



BV 202: The Income Approach

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 lectures and discussions, in conjunction with observations by the course instructors.

The valuation process and approaches presented in this course are:

- Not the only valuation process and approaches used by competent valuers;
- Not the only way that individual valuation methods could or should be done; and
- Not to be taken as a “cookbook” process or approach that may be applied to any valuation situation.

Valuations must be based on 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 another company or a different point in time.

The terminology and standards in this course are based on the International Valuation Standards 2020 (“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 2020, Copyright © 2020 International Valuation Standards Council. Copies of the publication can be purchased from the following website: <https://www.ivsc.org>. 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 BV core courses cover the IVSC competencies other than those which relate to the specific circumstances of the tax and legal regimes in various countries.

Section A. Course Overview – Purpose of BV 202

This course is an introduction to the income approach to value. It is the second course presented in the BV curriculum, following BV 201. It is assumed that the student has completed BV 201 and passed the exam, or has taken the 201 challenge examination. The purpose of the course is to bring together the concepts and tools of BV 201 with the new material of the income approach. After completion of the course, the student will have been introduced to all three approaches to value. The course will also introduce some new concepts necessary to address the correlation and conclusion of value.

It is important to note that the course is introductory in nature. The assumption is that although the student may have limited experience in valuation or in a related financial field, he/she has received no formal valuation training other than BV 201. This is not a course in advanced cost of capital techniques.

The objective of BV 202 is for you to master the fundamental theory and practice underlying the income approach to value. This basic body of valuation knowledge is common to all countries. After understanding the fundamentals of the income approach you should be capable of adapting the theory to the challenges and issues in your specific market.

Section B. Format

The course is presented in seven chapters which consist primarily of the lecture format. Part of the material is drawn from classic finance education, including capital markets theory, while some is based on valuation tools and techniques which comprise current best practices as of 2020. Some material is drawn from common practices in developing economies and is not supported by theoretical research or documented studies.

Each chapter includes problem sets or multiple choice questions which are intended to test the student on material presented in the preceding chapter. These questions will be handled in class, time permitting, or as homework if necessary. It is important that the student understands the solutions/answers to these exercises. These questions mimic the type of questions that the student will see in the exam.

Several readings relevant to certain chapters may be referred to by the instructors. The readings may be assigned as homework and may be discussed in class. The readings are intended to help the student understand the material presented in the chapter.

Ask questions if the discussion covers unfamiliar material. It is unlikely that you are the only one who has questions. More than other lecture courses, this course offers you the opportunity to learn from the experience of other practitioners. Students come from different practices and have varying experiences and viewpoints. It is probable that your viewpoint will enhance the understanding of another student.

Section C. Exam

On the last day of the course, you will take a multiple-choice exam, consisting of 100 questions, each worth one point. At the end of class on the third day, the instructors will conduct an exam review session that will highlight important areas of the course materials to understand for the exam. Instructors are also available to answer questions on a one-on-one basis before or after class and at some breaks.

Chapter 1. Overview of The Income Approach

Section A. IVSC Competencies Covered

Valuation Methods	
Income Approach	X
Main value drivers	X
Subject entity analysis	X
Earnings and cash flow based methods	X
Other Methods	
Capitalization of earnings before interest and taxes	X
Dual capitalization	
Other	
Valuation theory, principles and concepts	
Appropriate valuation principles consistent with purpose	X
Proper use of valuation concepts	X
appropriate valuation definitions	
Valuation Approaches	
Description of market, cost and income approaches	X
Premise of value and purposes of valuation	
Application of different valuation approaches	
Subject asset/liability characteristics	
Describe the characteristics of subject through which value is created	X

Section B. The Importance of Terminology

1. It is important to be precise in the use of technical terms when engaged in business valuation. These are the more important terms, used in International Valuation Standards, and used more generally by the valuation profession:
 - A. There are three valuation **approaches** – market, cost and income;
 - B. There are different valuation **methods** under each of the approaches;
 - C. There are six IVS **bases of value**:
 - (1) Market value;
 - (2) Market rent;
 - (3) Equitable value;
 - (4) Liquidation value;
 - (5) Investment value;
 - (6) Synergistic value.
 - D. There are other non-IVS bases, such as tax bases of valuation which differ from country to country;
 - E. There are four **premises of value**; these refer to the way in which the asset will be used:
 - (1) There are two going concern premises:
 - (a) Current use
 - (b) Highest and best use
 - (2) There are two liquidation premises:
 - (a) Orderly liquidation;
 - (b) Forced liquidation

Section C. Course Topics

1. The income approach and the financial markets
2. The levels of value and the income approach

3. The relationship between company and industry risk analyses and a company's cost of equity
4. Equity valuation analysis versus invested capital valuation analysis
5. Historical financial statements analysis and forecasting
6. International economics
7. The build-up method
8. The capital asset pricing model (CAPM)
 - A. Risk-free rate
 - B. Beta
 - C. Equity risk premium
 - D. Size and specific risk
9. Country risk and its quantification in the CAPM - introduction
10. Cost of debt and the weighted average cost of capital (WACC)
11. Single period capitalization and discounted models
12. Cost of debt in a multi-currency environment
13. Valuation adjustments and the income approach
14. Correlating the market, cost and income approaches into a final opinion of value

Section D. The income approach and the financial markets

1. If we assume that the Price earnings ratio (the market price per share divided by the earnings (the net income after tax)) for the whole stock market of a country is 16.2, [and this is about the same as it was 20 years ago] what long term annual returns would a diversified investor expect from that market over the previous twenty years?
2. In order to answer that question we need further information: the average growth in the gross domestic product (GDP) of the country concerned has been 2% over that twenty year period and the average rate of inflation annually has been 2.5%.
3. The first point to make is that statistics on the increase in the GDP are stated in “real” terms, that is with the impact of inflation taken out of the data. The increase in the GDP records the increase in the *volume* of goods and services transacted within an economy.
4. The financial statements of companies are expressed in “nominal” terms. That means that they record the transactions as they take place from day to day. These figures therefore include the effect of inflation.
5. We therefore need to combine the GDP growth and the inflation in some way in order to recognize growth. This is not done by addition but by multiplication:

$$(1 + GDP\ growth) \times (1 + inflation) - 1.$$

- A. The above combination of GDP growth and inflation is therefore 4.55%.
6. We next need to consider what the price earnings ratio represents: if it is divided into 1 it gives a capitalization rate. The capitalization rate is therefore $1/16.2$ and that is 6.17%.
 7. We next need another formula. This formula is central to nearly all business valuation work involving the market approach and income approach. The formula is:

$$K_e - g = \text{capitalization rate}$$

8. The term K_e refers to the cost of equity. This is also described as the discount rate. The term g refers to the rate of growth. Unlike corporate bonds and most

forms of government debt, the normal expectation is that equity returns will increase over the medium term.

9. The formula above can be rearranged to give:

$$\text{Discount rate} = \text{capitalization rate plus growth}$$

10. The discount rate K_e therefore equals 6.17% plus 4.55% which is 10.72%.

11. The next point to consider is if that should equate to shareholder returns. We need to consider the benefit that a shareholder receives. There are two main benefits from share ownership:

A. Receipt of dividend income;

B. Capital growth in the value of the shares held.

12. Economic theory states that the level of dividend income from the shares of a listed company should not affect the total returns received by a shareholder:

A. If dividends are paid by a company the shareholder receives an income return;

B. If the cash flows generated by the company are not paid out as dividends, they are normally retained within the company and invested in more capital expenditure or for corporate acquisitions. These investments should then generate more growth in profits.

13. This means that the dividend yield figure which has been provided should not have any effect upon the returns expected by investors.

14. Lastly we need to consider if the empirical evidence supports the view that returns made by stockholders using the above assumptions do equate to the expected returns of 10.7%. In some markets the returns made by shareholders are rather less than this calculated figure. We therefore need to examine the possible reasons for this:

A. The evidence supports the view that merger and acquisition activity often results in value destruction rather than value creation. Various studies

have been undertaken which indicate that more than 50% of acquisitions have poor outcomes;

(1) If funds are retained in the company and are then spent in the purchase of other companies, there will be a loss of value if any of the following occurs:

- (a) The price paid is excessive;
- (b) The price paid is market value but the integration of the acquired business with the existing business does not proceed according to plan.
- (c) The acquired business is successful but that success is dependant upon the inspirational leadership of business owners who do not remain with the business after the sale.

B. Another reason is what is known as the agency problem. It is the role of the officers of a company to manage the company for the benefit of the owners and other stakeholders. However, they are also obviously motivated to consider their own financial interests.

(1) Officers are very often incentivized by the financial performance of the company. As profits and share values increase they are rewarded for that success.

(2) The succes can be increased by making accounting judgements which have the effect of increasing profits. This is known as “aggressive earnings management”.

(3) However, if there is a suddent down-turn in performance, there will often be a change in the officers of the company. This may be before or after the down-turn.

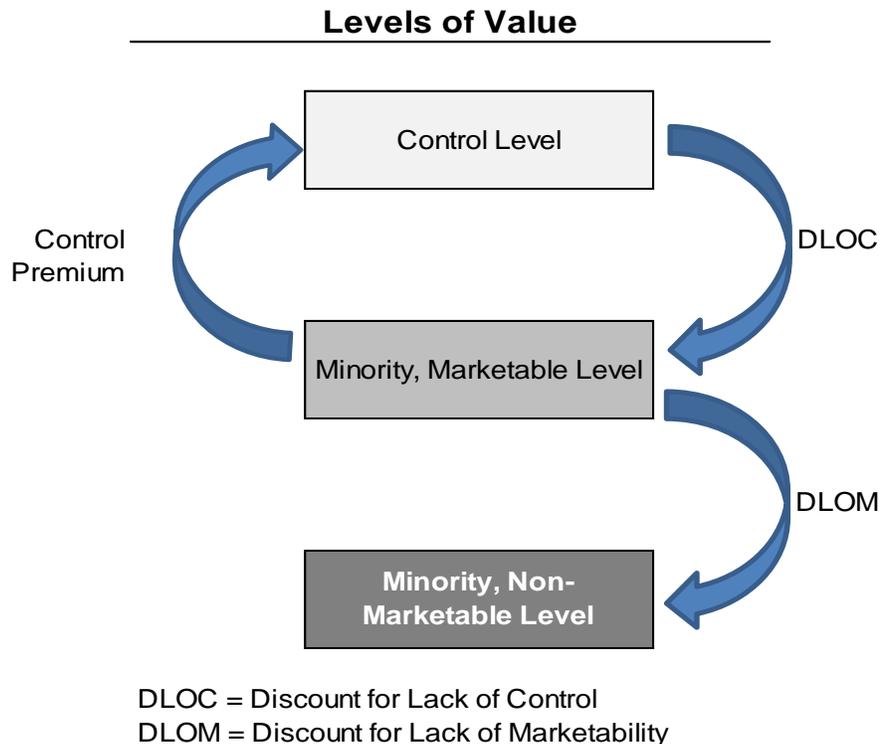
(4) Such a change will not result in all of the financial rewards paid to the officers being recovered from them.

(5) Such a change may also result in the new managers making more conservative accounting judgements when they are first appointed: it is not in their interests to take over the aggressive earnings judgements of their predecessors.

(6) History then repeats itself.

Section E. Levels of value and the income approach

1. This chapter of the manual considers the levels of value, in other words whether the holding being valued is a control or a minority holding. It then gives an overview of the income approach and the capitalization of benefits involved.
2. Review of Levels of Value
 - A. BV 201 covered the topic of levels of value and related adjustments to value. This chapter provides a brief review of the levels of value and how valuation adjustments apply to the income approach.
3. Levels of value chart



4. The above illustration of the different levels of value can be expressed in other ways. It can be useful to understand the calculations relating to the discount for lack of control:

$$DLOC = \frac{\text{Control Premium}}{1 + \text{Control premium}} = 1 - \frac{1}{1 + \text{Control premium}}$$

5. The use of computational techniques for valuation adjustments (control premiums, DLOCs, DLoms) was more relevant in North American practice than elsewhere in the world, but this has been rapidly changing.
 - A. The valuation profession in some countries is largely focused on valuation for financial reporting and mergers/acquisitions. These assignments mostly require control valuations. However, there are also requirements for minority values for tax and other reasons in many countries.
 - B. Although financial reporting and M&A assignments constitute a major portion of the valuation profession, there is also a high demand for the valuation of fractional interests from the following market niches:
 - (1) Estate Tax Law
 - (a) Many governments tax transfers of estates between generations at a stated rate above certain thresholds.
 - ◆ Investments in closely-held companies comprise a significant portion of many wealthy estates in many countries. Some countries give tax breaks for trading businesses, but charge tax on investment companies.
 - ◆ Part of the tax planning for these estates may involve gifting non-control interests in companies to heirs over a long period of time. Each individual gift may be valued on a non-control basis as per the definition of market value.
 - ◆ In some countries such gifts are valued on the basis of the loss to the donor, requiring valuations of the holdings of the controlling shareholder before and after the gift.
 - ◆ As an example, a holding of 2% as gifted by a stockholder with 51% of the common stock, will convert his holding from a control to a minority holding; this is likely to result in a very large reduction in value. How should that 2% be valued?
 - (2) Capital Gains Tax

- (a) Many countries charge tax on capital gains. If the transaction takes place between connected parties (not an arm's length transaction), the valuation of the shares transferred may be required as this may be substituted for the actual consideration for tax purposes.

(3) Employment Taxes

- (a) There is an increasing tendency to award shares in companies to employees; this may provide incentives to important members of the management team. Such shares need to be valued as such awards may be subject to employment taxes.

(4) Equitable Distribution

- (a) Interests in closely-held companies are subject to equitable distribution in divorce in many countries.

(5) Shareholder Disputes

- (a) Many countries have laws which protect non-controlling investors from either unfairly prejudicial conduct or from being squeezed out of their firms by controlling shareholders.
- (b) These valuation market niches all potentially involve litigation. Consequently, valuation experts are hired on both the plaintiff and defendant sides to opine on the values in the closely-held companies. It is often the case that the experts agree on a control value but have vast differences of opinion regarding the value of a non-controlling interest.
- (c) In some jurisdictions a valuer will be jointly instructed by both sides in order to determine a valuation if the amounts involved are relatively modest.

6. The questions addressed in this chapter involve the following:

- A. If the assignment is to value a control level investment in the subject company, what value is yielded by the type of income approach completed?

- B. If the valuation method yields a non-control value, what adjustment is needed to arrive at a control value?
- (1) If the assignment is to value a non-control interest in a closely-held company, what factors contribute to a DLOC and a DLDM and how can the discounts be supported?
- C. At the current time, the issue of fractional interests is challenging due to the lack of adequate information on the discounts for lack of control which apply in the market.
- D. There are no observable markets with reliable outputs relating to sales of fractional interests in private companies. Transfers of shares in such companies very often take place within families or groups of shareholders and the prices may not be indicative of market value.
- E. The former thinking was to use control premium data from the public markets in order to determine the discount for lack of control. The DLOC was often calculated as the Control premium divided by (1 plus the control premium).
- (1) This approach supports DLOCs in the range from 23% to 29%, assuming control premiums of 30% to 40%.
- F. There have been two sources commonly used for the DLDM:
- (1) Studies into restricted securities (known as letter stocks) on the USA market – these are stocks in US public companies which cannot be freely traded on the markets for stated periods.
- (2) Pre-IPO studies – the amounts at which minority interests in shares were transacted in the period prior to an Initial Public Offering or IPO.

7. The Challenge of the Takeover or Bid Premium

- A. In liquid stock markets, a takeover bid made for a public company normally involves an offer to stockholders which is 30% to 40% above the previous market price.
- B. Such a premium is normally required in order to convince sufficient numbers of stockholders to accept the offer and to sell their shares.
 - (1) Different shareholders will require different levels of incentive in order to sell: they may be short-term investors who will accept a small premium;
 - (2) Other investors may have an optimistic view of the value of the company and its prospects – they are likely to be induced to sell only if a significant profit can be realized.
- C. The companies which are prepared to pay a premium of 30% to 40% in order to gain control of a public company are likely to be those companies with a special purpose for the company:
 - (1) It is possible that they consider that they can increase the cash flows, or reduce the risk of the target company to such an extent as to justify the premium price paid;
 - (2) They may see significant synergy benefits as being available when their company is combined with that of the target.
- D. Five rational explanations have been given for takeovers of public companies:
 - (1) Synergy benefits to the buyer;
 - (2) The target company is under-priced by the market;
 - (3) The target company is over-priced by the buyer;
 - (4) The management of the buyer are focussed on their own rewards;
 - (5) The management of the target company is under-performing and better results can be obtained from better management.

- E. There are then various irrational motivations such as following the actions of competitors in the market, irrational exuberance, the arrogance of management.
- 8. Two Austrian academics, Weitzel and Kling, studied takeovers in the USA market, with a focus on the 8% of takeovers which involved a discount rather than a premium for control. The reasons why such transactions happened were complex, but they did not support the idea that a premium should be paid in order to have the benefits of a control of a public company.
- 9. In September 2017 The Appraisal Foundation in the USA (authorized by Congress for the development of valuation standards) issued a paper called “The Market Participant Acquisition Premium”. This paper is a valuation

- advisory for financial reporting purposes but it has wider application. The broad messages from this paper are:
- A. A premium for control should be viewed from the perspective of the market participant;
 - B. Such premiums are normally only expected if a market participant can either increase the cash flows or reduce the risk of the target;
 - C. A premium for control should not be applied to the stock prices of guideline public companies unless there is evidence that there is a market participant who is prepared to pay such a premium.
10. In view of the above, the valuer should consider the valuation of fractional interests by reference to the underlying cash flows:
- A. There are majority cash flows for control holdings – it is possible that parts of these cash flows cannot be accessed by minority interests if a control stockholder takes advantage of his position;
 - B. There are minority cash flows for minority holdings
11. Different stockholding structures are shown below, each with different considerations for the valuation of minority interests:
- A. 51%; 49%; (control and minority)
 - B. 5% x 20 stockholders; (no control)
 - C. 49%; 10%; 5%; 5%; 5%; 5%; 5%; 5%; 5%; 5%; 3%; 3% (practical control with minority holding)
 - D. 25%; 25%; 25%; 25%. (Equality of interests)
 - E. 33.3%; 33.3%; 33.3% (three swing blocks)
12. With the above structures there are different outcomes in the valuation of fractional interests. This is why it is important to consider:
- A. Whether there is any loss of value for the minority stockholders – are the benefits of cash flows being lost;
 - B. Whether there is the prospect of this changing in the future.

13. Level of Value from the Income Approach

- A. The level of value that results from an income approach methodology depends on the assumptions used by the analyst during the analysis.
 - B. If the income stream used is a control income stream, then the approach yields a control level value.
 - (1) A control income stream is one in which adjustments or addbacks are made which reflect a controlling investor's cash flow. The assumption here is that a non-controlling investor would not be able to benefit from the income stream. Examples of such adjustments are:
 - (a) Excess officer compensation
 - (b) Above fair market rent on properties owned by the controlling shareholder
 - (c) Other perquisites of control (employment of family members, use of company assets, etc.)
 - C. If the income stream used is a non-control income stream, then the approach yields a non-control, marketable level value.
 - (1) If there is a full pro rata distribution of annual cash flow (i.e. the controlling investor does not aggrandize cash flows to himself to the exclusion of the non-controlling investor), then a discount for lack of marketability may still be warranted.
 - (2) The opposite is also true. If the controlling shareholder keeps 100% of the cash flow, the non-controlling shares may still not be worth zero.
14. If the income approach is derived from rates of return from the public market, and the public market is constituted by non-control trading in publicly-held stock, then how can the income approach result in a control level value?
- A. At one time, both the market and the income approach methods were assumed to yield a non-control level value, regardless of the adjustments made to the income stream. This widespread assumption changed in the mid-1990s based on the following observations:
 - (1) If the income stream has been adjusted to reflect the benefits of control, it is unreasonable to expect that applying a market-derived discount rate will yield a non-control value.

- (2) Management of publicly-traded companies have different motivation from managers of closely-held companies.
 - (a) CEOs of public companies are charged with maximizing the value of the company's shares.
 - (b) Closely-held company owners are usually focused on maximizing their own after-tax cash flow.
 - (3) Public company CEOs and management are subject to external governance constraints that keep them from aggrandizing personal cash flows to the exclusion of all other shareholders.
 - (4) The public company Board of Directors would likely fire management in such circumstances. Private company management does not answer to an independent Board of Directors.
 - (5) Banking, accounting and governmental institutions can often direct, or at least influence, the conduct of management in a public company. Private company management is only subject to legal and tax constraints.
 - (6) The bid premiums observed in the public markets on a takeover are not necessarily indicative of a higher control value of public corporations. They are more likely reflecting the benefits of synergy or other unique considerations of the purchaser.
- B. There is therefore now an increasing recognition that the stock prices derived from efficient public markets with good governance constraints deliver close to the control level of value.
- C. This subject is covered more fully in BV 204.

15. Non-control, marketable or Non-control, non-marketable?

- A. The income approach yields a marketable level value.
- (1) The rate of return in the income approach is derived from the public market, where securities have immediate liquidity.
 - (2) The present value of the projected cash flows are therefore assumed to have liquidity. If the closely-held subject company cannot be

liquidated in the same manner as a public company, then a DLOM should be considered.

16. Discount for Lack of Control

A. It is accepted practice that a non-controlling interest in a closely-held firm is worth less than a control interest. Best practice however is still dealing with two questions:

(1) What criteria do we use to assess the size of the discount?

(2) How is the discount quantified (i.e. what empirical evidence exists to quantify the discount)?

B. To assess the severity of the non-controlling investor's position we consider the benefits of control and the extent to which a controlling investor uses those benefits to divert cash flows to himself and away from the non-controlling investor.

C. Typical powers of control may include:

(1) The ability to unilaterally control financial and operating policies, or the ability to appoint persons to the Board which controls policies.

(2) The power to declare dividends

(3) The power to set salaries

(4) The ability to sell the business

(5) The ability to liquidate assets within the business

(6) The ability to hire and fire personnel

(7) The ability to contract with related parties, including external entities owned or controlled by the controlling shareholder

(8) The power to repurchase outstanding stock or issue new shares

(9) The power to determine the levels of debt in the capital structure

(10) The power to make acquisitions or divest product lines

(11) The ability to sell a controlling interest in the company without participation by the non-controlling shareholders

- D. The control powers should be assessed for each subject company in the context of a control investor's ability to divert cash flow from the non-controlling owner to the control owner.
- (1) The discount for lack of control therefore should be thought of in terms of cash flow.
- (a) If a company is worth 100 on a control basis and an analyst opines that the same company is worth 65 on a non-control basis (after a 35% discount for lack of control), what support is there to document the lower level of cash flow that results in a 65 present value?
17. For investments that are less than 100%, there may be degrees of control, which are determined by:
- A. Applicable laws in the local country
- B. Articles of incorporation
- C. Shareholder and Operating Agreements
- D. The distribution of the remaining ownership interests
- (1) If the subject interest is 10%, is there one other controlling shareholder who owns 90% or are there nine other 10% investors?
- (2) Operating control may exist for interests of less than 50% if there is no controlling shareholder.
- E. Swing blocks
- (1) Small non-control interests may have a substantial degree of control if they can combine with another owner to reach the threshold of control set by local laws.
- (a) For example if there are two 49% shareholders, the third 2% interest represents a swing block.
- (b) Similarly, if there are three 33.3% interests, all three holdings represent swing blocks.

- F. There is virtually no empirical evidence available to quantify degrees of control. Hence this issue must be addressed with experience, judgment and consideration of relative values.

18. Empirical Evidence for the DLOC

- A. There is no direct evidence to support the DLOC. Traditionally, the discounts have been derived from the inverse of control premiums paid in the market.

- (1) However the bid premiums in the markets are now generally considered to represent a synergy dataset (or other factors relating to the buyer). Bid premiums are increasingly not being interpreted as control premiums. Therefore the inversion of such premiums into a discount for lack of control is being increasingly challenged.

Section F. Overview of Income Approach

1. Income Approach – Defined in the International Glossary of Business Valuation Terms (“International Glossary”) as:

“A general way of determining a value indication of a business, business ownership interest, security, or intangible assets using one or more methods that convert anticipated economic benefits into a present single amount.”

2. The Income Approach – Defined in the International Valuation Standards 2020 (“IVS 2020”) as:

“The income approach provides an indication of value by converting future cash flow to a single current value. Under the income approach, the value of an asset is determined by reference to the value of income, cash flow or cost savings generated by the asset.”

3. The income approach is based on the financial concept that the value of an asset is equal to the present value of the asset’s future benefits. Hence, the income approach is used to value not just business equity, but also financial instruments, real estate, tangible equipment, and intangible assets.

A. Components of the income approach

(1) Time period

- (a) Future benefits can last for a finite period or into perpetuity.

- ◆ An intangible asset, such as a patent, may have a defined life. The cash flows that the patent generates would be projected over the finite life and discounted to present value.
- ◆ Most businesses project cash flows into perpetuity. Both a single period and multi-period discount model can accommodate projections into perpetuity.

(2) Growth rate

- (a) Growth is measured in percentage terms on the base year.
- (b) The growth rate can be a constant percentage into perpetuity or it can change each time period.

(3) Risk factor

- (a) Represents the risk that projected cash flows will be actualized.
- (b) Measured as a percentage rate, alternatively referred to as the required rate of return, discount rate, cost of equity, cost of capital, or weighted average cost of capital.
 - ◆ These rates are not all synonymous. The rate used depends on the nature of the cash flow stream being discounted.
- (c) The higher the perceived risk of actualizing the projected cash flows, the higher the rate of return and the lower the present value.

Section G. Capitalization of Benefits

1. The income approach to value includes different methods, including the capitalization method and the discounted cash flow method. The capitalization method is a single calculation, as discussed below.

“Although there are many ways to implement the income approach, all methods under the income approach are effectively based on discounting future amounts of cash flow to present value. They are all variations of the Discounted Cash Flow (DCF) method and the concepts below apply in part or in full to all income approach methods.” (IVS 2020)

2. Definitions (from the International Glossary)

(1) Capitalization

“A conversion of a single period of economic benefits into value”

(2) Capitalization Factor

“Any multiple or divisor used to convert anticipated economic benefits of a single period into value.”

(3) Capitalization Rate

“Any divisor (usually expressed as a percentage) used to convert anticipated economic benefits of a single period into value.”

$$\text{Fair Market Value} = \frac{\text{Economic Benefit}}{\text{Capitalisation Rate}}$$

3. The capitalization of benefits method is based on the formula for calculating the value of an anticipated economic benefit of a single period growing at a constant rate in perpetuity as follows:

$$Value = \frac{Income_1}{k - g}$$

Where:

$Income_1$ = Representative anticipated economic benefit in the year after the valuation date. This is the same as the income in the latest year increased by the growth rate.

k = Discount rate that reflects the risk of the specific anticipated economic benefit

g = Constant growth rate for the economic benefit into perpetuity

- A. The $Income_1$ variable represents the first year of a forecast. It is calculated by taking the latest year's historical earnings and multiplying by one plus the growth rate.
- B. This model, also known as the Gordon Growth Model, is a shortened version of the discounted future benefits formula discussed in the next section of this chapter.
- C. It is consistent with the formula for an annuity increasing at a constant rate, and assumed to continue in perpetuity.
- D. The Gordon Growth Model can be rearranged in several ways which can be of practical use:

$$\text{Cost of equity } (k) = \frac{CF_1}{Value} + \text{growth}(g)$$

$$\text{growth}(g) = \text{cost of equity } (k) - \frac{CF_1}{Value}$$

- E. There is a more challenging situation if the value of growth is required but only CF_0 is provided:

$$growth(g) = \frac{V \cdot K_e - CF_0}{V + CF_0}$$

- (1) The difference between a capitalization model and a discounted future benefits model is that the discounted future benefits model has a certain number of years of specifically forecasted earnings prior to the calculation of capitalized earnings. Therefore both methods include a capitalization model as a major component of the valuation.

- F. The capitalization rate equals the denominator ($k - g$), and is therefore a discount rate less perpetual growth.

4. Example

- A. Acme Corporation is a small hospital supply company that has generated steady cash flows over the past 15 years.

- (1) The Company's after-tax equity cash flows have grown at a consistent rate of 4.0% over the past decade.
- (2) Management predicts, and all industry data supports, that cash flows will continue to grow at 4.0% in the long term future.
- (3) The valuation date is December 31, and normalized equity cash flow for the following calendar year (CF_1) is projected to be SR250,000.
- (4) The valuation analyst assessed a discount rate equal to 19.0%.

- B. The market value of the company at the end of December is calculated as follows:

$$Value = \frac{250,000}{19.0\% - 4.0\%} = 1,666,667$$

5. The above valuation is not in some way inferior to the use of a DCF method: if the DCF method was used, the cash flows would be expected to grow at 4% a year for the discrete period. They would continue to grow at 4% in perpetuity. This would give the same valuation as under the single period capitalization approach. This is shown later in this chapter.

6. The source of the Gordon growth model

- A. The Gordon Growth model is the equation for an annuity increasing at a constant rate in perpetuity.
- B. The formula for a steadily increasing annuity is:

$$CF_1 \times \left(\frac{1 - \left(\frac{1+g}{1+k} \right)^n}{k-g} \right)$$

- C. Using the above formula, an income stream of SR1 million, increasing at 3% a year, with a discount rate of 12% and lasting for a period of 8 years would be valued at SR5,426,000.
- D. As “n” (the number of years) approaches infinity, and assuming that g is less than k, the above formula simplifies to

$$\frac{CF_1}{k-g}$$

7. Components of the Capitalization Method

A. Economic benefits to be capitalized

- (1) The future economic benefits should be based on stabilized operations. The stabilized operations and a steady growth rate, represents capitalised economic benefits.
- (2) Anticipated growth is a function of management input and verification through independent company, industry, and economic analysis.
 - (a) For a steadily increasing business, as was exemplified above, the relevant growth rate will likely be represented by recent history.
 - (b) If the business is cyclical, then a longer historical analysis is necessary and should generally cover an entire cycle. IVS 2020 states: *“in the valuation of cyclical assets, the explicit forecast period should generally include an entire cycle when possible”*
 - (c) It can be very challenging in practice to determine the length of a business cycle.
 - (d) The forecast period should be *“the minimum explicit forecast period which should be sufficient for an asset to achieve a*

stabilised level of growth and profits, after which a terminal value can be used” (IVS 2020).

- (e) For a declining business, it may be more appropriate to look at a cost approach using liquidation values if there is no expectation of turning operations around.
- (f) If the company has no clear earnings trend, then the factors which cause the volatility should be determined. It is unlikely that a capitalization model would be appropriate unless a reasoning can be developed to support an average rate of growth.

B. The capitalization rate

- (1) Capitalization rates can be developed on an equity or invested capital basis. (Invested capital concepts are discussed in Chapter 3.)
- (2) As noted earlier, the payment of dividends or the retention of cash flows in the business should not, in theory, affect the valuation of a security.

“Cash flow to the whole asset is most commonly used because an asset should theoretically have a single value that is independent of how it is financed or whether income is paid as dividends or reinvested.” (IVS 2020)

- (3) Equity capitalization rates start with a discount rate developed using the capital asset pricing model or the build-up model.
 - (a) The equity discount rate reflects the risk of the equity investor cash flows.
 - (b) The equity capitalization rate equals the equity discount rate less growth.
- (4) Invested capital capitalization rates are derived from the weighted average cost of capital (WACC), which is a blend of the cost of equity and the cost of debt. The WACC, less growth, yields the invested capital capitalization rate.
 - (a) The same does not apply to minority holdings in private companies; for such companies a regular payment of dividends can increase minority shareholder value, as it represents a form of liquidity.

- (5) Analysts can derive capitalization rates from sources other than the CAPM or build-up model.
- (a) Public Stock market – Assuming a robust set of guideline public companies that are truly similar to the subject company, the cap rate can be derived from a representative market multiple from this group.
 - ◆ At the very least the analyst should compare the capitalization rates used in the income approach to the implied rates from the market approach.
 - (b) The guideline transaction Method – The market multiples derived from a transaction analysis have the same theoretical standing as the multiples from a guideline company analysis. However, as was discussed in BV 201, there are several limitations of the guideline transaction Method.
 - ◆ The price paid may not represent market value since synergistic value may have been included.
 - ◆ There may be insufficient information on the terms of the transaction and the level of earnings on which the price was based.
 - ◆ If it was an asset deal (i.e. price paid for invested capital), there is an implicit assumption about capital structure.
 - ◆ With very small companies, there may be accounting irregularities that are not reflective of the IFRS assumptions made in the valuation.
 - ◆ If the company is in an industry that is experiencing a “roll-up” or a consolidation trend, the price terms may not transfer well between the transaction date and the valuation date in the analyst’s report.

C. The Discount Rate

- (1) Factors affecting discount rates are discussed in Chapters 3 and 5.

- (2) External factors such as national and local economic conditions, local industry risks, cost and availability of capital, competition, etc. all affect the rate chosen.
- (3) Internal factors include the subject company's business risk (quality of management, customer relationships) and financial condition (margin levels, financial ratios, leverage).

D. Long- term Growth

- (1) Although the time horizon for any investment cannot be known with certainty, the assumption in business valuation is that market value reflects the present value of benefits that extend into perpetuity.
 - (a) An exception may be if a company is known to have a finite time horizon at which point it will be dissolved.
 - (b) Other assignments, such as a capital budgeting analysis or intangible assets valuation, may have a defined limited life and therefore require alternate assumptions.
- (2) Most businesses are subject to life cycles from early stage to maturation and decline. The subject company's position in its life cycle should be considered.
 - (a) Also, research shows that investors with controlling interests have holding periods that average in the 10-15 year range. While this factor may not affect overall company value, it may affect the value of non-control interests.
- (3) The analyst should be careful not to assume long term growth that exceeds inflation plus population growth. If higher growth rates are assumed, they cannot be applied in perpetuity as the subject company will otherwise become a larger and larger component of the relevant economy.

8. Correlating the Income Approach – Capitalization Method with the Market Approach

A. The capitalization rate is the inverse of the market multiple in the Market Approach.

- (1) The price/earnings multiple is the inverse of the earnings cap rate.

(a) P/E multiple = 8.0x

- ◆ Capitalization rate therefore equals 1/8, or 12.5%.
- ◆ Embedded in the cap rate of 12.5% are the discount rate and the perpetual growth rate. Therefore if long term growth is 3%, the discount rate (cost of equity capital) measured by reference to earnings is 15.5%.

(2) The same is true for other measures of economic benefits. For example, if the Price/equity cash flow multiple equals 9.0x, and the estimated long-term growth rate is 4.0%, what is the implied discount rate?

(a) P/CF multiple = 9.0x

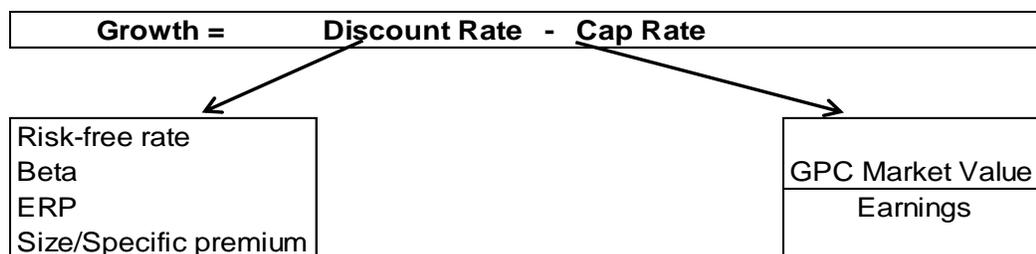
- ◆ Capitalization rate therefore equals 1/9, or a cap rate of 11.1% of cash flows.
- ◆ Given a constant growth rate of 4.0%, the discount rate would have to be 15.1% since the capitalization rate equals $(k - g)$, or $15.1\% - 4.0\% = 11.1\%$.

B. Therefore, in the market approach, growth is embedded in the multiple. In the income approach growth is quantified in the capitalization formula.

(1) Since the guideline public company has information available, the embedded growth rate can be derived and compared to the subject.

Cap Rate = Discount Rate - Growth
--

Solve for growth:



(2) The discount rate, or the WACC in an invested capital analysis, can be calculated for the guideline company. The components of the Capital Asset Pricing Model (CAPM) (covered in chapter 6) are market driven.

Depending on the GPC's market, the size premium or specific risk premium, if existent, may be subjective, but reasonably estimated.

- (3) The market value of the guideline public company (GPC) is known and its earnings are known. Therefore, the analyst can calculate the GPC's cap rate.
- (4) By deriving the discount rate and cap rate, the growth rate that the market has built into the company's price can be derived.

Example - Deriving Growth Rate from Market Multiple	
Guideline Company EBITDA =	260,000
Guideline Company Depreciation =	60,000
Guideline Company Net Operating Profit =	200,000
Tax Rate =	25.0%
Taxes =	50,000
Net Operating Profit After-Tax (NOPAT) =	150,000
Total Company MVIC ([share price * shares] + debt) =	1,900,000
NOPAT Multiple (1,900,000/150,000) =	12.7
Implied Market Capitalization Rate (1/12.7) =	7.9%
Weighted Cost of Capital (derived based on information)*	12.5%
<i>Implied Market Growth Rate (WACC - capitalization rate) =</i>	<i>4.6%</i>
* The WACC is derived from available data (risk-free rate, guideline company beta, equity risk premium, guideline company capital structure, value of debt and equity)	

- C. The analyst should carefully consider if the share price as of the Valuation Date, or an average of share prices for a certain period should be used.

The volatility of share prices may not reflect changes in growth expectations and may produce quite strange implied growth rates.

D. In BV 201 there was a case study called Ambro Holdings. The students were required to review the valuation calculations as prepared by another firm. One of the working papers showed the calculations relating to the weighted average cost of capital and also computed the implied growth rates. The valuers had decided not to use the data as reflecting differential growth rates, due to uncertainties as to the reliability.

E. The data was as follows:

<i>AUD</i>	Limited	Objective	UXC Ltd.	#3 Ltd.	Advanced Research	Runge
Beta	1.10	1.10	1.10	1.10	1.10	1.10
Risk-Free Rate	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%
Market Risk Premium	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%
Size/Specific Premium	5.67%	5.67%	5.06%	5.45%	5.39%	5.67%
Cost of Common Equity	13.5%	13.5%	12.9%	13.3%	13.2%	13.5%
Cost of Debt	0.0%	0.0%	8.4%	0.0%	0.0%	0.0%
Cost of Preferred	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
After-Tax cost of Debt	0.0%	0.0%	6.5%	0.0%	0.0%	0.0%
% Common Equity in Capital Structure	99.5%	99.4%	58.3%	100.0%	100.0%	100.0%
% Debt in Capital Structure	0.5%	0.6%	41.7%	0.0%	0.0%	0.0%
% Preferred in Capital Structure	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Weighted Cost of Capital	13.4%	13.4%	10.2%	13.3%	13.2%	13.5%
EBITDA	1.6	5.4	31.4	15.6	26.6	9.2
Depreciation	0.2	0.4	11.4	1.4	0.4	0.0
Net Operating Profit	1.4	5.0	20.0	14.2	26.2	9.2
Tax Rate	36.4%	23.4%	22.3%	30.3%	31.6%	20.4%
Taxes	0.5	1.2	4.5	4.3	8.3	1.9
Net Operating Profit After-Tax (NOPAT)	0.89	3.83	15.54	9.90	17.92	7.32
Total Company Value	21.4	34.0	261.0	130.9	203.4	64.0
NOPAT Multiple	24.0x	8.9x	16.8x	13.2x	11.3x	8.7x
Implied Market Capitalization Rate	4.2%	11.3%	6.0%	7.6%	8.8%	11.4%
Weighted Cost of Capital	13.4%	13.4%	10.2%	13.3%	13.2%	13.5%
Implied Market Growth Rate	9.3%	2.2%	4.3%	5.7%	4.1%	2.0%

(1) The range of NOPAT multiples was from 8.7 times to 24 times for the guideline companies in the Ambro Holdings example.

(2) The valuers did not have any credible explanation as to why they had used a constant beta of 1.1 for all of the companies.

(3) The valuers decided that this range could not be explained solely by reference to different rates of growth.

F. The analyst should derive the embedded growth rates for all GPCs.

(1) The subject company's long term growth rate does not need to equal the GPC's growth, but variations should be able to be explained.

9. Capitalization Rates for Other Measures of Income

A. Capitalization rates differ for varying levels of anticipated economic benefits.

(1) It is vital that the capitalization rate is related to the economic benefit measure.

B. The capitalisation rates will differ according to the income being measured. This can be seen with a simple example:

	'000	cap rate %	Value '000
Profits before tax	100		
Tax at 20%	(20)		
Net income after tax	80	8.33%	960
Dividends	(30)	3.12%	960
Retained	50		

C. The derivation of the discount rate from the CAPM or build-up model as discussed above is applicable to net after-tax equity cash flow.

D. If the analyst is working with a small company and wants to derive a capitalization rate for net income after tax or pre-tax earnings, then an adjustment is necessary.

(1) It is appropriate to use net income after tax in a valuation calculation only if it is a valid proxy for cash flow. Assuming that net income is a valid proxy for cash flow and assuming that the relationship between

net income will remain constant into perpetuity (which are two very large assumptions), then the following conversion can be completed:

$$CR_{net\ income} = \frac{NI}{NCF} \times CR_{net\ cash\ flow}$$

Where:

CR = Capitalization rate

NI = Net income

NCF = Equity cash flow

- (2) The above formula is frequently used in practice also for the discount rate, but only if there is no growth or quite a moderate growth rate.
- (3) For example, if normalized net income after tax is expected to be 125% of normalized net cash flow, an 18.0% net cash flow capitalization rate translates into a 22.5% net income capitalization rate.

$$1.25 \times 18.0\% = 22.5\%$$

E. Converting an after-tax net income capitalization rate to a pre-tax income capitalization rate:

- (1) Divide the net income capitalization rate by one minus the tax rate.

$$CR_{pretax\ income} = \frac{CR_{after\ tax\ income}}{1 - tax\ rate}$$

- (2) Assuming an 18.0% net income capitalization rate and a 25.0% tax rate, this would be:

$$\begin{aligned} &= 18.0\% / (1 - 25.0\%) \\ &= 18.0\% / 75.0\% \\ &= 24.0\% \end{aligned}$$

F. It should be remembered that the legitimacy of using alternate economic benefits such as net income after tax or pre-tax income should be explained. Investors base investments on equity or invested capital cash flow. Therefore relate valuations to the cash flows and do not confuse equity cash flows with invested capital cash flows.

Section H. Discounted Future Benefits Method

1. The discounted future earnings method is defined as:

“A method within the income approach whereby the present value of future expected economic benefits is calculated using a discount rate.”(International Glossary)

- A. The discounted future benefits method allows for greater flexibility and precision in reflecting known variations in the future anticipated economic benefits of a business.
 - (1) Equity net after-tax cash flow, or invested capital after-tax cash flow are usually used in a discounting model. This section will assume cash flow benefits.
 - (2) IVS 2020 states: *“Under the DCF method the forecasted cash flow is discounted back to the valuation date, resulting in a present value of the asset.”*
2. The discounted future benefits method involves the following steps.
 - A. Forecast specific cash flows for a specific number of years (known as the discrete projection period.)
 - B. Discount each year’s cash flow to present value at the appropriate discount rate.
 - C. Aggregate the present values of the specifically forecasted periods.
 - D. Determine the value of the business at the end of the discrete projection period, which is usually referred to as the
 - (a) terminal value,
 - (b) continuing value, or
 - (c) residual value.
 - E. The terminal value is the capitalization model calculated after the last individually projected year. It can also be computed by use of multiples or liquidation value. The terminal value captures the value of the company after the discrete projection period.
 - F. Add the terminal value to the sum of the present values in the discrete projections.
3. Discounting Formulas

A. The full equation for discounted future benefits:

$$\text{Value} = \frac{\text{NCF}_1}{(1+k)^1} + \frac{\text{NCF}_2}{(1+k)^2} + \frac{\text{NCF}_3}{(1+k)^3} + \frac{\text{NCF}_4}{(1+k)^4} + \dots + \frac{\text{NCF}_\infty}{(1+k)^\infty}$$

Where:

NCF = Net cash flow
 k = Net discount rate

B. This equation can be shortened to:

$$\text{Value} = \sum_{n=1}^{n=\infty} \frac{\text{NCF}_n}{(1+k)^n}$$

Where:

NCF= Net Cash Flow
 k= Net Cash flow discount rate
 n=Time period

C. The equation can be further modified where n is a finite period of time ending with period t, and all future value beyond t is included as a terminal value:

$$\sum_{n=1}^{n=t} \frac{\text{NCF}_n}{(1+k)^n} + \frac{\text{TV}_t}{(1+k)^t}$$

Where:

NCF= Net Cash Flow
 k= Net Cash flow discount rate
 n=Time period
 TV=Terminal Value
 t=Years in discrete projection period

D. Each of the components of this model must be analyzed.

- (1) The length of the discrete projection period
- (2) The forecasted cash flow

(3) Discounting conventions

(4) Calculating terminal value

4. Length of Discrete Projection Period

A. Specific annual forecasts should be made out to a point in the future where operations are normalized.

(1) If a company is experiencing losses, the discrete period should last until operations are not only turned around, but profits can be forecasted at a stable growth rate.

(2) If the company is undergoing an expansion, either due to a major capital investment or acquisition of another entity, extraordinary cash flow items are specifically forecasted until normalization. Exceptional levels of growth cannot be assumed to continue in perpetuity.

(3) In the case of a start-up or early stage business, alternate valuation models might be considered. If a discounted cash flow model is used however, the discrete projection might be lengthy until normalization is reached.

B. Many practitioners use a 5-year discrete projection period, although this may be the case since in-house models are set up that way. There is no inherent relationship between a 5-year period and a normalization cycle. Each company is different and discrete projections could last 1-2 years up to 20 years. For a cyclical business the valuer should use a discrete projection period which covers at least one business cycle.

C. However, as noted above, it can be very difficult in practice to identify when a business cycle has commenced and when it has completed a full cycle.

(1) It should be remembered that the further out the specific forecast is, the less certainty the analyst has (i.e. most business owners would be highly skeptical of a discrete projection that lasts 20 or more years).

5. Forecasting Net Cash Flow

A. Many firms have previously relied on management forecasts for liability reasons. However, management's projections may have ulterior motives.

B. IVS 2020 describes the responsibility of the valuer in reviewing forecasts:

“The process of valuation requires the valuer to make impartial judgements as to the reliability of inputs and assumptions. For a valuation to be credible, it is important that those judgements are made in a way that promotes transparency and minimises the influence of any subjective factors on the process.”

C. Points to consider in respect of projections and forecasts:

- (1) Projections made for banking purposes or impairment studies may be overly optimistic.
- (2) If the analyst accepts management’s forecasts as part of the valuation, he is accepting the reasonableness of the forecast.
 - (a) The ultimate opinion of value is owned by the valuation analyst, not management.
 - (b) As noted above, for a valuation to be credible, the valuer has to make impartial judgements as to the reliability of forecasts.
- (3) Therefore, the forecast should be made in the context of extensive industry and economic analysis, as well as internal financial analysis.
- (4) Any pro forma set of projections provided by management needs to be verified through independent research and testing.
- (5) If management have not prepared projections, they should be asked for the assumptions which are reasonable for the future. The valuer is then able to prepare projections based on the assumptions which have been provided by management.
- (6) If the analyst prepares his or her own projections, management should be consulted and asked to sign off.

6. Discounting Conventions

- A. There are generally two options, end-of-year discounting and mid-year discounting. It is possible to undertake continuous discounting but this is not generally used within the valuation profession, except in respect of some stock option models.
 - (1) End-of-year discounting assumes that all cash flows are received on the last day of the year. Although this convention is used in many

small entities, it is unrealistic except for certain types of companies, such as seasonal businesses.

- (a) The denominator for end-of-year discounting is:

$$\frac{1}{(1 + k)^t}$$

Where:

t=Year from which cash flow is received

- (2) Mid-year discounting assumes that cash flows are received on the middle day of the year. Cash flows are then discounted from the mid-point in the year.

- (a) The denominator for mid-year discounting is:

$$\frac{1}{(1 + k)^{t-0.5}}$$

Where:

t=Year from which cash flow is received

- (3) Present value based on end-of-year discounting (PV_e) can be converted to a present value based on mid-year discounting (PV_m) by growing the PV_e for one-half period using the discount rate as follows:

$$PV_m = PV_e * (1 + k)^{0.5}$$

- (4) The difference between the different discounting assumptions can be illustrated using an example. A valuation using DCF and initial cash flows of SR1,775,000 and variable rates of growth and a discount rate of 17%, results in a valuation of SR17,442,000 using mid-year discounting. If end of year discounting is used the figure is SR16,125,000, which is a difference of some 8%.

- (5) Both end of year discounting and mid-year discounting represent approximations of cash flows, as the precise timings of cash flows is not known. The mid year convention is a close approximation to the calculations on the assumption that the cash flows are received evenly on a weekly basis.

7. Calculating Terminal Value

- A. The terminal value captures the value from the end of the discrete period into perpetuity. It is often a single-period capitalization model calculated at the end of the last year of the discrete forecast.
- (1) The terminal value calculated as continuing in perpetuity is reasonable only if the subject business is expected to continue indefinitely.
 - (2) If the company is a liquidation candidate it may be reasonable to insert the liquidation value in the terminal year, less taxes and transactions costs.
 - (3) Some practitioners apply a market multiple to an earnings measure such as EBITDA to calculate the terminal value. This is often made under the assumption that the Company will be sold in a matter of years.
 - (a) While it is reasonable to expect a sale, especially in a private equity investor scenario, it is difficult to assume that any specific market multiple will be applicable years in the future.
 - (b) The current estimated multiple may reflect a period of anticipated exceptionally high growth. Once that period is over the EBITDA multiple would be expected to reduce. It may therefore be unrealistic to assume that the entry multiple and the exit multiple will be the same.
- B. The formula for calculating the terminal value formula using the single period Gordon Model:

$$\frac{NCF_t * (1 + g)}{k - g}$$

Where:

t=Length of discrete period

NCF_t= Net Cash Flow in last year (or NCF₀)

k=discount rate

g=long-term growth rate

- (1) This model grows the cash flow from the last year of the discrete projection period at the long-term growth rate.

(2) Care should be taken to ensure that the cash flow adjustments in the last year of the discrete projection can be validly forecast at the long-term growth rate. (Capital expenditure below the level of depreciation or reductions in working capital cannot continue in perpetuity. See Chapter 2, Section D: Forecasting).

C. The Gordon Growth formula requires the estimation of NCF_{t+1} , which means individual calculation of NOPAT, CAPEX and change in working capital. As explained in detail in Chapter 2, often the analyst does not have an easy life with the estimation of CAPEX in the terminal year. To overcome this difficulty the analyst may refer to the direct relationship between the NOPAT and Terminal Value:

$$TV_t = \frac{NOPAT_{t+1} * \left[1 - \frac{g}{RONIC}\right]}{WACC - g}$$

where:

NOPAT: The level of NOPAT should be based on a normalised level of revenues and sustainable margin and return on invested capital (ROIC).

RONIC: The expected rate of return on new invested capital (RONIC) should be consistent with the expected competitive conditions. The analyst can estimate the historical RONIC by dividing the $\Delta NOPAT_t$ (the change in NOPAT from one year to the other) with $CAPEX_{t-1}$. The competition, however, will eventually eliminate abnormal returns, so for many companies the analyst can assume that $RONIC = WACC$. This assumption will modify the above formula to:

$$TV_t = \frac{NOPAT_{t+1}}{WACC}$$

g : Few companies can be expected to grow faster than the economy for long periods. As stated previously the long term sustainable growth rate of the company cannot exceed the population growth plus inflation.

D. The terminal value is then discounted to present value at the valuation date, as follows:

$$PV = \frac{\frac{NCF_t * (1 + g)}{k - g}}{(1 + k)^t}$$

- E. If the assumption is that cash flows will be received periodically in the future, then the mid-year discounting assumption should be used. This can be handled by discounting the future value by $(t^{0.5})$ as shown below.

$$PV = \frac{\frac{NCF_t * (1 + g)}{k - g}}{(1 + k)^{t-0.5}}$$

Or

$$PV = \frac{\frac{NCF_t}{k - g} * (1 + k)^{0.5}}{(1 + k)^t}$$

- F. Perpetuity growth will be discussed in the forecasting module in Chapter 2. It would be difficult to support growth that exceeds the 5.0% - 6.0% range.
- G. If a business is expected to grow into perpetuity, it is likely that capital expenditures will exceed depreciation due to the impact of inflation. Similarly the net working capital is likely to increase at the constant growth rate.
- (1) Some analysts make the argument that capital investment and depreciation should equal each other in a residual model since everything that is purchased gets depreciated. However, in a constant growth environment, the fixed and working capital will be expected to expand at the constant growth rate.
 - (2) In simple terms we must assume that the size of the balance sheet will remain proportionate to the size of the business and the resulting balance sheet expansion will absorb some of the cash flows.
- H. It is wise to conduct a sensitivity analysis on the terminal value, first calculating the percentage of overall value comprised by the terminal calculation.

8. The Use of Single Period Multipliers

- A. Many practitioners recognise that transactions in the market place are often based on multipliers of anticipated profits in the first year following acquisition. The multiplier may be applied to EBITDA, EBIT, NOPAT or equity earnings before or after taxation.
- B. This is not an entirely different method of valuation: it can be reconciled to more detailed methods under the income approach:
- (1) The inverse of these multiples are the capitalization rates as applied to the different levels of profits;
 - (2) The valuer should assess the relationship between accounting profits and cash flows. Cash flows will very commonly be less than reported profits due to balance sheet expansion: there will likely be expenditure on fixed assets in excess of depreciation; the levels of inventories and receivables will likely increase with growth in the income statement, and only part of this growth will be covered by increasing payables balances;
 - (3) The differences between reported profits and cash flows will differ for different parts of the economy: capital intensive businesses such as manufacturing will likely experience significant balance sheet expansion with growth; parts of the services sector may have a far closer relationship between profits and cash generation;
 - (4) Having established the likely pattern of cash flows, and the relationship to profits, the capitalization rates can be adjusted to reflect the cash flows;
 - (5) The valuer can then have a greater understanding of the capitalization rates as being equivalent to the discount rate less growth.
- C. It is important to recognize the very close relationship between the two main methods under the income approach, namely the single period capitalisation rate and the discounted cash flow method. This can be demonstrated with the example of Acme Corporation which was addressed above. As Acme Corporation is growing at a consistent rate

and this is expected to continue, the valuation can be done using either of the methods. This is shown below:

ACME Corporation					
The long way					
Year	1	2	3	4	Terminal
Growth		4%	4%	4%	4%
Cash flows	250,000	260,000	270,400	281,216	292,465
Discount rate	19%	19%	19%	19%	
Ke - g					15%
Terminal value					1,949,764
Discount factor	0.840	0.706	0.593	0.499	0.499
Net present value	210,084	183,603	160,460	140,234	972,287
Total	<u>1,666,667</u>				
The short way	250,000				
Ke - g	15%				
Value	<u>1,666,667</u>				

- D. The message is a simple one: discounted cash flow techniques with a number of periods of discrete projections are only required if the company has not reached a state of stable growth. They are not otherwise intellectually preferable.

Section I. Chapter Exercises

1. Capitalization Model - Calculate the value of equity for a client company as of December 31, 2019 given the following variables:
 - 2019 net income after tax = 1,250,000
 - 2019 net after-tax invested capital cash flow = 1,400,000
 - 2019 net equity after-tax cash flow = 925,000
 - Market value of debt = 1,500,000

- Cost of equity after tax = 18%
 - Cost of debt before tax = 6%
 - Perpetual revenue growth rate = 6.0%
 - Perpetual cash flow growth rate = 4.0%
2. Discounted Cash Flow Model – Calculate the net present value of this subject company based on the following information. Assume the company receives its cash flow periodically during the year.
- Valuation date December 31, 2019
 - Discount rate = 17.0%
 - Cash flow, 2019 = SR1,775,000
 - Growth, 2020-22 = 8%
 - Growth, 2023-24 = 6%
 - Growth after 2024 = 4%
3. XYZ Company has been valued at SR114,000,000. What is the long term constant growth rate? Additional information:
- Value SR114 m.
 - Cash Flow, year zero SR14,250,000
 - Cost of equity 17.0%

4. When using DCF how many years should the discrete projections cover?
- A. Five years
 - B. Four years
 - C. The number of years until the business has reached a stage of stable growth
 - D. Until a loss-making business has moved into profit
5. For which of the following companies would the discounted cash flow model be the most appropriate valuation method:
- A. A company holding real estate for investment purposes;
 - B. A company incurring losses with no prospect of the business moving into profit;
 - C. A company experiencing high rates of growth which is expected to revert to sustainable growth over the next five years;
 - D. A company which has experienced growth at a rate of 3.5% to 4% a year over the last five years.

Chapter 2. Financial Analysis and forecasting

Section A. IVSC competencies covered

Financial statement analysis	
Differences between various entities	
Extent of investigation and normalization adjustments	x
Cash v accrual accounting & capitalize v expense	
Effects of accounting policies	x
Historic information and forecasts for valuation	x
Financial theory, principles and concepts	
Risk-return, time value of money, capital structure, cost of capital	
Financial state, ratio, trend and cash flow analysis	x
Historical results, benchmarks and guideline companies	
Valuation Process:	
Process in conduct of assignment	x
Scope of work in accordance with IVSC	
Qualitative and quantitative information needs	x
Assess the qualitative and quantitative information	x
Purpose of engagement and representation letters	
Financial Forecasting	
Identify information inputs- internal and external sources	x
Evaluate information inputs	x
Apply forecasting methods using reasonable assumptions	x
Describe assumptions for third party	

Section B. Introduction

1. BV 201 dealt with company, economic, and industry analyses which address the qualitative risk factors that affect the subject business. This chapter focuses on the quantitative risk factors that arise from a financial statement analysis.
2. A review of financial ratio analysis, trend analysis, and common size analysis is contained in the Appendix of this Chapter. It is advisable that the student review this material especially if some time has elapsed since completion of BV201.
3. Topics covered in this chapter include:
 - A. Financial statement analysis case study
 - B. Financial forecasting

Section C. Financial Statement Analysis Case Study

1. The historical balance sheets, income statements and financial ratios are shown below for Atlantic Beverages for the years 2016 through 2019. On the spread sheet the figures are shown on the following tabs:
 - A. **HBS; HIS; and His Ratios**
 - B. Atlantic Beverages is a relatively small manufacturer of soft drinks located in Germany. Although there is information lacking (no notes to financial statements, no statement of cash flows, no breakdown of cost of sales or selling, general & administrative expense), you have been assigned the task of providing a preliminary financial analysis on the company.
2. Financial ratios are based on historical financial statements. The last column of data contains averages from an industry survey of European beverage manufacturers.
3. The information contained below is part of the evidence envisaged by IVS 2020 Standard 102 – Investigations and Compliance – which requires evidence to be assembled by various means including computation and analysis to ensure that the valuation is properly supported.
4. Review the financial statements below and answer the questions that follow.

	2016	2017	2018	2019	4-Year Avg.	Industry Norm
Revenue	€ 3,890,801	€ 2,985,252	€ 3,717,785	€ 2,748,148	n/m	n/a
Revenue Growth		-23.3%	24.5%	-26.1%		
Profitability Ratios						
Gross profit margin	44.8%	45.3%	42.7%	45.9%	44.7%	34.6%
EBT margin	6.3%	-1.2%	7.7%	5.0%	4.5%	4.9%
EBIT margin	6.9%	-0.9%	8.6%	5.3%	5.0%	5.5%
EBITDA margin	14.4%	13.2%	16.4%	15.3%	14.8%	n/a
ROE (EBT/Equity)	49.1%	-8.4%	63.6%	45.9%	37.5%	9.0%
ROA (EBIT/Assets)	13.8%	-1.9%	23.3%	14.7%	12.5%	4.4%
ROIC (EBIT/Equity & Debt)	15.2%	-2.1%	31.4%	20.2%	16.2%	n/a
Liquidity Ratios						
Current ratio	0.9	0.6	1.0	1.8	1.1	2.0
Quick ratio	0.4	0.3	0.4	0.7	0.5	1.1
Coverage Ratios						
Times interest earned	11.4	(3.1)	9.9	18.7	9.3	1.8
Asset Management Ratios						
Total asset turnover	2.0	2.1	2.7	2.8	2.4	2.3
Accounts Receivable turnover	10.4	10.5	11.3	16.3	12.1	13.6
Days of receivables	35.2	34.9	32.2	22.4	31.2	26.8
Inventory turnover	5.1	4.5	4.4	3.4	4.4	13.9
Days of inventory	71.4	81.4	82.3	108.3	85.8	26.3
Accounts payable turnover	15.5	12.6	8.1	7.5	10.9	19.2
Days payables	23.5	29.0	44.9	48.9	36.6	19.0
Sales/Net fixed assets	4.0	3.9	7.9	9.2	6.3	5.5
Oper. Working capital/sales	17.2%	15.9%	14.4%	15.0%	15.6%	n/a
Leverage Ratios						
Total debt/ equity	2.89	2.43	2.03	2.31	2.4	1.2
Interest bearing debt/ equity	2.54	2.00	1.25	1.40	1.8	N/A
Assets/ equity	3.89	3.43	3.03	3.31	3.4	2.2

n/a = not available

n/m = not meaningful

5. Case Study Questions

- A. Calculate the change in operating working capital in 2017 and 2018. For the calculation of operating working capital include all current assets, but exclude interest bearing debt from liabilities.
- B. As of December 2019, what is the average life and the average age of fixed assets?

- C. Provide 3 or 4 fundamental observations from the balance sheet that should be asked of management.
- D. Provide 3 or 4 fundamental observations from the income statement that should be asked of management.
- E. Atlantic's average gross profit margin is about 10% higher than the industry norm, but its average operating margin is similar. What is one possible explanation?
- F. Assess the condition of Atlantic's liquidity and working capital management relative to the industry norm.
 - (1) What are possible reasons for the difference in Days of Inventory between Atlantic and the industry norm?
 - (2) Why is Atlantic's sales/net fixed assets so much higher than the norm?
 - (3) If sales/net fixed assets is so different, why is total asset turnover so similar?
 - (4) What is Atlantic's capital structure relative to the industry and is this factor an indication of financial risk?
- G. How much cash is being extracted by the owners of Atlantic Beverages?

Section D. Forecasting

1. Introduction

- A. As was discussed in Chapter 1, valuation analysis is the process of quantifying a company's growth and risk. If either of these analyses is done incorrectly, or without adequate support, the valuation result will be inaccurate.
- B. The forecast of operating cash flow represents the analyst's quantification of growth. For this reason, considerable time and effort should be exerted to develop a well-documented set of operating projections that are grounded in all known and knowable facts about the company.
- C. The Cash Flow forecast in the Income Approach is typically done using (1) the discrete period and (2) the terminal, or exit, or liquidation period.
- D. Some analysts accept management's projections without question or further analysis. This is inappropriate since management's projections could be skewed to achieve a desired result. IVS 2020 102 – Investigations and Compliance - states that *"investigations made during the course of a valuation assignment must be appropriate for the purposes of the valuation assignment."*
- E. The valuer should be aware that:
 - (1) A projection developed for an impairment analysis or for banking purposes may be overly aggressive.
 - (2) A projection developed for the purpose of buying out a departing partner may be overly pessimistic.
- F. The best forecast is usually done through a combined effort between management and the valuation analyst. The analyst will often begin with management's projections and then adjust elements of the forecast if adequate support is found.
 - (1) If projections are prepared by management, the analyst has a responsibility to challenge the assumptions made in the projections. For example:
 - (a) Is the rate of sales growth consistent with the past, or are there good reasons for the growth to differ from the past?

- (b) Are the assumptions of the gross margin realistic?
- (c) If there is a period of high growth, has adequate allowance been made for an increase in overhead costs?

G. The conventional view of growth is that businesses can only grow if the business retains most of the cash flows in order to fund the large increases in capital equipment and working capital that are required. This is still the case for manufacturing and certain other sectors. For such capital-intensive sectors and a period of high growth, the valuer needs to consider if adequate allowance has been made for the increase in fixed assets and working capital.

H. For some other businesses the situation is rather more complex: the expenditure which enables growth to take place is largely comprised of revenue expenditure in the form of creating new intangible assets:

(1) As an example, an insurance agency business seeks to grow by means other than acquisition. It hires a specialist in insurance for the agricultural sector, who builds a team around herself. The team target agricultural clients; losses are incurred in years 1 and 2; the new team breaks even in year 3 and is profitable in year 4.

(a) In these circumstances these costs are all recognised as revenue expenditure; they represent costs incurred in order to increase the total value of the business as new intangible assets are being created. However these costs cannot be reliably measured and are therefore expensed through the income statement.

(b) An alternative to the above would have been the acquisition of a business in which the agricultural specialist and a team which he headed worked. In that circumstance the cost would be capitalised and intangible assets recognized.

(2) If the analyst develops a forecast completely on his own, management should be asked to sign off on the projections prior to completing the job.

2. Cash Flow Forecast during Discrete Period

A. Where is the growth coming from?

(1) Growth can vary greatly across industries and across firms within industries. There are typically three ways to achieve growth:

- (a) Product portfolio: Companies can create additional value through developing new products and services, persuade customers to use more of the existing products and services and attract new customers.
- (b) Merger and Acquisitions: This is probably the fastest value-creating strategy, by entering fast growing markets and taking revenue from distant companies instead of local competitors. Valuers will rarely find projections which include the M&A of companies, unless such an acquisition is imminent.
- (c) Market share performance: This is probably the most difficult way to have growth, especially in mature markets, because of the prompt reaction of the competition. Product promotions, pricing promotions and incremental product changes rarely create lasting value. The valuer should carefully consider projections which aim to increase market share with long lasting positive effects. The valuer needs to understand how the business is able to increase market share at the cost of its competitors.

B. How can the company support growth?

- (1) In valuations of some businesses the company factors that generate growth are the new investments in depreciable assets and working capital. This is not always true. There are typically three factors that affect the growth in a company:
 - (a) Capital expenditures (Balance sheet item)
 - ◆ It is obvious that a company cannot grow unless it regularly invests in capital expenditures. Even to maintain the current level of operations you need to invest in the replacement of depreciable assets.
 - (b) Operational expenditures related to intangible assets (Income Statement items)
 - ◆ Typical items are the R&D expenses and advertising expenses. These expenses are part of Income Statement and affect the business through NOPAT. They serve to generate new intangible assets (which cannot be found in

the Balance Sheet) and/or maintain the existing intangible assets in the balance sheet.

- ◆ Other less obvious examples are revenue expenditure on the growth of new service lines, as referred to with the insurance agency business above.

(c) Efficiencies arising during the normal course of the business (Income Statement items)

- ◆ Achieving greater output of goods or services through better utilization of the resources of the Company, through greater efficiency in production, higher productivity of the workforce and other means.
- ◆ Replacement of worn assets with new ones may usually lead to better performance of the company, either through increasing productivity, and/or reducing costs. This is again a growth factor to be found in NOPAT.

C. The Sales Forecast

(1) The sales forecast is the most common way to project a company's operations. This is one of the most difficult – and, obviously, one of the most important – factors to estimate during the forecast of the cashflows. The steps in the sales forecast process are as follows:

- (a) Complete the financial ratio analysis and understand the relationships between all income statement and balance sheet accounts.
- (b) Select the number of years that operations can be specifically forecast with specificity. Sometimes a forecast can be made for only 2 to 3 years since operations beyond that point are an unknown. Other times a forecast can be made for an entire economic cycle which may span 5 to 10 years.
 - ◆ The rule is that the assumptions behind each year of the specific (or discrete) forecast must be documented.
- (c) In practice it is common for unsophisticated management to project sales as a percentage growth on the previous year. The analyst should carefully consider if the growth is coming from volumes, from prices, or both.

- ◆ Volume growth should be checked against the market (external factor) and the production capacity of the plant (internal factor), which may trigger new CAPEX
- ◆ Price growth should be checked against the market. Can the company increase prices without losing market share? How will competition react if prices are increased in this way?

D. Project the income statement

(1) Forecast sales growth throughout the discrete period.

- (a) Each year's growth assumption should be supported by an industry factor or internal company factor.
- (b) If the subject is a manufacturer, it is most useful to project unit sales and then include an inflation factor to reach the sales value.

(2) Project cost of goods sold as a variable expense based on research into raw material prices and the company's past gross profit margin.

(3) Project selling, general and administrative expense.

- (a) Variable overhead – variable expenses can be projected as a percentage of each year's sales.
- (b) Fixed overhead – fixed costs should be projected independently of sales. Examples:
 - ◆ Rent – rent or lease expense is based on the terms of the property lease.
 - ◆ Interest – based on the amount of debt projected to fund operations. This factor may be iterative in that the acquired debt may not be known until profitability is known.
 - ◆ Utilities & taxes – based on management's input, subject to confirmation.
- (c) Semi-fixed expense – semi-fixed expenses are fixed costs that are applicable only within a given range of sales. Once sales grow out of the given range, the fixed costs will grow into a higher range with sales. Examples:

- ◆ Depreciation – depreciation should be projected as part of a fixed asset schedule, which takes historical gross fixed assets, adds the capital expenditures that must be made each year to support sales, deletes the fixed assets that are retired, and takes the depreciation rate (straight-line depreciation or other methods) on the gross assets.
- ◆ Salaries – compensation for labor is not directly variable with sales. As sales pass through a relevant range the company can be expected to need more staff to support the larger operation. Salary per employee can grow annually by inflation or any other growth rate.
- ◆ The same can be said for physical plant. Hence, rent, utilities, real estate tax, etc. may be considered semi-fixed in certain companies.
- ◆ Certain costs will be fixed in the context of any single year, but they will become variable over a longer time period.

(4) Project items included in other income or expense as needed.

- (a) These items could include items deemed “non-recurring” as long as there is a legitimate expectation that they will occur. These items should not be included in a forecast used for computing the terminal value.

E. Project the balance sheet

(1) Balance sheet accounts can be forecast individually by applying the appropriate financial ratio to the relevant income statement account.

- (a) A macro can be written in excel to project the balance sheet using the same relationships. This function will iterate levels of financing needed given assumptions put into the model.
- (b) A manual example is shown below for a forecast of accounts receivable.

	Actual	Projected Operations			
	2019	2020	2021	2022	2023
Revenue (mill)	28,000	30,800	33,264	35,260	36,670

growth		10.0%	8.0%	6.0%	4.0%
Accounts receivable	7,300	8,030	8,672	9,193	9,560
A/R Turnover	3.836				

- ◆ In this example, the A/R turnover in 2019 was 3.836 based on actual results (this equates to 95 days). The analyst expects that this relationship will continue unchanged in the future. Since sales revenue was projected based on the growth rates that are given, the accounts receivable balances can easily be calculated as Sales/3.836.
 - ◆ Therefore projected accounts receivable in 2020
=SR30,800/3.836 = SR8,030
 - ◆ It is surprisingly common for projections not to take adequate account of changes in working capital.
- (c) This same process can be completed for each asset account on the balance sheet and for the current liabilities. The objective here is for the analyst to know how much is needed in working capital, fixed assets, and other assets in relation to the increase in the income statement.
- (d) It is very common for a period of rapid growth in a business to absorb significant liquidity due to the expansion of the balance sheet, with large increases in working capital and fixed assets.
- (e) Any company will typically make considerable upfront investments in plant, equipment (also called capital expenditures), and so on to get a project off the ground. These investments continue throughout the life of a company to maintain and grow its business.
- ◆ During the discrete period of the forecast, it is the management which typically will provide the valuation analyst with a detailed plan of the capital expenditures.

- ◆ The analyst has to understand how much of the CAPEX is used for the replacement of the existing assets, and how much is used to sustain the expected growth.
 - ⇒ The CAPEX for replacement of existing assets is equal to the replacement cost of the depreciable assets divided by the average life of the assets. The replacement cost is not equal to the historical cost of the assets (as reported in the Balance Sheet), but it has to take into account inflation and other price changing factors.
 - ⇒ The proposed CAPEX for expansion should also be assessed, whether it supports the revenue growth projections.
- (f) The CAPEX can either be “lumpy” or smoothed throughout a period. In manufacturing industry there may periods with intensive CAPEX, and others with low level of investments. Telecommunication industry has a different profile. Due to short life of electronic equipment and the revenue growth depending on the size of the network, it is common to estimate annual CAPEX as a percentage of revenues.
- (g) If the management projections for CAPEX are missing, the analyst can estimate CAPEX through the normalisation of the historical CAPEX over a number of years to arrive at an average annual CAPEX to be spent. In any case the analyst’s estimations should be discussed with the management for their reasonability.
- (h) Third party debt and/or equity should finally be projected based on assumptions about the future capital structure of the business. Assumptions should not be made about future financing needs without consulting management.
 - ◆ The financing forecast is iterative since changes in debt assumptions will change interest expense on the income statement which will change profitability, retained earnings, and possibly the need for external financing.

(2) Project Cash Flow

- (a) The equity valuation is based on discounted future net after tax equity cash flow. That cash flow is summarised as:

EQUITY CASH FLOWS:

Pre-tax earnings
(taxes)
<hr/>
Net Income after taxes
+ depreciation, amortisation
+/- changes in working capital
- capital investment
+/- changes in debt principal
<hr/>
Net Equity Cash Flow

- (b) There may be other adjustments for other balance sheet components, such as provisions, if these include non-cash movements.

3. Estimation of Terminal Year Cash Flow

- A. A correct estimation of the terminal value (also called “continuing value”) is very important in most of business valuation due to the significant weight the terminal value has in the overall enterprise value. It is normal to have a terminal value over 50% of the EV, and in cases of negative cashflows in some of the discrete period projections, the terminal value can be even higher than the EV itself.
- B. The estimation of terminal year cash flow starts with the “stabilised year”. As explained in both BV201 and in this course, the stabilised (or “normalised”) year is the last year of the discrete period projections when the company reaches the sustainable long term growth rate.
- (1) The business plan received from the company’s management often does not reflect a sustainable growth rate. Even in the case of 5-years or more of projections, the analyst may find both growth rates in revenues and/or EBITDA margins much higher than the industry averages. This cannot last forever, but the analyst cannot take shortcuts either.
- (a) If a company’s projections have a revenue growth rate of 10% (against the industry average of 3%) and an EBITDA margin of

20% (against the industry average of 12%) in the last year of projections, the analyst cannot:

- ◆ estimate the terminal value using the company's results in the last year of projections. This would overvalue the company.
- ◆ estimate the terminal value using the industry averages, because there may need to be some more years until the growth and profitability settle down to the industry level (unless there are reasons to believe that the company cannot grow more after the last projections year). This would undervalue the company.

(b) The analyst should discuss with the management an extrapolation period during which the revenue growth and profitability get closer to the industry averages.

(2) It is very easy to make mistakes in the terminal value. See the example on the slide. There is more than one mistake.

C. Capital Expenditures in the Terminal Year

- (1) It is very common to see in the calculation of the terminal year CAPEX equal to depreciation. The main argument behind this assumption is to have a constant level of assets in the balance sheet, to support the business operations.
- (2) Several academics and practitioners have indicated that this is not correct. As stated above the CAPEX has two main components: replacement CAPEX and expansion CAPEX. Even the replacement CAPEX needs to be higher than depreciation due to inflation.
- (3) According to some studies the relationship between the CAPEX and depreciation (it assumes straight-line method) in the terminal year is expressed as a function of average life of the assets and inflation

$$\frac{CAPEX}{Depreciation} = \frac{n * I}{1 - \frac{1}{(1 + I)^n}}$$

Where:

- n = weighted average depreciable life of new assets
- I = estimated future inflation

- (4) This relationship is also expressed in the table below. For example, if we have fixed assets with an expected 10-year of economic life and an estimated inflation of 4%, the CAPEX in the terminal year should be 23% higher than the last year depreciation.

CAPEX / Depreciation ratio in the Terminal Year

		Asset Life (in years)					
		2	4	8	10	15	20
Inflation rate (%)	1.0%	1.02	1.03	1.05	1.06	1.08	1.11
	2.0%	1.03	1.05	1.09	1.11	1.17	1.22
	3.0%	1.05	1.08	1.14	1.17	1.26	1.34
	4.0%	1.06	1.10	1.19	1.23	1.35	1.47
	5.0%	1.08	1.13	1.24	1.30	1.45	1.60
	6.0%	1.09	1.15	1.29	1.36	1.54	1.74
	7.0%	1.11	1.18	1.34	1.42	1.65	1.89

4. Common Errors in Forecasting

A. There are two common errors in forecasting:

- (1) Shortcuts are made since the analyst does not have the time or sufficient data to perform a fully documented projection.
- (2) Accounts are projected without appropriate support.

B. Assume an analyst relies on the financial statements provided earlier for Atlantic Beverages and decides to complete a “quick and dirty” sales forecast based on preliminary discussions with management.

C. A common mistake that analysts make is to forecast the income statement and cash flows without consideration of the effect that growth will have on the balance sheet. Since changes in balance sheet accounts affect cash flow, there is the potential that the valuation will be incorrect since the cash flows will be projected incorrectly.

D. In this case, management informed the analyst that sales would grow at a declining rate: the growth would be 20% in 2018 down to 5.0% in 2022, and then grow at 5.0% into perpetuity. The analyst applied those rates to sales, calculated profit margins based on historical norms, added back non-cash expenses, and discounted future earnings to a present value of 4.61 million euros.

Atlantic Beverages Preliminary Income Approach

	Fiscal Year Ended December 31,						
	2020	2021	2022	2023	2024		
Revenue	€ 3,297,778	€ 3,957,334	€ 4,550,934	€ 5,006,027	€ 5,256,328		
Cost of Revenues	1,780,800	2,136,960	2,457,504	2,703,255	2,838,417		
Gross Profit	1,516,978	1,820,373	2,093,429	2,302,772	2,417,911		
General & Administrative	989,333	1,167,413	1,319,771	1,426,718	1,471,772		
EBITDA	527,644	652,960	773,659	876,055	946,139		
Depreciation & Amortization	275,000	275,000	275,000	275,000	275,000		
EBIT	252,644	377,960	498,659	601,055	671,139		
Interest expense	(82,444)	(82,444)	(82,444)	(82,444)	(82,444)		
EBT	170,200	295,516	416,215	518,611	588,695		
Income Tax Rate	25.0%	25.0%	25.0%	25.0%	25.0%		
Taxes	42,550	73,879	104,054	129,653	147,174		
Net income after tax	127,650	221,637	312,161	388,958	441,521		
Add: non-cash expense	275,000	275,000	275,000	275,000	275,000	Residual	
Gross cash flow	€ 402,650	€ 496,637	€ 587,161	€ 663,958	€ 716,521	5,787,288	
Discount rate	18.0%	370,670	387,450	388,197	372,009	340,220	2,747,932
				Fair Value =		€ 4,606,479	

- (1) What are some of the implications of this analysis? Where does the analyst's forecast break down?
- (2) The analyst has not projected balance sheets. However, the implications of his projections (if we assume that the cash generated is extracted) are the projected balance sheets shown below:

Atlantic Beverages Projected Balance Sheets						
	Prior Year					
ASSETS	2019	2020	2021	2022	2023	2024
Current Assets						
Cash	€ 10,179	€ 10,179	€ 10,179	€ 10,179	€ 10,179	€ 10,179
Accounts receivable	168,865	168,865	168,865	168,865	168,865	168,865
Inventories	441,088	441,088	441,088	441,088	441,088	441,088
Other current assets	64,000	64,000	64,000	64,000	64,000	64,000
Total Current Assets	684,132	684,132	684,132	684,132	684,132	684,132
Gross Fixed Assets	2,634,345	2,634,345	2,634,345	2,634,345	2,634,345	2,634,345
Less: accumulated depreciation	(2,335,543)	(2,610,543)	(2,885,543)	(3,160,543)	(3,435,543)	(3,710,543)
Property and Equipment, net	298,802	23,802	(251,198)	(526,198)	(801,198)	(1,076,198)
Other Assets	2,384	2,384	2,384	2,384	2,384	2,384
TOTAL ASSETS	€ 985,318	€ 710,318	€ 435,318	€ 160,318	(€ 114,682)	(€ 389,682)
LIABILITIES & EQUITY						
Current Liabilities						
Current portion of LTD	€ 100,000	€ 100,000	€ 100,000	€ 100,000	€ 100,000	€ 100,000
Accounts payable	199,076	199,076	199,076	199,076	199,076	199,076
Other current liabilities	71,650	71,650	71,650	71,650	71,650	71,650
Total Current Liabilities	370,726	370,726	370,726	370,726	370,726	370,726
Long Term Debt						
Long-term debt, net	316,667	316,667	316,667	316,667	316,667	316,667
Total Long-term liabilities	316,667	316,667	316,667	316,667	316,667	316,667
Total Liabilities	687,393	687,393	687,393	687,393	687,393	687,393
Total Partners' Capital	297,925	€ 22,925	(€ 252,075)	(€ 527,075)	(€ 802,075)	(€ 1,077,075)
Total Liabilities and Partners' Capital	€ 985,318	€ 710,318	€ 435,318	€ 160,318	(€ 114,682)	(€ 389,682)

- (3) Other than accumulated depreciation (which grows since depreciation is reflected in the projection), there is no change projected in any accounts because an implicit assumption behind the income statement cash flows is that no investment is needed in the operations.
- (a) Total asset and equity become negative as fixed assets are depreciated down below zero.

- (b) The analyst has added back an insupportable depreciation charge. He has also implicitly assumed that a considerably expanded business would not result in any increase in fixed or working capital. (The turnover in the final year of the forecast is 1.75 times that of the first year.)
- (4) Given the income statement and balance sheet projections, note the changes to the projected financial ratios shown below.

Atlantic Beverages Financial Ratios

	2020	2021	2022	2023	2024
Revenue	€ 3,297,778	€ 3,957,333	€ 4,550,933	€ 5,006,026	€ 5,256,328
Revenue Growth	20.0%	20.0%	15.0%	10.0%	5.0%
Profitability Ratios					
Gross profit margin	46.0%	46.0%	46.0%	46.0%	46.0%
EBT margin	12.6%	12.5%	13.0%	13.6%	14.0%
EBIT margin	13.5%	13.5%	14.0%	14.5%	14.9%
EBITDA margin	16.0%	16.5%	17.0%	17.5%	18.0%
ROE (EBT/Equity)	1812.5%	(195.5%)	(112.5%)	(84.9%)	(68.5%)
ROA (EBIT/Assets)	62.5%	26.7%	29.8%	32.9%	35.3%
ROIC (EBIT/Equity & Debt)	62.1%	121.1%	387.3%	(658.2%)	(203.3%)
Liquidity Ratios					
Current ratio	1.8	1.8	1.8	1.8	1.8
Quick ratio	0.7	0.7	0.7	0.7	0.7
Coverage Ratios					
Times interest earned	15.7	13.5	14.3	15.9	17.1
Asset Management Ratios					
Total asset turnover	4.6	9.1	28.4	(43.7)	(13.5)
Days of receivables	18.7	15.6	13.5	12.3	11.7
Days of inventory	90.4	75.3	65.5	59.6	56.7
Days payables	40.8	34.0	29.6	26.9	25.6
Sales/Net fixed assets	138.6	(15.8)	(8.6)	(6.2)	(4.9)
Oper. Working capital/sales	12.5%	10.4%	9.1%	8.3%	7.9%
Leverage Ratios					
Total debt/ equity	30.0	(2.7)	(1.3)	(0.9)	(0.6)
Interest bearing debt/ equity	18.2	(1.7)	(0.8)	(0.5)	(0.4)
Assets/ equity	31.0	(1.7)	(0.3)	0.1	0.4

n/a = not available

n/m = not meaningful

(5) The forecasting errors are reflected in the financial ratios, several of which stray into nonsensical levels from as early as the second year of the forecast.

(a) The return ratios increase well above believable ranges since the analyst assumed no investment was needed to support sales

growth (if he had assumed investment, the cash flow forecast would have been reduced by working capital investment and capital expenditures.)

- (b) Turnover ratios increase sharply for similar reasons.
- (c) The leverage ratios become meaningless as the equity has become negative.

Section E. **Errors in computing the Terminal Cash Flows**

1. It is surprisingly common for errors to be made in computing the terminal cash flows:
 - A. The cash flows in the last discrete period (CF_n)
 - (1) may have an adjustment for a reduction in working capital such as the more rapid collection of receivables;
 - (2) may have capital expenditure which is less than the depreciation charge;
 - (3) may include other adjustments which cannot be deemed to continue in perpetuity.
 - B. Except in certain unusual circumstances, balance sheet expansion is to be expected:
 - (1) There will be a requirement for additional capital expenditure relating to the increased outputs; or
 - (2) Replacement capital expenditure will be more costly in nominal terms due to the impact of inflation;
 - (3) If sales increase it is likely that both trade receivables and inventories will also increase at a similar rate in nominal terms.
2. Due to the above factors the cash flows to be used for the terminal value cannot normally be based on the assumption that the capital expenditure will equal depreciation and that the working capital will remain constant.
3. The very unusual circumstances referred to above (when there is no balance sheet expansion to be expected) include:

- A. The business is anticipating a modest decline in real terms (with modest background inflation resulting in the turnover remaining constant in nominal terms);
 - B. The business has a negative working capital requirement and the negative working capital increases as the business expands, and this equates to the extra capital expenditure.
4. Negative working capital can arise in various business sectors: a common situation is rapid turnover retailing when the goods may be sold to the customers for cash before payment is due to the suppliers.
5. The important message is that the valuer must understand the business which is being valued. The cash flow dynamic must be understood; the relationship of cash flows to profits recognition must also be understood.
6. The relationship of cash flows to profits recognition can be complex. As the cash flows will be derived from the starting point of the income statement, it is essential that the correct adjustments are made in the terminal period.
7. Remember, economists say that if something cannot continue for ever then it will not.
8. Here are some points to consider when computing the cash flows for the terminal period. It can be helpful to imagine how things will look say ten years beyond the end of the discrete projection period when there have been ten years' growth in the sales and profits:
- A. Will the relationships of the trade receivables to sales be consistent with the current position in terms of debtor days?
 - B. Will the relationships of the inventories and the trade payable to costs of sales be consistent with the current position?
 - C. Has adequate allowance been made for additional capital expenditure that will be required to achieve the increased sales?
 - D. If the capital expenditure is intermittent with a cycle of replacement every 6 or 7 years, does the terminal period include sufficient allowance for replacement in perpetuity?
 - E. Will the returns on capital employed increase due to some overlooked component of balance sheet expansion?

9. An important point to bear in mind is that a business which doubles in size will normally be expected to have a balance sheet which is twice as large in consequence of that growth. If that is not the case with your model, you need to make sure that you have not overlooked some critical component.

Section F. Chapter Exercise

1. The file provided contains the spreadsheets for Atlantic Beverages. This exercise is a continuation of the example shown at the end of Chapter 1 for this company. The first two tabs in the spreadsheet contain the historical balance sheets (“HBS”) and the historical income statement (“HIS”) for Atlantic Beverages for the last four years, as shown in Chapter 1 above. The third tab contains the historical financial ratios (“His Ratios”) that are derived from the historical income statements and balance sheets.
2. Based on your critique of the “quick and dirty” income approach valuation conducted for Atlantic Beverages which arrived at a value of €4.6 million, identify the changes that should be made to the forecast and the valuation. Based on your observations, enter appropriate variables in the green shaded cells at the top of the “Proj BS#2” tab in the excel file.
3. Consider what other analysis you can undertake in order to test the model and the underlying assumptions.

Additional information:

- Projected income statements for the company have been provided by management and are shown in the tab “Proj I.S.”. Certain information is missing from the income statements since various decisions must be made about balance sheet accounts that affect the income statement.
- In the management interview, the CFO indicated that above average capital investment is needed in 2020 and 2021 to replace aging assets. The Company needs to invest €500,000 in 2020 and €350,000 in 2021. After 2021, annual capital investment should return to normal. You have to determine what level that should be.
- The Tab “Proj BS#2” contains input cells (shaded in green) which, when filled, will flow information through to the rest of the spreadsheets. Inputs are required for the following:
 - ✓ Accounts receivable turnover ratio

- ✓ Inventory turnover ratio
 - ✓ Accounts payable turnover ratio
 - ✓ Capital expenditures for the year 2020-2024
 - ✓ Additional debt funding, if any, from 2020-2024
- The ratios should be based on an historical analysis of the first three tabs.
 - Given the funding needs, you must decide how much of the required investment will be funded by debt. Whatever is not funded by debt is automatically added to equity funding in the Partners' Capital account on the balance sheet.
 - The input decisions can be checked by looking at the projected financial ratios ("Proj Ratios#2").
 - Net equity cash flows are calculated based on the inputs for the years 2020 through 2024 and flow through to the discounted cash flow analysis tab (DCF #2). Residual growth was set to 5.0% and an equity discount rate of 18.0% was applied in the DCF calculation.

Suggested solutions will be provided as Handouts or by spreadsheet during discussion.

Chapter 2 - Appendix

FINANCIAL STATEMENT ADJUSTMENTS

4. Adjustments for non-operating items

A. Non-operating items are accounts in the income statement or the balance sheet which are not part of the cash-flow generating function of the business.

B. These items are typically removed prior to the financial and valuation analysis, valued separately if necessary, and then accounted for at the end of the assignment.

(1) Non-operating assets, such as properties held for rental purposes, are removed and valued separately since they have a required rate of return that is distinct from the subject company's return.

C. Examples of non-operating balance sheet items

(1) Non-operating cash

(2) Non-operating fixed assets

(a) Any land, buildings, or equipment that is not used in the business operations is non-operating. At times management may acquire a property that they intend to use in the future. Depending on how realistic the plan is, the practitioner may decide to remove the asset from the balance sheet.

(b) One test is to consider if the value of the asset is captured in the capitalization of future cash flows.

(c) Sometimes a non-operating asset is linked to officer perquisites, as covered below.

(3) Officer related accounts

(a) Officer Note Receivable – The officer has borrowed money from the company.

(b) Officer Note Payable - The officer has loaned money to the company.

(4) Other assets

(a) Often companies will list non-operating items in the other asset account. All other asset accounts should be scrutinized for their relevance to the business. These may include such assets as the following:

- ◆ Intangible value that is no longer relevant to the company and has not been measured in an impairment study.
- ◆ Assets that are perquisites for the business owner but not necessary to generate cash flow, including vacation homes, automobiles, airplanes, etc.

D. Examples of non-operating income statement items

- (1) Secondary source of income – if a company generates income from separate lines of business, those must be valued separately since the different lines may require different rates of return.
 - (a) A common example of this is when a business leases extra real estate or equipment to an unrelated party. The asset that is leased and the lease income is considered non-operating to the core operation and removed.
 - (b) This is often a difficult issue. Many large companies generate revenue in multiple product or service lines. The analyst must decide whether those business lines are close enough to value as one operation, or whether they should be valued separately.
- (2) Excess officer compensation – If officer compensation is above a fair market level, then the excess amount is considered non-operating and added back to profit when valuing a control holding. The opposite applies if the compensation is below a fair market level.
- (3) Excess rent – If the business property is leased, especially if it is leased to the business by the owner, the rent should be compared to fair market levels and any difference adjusted.
- (4) Income statement effects of non-operating assets (discussed above).

- (5) Other – all income and expense accounts should be reviewed for their relevance to market value. Any account that is not stated at market value, for any reason, should be considered for adjustment.

5. Adjustments for Non-Recurring Items

- A. At times an expense that may be operating in nature should still be adjusted since it is not expected to recur in future years and its inclusion in the historical financial statements would skew financial ratios and potentially the forecast.
- B. Examples of non-recurring items:
- (1) Discontinued operations
 - (2) Restructuring expense
 - (3) Exceptional losses on receivables
 - (4) Impairment expense
 - (5) Expenses related to natural disasters
6. Financial Statement adjustments should be applied, adjusted financial statements calculated, and adjusted financial ratios computed. After this first step is completed, a formal financial analysis can commence.

FINANCIAL ANALYSIS

7. Breakeven Analysis

- A. Analyzing the breakeven position of a company (the level at which it makes neither profit nor loss) is a useful form of sensitivity analysis.
- B. The breakeven sales are computed as:

$$\frac{\textit{Fixed costs}}{\textit{Gross profit percentage}}$$

- C. Sectors with high breakeven points will tend to be businesses with relatively high fixed costs such as utilities, hotels and care homes. For some of these sectors it is market forces which results in high breakeven points. As an example a care home for the elderly may have a breakeven

point of more than 90% occupancy. The benefit of such a business is that the revenue can normally be projected with considerable certainty.

- D. Instead of computing the breakeven sales, the breakeven gross profit percentage can be calculated, assuming that sales remain constant in value terms. The formula is:

$$\frac{\text{Fixed costs}}{\text{Existing sales value}} \times 100$$

- E. It is important to recognise that this formula states the gross profit percentage which delivers breakeven assuming that the sales value remains constant; the underlying assumption is that the *volume* of goods will need to increase in order to retain the same value of sales at the lower margin.

8. Growth

- A. It is very often useful to consider the limiting factors on growth of a business. There are various possibilities, including:

- (1) The size of the market in the geography in which the business operates;
- (2) Difficulties in obtaining skilled employees;
- (3) The capital available;
- (4) The ambitions of the owners.

- B. It is also useful to consider how a business is achieving growth. This is very relevant if the business is growing at a faster rate than inflation. The possibilities include:

- (1) The business is disrupting a market place and thereby gaining market share;
- (2) The management are winning market share by cutting margins and following a policy of cost leadership;
- (3) The market sector is an expanding sector within the economy;
- (4) The business is acting as a consolidator;

- (5) The company has some other unique selling point (“USP”), such as the quality of the management.

9. Common Size Analysis

A. Historical income statements are stated as a percentage of sales. Both the income statement accounts and the percentages should be reviewed over the historical period to identify trends.

- (1) Sales trends – understand what is causing an upward or downward trend.

- (a) Market penetration – Is the company gaining a larger market share with the same capacity and same product lines?
- (b) Market change – is the market increasing in size? Does the company have the capacity to service the increase?
- (c) Market expansion – Is the company opening up new markets with new products or new geographic areas?
- (d) What are the limiting factors on sales – production capacity, skilled workforce, working capital, demand from the market?

- (2) Cost of goods sold

- (a) Are sales expanding at the expense of gross profits? (i.e. is the company “buying” market share?).
- (b) What raw materials does the company purchase and what are the pricing trends? Can any price increases be passed on to customers?
- (c) What other costs are included in cost of goods sold? Labor? Depreciation?

- (3) General and administrative costs

- (a) Review for trends. Common size statement is especially helpful here.
- (b) Are the assumptions regarding the administrative costs in an increasing business realistic?

- (c) What is the breakdown of fixed versus variable costs? What costs are fixed in a relevant range of sales?
- (4) Profit **margins** (EBITDA, EBIT, EBT, Net Income after tax, NOPAT)
- (a) What is the trend with each profit margin?
- (b) Many non-recurring items are placed “below” the line, meaning they are listed after operating income. It should be determined if these are non-recurring and/or non-operating.
- B. Historical balance sheets are stated as a percentage of total assets and analyzed to identify trends.
- (1) Simple trend observations should be made to determine if the company is growing and whether growth is being financed with debt, equity, or a mixture of the two.
- (2) Assets
- (a) What is the trend in working capital asset accounts? If sales are growing on the income statement, are accounts receivable and inventories growing as well?
- (b) Is the company capital intensive? If so, what is the relationship of net to gross fixed assets?
- (c) Each account under “Other Assets” must be investigated and understood. There is the potential that these assets might need restatement or removal as non-operating.
- (3) Liabilities
- (a) Current liabilities
- ◆ How are the working capital accounts (accounts payable, accrued liabilities) moving in relation to sales and current assets? Is the growth in accounts receivable being partly financed by growth in accounts payable?
 - ◆ Distinguish between short-term working capital loans and the current portion of long term debt.

- ◆ Are short-term lines of credit being used as long-term financing? Some companies roll over their “short-term” debt each year. This should be considered long-term debt and part of the capital structure.

(b) Long-term liabilities

- ◆ The terms of each debt instrument should be understood. The analysis here and the related management questions will determine the eventual projection of a long-term capital structure.
- ◆ If the operations are growing (or management claims that sales and profits will grow and this can be supported) the analyst must understand how much third party debt, if any, will be required. Remember that rapid growth may require significant funding in fixed and working capital.

(c) Equity

- ◆ The composition of equity securities and the rights of each should be understood.
- ◆ If different classes of preferred stock exist, the conversion rights and liquidation priority should be outlined.
- ◆ If the company is an early stage entity with a complex capital structure consisting of preferred stock and common stock, it may be necessary to use an option or lattice model to determine the value of the common stock. This is covered in more detail in BV 204.
- ◆ Equity as a source of funds relative to debt should be understood.
- ◆ If treasury stock exists (stock bought back and held on the balance sheet), details of the prior stock buyback should be requested from management.

C. Statement of Cash Flows

- (1) The accounting cash flow statement converts the accrual net income after tax to the changes in the cash account from the prior year.

10. Growth Analysis

A. Growth analysis can be applied to any financial statement account if the analyst has access to a significant time period. Annual growth rates and compound annual growth rates (CAGR) are both important as a foundation of any financial analysis. Growth is usually measured for at least the following accounts:

B. Annual percentage growth is measured as:
(current balance/prior year balance) – 1.

C. CAGR is measured as:

$$\left(\left[\frac{\text{Amount in year "n"}}{\text{Amount in year 1}} \right]^{\frac{1}{n-1}} - 1.0 \right) * 100$$

11. Ratio Analysis

A. Financial ratios reflect information about a company's financial performance. They are most useful when compared to the ratios of industry peers or guideline public companies. Usually financial ratios are categorized into measurements of profitability, returns, liquidity, asset management, and leverage.

B. Profitability ratios

$$\text{Gross Profit Margin} = \frac{\text{Gross Profit}}{\text{Sales}}$$

$$\text{EBITDA Margin} = \frac{\text{Earnings before interest, tax, depr and amort}}{\text{Sales}}$$

$$\text{Operating Profit Margin} = \frac{\text{Earnings before interest and tax}}{\text{Sales}}$$

$$\text{Pre – tax Profit Margin} = \frac{\text{Earnings before tax}}{\text{Sales}}$$

$$\text{Net Profit Margin} = \frac{\text{Net income after tax}}{\text{Sales}}$$

(1) Profitability ratios are a measurement of management's ability to control costs given varying levels of revenue in the company.

- (a) Each margin is presented in descending order (gross margin, EBITDA, EBIT, EBT, net income after tax) so that the relevant category of expense (cost of sales, operating expenses, other expenses, taxes) can be scrutinized.
- (b) The analysis of the gross margin and operating expense should consider the following issues:
- Expense categorization – the breakout of depreciation and labor between cost of sales and corporate overhead should be understood.
 - Variable vs. fixed costs – verify with management the breakout of fixed costs (those expenses which do not change in direct proportion to sales) versus variable expenses (those expenses which do change in proportion to sales).

C. Return ratios

- (1) Return ratios measure the relationship between profit on the income statements and the different balance sheet accounts that drive operations such as equity financing, invested capital financing and total assets.

$$\text{Pre-tax Return on Equity} = \frac{\text{Earnings before tax}}{\text{Total Equity}}$$

$$\text{Pre-tax Return on Assets} = \frac{\text{Earnings before interest and tax}}{\text{Total Assets}}$$

$$\text{Pre-tax Return on Invested Capital} = \frac{\text{Earnings before interest and tax}}{\text{Interest-bearing debt and equity}}$$

- (a) *Return on Equity (ROE)* – Measures the percentage return gained by the equity investors. This ratio can be analyzed on a pre-tax or after tax basis.

- ◆ Initially this ratio is measured on a book value basis, but the more important measurement considers the market value of equity which may vary from the book value of equity.

ROE can be further broken down by applying the Dupont Formula which separates the ROE into three component ratios:

$$ROE = \left[\frac{\text{Pre-tax income}}{\text{Sales}} * \frac{\text{Sales}}{\text{Assets}} \right] * \frac{\text{Assets}}{\text{Equity}}$$

Return on assets ratio

- ◆ Pre-tax ROE is derived as the pre-tax income margin multiplied by the asset turnover ratio times the asset to equity ratio.
 - ◆ By reviewing the DuPont Formula over a period of years, the analyst can identify changes in ROE as a function of changing profit margins, changing asset turnover, or a changing capital structure.
 - ◆ The first two components of the Dupont Formula can be combined into the return on asset ratio. By analyzing ROA, the analyst can identify whether the company's strategy is to rely on a high margin and low asset turnover (e.g. luxury automobile manufacturer) or a low margin and high asset turnover (e.g. mass retailer like Walmart).
- (b) *Return on Assets (ROA)* – Measures the interest and income return (EBIT) to all investors in the business against total assets.
- ◆ Some sources measure return on assets using earnings before tax instead of EBIT (the Dupont Formula above shows ROA in this way). Many analysts use EBIT in the numerator since the total assets in the denominator includes both equity and debt capital.
 - ◆ Before comparing ROA to industry surveys or other companies, the analyst should be sure that both ratios are calculated on the same basis.
- (c) *Return on Invested Capital (ROIC)* - This is a comprehensive return ratio which reflects the company's total return on all capital invested. Especially with companies that deploy complex capital structures, this ratio is indispensable in the analysis of operations.

(2) Liquidity ratios

$$\text{Current Ratio} = \frac{\text{Current assets}}{\text{Current liabilities}}$$

$$\text{Current Ratio} = \frac{(\text{Current assets} - \text{inventories})}{\text{Current liabilities}}$$

- (a) Liquidity ratios measure a company's ability to cover its financial obligations over the current accounting cycle, usually one year or less. It is an important area of analysis since an inability to meet short term demands could mean that the company triggers loan provisions which could result in a default.
- (b) Current ratio – reflects the amount of current assets relative to current liabilities. A ratio of 1.0 or higher suggests the company can cover current obligations with current assets.
- (c) Quick ratio – This ratio removes inventory from current assets since it is considered the least liquid of current assets. Thus, the quick ratio shows whether the company can cover current obligations with more liquid current assets.
- ◆ Some sources calculate the quick ratio (also called the acid test ratio) as (Cash + investments + accounts receivable)/ current liabilities.

(3) Asset management ratios

$$\text{Total Assets Turnover} = \frac{\text{Sales}}{\text{Total Assets}}$$

$$\text{Account Receivable Turnover} = \frac{\text{Sales}}{\text{Account Receivable}}$$

$$\text{Average Collection Period(ACP)} = \frac{365}{\frac{A}{R} \text{ turnover ratio}}$$

$$\text{Inventory turnover} = \frac{\text{Cost of goods solds}}{\text{Inventory}}$$

$$\text{Days of Inventory} = \frac{365}{\text{Inventory turnover ratio}}$$

$$\text{Average Cash Cycle} = \text{Days Inventory} + \text{ACP} - \text{Days Payable}$$

$$\text{Days payable} = \frac{365}{\text{cost of sales} / \text{accounts payable}}$$

$$\text{Fixed Assets Turnover} = \frac{\text{Sales}}{\text{Fixed assets}}$$

$$\text{Working Capital Turnover} = \frac{\text{Sales}}{\text{Working Capital}}$$

$$\text{Operating Working Capital to Sales} = \frac{(\text{Cash} + A/R + \text{Inv.}) - A/P + \text{accruals}}{\text{Sales}}$$

- (a) Asset management ratios reflect how well management is acquiring and deploying assets to generate sales and cash flow. Similar to the return ratios, the asset management ratios combine an account from the income statement with an account from the balance sheet.
- (b) Total asset turnover – This ratio reflects how many currency units in sales are generated for each currency unit invested in assets.
- ◆ Asset turnover is a “summary” ratio, usually followed by an analysis of its component ratios such as receivables turnover, inventory turnover, fixed asset turnover, etc.
- (c) *Accounts receivable turnover (A/R Turnover)* – This ratio shows how often the company collects or “turns over” a typical receivables balance in the course of one year or one accounting cycle.
- ◆ If there are sales taxes included in accounts receivable but not included in the figure for sales, the level of sales should be increased by the sales tax percentage before undertaking the calculations.
 - ◆ Average collection period (ACP) – A more intuitively pleasing form of the accounts receivable turnover ratio is the average collection period, which simply divides the A/R turnover ratio into 365, the number of business days in a year (some analysts use 260 days since it represents the approximate number of working days in a year).

- ◆ Alternatively this can be calculated as follows:

$$\frac{\text{Accounts receivable} \times 365}{\text{Sales}}$$

- ◆ The Average Collection Period reflects in days the amount of time it takes the company to collect its receivables. This ratio is especially meaningful when compared to industry norms.
 - ◆ A high ratio here relative to industry norms may indicate that the company has bad receivables that have not been written off or is too lenient in enforcing terms of collection.
 - ◆ Another common form of the A/R turnover and Average Collection Period takes an average measurement of accounts receivable over two years. This is more relevant with a company that is growing (or declining).
- (d) Inventory *turnover ratio* – This ratio reflects how quickly the company is able to move its inventory. It is measured as cost of goods sold (not sales) divided by inventory. When compared to industry norms a low ratio may tell the analyst that there is risk in the form of obsolete inventory or an inefficient inventory management system.
- ◆ *Days of Inventory* – similar to the Average Collection Period ratio, the inventory turnover ratio can be viewed in a more intuitively pleasing form by dividing the ratio into 365. This shows the time in days it takes to move a typical inventory holding amount through the company.
- (e) Average *Cash Cycle* – this ratio combines the days of inventory ratio, the Average Collection Period ratio, and the days payable ratio.
- ◆ The assumption behind the ratio is that a company is without cash flow for the number of days inventory sits in a warehouse plus the number of days that a receivable is outstanding after inventory is sold. Since companies may finance this time period by extending accounts payable, the days payable ratio is deducted to estimate the approximate number of days the company waits to generate cash.

- ◆ This should be treated with caution as it is using different denominators:

⇒ Sales for Average Collection Period;

⇒ Cost of sales for Days in Inventory;

⇒ Cost of sales and some administration costs for Days Payable ratio.

- ◆ Similar to other asset management ratios this is a somewhat rudimentary estimation of working capital risk and is only meaningful when compared to industry surveys or other competitors.

(f) *Fixed asset turnover (F/A turnover)* – Similar to the total asset turnover ratio, this reflects the sales generated for each currency unit invested in fixed assets. This ratio is most often analyzed separately as *gross fixed asset turnover* and *net fixed asset turnover*.

- ◆ A key issue in the analysis of fixed assets has to do with the age of the property, plant and equipment. The risk to an investor in this area comes partially from the amount and imminence of required investment in fixed assets.

- ◆ Toward this end, two other ratios are helpful:

⇒ F/A Average Life Ratio

$$\frac{\text{Gross Fixed Assets}}{\text{Average Annual Depreciation}}$$

Assuming that the annual depreciation reflects the accurate annual consumption of the asset, then the result of this calculation should provide the time in years that the company expects the fixed asset base should be useful.

⇒ F/A Average Age Ratio

$$\frac{\text{Accumulated Depreciation}}{\text{Average Annual Depreciation}}$$

Measured as total accumulated depreciation divided by average annual depreciation. This reflects the age of the fixed asset base.

- For example, assume a gross fixed asset base of 100,000,000, annual depreciation of 10,000,000, and accumulated depreciation of 60,000,000. The average life of the fixed assets would be 10 years (100,000,000/10,000,000) and the average age would be 6 years (60,000,000/10,000,000).
- These ratios are more relevant to a capital intensive company. The analyst should be careful how real estate is considered in these ratios since land is not subject to depreciation.

(g) *Working Capital Turnover* – This ratio reflects the amount in sales generated for each currency unit invested in working capital.

- ◆ A low ratio here relative to industry norms could mean that one or more of the current asset accounts is relatively high. Hence this ratio should be considered in tandem with A/R turnover, Inventory turnover, etc. It also may indicate that the company is retaining too much cash.

(h) *Operating working capital to sales* - Operating working capital is calculated as operating current assets minus operating current liabilities.

- ◆ Non-operating current assets such as extra cash or investments, shareholder receivables, etc. are excluded.
- ◆ Third party interest-bearing debt such as the current portion of long-term debt is also excluded.
- ◆ This ratio is useful for forecasting cash flows since it reflects in percentage of sales the amount that will be needed in receivables and inventory less payables and accruals.

(4) Leverage Ratios

$$\text{Debt to Assets} = \frac{\text{Total liabilities}}{\text{Total assets}}$$

$$\text{Debt to Equity} = \frac{\text{Total liabilities}}{\text{Total equity}}$$

$$\text{Interest – bearing Debt to Equity} = \frac{\text{Interest bearing debt}}{\text{Total Equity}}$$

$$\text{Asset to equity} = \frac{\text{Total Assets}}{\text{Total Equity}}$$

$$\text{Times Interest Earned} = \frac{\text{Earnings before interest and tax}}{\text{Interest expense}}$$

$$\text{Fixed Charge Coverage} = \frac{\text{EBIT} + \text{Fixed expense}}{\text{Interest expense} + \text{fixed expense}}$$

$$\text{Percentage Debt Financing} = \frac{\text{Interest – bearing debt}}{(\text{Interest – bearing debt}) + \text{Equity}}$$

$$\text{Percentage Equity Financing} = \frac{\text{Equity}}{\text{Interest – bearing debt} + \text{Equity}}$$

- (a) Leverage ratios reflect the amount to which debt is deployed in the capital structure and the amount of financial risk that is borne by the shareholders. Higher debt offers the opportunity of higher equity returns in percentage terms but brings with it higher risk.
- (b) Debt to Asset Ratio – This is a very general ratio that shows total liabilities (including interest-bearing debt, accruals, and other liabilities) as a percentage of total assets.
- (c) Debt to Equity – This similarly shows total liabilities as a percentage of total equity. It should not be confused with, or taken as a proxy for, interest-bearing debt to equity, although it often is.
- ◆ A higher ratio here above 1.0 may be indicative of excessive financial risk, but should always be considered in relation to industry norms.
- (d) Interest-bearing Debt to Equity Ratio – This ratio is an indication of the company's capital structure reflecting how much debt

financing has been deployed in relation to the amount of equity financing.

- ◆ It should be remembered that both the debt and equity accounts on the balance sheet do not necessarily reflect market value. To the extent that market values are materially different, the book value ratio may not be a relevant measurement of risk.
- ◆ Most analysts will likely think of capital structure as follows:

$$\text{Percentage Debt Financing} = \frac{\text{Interest - bearing debt}}{(\text{Interest - bearing debt}) + \text{Equity}}$$

$$\text{Percentage Equity Financing} = \frac{\text{Equity}}{(\text{Interest - bearing debt}) + \text{Equity}}$$

- ◆ The result of the interest bearing debt to equity ratio would be an expression like 30/70, meaning that debt comprised 30% of total financing and equity comprised 70%. This would be directly applied in a weighted average cost of capital analysis. Using the formulae above, the first formula is 30/100 and the second is 70/100.
 - ◆ This can alternatively be stated as 0.43:1, meaning that interest-bearing debt is 43% of the equity.
- (e) Assets to Equity – This ratio presents a book value measurement of capital structure, or the amount of total assets as a function of equity financing.
- (f) Time Interest Earned Ratio (TIE) – This ratio shows the number of times that earnings can decline before the company defaults on interest payments.
- ◆ A high ratio indicates that the profitability of the business can withstand an increase in interest rates or an increase in the amount of interest bearing debt. It is therefore a measure of financial stability.
 - ◆ The higher the ratio, the less the risk. However, a ratio that far exceeds industry norms may indicate that the company's capital structure is not at an optimum.

- (g) Fixed Charges Coverage – This ratio takes the TIE concept and adds fixed expense. Both interest expense and fixed expenses must be paid regardless of the amount of sales generated. Hence this ratio reflects how well the company is covering mandatory payments.

Chapter 3. Equity versus Invested Capital Streams

Section A. IVSC competencies covered

Valuation Methods	
Income Approach	x
Main value drivers	x
Subject entity analysis	x
Earnings and cash flow based methods	x
Financial Modelling	
Analyse and model financial aspects	x
Spreadsheets or bespoke programs re major assumptions	

Section B. Equity versus Invested Capital

1. A valuation can be completed using one of two distinct premises:

A. Equity valuation

- (1) Equity is defined in the International Glossary of Business Valuation Terms as *“the owner’s interest in a property after deduction of all liabilities.”*
- (2) In IVS 2020 equity is defined as *“the value of a business to all of its equity shareholders”*.
- (3) It is possible to value equity directly by isolating the income stream that is relevant to equity investors and discounting or capitalizing it by a rate which reflects the risks of the equity income stream.

B. Invested capital valuation

- (1) Invested capital is defined in the International Glossary as *“the sum of equity and debt in a business enterprise. Debt is typically: a) all interest-bearing debt; or b) long term interest bearing debt. When the term is used it should be supplemented by a specific definition in the given valuation context.”*
- (2) In IVS 2020 Total Invested Capital is defined as *“the total amount of money currently invested in a business, regardless of the source, often reflected as the value of the total assets less current liabilities and cash.”*
- (3) Invested capital can be valued directly by isolating the income stream attributable to the providers of the invested capital and discounting or capitalizing it by a rate which reflects the risks of the invested capital income stream.
 - (a) An invested capital income stream includes both the company’s earnings-based cash flows plus interest expense. This income stream represents the amount that would be collected by the company’s equity investors and outside financial creditors.
- (4) Participants should be sure of the definitions which are being applied. In some jurisdictions enterprise value is used to define equity and debt:

This is an extract from IVS 2020 200 para 20.3; *Enterprise value: Often described as the total value of the equity in a business plus the value of its debt or debt-related liabilities, minus any cash or cash equivalents available to meet those liabilities.*

- C. It is common to value companies using the invested capital method (also known as the enterprise value) since this premise gives the analyst more versatility with the company's capital structure.
 - D. IVS 2020, Standard 200 – Businesses and Business Interests – states:
“While equity or a particular class of equity can occasionally be valued directly, more often the enterprise value of the business is determined and then that value is allocated between debt and any types of equity.”
 - (1) However, smaller companies are often valued using an equity methodology.
 - E. Valuation by reference to the invested capital recognizes that a business should not be valued differently just by reference to the way that it is funded.
2. Invested capital includes all investment made by a company's equity shareholders and its financial creditors. Therefore it includes equity capital and third party debt.
 3. A balance sheet presentation of invested capital is shown below.

US GAAP Balance Sheet Presentation	
Current Assets	Current Liabilities
Net Working Capital (C/A - C/L) ----- Fixed Assets Other Assets	Long-term Debt Shareholders' Equity

Invested Capital

- A. Invested capital includes the equity investment and the long-term interest bearing debt investment. Preferred stock is considered either as equity or debt, depending on its participation in the Net income after tax. If it has a fixed entitlement it is considered as a form of debt for both financial reporting and valuation purposes. (The main difference from other forms of debt is that there is normally no tax relief for the dividends on preferred stock.) Other forms of interest bearing debt may or may not be included in invested capital as per the discussion above.
- (1) Invested capital funding is equated in the illustration above to the operating assets of the company, including: 1) net working capital (operating current assets minus operating current liabilities); 2) net fixed assets; and 3) other operating assets.
 - (2) The balance sheet may include accounts that do not fall neatly in the categories shown in the illustration above. The analyst must decide whether they are operating or non-operating in nature. Examples:
 - (a) Deferred taxes – This may be considered interest-free financing from the government.
 - (b) Shareholder loan – As was discussed in BV 201, the terms and reason for the loan must be reviewed. If the loan is part of the long-

term funding, and the valuation uses enterprise value, the loan should be deducted in deriving the value of the equity.

- (c) A critical test here is that the shareholder loan must not be treated, by oversight, as a form of cost-free funding for the business. It should either be added to the total equity or, more commonly, treated as debt in the capital structure, and is therefore deducted in arriving at the value of the equity.

Sample Company Balance Sheet		
	2019	2018
Assets		
Non-current assets		
Property, plant & equipment, net	298,802	473,128
Deferred income tax	0	0
Other	2,384	10,330
Total non-current assets	301,186	483,458
Current assets		
Inventories	441,088	480,027
Trade receivables	168,865	328,006
Financial assets	64,000	61,420
Cash	10,179	18,825
Total current assets	684,132	888,278
Total Assets	985,318	1,371,736
Equity & Liabilities		
Equity		
Ordinary shares	1,000	1,000
Retained earnings	296,925	451,042
Total Equity	297,925	452,042
Liabilities		
Non-current liabilities		
Borrowings	416,667	565,021
Other	0	0
Total non-current liabilities	416,667	565,021
Current Liabilities		
Trade payables	199,076	262,138
Other current liabilities	71,650	92,535
Short-term borrowings	0	0
Total current liabilities	270,726	354,673
Total liabilities	687,393	919,694
Total Equity and Liabilities	985,318	1,371,736

4. Financial Statements

A. The Balance Sheet

- (1) The equity investment in Sample Company as of the latest year is 297,925 and it is 452,042 for the previous year.
- (2) The invested capital in Sample Company as of the latest year is 714,592 (297,925 + 416,667) on a book value basis. For the previous year the invested capital is 1,017,063.
 - (a) Many companies will have short term interest-bearing debt (lines of credit, notes receivable, borrowings secured on receivables or other debt instruments) that may or may not be included as invested capital debt. This will depend on whether the analyst considers them part of the long term capital structure of the company, or part of the working capital. If the debt is seasonal it will normally be considered as part of working capital.

B. Income statement

- (1) The income stream chosen for the income approach will depend on whether an equity method or invested capital method is chosen.
- (2) The analyst must derive the appropriate income stream from the accrual income statement, an example of which is shown below.

Sample Company Income Statement	
	2019
Revenue	2,748,148
Cost of Sales	(1,485,962)
Gross profit	1,262,186
Distribution costs	(252,100)
General & administrative expense	(865,619)
Operating profit (EBIT)	144,467
Other income	9,321
Finance expense, net	(17,028)
Profit before tax (EBT)	136,760
Taxation at 32%	(43,763)
Net Income After Tax	92,997
Operating Profit (EBIT)	144,467
Taxation at 32%	(46,229)
Net Operating Profit After Tax (NOPAT)	98,238
From accounting notes:	
<i>Depreciation</i>	276,332
<i>EBITDA</i>	420,799

(3) Income streams include:

C. Earnings before interest, tax, depreciation and amortization (EBITDA = 420,799).

(1) This income stream may not be shown explicitly on an IFRS income statement but can be derived by adding depreciation (found in the notes) to operating income.

(2) EBITDA is relevant to an invested capital valuation.

(a) Operating profit

- ◆ Also referred to as earnings before interest and tax (EBIT = 144,467).

- (b) EBIT is relevant to an invested capital valuation.
- (c) NOPAT (not operating profit after taxation) (=98,238), is relevant to an invested capital valuation.
- (d) Profit before tax
 - ◆ Also referred to as earnings before tax (EBT = 136,760).
 - ◆ EBT is relevant to an equity valuation.
- (e) Net profit after tax from continuing operations, or net income after tax (NIAT = 92,997).

5. Cash Flow Adjustments

- A. Accrual based income statements record income when it is earned (not received) and record expenses when incurred (not paid).
 - (1) To the extent that there is a time lapse between earned and received income and a lapse between incurred and paid expenses, then a balance sheet accrual account is created.
 - (a) For example, if a company sells SR100 worth of goods in the last month of the year but is not paid until the following year, then, ignoring sales taxes, the year-end income statement would include the SR100 in sales, and an account receivable would be added to the balance sheet in the amount of SR100.
 - ◆ From a cash flow perspective therefore, the income statement overstates cash flow by SR100.
 - (b) If the company orders SR75 of goods which are sold in the last month of the year but does not pay for the goods until the following year, then the company adds SR75 to cost of sales, and SR75 to accounts payable.
 - ◆ From a cash flow perspective, the income statement understates cash flow by SR75.
- B. Accrual income statements also include non-cash expenses such as depreciation and amortization.

- (1) When capital assets such as land and equipment are acquired the cost of the assets is not recorded on the income statement since the assets have physical lives longer than one year.
- (a) The capital investment is recorded in the statement of cash flows.
- (b) A depreciation expense is recorded on the income statement for the pro rata consumption of the asset in the given year.
- ◆ For example, if equipment that is expected to last 10 years is acquired for SR1,500,000 in 2017, then the entire SR1.5 million cash outflow is reflected on the 2017 cash flow statement but only SR150,000 (SR1,500,000/10) is included as depreciation expense on the 2017 income statement.
 - ◆ Hence from a cash flow perspective, the SR150,000 is a non-cash item since it represents an economic cost, not a cash outflow.
- C. Market value is based on cash flow, not accounting income. Accounting earnings (pre-tax or net income) should only be used if there is no material difference between accounting earnings and cash flow.
- D. Since the net income on an income statement represents an economic level of earnings, it must be converted to a cash figure through a series of adjustments.
- (1) The cash flow adjustments will differ depending on whether *equity cash flow* or *invested capital cash flow* is being calculated.

EQUITY CASH FLOWS:

Pre-tax earnings

(taxes)

Net Income after taxes

+ depreciation, amortisation

+/- changes in working capital

- capital investment

+/- changes in debt principal

Net Equity Cash Flow

- (a) As stated above, depreciation and amortization are non-cash expenses that represent the economic consumption of an asset. Since they do not represent actual cash Euros paid, they are added back here.
- (b) Changes in working capital are accounted for as well. If, for example, trade receivables increase from one year to the next, that represents a negative cash flow relative to the income statement since more Euros are owed to the company relative to the prior year (but nonetheless were recorded as revenue and are reflected in net income).
- ◆ Conversely, an increase in trade payables would represent a positive cash flow from one year to the next. This is so since an increase in expenses were recorded on the income statement which have not yet actually been paid. Therefore, net income is lower than the cash flows in respect of trade payables.
 - ◆ Normally, operating current liabilities (which exclude third party debt) are deducted from operating current assets to arrive at each year's operating working capital.
 - ◆ To the extent working capital increases in the current year relative to the prior year, a negative cash flow adjustment is made.

- ◆ To the extent working capital declines in the current year relative to the prior year, a positive cash flow adjustment is made.
- (c) Changes in other assets (and other liabilities), to the extent they are operating assets and liabilities, are handled similarly to working capital items.
- (d) Capital investment is accounted for in the cash flow adjustments. Capital investment is not recorded on the income statement as discussed above since the asset will last longer than one accounting period. The amount of a given year's capital investment is obtained from the cash flow statement.
- (e) Third party debt principal is also included as a cash flow adjustment. From the perspective of an equity shareholder, an increase in a bank loan represents a positive cash flow and should be added.
- ◆ To the extent debt principal is paid back, this represents a negative cash flow from an equity perspective.
- (2) Differences between the calculation of invested capital cash flow and equity cash flow.
- (a) The difference between equity cash flow and invested capital cash flow is one of perspective. Invested capital investors include everyone who has invested money in the business, including equity investors and financing entities which have loaned money.
- (b) Therefore, the invested capital income stream must include all equity cash flows (earnings plus adjustments) and interest payments (plus debt principal).

Calculation of Invested Capital Cash Flow

Operating earnings (EBIT)
- Tax
<hr/>
Net operating profit after tax (NOPAT)
+ Depreciation & amortization
+/- Change in working capital
+/- Change in other operating assets
- Capital investment
<hr/>
Net invested capital cash flow

- (c) There are two key differences in the invested capital cash flow calculation.
- ◆ We begin with EBIT instead of EBT since the cash flows must not be reduced by interest expense. Taxes are assessed on EBIT and are therefore higher than the taxes that are actually payable.
 - ⇒ This can appear to be a strange outcome: the reason is that NOPAT must exclude both the interest expense and the tax shield represented by the interest expense in order to be a consistent measurement of invested capital cash flows.
 - ◆ All cash flow adjustments are identical to the equity calculation with one exception.
 - ◆ Debt principal changes are omitted since, from an invested capital perspective, loan balances are part of invested capital. For presentation purposes, both calculations are shown below:

Calculation of Equity Cash Flow

Earnings before tax (EBT)

-Tax

Net Income after taxes

+ depreciation, amortisation
 +/- changes in working capital
 - capital investment
 +/- changes in debt principal

Net Equity Cash Flow**Calculation of Invested Capital Cash Flow**

Operating earnings (EBIT)

- Tax

Net operating profit after tax (NOPAT)

+ Depreciation & amortization
 +/- Change in working capital
 +/- Change in other operating assets
 - Capital investment

Net invested capital cash flow**2. Invested Capital and Capital Structure Considerations**

- A. The invested capital income stream should be correlated with the capital structure assumptions made for the subject company.
- B. A company's capital structure includes equity financing and long-term debt necessary to fund future operations.
- (1) If the company has multiple lines of business these should be separated and valued apart since they may have different risk profiles and different financing needs.
- (2) Long-term capital structure debt may be difficult to analyze.
- (a) Some companies use short-term lines of credit on a perpetual basis to fund operations. If the short-term debt is rolled over every year, the debt may be considered part of the capital structure.
- (b) Some analysts include all interest-bearing debt as long term capital structure debt.
- ◆ This is theoretically incorrect if the company has short-term seasonal debt which is financing a short-term asset such as inventory and the debt is paid off imminently.
 - ◆ In this case, the debt is considered an operating liability.

- ◆ The interest expense associated with the short-term seasonal item should be excluded from EBIT or EBITDA by being moved up to administrative expenditure.

Reported Profits	
EBIT	144,067
Interest expense	<u>(17,028)</u>
EBT	127,039

Debt Analysis	Principal	Int. rate	Interest
Working capital debt	45,070	4.5%	2,028
Long term debt	250,000	6.0%	15,000

Adjusted Profits	
EBIT	144,067
Working capital interest exp	<u>(2,028)</u>
Adjusted EBIT	142,039
Interest expense (long term)	<u>(15,000)</u>
EBT	127,039

- ◆ In the example above, reported EBIT is SR144,067. This figure though does not correlate with capital structure debt since the interest on the working capital debt should not be deducted. Assuming the analyst will consider only the SR250,000 as part of the long term capital structure, then the interest on the working capital debt must be deducted from the reported EBIT as it is considered as an operating cost. The correct EBIT income stream is therefore SR142,039.
- ◆ It is important to be consistent with the decisions made: the relevant interest charge should be adjusted if the debt is not part of the capital structure.

Section C. Financial Statement Adjustments

1. Financial statement adjustments were covered in BV 201 and are summarized in the Appendix to Chapter 2.

2. Two commonly overlooked financial statement adjustments are revisited here.

- A. A non-operating asset is any asset that is not used in the generation of operating cash flows. Many companies have ancillary operations or other assets that are extraneous to the main operations. IVS 2020 Standard 200 states:

“Most valuation methods do not capture the value of assets that are not required for the operation of the business. For example, a business valued using a multiple of EBITDA would only capture the value of the assets utilised in generating that level of EBITDA. If the business had non-operating assets or liabilities such as an idle manufacturing plant, the value of that non-operating plant would not be captured in the value.”

- B. Dockside Company is an actual U.S. business (name is changed) that operates in a resort area on the east coast. The Company owns a fleet of fishing vessels and acquires the catch of several other fleets which it distributes to processors on the east coast. The Company also runs a large seafood restaurant at the dock where the fleet comes to port and it runs a retail store for take-out fresh seafood. The company's income statement is shown below.

Dockside Company, Inc.	
Income Statements	
<i>FYE December 31,</i>	2019
Revenues	
Fishing & distributor	1,756,125
Restaurant operator	1,260,450
Retail store	850,690
Total revenue	<u>3,867,265</u>
Cost of sales	
Boat expenses	498,780
Crew expense	365,470
Ice	56,125
Seafood purchases	514,500
Restaurant staff	498,510
Utilities	98,150
Store staff	110,560
Depreciation	162,400
Total cost of sales	<u>2,304,495</u>
Gross profit	1,562,770
Overhead	
Office salary	150,000
Admin staff	65,000
Employee benefits	299,000
Other G&A	789,010
Total Overhead	<u>1,303,010</u>
EBIT	259,760
Interest expense	(22,500)
Other income	14,900
EBT	<u>252,160</u>
	6.5%

(1) How would Dockside's income statement be adjusted?

(2) What difficulties does that present on the income statement?

- (3) What other problems would the valuer face after the initial adjustments?

C. Accelerated depreciation

- (1) Management should be asked to compare the actual expected life of major asset classes to the depreciable life assumed in the fixed asset register. If there is a difference, then depreciation should be adjusted.

	Cost	Annual		Adjusted	
		Expected Life	Depreciation	Actual Life	Depreciation
Machinery	1,000,000	10	100,000	15	66,667

- (a) In this example, machinery which was acquired for 1,000,000 is being depreciated over ten years at 100,000 per year. Management indicates during the interview that the machinery is actually expected to last 15 years.
- (b) The historical annual depreciation should be reduced to 66,667, with the 33,333 effectively being added to EBT each year.
- (c) The adjustment may more easily be addressed in a DCF model in which future depreciation and capital investment are specifically forecast.

Section D. Single Period Multipliers

- As explained in BV 201 it is possible to take multiples and to adjust them for growth. If a pricing multiple is 13x, the perpetual growth of the subject company is considered to be 2% above the derivation of the pricing multiple, the calculations are relatively simple:
 - the capitalization rate of a multiple of 13x is 7.7%.
 - This is reduced by the enhanced growth of the target of 2%, to give an adjusted capitalization rate of 5.7%.
 - This is the equivalent of an adjusted multiple of $1/5.7\%$ which is 17.5x.

- D. You can therefore see that a modest growth differential can result in sizeable changes in multiples.
2. Things are a bit more complex if dealing with multipliers which relate to the invested capital rather than just equity. This is covered more fully in the chapter dealing with the weighted average cost of capital.

Section E. Chapter Exercise

1. The balance sheet and income statements for Sample Company (which were used as examples earlier in this chapter) are shown below.
- A. Other income of SR9,321 includes SR7,000 in rental proceeds from a vacation flat that is owned by the company.
- B. The flat is included in property, plant and equipment. It was purchased for SR40,000 in 2012 and is depreciated at SR1,000 per year. The 2019 net value was SR35,000.
- C. The company officers are paid at a total of 5% of sales, recorded in general and administrative expenses. Industry norms are 3% of sales. Assume that corporate social security tax is paid at 12.8% of payroll.
- (1) No fixed assets were written off the balance sheet during 2019.
- (2) Cash should be considered a part of operating current assets.
- (3) Use the effective tax rate for the invested capital calculation.
- D. Calculate the net adjusted equity cash flow for the 2019 calendar year.
- E. Calculate the net adjusted invested capital cash flows for the 2019 calendar year.

Sample Company	
Income Statement	
	2019
Revenue	2,748,148
Cost of Sales	<u>(1,485,962)</u>
Gross profit	1,262,186
Distribution costs	<u>(252,100)</u>
General & administrative expense	<u>(865,619)</u>
Operating profit (EBIT)	144,467
Other income	9,321
Finance expense, net	<u>(17,028)</u>
Profit before tax (EBT)	136,760
Taxation at 32%	<u>(43,763)</u>
Net Income After Tax	<u>92,997</u>
Operating Profit (EBIT)	144,467
Taxation at 32%	<u>(46,229)</u>
Net Operating Profit After Tax (NOPAT)	<u>98,238</u>
From accounting notes:	
Depreciation	<u>276,332</u>
EBITDA	<u>420,799</u>

Sample Company		
Balance Sheet		
	2019	2018
Assets		
Non-current assets		
Property, plant & equipment, net	298,802	473,128
Deferred income tax	0	0
Other	2,384	10,330
Total non-current assets	301,186	483,458
Current assets		
Inventories	441,088	480,027
Trade receivables	168,865	328,006
Financial assets	64,000	61,420
Cash	10,179	18,825
Total current assets	684,132	888,278
Total Assets	985,318	1,371,736
Equity & Liabilities		
Equity		
Ordinary shares	1,000	1,000
Retained earnings	296,925	451,042
Total Equity	297,925	452,042
Liabilities		
Non-current liabilities		
Borrowings	416,667	565,021
Other	0	0
Total non-current liabilities	416,667	565,021
Current Liabilities		
Trade payables	199,076	262,138
Other current liabilities	71,650	92,535
Short-term borrowings	0	0
Total current liabilities	270,726	354,673
Total liabilities	687,393	919,694
Total Equity and Liabilities	985,318	1,371,736

Chapter 4. Cost of Capital Theory

Section A. IVSC competencies covered

Financial theory, principles and concepts

Risk-return, time value of money, capital structure, cost of capital x

Financial state, ratio, trend and cash flow analysis

Historical results, benchmarks and guideline companies

Section B. Discount Rates – Introduction

1. Defined in the International Glossary of Business Valuation Terms (“Glossary”) as:

“A rate of return used to convert a future monetary sum into present value”

2. The discount rate is also thought of as the rate of return that would attract investors to a particular investment.

A. In this regard, the discount rate can be thought of as a type of price tag on capital wherein the price is a function of how the capital will be deployed.

B. Example:

$$Value = \frac{Cash\ flow}{Discount\ rate} = \frac{1,000,000}{18\%} = 5,555,556$$

- (1) In the example above, an investment supposedly will generate one million currency units annually into perpetuity. The risk of the investment suggests that an 18% discount rate is appropriate to bring those future cash flows to a present value of 5.56 million.

(a) An investor will pay 5.56 million if he believes that the 18% accurately encompasses the risk the he will accept in actualizing the 1.0 million annuity.

- ◆ That is, the risk of the investment leads the investor to require an 18% annual return.

(b) The question of how the investor arrives at the 18.0% discount rate is the subject of Chapters 4 and 5.

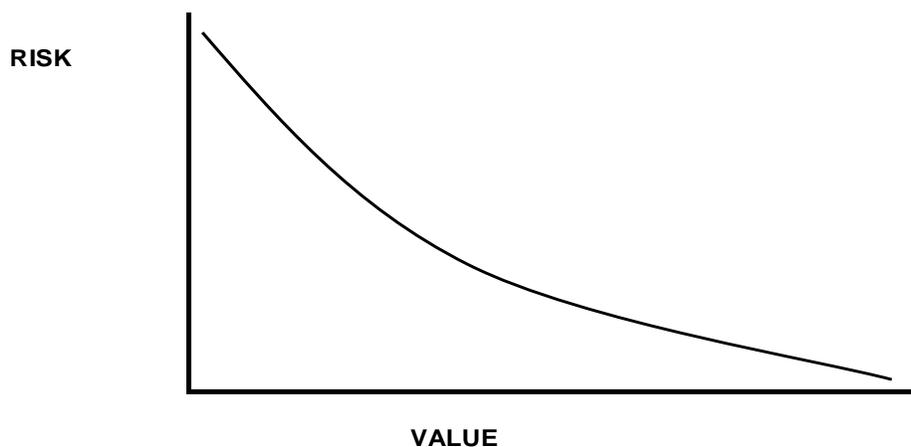
3. The term “discount rate” is a general term which can apply to different concepts:
- A. Cost of capital – this is the blended required return on different types of capital used in a business, including common and preferred equity, as well as debt.
 - B. Cost of equity – this is the discount rate on equity financing.
 - C. Cost of debt – discount rate on debt financing
 - D. Other terminology, such as required rate of return, capitalization rate, weighted average cost of capital, alternate cost of capital, are all rates that can be used to discount future returns to present value, but have different meanings and will be addressed later in the course.

4. Discount rate characteristics

A. Discount rates capture the risk of actualizing returns on an investment.

(1) Discount rates are positively related to risk – the higher the risk, the higher the discount rate;

(2) Discount rates are negatively related to value – the higher the discount rate, the lower the value



B. Discount rates are *forward looking*, embodying the market’s expectations of future conditions that contribute to the risk of cash flows.

- (1) This is sometimes confusing to practitioners since discounts rates are often quantified using historical data.
- C. Discount rates are based on *market values*.
- (1) As will be explained later, the cost of equity and the cost of debt are based on the market value of equity and debt in a company, not the book value.
- D. Discounts rates are expressed in *nominal terms*, and therefore capture a real rate of return and inflationary expectations.
- E. Discount rates are sometimes viewed as being based on *alternate investments*. Investors judge the riskiness of an investment by comparing it to alternative investment opportunities in the market.
- (1) A “risk-free” or risk neutral investor might invest in a developed government’s bonds since the bond is backed by the government’s ability to pay. This is often seen as baseline risk, or the minimum risk that is accepted in the market.
 - (2) Investors who invest in corporations require an additional return above the risk-free rate since corporations are riskier than established governments.
 - (3) Smaller publicly-owned corporations generally require higher returns than larger public corporations.
 - (4) Closely-held companies generally have higher risk than publicly-owned corporations.

Section B. Risk Analysis

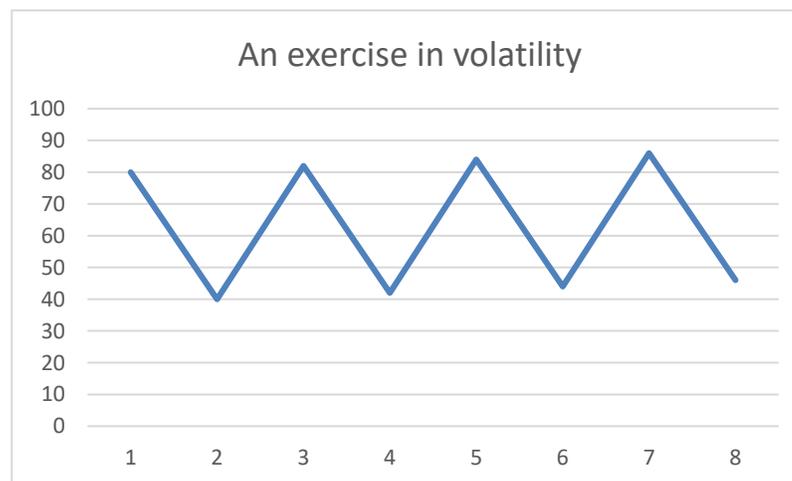
1. Risk and return

- A. The higher the risk of an investment, the higher the expected return.
- B. Three assumptions underlying risk analysis:
 - (1) Risk is associated with uncertainty.
 - (2) Volatility is a symptom of risk;
 - (3) Investors are risk averse.

- C. Financial theory distinguishes between the expected return on an investment and the variability or volatility of returns on an investment.
- (1) Consider two companies, both with an expected return of 15%.
- (a) Company A sells a product which enjoys a consistent, high demand in the market. Returns are expected to range from a low of 12% if the economy goes into recession and could be 18% if the markets experience higher growth.
- ◆ Utility companies are a commonly cited example in this category. The demand for water and power are universal and consistent. Consumers may conserve during difficult economic periods, but still consume.
- (b) Company B sells a product which is discretionary. Returns are expected to range from a low of 0% in a recession to 30% if markets experience higher than expected growth.
- ◆ The market for luxury goods, such as high-priced automobiles and large screen televisions are examples. These items are entirely discretionary. They are much less likely to be bought in an economic down-turn.
- (c) Although both companies may have an expected return of 15%, Company A will demand a lower required rate of return since there is less volatility of expected returns. There is less uncertainty in expected outcomes.
- ◆ Since investors are risk averse, they tend to avoid uncertainty and therefore must be enticed by a higher rate of return to invest in Company B even though its expected return is similar to Company A.
- (2) An alternative means of considering volatility is to consider the likely returns to an investor who invests in a stock with relatively low volatility, compared to an investor who invests in a high volatility stock.
- (a) There is a greater chance that the return on the high volatility stock will be eroded by the timing of buying and selling the stock.
- ◆ The investor does not know if he is buying at the peak or trough of the stock price;

- ◆ on realization he similarly does not know whether he is selling at a relative high point or low point.
- ◆ There is therefore a risk that the investor buys near a high point and sells at a low point

(b) This is illustrated in the following graph showing extreme volatility:



2. Market Rates of Return by Investment

- A. Discount rates were discussed earlier in terms of comparisons to alternate investments. Investors tend to measure an investment's riskiness by comparing its risk profile to similar assets in the market and considering the similar asset's historical returns.
- B. For example, returns in the U.S. market can be delineated by the risk and return of each class of asset. The following figures give nominal returns, that is returns without stripping out the inflation component:

<u>Investment Class</u>	<u>Historical Return</u>
Twenty-Year U.S. Treasury Bond	6.1%
Long-term Corporate Bond	6.2%
Large Cap Corporate Stock	11.7%
Mid-Cap Corporate Stock	13.4%
<u>Small-Cap Corporate Stock</u>	<u>17.7%</u>

Source: Stocks, Bonds, Bills, and Inflation 2009 Yearbook, Morningstar, Inc.

Financial information can be reviewed over a long time period, and with regard to real returns (that is returns over and above inflation in the relevant country). The following figures cover 117 years from 1900:

**Real Rates of Return (Returns Above Inflation)
1900 to 2015**

	USA	Germany	Japan	UK	France
Bills	0.8%	(2.4%)	(1.9%)	1.0%	(2.7%)
Bonds	2.0%	(1.4%)	(0.9%)	1.7%	0.2%
Equities	6.4%	3.3%	4.2%	5.4%	3.2%

Source: Credit Suisse Global Investment Returns Yearbook 2016

- (1) The above exemplify ladders of risk. The first two investments in the first example and the first two lines in the second example are bonds. As debt, they require a lower return since debt has a lower variability of return than equity financing.
 - (a) A government bond is generally seen as safer than a large-cap corporate bond in the same currency since the government can, after all, print money if it needed to.
- (2) There is a large jump between the corporate bond and the large-cap stock return to capture the difference in variability between debt and equity risk. The difference between the government bond rate and the large cap stock return is known as the “equity risk premium.”
- (3) This equity risk premium includes the following components:
 - (a) The default risk between a Government bond and a corporate bond;
 - (b) The greater default risk between a corporate bond and an equity investment (as equities are at greater risk of default than bonds);
 - (c) The greater bid/offer spread of equities when compared to government bonds;
 - (d) The enhanced returns required by equities because of the greater uncertainties in respect of both income returns and realization of capital;
 - (e) The tax differential which applies in many jurisdictions between the treatment of interest, dividends and capital gains.

- (4) Higher returns are generally thought to be required as the size of the equity market capitalization declines.
 - (5) These returns represent historical after-tax equity (or pre-tax returns on debt, on the bonds) cash flow returns. The rates cited in the example above equal an annual average over an 83-year time period and a 116 year time period, respectively. The assumption is that the investor will use these rates as a proxy for the expected return. As will be discussed later, this may not be a safe assumption.
 - (6) The stock returns capture returns on publicly-held stocks which are generally larger and more liquid than closely-held companies.
 - (a) On average, a typical closely-held company would require an additional discount from the valuation of the small-cap publicly-held investment.
3. Types of Risk – the models used to estimate discount rates in this course will measure each of the following types of risk.

A. Interest rate risk

- (1) Interest rate risk is the risk that an investment will lose value due to rising interest rates.
 - (a) Example: an investor buys a 10-year bond at a 3% interest rate. Suppose interest rates increase to 5% on the same class of bonds in year 3. The value of the 3% bond will decline since the investor is locked in to 3% returns when the rest of the market is enjoying 5% returns. For a 20 year bond the loss would be greater than with a 10 year bond.

B. Systematic Risk or Systemic Risk

- (1) Systematic risk measures the exposure of a company to factors which would cause a broad shock to the entire market.
- (2) Systematic risk cannot be diversified away by investing in a portfolio of well-diversified stocks since by its nature systematic risk affects the broad market.
- (3) IVS 2020 states: “Generally, investors can only expect to be compensated for systemic risk (also known as “market risk” or “undiversifiable risk”).”

- (4) Systematic risk is moderated by “beta” for different categories of company. The utility companies, as referred to in the example earlier, would be expected to have lower betas overall than the luxury goods companies with which they were compared in that example.

C. Unsystematic Risk

- (1) Unsystematic risk includes a large number of factors that can threaten returns for a single company. These risk factors can mostly be eliminated in the public markets by investing in a portfolio of well-diversified companies from different industries.
- (2) Even the smallest investor can achieve diversification by investing in a collective fund which holds a wide range of investments.
- (3) Unsystematic risk factors
 - (a) The quality of management or labor
 - (b) Obsolete technology
 - (c) Lack of capital
 - (d) Poor sourcing or distribution system
 - (e) Poor quality control
 - (f) Low barriers to entry
 - (g) High threat of replacement products

D. Liquidity Risk

- (1) This is the risk that an investor will not be able to liquidate an investment and access capital when he wants to. Public companies are relatively liquid since they can presumably be traded at any time on the open market. Other qualities of liquidity are:
 - (a) knowing the price in advance;
 - (b) modest dealing costs;
 - (c) a narrow bid-offer spread;
 - (d) the transaction does not move the market pricing.

- (2) Closely-held companies may not enjoy the same liquidity since it could take a long period of time to find a buyer.
- (3) Within a company's balance sheet, required rates of return increase as the liquidity of an asset decreases.
 - (a) Working capital assets have the lowest required rate of return since they could be converted to cash relatively quickly and easily. They can also be funded, at least in part, with relatively low cost interest-bearing debt.
 - (b) Tangible fixed assets such as real estate or equipment have a higher rate of return since it could take longer to convert them to cash. However tangible fixed assets can also be funded in part with interest-bearing debt.
 - (c) Intangible assets have the highest rate of return among all asset classes since these assets are the most uncertain in terms of liquidity and are subject to the most rapid price movements. They are also considered to be poor security for bank lending;
 - (d) Goodwill, being the residual balance after all intangible assets have been identified, has the highest required rate of return of all. With the exception of the assembled workforce, its constituents and nature are not known.

Section C. The Risk-free Rate

1. The Build-up Model

- A. Some practitioners develop an equity discount rate by "building up" the required rate of return. The build-up includes the returns on each class of assets until the cumulative returns equate to the assessed risk of the subject company.
 - (1) The capital asset pricing model which is more commonly used globally will be introduced in the next chapter.
 - (2) The build-up model does not include a beta. This is a significant difference between the build-up method and the capital asset pricing model.
- B. The build-up model is usually used with smaller companies that tend to have uncomplicated capital structures.

C. An example of the build-up model follows for a small closely-held company in Germany:

Risk-Free rate	1.0%
Equity risk premium	5.1%
Specific risk premium	<u>8.0%</u>
Equity Discount Rate	<u>14.1%</u>

- (1) In the example above, the risk-free rate is based on the yield to maturity of the thirty-year German government bond.
- (2) The equity risk premium is taken from the Dimson Marsh Credit Suisse Global Investment Yearbook¹ (“Dimson Marsh Study”). The equity risk premium represents the average premium over bonds in the German market between 1900 and 2015.
 - (a) Note that this represents an *historical* risk premium measurement.
- (3) In the build-up model, the specific risk premium captures a host of systematic and unsystematic risk factors including the relative size of the subject company to the large cap stocks included in the Dimson Marsh returns. Since beta is not captured in the model, the systematic risk must be captured at this stage.
- (4) Each of these components of the discount rate will be discussed throughout the rest of this chapter.

2. The Risk-Free Rate

- A. The risk-free rate represents the baseline level return which would appeal to an investor who is highly risk-averse.
 - (1) No investment though is totally free of risk.
- B. The government bonds of developed economies with control of their own currency are acceptable to use as proxies for a risk-free rate in that currency. This is because they are backed by the full faith of the

¹ Credit Suisse Global Investment Returns Yearbook 2016. (https://emagazine.credit-suisse.com/app/_customtags)

government and its ability, as a last resort, to print money to settle obligations.

(1) Some practitioners question this practice, especially after the sovereign debt crisis and the credit rating reduction of several western economies. There was a “flight to safety” as investors put their money into risk-free investments.

(2) This related largely to currencies in the Eurozone, which are economies without control of their own currency.

(3) One illogical output of the build-up method (and the capital asset pricing model) was that the cost of equity seemingly reduced at a time when it was, in reality, increasing. (In such a situation it is clear that the ERP had increased and this needed to be adjusted to compensate for this effect.)

C. Long-term government bond returns are usually used as proxies for the risk-free rate in valuation since valuation is measuring company returns over the long term, not the short term.

D. Long-term government bonds, like any bond, have three potential return components:

(1) Income return – coupon payments

(2) Increase or decrease in bond value – this will be largely driven by anticipated changes in interest rates

(3) Reinvestment return – this refers to the fact that the comparative measurement of returns on investments requires the assumption that income returns are reinvested in the same investment.

E. It is important to note that only the income return portion of the bond (the coupon return) is technically risk-free since the government bond is considered free of the risk of default.

(1) The price return and reinvestment return are subject to deteriorating market conditions and rising interest rates.

(2) Long-term government bonds are riskier than short-term government bonds since the investor is exposed to interest rate risk over a longer period of time.

- (3) Examples of the yields on 10-year government bonds as of quarter 1 2017 and March 2018.

	January 2017	March 2018
United States	2.55%	2.81%
Germany	0.17%	0.52%
United Kingdom	1.38%	1.42%
Japan	0.05%	0.02%
Canada	1.99%	2.17%
France	0.73%	0.76%
Italy	1.85%	1.90%

- (a) From <https://countryeconomy.com/bonds>
- (b) Differences between the government bonds' risk-free rates is indicative of varying economic conditions such as expected inflation, default risk, saving ratios and interest rates.
- (c) Savings ratios are the proportion of household income which is saved by households.
- (4) The risk-free rate on a long term bond contains a return for expected inflation risk.
- (a) However, changes in yields on government securities do not necessarily indicate that the market's expectation of future inflation has changed.
- (5) If a short-term government bond is less risky, why not use that security as the proxy for the risk-free rate?
- (a) Analysts match the investment time horizon of the risk-free rate to the subject company investment being valued. Unless the holding period of the investment is known to be shorter, then the subject and the government bond are long-term.
- (b) If the shorter term bond were used, there would have to be a separate premium in the built-up discount rate to measure the difference in risk between short-term and long-term bonds.

- (6) Returns on government bonds were affected by abnormal market conditions during 2008 through to the present, causing extreme rates of returns relative to historical rates. In certain cases there have been negative nominal yields on some government bonds due to their status as safe havens.

Section D. The Equity Risk Premium

1. The equity risk premium (“ERP”) is the return above the risk-free rate that is necessary to attract investors to a higher level of investment risk. If measured using historical data, it is shown as the delta between the total return on large cap equities and the income-only return on government bonds.
2. The equity risk premium therefore covers the default risk which is present in corporate bonds. It also reflects the differing tax treatment of bonds and equity investments: returns on bonds are normally stated without any tax charge; the returns on equities are after a corporate tax charge.
3. It is understandable that equity investors expect returns which are higher than those from government bonds: there is the default risk of corporate bonds; to this must be added the greater uncertainties as to income from equities; then there is the absence of redemption for a stated amount at a known date as there is with most bonds. The greater bid/offer spread of equities when compared to government bonds has also to be covered by the ERP.
4. Theoretically, the ERP, like the risk-free rate, is a forward looking rate that is based on the market’s expectations about future long term returns. As explained by Aswath Damodaran in his research², there are several determinants of the ERP, some of which can be quantitatively measured while others are more subjective.

A. Investors’ risk aversion

- (1) An appetite for risk will vary with each individual, but collective risk tolerance tends to decline after an economic downturn.

B. Economic risk

- (1) Expected risk is lower if the economy enjoys high predictability. Uncertainty breeds risk. Since developed economies are thought to have less uncertainty relative to developing economies they tend to have lower ERPs.

² Aswath Damodaran, “Equity Risk Premiums: Determinants, Estimation, and Implications – 2011 Edition” see <http://pages.stern.nyu.edu/~adamodar/>

C. Consumption patterns

- (1) Economies with low consumption, high savings rates, and low household debt tend to have lower ERPs. High savings rates tend to drive down investment returns.

D. Corporate governance

- (1) The higher the quality of management and the dependability of earnings information, the lower the ERP.

E. Liquidity

- (1) The ability to get into and out of an equity position is very important to investors. If investors need to wait to retrieve cash from an equity investment, they will require a higher return.

F. Catastrophic Events

- (1) The threat of an extraordinary, long-term downturn is calculated into investors' expectations. Examples:
 - (a) The U.S. depression in 1929 (which did not turn around until World War II, more than 10 years later)
 - (b) The Japanese recession in the late 1980s, from which Japan has not yet fully recovered.

G. Irrational economic behavior

- (1) Behavioral economists would argue that investors do not always behave in a way that would theoretically earn the highest return.
 - (a) For example, studies suggest that investors judge the risk of a new investment in isolation rather than in conjunction with the existing risk of their portfolio.
 - (b) There is also strong evidence of crowd behavior such as irrational exuberance or collective fear.

5. There are three traditional ways that the ERP is measured:

A. Historical Measurements

- (1) Practitioners often measure the ERP by looking at historical returns over the long-term past, based on the assumption that although there will always be short-term aberrations, the market's expectation of future long-term returns is equivalent to an average of past returns.
- (2) Past returns are usually measured as the arithmetic average or geometric average of the annual after-tax equity cash flow returns on large-cap equities.
- (3) The relevance of using past market returns as a proxy for the market's expectation of future long term returns has been controversial.
- (4) If historical returns are used to measure future returns, the formula is shown as follows:

$$\text{ERP} = E(R_m) - R_{f2}$$

Where:

ERP = equity risk premium

$E(R_m)$ = expected return on large-cap stocks

R_{f2} = income-only return on government bonds (i.e. the arithmetic mean of the historical returns measured over the same period as the expected total return).

- (a) R_{f2} is not the same metric as the risk-free rate (R_{f1}). The risk-free rate is the current yield on the government bond. R_{f2} is the historical income return on government bonds.
- (2) Numerous studies question the validity of using historical measurements of returns to estimate expected returns.
 - (a) In the U.S. (where the most-cited studies have been completed), the period between 1926 and the present includes non-recurring events that affect the historical returns.
 - (b) Returns during the past century have not been consistent. Returns in the second half of the twentieth century were larger than the first half due to increased productivity, declining corporate tax rates, declining monitoring costs and other factors, including two world wars in the first half of the century.

- (c) The expected ERP that could have been forecast given the economic factors in 1926 was less than the realized risk premium.³
- ◆ This means that even if an analyst in 1926 was omniscient and *knew* the future, that knowledge of future returns would not be useful in determining the actual expected risk premium in 1926.
- (d) Using different historical periods to measure the historical returns will yield different implied equity risk premiums.
- ◆ *Stocks, Bonds, Bills and Inflation*, The most widely used study in the United States, provides an arithmetic average return between 1926 and the present which was between 7.0% and 8.0% when most academics suggested the ERP should be in the 4.0% to 6.0% range.
- (3) The figures computed by Dimson, Marsh and Staunton are computed by reference to geometric averages and cover most of the large stock markets from 1900 to the present.
- (4) Damodaran's continuing study on worldwide equity risk premiums presents the difficulties with relying on historical measurements to estimate the ERP.
- (a) Shorter measurement periods, say 25-30 year periods, will most likely remove many of the non-recurring events that undermine historical studies. However, the shorter time periods yield significant standard errors which make the implied premiums useless.
 - (b) There is a survivor bias in the longer term data, especially the data used in the United States. That is, if an investor invested money in all of the world's major markets a century ago, he would have lost his investment or seen very low returns in some of those markets. In the period from 1889 to the end of 2015 the USA stock market grew from 15% to 52.3% of total world equity markets (according to Dimson, Marsh and Staunton).

³ Roger G. Ibbotson and Peng Chen, "Long Run Stock Market Returns: Participating in the Real Economy," *Financial Analysts Journal*, (January/February 2003).

- ◆ By just looking at the U.S. market (as many U.S. practitioners do) the valuer is capturing a survivor bias by excluding the down markets.

(5) The Dimson Marsh studies measure the equity risk premium for 19 countries based on data from 1900 to 2015. Excerpts from the 2016 study, giving the premiums over bonds, rather than bills, are shown below.

Canada	3.3%
Denmark	2.3%
France	3.0%
Germany	2.8%
Italy	3.1%
Japan	5.1%
UK	3.6%
USA	4.3%

- (a) Damodaran points out that the average arithmetic and geometric risk premiums from many of the 19 countries in the Dimson Marsh studies are lower than the U.S. premium, a fact which underscores the strong performance of the US economy in the last 116 years.

B. Prospective Measurements

- (1) Forward looking studies are more theoretically valid because they utilize economic data available to the market and reflect future expectations of investors.
- (2) There are two types of prospective measurements
- (a) Bottom- up studies
 - (b) Top-down studies
- (3) The *bottom-up studies* derive an ERP by calculating an internal rate of return within a market-wide discounted cash flow analysis.

- (a) The internal rate of return which equates projected returns with current price is calculated for a critical mass of companies in the market. The IRRs are averaged and the government bond rate is subtracted.
- (4) Damodaran performs such a study on an annual basis. He measures the projected dividends and stock buybacks on the S&P 500 index and solves for the return on equity which would set these cash flows to equal the Index Value at the beginning of each year.
- (a) He deducts the risk-free rate to arrive at an implied expected equity risk premium. His implied ERP for the U.S. market over the past years is shown⁴:

Date	<u>Implied ERP</u>
January 1, 2010	4.37%
January 1, 2011	6.43%
January 1, 2012	4.36%
January 1, 2013	5.20%
January 1, 2014	6.01%
January 1, 2015	5.78%
January 1, 2016	6.12%

- (5) There are several commercial providers that calculate ERPs using this method, including:
- (a) Bloomberg Euro-zone
 - (b) Reuters
 - (c) Value Line IBES
 - (d) Associès en Finance (based on 300 European corporations)
- (6) The top-down studies use independent predictors including the dividend yield, and macro economic indicators such as short-term

⁴ Damodaran, pages 59-60

interest rates, inflation, earnings ratios, default spreads and other variables. This is also called the supply side ERP.

- (7) SBBI now includes a supply side ERP, based on projected data in its annual yearbook for the U.S. market. Many practitioners who formerly used SBBI's historical arithmetic average ERP now use the supply side premium.

C. Surveys

- (1) Since the ERP theoretically represents the collected expectations of the entire market, a survey of industry sources, though seemingly unscientific, is an appropriate way to estimate the ERP.
- (2) An annual worldwide survey is conducted by Professor Pablo Fernandez of the IESE Business School of the University of Navarra, Spain.⁵
- (a) The 2016 survey asked 19,500 people worldwide for the required Market Risk Premium or MRP that they use in valuation.
- (b) The survey received 6,932 answers, with useable data from 6,754 individuals
- ◆ Breakdown:
- ⇒ 44.6% academics
- ⇒ 6.4% analysts
- ⇒ 34.5% companies
- ⇒ 14.5% other
- (c) An excerpt from this study is shown below:

2016 Survey of Market Risk Premiums, Selected Countries						
Country	Average MRP	Median	Standard Deviation	Max	Min	Number Responses

⁵ Pablo Fernandez, Alberto Orriz and Isabel F Acin, "Market Risk Premium Used in 71 Countries in 2016: A Survey with 6,932 answers, IBES Business School, Working Paper, available at www.papers.ssrn.com

United States	5.3%	5.0%	1.3%	20.0%	1.5%	2,536
United Kingdom	5.3%	5.0%	1.4%	12.8%	1.5%	221
Germany	5.3%	5.0%	1.7%	12.4%	1.2%	360
Japan	5.4%	5.0%	2.3%	16.7%	2.0%	58
France	5.8%	5.5%	1.6%	11.4%	2.0%	105
Australia	6.0%	6.0%	1.6%	15.0%	3.0%	87
Brazil	8.2%	7.0%	4.9%	30.0%	1.8%	107
Russia	7.9%	7.0%	3.5%	25.0%	2.7%	81
India	8.1%	8.0%	2.4%	16.0%	2.3%	82
China	8.3%	7.0%	4.4%	30.0%	3.8%	96
Portugal	7.9%	8.0%	2.1%	14.0%	4.0%	55
Ireland	6.6%	5.8%	2.2%	12.3%	4.0%	28
Italy	5.6%	5.5%	1.5%	10.1%	2.0%	152
Greece	13.0%	12.4%	5.2%	23.0%	6.5%	41
Spain	6.2%	6.0%	1.4%	12.0%	1.5%	817

- (3) As shown, the developed economies at the top of the chart show average ERPs between 5.0% and 6.0%.
- (4) The rapidly developing economies of China, Brazil, India, and Russia were significantly higher, between 7.0% and 8.0%.
- (5) The troubled European economies, with the exception of Greece, were in the 5.5% to 8.0% range.
- (a) It is possible that practitioners in these countries responded with the ERPs that they use in practice, not the ERPs that they felt were relevant to the country in which they practice. For example, an Irish valuation analyst may perform work for clients in the UK and continental Europe with fewer clients doing business within Ireland.

Section E. **Company Specific Risk**

1. The first two components in the cost of equity, the risk-free rate and the equity risk premium, are both objective measurements based on macroeconomic variables.
2. The addition of the risk-free rate and the ERP are at a level of risk that would equate to a large publicly-held corporate stock held as part of a diversified portfolio.
3. If the assignment is to value a small closely-held stock, an additional risk premium is necessary to capture the difference in risk between the large-cap public company and the closely-held subject.
4. Possible risk factors that need to be captured include:
 - A. Size risk
 - B. Liquidity risk
 - C. Other operating and business risks
 - D. The greater difficulty of diversifying away unsystematic risk for investors in small companies.
5. Since some of these categories overlap, there is the potential for double-counting risk factors, especially if the analyst includes a discount for lack of marketability at the end of the assignment.
6. Size risk is measured objectively, albeit through measuring historical returns on the market.
 - A. It has long been accepted in the financial and valuation communities that smaller size equates to a higher risk profile and a higher required return.
 - (1) Although this is accepted in the private company arena, the nature of the market evidence for this is disputed by some, including Aswath Damodaran. The size premium was identified in an academic paper in 1981. Since 1982 the small stock premium has scarcely been evident.
 - (2) Some taxing authorities dispute the notion that small companies are, a priori, riskier. The United States Internal Revenue Service argues that small companies are not risky because they are small. Rather, some

companies (but not all small companies) become small because they are risky.

B. Size premium studies are available on the United States markets and there is some data for European markets. However the data are not yet available in all other countries.

(1) Although some practitioners outside the U.S. use the U.S.-based size studies, it should be noted that the premium data does not transfer to other markets.

C. Initial models were based solely on the equity market capitalization. This resulted in some companies being included which had a low market capitalization as they were risky or because they were highly leveraged. Some other companies with very low market capitalizations were distressed companies. These studies were therefore criticized due to these weaknesses. This resulted in Duff & Phelps developing the studies to increase their sophistication.

D. The Duff & Phelps, LLC Risk Premium Reports (“DP Study”) are highly detailed studies on specific risk. The most widely used application of this study is to measure specific risk in relation to company size. As of March 2018 these studies will be found only on-line and can be used on a subscription basis. The DP Study includes two distinct analyses:

(1) The DP Size Study

(2) The DP Risk Study

7. Duff & Phelps Risk Premium Report

A. The DP Size Study measures size using eight different criteria:

(1) Market value of equity

(2) Book value of equity

(3) 5-year average net income

(4) Market value of invested capital

(5) Total assets

(6) Five-year average EBITDA

(7) Sales

(8) Number of employees

B. Each of the eight size criteria studies breaks the U.S. public market down into 25 size portfolios.

C. There are two separate sets of size studies, one for application to the build-up method of deriving the cost of equity and another for application to the capital asset pricing model.

(1) The example shown below assumes the analyst is using the CAPM.

D. Steps for the application of the DP Size Study

(1) Obtain a preliminary assessment of the value and operating metrics of the subject company.

(2) Select which of the eight size criteria are relevant in the subject assignment.

(3) Given the relevant size metric in the subject company (initial estimate of market value of equity, sales level, average EBITDA, etc.), locate the appropriate portfolio in the associated DP size study.

(4) Find the size premium in the “Smoothed Premium over CAPM” column to the right.

(a) If the subject company lies between two portfolios, the analyst can use regression or extrapolation to arrive at the size premium.

(5) After measuring the size premiums from the different criteria studies, select the appropriate size premium for inclusion in the capital asset pricing model as part of specific (unsystematic) risk.

E. Use of the DP Study can be problematic since the analyst needs to know the answer to the problem as an input to solving the problem. That is, he must estimate the MVIC or MVE to develop the cost of equity to arrive at the MVIC or MVE.

(1) To address this, an iterative approach may be required whereas if the MVE which results from applying the size premium in the CAPM differs from the estimated MVC in the study, a revised estimate should be used and the process repeated.

F. As mentioned before, these studies cannot be immediately applied to markets outside the United States without informed judgment and adjustment.

(1) There are other, more limited size premium studies outside the U.S. market.

8. Duff & Phelps *Risk Study*

A. D&P provides a separate analysis in its annual Risk Premium Report that measures the total effect of market risk, size premium, and company specific risk.

(1) The risk premium developed in this Study is added to the risk-free rate since it encompasses the ERP, size premium, and other specific risk.

(2) This Study is only useable if using the build-up model. The build-up model is therefore reconstructed as:

$$K_e = R_f + RP_{m+s+u} \text{ Where:}$$

K_e = Cost of Equity

R_f = Risk free rate

$RP_{m,s,u}$ = Risk premium for market risk, size risk and other unsystematic risk

(a) As shown, the equity risk premium is included in the RP variable, along with size risk and other company specific risk.

(3) Again, this analysis cannot be used as part of the CAPM.

B. The Risk Study uses three measurements of risk:

(1) Operating margin

(a) D&P measures this as earnings before interest, tax, depreciation and amortization (EBITDA). A five year average is assessed.

(2) Coefficient of variation of operating margin

(a) Calculated as the standard deviation of EBITDA over the prior five years divided by the mean EBITDA margin over the prior five years.

- ◆ As a reminder, the coefficient of variation (the standard deviation divided by the mean) is a very useful statistical tool; it enables different populations to be compared. The lower the coefficient of variation, the more closely grouped the data.

(3) Coefficient of variation of return on book value of equity

- (a) Calculated as the standard deviation of return on book equity for the prior five years divided by the mean return on book equity. Return is defined as net income after tax, before extraordinary items minus preferred dividends.

C. Application of the DP Risk Study

- (1) The Risk Study is similar to the Size Study except that there are only three measures of risk as opposed to eight measures of size.
- (2) Each of the three measurements is broken down into 25 portfolios, similar to the Size Study.
- (3) Risk is considered to correlate with the operating margin percent together with volatility of results.
- (4) The analyst calculates the relevant variables for the subject company and locates the appropriate portfolio given the subject's metric.
- (5) After calculating the appropriate smoothed risk premium, it is added to the risk-free rate as of the valuation date.
 - (a) It should be noted that the DP Risk Studies assume an ERP based on the period 1963 to current time frame. If the analyst is assuming an ERP from another source, then the difference should be added or subtracted.

D. Example

- (1) The application of the D&P Study is illustrated using an example of ABC Company below.

ABC Company					
	2013	2014	2015	2016	2017
Sales	1,010	990	1,150	1,240	1,310
EBITDA	175	165	210	275	240
EBITDA %	17.3%	16.7%	18.3%	22.2%	18.3%
Net income	125	115	160	225	190
Book Value	550	560	590	630	670
Average EBITDA %	18.6%				
ST DEV EBITDA %	2.1%				
Coefficient of Variation	11.5%				
ROE	22.7%	20.5%	27.1%	35.7%	28.4%
Average ROE	26.9%				
Standard Deviation ROE	5.9%				
Coefficient of Variation	21.8%				

	ABC Metric	DP Study Portfolio	Smoothed Avg Premium
Avg Operating Margin	18.6%	6	7.5%
C.V. Operating Margin	11.5%	17	8.6%
C.v. ROE	21.8%	18	8.6%

Average 8.2%
Median 8.6%

$$K_e = R_f + RP_{m+s+u}$$

$$K_e = 4.2\% + 8.6\%$$

$$K_e = 12.8\%*$$

* subject to ERP adjustment

ERP from DP Study = 4.25%

Applicable ERP = 6.0%

$$K_e = 12.8\% + 1.75\%$$

$$\underline{\underline{14.55\%}}$$

(a) In the example above, the analyst is using an ERP of 6.0%.

Since the assumed ERP in the DP Risk Study is 4.25%, then the delta of 1.75% is added to the formula.

- Although there are other studies which purport to measure industry risk and subject company risk in an objective way, those studies do not enjoy wide acceptance and often yield inconsistent results.
- It is common to apply a risk premium above the combined risk of the risk-free rate, ERP, and size risk, to capture operating risks of the subject, especially if the subject company is small. This will include the unsystematic risk which is not included in any of the other elements.

- A. If the company is located in a developing economy, it is common to add a risk premium for the riskiness of the country. Country risk will be discussed later on the next page.
11. It is easy to make errors in the specific risk analysis, especially in regard to double counting the same risk factor.
- A. A size risk premium may include several areas of risk that an analyst may erroneously bundle into an additional specific risk premium such as lack of management depth, lack of access to capital markets, limits on geographic diversity, reduced liquidity etc. The size premium may also include other technical factors such as a wider bid-offer spread for the securities of smaller listed companies, the implicit overstatement arising from arithmetic means, etc.
 - B. As was mentioned earlier, a large specific risk premium, coupled with a large discount for lack of marketability may capture the same specific risk factors twice.

Section F. **Country Risk – an Introduction**

1. There are challenges when valuing corporate entities which have activities in the form of subsidiary undertakings or branches in various countries. It is also challenging when valuing an entity for parties who are based in another country.
2. It is clear that the following valuation components may not be the same as that of a country in which the buyer or the valuer are based:
 - A. The risk free rate;
 - B. The equity risk premium;
 - C. The appropriate beta;
 - D. The specific company risk
3. Whatever approach is adopted, the valuation has to be undertaken from the viewpoint of the user and from the perspective of the country and currency in which the user is based.

4. This involves the recognition of additional country risk. This can be recognized in the cash flows or in the discount rate. Clearly this risk should not be double counted.
5. There are various aspects to country risk. A very significant aspect is currency risk, in other words the risk that the currency of the country concerned will not move exactly in line with the currency of the home country. There are five explanations given for the movements in exchange rates between different currencies:

A. Interest rate parity

- (1) This is an economic argument which states that the relative interest rates in two currencies reflect the market's expectation of the future movement in exchange rates. This means that a holder of a currency which is considered likely to devalue or weaken when compared with another currency should be rewarded with a higher rate of interest. If this relationship did not hold it would be possible for investors to make arbitrage gains. This therefore is a concept built upon the over-arching concept of efficient markets;

B. Market Expectations

- (1) The second concept is that exchange rates move based on the simple truth that this reflects the expectations of the market participants; these are the great numbers of currency traders seeking to profit from inefficiencies in the markets. The difference between the current rate, known as the spot rate and the rate in the future, known as the forward rate or future rate, is the combined effect of the inputs of market participants;

C. The Fisher Effect.

- (1) The rate of interest has two components: there is the real rate of interest, being the rental charge for the use of the capital, and there is an uplift for inflation. These two factors are multiplicative. Therefore a real rate of interest of 1% and inflation expectations of 4% should lead to an interest rate of 5.04% $((1.01 \times 1.04) \text{ less } 1)$.

D. The International Fisher Effect

- (1) In a perfectly liquid world market in all currencies, there would be one real rate of interest. Any interest differentials therefore represent

differing expectations for inflation in different currencies as the rental charge of money is a constant in the calculations and only the inflation is variable.

E. Purchasing Power Parity

(1) This concept assumes that the same basket of goods should have the same cost throughout the world. To the extent that this is not the case, the currencies will move in the direction of purchasing power parity.

6. There are also political risks within the concept of country risk. Within the concept of political risk are included the following:

A. The quality of government actions in their management of the economy;

B. The frequency of change of government and the perceived stability of government in that country;

C. The exposure of the country to external conflicts;

D. The extent of corruption within the government and within society;

E. The role of the military in the government;

F. The role of religious leaders in the government;

G. The degree of law and order and the primacy of the rule of law by means of an independent judiciary;

H. The size of the middle class;

I. The quality of the government bureaucracy;

J. The risk of expropriation.

7. There are then economic and financial risks in an economy, including:

A. The relative diversity of the economy in respect of goods and services;

B. The rates payable on Government bonds;

C. The debt servicing costs as a proportion of total Government revenues;

D. GDP per capita;

E. Real GDP growth;

- F. Inflation rate;
 - G. Current account balances;
 - H. Government debt expressed as a percentage of GDP.
8. Some of the above measures are complex; there is very often no direct correlation between the factors and the perceived country risk:
- A. Japan has a very high level of Government debt; however most of this is held domestically by Japanese investors and this is not generally considered to be a risk factor when investing in Japan;
 - B. Some countries have large Government deficits (larger Government spending than government tax receipts). However this has only an indirect impact on perceived country risk;
 - C. Some countries have large current account deficits, that is the comparison of imports and exports. Examples include the USA and the UK. However the level of the current account deficit again has only an indirect impact on the perceptions of country risk.

Section G. **Country Risk – Valuation Models**

1. There are various methods being developed for calculating country risk. None of these methods has yet achieved general acceptance in the business valuation communities.
2. We have provided brief details of some simple models below:
 - A. Local CAPM;
 - B. International CAPM;
 - C. Country risk rating model
 - D. Country Spread Model
 - E. Differential yields to maturity of Government bonds
3. In BV 104, four models are explained in some detail:
 - A. Relative Volatility Model
 - B. Erb-Harvey-Viskanta Country Credit Rating Model
 - C. Country Yield Spread Model
 - D. Damodaran Model
4. There is some complexity involved with these models.
5. In this course we discuss some of the alternative ways of considering the international cost of capital. We then give an overview of the above four methods, as an introduction to material that will be covered more fully in BV 104.
6. The first most obvious method is to use the risk-free rate, beta and equity risk premium of the local country. This can then enable the use of a local CAPM model to derive a value in the local currency. This requires a well-developed local financial market in order to derive reliable inputs. It is then necessary to convert that value to the value of the reporting currency.
7. The second method, called international CAPM, uses a local risk free rate and local beta; these are applied to an equity risk premium which is derived from regressing the local market ERP against that of other markets;

8. The next method is the country risk rating model, which bases country risk on the relative credit ratings of the Governments of various countries;
9. The country spread model looks at the different yields on government bonds. Some countries issue government bonds denominated in US Dollars, otherwise known as Brady bonds. As these are Dollar-based, the spread from the returns on US government debt gives one measure of the risk linked to the government of the other country. The country spread model can also be applied to countries in the Eurozone, with the returns assessed by reference to the returns on similarly dated German government bonds.
10. There are then various models of some complexity which are based on varying standard deviations of the returns on the stock markets of different countries. There is a base model which compares the relative volatility of the local market to the market in the relevant developed country. This model has then been adapted by Duff and Phelps to include a specific factor for country risk. The base model has then been further elaborated by Professor Damodaran in order to allow for a company based in one country to have various subsidiaries and branches in other countries.
11. One straightforward way to consider country risk is to take the base discount rate in the reporting country and then to multiply by the following factor:

$$\frac{\text{yield to maturity of government bond of guideline company}}{\text{yield to maturity of government bond of subject company}}$$

12. If using the above pragmatic approach it is important that the two government bonds are relatively long term and that they have the same period to maturity. Therefore two government bonds, both with 10 years to maturity, would be appropriate inputs.
13. The advantage of the above approach is that the differences in the yields to maturity should reflect both the differing inflation expectations and also the various aspects of country risk.
14. The Relative Volatility Model Formula
 - A. This uses the normal CAPM formula, with inputs from a base market with a liquid and efficient equity market and also with a secondary government bond market. These inputs are the risk free rate, the equity risk premium and the Beta.

- B. The Beta is then modified by the relative volatility of the local market compared to the base market. This is based on the standard deviation of the local market returns when compared to the base market.
15. The Erb-Harvey-Viskanta Country Credit Rating Model
- A. This is two stage process of some considerable complexity:
- (1) The country credit rating is regressed against the country market returns – for those countries which have country market returns. These are measured on a monthly basis. This enables a regression line to be prepared. This is stated to have a high R^2 of 0.97;
 - (a) This regression line can then be used to consider the risk premium for any country which has a credit rating or risk rating.
 - (2) Country risk premiums for any country relative to any other country are derived by subtracting one country's return from the other.
- B. The output of the regression analyses derives a cost of capital for a particular country when considering an investment in another country.
16. The Country Yield Spread Model
- A. This uses the CAPM based on the home country, with the addition of the spread between the yield on a long dated government bond of the home country and the yield on a similarly dated government bond of the country in which the investment is held.
- B. This can only be used if the government bonds are in the same currency – an example is Brady bonds which are expressed in US Dollars. The difference in the yield is an indicators of country risk.
- C. This therefore delivers a cost of capital to be applied to cash flows expressed in the home country.
17. The Damodaran Model
- A. Professor Aswath Damodaran of New York has developed his own model for determining country risk and this has evolved over several years.
- B. The current iteration builds up a cost of capital by computing a delta variable:

- (1) The standard deviation of the returns on the equity market;
 - (2) Divided by the standard deviation of the returns on the government bond market.
- C. Happily the delta is computed by Professor Damodaran on an annual basis and published free on his website.
- D. The delta is required as a major part of the model is based on government bond data. In order to convert bond data to equity data it is necessary to apply delta. This is because equity markets are rather more volatile than bond markets.
- E. The model then takes the differences in the credit default swaps between the home country and the local country.
- (1) A credit default swap (CDS) is a form of insurance policy against the risk of default. The spread in the CDS gives a measure of risk within the government bonds concerned.

Section H. **Summary**

1. This chapter introduced the discount rate as a metric which discounts projected cash flows to present value.
2. This course will consider two discount rates:
 - A. The Cost of Equity, calculated using either:
 - (1) The build-up model
 - (2) The capital asset price model
 - B. The weighted average cost of capital (WACC)
3. The principal components of the cost of equity are:
 - A. The risk-free rate
 - B. The equity risk premium (ERP)
 - C. Size premium
 - D. Additional specific risk premium

Section I. **Chapter Exercise**

1. You are to compute a cost of equity capital using the build-up method and the Duff and Phelps model using $R_{m,s,u}$. The inputs are as follows:

Duff & Phelps Equity Risk Premium 4.25%

Smoothed averages from D&P Study:

Average operating margin 6.3%

Coefficient of variation operating margin 9.3%

Coefficient of variation of return on equity 7.8%

Risk free rate 1.8%

Substitute Equity Risk Premium 5.5%

2. How would you describe the currency concept of interest rate parity?
3. What are the different methods of obtaining an equity risk premium?

Chapter 5. Capital Asset Pricing Model

Section A. IVSC competencies covered

Financial theory, principles and concepts

Risk-return, time value of money, capital structure, cost of capital x

Financial state, ratio, trend and cash flow analysis

Historical results, benchmarks and guideline companies

Section B. Introduction

1. The capital asset pricing model was first introduced by William F. Sharpe, a Nobel prize-winning economist in 1964. The model is part of capital market theory, which includes portfolio theory and how investors behave in capital markets.
2. The model was designed to explain the workings of a free market economy. It was not designed for the valuation of individual stocks.
 - A. There are two investments in the model:
 - (1) Government bonds which yield the risk-free rate;
 - (2) An investment portfolio comprising an interest in all of the other value producing assets in the economy in proportion to their value in that economy.
 - (a) This second investment portfolio therefore includes all public companies, all private companies and other assets such as rental properties.
 - B. Any investor obtains varying returns according to the weighting applied to these two asset classes;
 - (1) An investor who invests solely in Government bonds will receive the risk free rate;

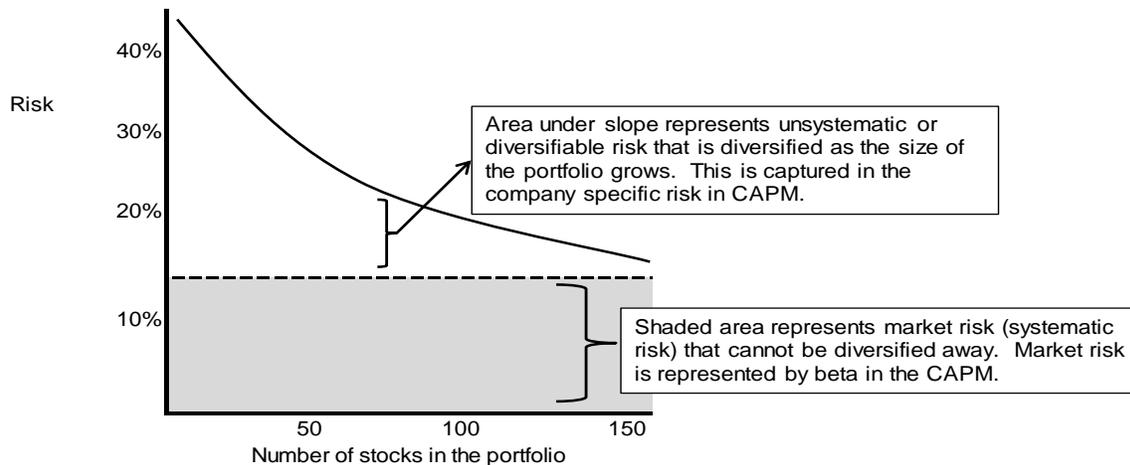
- (2) An investor who invests 50% in Government bonds and 50% in all other value-producing assets will obtain a higher return than the risk free rate due to the higher returns on the other assets – but will have accepted some risk into the portfolio;
 - (3) An investor who invests 100% in other value-producing assets will obtain a still higher return but with the acceptance of higher risk;
 - (4) An investor who wishes to increase returns still further can borrow at the risk free rate and can then invest these additional funds in the other value-producing assets in the economy. The risk is still higher due to the leverage that has been introduced into the model.
- C. The model is therefore highly theoretical and is designed to explain the workings of a free market economy at a macro-economic level.
- D. Some of the obvious differences between the model and actual investments are:
- (1) Investors cannot access many of the value-producing assets in the economy, as they are privately held;
 - (2) Investors normally increase returns by investing in riskier asset classes, before they consider using leverage to increase returns still further;
 - (3) Investors are not normally able to borrow at the risk free rate.
3. Capital market theory differentiates between two kinds of risk that investors face, both of which were discussed in Chapter 4:
- A. Systematic risk
- (1) Systematic risk, also referred to as systemic risk or market risk, reflects the uncertainties of future cash flows resulting from market-wide events that threaten the broad stock market such as wars, recession, inflation, investor sentiment, etc.
 - (2) Systematic risk is evident in the rises and falls of the whole stock market. Such rises and falls tend to be closely correlated on a global scale due to the global nature of much financial investment.

- (3) However not all stocks in a market behave in the same way: some stocks will tend to rise and fall less than the entire market; other stocks will rise and fall more than the entire market.
- (4) Systematic risk therefore is measured by comparing movements in a subject company's stock to a broad market index.
- (5) Capital market theory explains the behavior of a portfolio of stocks since a prudent and rational investor would diversify risk by buying a portfolio of different investments rather than a single investment.
 - (a) Systematic risk cannot be diversified away by the purchase of other equity investments since it affects the broad market.
 - (b) If an investor has investments in say 30 stocks in different sectors he will be likely to experience close to the systematic risk of the market as the unsystematic risk will have been largely removed by diversification.
 - (c) Index tracking investments will deliver the systematic risk of the whole market
 - (d) Diversification from the market systematic risk can only really be achieved by investing in bonds and asset classes other than equities

B. Unsystematic risk

- (1) Unsystematic risks are the risks that are particular to a company.
 - (a) These are the risks that are uncovered in a typical company analysis, such as lack of management depth, obsolete technology, poor quality control, etc.
 - (b) Capital market theory assumes that a prudent investor would diversify away this risk by investing in a portfolio of stocks.

C. The relationship between systematic and unsystematic risk is shown in the following graph:

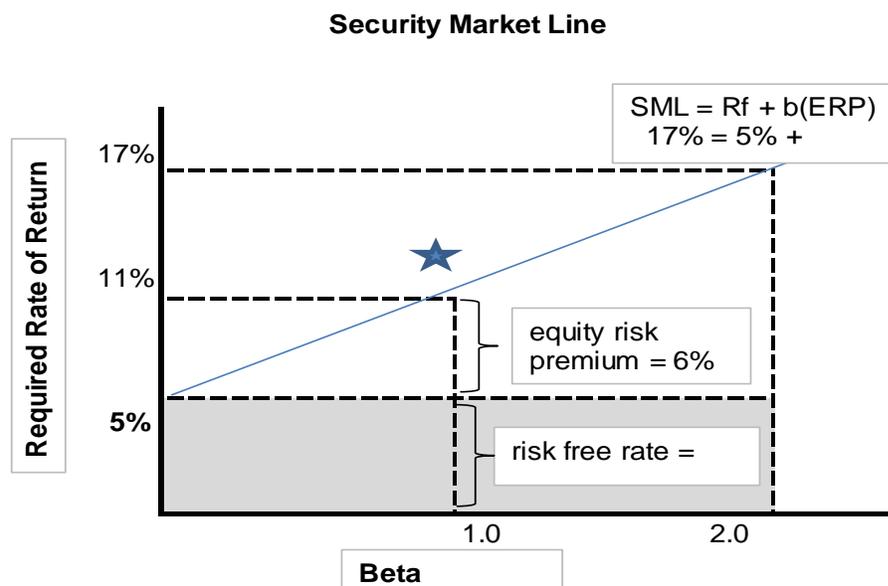


- D. Ownership of a single stock exposes the investor to both systematic and unsystematic risk. Ownership of a well-diversified portfolio exposes the investor to just systematic risk, which will be measured by beta.
- E. The Beta of each stock measures both systematic and unsystematic risk. Once the Beta for each market sector has been computed it is anticipated that the unsystematic risk will have been removed by taking an average of a number of different stocks.

Section C. The Security Market Line

1. Capital market theory assumes efficient markets. The theory states that a security's price will not part from its justified economic value for an extended period of time.
 - A. An efficient market does not mean that all securities will be correctly priced all of the time; however it is not possible to determine beyond the short term, by any particular trading style, which investments are under-priced.
 - (1) There have been occasions when one particular investment style has generated higher returns: in the "dot.com" bubble of the late 1990's, and subsequent market collapse, some investment funds made above market returns over the medium term by investing in "value stocks" rather than "growth stocks". One example is the Legg Mason Value Fund in the USA. This delivered above market returns until 2008 when much of the excess returns were lost. A fund run by Neil Woodford in the UK also delivered strong returns by investing in UK value stocks.

- (a) Value stocks are shares in those companies with high cash flows and relatively high tangible asset backing compared to their equity market capitalization ;
- (b) Growth stocks are shares in those companies which are rapidly expanding and which may have negative cash flows and relatively low tangible asset backing compared to their equity market capitalization.
2. In estimating a required rate of return, it is assumed that the security's risk premium above the risk-free rate is a linear function of the security's beta, as reflected in the Security Market Line (SML), below. This is therefore an adaptation of the model described by William Sharpe.
3. The SML depicts the relationship between risk and return that is derived from the CAPM. Rates of return on diversified portfolios are plotted against risk as measured by the standard deviation of returns, or beta.
4. The risk-free rate is shown on the y-axis and a line is drawn from the risk-free rate to the portfolio with the optimal risk-return relationship or the portfolio with the highest return for a given level of risk. The resulting line is the SML.
- A. The plots on the security market line are risk/return relationships for portfolios of diversified stocks.



5. Suppose the star in the graph represents a portfolio placed above the SML since it is priced too low. The stock has a beta of .90 which should result in

an expected return of 10.4% rather than the 12.0% shown. The stock would be underpriced and market demand would drive the price higher given its risk profile.

6. The equity risk premium is a linear function of the stock's beta as shown in the CAPM below:

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

Where:

K_e = Cost of Equity

R_f = Risk-free rate

β = Beta

ERP = Equity risk premium

Section D. Beta

1. Beta measures the degree to which an individual stock and the market return move in the same direction.
 - A. If a stock moves in perfect correlation with the market, it has a beta of 1.0.
 - B. A company whose returns above the risk-free rate move to a greater degree of magnitude than the excess market returns has a beta above 1.0.
 - C. A company whose returns above the risk-free rate move to lesser degree than the market has a beta less than 1.0.
2. Beta is a measure of volatility which is a proxy for risk. If a stock's reaction to market shocks exceeds the market's reaction, it is relatively riskier than the market.
 - A. Hence, the higher the beta, the greater the risk, and the higher the expected rate of return.
 - B. The higher the expected rate of return, the lower the value of the stock.
3. The Build-up Model was introduced in Chapter 4. The capital asset pricing model introduces the concept of beta to determine the cost of equity.

4. Measuring beta

A. Beta is measured by regressing the excess returns on a group of guideline companies against the excess returns on the market over a certain period of time, usually three to five years.

(1) In practice, though, some practitioners and information providers regress total returns against market total returns. There is no significant difference between using total or excess returns.

(2) Other practitioners regress changes in the subject stock price against changes in the market index price, ignoring dividends.

(a) By excluding dividends it is possible that this alternative way to measure beta is skewed since some companies' returns are primarily dividends. Over the long term returns are very largely comprised of dividends.

B. The guideline companies should be regressed against a market index which is well-diversified with an array of industries represented. Unfortunately, the public market indices in many developing countries do not meet this criterion.

C. Historical Period – although betas are normally measured with historical price data, the metric is theoretically forward looking. Hence, if historical data is for some reason not indicative of the future, allowances should be made.

(1) Most information providers calculate beta on either a three-year or five-year historical period. A central assumption with Beta is that past volatility is a valid proxy for anticipated future volatility.

(a) Return data can be based on daily, weekly or monthly price data.

(b) If betas are obtained from an information provider, the analyst should know how the beta is calculated since differences in historical period and data frequency can cause a difference in the beta.

◆ ValueLine – five years of weekly returns. Betas are smoothed.

◆ Bloomberg – interactive depending on the analyst's inputs. Betas are smoothed.

◆ Ibbotson – five years of monthly returns.

(c) Information providers that “smoother” betas apply a statistical adjustment to historical data to lessen the impact of sudden swings and to provide a beta that is theoretically more indicative of the future.

5. Relevering beta for capital structure

- A. Published betas that are based on the daily trading prices of companies are called “levered” betas because the risk reflects both the financial and operating risk in the company. Hence the beta is reflective of the company’s capital structure.
- B. If the subject’s capital structure does not reflect the industry target capital structure or if there are varying capital structures between the subject and the guideline public companies that are used as a proxy for the industry, then two adjustments are necessary before the cost of equity can be applied to future cash flows. These relate to differences in leverage and differences in tax rates.
- (1) Usually, the analyst has obtained betas from guideline public companies (“GPC”) since the subject company does not trade on an active market.
 - (2) The GPC betas must be adjusted to reflect the target capital structure used in the analysis.
 - (3) To do this, the GPC betas are unlevered to obtain the unlevered or “asset” beta.
 - (a) The asset beta represents a company’s beta as if it had no debt.
 - (4) Each GPC asset beta is then relevered with the target capital structure and with the target company tax cost.
- C. The Hamada formula has been a commonly-applied tool to relever betas. The Hamada formula is shown below:
- (1) To unlever the levered beta:

$$\beta_U = \frac{\beta_L}{1 + ((1 - t) \left(\frac{D}{E}\right))}$$

Where:

β_U = Unlevered beta

β_L = Levered beta

t= tax rate

D= Debt weight in capital structure

E= Equity weight in capital structure

- (2) After the beta is unlevered, it must be relevered with the subject company's target capital structure. The Hamada formula for relevering the beta is a simple rearrangement of the above formula and is:

$$\beta_L = \beta_U \left(1 + ((1 - t) \left(\frac{D}{E}\right))\right)$$

(3) Example:

- (a) The representative guideline company beta is 1.35 and should be relevered to obtain a beta that is relevant to the subject business. Additional information is shown:

- ◆ Guideline company debt/equity capital structure is 25% and 75%
- ◆ Guideline company tax rate is 38%
- ◆ Subject company target capital structure is 15% and 85%
- ◆ Subject company tax rate is 32%

- (b) In the first step, the GPC beta is unlevered using the GPC capital structure and tax rates.

$$\begin{aligned} \beta_U &= 1.35 / [1 + (1 - .38)(.25/.75)] \\ &= 1.12 \end{aligned}$$

- (c) In the second step, the unlevered beta is relevered using the subject company's tax rate and target capital structure.

$$\begin{aligned} \beta_L &= 1.12 (1 + (1 - .32)x(.15/.85)) \\ &= 1.25 \end{aligned}$$

- D. The Hamada formula assumes several market conditions which can be challenged, especially during recessionary periods.
- (1) The tax shield has the same risk profile as the company's debt.
 - (a) These may not be equal especially during volatile markets.
 - (2) The tax shield on interest expense is realized in the period in which the interest is paid.
 - (a) During recessionary periods a company's profits may decline or be erased altogether, eradicating the current applicability of a tax shield on debt.
 - (3) The value of the tax shield on interest expense is proportional to the market weight of the debt capital.
 - (4) The amount of debt capital does not change.
 - (a) In reality the amount of debt in a capital structure will often change over time.
 - (b) Assuming that equity capital will increase over time with profits retained, debt capital will have to increase in order to maintain the same weight in the capital structure.
- E. Two alternatives to the Hamada formulas are presented here to address these assumptions, the Miles-Ezzell formula, and the Practitioners' formula.

- (1) The Miles-Ezzell formula is shown below:

$$\beta_U = \frac{M_e * \beta_L + M_d * \beta_d [1 - (t * K_{d(pt)}) / (1 + K_{d(pt)})]}{M_e + M_d [1 - (t * K_{d(pt)}) / (1 + K_{d(pt)})]}$$

Where:

B_u = Unlevered or "asset" beta

B_L = Levered beta

M_e = Market value of equity

M_d = Market value of debt

B_d = Beta of debt capital

t= Company tax rate
 $k_{d(pt)}$: Cost of debt prior to tax effect

(2) The Miles-Ezzell formula has the following assumptions, relative to the Hamada formula:

- (a) The tax shield has the same risk profile as the company's operating cash flows (EBIT) after the first year. From a balance sheet perspective, the tax shield risk is equivalent to the company's invested capital risk, including debt and equity.
- ◆ Hamada on the other hand assumes the tax shield risk equals debt risk.
- (b) Since the formula uses a debt beta, debt principal and interest payments may not be made when owed. Hence, the tax shield on interest payments may not be realized in the same period in which interest payments are made.
- ◆ Hamada assumes that the tax shield on interest payments occur in the same period the interest paid.
- (c) Debt capital remains at a constant percentage of equity. Hence assuming that equity capital increases in a growing company, the debt capital will also increase in proportion.
- ◆ Hamada assumes that the debt capital amount does not change.

F. Practitioners Method

(1) The Practitioners' Method is used in cases where there is the least expectation of taking the tax deduction on interest.

$$\beta_U = \frac{\beta_L}{1 + \frac{D}{E}}$$

Where:

β_U = Unlevered beta

β_L = Levered beta

D= Debt weight in capital structure

E = Equity weight in capital structure

- (2) To relever the beta, the subsequent formula under the Practitioners' Method is:

$$\beta_L = \beta_U(1 + D/E)$$

- (3) The Practitioner's method assumes that the risk of the tax shield is comparable to the risk of the operating cash flows, or EBIT. Hence, the risk of realizing the tax deduction is greater than the risk implied in the Hamada and Miles-Ezzell formulas shown above.

- G. Using the example above, the Practitioners' Method would yield the following relevered beta:

- (1) Step One

$$\begin{aligned} B_u &= 1.35 / [1 + (.25/.75)] \\ &= 1.0125 \text{ (1.12 when using Hamada)} \end{aligned}$$

- (2) Step Two

$$\begin{aligned} B_l &= 1.0125 * [1 + (.15/.85)] \\ B_l &= 1.191 \text{ (1.25 using Hamada)} \end{aligned}$$

- (3) The Practitioners' Formula results in a lower beta here than the Hamada formula above since the relevered capital structure has such a low level of debt (15% debt in the capital structure). The opposite result (that is, a higher relevered beta under the Practitioner's method) would occur if the relevered capital structure is debt heavy. See the Chapter Exercise below.

Section E. Modified Capital Asset Pricing Model

1. The CAPM discussed above, as used for the valuation of individual investments, assumes that securities are held in a perfectly diversified portfolio.
2. Business valuation has a different set of assumptions. It is assumed that a subject stock is not being valued as part of a portfolio, but rather as a stand-alone entity.
 - A. Therefore we cannot assume that unsystematic risk is diversified away. It must be measured and accounted for in the CAPM. This is called the modified capital asset pricing model.

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

Where:

- K_e = Cost of Equity
- R_f = Risk-free rate
- β = Beta
- ERP = Equity risk premium
- Alpha = Unsystematic or specific risk

- B. Unsystematic risk includes the specific risk that is associated with industry or company issues such as small size or other factors which cause an uncertainty in future cash flows. It also includes the absence of diversification.
3. Assumptions behind the CAPM and Capital Market Theory
 - A. Investors are risk averse.
 - B. Rational investors do not accept unnecessary risk and invest in well-diversified portfolios of stocks.
 - C. All investors have identical investment horizons (i.e. holding periods).
 - D. All investors have identical expectations about expected rates of return and how capitalization factors are generated.
 - E. There are no investment related taxes or transaction costs.
 - F. Relative price volatility is a modifier of equity market risk and required return.

- G. The rate received from lending money is the same as the cost of borrowing money and both are assumed to be at the risk free rate.
- H. There is no bid-offer spread.
- I. The market has perfect divisibility and liquidity.
4. Problems with the assumptions
- A. Critics would argue that all investors do not have equivalent knowledge and do not always act rationally. Academic papers refer to the “noise trader” as a possible irrational presence in the markets.
- (1) The widespread frauds that contributed to the severe global recessions in 2008-09 were neither short-term nor insignificant. This is one argument that can be used to counter the premise that markets are educated and rational.
- (a) In the United States, a major contributor to the recession was the collapse of collateralized debt obligations (CDOs), a class of securities which brought profound and uncalculated risk to the balance sheets of most of America’s financial institutions. A very large amount of investment in CDOs was shown to have been unwise and ill-judged.
- (b) The risks inherent in the CDOs were also misunderstood by financial institutions elsewhere. Many of these held CDOs and other derivatives, without full knowledge of the risks which they carried within them. This turned the financial crisis into a global event.
- ◆ This was not a short-term phenomenon. The risk of subprime mortgages was bundled into debt instruments for 20 years before the recession. Neither consumers, bankers, investment professionals, nor government regulators understood the risk.
 - ◆ This would argue against Assumption B above.
- B. There are taxes, bid/offer spreads and transaction costs and these create what is known as friction in the markets.

- C. It is virtually assured that the cost of lending and borrowing will not be the same.
 - D. Some academic studies show that volatility (as measured by beta) is not a good proxy for risk.
 - E. The holding period of investors in publicly-held securities is likely shorter than the holding period of investors in closely-held companies.
 - F. The CAPM is part of capital market theory and used to develop rates of return for securities in a well-diversified portfolio. It was not intended as a model for developing the cost of equity of a single private entity.
 - G. Some practitioners advocate the use of a multi-factor model on the basis that beta embraces only part of the market pricing. It has been argued by academics that Beta captures only about 70% of the differential returns in the markets.
5. However, for all of its faults, CAPM provides very useful insights into the workings of liquid investment markets.
6. Certain stocks, such as utility companies (electricity, water, telephone, etc.) will normally have lower Betas than the entire market: they are largely non-discretionary services with predictable revenue streams when compared to many other companies.
7. Prof Pablo Fernando is among the important critics of CAPM being used as a measure of discount rate for valuation of companies.

Section F. Chapter Exercise

1. The Hamada Model example from Section III of this chapter is revisited below:

The representative guideline company beta is 1.35

Guideline company debt/equity capital structure is 25% and 75%

Guideline company tax rate is 38%

Subject company target capital structure is 15% and 85%

Subject company tax rate is 32%

This resulted in an unlevered beta of 1.12 and after applying the second Hamada formula, a relevered beta of 1.25.

A. Using these input variables calculate the unlevered and relevered betas using the Practitioners' Model.

B. Why is the relevered beta lower than the relevered beta in the Hamada formula?

C. Now calculate the unlevered and relevered beta under both Hamada and the Practitioners method using the set of assumptions below:

Guideline company debt/equity capital structure is 25% and 75%

Guideline company tax rate is 38%

Subject company target capital structure is 60% debt and 40% equity

Subject company tax rate is 32%

Chapter 6. Cost of Debt and Weighted Average Cost of Capital

Section A. IVSC competencies covered

Financial Markets	
Sources of capital	x
Financial and securities markets	
Economic indicators, political developments and market sentiment	
Government monetary, fiscal, wages and economic policy	x

Section B. The WACC and Invested Capital

1. Previous chapters covered the variables and methodologies used to calculate a cost of equity which reflects the risks and subsequent required rate of return on equity capital in a subject company.
 - A. The cost of equity is applied to net after-tax equity cash flows to determine the value of equity investments.
 - B. This chapter covers the cost of capital which is the discount rate applied to the invested capital cash flow in a company. The required rate of return reflects the risk of both the debt investment and the equity investment. This discount rate is called the Weighted Average Cost of Capital (WACC).
2. WACC is defined in the International Glossary as:

“The Cost of Capital (discount rate) determined by the weighted average, at market value, of the cost of all financing sources in the business enterprise’s capital structure.”
3. The WACC captures the cost and weight of each class of investment in the subject company’s capital structure:

- C. Long-term interest bearing debt
 - D. Preferred equity
 - E. Common equity
4. Invested capital is the sum of the market value of debt and equity.
 - F. Invested capital should not be calculated using book values.
 - G. The value of equity can be derived from the value of invested capital by simply deducting the value of debt.
 5. The WACC formula is as shown below:

$$WACC = (K_e * W)_e + (K_p * W_p) + (K_d[1 - t] * W_d)$$

Where:

K_e = Cost of common equity

W_e = Weight of common equity FV in capital structure

K_p = Cost of preferred equity

W_p = Weight of preferred equity FV in capital structure

K_d = Cost of Debt

T =Company tax rate

W_d = Weight of debt FV in capital structure

6. This formula looks far worse than it actually is. The formula provides for the total invested capital to be weighted between the proportions relating to equity, preference stock and debt. There is then an added adjustment to reflect the fact that there is normally tax relief on debt servicing costs, that is interest. However there is not normally tax relief on dividends on common or preferred stock.
7. An example of a WACC calculation follows. Assume a company's market value of debt capital, preferred stock and common stock equals 340,000, 560,000, and 1,350,000, respectively, and assume an effective tax rate of 25%.
8. This means that 60% (1,350/2,250) of the capital is equity, 24.9% is preferred stock and 15.1% is debt.

H. The post-tax rates of return are 10.0% for preferred stock and 15.0% for equity. The pre-tax cost of debt is 6.5%. The after-tax cost of debt is therefore 4.875%. Given this data, the WACC equals:

(1) The weighted average cost of capital is 12.2%. This is $[15\% \times 60\%] + [10\% \times 24.9\%] + [4.875\% \times 15.1\%]$.

9. The WACC is based on the discount rates on invested capital. Since invested capital should equal the total net operating assets, including the market value of intangibles, the WACC should equal the weighted returns on each class of a company's assets.

A. Assume the company has market values as follows:

(1) Net working capital	350
(2) Property, plant & equipment	900
(3) Intangible assets	750
(4) Goodwill	<u>250</u>
Total	<u>2,250</u>

B. On the following page we show the allocation of the WACC over the above net assets.

C. The weighted return on each asset class is commonly called the weighted average return on assets, or WARA. An example using the WACC above is shown:

ASSETS

	Fair Value (000)	Weight	Discount Rate	Weighted Return
Net Working Capital	350	15.6%	5.0%	0.8%
Property, Plant & Equip	900	40.0%	8.0%	3.2%
Identified Intang. Assets	750	33.3%	18.0%	6.0%
Goodwill	250	11.1%	20.0%	2.2%
TOTAL ASSETS =	2,250		WARA =	12.2%

LIABILITIES and EQUITY

	Fair Value (000)	Weight	Discount Rate	Weighted Return
Debt	340	15.1%	4.9%	0.7%
Preferred Stock	560	24.9%	10.0%	2.5%
Common Stock	1,350	60.0%	15.0%	9.0%
TOTAL L&E =	2,250		WACC =	12.2%

- D. In the example above, the sum of the rates of return on each class of assets multiplied by the percentage of each class of total assets (WARA – weighted average return on assets) equals the WACC.
- E. Theoretically, the risk profile of each class of assets must approximate the risk profile of each class of capital that funds the assets.
10. The complexity of any WACC calculation is that the market value of the debt and equity must be known in order to calculate the cost of capital, which in turn is necessary to determine the market value of debt and equity. This issue will be addressed below.

Section C. The Optimal Capital Structure

1. It is common practice, especially with larger companies, to assume an optimal or industry capital structure in the WACC calculation instead of the actual capital structure that exists in the company.
 - A. One assumption is that a buyer would impose an optimal capital structure on the business in an acquisition. The buyer with the most optimal capital structure should, in theory, offer the highest price. The IVS 2020 market value is consistent with the concept of “highest and best use” in IFRS 13.
 - B. Another assumption is that any company with a capital structure that differs from an optimal debt/equity ratio will gradually move toward an optimal capital structure over time.
2. Some analysts do not use an optimal or industry capital structure.
 - A. If a non-controlling interest is being appraised, a strong argument can be made that a non-controlling investor cannot influence a change in the existent capital structure.

B. When valuing small companies, a case can be made that they have simpler capital structures that tend to be financed with equity and there is little basis for an imposed structure that differs from the actual capital structure.

(1) Research shows certain types of companies tend to favor debt financing:

(a) Large capital intensive companies with few growth options

(b) Companies with high effective corporate tax rates

(c) Highly profitable companies

(d) Companies which can rapidly sell plant and equipment if required and then pay down the debt if the need arises

(e) Companies with a high amount of product line diversification

C. Analysts typically obtain an industry capital structure by consulting the following sources:

(1) Guideline public company norms

(2) Morningstar Cost of Capital Yearbook

(3) Duff & Phelps Risk Premium Report

(4) International sources

(5) Key considerations in estimating the cost of capital are similar to what a lender might consider when granting a loan:

(a) Profitability

(b) Collateral

(c) Industry norms

(d) Risk

D. If the decision is made to impose an industry capital structure on the subject business, consideration should be given to the following:

- (1) The ability of the subject to assume the debt capacity that is implied in the capital structure being imposed on the business.
 - (a) For example, if the company is financed completely with equity and its operations are risky or compromised, what is the likelihood that it could obtain debt financing?
 - (b) Some sources for industry capital structure provide ratios based on book values, not market values. The analyst should know the source and how the capital structure is calculated.

Section D. **Debt**

1. Debt Capacity

A. Practitioners sometimes use the book value of debt – often erroneously - in estimating the capital structure. The assumption is that the company's market value of debt will not change significantly from its book value.

- (1) Market value of debt could vary from book value as a result of several causes.
 - (a) Market rates could increase or decrease given a change in macroeconomic events or a change in company risk.
 - ◆ If interest rates increase, the market value of fixed interest debt will decline below book value. If rates decline, the market value will increase above book.
 - ◆ If borrowing is at variable rates then changes in interest rates do not change the market value of the debt in the same way.

2. Debt Beta

A. The formulas used to lever equity betas (Hamada, Miles-Ezzell, etc.) assume that the relationship of incremental amounts of debt, and the effect that the debt has on the levered beta, are linear in nature.

- (1) This is unlikely. The risk of equity at very high levels of debt, as seen during the 2008-2009 recession, is often more than the re-levered betas imply.

- (2) Basic financial theory tells us that debt provides a tax shield benefit to equity investors and is therefore beneficial. However, as debt is added to a capital structure, a point will be reached where the likelihood and costs of financial distress increase quite rapidly and overwhelm the value of the tax benefit.
 - (a) This occurs when the present value of future tax savings attributable to additional layers of debt is offset by the present value of the costs of financial distress.
 - (3) Debt also adds uncertainty: there is an increasing risk of financial distress as the debt component of the financing capital increases.
- B. Some relevering models require a debt beta, as was discussed in Chapter 5. Debt betas, like equity betas, are measured by regressing returns against the market.
- (1) Debt risk is a function of several factors;
 - (a) Existing levels of debt
 - (b) Variability of operating earnings
 - (c) Variability of profit margins
 - (d) Quality of the collateral
 - (e) Other operating factors
 - B. Debt betas can be calculated for public companies. For private companies, the riskiness of the debt should be assessed relative to a class of rated bonds in the market.
 - (2) During the recession of 2009, debt betas in the U.S. ranged from 0.10 for Aaa bonds to 1.60 for Ca-D bonds in the public market.⁶
3. Many WACC models used by practitioners do not consider that the addition of debt will change the cost of equity. This is not realistic as the cost of equity increases when there is higher levels of debt. Also, higher percentages of debt will increase the cost of debt as well.

⁶ Pratt and Grabowski, *Cost of Capital*, Fourth Edition, page 180.

Section E. The Weighted Average Cost of Capital in an EBIT Multiple

1. Corporate finance transactions often take place on the basis of EBITDA or EBIT multiples.
2. Either of these types of multiple can be readily converted to a NOPAT multiple.
3. As an example, a company has an EBIT of SR1 million and the tax rate is 20%. The NOPAT is therefore SR800,000.
4. The company has been valued in a transaction at an EBIT multiple of 7.5, giving an enterprise value (EV) of SR7,500,000. This is therefore a NOPAT multiple of 9.375. The NOPAT capitalization rate is therefore 10.7% (1/9.375).
5. The company has debt of SR3 million and the cost of debt before the tax shield is 4%. This is both the book amount and the market value of the debt.
6. We are required to calculate the cost of the equity.
7. This is relatively straightforward:
 - A. the EV is SR7,500,000 and the debt is SR3 million so the value of the equity is SR4,500,000;
 - B. The debt has a cost before taxation of 4% and a cost after taxation of 3.2%. The cost of the debt is therefore SR3,000,000 x 3.2% which equals SR96,000.
 - C. The NOPAT is SR800,000; the balance of the NOPAT for the equity investors is therefore SR704,000 (SR800,000 less SR96,000).
 - D. This equates to a capitalization rate of equity (with this funding structure) of 15.6%.
8. With no debt in the capital structure the capitalization rate for the equity is 10.7%. It is therefore evident that the capitalization rate of equity has increased by 46% due to the debt in the structure.
9. There is clearly a similar effect with the deleveraging and releveraging of Beta within CAPM.
10. If the amount of debt in the capital structure increases still further it is likely that the cost of debt will also increase. The extent of the increase will depend on various metrics, including the quality of the collateral which is available.

Section F. Weighted Average Cost of Capital by Iteration

1. As noted above, the weightings in the weighted average cost of capital can only be computed once the values of both the debt and the equity are known. The problem that arises is that the value of the equity can only be determined once the WACC is known.
2. The solution to this problem involves iteration, using the following steps:
 - A. Establish the cost of the debt (this does not normally vary materially with changes in the WACC), but should be reassessed once an equity value is calculated;
 - B. Estimate the cost of the equity using another method or approach, such as the market approach;
 - C. Establish the initial weightings and conduct the valuation;
 - D. Compare the resulting value of the equity with the initial estimate;
 - E. If the figures are some distance apart, revise your estimate of the value of the equity and undertake the valuation using WACC again.

Section G. Exercise: QRS Group Constant Capital Structure

1. Use the example of QRS Group in order to calculate the value of the equity by iteration. On tab ***iteration1*** the market value of invested capital has been estimated at SR11,250,000. This is based on an EBITDA of SR1,500,000 and

- an estimated multiple of 7.5. Debt of SR2,000,000 has been deducted to give an indicative initial valuation of equity of SR9,250,000.
2. In this example it has been assumed that the capital structure remains unchanged during the period of discrete projections and also in perpetuity.
 3. The DCF valuation results in the market value of invested capital being SR12,443,000. This is SR1,193,000 more than the initial estimate which was used in order to derive the WACC.
 4. Change the value in the orange cell on tab **iteration2** so that the initial estimate of the value of the equity in cell C12 approximates to the WACC derived value in cell J63.
 5. A quick way of dealing with this on Excel is:
 - A. Select cell C58 and make that equal to the equity value as derived from the EBITDA multiple, less the equity as derived from the DCF using the WACC;
 - B. In the Data ribbon choose “What if analysis” and then select “goalseek”;
 - C. In the command box:
 - (1) set cell C58
 - (2) To value 0
 - (3) By changing cell C7.

D. This should then calculate an EBITDA multiple which will exactly match the value under the DCF calculation

6. The initial spreadsheet is shown below:

QRS Group					
Capital Structure Analysis					
	2020	2021	2022	2023	2024
EBITDA	€ 1,500,000	€ 1,650,000	€ 1,825,000	€ 2,000,000	€ 2,150,000
Multiple	7.50	7.50	7.50	7.50	7.50
MVIC (market value of invested capital)	11,250,000	12,375,000	13,687,500	15,000,000	16,125,000
Preferred Stock	0	0	0		0
Total Debt	2,000,000	2,200,000	2,433,333	2,666,667	2,866,667
Common Equity Value	9,250,000	10,175,000	11,254,167	12,333,333	13,258,333
Interest Rate, Pre-tax	6.0%	6.0%	6.0%	6.0%	6.0%
After-tax cost of debt	4.5%	4.5%	4.5%	4.5%	4.5%
<u>CAPITALIZATION %:</u>					
Debt	17.8%	17.8%	17.8%	17.8%	17.8%
Preferred Equity	0.0%	0.0%	0.0%	0.0%	0.0%
Common Equity	82.2%	82.2%	82.2%	82.2%	82.2%
Total	100.0%	100.0%	100.0%	100.0%	100.0%
Interest expense	120,000.0	132,000.0	146,000.0	160,000.0	172,000.0

7. The calculations of the WACC and the market value of invested capital are shown below.

4. Then repeat the exercise of iteration in ChangeCap2 in order that the EBITDA-derived equity value approximates to the value derived from the WACC DCF calculation.
5. The DCF model below takes the asset beta (unlevered beta in the assumptions) and relevers it based on the capital structure implied in the projections above.
6. The projected market values of debt and equity result in projected capital structures that trend toward 40% debt and 60% equity.
7. The cost of equity is calculated separately for each year with a relevered beta using the Hamada formula and the CAPM, as follows:

$$\left((B_u * (1 + ((1 - \text{tax rate}) * (\% \text{Debt} / \% \text{Equity})))) \right) * \text{ERP} + R_F + \text{Size Risk} + \text{Specific Risk}$$
8. The WACC is calculated by the model each year with the cost of debt, weight of debt, revised cost of equity and the weight of equity as per the WACC formula shown earlier.
9. The cost of debt has been altered within the model in the expectation that there will be increasing debt in the capital structure.

Section I. Cost of Debt in Multinational Markets

1. A complication in estimating WACC is how to assess the cost of debt when the subject company operates in multiple countries and could potentially obtain debt in multiple debt markets.
2. For example, suppose an analyst is valuing a Polish Company but expressing the value in UK pounds. Hence, the CAPM variables in deriving a cost of equity are derived from the UK economy, with a premium added for the country risk of operating in Poland versus the UK. Also, assume the following:
 - (1) The subject company has the ability to raise debt capital in Poland as well as other countries, including the Eurozone or in Swiss Francs.
 - (2) The subject company's risk profile would warrant varying costs of debt in the various markets.

- (3) Which cost of debt should be assumed as the market cost in the WACC?
3. There are several options to address this issue that are chosen in practice.
- A. Assume that the Polish company would borrow in the market with the lowest cost of debt and purchase a principal swap to hedge against interest rate fluctuation.
 - B. Assume that the Polish company would borrow in the currency in which the main cash flows are generated as this provides a natural hedge.
 - C. Assess the cost of raising debt in Poland but in pounds sterling. Remember, that if the cash flows are in a certain currency, the discount rate must match that currency.
 - D. Assume the cost of debt for a similar company in the UK. Add a debt premium based on a country default spread or another factor to capture the difference in risk.

Section J. Multiples

1. The enterprise value equivalent of price/earnings is EV/NOPAT where:
 - A. EV is enterprise value
 - B. NOPAT is net operating profit after tax.
2. Factors such as size premium affect equity only. This means that, when using weighted average cost of capital, it is necessary to make a weighting adjustment when using multiples.
3. This can be explained with an example:
 - A. the equity discount rate is to be increased by 6% for a size premium.
 - B. The equity represents 75% of the weighted average cost of capital.
 - C. The EV/NOPAT base multiple is 9x.
4. The capitalization rate of an EV/NOPAT multiple of 9x is 11.1%. This is increased by 4.5% (6% x 75%) for the equity component of the WACC.
5. The capitalization rate is increased from 11.1% to 15.6%.
6. This equates to an EV/NOPAT multiple of 6.4x.

Section K. **Chapter Exercise**

1. See Exercise 8-1 on the distributed student excel file. You have been assigned the task of reviewing a valuation of the Software Group plc that was performed as part of an impairment analysis. The income approach consists of the discounted cash flow model provided below.
 - A. List any flaws that you see in the report.
 - B. Assuming that the forecasted cash flows are accurate and the book value of debt provided (SR40 million) equals the market value of debt, what value of equity would be appropriate for this company?

The Software Group, Plc Discounted Cash Flow Analysis

Assumptions						
Business Risk Index		1.10				
Risk-Free Rate		4.0%				
Market Risk Premium		6.0%				
Size Risk Premium		4.0%				
Specific Risk Premium		1.0%				
Perpetuity Growth Rate		5.0%				
Tax Rate		25.0%				
Unlevered Cost of Equity		15.6%				
	2018	2019	2020	2021	2022	Perpetuity
Free Cash Flow	9,700,000	11,100,000	11,670,000	12,180,000	12,970,000	13,618,500
% Debt Capital	31%	31%	31%	31%	31%	31%
% Preferred Capital	0%	0%	0%	0%	0%	0%
% Common Capital	69%	69%	69%	69%	69%	69%
After-Tax Cost of Debt	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%
Cost of Preferred	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Levered Cost of Common	17.8%	17.8%	17.8%	17.8%	17.8%	17.8%
WEIGHTED COST OF CAPITAL	13.7%	13.7%	13.7%	13.7%	13.7%	13.7%
Cash Flow in Period	100.00%					
Period to Discount	0.50	1.50	2.50	3.50	4.50	
PV of Free Cash Flow	9,096,797	9,155,316	8,465,543	7,770,784	7,277,649	
						Perpetuity Value at start of 2023
						156,506,440
						PV of Perpetuity
						87,817,956.33
						FV of Invested Capital
						129,584,045.26
						less: Debt
						<u>40,000,000.00</u>
						FV of Equity
						<u>89,584,045</u>

The Software Group, Plc Capital Structure Analysis

	2018	2019	2020	2021	2022
Assumed Market Value of Invested Capital (MVIC)	129,580,000	129,580,000	129,580,000	129,580,000	129,580,000
Preferred Stock	-	-	-	-	-
Total Debt	40,000,000	40,000,000	40,000,000	40,000,000	40,000,000
Assumed FV of Equity	89,580,000	89,580,000	89,580,000	89,580,000	89,580,000
Interest Rate, Pre-tax	6.0%	6.0%	6.0%	6.0%	6.0%
After-tax cost of debt	4.5%	4.5%	4.5%	4.5%	4.5%
CAPITALIZATION %:					
Debt	30.9%	30.9%	30.9%	30.9%	30.9%
Preferred Equity	0.0%	0.0%	0.0%	0.0%	0.0%
Common Equity	69.1%	69.1%	69.1%	69.1%	69.1%
Total	100.0%	100.0%	100.0%	100.0%	100.0%
Interest expense	2,400,000.0	2,400,000.0	2,400,000.0	2,400,000.0	2,400,000.0

Chapter 7. Correlation and Conclusion of Value

Section A. IVSC competencies covered

Discounts and Premiums in Equity Interests	
rights and limitations of minorities, DLOC and DLOM	x
Blockage discounts	x
Controlling interests and special purchaser	
Impact of special purchaser on value	
Basis of Value	
The various bases, including investment and market	x
Differentiates between different bases	x
Applies the appropriate basis	x

Section B. Correlation and Conclusion of Value

1. Assuming that more than one valuation methodology was used in the valuation process, the analyst must conclude on a final value from the indications in each approach.
2. The following steps are necessary before opining on a final value:
 - A. Reread the engagement letter to be sure which level of value is requested. IVS 2020 states: *“Valuers must choose the relevant basis (or bases) of value according to the terms and purpose of the valuation assignment. The valuer’s choice of a basis (or bases) of value should consider instructions and input received from the client and/or its representatives.”*
 - B. Determine which level of value resulted from each of the valuation methodologies chosen in the analysis.
 - (1) If the preliminary indications of value from each approach are expressed on different levels, then apply premiums or discounts to express each value on the same level.
 - C. Once the methodologies used are expressed on the same level, select a preliminary indication of value.

- (1) Support for the final conclusion should be made clear, especially if there are disparate indications of value from each approach.
 - (2) IVS 2020 states: *“Where more than one approach and method is used, or even multiple methods within a single approach, the conclusion of value based on those multiple approaches and/or methods should be reasonable and the process of analysing and reconciling the differing values into a single conclusion, without averaging, should be described by the valuer in the report.”*
 - (3) IVS 2020 also states: *“When different approaches and/or methods result in widely divergent indications of value, a valuer should perform procedures to understand why the value indications differ, as it is generally not appropriate to simply weight two or more divergent indications of value.”*
- D. If the single preliminary indication is not expressed at the same level as requested in the engagement letter, apply discounts or premiums as necessary.
3. Some considerations for review of each valuation approach are discussed below.
- A. Cost Approach
- (1) As was discussed in BV 201, the cost approach is not relevant if the company has intangible value (assuming the cost approach was completed by restating the tangible assets and debt to market value).
 - (2) However, the cost approach is useful as it is the means of determining the intangibles component in the valuation. With many smaller entities the size of the intangibles component is a sensitive factor in the valuation.
 - (a) If the cost approach is close to, or above, the values expressed in the income and market approaches, then the analyst must understand why that is the case.
 - (b) The valuer should firstly make sure that there are no non-performing assets which are included in the cost approach valuation but which have been omitted in the workings of the market and the income approaches, such as surplus cash, amounts owing by officers, non-operating properties, etc.

- (c) The immediate implication is that the company is not generating a sufficient return on the operating assets. The cost approach is indicating that the assets are not being used for their highest and best use, or are being used inefficiently.
- (d) You should make a determination as to whether the company is a going concern.
- (e) If the company is not a going concern, then it must be determined whether a forced or orderly liquidation value is necessary.

B. Market and Income Approaches

- (1) There should not be a material difference between the values expressed in the market and income approaches since theoretically one approach is using data which is the inverse of the other.
 - (a) The income approach is based on rates of return from the market, adjusted to reflect the risk of the subject company.
 - (b) The market approach is based on multiples from the market, adjusted to reflect the risk of the subject company. The capitalization rates are the inverse of the market multiples. The capitalization rates reflect the cost of equity less growth.
- (2) If there is a material difference, then it is likely that one, or both, of the analyses contain errors. Each approach should be reviewed as follows:
 - (a) Market Approach
 - ◆ How many guideline companies were used? Does the number of guideline companies provide a robust data base?
 - ◆ If there were only three or four guideline companies, there is the possibility that each of them could be outliers.
 - ◆ Are the guideline companies truly similar?
 - ⇒ Revisit the criteria used to select GPCs.
 - ⇒ Are the public GPCs so much larger than the subject company that comparison is unrealistic?

- ⇒ Review the data and analysis
- ⇒ Revisit the public filings for each GPC to make sure data was entered correctly. Were GPC adjustments missed?
- ⇒ What information is affecting the market value of the GPC? Has there been some press release or other information which has had a material effect on the market value of the GPC?
- ⇒ Did the comparative analysis between the GPCs and the subject company identify a realistic subset of public companies whose multiples are more applicable to the subject?
- ⇒ Were appropriate multiples used? If invested capital multiples, was the correct amount of debt deducted?

- ◆ Review dispersion statistic in the multiples used. If there is a high degree of dispersion, are the GPCs really similar to each other?
- ◆ Compare growth rates. One of the more common oversights between the income approach and market approach is an inconsistency between the projected growth; growth is explicit in the income approach DCF model and it is implicit in the market multiples.

⇒ Growth rates for the GPCs can be derived as follows:

- 1 NOPAT Mult = $\frac{\text{MVIC}}{\text{Net Operating Profit After Tax}}$
- 2 Invert the NOPAT multiple (this is the cap rate)
- 3 Growth = WACC - Inverted multiple

⇒ Example:

MVIC=	275,000
NOPAT=	30,000
NOPAT Multiple.=	9.17
Cap Rate =	10.9%
WACC =	15.0%
Growth =	4.1%

- ◆ The market's implied growth can be derived from the variables that were assessed during the market approach analysis. In the example above, we assume an MVIC of 275,000, net operating profit after tax of 30,000. The MVIC/NOPAT multiple therefore is 9.17x, and the capitalization rate is 10.9%.

⇒ Since the capitalization rate = $(K - G)$, then it follows that:

⇒ $G = K - \text{capitalization rate}$

⇒ In this case, the implied market growth is 4.1%. This computation should be done for all GPCs. Is there dispersion in the implied growth rates? How do the growth rates compare to what was used in the DCF?

(b) Income Approach

- ◆ Review the projections.

⇒ How does the growth rate compare to the GPCs?

⇒ Compare the cost structure and profit margins to the guideline companies. If there is a difference, has this been taken into consideration in the multiple adjustment?

- Compare the WACC or cost of equity (plus growth) to the market multiples.

⇒ If there is a significant difference between the capitalization rate used in the market approach and the inverted multiples

from the market approach, then risk has probably not been assessed properly in one or both models.

4. Non-control Interest Sanity Check

A. If the assignment is to value a subject company on a non-control, non-marketable level, some analysts perform the valuation on a control level and then take a DLOC and DLOM based on external empirical studies.

(1) While this is a reasonable practice, it needs to be used with care: it could result in a value that is unrealistic since factors that are outside the company and its industry were used.

B. A sanity check is recommended in which the control cash flows are matched to the adjusted non-control, non-marketable value to yield an internal rate of return.

(1) This rate of return expresses the discount rate or risk factor of the non-controlling investor relative to the control value of the entity. See the example below.

LMN, Plc
Discounted Cash Flow Analysis - Original

Assumptions

Control rate of return	14.0%
Long term growth	5.0%
Control value	9,574,859
DLOC @ 15.0%	(1,436,229)
Minority, marketable value	8,138,630
DLOM @ 35.0%	(2,848,521)
Minority, non-marketable value	<u>5,290,110</u>

	2020	2021	2022	2023	Residual
Free Cash Flow	890,000	1,023,500	1,146,320	1,260,952	14,711,107
Cost of equity	14.0%	14.0%	14.0%	14.0%	14.0%
Period to Discount	0.50	1.50	2.50	3.50	6.5
NPV Factor	0.9366	0.8216	0.7207	0.6322	0.6322
PV of Free Cash Flow	833,561	840,873	826,121	797,134	6,277,169
Total	<u>9,574,859</u>				

- (2) In the example above, the control level value was discounted by 15.0% to recognize the DLOC and then by another 35.0% to recognize the DLOM, resulting in a value of SR5.29 million, which is a combined discount of 44.7%.
- (3) The sanity check involves calculating the non-control rate of return which is consistent with a DLOC of 15% and a DLOM of 35%. This is done through the goal-seek function in excel.
- (4) This is shown below:

LMN, Plc**Discounted Cash Flow Analysis - Revised to show Minority Rate of Return**Assumptions

Minority rate of return	21.1%	Calculated using goal seek
Long term growth	5.0%	
Minority, non-marketable value	<u>5,290,110</u>	

	0	1	2	3	Residual
Free Cash Flow	890,000	1,023,500	1,146,320	1,260,952	8,205,271
Cost of equity	21.1%	21.1%	21.1%	21.1%	21.1%
Period to Discount	0.50	1.50	2.50	3.50	6.5
NPV Factor	0.9086	0.7501	0.6192	0.5111	0.5111
PV of Free Cash Flow	<u>808,637</u>	<u>767,676</u>	<u>709,779</u>	<u>644,529</u>	<u>2,359,488</u>
Total	<u>5,290,110</u>				

(5) The analyst should be aware of the effective discount rate that is assigned to the non-control interest when the 15% DLOC and 35% DLOM are taken. In this case, the IRR is 21.1% for the non-control investor versus 14.0% for the control investor.

- In effect, the DLOC and DLOM, which in many cases are based on external data, represent a 7.3% premium return for non-control risk (that is 21.3% less 15%). While this is not necessarily unusual or inappropriate, the analyst should be aware of it and prepared to defend it.
- Through this method the concepts of DLOC and DLOM of 15% and 35% respectively can be expressed using different terms: as the minority investor does not have control and has reduced marketability, that investor requires an extra 7.3% a year return to compensate for these disadvantages.

Section C. Summary

- The valuer should therefore use all of the tools at his disposal when concluding on value. It is by understanding the principles behind the various valuation approaches that the valuer is able to compare differing results from

the three approaches and also from different methods under the same approach.

2. Some main principles:

- A. Do not just take the average of different valuation results if they are not relatively close.
- B. If the cost approach gives a value which is higher than the market or income approaches, consider why this might be the case.
- C. If the income and market approaches give widely different values consider the underlying assumptions in respect of cost of capital, and implied rates of growth.
- D. If there are non-operating assets have they been treated in a similar way under the different valuation conclusions?

Section D. **Close**

1. Everyone at BV hope that you have found this manual, and the related course, to have been useful to you in the development of your business valuation skills.

