

# Ratio Analysis Fundamentals

How 17 Financial Ratios can allow  
You to Analyse any Business on the Planet

**2nd  
Edition**



# **Ratio Analysis Fundamentals**

***How 17 Financial Ratios Can Allow You to Analyse  
Any Business on the Planet***

By Axel Tracy

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*For Sarah:* Thanks for the ongoing love and inspiration.

*For Mum & Dad:* Nothing I have achieved, or will ever achieve, would be possible without you both.

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## About

### ***About the Author***

Axel Tracy is an accounting and business student at the University of Technology, Sydney (UTS). He has a passion for his studies and is a member of the invitation-only Golden Key International Honours Society in recognition of having a GPA that placed him in the top bracket of students at his university. He is also a member of the UTS Honour Society.

He was employed by the University of Technology, Sydney, to run PASS sessions in the subject of Accounting Standards and Regulations; an undergraduate accounting subject that trains students to become familiar with Australia's implementation of International Financial Reporting Standards and the current Australian accounting standard regime. He was also employed by UTS as a one-on-one tutor for the study of another 2nd year accounting subject, Accounting for Business Combinations, a subject that dealt with the financial accounting of corporate groups, joint ventures and associates.

Since April 2011, he has been the Founder & Manager of RatioAnalysis.net, a website dedicated to financial and accounting ratios. In August 2013, Axel launched accofina.com. This website promotes the sale of products involved with accounting and finance knowledge and education.

Axel lives in Armidale, Australia, and apart from studies or working, enjoys spending time with his partner, Sarah, or enjoying a good cup of coffee.



## ***About accofina.com***

accofina.com launched in August, 2013, and is a hub for accounting & finance knowledge and technology.

On the website you will find Books, Apps, Online Courses & Tutorials, MS Excel Spreadsheets and other Online Calculators all customized to assist putting academic accounting & finance knowledge, through technology, in the hands of businesspeople, investors and students.

accofina.com is part of Bidi Capital Pty Ltd, which is a company founded, directed and owned by this book's author, Axel Tracy.

## ***What New in the 2nd Edition***

Revised and improved content in many sections as a result of the author's further research.

Updated formatting to assist reading experience on mobile devices.

Removal of spelling and grammatical errors to reduce confusion and improve professionalism.

## Introduction

Do you look at financial statements and not know what they mean, or more importantly what you can learn about a business from them? Is a lack of accounting training holding you back from getting value from these important financial documents? This book aims to address these problems through the application of ratio analysis, which is one use derived from a business' financial statements.

The financial statements, these being the Income Statement, Balance Sheet & Cash Flow Statement, allow you to tell the 'story' of a business. You can tell its history, its strengths and weaknesses and sometimes even its future. Financial numbers alone will not tell you everything about a business. For instance (and according to Kaplan and Norton's 'Balanced Scorecard' theory) it's important to assess how customers perceive the business. But when it comes to the overarching business goals (how shareholders and owners view the business), and the breadth of information that financial data can summarize (every department of a business and most activities the business carries out can usually be translated into financial form), an appreciation of the financial statements is vital.

The financial statements are three 'pieces of paper', or three worksheets of a spreadsheet, that are recognized as being a summary of the business over the preceding or current period. The statements tell a concise story that can be used by investors and managers to test and assess strategy, as well as assist in putting together action plans in regards to whether or not to buy, hold or sell a stock or what to do internally within the business. But being able to look behind the numbers and glean this story takes some skill. However, not lots of skill! Accountants, like many professions, like to make their skills seem more complicated than what they really are; after all, this allows them to charge higher fees. But ANY business manager, investor or student can quickly learn some key techniques that will allow them to tell the story of almost any business on the planet. This is what this book is for! There are multiple forms of financial statement analysis, whether it's horizontal and vertical analysis, valuation techniques or even capital budgeting decision making. This book aims at introducing the technique of ratio analysis, the concept of combining multiple aspects of the three

statements (to form ratios) and then using the results to assess the success, or lack of it, of a business or investment.

I am not primarily an author, I'm just a plain accounting student and over the past few years I have been learning how to use the financial statements to tell a story through ratio analysis and financial statement analysis. I have done this by breaking down complicated jargon and foreign concepts into little sections of understandable knowledge. But if this is all foreign to you now, I must warn you that accounting is littered with jargon. Accountants have the ability to turn vast amounts of data into actionable information, but they tend to give their own names to this 'actionable information' and in effect create a language of their own. And if this is all foreign to you: firstly, congratulations on taking the first steps, you won't regret it. Secondly, in this book I will try to clearly, simply and concisely break down this 'foreign language' and its arithmetic tools into something more digestible, irrespective of whether you're a marketer, barista, production manager or even a retiree managing their nest egg. That is, putting seemingly unrelated, black & white numbers into concepts, tools and techniques that can be understood and applied by anyone who has some high-school arithmetic capabilities into analysing a business. Honestly, I don't like mathematics, but accounting mathematics is basically just simple arithmetic, and best of all, what you can do with a few simple calculations and ratios could take your business, investments or career to a level you thought would only be achievable with the help of a high-priced consultant. And even if this book can't replace that consultant, then at least you should be able to converse with them better, understand where they are coming from or even check up on them or have the ability to question them with more force.

Note: accofina (the business behind this book) has produced a Free Ratio Analysis Spreadsheet that can calculate all the ratios described in this book, as well as offering all the formulae. You can access the Free Spreadsheet here:

<http://accofina.com/spreadsheets/ratio-analysis-excel.html>

While a little arithmetic skill will help (or just a reliable calculator), you may need a small primer into what you are exactly looking at when someone gives you the financial statements. If you already know these details, you can skip this primer, otherwise, here goes:

# ***PRIMER START***

## **The Income Statement**

This is also known as the Profit and Loss Statement and is a document broken down into 3 main sections. However, the first thing you must know is that it measures a time-period. That is, imagine it is like a video that runs from start to finish over a set time-period. The Income Statement is a 'video' that displays three key sections of the business.

The 1st section (or "top-line") is revenue. This is all the money earned throughout the period from the sales of products or services. This is the uppermost section of the Income Statement.

From here, the 2nd section lists all the expenses. These are the expenses throughout the period that are matched against the revenue. The expenses sit in the middle of the Income Statement

When all the expenses are subtracted from all the revenues you are left with the profit (income) or loss for the period. The income figure sits at the bottom of the Income Statement and this is why it is known as "the bottom line".

*The equation: Revenues – Expenses = Income*

## **The Balance Sheet**

So, when I said the income statement was a video, now I am saying the Balance Sheet is a photo, a snapshot. At any point in time you can take a 'photo' of the business and have the Balance Sheet for that day. If you want the Balance Sheet for another day, you need another photo, another separate Balance Sheet.

The Balance Sheet is also broken into three sections.

The 1st section relates to assets. Assets are things the business owns or controls ('things you own') that will generate monetary benefits. This can include anything from cash to machinery and so on. Generally, the assets are ordered by liquidity (the ability to turn them into cash), with the most liquid (cash) at the top and the least liquid at the bottom of the assets section.

‘Current assets’ are those assets that will be used up or turned into cash within a year. ‘Non-current assets’ are those that last, or won’t be turned into cash until longer than a year has passed.

The 2nd section relates to liabilities and they sit in the balance sheet below assets. Liabilities are obligations of a business that will lead to an outflow of monetary resources (‘things you owe’). This includes everything from accounts payable to long-term debt. Once again they are ordered by liquidity.

And once again, current liabilities are those due within a year. Non-current liabilities are those due in more than a year.

The final section (at the bottom) of the Balance Sheet is equity. Equity has a rather odd, and ultimately derivative, definition in the accounting standards (The IFRS Accounting Standards are the ‘rules’ of financial accounting), but ultimately it is what’s left from assets after removing all liabilities. It’s what would be returned to the owners of the business if the business shut down, all assets were sold and all liabilities paid off. It is often referred to “owners’ equity” in small businesses and can be broken into many categories in large businesses.

There is again an equation within the Balance Sheet that will always hold; it is known as the “Accounting Equation” and has been at the heart of accounting for a very, very long time. In fact, ‘double-entry accounting’ which lies at the heart of this accounting equation, was developed by an Italian monk over 500 years ago!

*The equation: Assets = Liabilities + Equity*

## **The Cash Flow Statement**

None of the ratios we look at in this book use the Cash Flow Statement so we won’t spend much time here. But in short, it tells us how cash came into the business and how it flowed out during a particular period. It too is like a video and covers a length of time. The cash flows (money going in and coming out, hence Cash Flow Statement) are broken down into three sections depending on what the company was doing with the cash.

The first section is ‘cash flow from operations’ and these are all the cash flows involved with day-to-day management of the business.

The second section is ‘cash flow from investing activities’ and this involves buying or selling long-term assets that will be used in the day-to-day operations.

And the final section is ‘cash flow from financing activities’ and these are the cash flows that deal with funding the business, whether it’s getting money from (or paying money to) creditors or shareholders.

*The equation: Cash Today (End of Period) = Cash at Start of Period + Cash Flow from Operations + Cash Flow from Investing Activities + Cash Flow from Financing Activities*

## ***PRIMER FINISH***

So now, hopefully we all know what we are looking at with the three main financial statements. If you are comfortable with this then the majority of ratios covered in this book just push you to look deeper into these statements. Note: that’s a one or two page explanation of the statements, so it’s a little brief and there is room for further education, but at this stage let’s just follow the KISS principle.

If you still feel less than comfortable with the Balance Sheet, in particular, you may be interested in another title, written by this book’s author: Balance Sheet Basics: From Confusion to Comfort in Under 30 Pages. There is also Income Statement Basics available and Cash Flow Statement Basics, but one self-promoting link is enough for now.

There is a key thing to remember before we dive into the ratios. The skill is termed “Ratio Analysis” and NOT “Ratio Calculation”. This means that the actual calculations and results are just the first step. In a way a doctor is presented with symptoms, he or she must analyse how all the symptoms fit together and then make a diagnosis and prognosis. This is also how you should approach ratio analysis. Taking a single calculation and then making a quick decision may lead to the wrong prognosis. You have to take the calculations and results, compare them with other results and carefully consider what could be behind (and causing) this particular calculation and only then take a course of action. But don’t worry, it’s nowhere near as difficult as medicine and what a doctor must do; it’s actually rather enjoying and can give you a lot of confidence prior to taking a big leap. Hopefully,

this book can give you a nudge in the right direction in both the calculations and the reasons behind the results. But don't let me and this concise book limit you! The more you analyse (dig) the more you increase your chances of coming to the right conclusion (finding gold).

Best wishes and enjoy your ratio analysis!

## *Financial Statements and Other Company Information used in Ratio Examples*

Here we have an Income Statement & Balance Sheet as well as some Other Company Information for two consecutive years.

These financial statements and data are for your reference and are used in the Examples when ratios are detailed.

*Note:* Creating ‘real’ financial statements is rather tricky. This is because each component of the statements and data are linked to another section. Thus, creating accurate financial statements is kind of like playing Financial ‘Whack-A-Mole’ in that every time you change one figure, another figure should also be changed to make the statements truly accurate...and it just goes on and on and on. After much time I simply gave up and created ‘semi-real’ financial statements and data. This means that the example financial data should only be seen as an example. They are not 100% accurate and could be pulled apart with a short investigation. The only rules that I genuinely held to were that ‘Assets = Liabilities + Equity’ and ‘Revenue – Expenses = Income’ (as explained in The Primer equations). I tried to make them as real as possible, but I only guarantee that the just mentioned equations hold.



# ***The Income Statement***

**Jan-13 to Dec-13**

## **Revenue**

Revenue \$5,450,000

Other Revenue, Total \$327,000

*Total Revenue \$5,777,000*

Cost of Revenue (COGS) \$1,846,450

*Gross Profit \$3,930,550*

## **Expenses**

Selling/General/Admin, Total \$1,167,000

Research & Development \$284,000

Depreciation/Amortization \$89,000

Other Operating Expenses \$208,000

Total Operating Expenses \$1,748,000

*Operating Income \$2,182,550*

Interest Expense \$85,000

Gain (Loss) on Asset Sales (\$142,000)

*Income Before Tax \$1,955,550*

Provision for Taxation \$586,665

*Net Income \$1,368,885*

## **Jan-12 to Dec-12**

### Revenue

Revenue \$4,866,000

Other Revenue, Total \$263,700

*Total Revenue \$5,129,700*

Cost of Revenue (COGS) \$1,565,000

*Gross Profit \$3,564,700*

### Expenses

Selling/General/Admin, Total \$1,071,000

Research & Development \$189,000

Depreciation/Amortization \$84,000

Other Operating Expenses \$172,000

Total Operating Expenses \$1,516,000

*Operating Income \$2,048,700*

Interest Expense \$82,000

Gain (Loss) on Asset Sales \$35,000

*Income Before Tax \$2,001,700*

Provision for Taxation \$600,510

*Net Income \$1,401,190*

# ***The Balance Sheet***

**31-Dec-13**

## Assets

Cash & Equivalents \$265,000

Short-Term Investments \$94,000

Cash & ST Investments \$359,000

Accounts Receivable \$368,000

Receivables – Other \$77,000

Total Receivables \$445,000

Inventory \$802,000

Prepaid Expenses \$205,000

Other Current Assets, Total \$49,000

*Total Current Assets \$1,860,000*

Property, Plant & Equipment \$8,541,000

Accumulated Depreciation (\$210,000)

Goodwill, Net \$174,000

Intangibles, Net \$96,000

Long-Term Investments \$2,380,000

Other Long-Term Assets \$52,940

*Total Assets \$12,893,940*

## Liabilities

Accounts Payable \$122,000  
Accrued Expenses \$165,000  
Notes Payable/Short-Term Debt \$88,000  
Current Portion of LT Debt \$866,000  
Other Current Liabilities \$29,000  
*Total Current Liabilities \$1,270,000*  
Long-Term (LT) Debt \$1,546,000  
Deferred Income Tax \$47,000  
Other Liabilities, Total \$65,000  
*Total Liabilities \$2,928,000*

Equity.

Preferred Stock, Total \$1,000,000  
Common Stock, Total \$3,925,000  
Retained Earnings \$5,026,940  
Other Equity, Total \$14,000  
*Total Equity \$9,965,940*  
*Total Liabilities & Equity \$12,893,940*

**31-Dec-12**

Assets

Cash & Equivalents \$212,000

Short-Term Investments \$78,000  
Cash & ST Investments \$290,000  
Accounts Receivable \$163,000  
Receivables – Other \$74,000  
Total Receivables \$237,000  
Inventory \$542,000  
Prepaid Expenses \$207,000  
Other Current Assets, Total \$38,000  
*Total Current Assets \$1,314,000*  
Property, Plant & Equipment \$8,614,000  
Accumulated Depreciation (\$126,000)  
Goodwill, Net \$171,000  
Intangibles, Net \$96,000  
Long-Term Investments \$2,202,000  
Other Long-Term Assets \$55,000  
*Total Assets \$12,326,000*

### Liabilities

Accounts Payable \$369,000  
Accrued Expenses \$171,000  
Notes Payable/Short-Term Debt \$482,000  
Current Portion of LT Debt \$144,000  
Other Current Liabilities \$28,000  
*Total Current Liabilities \$1,194,000*  
Long-Term (LT) Debt \$1,406,310

Deferred Income Tax \$63,000  
Other Liabilities, Total \$69,000  
*Total Liabilities \$2,732,310*

Equity.

Preferred Stock, Total \$1,000,000  
Common Stock, Total \$3,925,000  
Retained Earnings \$4,655,000  
Other Equity, Total \$13,690  
*Total Equity \$9,593,690*  
*Total Liabilities & Equity \$12,326,000*

## ***Other Company Information***

**2013**

Weighted Average Number of Common Shares 19,625,000

Annual Dividends per Share \$0.04

Preference Dividends, Total \$50,000

Credit Sales \$812,000

Stock Price \$0.32

**2012**

Weighted Average Number of Common Shares 19,625,000

Annual Dividends per Share \$0.03

Preference Dividends, Total \$50,000

Credit Sales \$738,000

Stock Price \$0.22



## **Part 1: Profitability Ratios**

**Profitability:** “affording profits; yielding advantageous returns or results”  
(Merriam-Webster Dictionaries, 2012)

### **PROFIT MARGIN**

The Profit Margin is one of the most popular of all the ratios out there, and for good reason. Ultimately, it tells us how much profit is generated from our sales, specifically the percentage of sales revenue that ends up in profit.

It is a key ratio because a primary financial performance measure of a business is profit (it's the bottom line!). And while profit can't be generated without sales revenue (selling your product/service is why you're in business!), expenses are another fact of business life and keeping these expenses as low as possible leads to profit being as great as possible (within your sales range).

So if you're in business or you're an investor, you need to know how well the business in question keeps its cost under control and how much revenue (an often quoted figure) actually ends up on the bottom line. It's also important as a measure of 'pricing power', i.e. the relative power of the business within its market to charge a premium price and maintain market share.

#### **The Formula:**

Profit Margin = Net Income / Sales Revenue

#### **Example from given Financial Statements:**

Profit Margin

= \$1,368,885 / \$5,777,000

= 23.7%

**Where do we find the information for this ratio?**

Net Income (Profit): In the Income Statement (Profit & Loss Statement)

Sales Revenue: In the Income Statement (Profit & Loss Statement)

**What the result means:**

If you have a Profit Margin of, say, 22%, then this means that 22% of your sales revenue ends up as profit and the remaining 78% is used up on expenses over the period. Not too tricky, huh?

**What it means if the Profit Margin changes:**

The first thing I will say since this is the initial ratio addressed (and this applies to all following ratios) is that the most value derived from analysing a single ratio from a single company is through a trend analysis. That is by comparing the ratio over time and how it changes. You can of course analyse one ratio against another or compare one company against another, but trend analysis is the best value for single ratio, single company analysis. This lesson applies to the 'Profit Margin' and all ratios that follow.

If you compare the Profit Margin over time and it is rising then what does this mean? Firstly, it's generally a very good sign, whatever the reason! Arithmetically it means one of two things: (1) that expenses have fallen in relation to sales. This is good as it means that management is caring about cost control and is able to generate sales at a lower cost. Or that sales revenue is increasing at a rate faster than expenses, another sign of cost control by management or through economies of scale.

The other reason is (2) the business is selling products at a higher price without a corresponding increase in costs. Again, another good sign that could be reflecting premium products that customers are willing to pay higher prices for, or that the business is improving in the competitive business environment and all its efforts are being rewarded by loyal customers who will pay higher price (these are just a couple of examples).

This second reason relates to the 'pricing power' phenomenon mentioned earlier. Every business would like to be a 'price maker' and not a 'price taker' and the only way one can be a price maker is that they have a particular level of market strength. Now I don't mean strength as in some sort of bullying way, but instead that the business' product or service is valued by customers greatly enough that they are willing to purchase it at a price dictated by the business.

So, how about the reverse? Once again there are two main reasons, and generally they are just the reverse. (1) Costs could be increasing in relation to revenue; not a good sign, as it may signal a cost spiral trend and/or that management does not have a tight enough reign over cost controls. However, this situation may not always be the fault of management directly, it may be due to a weak bargaining position along the supply chain (and suppliers are able to raise input costs without recourse) or even economic factors that are completely outside control of the business. Think airline companies and jet fuel. A spike in oil prices (nothing to do with management) can lead to an uncontrollable increase in business costs.

The second reason is that (2) products may be selling at a lower price than previously. This may be because of competitive pressures in the market and price discounts must be made to keep market share. Or it may mean that the quality of the product, as perceived by customers, doesn't warrant the previously higher price. This again is the price taker situation. This position is often the result of competition in the marketplace or the structure of the market. In the first instance, high levels of competition combined with low switching costs (the ease at which customers can move to a competitor) often means that the business has no power to set its prices; the market sets them for it. In this situation it's almost impossible to raise prices without losing market share and you must often even lower prices to maintain one's own position. In relation to the structure of the market, there are some industries when you are almost always a price taker. This occurs when the

product or service is viewed as a commodity; a uniform product where differentiation is impossible, switching costs are low and price is overriding factor in customers' minds.

### **Drawbacks of the Profit Margin Ratio:**

Like all ratios, the Profit Margin has its advantages and disadvantages. One of the major drawbacks of the Profit Margin is that it is difficult to compare the results between industries. Some industries have a naturally higher or lower Profit Margin within them (as we just discussed in regards to market structures or bargaining power in supply chains), so comparison of the Profit Margins of say Apple Inc. and Chevron Corporation probably wouldn't tell you that much.

Another drawback is that the Profit Margin is affected by business strategy. The guidance of the results given earlier is limited because we don't know an individual business' particular strategy. I told you that a fall in Profit Margin was a negative sign. But this could be a deliberate strategy by the business. They may be targeting a different market, trying to increase market share and possibly hopefully making up the fall in Profit Margin with an increase in scale. For example, would you rather have the dividends from owning a business that had a 40% profit margin on \$100 in revenue, or a business (in the same industry) that had a 10% profit margin on \$1,000,000 in revenue? There is simply no way to tell the business strategy from the Profit Margin alone. But on a positive note, if you can learn the strategy of the business then you can break down this weakness and, better yet, test management's implementation of that strategy with profit margin (and other ratio) analysis.

## **GROSS PROFIT MARGIN (ALSO KNOWN AS GROSS PROFIT PERCENTAGE)**

The Gross Profit Margin is a very important calculation, particularly in retail or manufacturing entities. Specifically, it is a measure of sales revenue less cost of sales, that is, the profit between the cost producing or purchasing an item of inventory and its eventual sales price. It is measured as a percentage and it tells us what percentage of every dollar of sales revenue remains after the cost of purchasing or manufacturing the inventory.

Note: Within service firms, the cost of sales are generally not inventory costs, but instead could be the salary of the staff member providing the service to the customer.

It is an important indicator for both investors and business managers because it tells us how much funds are left from sales revenue to pay all our remaining expenses while also having net profit left over. If a business cannot generate a large enough gross profit from its sales, then there is pressure on the bottom line when financial reports are generated, and ultimately the viability of the business.

### **The Formula:**

Gross Profit Margin = (Sales Revenue – Cost of Sales) / Sales Revenue

### **Example from given Financial Statements:**

Gross Profit Margin

= (\$5,777,000 - \$1,846,450) / \$5,777,000

= 68.04%

**Where do we find the information for this ratio?**

Sales Revenue: In the Income Statement (Profit & Loss Statement)

Cost of Sales [COGS]: In the Income Statement (Profit & Loss Statement)

*Note:* There are different names for Cost of Sales. The main others are Cost of Goods Sold [COGS] or Cost of Revenue.

**What the result means:**

If you have a Gross Profit Margin of, say, 35%, then this means that 35% of your sales revenue is left to pay your remaining expenses and left for net profit. In other words, 65% of your final sales price was consumed by the costs of manufacturing or purchasing the inventory.

**What it means if the Gross Profit Margin changes:**

If you compare the Gross Profit Margin over time and it is changing then what does this mean?

All else things being equal, any business wants a higher Gross Profit Margin; it's a good sign. There are a number of reasons why this situation might occur. (1) Final selling prices (sales revenue) may be increasing in relation to the cost of inventory.

Why would this occur? Perhaps you have increased your market power and customers don't switch away from your product when you raise your prices. I mentioned this earlier, but this position of power is highly desired and you will often find many serious investors who look for pricing power when screening investments. This power is the result of a deep 'moat'; the business has protected itself from competitors and has strong connections with its customers. Pricing power is a quick way to tell how deep the moat is.

There also could be increased demand for your product in general and you can charge more before the increased demand flows right through the supply chain and your suppliers increase their prices. This situation is normally the result of external factors and management's ability to

capitalize on them. There could be, for examples, production difficulties within a large competitor and a sharp manager could meet their unmet demand quickly without input costs increases flowing through the supply chain.

There are, in fact, many reasons why selling prices increase in relation to cost of sales and it may be important to find out why.

The other arithmetic reason why a Gross Profit Margin will improve is (2) cost of sales falls in relation to sales revenue. This again can occur from increased market power of the entity. For example Wal-Mart Stores has a reputation of driving down their suppliers selling prices (Wal-Mart's cost of inventory) because of their market dominance and power over their industry.

On the other hand, cost of inventory may fall simply because an entity changed suppliers or a manufacturer improved the efficiency of their production.

There are also economy-wide reasons (which relate back to the profit margin section) such as the situation when the cost of sales inputs are commodities. Think Starbucks. They may do absolutely nothing at all different from the previous period but if coffee growing regions have a boom season and there is a glut of Arabica beans on the market then their cost of sales will fall as the price of coffee beans has fallen.

Again, there are many reasons why cost of sales may fall in relation to revenue. Importantly, a single ratio calculation is not an end in itself but should be the beginning of an investigation.

Simply, the reverse is true if the ratio is falling:

Final selling prices are falling in relation to the cost of inventory. Two examples of why this might occur include (a) a marketing strategy change where an entity is trying to win market share by discounting their prices but still having to pay full price to their suppliers. Or perhaps the economy is slowing and to maintain sales levels, with lower consumer sentiment, prices must be reduced.

Then perhaps final selling prices remain static in relation to cost of goods sold (COGS/cost of inventory) increases. This could occur due to inflation in the supply chain, which the final entity has yet to pass on, maybe if

within a competitive market and pushing up end-user prices will result in lower market share. Or perhaps the entity is a fresh start-up and their market power and market share is so small that suppliers can arbitrarily increase their prices but the entity isn't developed enough to make its own price increases. This new start-up would again be a 'price taker'.

### **Drawbacks of the Gross Profit Margin Ratio:**

There are drawbacks to the Gross Profit Margin. Similar to the Profit Margin drawback, the Gross Profit Margin varies across industries, so cross-industry comparisons may not always be relied upon as a good indicator. For example, software companies are known for having high gross margins while most food retailers have low gross profit margins.

Secondly, as described in previous sections, there are very many reasons why this figure may change over time. Often, it is not enough to simply know whether the result is moving up or down over time, the initial result may simply be indicator to dig deeper into the business to access its market or competitive strategy.

Finally, the formula to this ratio simply takes two inputs and ignores a significant amount of other financial information important to a business. A great Gross Profit Margin may be useless if management is inefficient in other areas and has severely bloated expenses elsewhere. In other words, the ratio is no indicator of the final, bottom line net profit, or funds available for dividends or retained earnings.



## **RETURN ON ASSETS**

Along with the return on equity, the Return on Assets is one of the most fundamental measures of the success of a business. It takes pre-tax profit, adds back the interest expense and uses the result in a ratio against the assets of the business. What it is telling us is the return generated by the assets of the business for those who funded the assets, these being the stockholders (pre-tax profit) and creditors (interest expense). It is measured as a percentage of the average level of assets over the period.

Why is so much emphasis placed on the Return on Assets? This is because it is a simple indicator to calculate while giving great insight into the success of management to those who fund, or own, the business but are outside of management. After all, the money shareholders or creditors invest in the business is allocated by management in the purchase on income generating assets. That is, the normal lifecycle of a business is that (a) it raises funds (b) invests in assets (c) makes a return on those assets (d) gives back the returns to those who funded the assets. Thus, you want to know (as a creditor, investor or manager) that the income-generating aspect of the business is generating a decent return. If asset allocation decisions are good and the assets are run well, then the Return on Asset figure will also be strong.

### **The Formula:**

Return on Assets =

$$\frac{(\text{Income Before Tax} + \text{Interest Expense})}{((\text{Assets at Start of Period} + \text{Assets at End of Period}) / 2)}$$

### **Example from given Financial Statements:**

Return on Assets

$$= (\$1,955,550 + \$85,000) / ((\$12,326,000 + \$12,893,940) / 2)$$

$$= 16.18\%$$

**Where do we find the information for this ratio?**

Income Before Tax: In the Income Statement (Profit & Loss Statement)

Interest Expense: In the Income Statement (Profit & Loss Statement)

Assets at Start of Period: In the previous Balance Sheet

Assets at End of Period: In the current Balance Sheet

**What the result means:**

As mentioned, the result is a percentage. So if you have a Return on Assets of 18% this means for every dollar of assets in the business, 18% (or 18 cents) of that is available as a return for those who fund the business.

**What it means if the Return on Assets changes:**

So what does an increasing Return on Assets mean? Generally it means your profitability has increased in relation to your level of assets.

The reasons behind this incorporate all the business decisions within a period. It could be a reduction in expenses or increase in revenue, all while holding relative assets constant.

And further behind these, it essentially means that management is improving their performance. Their decisions are resulting in getting “more for less” or at least more returns for the same inputs.

Another reason behind an increasing Return on Assets is that the assets are being consumed while there isn't the capital spending to maintain (or replenish) their levels. This situation is trickier to assess because while the ratio is improving, no business should completely let their income generating assets diminish without replacing them. It again might be important to look at other information to determine which of the above two situations is occurring.

Let's look at the previous section's latter situation first when we analyse the reverse situation, and the Return on Assets is declining. This can occur when assets have suddenly increased and the profitability is yet to do the same. This can often be the case when large asset investments have a lag time before the profitability ends up in the books. Again, look into the strategy of the business to determine if this is the case.

On a more negative note, a declining Return on Assets can simply mean that the assets aren't performing as they once did, or those new large asset investments are never showing up as profitability in the books.

This once again boils down to management performance. Whether it's competitive pressure, bad strategy or being unable to counter an economic downturn, the nature of the ratio means that most performance inputs are being incorporated (income before tax from the profit and loss statement and asset levels from the balance sheet) and these are management decisions.

### **Drawbacks of the Return on Assets Ratio:**

The Return on Assets does have its drawbacks. Firstly, like many other ratios, it's difficult to make comparisons between businesses that are in different industries and this can severely limit the investment benefits unless you are certain you will invest in a particular industry. Take a new Silicon Valley start-up as an example, they wouldn't spend as much on assets as a mining business. Most of the start-up's early costs would be wage and marketing expenses until it generated some of its own intellectual property assets, while a mining company without enormous levels of fixed assets would be breaking the norm. So when comparing Vale or BHP Billiton to Twitter or Facebook, whose Return on Assets (ROA) figure is better?

As mentioned earlier, while an increasing Return on Assets figure is generally very positive, businesses can reduce their assets to very low levels and increase this ratio. Keeping a very low asset base isn't always something that should be encouraged.

Finally, the most common way assets are reduced is through depreciation and amortization (amortization is depreciation for intangible assets). And

depreciation policy is a management choice and there are different, perfectly acceptable (and legal) options when it comes to choosing how to depreciate assets. Therefore choice of depreciation policy can impact the Return on Assets. For example, two companies may be identical in all respects, but one uses straight-line depreciation and other uses reducing-balance depreciation. The one using reducing-balance depreciation would have a higher ROA earlier on throughout the life of the asset, because its assets levels are reduced faster early in the life of the asset with the reducing-balance method.

## **RETURN ON EQUITY**

The Return on Equity is rather similar to the return on assets. However, the Return on Equity specifically focuses on the return of one group of the business' financiers, the common stockholders, the owners of the business.

The numerator of the ratio is net profit minus preference dividends and the denominator is average common stockholder equity. The ratio is given as a percentage and represents the return that the business achieved using the funds that the owners have put into the business as well as the retained earnings of the business (which are essentially stockholder funds also).

As with the return on assets, the Return on Equity is a simple measure of performance over time and between businesses.

There is also a key relationship between the Return on Equity and the return on assets. If the Return on Equity is higher than the return on assets then this means that the business is generating higher returns for its shareholders than it is paying in interest. In effect, it is successfully leveraging borrowed funds. Leverage, or gearing, is using borrowed funds to 'lever' your results. That is, you can achieve higher returns than would be possible from funding the business from retained earnings or from the business' earnings in general. Note: while it can magnify ('lever') the results positively, it can also magnify the results negatively if things go bad. Leverage is a double-edged sword.

### **The Formula:**

Return on Equity =

$$\frac{(\text{Net Income} - \text{Preference Dividends})}{((\text{Common Stockholder Equity at Start of Period} + \text{Common Stockholder Equity at End of Period}) / 2)}$$

*Note:* In this case, and most cases, Common Stockholder Equity is:

All equity minus "Preferred Stock, Total"

"Common Stock, Total" is the value of the initial share issue and doesn't include Retained Earnings and Other Equity

**Example from given Financial Statements:**

Return on Equity

$$= (\$1,368,885 - \$50,000) / ((\$8,593,690 + \$8,965,940) / 2)$$

$$= 15.02\%$$

**Where do we find the information for this ratio?**

Net Income: In the Income Statement (Profit & Loss Statement)

Preference Dividends: In the Income Statement (Profit & Loss Statement) or from the Company Announcements of the Company Investor Relations.

Common Stockholder Equity at Start of Period: In the previous Balance Sheet

Common Stockholder Equity at End of Period: In the current Balance Sheet

**What the result means:**

A Return on Equity figure of 18% means for every dollar of common stockholder funds, the business is returning 18%, or 18 cents, of profit for the owners.

**What it means if the Return on Equity changes:**

Over time a rising Return on Equity is a very good sign, similar to the return on assets. It generally means that management has improved the overall performance of the business on behalf of the stockholders. This is most likely because net profit has increased in relation to common stockholder equity, and a higher net profit, while all else equal, is always a positive.

However, the Return on Equity can be manipulated by increasing liabilities deliberately with a corresponding decrease in equity. This can be done, for example, by putting all incoming expenses on credit: this reduces equity (e.g. Debit Expense) and increase liabilities (e.g. Credit Bank Overdraft). Then with an equal profit as previous periods, the reduced equity will have the effect of increasing the Return on Equity. Whether this type of increase is positive is less certain. That is why the relationship between Return on Equity and return on assets must be examined. Only if the Return on Equity is higher than the return on assets then is the new increased level of liabilities is being managed well.

The reverse case is simply the flip side of what was explained in the previous section. In general, you don't want a falling Return on Equity. This normally means that net profit has fallen in relation to common stockholder equity, and this is obviously not a good sign and not good management on behalf of stockholders.

There is an important valuation concept that relates to the Return on Equity (ROE) that is worth mentioning. If a business can generate a ROE, which is higher than its cost of capital (the cost it pays for debt, via interest, or the cost it pays for equity, via dividends), then in theory it is 'creating value'. This is vital to any business, as the quest for value creation is fundamental premise of enterprise. In theory, if a business can create value then its stock price will be higher than the book value of the shares.

### **Drawbacks of the Return on Equity Ratio:**

The biggest drawback has already been mentioned in previous sections. While the ratio is a measure of performance, the level of debt and liabilities can alter it, and debt is the primary reason for most corporate collapses.

The other major drawback is that the Return on Equity is heavily reliant on the net profit figure. While the 'ins and outs' of profit manipulation is beyond the scope of this book, the accounting policies of management can alter the profit figure and ultimately the Return on Equity. Even when deceitful profit manipulation is not the motive, different accounting policies between businesses and industries reduce the effectiveness of this measure.

## **Part 2: Liquidity Ratios**

**Liquidity:** “consisting of or capable of ready conversion into cash”  
(Merriam-Webster Dictionaries, 2012)

### **CURRENT RATIO**

We now look at liquidity ratios. The first we look at is the Current Ratio and this is also the most widely used liquidity ratio. Quite simply, it measures how easily a business can pay short-term liabilities with short-term assets; that is, its current liabilities from current assets.

The Current Ratio is important because if you can't pay your short-term liabilities you are out of business; and you can only pay your debts with your assets that are highly liquid, that is, they can be converted to cash quickly to pay those debts when they fall due.

The result of the ratio is also general indicator of the safety or security of the business. A high Current Ratio generally means a more secure business. As will be explained later, this is not a hard and fast rule for all businesses, but for most businesses it's a pretty straightforward indicator into how easily the business will survive in the near future.

#### **The Formula:**

Current Ratio = Current Assets / Current Liabilities

#### **Example from given Financial Statements:**

Current Ratio

= \$1,860,000 / \$1,270,000



= 1.46

### **Where do we find the information for this ratio?**

Current Assets: In the Balance Sheet

Current Liabilities: In the Balance Sheet

### **What the result means:**

The Current Ratio of say, 1.82, simply represents the number of times your current assets can be used to pay out your current or short-term liabilities. So a result of 1.82 simply means your current assets can be used 1.82 times over to pay current liabilities.

### **What it means if Current Ratio changes:**

As a general, but not definitive rule, the higher the Current Ratio the better. If your Current Ratio increases then this means you have more ability to pay your upcoming, short-term debts. There are only two inputs into this calculation: current assets and current liabilities, therefore if the ratio changes then only these two factors could have changed. Increased current assets are generally better for a business, liquidity-wise, and the same can be said for a decrease in current liabilities.

What the ideal ratio figure should be is debatable. Off-the-cuff, a ratio of 2 is regarded as a safe liquidity position in most business. A figure of less than 1 may be of concern as this means, in theory, in your current position you do not have enough liquid assets to meet your obligations when they fall due in the near term; and this may mean you need to sell non-current assets or otherwise quickly rebuild your level of current assets to make sure you are not insolvent. After all, a business will only close down when it is insolvent, and this is not necessarily based on how profitable the business is.

A healthy current ratio is not only a good sign of solvency, it is also a sign of a well-functioning business. Many businesses sell inventory (a current asset) that ends up as part of accounts receivable (a current asset) and is then collected as cash (another current asset). To do this, they purchase inventory on credit and that becomes an accounts payable (a current liability) and pay their other wages and expenses throughout the year (which are generally all current liabilities). So for most business, the standard, 'healthy' business cycle all runs through current assets and current liabilities. A well-functioning and flowing current ratio is thus a sign that 'business life is normal', so to speak.

You may be wondering what the term 'current' means, and if this is the case then don't worry it's rather simple accounting jargon. 'Current' simply means that it will be due (in the case of liabilities) or completely liquid (in the case of assets) within a 12-month period. Any liabilities that don't need to be paid for over 12-months and any assets that are not expected to be turned into cash for over 12-months are regarded as 'Non-Current'. 12 months is the line in the sand.

### **Drawbacks of the Current Ratio:**

Earlier we talked about what the ideal ratio should be, and said that it was debatable. This is part of its biggest weakness. There is simply no hard-and-fast rule; I also said that a ratio below 1 may be a concern, yet you will find many larger businesses with a high inventory turnover often have a Current Ratio below 1 and they are not in risk of being insolvent. This situation can occur, for example, when accounts payable (a common current liability) are only due monthly or quarterly, but with a high inventory turnover, larger business can quickly turn its inventory (a current asset being used to calculate the ratio) into a higher level of cash (after it is sold at a mark-up, at a profit and thus at a higher level), and this higher level of cash (with the extra profit margin on top) can then quickly bump up the current assets to meet its obligations when they fall due.

Secondly, there is an inherent assumption that all current assets can be turned into cash to pay current liabilities. Some current assets are never turned into cash, in the case of prepayments, and some are dependent on

sales results, in the case of inventory. You may have \$10,000 worth of inventory, but if you can't sell it for a reasonable price in a reasonable timeframe, you can't pay that \$10,000 current liability.

Another drawback relates to the fact that it is claimed that a high Current Ratio is better. This is true for liquidity only, if you had a Current Ratio of, say, 25 then this would be great for liquidity but is it best for the business? It is generally agreed that the more liquid an asset, the lower the return you receive for it. Often a higher return is the payment for a lack of liquidity. Therefore, if you had a Current Ratio of 25 then you may have too many low-return current assets that should be invested into higher-return non-current assets.

## **ACID-TEST RATIO**

The Acid-Test Ratio is the second liquidity ratio we will look at. This ratio is stricter than the current ratio, in that only more liquid assets are used to cover the current liabilities. Specifically, it uses cash & cash equivalents, short-term investments and short-term (current) receivables to meet the current liabilities.

So what is different from the current ratio? There are some current assets (used in the current ratio) that are either not convertible to cash, such as the prepayments mentioned before, or are either dependent on other factors to turn into cash, such as the state of the economy in selling inventory (again as mentioned before).

Since the Acid-Test Ratio is stricter than the current ratio you have more flexibility (and maybe feel ‘safer’) to meet your short-term obligations if you have a strong result, in comparison to an equivalent current ratio. In other words, it’s meant to be a tougher test and if the business ‘passes’ the tougher test, then in theory you can sleep a little easier at night.

### **The Formula:**

Acid-Test Ratio =

(Cash & Cash Equivalents + Short-Term Investments + Current Receivables) / Current Liabilities

### **Example from given Financial Statements:**

Acid-Test Ratio

= (\$265,000 + \$94,000 + \$445,000) / \$1,270,000

= 0.63

**Where do we find the information for this ratio?**

Cash & Cash Equivalents: In the Balance Sheet

Short-Term Investments: In the Balance Sheet

Current Receivables: In the Balance Sheet

Current Liabilities: In the Balance Sheet

**What the result means:**

Similar to the current ratio, if you have an Acid-Test Ratio of 1.45 or 2.67, this means that for each dollar of short-term debts (current liabilities) you have liquid assets to meet these debts 1.45 or 2.67 times, whichever the case may be.

**What it means if the Acid-Test Ratio changes:**

A general, but not definitive, rule is that the higher the Acid-Test Ratio, the better. The Acid-Test Ratio suffers from similar drawbacks to some liquidity ratios (as mentioned both in the current ratio section and below), but ultimately this ratio should not be used to draw wide conclusions about the overall success or efficiency (for example) of an organization, it is simply a pure measure of a business' ability to meet its debts when they fall due in the near-term.

Using this motive alone, what does it mean if the ratio changes? In theory, if the ratio increases over time then you have a financially stronger (or safer) business. Since the only reason a company will be forced out of business is its inability to pay its debts when they fall due (note: not when they run losses; even for many periods consecutively...although this can't be a "good" sign of corporate health), an increasingly higher Acid-Test Ratio can be extrapolated to mean there is less chance the business will collapse due to insolvency.

A high, or higher, Acid-Test Ratio may also mean that a business can continue to run without drastic changes, interruptions or changes in strategy. In other words, a low or falling Acid-Test Ratio does not mean

certain doom for a standard business, but what it may mean is that its managers may have to spend time, effort, and possibly cash, restructuring, recapitalizing or otherwise improving the “liquidity” and balance sheet of the business so it can meet its short-term debts.

This could entail selling long-term assets for cash (and then maybe halting production in a division, for instance) or increasing cash through an equity capital raising, and therefore diluting stockholders who do not participate or forcing those who do participate to front-up more cash.

### **Drawbacks of the Acid-Test Ratio:**

Liquidity Ratios are just that; they measure the ability of a business to meet its financial obligations. This is also where a problem in this ratio lies; business decisions that are good for the Acid-Test Ratio may not necessarily be good for the business.

The Acid-Test Ratio is a good measure for the ‘risk’ of an investment, but what about the other side; the ‘reward’ of an investment. Book stores are full of businessperson biographies and autobiographies and many tell about a ‘critical decision’ where everything was ‘put on the table’ for a new business strategy only to have it turn up trumps and end up making the businessperson a legend... and a big pile of cash for the aforementioned businessperson. So okay, that analogy is a little fanciful, but on the other end of an extreme, having a balance sheet completely in high-liquid, low-return assets may be great for the Acid-Test Ratio but no better than putting the money in an interest-bearing bank account. Few great successes come about by simply putting money in the bank.

As a result of liquidity measures being primarily risk measures, they may be more useful to banks and creditors as opposed to investors. This book is about business analysis, and not risk management. It is banks, and not us, who will probably focus most on measures such as this one. They will assess credit risk; they may use ratios like the Acid-Test Ratio in debt covenants and other conditions. But when it comes to business analysis in a generally secure business, this ratio should be used as a safety backstop and not a launch pad for analysis.

## **CASH RATIO**

The Cash Ratio is the final, and strictest, of the liquidity ratios we look at. It is a 'hard and fast' measure of a business' ability to meet its debts in the very near term.

It measures obligation serviceability if, hypothetically, a debt was due in a few days' time, or less; which is obviously much stricter than the 12-months that the current ratio implies.

To meet the current liabilities in this ratio, you only look at cash in the bank and the most liquid investments that can essentially be called on-demand. Thus, the ratio measures a business' ability to meet current liabilities from all on-demand funds, e.g. within a few days or less.

### **The Formula:**

Cash Ratio = (Cash & Cash Equivalents + Short-Term Investments) /  
Current Liabilities

### **Example from given Financial Statements:**

Acid-Test Ratio

= (\$265,000 + \$94,000) / \$1,270,000

= 0.28

### **Where do we find the information for this ratio?**

Cash & Cash Equivalents: In the Balance Sheet

Short-Term Investments: In the Balance Sheet

Current Liabilities: In the Balance Sheet

**What the result means:**

Like the previous two liquidity ratios, a Cash Ratio of 2.13 or 1.12 simply means that you can meet your current liabilities 2.13 or 1.12 times over with your most liquid assets.

Or in other words, for every dollar of current liabilities, there are \$2.13 or \$1.12 of highly liquid assets to meet these obligations.

**What it means if the Cash Ratio changes:**

Of all the liquidity ratios the Cash Ratio is the one that will change most frequently. This is because cash and (to a lesser extent) short-term investments are considered 'idle assets'; those that are not working hard for the business, and thus they are normally redeployed into more attractive (and less liquid) asset forms very frequently.

You will also find that the reverse can be true and that cash and other highly liquid assets may balloon quickly, for example after a high-value sale or collection, or when other assets are converted to cash to meet ongoing expenses (and the liabilities this ratio incorporates).

So this may explain why the Cash Ratio can be volatile, but underlying this, the same principles as other liquidity ratios still hold. That is, the higher the ratio, the better.

In short, the underlying theory is that if the Cash Ratio is increasing then highly liquid assets are building up on the balance sheet in respect to current liabilities, which in turn means the ability of a business to meet its obligations when they fall due is improving.

As for the flip side, if the Cash Ratio is falling then there is increased uncertainty on how it will meet its short-term debts, without undergoing asset restructures or conversions (that is, turning less liquid assets into more liquid assets allowing it to 'pay the bills on time').



**Drawbacks of the Cash Ratio:**

The strongest drawback of the Cash Ratio is that it can be volatile and may actually be just a measure of cash that is currently in the bank, and not really a measure of how capable a business is able to pay its debts.

Because increased liquidity normally results in lower returns for an asset, many businesses simply keep the bare minimum in cash and short-term investments; the rest is in inventory or higher returning assets. Only when a debt actually becomes due are the other assets liquidated to meet the payment.

Therefore, for example, a business may have a terrible Cash Ratio for 27 days in a month, but be very capable of turning assets into cash to meet their debts for the last days of the month when the debts are actually due. In situations like this, you can see why the cash ratio wouldn't be very helpful, if relying on this measure during those first 27 days.

Further along this point, unless you know the inner workings of the business you are studying, on what day should you calculate the Cash Ratio? The figure may be drastically different on each day of the month, let alone the quarter or year. Which is the 'true' figure? Unless, you measure the figure daily, hourly, etc. and then take an average, you may never know the 'true' figure.

## **Part 3: Leverage Ratios**

**Leverage:** *“the use of credit to enhance one's...capacity”*

(Merriam-Webster Dictionaries, 2012)

### **DEBT RATIO**

The Debt Ratio is the first leverage ratio we are looking at. It is both a risk ratio in regards to solvency as well as strategy ratio as it can also be viewed as the level of assets within a business that are financed by debt.

Simply put, it measures the level of liabilities in relation to assets and is expressed as a percentage. It tells us how high the company's debt levels are, while not in absolute terms. And since it's not in absolute terms you can compare across different companies of different sizes and use the same measure (as with most ratios in this book).

It can also tell us what proportion of assets could be distributed to owners of the business if we sold all the assets and paid off the debts of the company.

In regards to being a strategy measure, you can assess what proportion of assets are financed by debt. When assets are the income generating section of the business and all assets must either be financed by debt or equity, the Debt Ratio tells us what percentage of assets are financed by debt (and not equity).

#### **The Formula:**

Debt Ratio = Liabilities / Assets

### **Example from given Financial Statements:**

Debt Ratio

$$= \$2,928,000 / \$12,893,940$$

$$= 22.71\%$$

### **Where do we find the information for this ratio?**

Assets: In the Balance Sheet

Liabilities: In the Balance Sheet

### **What the result means:**

As mentioned, the result is expressed as a percentage. If you have a result of 65%, this means 65% of your assets are financed by debt, or put another way, for every \$1 of assets there are 65 cents of debt.

Perhaps in the simplest terms, a 65% Debt Ratio means the value of debt is 65% of the value of assets.

### **What it means if the Debt Ratio changes:**

The most widely used interpretation of the Debt Ratio is using it as a measure of risk. Therefore if the Debt Ratio moves up or down over time then the level of risk is changing. For instance, if the Debt Ratio falls from 65% down to 30% then this is generally regarded as an improvement in the safety of the business; that the business has a lower chance of failure. This is because, in theory, there are more assets available to sell to meet the payment of all debts and allow the company to continue with less adjustment to the overall cash-generating units (the assets).

Arithmetically, a fall in the Debt Ratio simply results from lower debt or higher assets in relation to each other. Not only is a falling Debt Ratio a good measure of lower risk, it can also be an indicator of an improvement in the business success as, perhaps, more sales have been made (increasing

assets and equity but not liabilities) or other assets have increased in value without requiring a corresponding increase in debt to achieve this; in either case this is a positive.

On the negative side, if the result is above 100% then, in theory, the business could not pay off all its debts even if it sold every one of its assets. This is a negative for both creditors and the business itself.

### **Drawbacks of the Debt Ratio:**

The major drawback of the Debt Ratio is that it can often be too broad in that it doesn't break assets and liabilities down into smaller groups, such as current and non-current groups. This can affect the risk measure utility of the ratio. For example, many of the debts may be long-term (non-current) and therefore may not need to be paid off for a while and therefore the business is not really at risk (at least not for the moment) and the debt ratio alone cannot tell us this.

Secondly, it only shows the book-value of the assets and even though they may be recognized at fair value, if all assets had to be completely sold off quickly to pay the debts then their book value may not be realized. It's kind of like trying to sell a house quickly; if you're forced into a quick sale you will usually accept a lower price and not its fair value. This is why using the Debt Ratio to tell us how much would be left over for the owners or tell us how easily a company could pay off all its debts, may not be 100% accurate.

## **DEBT TO EQUITY RATIO**

The Debt to Equity Ratio is the second leverage ratio on our list. The Debt to Equity Ratio is best used as a strategy measure in that it measures the level of leverage within a business.

This ratio reflects how aggressive the business has been in its debt policy. It measures the use of debt to finance the business against the use of stockholder equity to finance the business.

It is termed 'aggressive' as a business may use outside debt finance to 'leverage' or 'speed up' their growth instead of relying upon stockholders & retained earnings (equity) to finance future growth of the business.

The idea behind leverage is that it 'levers' the results of the business. In other words, it allows the business to operate on a scale beyond what the owners or the business itself have financed. The business can use creditors to lever the business to achieve better results than would otherwise be possible.

However, leverage is a double-edged sword, while if the business is successful in using the borrowed funds it can distribute greater benefits to the same number of owners, if the business is not successful in using the borrowed funds the leverage will also lever the losses and make the losses bigger than they would have been without the leverage.

Further, with credit (unlike stockholder funds) if the business cannot provide a return to the creditors (i.e. service the debt) then the business may go into bankruptcy.

### **The Formula:**

Debt to Equity Ratio = Liabilities / Equity

### **Example from given Financial Statements:**

Debt to Equity Ratio

= \$2,928,000 / \$9,965,940

= 29.38%

### **Where do we find the information for this ratio?**

Liabilities: In the Balance Sheet

Equity: In the Balance Sheet

### **What the result means:**

The result is expressed as a percentage: A figure of 20% means that for every dollar of stockholder funds (equity) there are 20 cents of liabilities.

Expressed another way, for all assets that have been funded in the business by either debt or equity (the two ways to fund a business), the proportion of debt is 20% of the level of equity.

### **What it means if the Debt to Equity Ratio changes:**

A change in the Debt to Equity Ratio represents a change in 'gearing' or 'leverage'. This normally occurs due to a deliberate change in how the business will fund its growth. A higher level of leverage (a higher Debt to Equity Ratio) can often accelerate growth than would otherwise be the case. This is because more cash-generating assets can be funded (by the extra debt) which would ideally increase the speed that the assets can generate returns while keeping the level of stockholder funds the same. This increases returns for the same level of stockholders. That is, you use a 'lever' to grow the business faster than would otherwise be possible than simply using retained earnings or performing a capital raising for more stockholder funds (which while still increasing returns would have to be spread across more stockholders; thus neutralizing the higher returns).

The negative side of having a high Debt to Equity Ratio, and why it is also used as a risk measure, is that while leverage can increase growth it can also 'lever' the losses if the business plan does not work out. Higher debt will

require higher interest payments and when a business is performing poorly these high interest payments can be a large burden than would otherwise be the case. Generally, a company only goes out of business due to debt it cannot service, therefore high debt can lead to possible collapse which would not be the case if funds were raised through equity issuance and retained earnings.

In conclusion, when the Debt to Equity Ratio changes it represents a change in the financing strategy of the business.

### **Drawbacks of the Debt to Equity Ratio:**

As for drawbacks, there is no black-and-white 'optimal' Debt to Equity Ratio that a company should maintain.

This means even when you do calculate the result you cannot determine whether this result is 'good' or 'bad'. How you interpret the figure often depends on the internal company policy and even on the opinion of the person performing the analysis. This means you may see a 75% Debt to Equity Ratio as a negative while an equally intelligent person may not view it negatively.

In regards to company policy, not only does the figure depend on the industry, it may also depend on the life-stage of the business and generally how successful the business is at implementing its business plan and managing its debt. New businesses for example may wish to grow faster and take advantage of new opportunities quicker and thus may want a higher debt to equity ratio. Or a business may make excellent use of its borrowed funds and thus a continually high debt to equity ratio may be of no concern risk-wise and may be ideal for faster growth.

## **TIMES INTEREST EARNED RATIO (ALSO KNOWN AS INTEREST COVERAGE RATIO)**

The Times Interest Earned Ratio is the final leverage ratio we look at and is slightly different to the previous two. It is purely a risk measure and the calculation tells us how many times over a company's earnings, specifically its earnings before interest and tax (EBIT), can be used to meet its interest payments.

While the debt ratio is a risk measure telling us the level of business debt, the times interest earned ratio is a risk measure telling us about debt serviceability. It explains how easily (or not) a business can service its debts. The higher the ratio, the more times over its EBIT can meet its interest expense, the easier it can service its debt and the safer a business appears to be.

### **The Formula:**

Times Interest Earned Ratio =  $(\text{Income Before Tax} + \text{Interest Expense}) / \text{Interest Expense}$

### **Example from given Financial Statements:**

Times Interest Earned Ratio

=  $(\$1,955,550 + \$85,000) / \$85,000$

= 24.01

### **Where do we find the information for this ratio?**

Income Before Tax: In the Income Statement (Profit & Loss Statement)

Interest Expense: In the Income Statement (Profit & Loss Statement)



**What the result means:**

The measurement simply represents how many times over a company's EBIT covers its interest expense.

That is, a result of 5.6 means there is 5.6 times EBIT than there is interest expense.

**What it means if the Times Interest Earned Ratio changes:**

Firstly, the fact there is any result at all after the calculation must imply there is some interest expense (if not, the result would be a figure divided by zero).

Next, the ratio is a pure risk measure. The main reason why a company collapses is that it cannot service its debts when they fall due (i.e. pay the interest expense). Therefore you need to have a margin of safety from EBIT that covers your interest expense; so the business does not collapse. If you do not have this margin of safety then the only way to meet your interest expense is to sell part of your asset base for cash or otherwise negotiate with the creditors.

So, if the Times Interest Earned Ratio is changing then this margin of safety (risk) is changing. Ideally you want the ratio to be increasing over time as this means you are finding it easier to service debts from your earnings and allow for further growth or investments.

If the ratio is falling over time, then this means either you are earning less from operations (other things being equal) or you have taken on more debt (with a higher interest expense) but you do not have a corresponding increase in EBIT as a result of the extra borrowings. Neither of these cases is positive news for a business, both as performance measures nor as risk measures.

In conclusion, a change in the times interest earned ratio represents a change in debt serviceability based on EBIT.

**Drawbacks of the Times Interest Earned Ratio:**

The chief drawback of this ratio is that it does not definitively tell you whether a business is in danger of collapse. It only uses earnings/EBIT (the income statement) as the basis to meet its debt costs, yet as we saw from other leverage ratios which we covered, assets (the balance sheet) may be available to meet the ongoing interest expenses; as well as further capital raisings (the balance sheet).

While it is not ideal to be selling-off your asset base or keep on raising capital to meet your interest expenses, there is no reason why this can't be done for a period of time.

So while it is a good risk measure, it should probably be used in conjunction with other leverage ratios. You should review the level of assets in the business in relation to total debt and maybe even the business' success with previous capital raisings.

## **Part 4: Efficiency Ratios**

**Efficiency:** “effective operation as measured by a comparison of production with cost (as in energy, time, and money)”

(Merriam-Webster Dictionaries, 2012)

### **INVENTORY TURNOVER**

Now it's time to get into the efficiency ratios. These are the ratios that allow measurement of how well management operates this business; that is, how efficient they are in particular areas.

The first efficiency ratio we look at is the Inventory Turnover. This ratio measures how many times in a given period a business is able to sell its average level of inventory.

It is obvious that a business wants to sell its inventory as quick as possible and not leave it sitting on the shelf, so to speak. So the Inventory Turnover tells us how many times a business sells its inventory, replaces it and sells it again and so on.

In regards to 'efficiency', the Inventory Turnover tells us how efficient a business is at stocking and selling its inventory... and stocking and selling inventory is obviously a very important aspect of those businesses that hold inventory.

#### **The Formula:**

Inventory Turnover =

Cost of Sales / ((Inventory at Start of Period + Inventory at End of Period) / 2)

**Example from given Financial Statements:**

Inventory Turnover

$$= \$1,846,450 / ((\$542,000 + \$802,000) / 2)$$

$$= 2.75$$

**Where do we find the information for this ratio?**

Cost of Sales [COGS]: In the Income Statement (Profit & Loss Statement)

Inventory at Start of Period: In the previous Balance Sheet

Inventory at End of Period: In the current Balance Sheet

*Note:* There are different names for Cost of Sales. The main others are Cost of Goods Sold [COGS] or Cost of Revenue.

**What the result means:**

A calculation of, for example, 8.9 can be interpreted as the business has stocked the shelves of inventory and completely sold out 8.9 times over.

While the figure uses average inventory, and a business normally orders different levels of inventory over the period, the COGS figure should be very accurate and therefore '8.9 times' can be used as a good benchmark.

**What it means if the Inventory Turnover changes:**

Since it is an efficiency measure you can regard a change in this ratio as a change in efficiency. That is, in selling or procurement efficiency.

Either sales are increasing and the speed at which goods are leaving the shop floor is improving or perhaps procurement has become more accurate and inventory purchases represent what the market wants and less is being

left on the shelves (even though the level of inventory purchases may be changing).

What is attempting to be expressed here is that the higher the figure the Inventory Turnover is almost always the better. There would be very few business that would not want to completely sell out their inventory more regularly.

However what exactly is causing the change is generally unable to be distinguished from the ratio alone. If you are an outsider to the company you are analysing, then look for an increasing trend in the Inventory Turnover as a general (single indicator) sign of good business sales health. In you are an insider to the business, then you should hopefully be able to drill-down into what is causing this change. Has a marketing campaign been implemented recently? Have you recently changed the way you source inventory?

### **Drawbacks of the Inventory Turnover Ratio:**

As with many efficiency measures, unless you're an insider and have access to internal management reporting it can sometimes be hard to determine what is causing changes in the Inventory Turnover. A good economy generally lifts up all the boats in the ocean, and the reverse for a poor economy. Without knowing the particular operations and strategies of the company being analysed it's difficult to know if it's good management or good luck.

Further, the components of the Inventory Turnover have nothing to do with selling prices or gross profits. Therefore, while a business may have a fantastic Inventory Turnover it may not be achieving the profit or returns that others may be, even though their ratio isn't as impressive.

Finally, the Inventory Turnover is very industry-specific, and cross-industry comparisons aren't recommended. Some industries simply sell their inventory quicker than others and will have a higher Inventory Turnover naturally. For example, you would expect a national grocery retailer to have a much higher Inventory Turnover Ratio than an automobile dealership

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## **ACCOUNTS RECEIVABLE TURNOVER**

The next efficiency ratio we look at is the Accounts Receivable Turnover. This ratio is very similar in its structure to the inventory turnover ratio, except now we interpose accounts receivable in place of inventory.

The second feature we need to mention is that this ratio is used for internal purposes for those within an organization, instead of externally from those outside. This is because it is almost impossible to garner the necessary inputs unless you have access to internal reporting. That is, you need to know the level of credit sales made in the period. Therefore unless you know the business' credit policy and proportion of credit sales to cash sales, then you will be unable to calculate this ratio.

However, if you do have all the required information, what does this ratio tell you? It tells you how times over you turned your accounts receivable (AR) balance into cash. How many times you built up an AR balance, collected the cash & repeated this.

The benefit from knowing the result of this ratio is that it can assist with cash flow planning and assess the level of success within the collections department. While knowing how many times an AR balanced turned over isn't that useful in isolation, the result can be used as a good benchmark for measurement over time. Further, as it removes scale from the business the benchmark can be used within an organization that is changing in size.

### **The Formula:**

Accounts Receivable Turnover =

Credit Sales / ((Accounts Receivable at Start of Period + Accounts Receivable at End of Period) / 2)

### **Example from given Financial Statements:**

Accounts Receivable Turnover

$$= \$812,000 / ((\$163,000 + \$368,000) / 2)$$

$$= 3.06$$

**Where do we find the information for this ratio?**

Credit Sales: From the Internal Accounting Records or the Sales Department

Accounts Receivable at Start of Period: In the previous Balance Sheet

Accounts Receivable at End of Period: In the current Balance Sheet

**What the result means:**

A figure of 6.5 (for example) means the business turned their complete accounts receivable balance into cash 6.5 times (through collections) over throughout the period.

**What it means if the Accounts Receivable Turnover changes:**

There are three main causes to a changing Accounts Receivable Turnover, with two being genuinely under the control of management.

The first under internal control is that new processes, systems and/or management have changed the success in which they collect debts. If the AR Turnover increases, then the Accounts Receivable and Collections team have become better at achieving a core function; this is generally a good thing (see the 'Drawbacks' section for when it is not a good thing). When the AR Turnover falls, the opposite is true: the collections team is performing worse or if there is no dedicated collections team, then the accounts department (or perhaps management) is dedicating less time and effort on managing a key aspect of cash flow control.

The second reason under internal control is that there has been a deliberate change in the credit and collections policy of the business. A business may have changed its payment terms for strategic or cash flow reasons and

customers and the collections team may have adjusted to the new payment window. For example, changing terms from 30-day to 60-day would both increase the balance of AR within the balance sheet as well as lower the actual rate of collection turnover. A change of credit and collections policy is very common and may result in increased sales (if the policy is loosened) or improved cash flow (if policy is tightened effectively).

The final reason, not under the control of management, and a factor in many of this book's ratios, is that the general economy or particular industry may be trending towards a downturn. A general slump in business conditions may lead to everyone's cash flow coming under pressure. Often the simplest method to improve one's own cash flow is to delay or ration payments of their invoices until a later time (maybe even until they are 'forced' to pay them). Delayed payment of invoices is a unique barometer of the general health of an economy or industry and the more widespread this action is, the greater the flow-on effect is; as a business may delay payment of its own invoices as it is waiting for a payment from someone else.

### **Drawbacks of the Accounts Receivable Turnover Ratio:**

There is one very large drawback of the Accounts Receivable Turnover ratio and it is similar to many other ratio drawbacks and comes from focusing on financial information too heavily. This drawback has been referred to earlier and is the fact that a company's credit policy may in fact be part of its strategy and thus the ratio may not be a reflection of collection success at all. If a business can offer 'favourable' credit terms, by perhaps offering a longer payment window, then it may in fact increase its level of sales. So while the AR Turnover may be falling due to an increased payment window, this may be a boon in the sales revenue account. And after all, the new customers may be big spenders, loyal customers and may always pay on time, just a later date.

On the flip side, if a business is unimpressed with its AR Turnover and management comes down hard on the collections team to "hurry up and collect", and they do this, then possible loyal, long-term customers may be discouraged from repeat business by the 'aggressive' collections team they



must now deal with when using this business. It's not good business practice and may be 'throwing the baby out with the bathwater' (frustrating good-paying clients as well as delinquent payers) to have a super-friendly sales team and then a super-aggressive collections team.

Credit policy is a key part of any sales and client service strategy and the Accounts Receivable Turnover simply does not take this into consideration. Changes in credit policy will immediately change the AR Turnover, and unless this policy change is taken into account, then decisions based on this ratio alone may become warped.

## **DAYS' SALES IN RECEIVABLES**

This is one of my favourite ratios, especially when it comes to efficiency management. Why? Because it has the ability to turn accounting and financial data from the financial statements into a result that is expressed in time, that is, in days.

Days' Sales In Receivables tells you how many days on average it takes to turn your accounts receivable balance into cash. Therefore it measures the efficiency of your collections policy and department.

The ratio's benefits and drawbacks are similar to the accounts receivable turnover ratio, but it has a unique advantage in relation to the previous ratio because it allows a level of cash flow planning, which aids in management decision making, that is more easily observed and understood. In other words, the ratio gives an exact average of the length of the collection period, so for example if your Days' Sales in Receivables result is a particular figure, then you can adjust your own cash spending to accommodate when you expect to turn your accounts receivable balance into cash, given you have a set figure measured in 'days'.

### **The Formula:**

Days' Sales in Receivables =

$$((\text{Accounts Receivable at Start of Period} + \text{Accounts Receivable at End of Period}) / 2) / (\text{Sales Revenue} / 365)$$

### **Example from given Financial Statements:**

Days' Sales in Receivables

$$= ((\$163,000 + \$368,000) / 2) / (\$5,777,000 / 365)$$

$$= 16.77 \text{ Days}$$

**Where do we find the information for this ratio?**

Sales Revenue: In the Income Statement (Profit & Loss Statement)

Accounts Receivable at Start of Period: In the previous Balance Sheet

Accounts Receivable at End of Period: In the current Balance Sheet

**What the result means:**

A result of 35 “Days” means that on average it takes 35 days to turn your accounts receivable balance into cash; or 35 days, on average, to collect your credit sales.

**What it means if the Days’ Sales in Receivable changes:**

Since both the accounts receivable turnover and Days’ Sales in Receivables use very similar financial data in their equations (it is only a different formula producing an output in a different unit of measurement) the reasons for a change in Days’ Sales in Receivables, and how to interpret it, are also very similar.

There are four major drivers in a change to Days’ Sales in Receivables with three being under the control of management.

Three of the major drivers are identical to those of the accounts receivable turnover, so we will not focus on these again and you can just refer to the explanations in accounts receivable turnover if you need a refresher. These drivers are [1] the efficiency of the collections team, [2] the credit and collections policy and [3] the general state of the economy.

The fourth and final reason for any possible change to Days’ Sales in Receivables reflects the new input into the equation (in comparison to the accounts receivable turnover). This final reason, related to sales revenue, is the credit policy and level of credit sales within sales revenue. All other things being equal, if the level of credit sales increases as a matter of policy and therefore leading to a higher accounts receivable balance on average, then the Days’ Sales in Receivable will increase. This figure will increase even though no other changes to the business may have occurred. But at the

same time, this result makes sense. If, for instance, credit sales suddenly double and accounts receivable suddenly double then there will be more outstanding accounts for the same collections team to manage.

### **Drawbacks of the Days' Sales in Receivable Ratio:**

The main drawback to this ratio was mentioned both within the section on the accounts receivable turnover as well just mentioned in the previous paragraph.

This main drawback is that the resulting figure is very susceptible to the particular credit policy of the business being analysed, and the optimal credit policy cannot be accurately channelled into a single 'time' period as it revolves around various levels of management, marketing and service strategy.

Then there is the fact that a simple adjustment in credit policy (and resulting level of accounts receivable) arbitrarily alters the ratio's result when all other facets of the business have not changed at all. You would hate to be the collections manager being given a stern lecture based on a poorer Days' Sales in Receivable ratio (with higher AR balances and a stable sales revenue figure) simply because the management decided to shift their strategy from cash sales to sales on credit.

## **Part 5: Valuation Ratios**

**Valuation:** “The monetary worth of something, especially as estimated by a valuer”.

(Oxford Dictionaries)

### **EARNINGS PER SHARE (EPS)**

Earnings per Share is probably the most widely quoted ratio for listed companies worldwide. From all points of the financial media you will hear references to the Earnings per Share, or EPS, of major companies in response to profit or earnings results. The ratio is a quickly comparable measure across businesses of the earnings in relations to each share of the company. And when the owners of the business hold shares, or stock, the EPS provides an easy guide across all companies and investment opportunities in the stock markets. Further, since the goal of business is to earn a profit (earnings) and shareholders are the owners of the firms, the Earnings per Share figure gives an immediate reference for valuation of a business.

This ratio is also widely quoted as it can have a direct influence on the value of a stock. Owners indirectly buy the earnings potential of a business when they purchase stock, thus this ratio (based on earnings) can have a direct influence on what one would pay for each share. While not a 100% direct influence on stock price, it is no accident that companies with higher EPS generally have a higher stock price, and vice-versa.

What the ratio represents is how much profit is generated per common share of the business. Simply, you take the net profit figure, adjust it for preference shares (who aren't ordinarily voting members of the business) and divide this result by the number of shares outstanding.

**The Formula:**

Earnings per Share (EPS)

= (Net Income – Preference Dividends) / Weighted Average Number of Common Shares Outstanding

**Example from given Financial Statements:**

Earnings per Share (EPS)

= (\$1,368,885 - \$50,000) / 19,625,000

= \$0.07

**Where do we find the information for this ratio?**

Net Income (Profit): In the Income Statement (Profit and Loss Statement)

Preference Dividends: Either from the Income Statement or from other Company Documentation

Weighted Average Number of Common Shares Outstanding: Within the Notes to the Financial Statements.

**What the result means:**

The result is expressed as a monetary figure. An EPS of 58 cents would mean that for every common share outstanding there were 58 cents of net profit (earnings) for that share.

If you multiply the EPS by the number of common shares outstanding then you would have the total reported aggregate net profit and preference dividends for the period.

### **What it means if the Earnings per Share changes:**

If you are a stockholder of a business then you want the EPS to increase over time, as this generally means for every dollar you invested an increasing level of profit is being generated.

The key driver of EPS is management success or lack of it, the financing policy of the business or the general strength of the economy.

Let's cover the easiest one first. As mentioned within other ratio sections, the strength of the economy is like the rising or falling tide of the ocean: generally it lifts or drops the financial success of a business no matter how skilled, special or well-trained a management team is. A booming economy will normally lead to a higher EPS for most businesses or lead to a falling EPS when the economy is shrinking.

The second reason is the skill of management. All internal decisions are incorporated into the earnings figure. In fact, management is normally hired because they can ideally lead to superior earnings for the business. Not only does it represent the bottom line for the business, but also its strong influence on the stock price means that it is often the 'bottom line' for the stockholders (the owners). And since management is responsible for the bottom line and the stock price, it can be assumed that EPS is a direct result of management's strategy and implementation. The comprehensiveness of the EPS figure (using the final net income figure) and its flow on effects means that EPS results will almost always be a key performance indicator for management too. This aspect alone implies that management will always try to have a direct influence on its outcome. Further (in the defence of management), the same comprehensiveness does mean that external, uncontrollable influences will impact the ratio beyond any management's ability to control it.

The final influence, the financing policy of the business, is covered both here and within the 'Drawbacks' section. The reason financing policy is an influence lies in that the EPS is as a result of net profit in relation to common stockholder equity and therefore debt financing is totally excluded and that the issuance or cancellation of shares can also have a direct impact. If debt is suddenly tripled, for instance, then profits generated from this debt may suddenly balloon as well. This means EPS will grow as profits have increased while common stockholder equity has remained the same.

On the other hand, if common stockholder equity changes, possibly from a new share capital raising then the EPS would fall if profit remained the same.

### **Drawbacks of the Earnings Per Share Ratio:**

As was mentioned just previously, debt financing is excluded from the computation of EPS. This may mean the EPS is somehow being disguised or manipulated without a necessary reference to risk. What is meant by this? Earlier it was said that as a stockholder you want EPS to be increasing over time, but what if an increasing EPS is being driven purely by increased debt? This otherwise good result hides the possible risk being taken on by higher debt levels.

The other main drawback is often the over-importance that is placed on the EPS. It is often the first headline figure quoted by the financial media and has an immediate impact on the stock price. However, what actually determines the true value of a stock has never been definitively agreed upon and many experts rely on many different statistics and ratios to make their valuations. To focus only on the EPS as a measure of stock value may be an oversimplification. For example, EPS relies heavily on net income, yet many believe cash flow from operations (from the cash flow statement) is a better measurement for performance. Further, an idol of mine, Warren Buffett uses a modification of net income (not EPS) in his calculations of valuation.



## **PRICE/EARNINGS (P/E) RATIO**

The Price/Earnings Ratio, or P/E Ratio, is a popular valuation measure for listed companies. It is often used as a measure of how ‘cheap’ or ‘expensive’ a stock is in relation to another benchmark, such as an index or industry comparison.

What the ratio measures is the number of times the stock price covers the EPS of a company. Or to put it another way, how many years of earnings (indicated by EPS) would be required to meet the level of the stock price.

Since earnings and EPS is closely linked to stock price value, the P/E Ratio can be regarded as a measure of value (cheap or expensive) because in theory it measures how much investors are willing to pay for a given level of EPS, i.e. “this stock is cheap because I only have to pay 4 times its EPS” or “this stock is expensive because I am paying 50 times its EPS”.

How accurate this ‘value’ application of the P/E Ratio is debated by different practitioners and depends on individual valuation theories. But what is not debatable is its widespread popularity as one of the most quick and simple references to value.

What you will also often find is that the P/E Ratio is calculated for an entire index or segment of the market and the same quick valuation references are made. I, for one, often hear how the whole ASX200 (my home town, Australian index) has a P/E ratio of, say, 8.5 and that this is ‘cheap’ in relation to historical P/E Ratios for the market.

### **The Formula:**

Price/Earnings (P/E) Ratio

= Stock Price / Earnings per Share

### **Example from given Financial Statements:**

Price/Earnings (P/E) Ratio

= \$0.32 / \$0.07

= 4.57

### **Where do we find the information for this ratio?**

Stock Price: From your Broker or the Financial Media.

EPS: You can either use the Formula provided in this book or can often find the EPS quoted in Financial Media or Company Announcements.

### **What the result means:**

The P/E Ratio is given as an integer, normally with a decimal place or two.

What the number means, for example 7.4, is that the stock price is 7.4 times the EPS. Or that it will take 7.4 years of earnings (given constant annual EPS) to match the stock price (arguably what you pay for the earnings).

### **What it means if the Price/Earnings Ratio changes:**

Since there are only two inputs into this ratio this means that the only reason for a changing P/E Ratio can be a change in stock price or a change in EPS.

Like many other ratios, the economy can alter this ratio with no effort from management. A booming economy may lead to a booming stock market and/or level of earnings, or vice-versa in a declining economy. Therefore, this factor can affect either of the two inputs into the ratio.

As for the stock price input alone, this is normally affected by either the general popularity of the stock, the anticipated growth levels of the company or some sort of valuation based on earnings or discounted cash flows or return on equity.

The previous paragraph is the shortest possible explanation into why a stock price might change. As I write this second edition of the book I have deleted a few paragraphs and simply would rather say this instead in

relation to stock price changes: Determining every possible reason why or why not a stock price may change is beyond the scope of this introductory book and beyond my own capabilities of knowledge and explanation. Simply, explaining and predicting stock price changes is the 'Holy Grail' of millions of stock market investors and professional worldwide. Endless books have been written, academic theories developed, careers built and fortunes been made and lost in the quest to explain and predict stock valuations. I will not add to this body of knowledge in this section of the book (beyond the brief paragraph beforehand) but will instead refer you to this book's entirety into how you can begin to explain why stock prices change. The final thing I will say (for now) on the matter is that businesses are generally rewarded with higher valuations when they undertake projects that earn them a higher return (measured by return on equity) than their cost of capital (cost of debt and equity). Apart from that, happy hunting in your own quest for the Holy Grail!

As for reasons that may affect the EPS, please have a look at the EPS ratio section in this book (the previous section) for more detail, as it would be not be efficient to simply rehash the reasons again here.

### **Drawbacks of the Price/Earnings Ratio:**

Firstly, assuming that it does accurately tell you whether a stock is cheap or expensive, then there is the drawback that you can only consistently use the ratio within industries. You will find that particular industries have various average P/E's in relation to other industries. Some industry's companies have naturally higher average P/E ratios, while other industries' businesses are lower. Therefore you will have to decide on what particular industry you're going to invest into before using this ratio for valuation.

Perhaps the biggest drawback is that the P/E Ratio may not tell you at all whether a stock is cheap or expensive. For the original assumption to hold then you must expect that a 'cheap' stock will eventually rise to fair value and an 'expensive' stock will eventually fall. As one of my investment idols said: you may be comparing a 'cheap' 4-cylinder hatchback car, to an 'expensive' V8 racecar. The racecar will always be a better car, always perform better and always win the race. Just because you bought the

'cheap' car doesn't mean its performance will rise to a fair, average level in the future and catch up to the racecar. After all, there may be a very valid reason why it was so cheap. Basing the future performance of a business or stock on how 'cheap' the P/E Ratio says it is may be placing too much weight on this valuation technique.

## **DIVIDEND YIELD**

If you are an income investor in listed companies then there are few more important ratios than the Dividend Yield. The ratio gives a simple annual return on investment based on the level of dividends in relation to the stock price.

It is widely used for investment comparison both across stocks themselves and across asset classes. This is because most investment returns are expressed as some sort of yield or percentage return on investment, whether it is property, bonds, bank savings, etc. What the Dividend Yield does is turn the return on an investment in the stock market into a yield that can be compared against every other alternative investment.

If you invest in companies to see a return based on capital growth then you may not be interested in the Dividend Yield. However many finance academics believe that dividends are the only 'true' return on a stock market investment. This is based on the idea of 'efficient market hypothesis' and 'random walk hypothesis' and that the idea that capital growth from stock investment is based on pure chance and you are equally likely to see a stock price fall as it to rise. Therefore the dividends you receive from holding the stock are the only 'true' returns that can be predicted and valued; and therefore dividend returns determine the 'true value'. For people that hold these views, or for those who invest simply for income through dividends, then having the Dividend Yield to measure an annual return and to make comparisons between alternative investment opportunities is critical.

### **The Formula:**

Dividend Yield

= Annual Dividends per Share / Stock Price

### **Example from given Financial Statements:**

Dividend Yield

= \$0.04 / \$0.32

= 12.5%

**Where do we find the information for this ratio?**

Stock Price: From your broker or the financial media.

Annual Dividend: From the financial media, company announcements or from a company's investor relations resources.

**What the result means:**

The Dividend Yield is expressed as a percentage. A result of 5.4% means that the annual dividend of the company is 5.4% of the stock price.

Or expressed differently, if you purchase the stock today you will receive an annual return of 5.4% from dividends.

**What it means if the Dividend Yield changes:**

There are three arithmetic reasons why the Dividend Yield will change; either the stock price changes, profit changes with a static payout ratio & stock price or, on the other hand, profits & the stock price remain static while the payout ratio changes.

The reason (or uncertainties and ambiguities) for a stock price changes was covered in the P/E Ratio section of this book, and similarly, reasons for profit changes have already been canvassed a number of times in previous sections of this book and will not be returned to again. The mathematical idea is that if the stock price remains constant and profits rise (or fall) and the same percentage of profits are paid out as dividends (the payout ratio), then the absolute figure of dividends will increase (or decrease) and the dividend yield will also change.

As for the payout ratio changing, this is a choice of management and the company board.

The reason behind dividend policy is a study in itself and is part of most corporate finance education. A dividend policy may be chosen because of an active stockholder base demanding a return of excess cash. Or perhaps the company management may believe a higher dividend will attract more investors and push up the stock price for the benefit of all current stockholders.

As for taking the decision to reduce the level of dividends, there are once again many reasons. Two major reasons are that (1) the company simply does not have the spare cash; perhaps the success of the business was not as hoped or that there are upcoming expenditures which require the cash to be utilized in other ways apart from dividends. There is also the reason (2) that management, and stockholders, believe the company can use the money to grow the business faster and generate more return on equity or capital growth than the stockholders could achieve if they received the cash. For instance, if management paid lower dividends, kept the cash to grow the business and achieved a return on equity of 20% and saw a 15% increase in the stock price, then this for many is better than receiving a dividend and putting it in the bank that will return 3%.

### **Drawbacks of the Dividend Yield:**

A drawback is that the ratio is only really of use for income investors. If you invest for capital growth, i.e. to see the stock price increase and make your return that way; then dividends aren't too important. In fact, you may only look at the ratio to see if the Dividend Yield is low in the hope that the funds are being used to accelerate growth.

Further, two professors from the 1950s, Modigliani and Miller, won the 1985 Nobel Prize in Economics for developing a theory that (in part) stated that dividends have no impact of a company's value whatsoever. Dividend payouts could be 'chosen' by individual investors, as they are free to reinvest their dividends in company stock and thus reduce their own dividends or, on the other hand, sell company stock in the market, receive cash for this, and create (increase) their own dividends.

Finally, there is the drawback that the Dividend Yield can be misleading when it comes to the total return on an investment. Why is this? Because you may calculate the Dividend Yield to be 7% (which sounds fantastic in relation to many other investments) only to find the stock price falls 20% over a year. Therefore, combining your dividend return and paper loss, you are not up 7% but actually down 13%. In other words, whether you're an investor for capital growth or not, the stock price and changes in it, will have a material impact on your investment. Perversely, the faster a stock price is falling, the more appealing the Dividend Yield becomes as the 'fixed' dividend grows in relation to a falling stock price.



## **PAYOUT RATIO**

The Payout Ratio displays the proportion of earnings that is paid out in dividends. It expresses dividends per share as a percentage of EPS. The payout ratio along the 'retention ratio' (which is '1 – Payout Ratio'), are both quick references into how management uses its earnings. That is, whether earnings are returned to the stockholders as dividends or retained in the business for future growth.

The payout ratio is specifically based on the concept that stockholders are owners of the business and should therefore receive the benefits (profits) of the business.

When it comes to the 'retention ratio', this can be used as guide on how much of the generated profits is being retained in the business, which can be used for growth and increased profits down the track.

How you value and select your investments will determine whether you place more weight on the Payout Ratio or the 'retention ratio'. Essentially it comes down to whether you prefer to control the profits of the business yourself (i.e. take the dividend and decide what to do with the cash) or whether you prefer your investment's management to control the funds (i.e. leave the funds in the business and have management make the investments from there).

### **The Formula:**

Payout Ratio

= Dividends per Share / Earnings per Share

### **Example from given Financial Statements:**

Payout Ratio

= \$0.04 / \$0.07

= 57.1%

**Where do we find the information for this ratio?**

Dividend per Share: From the financial media, company announcements or from a company's investor relations department.

Earnings per Share (EPS): From the financial media, company announcements or you could use the EPS formula given in this book.

**What the result means:**

The Payout Ratio is given as a percentage. It represents the percentage of earnings (EPS) 'paid out' as dividends. Thus a Payout Ratio of 25% means that given the stated EPS, 25% of the figure was used as dividends per share. Or that 25% of earnings was 'paid out'.

**What it means if the Payout Ratio changes:**

Firstly, as for there being an "ideal" Payout Ratio, this will depend on your own individual investment preference and strategy.

As for what it means when the ratio changes, this in turn depends on dividend policy and earnings capability.

Dividend policy is under control of management and was described in the dividend yield section. The policy revolves around the activity of the stockholders and how management generally sees the benefits (or lack of them) of handing back the cash to the owners of the business. This itself can be affected by the growth strategy of the business and management's perception of how investors will react to a given dividend policy.

As for earnings capability, this is also generally under the control of management and has a direct influence on the payout ratio because if the dividend policy remains constant (i.e. a given dividend per share) and EPS increases, then the Payout Ratio will fall as a matter of arithmetic.

On the flip side, one could argue if you are a stockholder, then a higher EPS should lead to a higher dividend, which could keep the Payout Ratio

constant.

As for more detail on what a changing EPS means, please refer to that section of this book. As you have become more skilled in ratio analysis, you are obviously seeing how many of these ratios relate to one another and that many ratios often reinforce the same messages.

### **Drawbacks of the Payout Ratio**

While very useful to know, the Payout Ratio doesn't tell beginners much about the business except the management's internal dividend policy. While the dividend yield can help us compare investments and the core EPS figure helps us with valuation, the Payout Ratio is a little abstract.

Outside of the ability to 'judge' an investment based on an individual's preferred Payout Ratio, there is not too much else to extrapolate from the ratio. While not a serious drawback in itself, you will have found that many of the earlier ratios often led to many avenues of enquiry and could help paint a much more detailed picture of the business. This is not the case with the Payout Ratio alone.

## *Final Thoughts*

Well that's about it. I hope you have learnt some techniques and built some confidence in conducting your own ratio analysis. I know that this concise book is hardly a 'classic' or "War and Peace", but I hope your investment of money and time in purchasing and reading this book will pay off many times over when making future financial decisions.

On final thing to remember: for best results, you should not see ratio analysis as a 'one-off' process. You should have a regular routine of using these ratios and look out for trends within the results. This will allow you to add further clarity to the 'stories' of the businesses you are analysing; and you can better tell how the sands are shifting over time.

*FURTHER NOTE:* While every ratio is expressed in this book is how I use them, different textbooks, teachers or advisors may have slight variations in comparison to those expressed here. It's normally a personal preference or how an individual learnt them themselves. But don't worry, how you measure, for example return on assets (either using average assets or final assets) or other ratios is not of utmost importance. As I said in the Introduction, it is not the calculator (or single) result that is most important but it is how you interpret the results, through comparison, trend watching and analysis from inquiry, which is most important.

## *Extras*

## ***Book Excerpt***

The book just completed made the assumption that you know how to read a balance sheet. Many of the references for the calculations required this. Even if you were able to make these leaps, you may want to spend more time in building your balance sheet knowledge. In fact, there is much financial statement analysis that can be done even without calculating ratios.

Written for the novice & non-accountant, Financial Statement Basics: From Confusion to Comfort in Under 100 Pages, is another book written by Axel Tracy (the author of Ratio Analysis Fundamentals).

Below is an excerpt from this book. If you wish to Buy the Book, you should be able to find it at the same bookstore offering Ratio Analysis Fundamentals.

### **Assets**

*“An asset is a resource controlled by the entity as a result of past events, and from which future economic benefits are expected to flow to the entity”*

- IASB Conceptual Framework: Chapter 4 The Framework; paragraph 4.4(a)

The definition above is the ‘complicated’ definition of an asset, which I mentioned earlier. The definition comes from the International Accounting Standards Board (IASB), a financial accounting standards (rules) organization that sets the standards for all nations who follow international accounting standards.

Breaking the jargon down, the definition is not too complicated. An asset is something that is “controlled” by a business (like a factory) due to a “past” transaction (buying the factory), which causes a flow to the business of

“future economic benefits”, i.e. income will be derived from using the asset in the future (the factory will produce goods in the future that will be sold for income).

Technically, anything that fits inside the above definition could be called an asset. And these are what sit at the top of the balance sheet.

The key idea is that an asset is acquired and/or held by a business in order to generate, or access, cash from it in the future.

Generally, the convention is that assets are listed in order of liquidity down the balance sheet. That means that the most liquid assets (e.g. cash) sit at the top of the list of assets and the least liquid (perhaps an oil transport tanker) sit at the bottom. The term “liquidity” simply refers to the ability to turn the asset into cash. If the asset is considered highly liquid, then it is easy to convert to cash, if it considered highly illiquid, then it is hard to convert to cash.

Taking on board these key ideas, have a look at the Amazon Inc. balance sheet. What can you deduce from the assets listed in this financial statement? Are the highest asset values located near the top, implying lots of liquid assets? What does each asset value tell you about the Amazon business model, e.g. does it use high levels of equipment fixed assets, or have high levels of accounts receivable?

I cannot stress enough the concept of asking yourself, when you look at the balance sheet, “what does this tell me?” If you spend enough time analysing the accounts, you can start to draw inferences about the business. For example, I just mentioned testing whether the accounts receivable is high, you could spend time comparing the accounts receivable balance over time (over multiple balance sheets) and test if this asset figure is rising or falling. A fall may mean that the business is improving its collections operations, or maybe that it is tightening its credit policy. When you draw one conclusion, you can often check its validity by looking at other sections of the financial statements.

While this last paragraph is more about financial statement analysis rather than understanding balance sheets, I hope you can appreciate the idea that while this concise book can help you get your head around a balance sheet you can always learn more and get more value from all financial statements.

## **Current Assets**

Now that we've covered the definitions of 'current' and 'assets' we can take a little more time looking at specific current assets.

Remembering that the current assets are the most liquid since they are at the top of the balance sheet, you will soon realize that many current assets are, in fact, monetary in nature. That is, they are defined and measured in terms of currency. Where the Property, Plant & Equipment (a non-current asset) value represents something like a factory in a city, many of the current assets specifically represent a currency value (like 'Cash' or 'Accounts Receivable').

Let's add a quick finance concept before moving onto analysing current assets...

We mentioned that asset liquidity refers to assets ability to be converted to cash. You may ask why a business would give up liquid assets (which can pay the invoices that come in) for less liquid assets (which may involve a lengthy process before using them to pay the invoices)? The answer lies in the generally accepted principle that a business (or even an individual) gives up liquidity in order to (hopefully) obtain a higher return from the asset. Look at Amazon Inc's top two current assets, 'Cash & Equivalents' and 'Short-Term Investments': now both are highly liquid (they both sit right at the top), but from their order you can see that cash is more liquid than short-term investments. Now that makes sense, you can simply go to your bank and make a withdrawal from Cash today, yet you may need a few days or few weeks to sell the Short-Term Investments and wait for the delayed settlement to realize their cash value. But look what also makes sense: do you expect a higher return from your checking account interest rate (Cash & Equivalents) or from your corporate bonds (Short-Term Investments)? While not specifically fitting into the 'Current Assets' section alone, this lesson is important to remember for the rest of this book and your own balance sheet analysis.

Now with this lesson under our belt, what can we learn from the current assets section of a balance sheet? One, of many, things we can draw is that we can test how 'secure' the business will be at maintaining its operations. As mentioned, you can generally only pay the business' bills with cash, and you only really ever go out of business if you can't pay your bills. So knowing this we can look at the structure of a business' current assets. If 'Inventory' is too high, it may mean that the entity can't sell its stock or



maintain optimal stock levels in-store. If 'Accounts Receivable' is too high then it may mean that the entity can't collect its debts adequately. Yet, if the more liquid current assets are too high, then this may mean that the entity is forsaking a higher return on its assets for the sake of having lots of cash and short-term investments. Knowing what to look for, and how to interpret values, will take practice, but even within these past few pages you can begin to start telling the story of the business from what may have been an almost 'foreign' set of line items and values.

## ***Free Resources***

**[Yahoo Finance](#)** A personal favourite financial reference on the Internet. The sheer volume of free financial data offered by Yahoo is great. You will find company data, company news, financial statements as well as other stock market information.

**[Coursera Yale Financial Markets Course](#)** This MOOC is a great introduction to financial markets and academic financial theory taught by the famous Robert Shiller at Yale. It offers something for both the finance newbie as well as the experienced investors who want to learn from one of the world's best.

**[Coursera Wharton Introduction to Financial Accounting Course](#)** This is a great short course from Coursera that is both informative and enjoyable. The course is taught by a top professor from a leading university. The concepts in this book are all based on financial accounting knowledge, after all. There is also a section specifically on Du Pont Ratio Analysis.

**[Investopedia Financial Ratio Tutorial](#)** A great website for financial education. This link specifically takes you to their University Section and teaches about a number of other ratios.

**[Wikipedia](#)** While this entry doesn't have many explanations, it does provide the formulas for a wide variety of ratios.

*'accofina' is the business behind this book and within its website, [accofina.com](#), you will find a number of free resources available for download or for use on-site:*

## ***Free accofina.com Books***

**[Accounting: Foundation Inputs & Outputs](#)** is a 15-page PDF mini-book which is available for download. It offers some of the basic accounting theory into the inputs and outputs of a financial accounting system. The

outputs being the three main financial statements and the inputs being the theory behind accounting data entry.

**[331 Great Quotes for Entrepreneurs](#)** This title offers a broad range of historic and memorable quotes aimed at uplifting and inspiring entrepreneurs with their journey. The book is broken down into 12 major categories, or skills, that should hopefully lead any entrepreneur to success.

## ***Free accofina.com Spreadsheets***

**[Ratio Analysis Spreadsheet](#)** The 17 ratios within this book have been put into a MS Excel Spreadsheet which both calculates the ratios as well as offering the formulae behind them. This spreadsheet comes as a download with three other free accounting and finance spreadsheets.

**[Time Value of Money Spreadsheet](#)** The Time Value of Money is one of the most important concepts in finance. This available spreadsheet calculates some of the primary time value of money concepts such as future values, present values and annuities. All formulae are also provided within.

**[Cash Flow Forecast Spreadsheet](#)** The final spreadsheet offered by accofina is a 2-year monthly cash flow forecast to assist in planning and control. It provides a strong overview of 24-months and also calculates running balances, aggregate totals and overdraft interest.

**[Retirement Planner Spreadsheet](#)** With this spreadsheet you can test out a variety of retirement scenarios which will allow you to assess how much savings you need to put in your retirement account during your working life dependent on your expected level of expenditure during retirement.

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1) Balance Sheet Basics (Book 1)

<http://accofina.com/books/balance-sheet-basics.html>

2) Income Statement Basics (Book 2)

<http://accofina.com/books/income-statement-basics.html>

3) Cash Flow Statement Basics (Book 3)

<http://accofina.com/books/cash-flow-statement-basics.html>

4) Financial Statement Basics (Books 1, 2 & 3)

<http://accofina.com/books/financial-statement-basics.html>

5) Corporate Finance Fundamentals

<http://accofina.com/books/corporate-finance-fundamentals.html>

### **Online Courses and Tutorials:**

1) Financial Statement Fundamentals (Udemy)

<http://accofina.com/online-education/financial-statement-fundamentals.html>

2) Udemy Instructor Page

<http://www.udemy.com/u/axeltracy/>

3) YouTube Channel

<http://www.youtube.com/accofina>

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Also, I'd love to get a review from you if you enjoyed, and got value, from this book.

Positive reviews on are worth their weight gold in the self-publishing world and could possibly propel my little business beyond my wildest expectations.

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