ACCT7106 – Session #3: The Valuation Process

PART 1 – Background

Our ***primary focus – corporate***

shareholders ↔ board **ement**

re: management → operate firm

assumed objective of management = ***maximize shareholders' wealth***

⇒ ***maximize share price!***

- **Why maximize share price?**

  If management maximizes share price, investors can always sell their shares if they don't like the firm's policies and receive maximum price

  Further, given well-functioning markets and rational investors, share price will reflect the market's risk attitude, time preference, and opportunity cost

- **Why not the more typical economic objectiv izing profit?**

  - profit should be viewed relative to inves concept of opportunity cost

  - since multiperiod, the time value of money must be acknowledged

  - profit must be judged relative to risk

➢ Roles of Management

1. Controller function ⇒ asset efficiency

i.e., efficient use of working capital and liquidity management
running the internal accounting system

2. Treasury function ⇒ long-

i.e., debt or equity? - will affect the ri sition of the firm

3. Capital budgeting ⇒ real (productive) asset acquisition

i.e., composition of the firm's fixed assets
mix of capital and labour

⇒ determines the firm's profitability and operating risk

➢ Market Efficiency

- **Operational efficiency –** low operating costs
- **Allocational efficiency –** funds to most promising real investment opportunities
- **Informational (pricing) efficiency –** market price reflects all relevant information and further, price adjusts rapidly to the release of any price relevant new information

⇒ **price =**

informational (pricing) efficiency is critical for [illegible] asons:

- **encourages people to buy shares** (facilitates an active market)
- **facilitates financial management** (decisions evaluated through their impact on price)
- **helps to allocate resources** (to their most productive uses)

- *Academic research suggests:*
  - strong form efficiency generally does not hold – further, insider trading is illegal or restricted
  - stock market probably satisfies weak form efficiency
  - stock market is largely semi-strong form efficient, but it is unclear if it is completely semi-strong form efficient

- *Fundamental analysis might s*

  - the market might not be completely semi-s fficient => you might be able to value companies more accurately than t

  - investors might be rewarded fairly for doing fundamental research. How do market prices reflect all public information, if no one is doing fundamental research?

*Aside – **'fundamental analysis'***

fundamental analysis represents an exercise designed to determine the 'intrinsic value' of the company (to form your own view of the value of a company for trading purposes)

it involves analyzing both quantitative and qualitative data about the company and the environment within which it operates including –

- macroeconomic factors (the state and prospects of the overall economy; industry conditions and prospec
- company-specific factors (financial con tiveness of management; strategic initiatives; consumer behaviou

The end goal is to arrive at a number that an investor can compare with a security's current price in order to see whether the security is undervalued or overvalued

Fundamental analysis assumes that over the long term, a stock price will reflect the company's intrinsic value

PART 2 – Implementing the Valuation Model

$$V_0 = \sum_{t=1}^{\infty} \frac{x_t}{(1+k_t)^t} = \sum_{t=1}^{n} \frac{E(x_t)}{(1+k)^t} + \frac{E(x_n)(1+g)}{k-g} \frac{1}{(1+k)^n}$$

Issue #1 **– discount rate (*k*):**

Issue #2 **– investment horizon (*n*):**

Issue #3 **– choice of flow measure (*x*):** (e.g., dividends, free cash flow, earnings)

Issue #4 **– estimating future values of '*x*'** (on a year-by-year basis for '*n*' years, and then the 'on average' growth rate, *g*, over the extended period)

Issue #1 **– discount rate:**

In general, the rate of return required by investors to induce them to commit capital, given the level of risk involved → $R = R_F + E(I) + RP$

where R_F = risk-free rate of return $E(I)$ = expected rate of inflation,

RP = risk premium specific to investment

The CAPM, which is one relativ h to developing a discount rate, predicts that the required rate of return on comm :

$$k_e = R_F + \beta\,[E(R_M) - R_F]$$

$[E(R_M) - R_F] \equiv$ 'market price of risk' (historic range approximately 5% → 7%

$\beta \equiv$ measure of the firm's systematic risk (broadly available for most major companies

R_F = risk-free rate of return

Issue #2 **– investment horizon:**

preferred approach to implementing the valuation model

predict future year-by-year flows for some finite number of years and then estimate the terminal value at the end of this forecast horizon.

→ question of what constitutes an appropriate forecast horizon?

→ involves trade-of ast year-by-year accurately and the weight placed

Analysts typically select a forecast horizon in the range of 3 to 5 year

Issue #3 **– flow measure:**

two basic flow measures

- earnings
- cash flow
  - cash flows to
  - cash flows to

General form of the dividend valuation model:

+ ……

General form of the free cash flow model:

=

General form of the 'abnormal earnings' m

+

Conceptually, the choice of a 'flows measure' should not matter (i.e., the dividend, free cash flow, and abnormal earnings valuation models should lead to ***identical*** estimates of value!).

Requires –

1. the terminal value perpetuity must be based on internally consistent amounts

⇒ the clean surplus relation must hold at all times ($SE_t = SE_{t-1} + NI_t - D_t \pm NCC$), and simultaneously and consistently for both models

⇒ for the CF model, the terminal value estimate must be based on D_{t+1} where D_{t+1} follows from the clean surplus relation, on estimates of NI_{t+1} and SE_{t+1}, not simply on D_t (1+g)

similarly, the terminal value estimate f odel must also follow from the clean surplus relation as opposed to simply using AE_t (1+g) as the estimate of AE_{t+1}

2. forecasted yearly data consistent with clean surplus and other accounting identities

e.g., the forecasted dividend series must be consistent with the forecasted Shareholders' Equity and Net Income series, and with the forecasted price)

To illustrate, consider the following (an expanded version of the example used last week):

Example #3-1

An all-equity financed firm has as its only asset, inventory which cost $240 million. The firm's tax rate is zero and its cost of equity capital is 12%

Analysts forecast that the firm *h of its inventory in each of the next six years for cash*

The projected revenues from the first year's sales *tion and the revenues are projected to grow at the expected rate of inflation (3%) each successive year. The firm is then expected to be dissolved at the end of year six*

The firm will adopt a 40% payout ratio, with remaining cash reinvested at the cost of equity and paid out as a terminal dividend at the end of year 6

Balance Sheet inventory 240,000,000 shareholders equity 240,000,000

anticipated sales revenue (FCF)

$FCF_1 = 50{,}000{,}000$ $FCF_2 = 50{,}000{,}000\ (1.03) = 51{,}500{,}000$

$FCF_3 = 50{,}000{,}000\ (1.03)^2 = 53{,}045{,}000$ $FCF_4 = 50{,}000{,}000\ (1.03)^3 = 54{,}636{,}350$

$FCF_5 = 50{,}000{,}000\ (1.03)^4 = 56{,}275{,}440$ $FCF_6 = 50{,}000{,}000\ (1.03)^5 = 57{,}963{,}700$

profit & AE (assuming weighted average inventory method – cost = 40 / year)

$\pi_1 = [50 - 40] = 10{,}000{,}000$ AE_1 = (10 – 0.12*240) = -18,800,000

$\pi_2 = [51.5 - 40] = 11{,}500{,}000$ *200) = -12,500,000

$\pi_3 = [53.045 - 40] = 13{,}045{,}000$ 12*140) = -6,155,000

$\pi_4 = [54.63635 - 40] = 14{,}636{,}350$ 4 2*120) = 236,350

$\pi_5 = [56.27544 - 40] = 16{,}275{,}440$ AE_5 = 2*80) = 6,675,441

$\pi_6 = [57.9637 - 40] = 17{,}963{,}700$ AE_6 = 2*40) = 13,163,700

proposed dividends (D) (= 40% of profit)

$D_1 = 0.4(10) = 4{,}000{,}000$ (→ cash retained = 50 – 4 = 46,000,000)

$D_2 = 0.4(11.5) = 4{,}600{,}000$ (→ cash retained = 51.5 – 4.6 = 46,900,000)

$D_3 = 0.4(13.045) = 5{,}218{,}000$ → cash retained = 53.045 – 5.218 = 47,827,000)

$D_4 = 0.4(14.63635) = 5{,}854{,}540$ (→ cash retained = 54.63635 – 5.85454 = 48,781,810)

$D_5 = 0.4(16.27544) = 6{,}510{,}176$ (→ cash retained = 56.27544 – 6.510176 = 49,765,260)

$D_6 = 0.4(17.9637) = 7{,}185{,}481$ (→ cash retained = 57.9637 – 7.185481 = 50,778,220)

Under the FCF valuation model

= + + + + + = $219,475,525.7029

Under the AE valuation model, assuming weighted average inventory method

= 240 + + + + + + = $219

Under the dividend valuation model, assuming a 40% payout ratio, and remaining cash reinvested at the cost of equity and paid out as a terminal dividend at the end of year 6

= + + + + + + = $219,475,525.7029

HOWEVER, what if we "naively" adopt a 5-year forecast horizon and then assume an 'on average' growth rate of 4% from year 6 into the foreseeable future (approximately the growth rate in the GDP)

= + + + + + ()= $605,227,861

V^{AE} = 240 + + + + + + ()= $282,648,099

= + + + + + () = $66,389,939

WHY are the estimates no longer identical?

the assumption that each stream (earnings, dividends, and cash flows) can grow at the same rate indefinitely violates 'clean surplus' !!

HOW? sales, inventory, dividends, cash balance, etc. etc. etc.

PART 3 – Implementing the Valuation Model (cont)

Issue #4 – estimating future values of '*x*'

⇨ on a year-by-year basis over the forecast horizon ('*n*' years)

the 'on average' growth rate, *g*, that applies over the foreseeable future post the forecast horizon

fundamental analysis represen determine *'intrinsic value'*

it involves analyzing both quantitative and qu a about the company and the environment within which it operates including –

- ❑ macroeconomic & industry factors (e.g., the state and prospects of the overall economy; industry conditions and prospects)
- ❑ company-specific factors (e.g., financial conditions; effectiveness of management; strategic initiatives; consumer behaviour)

undertaking ‘fundamental analysis’ is a relatively involved and complex process

i.e., FCF and earnings-based valuation models require analysts to project likely amounts of revenues, expenses, assets, liabilities, and shareholders' equity.

→ their use requires analysts to undertake the very complex and "labour intensive" task of developing an understanding of the firm's future operating, investing, and financing decisions

To illustrate, Palepu, Bernard, and Healy characterize the process followed by a thorough analyst as involving the following 7 steps:

#1 Analyse strategy to understand factors driving the performance of an industry and a firm, and to assess whether those factors are likely to persist

#2 Analyse accounting to assess whether management has made conservative or aggressive accounting decisions.

#3 Forecast future earnings to th (to the terminal year).

#4 Forecast growth in book value for the firm fo orizon.

#5 Forecast earnings and book value growth beyond the terminal year.

#6 Estimate the firm's cost of equity.

#7 Use the cost of equity to estimate the abnormal earnings and discount these amounts.

➢ Financial Analyst

- A ‘securities analyst’ is an “individual, usually employed by a stock brokerage house, bank, or investment institution, who performs investment research and examines the financial condition of a company or group of companies in an industry” (Downes, J., & Goodman, J. (2014). *Dictionary of Finance and Investment Terms* (Barron's Business Dictionaries).

- There are sell-side and buy

  - ***Buy-side:*** work for an investment fund (k, Vanguard, Franklin Templeton, superannuation funds) and se internally on what the fund should invest in

  - ***Sell-side:*** provide advice to investors on the financial condition of companies. Most work for investment banks or brokers and write regular ‘research reports’ on the companies that they ‘cover’, giving their opinion about whether the company represents a good investment

- Typical contents of a sell-side analyst report include:
  - the analyst's share price valuation of the company, usually expressed as a 'price target', which is the price the analyst expects in 12 months
  - a buy/sell/hold recommendation based on comparing the price target to the current market price
  - detailed forecasts of the m ns for the next 2 or 3 years, such as earnings per share (EPS), dividends PS), sales, capex, etc.
  - the analyst's commentary on recent compa
  - information about how the analyst valued the stock

Aside – once the various year-by-year estimates and the post-horizon terminal growth estimate have been developed, as implied by the preceding material, the valuation exercise is essentially 'mechanical' – to illustrate:

***re:* Coles (COL)** – from the CommSec website

5-year beta **0.73** ⇒ ***k* = 0.03 + 0.73 [0.06] = 0.0738** **7.4%**

forecasts	current	2021 E	2022 E	2023 E
EPS ($)			0.785	0.889
DPS ($)	0.575	0	0.653	0.733

***re:* Woolworths (WOW)** – from the CommSec website

5-year beta **0.64** ⇒ ***k* = 0.03 + 0.64 [0.06] = 0.0684** **6.8%**

forecasts	current	2021 E	2022 E	2023 E
EPS ($)	1.268	1.482	1.547	1.718
DPS ($)	0.940	1.103	1.158	1.274

note – the forecasts represent the 'consensus analyst forecast'

→ mean / median forecast across all sell-side analysts covering the company
(used as a proxy for the 'markets' forecast of earnings or dividends)

Based on these forecasts, we can then directly apply the 'dividend valuation model' to both COL and WOW

+ ()

The remaining issue is then that of what constitutes an appropriate 'g' – the 'on average' post-horizon (terminal) growth rate (??)

- could assume that Coles / Woolies will stop paying dividends after 2023
- could assume that Coles / Woolies will pay dividends at the 2023 level into the foreseeable future (i.e., $g = 0$)
- could (should) independently develop a defensible value for g that reflects the company's like future path

assuming that Coles & Woolies will stop paying dividends after 2023:

assuming that Coles & Woolies p evel in perpetuity (g = 0):

As a frame of reference, the current share prices for COL and WOW at the close of trade on Friday 4 December are:

P_{COL} = \$17.98

P_{WOW} = \$37.72

⇨ both estimates significantly understate the current share price (since g is likely inappropriate)

What is an appropriate post-horizon (terminal) growth rate, g?

- g represents how fast the company will grow (on average) *forever*
- you should not use a g that is greater than the nominal GDP growth of the country where the company operates (assuming it operates primarily in one country)
- it is unreasonable to assume that a company can grow faster than the economy as a whole forever, as eventually its size would exceed the size of the entire economy!

Australia's historical nominal GD d by fluctuations in real GDP growth and inflation (primarily inflation). The av e measure are:

over the last 10 years: about 4.2%

over the last 20 years: about 5.8%

over the last 50 years: about 8.4%

g likely should not therefore exceed 4 – 4.5% for an Australian company, and could be less (depending upon the company's circumstances and prospects)

assuming g = 3%:

assuming g = 4%:

	Actual Price	Estimated post-horizon dividend growth rate, g			
	(4/12/20)	$D = 0$	$g = 0\%$	$g = 3\%$	$g = 4\%$
P_{COL}	**≈ $18**	1.772	9.923	15.220	19.175
P_{WOW}	**≈ $38**	3.094	18.473	30.615	40.444

Summary reflection –

- for both companies, clearly the capital markets appear to factoring in growth estimates of between 3% and 4%, currently closer to 4%

re: use of the 'discounted dividend' valuation model (DDM) –

❑ **Advantages:**

- dividends are what shareholders actually receive and thereby not affected by 'earnings management' (strategic manipulation of accounting figures to portray a desired image or picture)
- can work reasonably well for mature companies with high dividend payout rates
- dividends can be more sta tend to 'smooth' their dividends

❑ **Disadvantages:**

- dividends are the result of present/past profitability and a financing decision (to pay out shareholders equity – it is therefore better to focus on the *source* of dividends, which is earnings and cash flow
- the DDM is difficult to implement if the company is not paying any dividends (you have to forecast when the company will eventually begin paying dividends)

re: use of the 'abnormal earnings (residual income)' valuation model (AE / RIM) –

❑ **Advantages:**

- Focuses on earnings, which is a better measure of performance than dividends or FCF
  - advantages of accrual accounting
  - not the result of a financing decision unlike dividends
  - earnings does not punish investment in net operating assets (NOA) unlike FCF
- for some companies, the fo l RI reaches a steady state) will be shorter than for the DD
- can use analyst forecasts of DPS and EPS as adily available

❑ **Disadvantages:**

- more complex than DDM
- earnings can be manipulated, in particular accruals are easier to manipulate than FCF
- still requires forecasting dividends as dividends are needed to calculate future 'shareholders' equity' (for clean surplus)

PART 4 – Issue #4: Estimating future values of '*x*'

- ***Sell-side analysts*:** provide advice to investors on the financial condition of companies. Most work for investment banks or brokers and write regular 'research reports' on the companies that they 'cover', giving their opinion about whether the company represents a good investment

Investopedia – the job of a sell-side research analyst is to follow a list of companies, all typically in the same industry, and provide regular resear As part of that process, the analyst will typically build models to project the as speak with customers, suppliers, competitors, and other sources with knowledge of the i

There are a number of templates that detail the type of inputs the analyst utilizes in developing their reports. On balance, however, these template incorporate the same material.

One such template is the so-called 'top down' approach detailed on the next slide

- *Typical analyst's report - Top down approach*
  - **Macroeconomic factors** e.g.,
    - GDP
    - Interest rates
    - Inflation
    - Foreign exchange (FOREX) rates
    - Oil and commodity prices
    - Hedging
    - Business cycle
  - **Industry factors** e.g.,
    - Sensitivity to macroeconomic factors
    - Industry operation, ratios and stats
    - Competition
  - **Firm level** e.g.,
    - Strategy
    - Synergy
    - Financial Performance

Bradshaw, 2011

"Analysts' forecasts: What do we know after decades of work?"

Starting with the ***'Macroeconomic Factors'*** e.g.,

- GDP; Business cycle; Inflation
- Interest rates; Foreign exchange (FOREX) rates; Commodity Prices

These factors are largely outside the control of the company but have the potential to significantly impact the company's performance.

The RBA provides data on both the historical the relevant dimensions and projections. Consider, for example, the summary 'snapshot' of key indicators provided by the RBA dated 3 December

While the ‘macroeconomic factors’ are largely (or wholly) outside the control of the company, the company can however undertake steps to mitigate its exposure to various risks that the factors pose to its profitability

⇒ **treasury risk management:**

⇒ managing the firm' ted changes in interest rates, foreign exchange rates, and commodi

focus: fluctuations in the firm's profit, ROE, and/or market value

main sources of risk include**:**

a) interest rate risk ⇒ fluctuations that result from changes in interest rates

b) exchange rate risk ⇒ fluctuations that result from changes in exchange rates

c) c fluctuations that arise from changes in the prices ties that the firm either sells or purchases

note: even firms that do not directly use a commodity may face commodity price risk as price increases affect other factors of production (e.g., delivery costs)

Managing risk: ⇒ hedging strategies

hedge: adopting an offsetting position to reduce (or eliminate) risk exposure

typically involves the creation of a position in the derivatives market to offset an existing risk in the cash market.

hedger: a person or firm w _____n the actual commodity or asset underlying the hedge instrument

note: by hedging, have reduced (eliminated) downside risk BUT have also reduced (eliminated) upside potential!

note: can have risk exposure either when hold the asset or when wish to acquire the asset (i.e., "long" position or "short" position).

e.g., Coles 2020 Annual Report

e.g., Qantas 2020 Annual Report

PART 5 – ‘strategy analysis’ → ‘understanding the business’

Penman presents on possible structure (template) in Figure 3.1 (page 85) around ‘the process of fundamental analysis’

Step #1 Knowing the business

Step #2 Analyzin

Step #3 Forecasting payoffs

Step #4 Converting forecasts to valuation

Step #5 Trading on valuation

The final three steps of the basic process are relatively "straightforward" or non-contentious

For example, Step #3 basically involves interpretation of the information developed in the first two steps and then its transformation/translation into the pro-forma financial statements.

The process can be considered 'relatively "straightforward" and non-contentious' because, while it involves considerable s[illegible]), the objective / purpose of the exercise (pro-forma statements

➡ development of the 'pro forma' financial statements through to the forecast horizon

- ✓ the heart of good valuation is good forecasting (***'Good Forecasts'***)
- ✓ forecasts are only as good as the information supporting them

NOTE: *the ultimate objective of the processes in Steps #1 and #2 is then to gain the knowledge and understanding necessary to develop the pro-forma financial statements (as inputs into the estimation of value using the fundamental valuation models)*

Step #1 Knowing the business

- ❑ the products
- ❑ the knowledge base
- ❑ the competition
- ❑ the regulatory constraints

Step #2 Analyzing information

- ❑ in financial statements
- ❑ outside financial statements

there are a number of different strategies (structures or processes) to guide the acquisition of the information

for example, consider the following two presentations (generically labeled A and B) which are virtually identical in substance, if not in form

note, while each of these presen s of how a firm might evaluate its own current position and t te response strategy, they can alternatively be viewed as providing the exter ith a "checklist" from which to develop an indepth understanding of the firm, ircumstances, and its prospects

Approach A –

Motivation – to add value for stakeholders (EVA = difference between the value of a firm's outputs and the value of its inputs)

External Analysis – evaluation of the business environment

- business strategy consists of
  - corporate level strategy
  - competitive (business lev
  - functional (operations level) strategy

➢ analysis of the business environment

⇒ analyze conditions outside the firm to assess opportunities and threats

- the general environment
- the industry

- general environment – PEST analysis

political forces
e.g., trade liberalization and emergence of trade blocs

economic forces
e.g., world and local economic changes; wage differentials; exchange rate movements

social changes
e.g., as caused by advances in transpor ications
→ global products

technological change
e.g., computers, satellites, ceramic superconductor

- analyzing the firm's industry environment

  ⇒ Porter's five forces model

  the bargaining power of suppliers

  the bargaining power of the buyers

  the threat of potentia

  the threat of substitutes

  the extent of competitive rivalry

Internal Analysis

Value chain (Porter) – breaks activities of an organization into

- primary activities → creating products, marketing, sales & service
- support activities → inputs allowing primary activities to occur

- looks inside the firm to asse weakness

- is performed to identify strengths to build o esses to overcome in building strategies for competitive advantage

- identifying / building
  - core competencies or distinctive capabilities
    e.g., innovation, reputation, and/or business relationships
  - strategic assets

- methods for assessing internal strengths and weakness
  - ✓ the balanced scorecard
    - → examines all aspects of the organization's activities that impact on the 'bottom line'

Financial

Customer

Operations

Organizational

✓ SWOT analysis

- strengths, weaknesses, opportunities, and threats

- strengths and weaknesses based on the internal analysis

- opportunities and threats based on the external analysis

⇒ a potentially usefter the analysis of the external environment and the analysis of (in rces

Approach B –

I. Situational Analysis

- **General external environment**
  - ✓ political / legal
  - ✓ sociolcultural
  - ✓ technological
  - ✓ demographic
  - ✓ global

- **Industry analysis (Porter's five forces)**
  - ✓ threat of new entrants and barriers to entry
  - ✓ intensity of rivalry among competitors
  - ✓ product substitutes
  - ✓ suppliers
  - ✓ buyers

- **Competitive environment analysis**
  - ✓ are other companies developing similar products?
  - ✓ what resources do potential competitors ve?

mental trends

tiveness of external (market) environment

➢ Strategic analysis

1. key success factors

e.g., first mover advantage; marketing & distribution capabilities; production efficiencies

2. strategies

- business level — e.g., high price strategy; market penetration strategy
- competitive strategy — e.g. first mover into industry
- corporate level — e.g. ; core business

3. core competencies

- resources
  - ❖ tangible - financial; physical; human
  - ❖ intangible - resources for innovation; reputation
- capabilities
  - ❖ operations
  - ❖ marketing and sales
  - ❖ management
  - ❖ technology

II. SWOT

- *Strengths e.g.,*
  - ✓ product development
  - ✓ professional network
  - ✓ management
- *Opportunities e.g.,*
  - ✓ develop additional products
  - ✓ expand into new markets

- *Weaknesses e.g.,*
  - ✓ marketing and/or distribution
  - ✓ production
  - ✓ experience with product
- *ts e.g.,*
  - ulatory hurdles
  - ✓ rivals with similar products
  - ✓ competency of competition