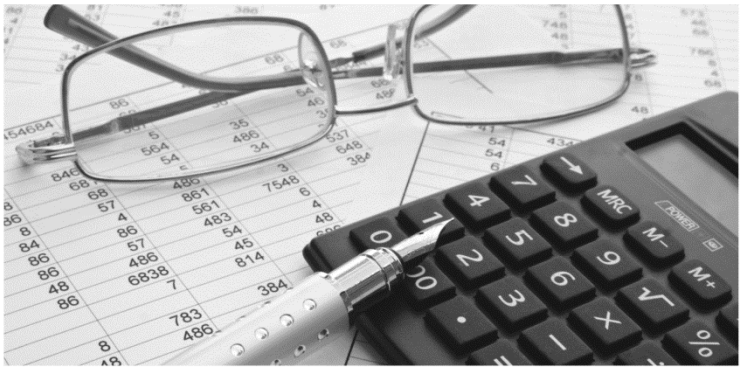
DEPARTMENT OF FINANCE, RISK MANAGEMENT AND BANKING
SCHOOL OF MANAGEMENT SCIENCES



Investments:

EQUITY ASSET VALUATION

Semesters 1 & 2

ONLY STUDY GUIDE FOR

INV3701

UNIVERSITY OF SOUTH AFRICA, PRETORIA

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IMPORTANT INFORMATION:

This study guide contains important information about your module.

CONTENTS

MODULE AIM

The aim of the module is to introduce you to the techniques used in determining the intrinsic value of an equity security and show you how to apply these techniques in both foreign and domestic markets.

THE LEARNING OUTCOMES OF THIS MODULE

On completion of this module you should be able to do the following:

- Understand the equity valuation process.
- Apply discounted dividend valuation in determining the intrinsic value of equity.
- Apply free cash flow valuation in determining the intrinsic value of equity.
- Apply residual income valuation in determining the intrinsic value of equity.
- Apply market-based valuation in determining the intrinsic value of equity.

MODULE CONTENT

- Study unit 1: The equity valuation process
- Study unit 2: Discounted dividend valuation
- Study unit 3: Free cash flow valuation
- Study unit 4: Residual income valuation
- Study unit 5: Market-based valuation: Price multiples

OVERVIEW OF THE MODULE

- INV3701 deals with the equity valuation process. Valuation is considered to be the most critical element of successful investment. The long-term performance of financial assets is inextricably linked to their underlying value. The underlying value is determined by the revenues and earnings as well as the cash flows generated by a company. A company's income statement, balance sheet and cash flow statement provide the figures used in determining this underlying or intrinsic value. An analyst requires the knowledge, skills and abilities presented in this module to estimate the value of equity securities and understand security pricing.
- This module on Equity asset valuation is part of the Investments series offered by Unisa on third-year level and is based on the CFA curriculum and should only be taken by students who intend pursuing the Chartered Financial Analyst® (CFA®) programme offered by the CFA Institute (in the United States of America) by means of distance education. Investments: Fixed Income Analysis (INV3702) and Investments: Derivatives (INV3703) completes the current three-part (third-year) series. Details on the CFA programme may be obtained from www.cfainstitute.org.
- The UNISA Investment series also includes:
    - *Second-year* level
      INV2601 (Investments: An Introduction)
    - *Honours level*
      INV4801 (Investments: Portfolio Management)

ICONS USED IN THIS STUDY GUIDE

	**Learning outcomes and assessment criteria**. The aspects of a particular topic or study unit you have to master (i.e., know and understand) and will be tested on in the examination to demonstrate competence.
	**Key concepts.** Attention is drawn to certain keywords or concepts that you will come across in the topic or study unit.
	**Overview**. The overview provides the background to a particular topic or study unit.
	**Activity and feedback**. These self-assessment activities should be performed in order to develop a deeper understanding of the learning material. Feedback is provided on the self-assessment activities.
	**Study.** The Study icon indicates which sections of the prescribed book you need to study (i.e., learn, understand and practise).
	**Assessment.** When you see the Assessment icon you will be required to test your knowledge, understanding and application of the material you have just studied.
	**Summary.** This section provides a brief summary of what was covered in a particular study unit and what can be expected in the following study unit(s).
	**Checklist.** After completion of a particular study unit, you should confirm that all learning outcomes where in fact achieved and that you comply with the assessment criteria.

MODULE FRAMEWORK

Topic	Study unit	Chapter
EQUITY ASSET VALUATION	The equity valuation process and return concepts	1 & 2
	Discounted dividend valuation	5
	Free cash flow valuation	6
	Residual income valuation	8
	Market-based valuation: price multiples	7

STUDY UNIT 1: THE EQUITY VALUATION PROCESS

CONTENTS

OVERVIEW

This study unit deals with the equity valuation process and return concepts. This study unit will focus on the definitions, applications and processes of valuation and how the results obtained from a valuation can be communicated.

Read the introduction on page 2 for chapter 1 and page 40 for chapter 2 of the prescribed book.

LEARNING OUTCOMES and ASSESSMENT CRITERIA

Once you have worked through this study unit, you should be competent in the following:

- Justify valuation and identify the uses of valuation models.
- Present an argument on the importance of expectations in the use of valuation models.
- Identify the role of valuation in portfolio management.
- Identify the steps, and the objectives and tasks within each, in the valuation process.
- Identify the elements of a competitive analysis for a company.
- Contrast top-down and bottom-up approaches to economic forecasting.
- Contrast quantitative and qualitative factors in valuation.
- Argue the importance of quality of earnings in financial forecasting and identify the sources of information for such analysis.
- Identify quality of earnings indicators and risk factors.
- Interpret intrinsic value.
- Calculate the holding period return.
- Interpret and calculate alpha.
- Illustrate the relationship between alpha and perceived mispricing.
- Critique the use of valuation models within the context of traditional and modern concepts of market efficiency.
- Contrast the going concern concept of value to the concept of liquidation value.
- Evaluate fair value.
- Contrast absolute and relative valuation models and classify different types of models.

- Identify the broad criteria for choosing an appropriate approach for valuing a particular company.
- Appraise the role of ownership perspective in valuation.
- Defend the role of analysts in capital markets.
- Identify the contents and format of an effective research report.
- Identify the responsibilities of analysts in performing valuations and communicating valuation results.
- Differentiate between the capital asset pricing model (CAPM), arbitrage pricing theory (APT), and bond yield plus risk premium approaches to determining the required rate of return for an equity investment.
- Calculate the required rate of return for an equity investment using each major approach.
- Calculate the Gordon growth model (GGM) equity risk premium estimate.
- Identify the three limitations to the CAPM and APT approaches to determining the required return on equity.
- Calculate the expected holding period return on a share given its current price, expected next-period price, and expected next-period dividend.
- Contrast the expected holding period return with the required rate of return.

[Adapted from the learning outcomes as stated in the prescribed book]

KEY CONCEPTS

abnormal return	absolute valuation model	asset-based valuation
bottom-up approach	mispricing	holding period return
fair value	valuation process	intrinsic value
going concern value	relative valuation models	discount rate
top-down approach	required return on equity	

STUDY

Study chapters 1 and 2 of the prescribed book.

ASSESSMENT

Throughout the chapters you will find examples that explain the sections you have dealt with. These examples are there to help you understand the concepts in the study unit. Work through them and make sure that you understand that part of the work before moving on to the next section.

At the end of chapters 1 and 2 (pages 35 and 85 of the prescribed book) there are problems that you can use to test your knowledge of the study unit and chapter you have completed. If there are certain questions that you are unable to answer, take the time and work through the chapter again to get a clear understanding of all the learning outcomes in this study unit. The workbook will provide the learning outcomes, an overview of the chapter

and solutions to the problems. You can mark the questions to see if you understand the work and can move on to the next study unit.

SUMMARY

Use the summary below together with the summary found on pages 33 to 34 and pages 82 to 83 of the prescribed book. The summary will give you some of the key concepts and terms in the chapter in point format. You can also use the summary together with your learning outcomes as a checklist that you are competent in the study unit.

NOTE: Only some of the concepts are highlighted in this summary; by no means does this indicate that you must exclude the concepts not highlighted.

CHAPTER 1 - THE EQUITY EVALUATION PROCESS

Valuation – the estimation of an asset's value based on

» variables, perceived to be related to future returns
» comparison with similar assets

When relevant, estimate of immediate liquidation proceed.

- Valuation process – pages 7–28 (3rd edition). Read through text for explanations on the five steps:

    1. understanding the business
    2. forecasting company performance
    3. selecting the appropriate valuation model
    4. converting forecasts to a valuation
    5. applying the valuation conclusion

- Intrinsic value – the value of an asset given a hypothetical complete understanding of the asset's investment characteristics
- Alpha – excess adjusted return
- Mispricing – any departure from the estimated intrinsic value
- READ THROUGH THE SUMMARY ON pages 33–34
- ADDITIONAL QUESTIONS on pages 35-38

Select the correct answer

Mispricing is

1. any departure from the estimated intrinsic value
2. all departure from the estimated intrinsic value
3. some departure from the estimated intrinsic value

Which one of the following is least likely a correct description of a type of an absolute valuation model?

1. Discounted cash flow model
2. Present value model
3. Expected dividends model

Which one of the following statements is **most likely correct,** with regards to steps and activities/actions in the equity valuation process?

1. An analyst applies the valuation conclusions by choosing the FCFE model.
2. To convert his forecast into a valuation an analyst carried out a sensitivity analysis.
3. To understand the business an analyst helped the firm he is evaluating compile their financial statements.

CHAPTER 2 – RETURN CONCEPTS

- Return on investment is a fundamental element in asset valuation (page 40).

  » Investors – compare expected return to fair given return
  » Analysts – discount future cash flow
- HPR (holding period return)

  » The return earned from investing in an asset over a specified time period
  » It is the dividend yield + price appreciation return, pages 40–41
  » $r = \frac{D_H + P_H}{P_0} - 1$

- Example: A share is worth R50 when you buy it; you expect to receive a dividend of R1 in two months. After receiving the dividend you then decide to sell it because of the new market price of R52. What was your HPR?

  » $r = (1 + \frac{52}{50}) - 1 = 6\%$

- Required return on equity

  » The minimum level of expected return that an investor requires on the asset in order to invest in the asset over a specified time period, given the asset's risk.
  » Can be calculated using CAPM as $E(R_i) = R_F + \beta_i [E(R_M) - R_F]$
  » Expected alpha = expected return – required return

  = HPR – CAPM (required return)

  » The risk-free rate can also be presented in two ways:
    i. Long-term government bond return
    ii. Short-term government debt instrument (Treasury bill) return

  » **Other measures of required return on equity**
    i. Fama-French model – refer to pages 68–72 and example 7.
    ii. Macroeconomic models – refer to page 74.
    iii. Bond yield plus risk premium – refer to pages 77–79 and example 9 on page 78.
- Weighted average cost of capital

  » The overall required rate of return of a company's suppliers of capital
  » Also referred to as company's cost of capital
  » Estimated using company's after-tax weighted cost of capital or weighted average cost of capital (WACC)
  » Do example 10 on page 81

- READ THROUGH THE SUMMARY on pages 82–83
- ADDITIONAL QUESTIONS on pages 85-89

STUDY UNIT 2: DISCOUNTED DIVIDEND VALUATION

CONTENTS

OVERVIEW

Study unit 2 deals with the discounted dividend valuation. In this study unit you will firstly focus on the different discount dividend models, including the present value model, dividend discount model, Gordon growth model and the multistage dividend discount model and then the determinants of the growth rate will be explained.

Read the introduction on the dividend discount model on pages 232–233 of the prescribed book (chapter 5).

LEARNING OUTCOMES and ASSESSMENT CRITERIA

Once you have worked through this study unit, you should be competent in the following:

- Justify the economic rationale for discounted cash flow (DCF) valuation.
- Distinguish between three expected cash flow definitions that can be used in discounted cash flow valuation, taking account of the advantages and disadvantages of each, and identify the investment situations in which each is suitable.
- Determine whether a dividend discount model (DDM) is appropriate for valuing a share.
- Identify the components of the required rate of return on equity used to discount expected future cash flows.
- Calculate the value of an ordinary share using the DDM for one-, two-, and multiple-period holding periods.
- Identify the equation and account for the general form of the DDM.
- Identify the two major approaches to the dividend-forecasting problem.
- Evaluate the assumptions of the Gordon growth model.
- Calculate the value of an ordinary share using the Gordon growth model.
- Assess the choice of growth rate in the Gordon growth model in relation to the growth rate of the economy.
- Calculate the expected rate of return or implied dividend growth rate in the Gordon growth model, given the market price.
- Calculate and apply the justified leading and trailing price to earnings ratio (P/Es) based on fundamentals, using the Gordon growth model.
- Calculate the value of a fixed-rate perpetual preference share given the share's annual dividend and the discount rate.

- Calculate and apply the present value of growth opportunities (PVGO) given current earnings per share, the required rate of return, and the market price of the share (or value of the share).
- Analyse the strengths and limitations of the Gordon growth model.
- Justify the selection of the Gordon growth model to value a company, given the characteristics of the company being valued.
- Evaluate the assumptions and justify the selection of the two-stage DDM, the H-model, the three-stage DDM, and spread sheet modelling.
- Contrast the concepts of the growth phase, transitional phase, and maturity phase of a business.
- Argue the concept of terminal value and identify alternative approaches to determining the terminal value in a discounted dividend model.
- Calculate the value of ordinary shares using the two-stage DDM, the H-model, and the three-stage DDM.
- Justify the selection of a particular multistage dividend discount model given the characteristics of the company being valued.
- Estimate the implied expected rate of return for any DDM, including the two-stage DDM, the H-model, the three-stage DDM, and the spreadsheet model.
- Calculate the implied expected rate of return for the H-model and a general two-stage model.
- Identify the strengths and limitations of the two-stage DDM, the H-model, the three-stage DDM, and the spreadsheet model.
- Argue the concept of sustainable growth rate and assess the underlying assumptions.
- Calculate the sustainable growth rate for a company.
- Use the DuPont model to forecast the return on equity in estimating the sustainable growth rate.
- Demonstrate how dividend discount models are used as a discipline for portfolio selection, and identify two risk control methodologies.

[Adapted from the learning outcomes as stated in the prescribed book]

KEY CONCEPTS

capital asset pricing model	dividend discount model	Gordon growth model
H-model	multistage DDM	P/E model
present value models	three-stage DDM	two-stage DDM
WACC	required return on equity	

STUDY

Study chapter 5 of the prescribed book.

ASSESSMENT

Throughout the chapter you will find examples that explain the sections you have dealt with. These examples are there to help you understand the concepts in the study unit. Work through them and make sure that you understand that part of the work before moving on to the next section.

At the end of chapter 5 (pages 287–293 of the prescribed book) there are problems that you can use to test your knowledge of the study unit and chapter you have completed. If there are certain questions that you are unable to answer, take the time and work through the chapter again to get a clear understanding of all the learning outcomes in this study unit. The workbook will provide the learning outcomes, an overview of the chapter and solutions to the problems. You can mark the questions to see if you understand the work and can move on to the next study unit.

SUMMARY

Use the below summary together with the summary found on pages 283 to 285 of the prescribed book. The summary will give you some of the key concepts and terms in the chapter in point format. You can also use the summary together with your learning outcomes as a checklist that you are competent in the study unit.

NOTE: Only some of the concepts are highlighted in this summary, by no means does this indicate that you must exclude the concepts not highlighted.

CHAPTER 3 – DISCOUNTED DIVIDEND VALUATION

- Common stock

  » Represents an ownership interest in a business.
  » Common stock holders have an equity ownership of future cash flows.

- DCF (discounted cash flow valuation model)

  » View intrinsic value of common stock as the present value of its expected future cash flows.
  » Refer to pages 233–234 and do example 1.

- Four steps in applying DCF: page 232

  1. choosing the class of DCF model,
  2. forecasting the cash flow,
  3. choosing a discount rate methodology,
  4. estimating the discount rate.

- DDM

  » Dividend discount model.
  » Objective – to value a stock. Dividends:

    - Distribution to shareholders
    - Authorised by a company's board of directors
    - Appropriate definition of cash flow

- The DDM and dividends as future cash flow are suitable when:

  » the company is dividend-paying
  » the investors takes a non-control perspective
  » the board of directors has established a dividend policy that bears an understandable and consistent relationship to the company's profitability

  Refer to pages 235–241: Streams of expected cash flows, to see when FCFF/FCFE and residual income are suitable to be defined as returns.

- Types of dividend discount models

  » SINGLE HOLDING PERIOD (pages 241–242)

    - Example 3, page 242
    - Intrinsic value formula

$$V_0 = \frac{D_1}{(1+r)^1} + \frac{P_1}{(1+r)^1}$$
$$= \frac{D_1 + P_1}{(1+r)^1}$$

  » MUTIPLE HOLDING PERIODS (pages 242–244)

    - Example 4, page 243
    - Intrinsic value formula

$$V_0 = \sum_{t=1}^{n} \frac{D_t}{(1+r)^t} + \frac{P_n}{(1+r)^n}$$

» GORDON GROWTH MODEL (pages 244–260)

- Assumes dividends grow indefinitely at a constant rate
- Example: 5 and 6, pages 247–249
- Intrinsic value formula

$$V_0 = \frac{D_0(1+g)}{r-g}$$
$$= \frac{D_1}{r-g}$$

- Gordon growth model and preferred stock dividend
- Example 8, page 251
- Intrinsic value formula

$$V_0 = \frac{D}{r}$$

- Gordon growth model and negative growth
- Example 9, page 251
- Gordon growth model and P/E, pages 256–258
- Focus on calculating justified trailing P/E and leading P/E
- Interpretation of results (is it under-/over-/fairly valued?)
- Do example 11, pages 257–258
- Estimating a required return using the Gordon growth model
- Solve for r:

$$r = \frac{D_0(1+g)}{P_0} + g$$
$$= \frac{D_1}{P_0} + g$$

- Do example 12, page 259

» MULTISTAGE DIVIDEND DISCOUNT MODELS, pages 260–276

- Growth falls into three stages (refer to pages 260–261)
- Growth phase
- Transition phase
- Mature phase
- Two-stage dividend discount model
- Based on the multiple period model
- Refer to pages 261–265 for intrinsic value formula and example 13

- H-model
  - Refer to pages 265–267 for intrinsic value formula and example 16
- Three-stage model

- Refer to pages 267–272 for intrinsic value formula and examples 17 and 18

- SUSTAINABLE GROWTH RATE, pages 276–282

  » The rate of dividend (and earnings) growth

  – that can be sustained for a given level of return on equity
  – assuming that the capital structure is constant through time and that additional common stock is not issued

$$g = b \times ROE$$

$$ROE = \frac{\text{Net income}}{\text{Shareholders' equity}}$$
$$= \frac{\text{Net income}}{\text{Total Assets}} \times \frac{\text{Total assets}}{\text{Shareholders' equity}}$$
$$= \frac{\text{Net income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Total assets}} \times \frac{\text{Total Assets}}{\text{Shareholders' equity}}$$

  » Example 22 on page 277, for other ROE and g formulas do example 23 on page 279.
  » Note: b = retention rate = (1 – dividend payout ratio (D/E))

- READ THROUGH THE SUMMARY on pages 283–285.
- Make sure you know your intrinsic value formulas and when they are applicable. Train yourself to recognise the correct formula for the question by identifying the information given with the formula.
- ADDITIONAL QUESTIONS on pages 287–293

STUDY UNIT 3: FREE CASH FLOW VALUATION

CONTENTS

OVERVIEW

Study unit 3 deals with the free cash flow valuation. In this study unit you will learn more about the free cash flow to the firm (FCFF) and the free cash flow to equity (FCFE) valuation approached. You will learn how to forecast free cash flow, and the variations to the free cash flow models.

Read the Introduction on free cash flow valuation on page 296 of the prescribed book (chapter 6).

LEARNING OUTCOMES and ASSESSMENT CRITERIA

Once you have worked through this study unit, you should be competent in the following:

- Justify the choice of a free cash flow valuation approach.
- Classify and interpret free cash flow to the firm and free cash flow to equity.
- Contrast the FCFF and FCFE approaches to valuation.
- Identify the strengths and weaknesses of the FCFE model.
- Contrast the ownership perspective implicit in the FCFE approach to the ownership perspective implicit in the dividend discount approach.
- Contrast the appropriate discount rates for the FCFE and FCFF approaches.
- Identify the appropriate adjustments to net income; earnings before interest and taxes (EBIT); earnings before interest, taxes, depreciation, and amortisation (EBITDA); and cash flow from operations (CFO) to arrive at FCFF and FCFE.
- Calculate FCFF and FCFE given a company's financial statements, prepared according to US Generally Accepted Accounting Principles (GAAP) or International Accounting Standards (IAS).
- Distinguish between approaches for forecasting FCFF and FCFE.
- Contrast the recognition of value in the FCFE model with the recognition of value in dividend discount models.
- Determine how dividends, share repurchases, share issues, and changes in leverage may affect FCFF and FCFE.
- Contrast FCFF with EBITDA.
- Critique the use of net income and EBITDA as proxies for cash flow valuation.
- Differentiate the stable-growth, two-stage, and three-stage FCFF and FCFE models.
- Evaluate the assumptions of the stable-growth, two-stage, and three-stage FCFF and FCFE models.

- Justify the selection of a stable-growth, two-stage, or three-stage FCFF or FCFE model given characteristics of the company being valued.
- Calculate the value of a company using the stable-growth, two-stage, and three-stage FCFF and FCFE models.
- Illustrate how sensitivity analysis can be used in FCFF and FCFE valuations.
- Identify approaches for calculating the terminal value in a multistage valuation model.
- Identify the characteristics of companies for which the FCFF model is preferred to the FCFE model.

[Adapted from the learning outcomes as stated on in the prescribed book]

KEY CONCEPTS

constant-growth model	EBIT	EBITDA
FCFE	FCFF	free cash flow analysis
sensitivity analysis	single-stage model	three-stage growth models
two-stage FCF models	WACC	

STUDY

Study chapter 6 of the prescribed book.

ASSESSMENT

Throughout the chapter you will find examples that explain the sections you have dealt with. These examples are there to help you understand the concepts in the study unit. Work through them and make sure that you understand that part of the work before moving on to the next section.

At the end of chapter 6 (page 348 of the prescribed book) there are problems that you can use to test your knowledge of the study unit and chapter you have completed. If there are certain questions that you are unable to answer, take the time and work through the chapter again to get a clear understanding of all the learning outcomes in this study unit. The workbook will supply you with the learning outcomes, an overview of the chapter and solutions to the problems. You can mark the questions to see if you understand the work and can move on to the next study unit.

SUMMARY

Use the summary below together with the summary found on pages 346 to 348 of the prescribed book. The summary will give you some of the key concepts and terms in the chapter in point format. You can also use the summary together with your learning outcomes as a checklist that you are competent in the study unit.

NOTE: Only some of the concepts are highlighted in this summary; by no means does this indicate that you must exclude the concepts not highlighted.

CHAPTER 4 – FREE CASH FLOW VALUATION

- Analysts use free cash flow whenever one of the following conditions are met:
  - » The company does not pay dividends
  - » The company pays dividends but the dividends paid differ significantly from the company's capacity to pay dividends
  - » Free cash flows align with profitability within a reasonable forecasting period with which the analyst is comfortable
  - » The investor takes a control perspective
  - » Refer to pages 296–300

- Free cash flow to the firm (FCFF)
  - » Cash flow available
    - – to the company's suppliers of capital
    - – after all operating expenses (including tax) have been paid
    - – and necessary investments in working capital and fixed capital have been made.
  - » FCFF = cash flow from operations – capital expenditure

- Cash flow to equity
  - » Cash flow available
    - – to the company's holders of common equity
    - – after all operating expenses, interest and principal payments have been paid
    - – and necessary investments in working capital and fixed capital have been made
  - » FCFE = cash flow from operations – capital expenditures payments to debt holders

- Firm value is calculated as: $\text{Firm value} = \sum_{t=1}^{\infty} \frac{\text{FCFF}_t}{(1+\text{WACC})^t}$
  - » Dividing firm value by number of shares issued you get value per share
- Equity value = firm value – market value of debt or $\sum_{t=1}^{\infty} \frac{\text{FCFE}_t}{(1+r)^t}$

- <u>Types of free cash flow models</u>
  - » SINGLE-STAGE CONSTANT GROWTH FCFF AND FCFE MODELS

$$\text{Firm value} = \frac{\text{FCFF}_1}{\text{WACC - g}} = \frac{FCFF_0(1+g)}{WACC - g}$$

$$\text{Equity value} = \frac{\text{FCFE}_1}{\text{r - g}} = \frac{FCFE_0(1+g)}{r - g}$$

» Do example 1 on page 300.
» COMPUTING FCFF

- FCCF = Net income available to common shareholders (NI)

  Plus: net non-cash charges (NCC)

  Plus: interest expense x (1 – tax)

  Less: investment in fixed capital (FCInv)

  Less: investment in working capital (WCInv)

- NI represents income after depreciation, amortisation, interest expense, income taxes and payments of dividend to preferred shareholders
- Calculating FCFF from net income – do example 2 on page 303
- Calculating FCFF from CFO (cash flow from operation) – do example 3 on page 306
- $\text{FCFF} = \text{CFO} + \text{Int}(1 - \text{tax rate}) - \text{FCInv}$

» Calculating FCFE from FCFF

- FCFE = FCFF – interest expense x (1 – tax rate) + net borrowing

» FCFE is the amount that the company can afford to pay out as dividends

- Go through pages 312–345

- READ THROUGH THE SUMMARY on pages 346–348.
- ADDITIONAL QUESTIONS on pages 348–360.

STUDY UNIT 4: RESIDUAL INCOME VALUATION

CONTENTS

OVERVIEW

Study unit 4 deals with residual income valuation. In this study unit you will look at the concept of residual income, the residual income model and the residual income valuation in relation to other approaches; in the last section you will look at the accounting and international considerations of residual income.

Read the introduction on page 464 of the prescribed book.

LEARNING OUTCOMES and ASSESSMENT CRITERIA

Once you have worked through this study unit, you should be competent in the following:

- Identify and calculate residual income.
- Distinguish between alternative measures of residual earnings, such as economic value added.
- Analyse the use of residual income models.
- Calculate future values of residual income given current book value, earnings growth estimates, and an assumed dividend payout ratio.
- Calculate the intrinsic value of an ordinary share using the residual income model.
- Contrast the recognition of value in the residual income model to value recognition in other present value models.
- Argue the strengths and weaknesses of the residual income model.
- Justify the selection of the residual income model for equity valuation, given characteristics of the company being valued.
- Identify and evaluate the fundamental determinants or drivers of residual income.
- Evaluate the relationship between the justified price-to-book ratio and residual income.
- Evaluate the relationship of the residual income model to the dividend discount and free cash flow to equity models.
- Identify the major accounting issues in applying residual income models.
- Calculate an implied growth rate in residual income given the market price-to-book ratio and an estimate of the required rate of return on equity.
- Determine continuing residual income and assess the common assumptions regarding continuing residual income.

- Justify an estimate of continuing residual income at the earnings forecast horizon given company and industry prospects.
- Calculate the intrinsic value of an ordinary share using a multistage residual income model, given the required rate of return, forecasted earnings per share over a finite horizon, and forecasted continuing residual earnings.

[Adapted from the learning outcomes as stated in the prescribed book]

KEY CONCEPTS

economic value added	GAAP	general RIM
IAS	international considerations	multistage RIM
NOPAT	RI valuation model	ROE
single-stage RI valuation	Tobin's Q	

STUDY

Study chapter 8 of the prescribed book.

ASSESSMENT

Throughout the chapter you will find examples that explain the sections you have dealt with. These examples are there to help you understand the concepts in study unit 4. Work through them and make sure that you understand that part of the work before moving on to the next section.

At the end of chapter 8 (page 506 of the prescribed book) there are problems that you can use to test your knowledge of the study unit and chapter you have completed. If there are certain questions that you are unable to answer, take the time and work through the chapter again to get a clear understanding of all the learning outcomes in this study unit. The workbook will provide the learning outcomes, an overview of the chapter and solutions to the problems. You can mark the questions to see if you understand the work and can move on to the next study unit.

SUMMARY

Use the summary below together with the summary found on pages 503 to 504 of the prescribed book. The summary will give you some of the key concepts and terms in the chapter in point format. You can also use the summary together with your learning outcomes as a checklist that you are competent in the study unit.

NOTE: Only some of the concepts are highlighted in this summary; by no means does this indicate that you must exclude the concepts not highlighted.

CHAPTER 5 – RESIDUAL INCOME VALUATION

- Residual income is net income – equity charge (shareholder's opportunity cost in generating net income).
- The income statement does not deduct

  » dividends
  » other charges to equity capital

- There are two approaches to calculate residual income

  » Refer to pages 464–467

- Equity charge = equity capital x cost of equity capital
- Debt charge = debt x after-tax cost of debt
- Total capital charge = debt charge + equity charge

  » Do example 1 on pages 465–466; work through pages 464–467.

- When income is > its cost to generate it, then residual income is positive and there is creation of value.
- When income is < its cost to generate it, then residual income is negative and there is destroying of value.
- All else equal, higher (lower) residual income should be associated with higher (lower) valuations.
- A company that generates positive economic profit (residual income) should have a market value in excess of the accounting book value.
- MVA = Market value of company – total capital
- EVA = NOPAT – (C% x TC); refer to page 468
- <u>Types of residual income models</u>

  » Intrinsic value = current book value + present value of expected residual income. Refer to pages 469–472; do example 2 and 3.
  » Residual income model (1)

$$V_0 = B_0 + \sum_{t=1}^{\infty} \frac{RI_t}{(1+r)^t}$$

$$= B_0 + \sum_{t=1}^{\infty} \frac{E_t - rB_{t-1}}{(1+r)^t}$$

  » The residual income model has a relationship with other valuation models, for example DDM.
  » Clean surplus relationship states among earnings, dividends and book value as

$$B_t = B_{t-1} + E_t - D_t$$

    - Clean surplus accounting – the condition where income
    - reflects all changes
    - in book value of equity
    - other than ownership transactions

  » Residual income model (2) – refer to pages 472–476, example 4

$$V_0 = B_0 + \sum_{t=1}^{\infty} \frac{(ROE_t - r) \times B_{t-1}}{(1+r)^t}$$

» Fundamental determinants of residual income – refer to pages 477–478.
» Single-stage residual income model (1)

- Example 6 on page 478

» Single-stage residual income model (2)

- Example 7 on page 479

» Multistage residual income valuations

- Estimating a terminal value is based on continuing residual income at the end of that time horizon.
- Continuing residual income is residual income after forecast horizon.
- Following assumptions concerning continuing residual income
- Residual income continues indefinitely at a positive level.
- Residual income is zero from the terminal year forward.
- Residual income declines to zero as ROE reverts to the cost of equity through time.
- Residual income reflects the reversion of ROE to some mean level.

» Refer to pages 480–484.

- Strengths and weakness of the residual income model

» Refer to page 487.

- Broad guidelines for using a residual income model

» The residual income model is most appropriate when
» The residual income model is least appropriate when
» Refer to page 487.

- Read through pages 488–502.
- READ THROUGH THE SUMMARY on pages 503–504.
- ADDITIONAL QUESTIONS on pages 506–511

STUDY UNIT 5: MARKET-BASED VALUATION PRICE MULTIPLES

CONTENTS

OVERVIEW

This study unit deals with market-based valuation. In this study unit you will look at the price multiples in the valuation process, the different price multiples (price to earnings, price to book value, price to sales, price to cash flow and price to dividend and dividend yields); further on you will look at the international considerations and value indicators in practice.

Read the introduction on page 362 of the prescribed book.

LEARNING OUTCOMES and ASSESSMENT CRITERIA

Once you have worked through this study unit, you should be competent in the following:

- Distinguish among types of valuation indicators.
- Distinguish between the method of comparables and the method based on forecasted fundamentals as approaches to using price multiples in valuation.
- Interpret a justified price multiple.
- Identify the economic rationales for the method of comparables and the method based on forecasted fundamentals.
- Identify and judge rationales for each multiple and dividend yield in valuation.
- Identify possible drawbacks to the use of each price multiple and dividend yield.
- Contrast and calculate each price multiple and dividend yield.
- Determine underlying earnings, and calculate underlying earnings given earnings per share (EPS) and nonrecurring items in the income statement.
- Determine normalised EPS, recognise methods of normalising EPS, and calculate normalised EPS by each method.
- Distinguish and justify the use of earnings yield (E/P).
- Identify and evaluate the fundamental factors that influence each price multiple and dividend yield.
- Calculate the justified price-to-earnings ratio (P/E), price-to-book ratio (P/B), and price-to-sales ratio (P/S) for a share, based on forecasted fundamentals.
- Calculate a predicted P/E given a cross-sectional regression on fundamentals and assess the limitations to the cross-sectional regression methodology.
- Determine the benchmark value of a multiple.
- Evaluate a share using the method of comparables.

- Argue the importance of fundamentals in using the method of comparables.
- Classify and calculate the P/E-to-growth (PEG) ratio and determine its use in relative valuation.
- Calculate and evaluate the use of price multiples in determining terminal value in a multistage discounted cash flow (DCF) model.
- Identify alternative definitions of cash flow used in price multiples and evaluate the limitations of each.
- Identify the sources of differences in cross-border valuation comparisons.
- Identify the main types of momentum indicators and their use in valuation.
- Critique the use of share screens in investment management.

[Adapted from the learning outcomes as stated in the prescribed book]

KEY CONCEPTS

BV per share	dividend yield	earnings per share
international valuation	momentum valuation	price to book value
price to cash flow	price to earnings	price to sales
relative industry valuation	tangible BVPS	earnings yield

STUDY

Study chapter 7 of the prescribed book.

ASSESSMENT

Throughout the chapter you will find examples that explain the sections you have dealt with. These examples are there to help you understand the concepts in study unit 5. Work through them and make sure that you understand that part of the work before moving on to the next section.

At the end of chapter 7 (page 454 of the prescribed book) there are problems that you can use to test your knowledge of the study unit and chapter you have completed. If there are certain questions that you are unable to answer, take the time and work through the chapter again to get a clear understanding of all the learning outcomes in this study unit. The workbook will provide the learning outcomes, an overview of the chapter and solutions to the problems. You can mark the questions to see if you understand the work and can move on to the next study unit.

SUMMARY

Use the summary below together with the summary found on pages 449 to 452 of the prescribed book. The summary will give you some of the key concepts and terms in the

chapter in point format. You can also use the summary together with your learning outcomes as a checklist that you are competent in the study unit.

NOTE: Only some of the concepts are highlighted in this summary; by no means does this indicate that you must exclude the concepts not highlighted.

CHAPTER 7 – PRICE MULTIPLE VALUATION

- Price multiples are ratios of a stocks market price to some measure of fundamental value per share

  » Investors valuate the price of a share of stock, judge whether it is fairly/under-/over-valued - by considering what a share buys in terms of per share earnings, net assets, cash flow.

- Enterprise value multiples; relate to the total market value of all sources of a company's capital to measure of fundamental value for the entire company

  » Investors evaluate the market value of an entire enterprise relative to the amount of EBIT, sales, operating cash flow

- THE METHOD OF COMPARABLES

  » Refers to valuation of an asset based on multiples of comparable assets
  » Valuation based on multiples benchmarked to the multiples of similar assets
  » Stock cannot be evaluated in isolation.
  » Refer to pages 363–364, example 1 on page 364

- THE METHOD BASED ON FORECASTED FUNDAMENTALS

  » Refers to the use of multiples derived from forecasted fundamentals
  » Characteristics of a business related to profitability, growth or financial strength
  » Pages 365–366

- TYPES OF PRICE MULTIPLES, pages 366–425

  » Price to earnings

    - Rationales that support the use of P/E multiples in valuation; page 367
    - Potential drawbacks to using P/E derived from the characteristics of EPS – page 367
    - Alternative definitions of P/E
    - Calculating trailing P/E analyst must consider four things – refer to page 369
    - Go through pages 369–376
    - Forward P/E
    - Forward looking
    - Do example 5 on page 377
    - Valuation based on forecasted fundamentals
    - Forward P/E

$$\frac{P_0}{E_1} = \frac{D_1 / E_1}{r - g}$$

$$= \frac{1 - b}{r - g}$$

- Trailing P/E

$$\frac{P_0}{E_0} = \frac{D_0(1+g)\big/E_0}{r-g}$$
$$= \frac{(1-b)(1+g)}{r-g}$$

- Example 7, 8 and 9 on pages 380–382.
- Using P/E to obtain the terminal value in multistage dividend discount models
- Key condition – company reflects earnings growth that the company can sustain in the long run.

» Price-to-book value

- Rationales for using P/B: pages 399–400
- Drawbacks: page 400
- Work through pages 399–410
- Valuation based on forecasted fundamentals (P/B)

$$\frac{P_0}{B_0} = \frac{ROE-g}{r-g}$$

$$\frac{P_0}{B_0} = 1 + \frac{\text{Present value of expected future residual earnings}}{\text{B}_0}$$

- This equation makes special assumptions about growth; refer to page 408
- Refer to pages 408–409

» Price to sales: pages 410–417

- Rationales: page 410
- Drawbacks: page 410
- Calculating P/S, example 22; refer to page 411

$$\frac{P_0}{S_0} = \frac{(E_0/S_0)(1-b)(1+g)}{r-g}$$

» Price to cash flow: pages 417–422

- Rationales: page 417
- Drawbacks: page 418
- Example 30 on page 421

» Price to dividends and dividend yield

- Rationales: page 422
- Drawbacks: page 423
- Example: 32 on page 423
- Based on forecasted fundamentals – page 424

$$\frac{D_0}{P_0} = \frac{r-g}{1+g}$$

Go through the following:

- » ENTERPRISE VALUE MULTIPLES – pages 426–435
- » INTERNATIONAL CONSIDERATIONS WHEN USING MULTIPLES – pages 435–437
- » MOMENTUM VALUATION INDICATORS– pages 437–442
- » VALUATION INDICATORS: ISSUES IN PRACTICE – pages 442–449

- READ THROUGH THE SUMMARY on pages 449–452
- ADDITIONAL QUESTIONS on pages 454–462