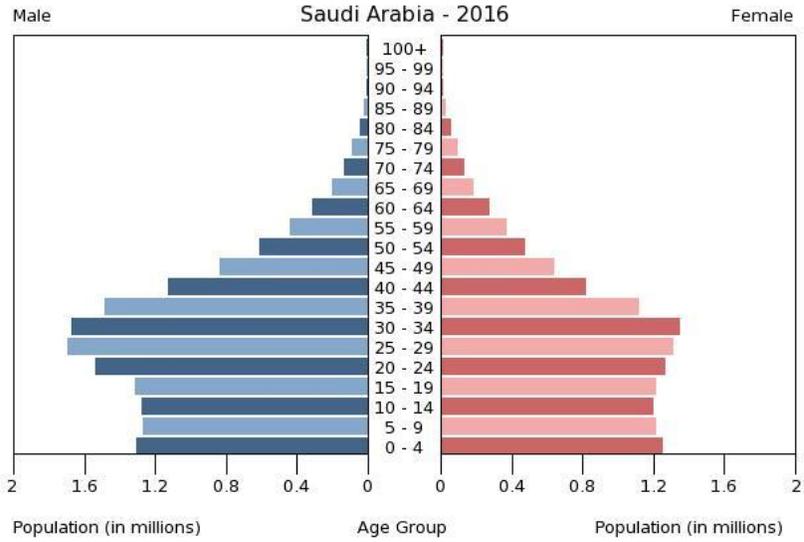
(a) The economic profile should therefore focus on those issues which pose opportunities and challenges to the country and the companies that operate within the country.

B. Macroeconomic Challenges to the KSA economy

(1) Population profile

(a) The shape of the population's age demographic might indicate a risk factor. KSA's population is youthful by world standards, with 44.5% of the population under the age of 25 years.

- ◆ A young population could pose a risk if there are not enough jobs available to bring them into the workforce.
- ◆ Conversely, a population with an disproportionately older population could pose a risk since there may not be a sufficient number of younger people in the workforce to support the old age population in terms of healthcare and other social welfare support payments.
- ◆ KSA's population graphic is compared to that of the U.S. and Japan below:



(b) KSA's population, relative to the U.S. and Japan is significantly younger.

- ◆ KSA's median age is 30.2, compared to 37.8 in the U.S., and 46.1 in Japan.
- ◆ With declining opportunities in the energy sector, the country is under pressure to diversify the economy to allow multiple career paths for younger generations.
- ◆ Higher youth unemployment yields higher country risk since unemployed youth are at greater risk of drifting into socially unacceptable behaviors.

(c) KSA's total population is 33.5 million as of 2018. Relevant population metrics include the following:

- ◆ The unemployment rate is 5.6%. This rate excludes women. If women of working age are included, the unemployment rate is 25.0%.
- ◆ The workforce participation rate is 54.8%. The participation rate is the number of people of working age who are employed or are seeking work. KSA's rate is low by worldwide standards. Other selected rates include:

⇒	United Kingdom	78.7%
⇒	Kuwait	77.8%
⇒	United States	62.7%
⇒	European Union	58.2%
⇒	Turkey	53.3%
- ◆ About 36.0% of the population are non-Saudis, many of whom are foreign nationals who came to KSA to work.
 - ⇒ Foreign workers are mostly employed in agriculture, cleaning, and domestic services occupations.
- ◆ Total population is forecast to grow to approximately 36 to 37 million by 2022.

(d) Saudization Program (Nitaqat Program)

- ◆ The Saudization Program was initiated in KSA in 2003 to alleviate the unemployment problem among Saudi

citizens by replacing foreign nationals in many industries with Saudi nationals. Under the program, companies were assigned quotas for hiring Saudi citizens. Quotas are based on the size of the company's workforce and the type of industry.

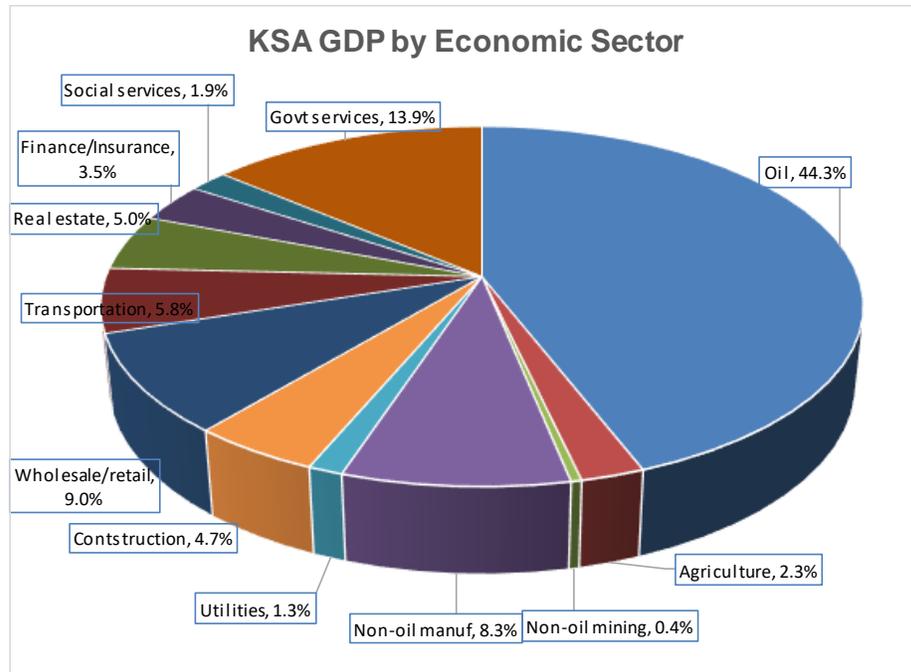
- ⇒ This program was unpopular in the private sector as Saudi citizens were difficult to recruit and required higher compensation.
- ⇒ Some employers in KSA tried to evade the quotas.
- ⇒ The Program was updated in 2017 to become more stringent with higher quotas. Employers must now hire more Saudi nationals before becoming eligible for Block Grants to bring in foreign workers.
- ⇒ The Saudization Program is intended to alleviate the high percentage of unemployed youth in the country by replacing foreign workers with Saudi nationals.

(2) Gross Domestic Product (GDP)

(a) The Saudi economy is heavily influenced by a single sector, energy. The country has 16% of the earth's oil reserves.

- ◆ Oil constitutes 42.0% of GDP.
- ◆ Oil represents 87.0% of the KSA governmental revenues.
- ◆ Oil represents 90.0% of KSA export

(b) There are eleven other sectors in the KSA macroeconomy, several of which show room for future growth.

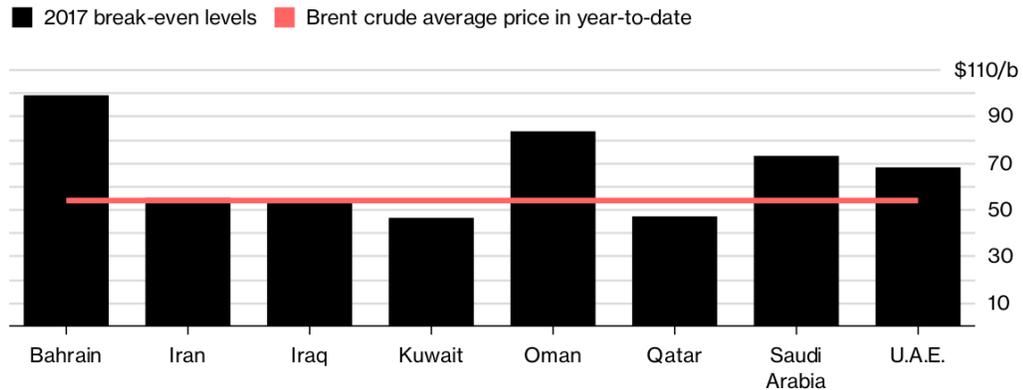


(c) The reliance on oil for government budgets, employment, and disposable income adds volatility to GDP and the nation's macroeconomic well-being.

- ◆ The lack of diversity affects employment opportunity, disposable income and the health of the stock market.
- ◆ According to the International Monetary Fund (IMF), the Saudi economy needs an oil price per barrel at \$73.00 (U.S.) to break even. Other oil producing economies have a more forgiving breakeven price:
 - ⇒ Kuwait = \$46.50
 - ⇒ Qatar = \$46.80
 - ⇒ Only Bahrain and Oman have higher breakeven points than KSA among middle eastern producers.

2017 Outlook

With oil averaging \$53.72 a barrel so far this year, Gulf crude producers are still overspending



Source: International Monetary Fund; Brent crude prices compiled by Bloomberg

Bloomberg

⇒

- ◆ As of early 2018, crude oil prices were in the \$63.00 price per barrel range, up slightly relative to the prior year, but still approximately \$10.00 below KSA’s breakeven point given government spending levels.
- ◆ The volatility issue in KSA is graphically presented in world oil prices over the past 45 years:

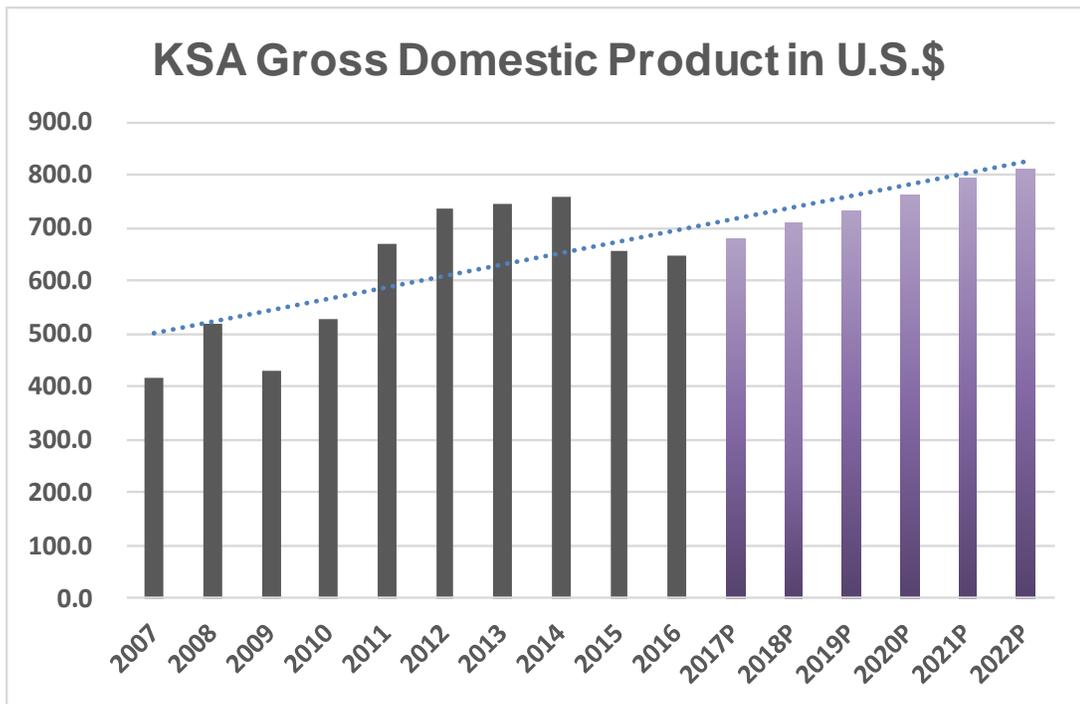
U.S. Crude Oil First Purchase Price



 Source: U.S. Energy Information Administration

- ◆ Oil prices collapsed in 2015 from \$96.29 per barrel to \$49.49 per barrel. This caused a shock to the KSA economy.
 - ⇒ In early 2018, prices increased to \$66.85, but the IMF predicts that prices will remain in the \$55.00 to \$65.00 range for the foreseeable future.
 - ⇒ This means that KSA will need to further curtail government spending (or increase non-oil revenues) in order to lower its breakeven point by approximately another \$10.00 per barrel.
 - ⇒ The government recognized this fact several years ago and is engaged in a comprehensive effort to make this happen.

(d) KSA's annual GDP growth was impressive over the past ten years as oil prices fueled macroeconomic activity. With the decline in oil in recent years, GDP has also declined.



Source: Statistica

- ◆ KSA's GDP is expected to increase over the next five years for the following reasons:

- ⇒ KSA is easing social and economic restrictions which should encourage greater foreign investment and domestic consumption.
 - Women are allowed to drive which will lower household spending on outside transportation.
 - The government is taking steps to encourage higher foreign investment in local companies.
 - Domestic and foreign investors will be allowed to invest in ARAMCO, the Saudi national oil company.
- ⇒ A value-added tax (VAT) will be instituted which will diversify the government's reliance on oil and alleviate the recent decline in government spending.
- ⇒ The general strategy of diversifying away from oil into other economic sectors (technology, healthcare, life sciences, services) is expected to have a positive effect on GDP growth.

(3) Taxation

(a) Value-added Tax (VAT) – as of 2018 KSA imposed a 5.0% VAT on consumer items such as food, clothing, electronics, gasoline, telephone and electric bills and hotel bills.

- ◆ Some large expenses are exempt from the tax, including rent, property sales, medications, airline tickets, and tuition costs
- ◆ Sales tax on several products had already been introduced prior to 2018, including a 50% tax on soft drinks and a 100% tax on tobacco and energy drinks.
- ◆ Although the tax will affect consumption, the VAT is still significantly less than many other countries such as in the European Union, where the VAT is as high as 20.0% in some countries.

- ◆ The VAT had been recommended to the gulf countries by the IMF as a way to diversify government revenues away from oil income.

(b) Corporate income tax

- ◆ Non-Saudi investors are liable for a 20% tax on the company's net adjusted profits. Saudi investors are exempt from this income tax.
 - ⇒ If a company is owned 90% by a Saudi citizen and 10% by a non-Saudi, and the company earns 1,000,000 riyals in net adjusted profits, then 100,000 riyals (10%) is subject to the 20% tax (20,000 riyals of tax).
- ◆ Zakat tax – Saudi citizens though are not completely exempt from tax. The Zakat is an Islamic assessment on corporate income of Saudi citizen investors. In the example above, the remaining 800,000 riyals would go into the basis on which the Zakat is assessed. This basis is taxed at a 2.5% rate.
- ◆ Energy taxes – Activities in natural gas and hydrocarbons are subject to different tax rates.
 - ⇒ Natural Gas Investment Tax (NGIT) – the tax rate is based on the internal rate of return of the natural gas project. The tax rate is 30% if the IRR is 8.0% or less. The NGIT is progressive, with a top rate of 85% if the IRR is 20% or higher.
 - ⇒ Income from oil and hydrocarbon production is taxed at a rate of 50% to 85%.
- ◆ Withholding taxes:
 - ⇒ Dividends – 5.0% withholding tax is levied on dividends paid to non-Saudis.
 - ⇒ Interest – 5.0% withholding tax is levied on interest paid to non-Saudis.
 - ⇒ Royalties – 15.0% withholding tax is levied on royalties paid to a non-resident.

⇒ Technical – 5% withholding tax is levied on technical service fees paid to non-Saudis.

- ◆ Capital Gains Tax – a 20.0% capital gains tax is levied on the sale of shares in a company by a non-Saudi investor. Shares of companies traded on the Saudi stock exchange are exempt from this tax.

2. KSA Market Transactions:

A. The business valuation profession in KSA is evolving. Demand for business valuations typically comes from:

- (1) Mergers & acquisitions – 34%
- (2) Private placements – 33%
- (3) Shareholder disputes – 23%
- (4) Financial reporting – 5%
- (5) Legal settlements – 5%

B. Key industrial sectors in which valuations are being conducted in KSA:

- (1) Healthcare – 18%
- (2) industrial manufacturing - 15%
- (3) F&B – 12%
- (4) Retail – 9%

C. The percentage of companies being valued by sizes

- (1) Valuations > SAR 250 Mn is 33%
- (2) Valuations between SAR 100- 250 Mn is 48%
- (3) Valuations between SAR 20-100 Mn is 19%
- (4) Valuations < SAR 20 Mn is difficult to estimate

D. It is estimated that approximately 1,000 - 1,500 valuations were undertaken in KSA annually.

- (1) 38% of the valuations were for companies more than SAR 250 Mn,
- (2) 35% were for companies between SAR 100 Mn - 250 Mn and
- (3) 27% were for companies between SAR 20 Mn -100 Mn

- E. There are approximately 140 to 160 successful transactions in KSA during 2016:
- (1) Approximately 20% were valued above SAR 250 Mn,
 - (2) 32% between SAR 100 and SAR 250 Mn,
 - (3) 48% between SAR 20 and SAR 100 Mn.
- F. The total size of transactions in KSA varied between SAR 24 Bn to SAR 28 Bn annually and these include M&A, minority investments and IPO activities.
- G. Cross border transactions are few and form a small portion of the valuation exercises done in KSA (3% of KSA valuations). Few large corporate firms undertake cross border valuation and transactions (e.g., Savola and STC). Such firms typically acquire strategic assets in different geographies outside KSA. Few large multinational investment banks with global networks also undertake cross border transactions. However the number of such transactions is small.
- H. Public Offerings:
- (1) The KSA's capital markets have seen 45 Initial Public Offerings (IPOs) between 2010 and 2014 and approximately SAR 56 Bn of funds were raised by the IPOs.
 - (2) The annual number of IPOs taking place in KSA varied between 6 and 12 during 2010 and 2014. The annual amount of capital raised through public offerings varied due to the differences in size of transactions.
 - (a) IPO applications are coming from the following commercial sectors:
 - ◆ Industrial manufacturing – 27%
 - ◆ Financial services – 26%
 - ◆ Healthcare – 10%
 - ◆ Retail – 5% 6%, 10%, and 5% of the IPO applications in KSA
 - (3) In 2014, the IPO of NCB was worth approximately SAR 22.5 Bn and was the second largest public offering in the world. This large transaction indicates the strong fundamentals of an attractive investment climate and demand for valuation and transaction services in KSA
- I. Merger & Acquisition Activities:
- (1) Between 2010 and 2014 there were 126 announced M&A transactions in KSA. The annual number of announced M&A transactions varied between 17 and 37 transaction during 2010 – 2014.

- (2) Of the 126 M&A transactions, the size of transactions was disclosed in 75 transactions. Between 2010-2014 approximately SAR 22.2 Bn worth of M&A transactions were disclosed.
- (3) Industrial manufacturing, F&B, financial services, construction and real estate were the key sectors that comprised 20%,13%, 9%,7%, and 6% of the total M&A transactions in KSA.
- (4) Some of the largest M&A declared M&A transactions in KSA between 2010 and 2014 included:
 - (a) Acquisition of 50% of Aujan Industries Company shares by Coca Cola U.S. for SAR 3.7 Bn in 2012.
 - (b) Acquisition of an interest of 12% in Mobile Telecommunications Company Saudi Arabia by Mobile Telecommunications Company Kuwait for SAR 2.8 Bn.

J. Asset Management:

- (1) The number of investment funds in KSA has increased from 359 funds in 2011 to 578 funds in 2014.
 - (a) The number of public placement funds declined from 272 funds in 2011 to 263 funds in 2014, however the number of private placement funds increased from 87 funds in 2011 to 315 funds in 2014.
 - (b) Total AUM of funds increased from SAR 99,131 Mn in 2011 to SAR 162,088 Mn in 2014 at a CAGR of 18%.
- (2) In 2013, approximately SAR 2,790 Bn of private equity funds were raised in MENA region and approximately 66 investments of a total value of SAR 2.7 Bn were invested by private equity funds in MENA region.
- (3) KSA is an attractive market for private equity funds in KSA and attracted approximately 12% of the private equity investments in MENA region.
- (4) Financial services, real estate, healthcare and manufacturing were some of the key sectors in which private equity funds were invested in KSA.

3. Valuation market characteristics

- A. Full businesses refers to valuation of 100% of equity of the business being valued. It is the most common type of valuation requested by clients (73% of valuation market).

- B. Shares of business valuation is done to value a subsidiary of a business or a minority stake, this is undertaken for fund raising or divestments (23% of valuation market).
- C. Valuation of tangibles assets are carried out when a company is going for a liquidation or when the assets it holds on books are non cash-generating assets. The work is usually conducted by specialized asset appraisal companies (3% of valuation market).
- D. Intangible assets are not physical in nature, such as intellectual property, goodwill, trademarks and brands. Goodwill is added to the balance sheet due to premiums paid on net assets of acquired businesses. Valuation of tangible and intangible assets as a standalone transaction is very low in KSA (1% of valuation market).
- E. Commonly Applied Valuation Methods and Information Sources
- (1) The DCF method is the most common valuation approach and given 73% weight by valuers and other approaches including market multiples and asset based approaches were given 23% and 4% weights by valuers respectively.
- (a) Sources of Information Used for Industry Benchmarks include:
- ◆ Government agencies publish economic and industry performance indicators such as SAMA, MOL, MOH and others.
 - ◆ Economist Intelligence Unit has the most sector coverage and is used by firms to get an understanding of the sector
 - ◆ International agencies (e.g., IMF, WHO and the World Bank) also publish macroeconomic indicators for sectors and countries.
 - ◆ Local investment banks have their own research departments and produce reports for their subscribers.
- (b) Sources of Information
- ◆ Damodaran produces well researched information on:
 - ◆ Estimates for betas for different industries for developed and emerging markets.
- ⇒ Country and market risk premiums for major countries including KSA.

⇒ Market multiples for major industries.

(c) Stock exchange websites, such as Tadawul that have information on listed companies.

4. Valuation challenges in the Saudi Market:

- A. Difficulties in data collection.
- B. Lack of comparable companies.
- C. High expectation on valuations by clients.
- D. Lack of industry knowledge.
- E. Lack of knowledge on valuation.
- F. Inadequate Accounting Systems.

5. Valuation Body in the Kingdom:

- A. Saudi Authority for Accredited Valuers (Taqeem) is the government body responsible for the valuation profession in the Kingdom.
- B. Taqeem has been dedicated to deliver the following roles:
 - (1) Organize the valuation profession and establish the necessary standards for valuation procedures.
 - (2) Develop the valuation profession and raise the level of practitioners professionally and ethically.
 - (3) Qualify and accredit professional valuers to practice valuation in all sectors.
 - (4) Increase the public trust in the valuation profession and lift the profession to the ranks of other prestigious professions.

**Section B. How does the KSA Macroeconomy affect the Subject Company:
Questions to ask:**

1. How will the VAT tax affect demand in the subject company?
2. Is the subject company affected in any way by the price of oil?
3. How will levels of government spending affect the subject company?
4. How does the Saudization Program affect the subject company?
5. How should corporate taxes be handled in a valuation?
6. Is the company worth more to a Saudi investor than a non-Saudi investor?
7. How is the Zakat tax handled in a business valuation?
8. If a comparable company traded overseas is taxed at a 25% rate and a Saudi company is taxed at a 2.5% rate, should the market multiple from overseas be adjusted?
9. How will the subject company's demand be affected by the younger population as it moves into its peak consumption years?
10. How would the subject company be affected if the government opens up more to multinational companies and foreign investment?
11. Will the increase in the number of automobile drivers affect the subject company?
12. If the number of foreign workers declines (in favor of Saudi employees) will the subject company be affected?

Section C. Chapter Review Questions

1. Which of the following statements is true about population demographics in KSA?
 - A. Saudi Arabia has a citizen population of 33 million, but if non-Saudis are included, the population increases to 62 million.
 - B. The Saudi birth rate is highest among all Asian nations.
 - C. Relative to other nations, Saudi Arabia has a youthful population with a median age of about 30 years.
 - D. Approximately two-thirds of Saudi citizens are employed by the KSA government.

2. All else being equal, would a Saudi investor pay more or less for a KSA company than a non-Saudi investor?
 - A. He would pay the same since all equal fractional interests in a company must, according to valuation principals, be worth the same.
 - B. He would pay more since his net after tax equity cash flow would be higher than a non-Saudi investor with the same fractional interest.
 - C. He would pay less since Saudi citizens are taxed at a higher rate than non-Saudi investors.
 - D. He would pay more since the investment is located in Saudi Arabia.

3. The objective of the Saudization Program is which of the following:
 - A. Increase foreign investment in KSA companies
 - B. Increase the number of IPOs on the Tadawul
 - C. Lower the restrictions on foreign workers entering KSA
 - D. Lower the unemployment rate among Saudi citizens