



Duncan Williamson

Finance for the Non-Financial Manager I



Duncan Williamson

Finance for the Non Financial Manager

Finance for the Non Financial Manager

1st edition

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Introduction

This book has the aim of giving you an excellent grounding in finance for the non financial manager. In other words, it's going to share with you the words, the phrases and the methods of working of bookkeepers, accountants and some finance people.

The book encourages you to work in a step by step way using a variety of methods:

- Good old fashioned **reading** for knowledge, understanding, application and analysis
- **Arithmetic:** basic calculations involving + - / * and maybe a little more, such as fractions and percentages
- **Spreadsheeting:** since we've all got Excel or something that will work with Excel why not use it: so we will. In some cases I will parts of a spreadsheet, in other cases I will hand it over to you for you to explore on your own

Objectives

This book has been written for junior, middle and senior managers who do not work in accounting or finance but who need to know what happens in accounting and finance! By the end of the book, you will

1. Be able to distinguish between and use the three major financial statements
 - a) Income Statement
 - b) Balance Sheet
 - c) Cash Flow Statement
2. Carry out an analysis of financial data using a variety of techniques, including ratio analysis
3. Carry out a qualitative analysis of financial and non financial data
4. Review the annual report and accounts of organisations, including the notes of explanation found in those reports
5. Identify trends and strategies contained in financial and non financial data and reports

Learning Methodology

We all learn in different ways: some of us need to read things to appreciate them; some of us can learn just by hearing about them; some of us have to watch and listen and then write things down; and yet others must do something for it to stick. How you approach this book is up to you but you will find all four of those approaches to learning built into this book or you can easily adapt its style to suit your own learning style.

Questions and quizzes: there are over 90 questions/exercises in this book and you are encouraged to work through all of them, in full. At every step of the way there will be a task for you to do to help you either to demonstrate your knowledge, understanding, application and analysis or for you to go and find something, solve something...always answer the questions honestly and diligently and you will succeed.

The Practical Materials

There are many practical examples in use throughout this book and what I have done is to use data from companies that I think most if not all of the readers will be familiar with: amazon.com and Apple Inc. I do add some more companies' data at times, however. I do say, though, that if you think you are bored with amazon.com and Apple Inc, please go and find your own data since you can arrange them in the same way as I have and you will lose nothing by doing that.

Glossary of Terms

I recommend that you create your own glossary of bookkeeping, accounting and finance terms as you go along. I have helped you in this task by highlighting all of the words and phrases that I think are important for you. However, there may be other examples that are personal to you. The very first thing we will do is to work through a series of definitions that will help us to explore basic bookkeeping, the bookkeeping cycle and accounting.

Exercises 1–14: what do you know already?

Let's begin with a quiz: if you don't know any of the answers, don't worry; because that will spur you on when you realise that by the end of this book you WILL know the words, you WILL understand them and you WILL be able to use and apply them.

1. A bookkeeper is someone who spends their working hours cataloguing the books in the company library. True or false?
2. A bookkeeper spends his working hours collecting accounting information, classifying it and recording it in a systematic way. True or false?

3. An accountant is someone who takes the work of a bookkeeper and then prepares financial statements for the business owners. True or False?
4. An accountant is just a bean counter who doesn't need to know or understand anything about business. True or False?
5. This financial statement is an example of a balance sheet. True or false?

Sales/Revenue	100,000
- Cost of goods sold	55,000
= Gross Profit	45,000
- Expenses	20,000
= Net Profit	25,000

6. This financial statement is an example of part of a balance sheet. True or false?

Assets

Fixed Assets/Non Current Assets

land	265,000
buildings	300,000
machinery	75,000
equipment	50,000
Total Fixed Assets	690,000

Current Assets

stocks/inventory	50,000
debtors/accounts receivable	75,000
prepayments	5,000
short term investments	25,000
bank	5,000
cash/cash and cash equivalents	15,000
Total Current Assets	175,000
Total Assets	865,000

7. A fixed asset is an asset we hope to sell within one year. True or false?
8. Liabilities and Shareholders' funds are the same things because it means money owing to outsiders. True or false?
9. The relationship between total sales and net profit tells us a great deal about the health of a business. True or false?
10. The net profit margin is found this way: net profit/total sales * 100. True or false?
11. The asset turnover ratio tells us how many of our assets we have sold. True or false?

12. A KPI is a Kool Performance indicator in text speak. True or false?
13. All of these are part of the features of a valid KPI:
 1. Nonfinancial measures (not expressed in dollars, yen, pounds, euros, etc.)
 2. Measured frequently (e.g. daily or 24/7)
 3. Acted on by the junior management team only
- True or false?
14. The Balanced Scorecard is a bookkeeping tool to ensure the ledgers are balanced. True or false?

1 Building the Accounting Picture

Introduction to Bookkeeping, the bookkeeping cycle and accounting

1.1 Definitions

A **bookkeeper** is the person who maintains the day to day **financial records** of a business: the **books of account** and **bookkeeping** is the job that the bookkeeper does. The work of the bookkeeper begins with the identification of a **bookkeeping transaction** and ends with something called the **trial balance**.

Accounting is the generation of **financial information** for a **business entity** and the reporting of that information on behalf of the **owners** of that business. An **accountant** is a person qualified to carry out the processes involved in accounting.

The **books of account** can be physical and/or virtual these days. In a **non computerised** organisation, the books of account will be books, **folders** or **files** in which all accounting information is written. In a **computerised organisation**, the books of account will be made up of files on a **hard disk**.

Whether a business's bookkeeping and accounting systems are computerised or not, the end result should be the same: the total value of sales will be the same under each system, the total value of expenses will be the same under each system. And so on.

1.2 The Bookkeeping and Accounting Cycle

Under the three headings,

- paper trail
- paper mill and
- paper work

the following diagram summarises what has to happen in order for the business to be able to publish and read its own financial statements:

The Bookkeeping and Accounting Cycle

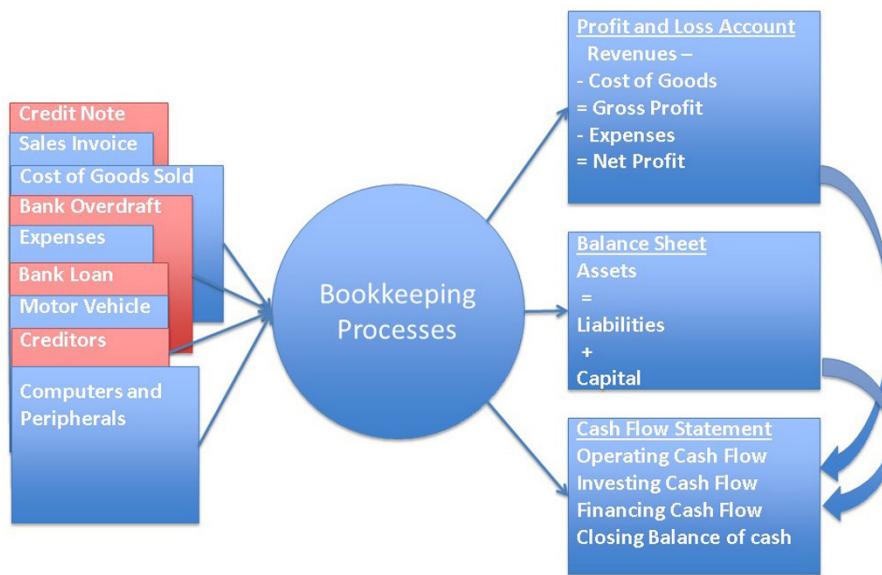


Figure 1 Bookkeeping and Accounting Cycle

By **paper trail** we mean to say that the accountant, the bookkeeper and the business person all have access to a stack of **real or virtual paper** that they can call on to help them to prepare the financial reports they need for a company for an accounting period. All of the invoices, all of the bank statements, in fact every record of every financial transaction are all to be included in this list.

By **paper mill** we mean the things that the bookkeeper has to do to convert the data found on and in the real and virtual paper into information. That is, as we will see throughout this section, the bookkeeper will prepare what he calls the **journals**, the **ledger accounts** and the **financial statements** (see next paragraph).

The **paper work** provides us with the financial statements we have just mentioned: the final outcome of all of the work of the bookkeeper and the accountant. Under this heading we will find the three main financial reports:

- the income statement
- the balance sheet and
- the cash flow statement

Source: Duncan Williamson (2014) *The Bookkeeping and Accounting Coach* Hodder and Stoughton.

Exercise 15

Choose the answer you believe to be correct:

The bookkeeping and accounting cycle comprises

- a) Invoices, returns notes, petty cash vouchers, journals vouchers
- b) A logical time frame and a Gantt Chart is an ideal way of showing it
- c) Comprised rather technical ideas best left to the accountant and his team

Exercise 16

Choose the answer you believe to be correct:

In the section we call the *Paper Trail* there are three statements named, which of the following could we also have added?

- a) Statement of Comprehensive Balances and Statement of Changes in Equity
- b) Statement of Comprehensive Income and Statement of Changes in Equity
- c) Statement of Comprehensive Equity and Statement of Changes in Income

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1.3 Bookkeeping Processes

In a busy business, however large or small, the paper mill, the bookkeeping office, creates order out of chaos. If we are using a computerised system, the system can create perfect order out of chaos: it just needs dates, times and sequence numbers and it will sort them automatically. If we are using a manual system, we need a properly thought out and applied filing system.

Let's take a look at **Figure 2, Bookkeeping Process**, to see what we are going to be doing in the next section:

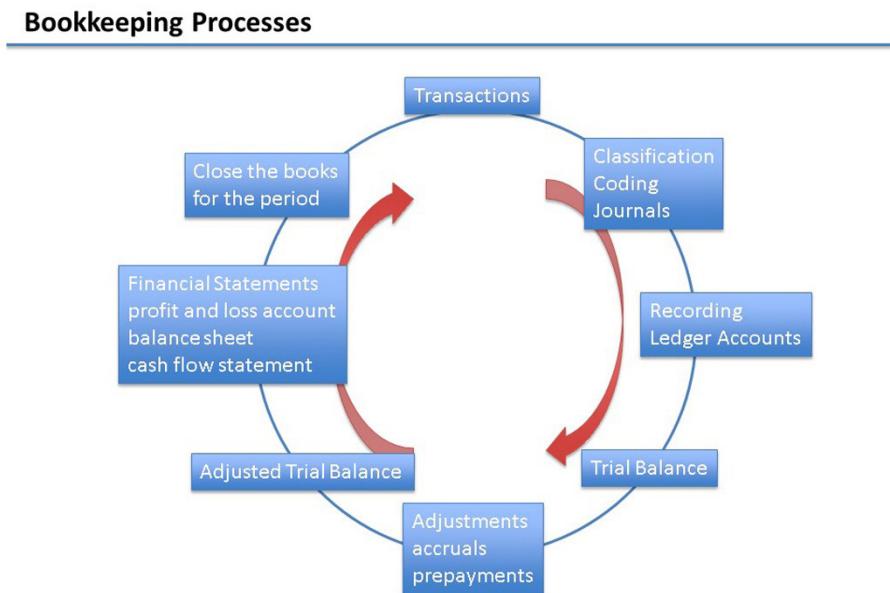


Figure 2 Bookkeeping Processes

Source: Duncan Williamson (2014) The Bookkeeping and Accounting Coach Hodder and Stoughton.

The outcome of these processes are financial statements like these:

Profit and Loss Account/Income Statement for the year ended XX/XX/XXXX

Sales/Revenue	100,000
- cost of goods sold	55,000
- Expenses	45,000
- Expenses	20,000
= Net Profit	25,000

Table 1 Basic Income Statement

Balance Sheet as at XX/XX/XXXX**Assets****Fixed Assets/Non Current Assets**

land	265,000
buildings	300,000
machinery	75,000
equipment	50,000
Total Fixed Assets	690,000

Current Assets

stocks/inventory	50,000
debtors/accounts receivable	75,000
prepayments	5,000
short term investments	25,000
bank	5,000
cash/cash and cash equivalents	15,000
Total Current Assets	175,000
Total Assets	865,000

Table 2 Basic Balance Sheet: Assets**Liabilities****Long Term Liabilities/Non Current Liabilities**

debt	200,000
bank loan	100,000
Total Long Term Liabilities	300,000

Current Liabilities

creditors/accounts payable	100,000
accrued expenses	10,000
bank (overdraft)	125,000
taxation owing	15,000
Total Current Liabilities	250,000

Capital/Equity

investment of owner/share capital/equity	300,000
profits	15,000
Total Capital	315,000
Total Liabilities and Capital	865,000

Table 3 Basic Balance Sheet: Liabilities and Equity**Cash Flow Statement for the year ended XX/XX/XXXX**

operating cash flow	175,000
investing cash flow	-125,000
financing cash flow	35,000
closing balance of cash and cash equivalent	15,000

Table 4 Basic Statement of Cash Flows

Source: Duncan Williamson (2014) The Bookkeeping and Accounting Coach Hodder and Stoughton Chapter 1.

Exercise 17

Choose the answer you believe to be correct:

- a) The Income Statement is a period statement while the Balance Sheet is a Flow Statement
- b) The Income Statement is a period statement while the Balance Sheet is a Position Statement
- c) The Income Statement is a position statement while the Balance Sheet is a period Statement

Exercise 18

Choose the answer you believe to be correct:

- a) Total Assets = Total Liabilities – Capital
- b) Total Assets = Total Liabilities / Capital
- c) Total Assets = Total Liabilities + Capital

Exercise 19

Choose the answer you believe to be correct:

In a balance sheet, the word current means

- a) Something will be received/paid within one year from the balance sheet date
- b) Something will be received/paid more than one year from the balance sheet date
- c) Something will be received/paid whenever time permits

2 Identifying a Bookkeeping Transaction

Introduction

By the end of this section you will have begun to appreciate the:

- layout and content of a balance sheet
- layout and content of a trading and profit and loss account
- links between the balance sheet and the trading and profit and loss account
- nature and meaning of the basic concepts and conventions of accounting
- duality principle of accounting...

It might seem obvious to everyone that all a bookkeeper needs to do is to pick up an invoice or a credit note and enter it into the ledgers and accounts. The purpose of this section is to explain all of the basic rules to do with sorting out what is a bookkeeping transaction and what isn't.

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2.1 The Concepts of Accounting

Every bookkeeper and accountant follows a set of rules to try to ensure that their work is as accurate as possible. These rules are called the concepts (or conventions) of accounting. The most important concepts are these:

Going Concern

Under this concept the bookkeeper and accountant assumes that that a business will remain in existence for the foreseeable future. Without this concept, accounts would have to be drawn up on the **winding up** basis.

Exercise 20

What do you think is meant by the winding up basis in the context of the going concern concept?

Accruals

This concept says that even if an expense, for example, has not been paid yet, we must record them when we incur them.

Exercise 21

Imagine two expenses that a business might incur today but only pay for in a week's time or even later.

Exercise 22

The idea of prepayments are important here too: where we pay for something before we use it. Give an example of when a business might prepay an expense.

Consistency

As we will see throughout this section, bookkeepers and accountants have a variety of methods to use at various stages in the bookkeeping cycle. The consistency concept says that if you use one method this month, you should use the same method next month, the month after and onwards into the future.

Examples of different methods we might come across include methods of calculating

- depreciation
- doubtful debts

Exercise 23

- a) Try to find the names of two methods of calculating depreciation.
- b) Show how the two depreciation methods you have found in your answer to part a) of this question might work for, for example, a motor vehicle that costs \$25,000, has a useful, working, life of 10 years might be sold for \$5,000 after the ten years of use.

Prudence

Basically the concept says that whenever there bookkeeping and accounting decisions to take, the accountant will choose the one that results in a lower profit, a lower asset value and a higher liability value: anticipate no profit and provide for all possible losses'.

Exercise 24

Give an example of how the prudence concept might work in reality.

Objectivity

The objectivity concept requires an accountant to draw up any accounts only on the basis of objective and factual information. This concept attempts to ensure that if, for example, 100 accountants were to draw up a set of accounts for one business, there would be 100 identical accounting statements prepared.

Exercise 25

Give an example of an objective decision being taken by an accountant by first thinking about a subjective decision he might take.

Duality

This is the very foundation of the universally applicable double entry book keeping system and it stems from the fact that every transaction has a double (or dual) effect on the position of a business as recorded in the accounts.

Exercise 26

Suggest what the dual effects of buying an asset by a business would be if the business bought the asset

- for cash
- from a creditor

Suggest what might be the dual effects of a sale of goods by a business for cash.

Entity

The idea here is that the financial transactions of one individual or a group of individuals must be kept separate from any unrelated or private financial transactions of those same individuals or group.

Exercise 27

Suggest an example of why the entity concept is so important for a business.

Cost

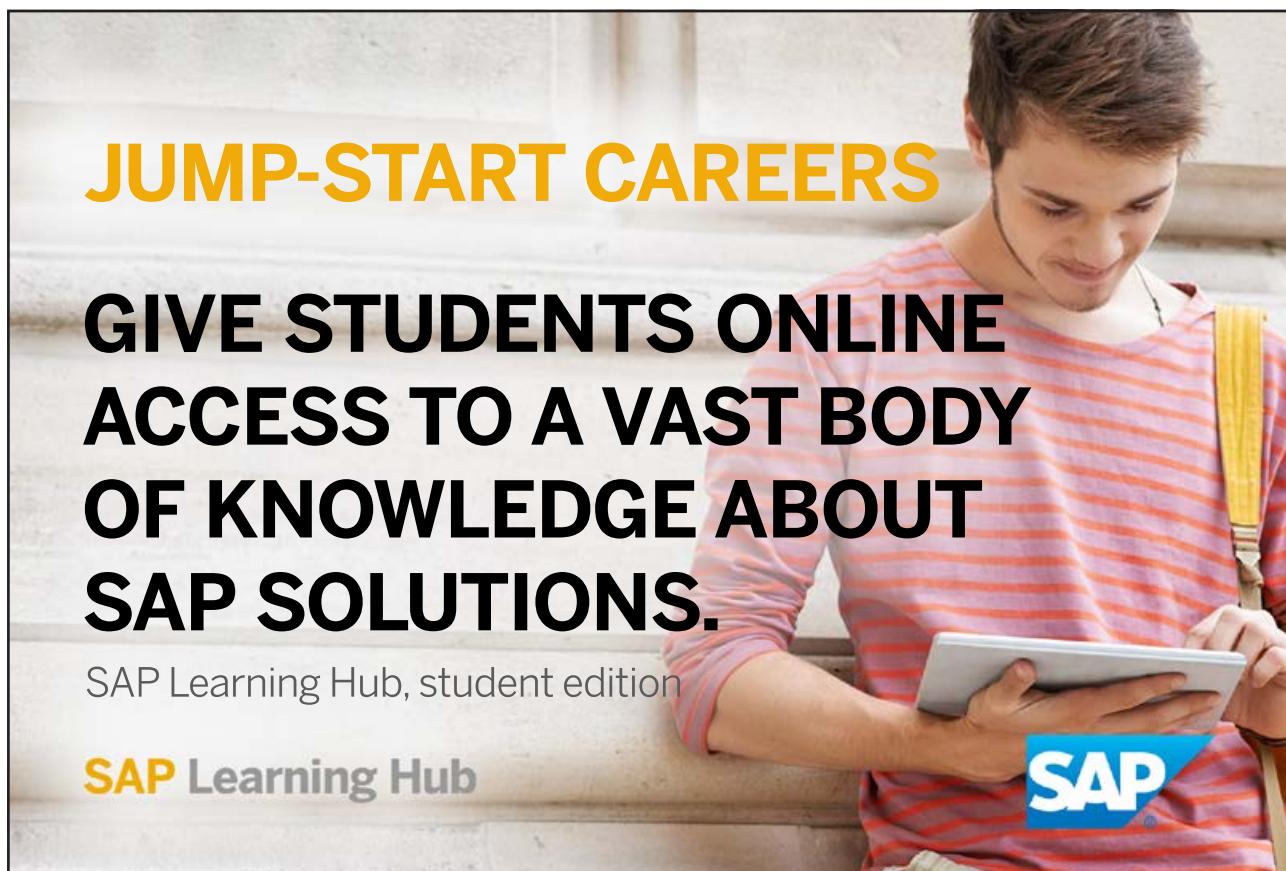
The bookkeeper says that only the costs paid to acquire an asset should be the only values to be shown in the accounts. For example, assets are shown on the balance sheet at the value paid to acquire them; that is, their historic cost less depreciation to date.

Exercise 28

If assets and expenses are not included at cost value, what could they be included as?

Money Measurement

The money measurement concept says that only those transactions that can be expressed in money values (whatever the currency) are of interest to the accountant.



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Exercise 29

What are the implications of the money measurement concept for the bookkeeper and accountant?

Materiality

We are concerned here with the idea that bookkeepers should concern themselves only with matters that are significant because of their size and should not consider trivial matters. What we are concerned with here is RELATIVE IMPORTANCE. As far as an individual is concerned, the loss of a \$10 would be important and MATERIAL.

Exercise 30

Try to find an example of how bookkeepers and accountants use the concept of materiality.

Realisation

The realisation concept helps the bookkeeper to decide when a transaction is certain enough for the profit to be made on it. Realisation occurs when a sale is made to a customer. The basic rule is that revenue is created at the moment a sale is made and not when the account is later settled by cheque or by cash.

Exercise 31

Give an example of when a newspaper seller realises a sale and an example of when a car dealership realises a sale if that business receives cars from the manufacturer on a sale or return basis.

Source: Duncan Williamson (2014) The Bookkeeping and Accounting Coach Hodder and Stoughton Chapter 2.

3 Building Financial Statements

Income statement

Balance sheet

Cash flow statement

We are going to use a comprehensive case study now to build the three financial reports just mentioned. This is a very systematic exercise and by the end of it we will have seen a variety of the aspects of bookkeeping transactions, together with an appreciation of some of the work of an accountant.

3.1 Case Study: David Tasker

For the rest of this section we will work through the David Tasker Case Study. The purpose of this case study is to walk through a whole series of events in the life of an imaginary business. As we work through the events we will determine whether a transaction is a bookkeeping transaction. We will also apply the basic accounting concepts and conventions to each transaction.

By the end of this case study we will have a good grasp of how and why a transaction should or should not enter the world of the bookkeeper!

David Tasker operates a wholesale operation. The company employs (among others) Jack Smith as a Sales Manager. **By filling in the templates that follow, draw up the final accounts of the business after each of the following transactions: where necessary.**

- Jan 1 Tasker starts the business with \$7,000 in a bank account for the business
- Jan 2 the company buys fixtures and fittings by cheque \$3,000
- Jan 3 Smith resigns
- Jan 4 Tasker withdraws \$1,000 from the bank for his personal use
- Jan 5 the company buys land for \$7,000: \$2,000 is paid by cheque immediately and \$5,000 is paid for by means of taking out a mortgage secured on the property
- Jan 6 the company buys goods on credit for \$1,000
- Jan 7 Tasker is offered \$7,000 for his business but refuses to sell
- Jan 8 the company sells for cash for \$600, goods which had cost \$500
- Jan 9 Tasker is told that land similar to his was sold recently for \$8,000: whilst Tasker is interested in this news, he takes no action on it.
- Jan 10 goods are sold on credit for \$600, which had cost \$500
- Jan 11 debtors pay their debts in cash \$600
- Jan 12 a customer, Sandy Bedds, pays \$1,200 cash for goods to be supplied after 10 days

- Jan 13 the company pays \$2,100 cash into the bank and draws a cheque for \$1,000 to pay for goods bought on the 6th
- Jan 14 goods are bought on credit for \$2,000
- Jan 15 goods costing \$1,000 were delivered to Sandy Bedds in full settlement of the outstanding advance of the 12th
- Jan 15 Tasker decides to calculate his profit so far. He reads the electricity meter and finds the business has used \$10 worth of electricity. The electricity bill will not be received until the end of January
- Jan 15 salaries to date paid in cash \$50
- Jan 15 the rate of interest on the mortgage is 12% pa, payable on 31st December. Tasker calculates the appropriate charge for the month to be \$25: charge this amount in full
- Jan 15 Tasker assesses the value of the use of the fixtures and fittings to be \$25

You can work completely independently here if you wish by setting out your work as you think best and then checking your answers as and when you are ready or you can print out and use the templates you will find below and fill them in as you go.

We have provided detailed solutions to the first **four** transactions, you should then complete the rest of them on your own. Check your answers AFTER you have attempted each question for optimum learning!



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3.2 David Tasker Guidance and Templates

January 1 Tasker starts the business with \$7,000 in a bank account for the business

Solution

David Tasker balance sheet as at	1 January
Asset: Bank	\$7,000
Owner's Capital	<u>\$7,000</u>

Table 5 Tasker 1st January

Here is the **duality** aspect of this transaction: we add the \$7,000 to the bank account and to the capital account at the same time. We have also used the **cost concept** we saw earlier: after all we can only pay into the account the amount we received.

In addition, we have used another accounting concept: the **entity concept**. This means that we have established a set of accounts for David Tasker's business in addition to whatever personal accounts David Tasker keeps for his personal life.

⇒ **Review the Concepts and Conventions Definitions**

January 2 the company buys fixtures and fittings by cheque \$3,000

Solution

David Tasker balance sheet as at	2 January
Fixtures & Fittings	3,000
Bank	4,000
Assets	<u>7,000</u>
 Owner's Capital	 <u>7,000</u>

Table 6 Tasker 2nd January

We know that the total of assets must equal the total of liabilities plus owner's capital: it does, even though there are no liabilities in this case.

Notice also, for the second time, we have given the balance sheet the same title: David Tasker balance sheet as at... This is the standard format that we need to adopt: the title is really in three parts:

- the name of the business
- the fact that it's a balance sheet
- the time at which the balance sheet was drawn up: usually at the end of the day.

Because a balance sheet is a list of balances it is drawn up at the end of the day that it relates to and because of this, a balance sheet is said to be a **snapshot**.

January 3 Smith resigns

This is not a transaction so the accountant cannot record this event since there is no **cost** associated with it; and we **cannot measure any money**.

We have seen the cost concept already but what about measuring money? **Remind yourself of** the accounting concepts to see what we mean by money measurement if you are still unsure.

There is no column in the balance sheet template for 3rd January anyway!

January 4 Tasker withdraws \$1,000 from the bank for his personal use

David Tasker balance sheet as at	4 January
Fixed Assets	
Fixtures & Fittings	3,000
Total Fixed Assets	<hr/> 3,000
Current Assets	
Bank	3,000
Total Current Assets	<hr/> 3,000
Total Assets	<hr/> 6,000
Capital	
Balance brought down from yesterday	7,000
Less: Drawings	1,000
Balance carried down to tomorrow	6,000
Capital Employed	<hr/> 6,000

Table 7 Tasker 4th January

If you didn't quite agree with what you see here, make sure you can see where you went wrong.

The fixed and current assets are fairly straightforward. The only real problem you might have had is with the withdrawal itself.

In fact, in the case of a business like David Tasker's, a **withdrawal** of cash by the owner is, really, a withdrawal of his capital. That's why we have recorded it as a reduction of capital. In accounting speak the word withdrawal has become **drawing**. Always, then, whenever the owner takes money or goods that have a value, out of the business, it's classed as a drawing.

Now David Tasker has only \$6,000 invested in his business.

3.2.1 David Tasker Template

Use the following template to make a record of your answers to this case study. In each column, enter the effects of the transaction in the appropriate cell. In some cases, there is nothing to enter because the event is not a bookkeeping transaction.

The file *tasker_template_solution.xlsx* is available for download and it contains the full solution to this case study,

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A professional man in a light blue shirt and patterned tie is looking down at a white tablet computer he is holding in his hands. He appears to be in an office environment with other people and desks visible in the blurred background.

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David Tasker: successive balance sheets as at															
	January														
	1	2	4	5	6	8	10	11	12	13	13	14	15	15	
FIXED ASSETS															
Land															
Fixtures & Fittings		3,000	3,000												
TOTAL FIXED ASSETS	3,000	3,000													
CURRENT ASSETS															
Stock															
Debtors															
Bank	7,000	4,000	3,000												
Cash															
TOTAL CURRENT ASSETS	7,000	4,000	3,000												
TOTAL ASSETS	7,000	7,000	6,000												
CAPITAL															
Initial Investment/Opening Balance	7,000	7,000	7,000												
Plus: Profit		7,000	7,000	7,000											
Less: Drawings					1,000										
Closing Balance	7,000	7,000	6,000												
LONG TERM LIABILITIES															
Mortgage															
CURRENT LIABILITIES															
Creditors															
Prepaid Revenue															
Accruals															
TOTAL CURRENT LIABILITIES															
CAPITAL EMPLOYED	7,000	7,000	6,000												

Figure 3 Tasker Balance Transaction Template

David Tasker: annotation of transactions		
Account Classification	Date	Concepts/Notes
CA, Capital	1	entity, duality, cost, money measurement, materiality, objectivity, realisation
FA, CA	2	cost, duality, money measurement, materiality, objectivity, realisation
-	3	cost, money measurement, not a transaction
CA, Capital	4	entity, duality, cost, money measurement, materiality, objectivity, realisation
	5	
	6	
	7	
	8	
	9	
	10	
	11	
	12	
	13	
	14	
	15	
	15	
	15	
	15	

Figure 4 Tasker Table of Annotations

Table 8 Exercise 32 Indicate in which of the principal financial statements each item appears

Item	Balance Sheet	Income Statement	Statement of Cash Flows
Accounts Payable			
Accumulated Depreciation			
Capital Expenditures			
Change Cash and Equivalents			
Ordinary Shares Issued			
Current Debt: Changes			
Direct Operating Activities			
Financing Activities: Net Cash Flow			
Gross Plant, Property and Equipment			
Income before Extraordinary Items			
Indirect Operating Activities			
Interest Paid: Net			
Investing Activities			
Long Term Debt Due In One Year			
Receivables			
Operating Activities: Net Cash Flow			
Preference Shares: Non redeemable			
Pre tax Income			
Retained Earnings			
Disposal of Property, Plant and Equipment			
Selling, General and Administrative Expense			
Stock Equivalents			
Total Current Assets			
Total Income Taxes			
Total Preference Shares			

Table 8 Exercise 32 Indicate in which of the principal financial statements each item appears

Item	Balance Sheet	Income Statement	Statement of Cash Flows
Accrued Expenses			
Cash and Equivalents			
Ordinary Shareholders 'Equity			
Cost of Goods Sold			
Dividends per Share			
Earnings per Share			
Financing Activities			
Funds from Operations: Other			
Income Taxes Paid			
Interest Expense			

Inventories			
Investing Activities: Other			
Long Term Debt			
Net Plant, Property and Equipment			
Other Assets			
Other Current Liabilities			
Preference Share Dividends			
Prepaid Expenses			
Total Assets			
Total Equity			
Total Liabilities and Equity			

Table 9 Exercise 33 Indicate in which of the principal financial statements each item appears

4 Business Analysis

Financial statement analysis is an important and integral part of business analysis. The goal of business analysis is to improve business decisions by evaluating available information about a company's financial situation, its management, its plans and strategies and its business environment. Business analysis is applied in many forms and is an important part of the decisions of security analysts, investment advisors, fund managers, investment bankers, credit raters, corporate bankers and individual investors.

This section considers two major types of business analysis that fall under Financial Analysis, Analysis of Sources and Uses of Funds:

- Credit analysis
- Equity analysis

4.1 Credit Analysis

Credit analysis is the evaluation of the creditworthiness of a company. **Creditworthiness** is the ability of a company to honour its credit obligations: the ability of a company to pay its bills. Accordingly, the main focus of credit analysis is on **risk**, not profitability. Variability in profits, especially the sensitivity of profits to downturns in business, is more important than profit levels. Profit levels are important only to the extent they reflect the margin of safety for a company in meeting its obligations.

Credit analysis focuses on downside risk instead of upside potential. This includes analysis of both liquidity and solvency. Liquidity is a company's ability to raise cash in the short term to meet its obligations. Liquidity depends on a company's cash flows and the makeup of its current assets and current liabilities. Solvency is a company's long run viability and ability to pay long term obligations. It depends on both a company's long term profitability and its capital (financing) structure.

The tools of credit analysis and their criteria for evaluation vary with the term (maturity), type and purpose of the debt contract. With short term credit, creditors are concerned with current financial conditions, cash flows and the liquidity of current assets. With long term credit, including bond valuation, creditors require more detailed and forward looking analysis. Long term credit analysis includes projections of cash flows and evaluation of extended profitability. Extended profitability is a main source of assurance of a company's ability to meet long term interest and principal payments.

Creditors lend funds to a company in return for a promise of repayment with interest. Creditors lend funds in many forms and for a variety of purposes.

- Trade (or operating) creditors deliver goods or services to a company and expect payment within a reasonable period, often determined by industry norms. Most trade credit is short term, ranging from 30 to 60 days, with cash discounts often granted for early payment. Trade creditors do not usually receive interest for an extension of credit: instead, trade creditors earn a return from the profit margins on the business transacted.
- Non trade creditors (or debtholders) provide more formal financing to a company in return for a promise of repayment with interest on specific future dates. This type of financing can be either short or long term.

In pure credit financing, an important element is the fixed nature of benefits to creditors. That is, should a company prosper, creditors' benefits are limited to the debt contract's rate of interest or to the profit margins on goods delivered. However, creditors bear the **risk of default**. This means a creditor's interest and principal are at risk when a borrower encounters financial difficulties.

An advertisement for SAP Learning Hub. It features a woman with dark hair tied back, wearing a white button-down shirt, looking up and to the side with a thoughtful expression. She is holding an open book or document in her hands. The background is a bright, slightly overexposed outdoor scene with a clear blue sky and some blurred architectural elements. The text "ANYTIME, ANYWHERE" is displayed in large, bold, orange capital letters at the top left. Below it, a large black text block reads "LEARNING ABOUT SAP SOFTWARE HAS NEVER BEEN EASIER." At the bottom left, the text "SAP Learning Hub" is written in a stylized font. In the bottom right corner, the SAP logo is shown, consisting of the word "SAP" in white on a blue rectangular background with a registered trademark symbol.

Creditor Analysis

Let's begin to look at creditor analysis by looking at amazon.com's financial results: their current liabilities and trade creditors. At first we will review their latest three years and then expand that to their last ten years.

	A	B	C	D
1	amazon.com Current Liabilities and Trade Creditors			
2				
3	Current liabilities	2014-12	2013-12	2012-12
4	Short term debt	-	-	-
5	Accounts payable	16,459	15,133	13,318
6	Accrued liabilities	9,807	6,688	5,684
7	Deferred revenues	1,823	1,159	-
8	Total Current Liabilities	28,089	22,980	19,002
9	Cash Flows From Operating Activities			
10	Accounts payable	1,759	1,888	2,070
11				
12	Revenue	88,988	74,452	61,093
13	Cost of revenue	62,752	54,181	45,971
14		2014-12	2013-12	2012-12
15	Trade Creditors	14,813	13,468	11,453

Figure 5 amazon.com CL and Trade Creditors

Exercise 34 Complete the following table of ratios:

L	M		N	O	P
16	Ratio Name	Ratio Formula	2014-12	2013-12	2012-12
17	Creditors Turnover	accounts payable/average daily cost of sales	95.73		
18	Trade Creditors Turnover	trade accounts payable/average daily cost of sales	86.16		
19			2014-12	2013-12	2012-12
20	Creditors Turnover	from morningstar.com	23.63		

Figure 6 amazon.com creditors turnover

The creditors' turnover ratio tells us on average how many days it takes amazon.com to pay its accounts payables: in 2014, an average of 95.73 days or by the 96th day. What are the results for 2012 and 2013?

Trade Payables

The creditors' turnover ratio we have found is fine but we need to appreciate that not all payables are trade payables. What we have to do is to search the company's financial reports and find the trade accounts payable figure and use that instead of just the total payables figure.

Exercise 35 The table below shows the new payables figure for amazon.com and then the revised ratio table showing creditors' turnover and trade creditors' turnover **for you to complete**:

	L	M	N	O	P
16	Ratio Name	Ratio Formula	2014-12	2013-12	2012-12
17	Creditors Turnover	accounts payable/average daily cost of sales	95.73		
18	Trade Creditors Turnover	trade accounts payable/average daily cost of sales	86.16		

Figure 7 amazon.com creditors turnover 2

	L	M	N	O	P
16	Ratio Name	Ratio Formula	2014-12	2013-12	2012-12
20	Creditors Turnover	from morningstar.com	23.63	30.2	37.68

Figure 8 amazon.com creditors turnover three years from www.morningstar.com

Note: these are not amazon.com's true trade creditors' figures, they are for illustration only

Exercise 36 Here is the table of fully worked payables turnover data for ten years for amazon.com: what comments do you have?

	L	M	N	O	P	Q	R	S	T	U	V	W	X
16	Ratio Name	Ratio Formula	2014-12	2013-12	2012-12	2011-12	2010-12	2009-12	2008-12	2007-12	2006-12	2005-12	
17	Creditors Turnover	accounts payable/average daily cost of sales	95.73	101.95	105.74	109.09	110.64	107.80	88.06	88.85	80.30	77.29	
18	Trade Creditors Turnover	trade accounts payable/average daily cost of sales	86.16	90.73	90.94	102.55	106.21	95.94	77.50	87.07	74.67	76.52	

Figure 9 amazon.com creditors turnover ten years

4.2 Equity Analysis

Equity investors provide funds to a company in return for the risks and rewards of ownership. Equity investors are major providers of company financing. Equity investors are entitled to the **distributions** of a company's assets only after the claims of all other **senior claimants** are met, including **interest** and **preference dividends**. As a result, equity investors are said to hold a **residual interest**: that is, equity investors are the first to absorb losses when a company liquidates, although in a limited company their losses are normally limited to the amount invested. However, when a company prospers, equity investors share in the gains with potentially unlimited potential. Thus, unlike credit analysis, equity analysis is symmetric assesses both downside risks and upside potential. Because equity investors are affected by all aspects of a company's financial condition and performance, their analysis needs are among the most demanding and comprehensive of all users.

Accounts Receivable

We can look at accounts receivable, debtors, in a similar way to the accounts payable and here are the debtors' turnover results we need to look at amazon.com's position:

	L	M	N	O	P	Q	R	S	T	U	V	W	X
18	Ratio Name	Ratio Formula	2014-12	2013-12	2012-12	2011-12	2010-12	2009-12	2008-12	2007-12	2006-12	2005-12	
19	Debtors Turnover	accounts receivable/average daily credit sales	32.64	32.11	26.71	25.17	21.81	19.00	20.26	22.41	17.64	15.50	
20	Trade Debtors	trade accounts receivable/average daily credit sales	16.13	23.99	24.57	38.79	63.71	55.64	20.42	17.49	41.44	47.47	

Figure 10 amazon.com debtors turnover ten years

Exercise 37 What do you make of those results?

Data Warning

I have given you the data and carried out the calculations: as best as I could. However, look at these results from morningstar.com as far as they relate to amazon.com:

L	M	N	O	P	Q	R	S	T	U	V	W	X
16 Ratio Name	Ratio Formula	2014-12	2013-12	2012-12	2011-12	2010-12	2009-12	2008-12	2007-12	2006-12	2005-12	
20 Creditors Turnover	from morningstar.com	23.63	30.2	37.68	40.91	44.09	42.83	40.58	43.23	43.1	41.62	

Figure 11 amazon.com creditors turnover ten years from www.morningstar.com

L	M	N	O	P	Q	R	S	T	U	V	W	X
18 Ratio Name	Ratio Formula	2014-12	2013-12	2012-12	2011-12	2010-12	2009-12	2008-12	2007-12	2006-12	2005-12	
22 Debtors Turnover	from morningstar.com	9.38	10.3	11.87	10.33	10.17	8.44	7.15	9.95	10.87	9.15	

Figure 12 amazon.com debtors turnover ten years from www.morningstar.com

In both cases there are massive differences from my results. So what's the problem? The problem is that I have relied on general, aggregate data from amazon. www.morningstar.com has people whose job it is to dig and dig and dig to get the most comprehensive and accurate picture possible.



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So, my results are rubbish then? No, not quite: whilst they are not accurate in many senses, they probably do reveal the trend quite accurately and as proxies for real information, they are a good starting point. This does lead us to a really vital point, however:

Ratio analysis is a start: it helps you to ask the questions you need to ask.

How can amazon.com have debtors if we all pay cash up front? Remember I said a while ago that the big question is asking what business the company you are analyzing is in? Now you know why: once you look at amazon and see that it serves several markets then you can see that they are probably giving credit to some of its customers, even if it's not you!

In each of our two geographic segments, we serve our primary customer sets, consisting of consumers, sellers, enterprises, and content creators. In addition, we provide services, such as advertising services and co branded credit card agreements.

Source: amazon.com annual report 2014 page 3.

Analysis of Shares

Let's have a look at the ways in which a company can raise money: we have already considered current liabilities, which are a source of short term funding. Other liabilities such as non current liabilities provide another source of funding but for now, for amazon.com, we will concentrate on shares.

Two Types of Share

Basically there are two types of share

- Ordinary shares or common stock
- Preference shares or preferred stock

Ordinary Shares/Common Stock

Ordinary Shares are known as equity or equity shares as well as the risk capital of a company. The reason for these names is because their reward comes in the form of a dividend. However, no company is forced to pay a dividend so the risk is that shareholders will receive no reward.

Companies don't pay dividends if they can't afford them: no profit, no cash and so on. In the case of amazon.com, they don't pay dividends because they say they will never pay a cash dividend: instead they want to plough back their profits to boost company growth and development. We have already noted that this company doesn't pay dividends!

When shares are issued at first they usually have a split price:

- Nominal or par value
- Share premium

For example, a share might have a par value of \$1 but when it is issued the company sets the initial selling price at, say, \$5. In that case, assuming they are selling 100,000 shares:

Par value of ordinary shares	\$1 * 100,000 =	\$100,000
Share premium on ordinary shares	$(\$5 - 1) * 100,000 =$	\$400,000
Total amount raised		\$500,000

Table 10 Share Capital Amount Raised

The market price of these shares from then on is not set or managed directly by the company: it changes according to supply and demand on the stock market.

When amazon.com issued its first shares in 1997 they were valued at \$1.96 per share: at the end of August 2015 their shares were trading on the market at \$518.01 per share.

In the USA the shares that have been issued are called **shares outstanding** and here they are for the last ten years for amazon.com:

A	B	C	D	E	F	G	H	I	J	K
27 Weighted average shares outstanding (million)	2014-12	2013-12	2012-12	2011-12	2010-12	2009-12	2008-12	2007-12	2006-12	2005-12
28 Basic	462	457	453	453	447	433	423	413	416	412

Figure 13 amazon.com Weighted Average Number of Shares: Basic

As at the end of 2014, then, amazon.com has 462,000,000 shares issued or outstanding and their ordinary shares have a par value of \$0.01 each.

Exercise 38 Summarise the equity section of Apple Inc's balance sheet from the following:

A	B	C	D	E	F	G	H	I	J	K
1 Stockholders' equity	2014-09	2013-09	2012-09	2011-09	2010-09	2009-09	2008-09	2007-09	2006-09	2005-09
2 Common stock	23,313	-	-	-	-	-	7,177	5,368	4,355	3,521
3 Additional paid-in capital	-	19,764	16,422	13,331	10,668	8,210	-	-	-	-
4 Retained earnings	87,152	104,256	101,289	62,841	37,169	23,353	13,845	9,101	5,607	4,005
5 Accumulated other comprehensive income	1,082	(471)	499	443	(46)	77	8	63	22	(60)
6 Total stockholders' equity	111,547	123,549	118,210	76,615	47,791	31,640	21,030	14,532	9,984	7,466
7										
8	2014-12	2013-12	2012-12	2011-12	2010-12	2009-12	2008-12	2007-12	2006-12	2005-12
9 Basic Weighted average shares outstanding (i)	6,086	6,477	6,544	6,470	6,366	6,251	6,171	6,052	5,908	5,659

Figure 14 Apple Inc Shareholders Equity and Shares Outstanding

In the USA share premium is known as **additional paid in capital** and as at the end of 2014 for amazon.com it was \$11,135,000,000: the ten year history of amazon.com's share premium is included in the table below which also shows us retained earnings, treasury stock and accumulated other comprehensive income:

A	B	C	D	E	F	G	H	I	J	K
	2014-12	2013-12	2012-12	2011-12	2010-12	2009-12	2008-12	2007-12	2006-12	2005-12
1 amazon.com Stockholders' equity										
2 Common stock	5	5	5	5	5	5	4	4	4	4
3 Additional paid in capital	11,135	9,573	8,347	6,990	6,325	5,736	4,121	3,063	2,517	2,263
4 Retained earnings	1,949	2,190	1,916	1,955	1,324	172	(730)	(1,375)	(1,837)	(2,027)
5 Treasury stock	(1,837)	(1,837)	(1,837)	(877)	(600)	(600)	(600)	(500)	(252)	-
6 Accumulated other comprehensive income	(511)	(185)	(239)	(316)	(190)	(56)	(123)	5	(1)	6
7 Total stockholders' equity	10,741	9,746	8,192	7,757	6,864	5,257	2,672	1,197	431	246
8										
9										
10 Basic Weighted average shares outstanding (million)	462	457	453	453	447	433	423	413	416	412

Figure 15 amazon.com Shareholders Equity and Shares Outstanding

Note: these figures are in \$ millions

Treasury Stock is

The portion of shares that a company keeps in their own treasury. Treasury stock may have come from a repurchase or buyback from shareholders; or it may have never been issued to the public in the first place. These shares don't pay dividends, have no voting rights and should not be included in shares outstanding calculations.

Source: <http://www.investopedia.com/terms/t/treasurystock.asp>

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In the case of amazon.com, their treasury shares come from a share buy back scheme they have set up.

Accumulated Other Comprehensive Income is

An entry that is generally found in the shareholders' equity section of the balance sheet. Accumulated other comprehensive income is used to add together unrealised gains and losses because those items have not been settled. This account can include unrealised gains and losses from investments held by the firm, company pension funds and foreign currency transactions.

Source: <http://www.investopedia.com/terms/a/accumulatedother.asp>

Exercise 39 Find examples of companies that have treasury stock and how that came about. Give real examples of unrealised gains and losses that might appear in the line item *accumulated other comprehensive income*.

Preference Shares

Preference or preferred shares have that name because their holders receive their dividends before or in preference to equity shareholders. Moreover, preference shares are usually paid a fixed dividend

Preference shares are shares with dividends that are paid to shareholders before ordinary share dividends are paid out. In the event of a company bankruptcy, preference shareholders have a right to be paid company assets first. Preference shares typically pay a fixed dividend, whereas common stocks do not. Unlike common shareholders, preference share shareholders usually do not have voting rights.

Reference: <http://www.investopedia.com/terms/p/preference-shares.asp>

There are other aspects to preference shares such as whether they are cumulative and whether they can suspend their dividend. Preference shares are not very easy to find these days.

Amazon.com has authorized 500,000,000 \$0.01 preference shares but so far they have not issued any of them according to their 2014 annual report.

Exercise 40 Trends in Equity Shares?

Consider the following graph, showing share premium and total shareholders' equity for amazon.com:

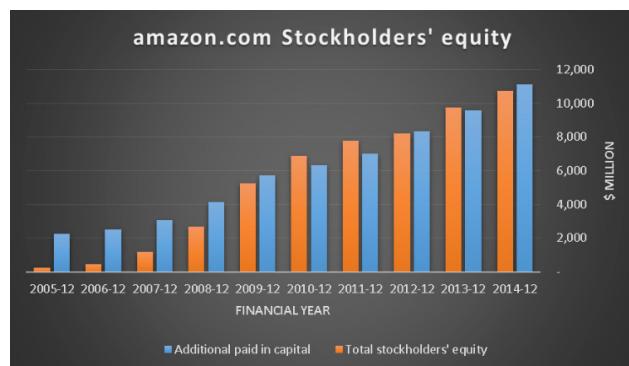


Figure 16 amazon.com Share Premium and Stockholders Equity

Note: at an almost constant \$5 million, it is hardly worth showing the par value on that graph.

Create the stockholders' equity graph for Apple Inc that you see above for amazon.com and comment on what you have found. In addition, create a graph of issued ordinary shares of Apple Inc and comment on what you have found.

Retained earnings, the total accumulated profits to date that amazon.com has not paid out in expenses, taxes and dividends and so on is \$1,949 million at the end of 2014: contrast that with total sales of the company over its lifetime of over \$462 million. This is what is meant by the profit ploughed back into the company.

Exercise 41 In the last ten years Apple Inc has generated total sales of \$647,391 million and its closing balance on retained earnings at the start of those ten years was \$4,005 million and at the end of those 10 years it is \$87,152 million. Prepare your analysis of Apple Inc's profit retention policy by creating a graph of sales, net income and retained earnings for the ten years for which you have full data:

Financial period	Net sales (\$ million)	Net profits (\$ million)	Retained Earnings
2005	13,931	1,328	4,005
2006	19,315	1,989	5,607
2007	24,578	3,495	9,101
2008	37,491	6,119	13,845
2009	42,905	8,235	23,353
2010	65,225	14,013	37,169
2011	108,249	25,922	62,841
2012	156,508	41,733	101,289
2013	170,910	37,037	104,256
2014	182,795	39,510	87,152

Table 11 Apple Inc Sales, Profits and Retained Earnings

Other Users of Business Analysis

Business analysis and financial statement analysis are important in a number of other contexts.

- **Managers** Analysis of financial statements can provide managers with clues to strategic changes in operating, investing and financing activities. Managers also analyse the businesses and financial statements of competing companies to evaluate a competitor's profitability and risk. Such analysis allows for interfirm comparisons, both to evaluate relative strengths and weaknesses and to benchmark performance.
- **Mergers, acquisitions and divestitures** Business analysis is performed whenever a company **restructures** its operations, through mergers, acquisitions, **divestitures** and **spin offs**. **Investment bankers** need to identify potential targets and determine their values and security analysts need to determine whether and how much additional value is created by the merger for both the acquiring and the target companies.
- **Financial management** Managers must evaluate the impact of **financing decisions** and **dividend policy** on company value. Business analysis helps assess the impact of financing decisions on both future profitability and risk.
- **Directors** As elected representatives of the shareholders, directors are responsible for protecting the shareholders' interests by vigilantly overseeing the company's activities. Both business analysis and financial statement analysis aid directors in fulfilling their oversight responsibilities.
- **Regulators** The Taxation Authority applies tools of financial statement analysis to audit tax returns and check the reasonableness of reported amounts.
- **Trade unions** Techniques of financial statement analysis are useful to trade unions in collective bargaining negotiations.
- **Customers** Analysis techniques are used to determine the profitability (or staying power) of suppliers along with estimating the suppliers' profits from their mutual transactions.

Reference: Subramanyam, KR and John J Wild 10th edition (2009) *Financial Statement Analysis*

As you consider these uses and users of business analysis, consider the business and what it does, what you want to know, what do these users want to know, how to carry out your analysis and so on. Don't rush it: be systematic and take your time!

Exercise 42 Think of at least three other possible users of business analysis or financial data: name them or their position and suggest what it is that they might want to know.

- The business community
- Regulatory authorities such as a stock exchange and an accounting institute
- Legal authorities such as the police/financial crimes unit

4.3 Business Activities

A company carries out many activities as it tries to provide a saleable product or service and to yield a satisfactory return on investment. Its financial statements and related disclosures tell us about the four major activities of the company:

- Planning
- Financing
- Investing
- Operating

It is important to understand each of these major business activities before we can effectively analyse a company's financial statements in detail.

Exercise 43 Suggest two activities you can find under each of the above four headings.

An advertisement for SAP Learning Hub. On the left, large text reads "MAXIMIZE PRODUCTIVITY" in orange and "HELP YOUR ENTIRE ORGANIZATION BUILD EXPERTISE IN SAP SOFTWARE." in black. At the bottom left is the "SAP Learning Hub" logo, and at the bottom right is the SAP logo. A woman is shown from the side, looking down at her smartphone, standing near a window.

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4.4 Planning Activities

A company's goals and objectives are usually found in its business plan that describes the company's purpose, strategy and tactics for its activities. A business plan helps managers to focus their efforts and identifying expected opportunities and obstacles. Insight into the business plan considerably aids our analysis of a company's current and future prospects and is part of the analysis of business environment and strategy.

Where can we find the business plan or construct the company's purpose, strategy and tactics? We can find this information in varying forms, for example, it is often revealed in financial statements. It is also available through less formal means such as press releases, industry publications, analysts' newsletters and the financial press.

Many companies have an annual Letter to Shareowners in their annual report. amazon.com's letter for 2014 is found in the annual report for 2014 that we have been discussing. Here are the headings from the 2014 letter: what do they reveal about the company today?

- Marketplace
- Amazon Prime
- Amazon Web Services
- Career Choice

Also for amazon.com, additional discussion appears in the section in their annual report entitled ***Management's Discussion and Analysis of Financial Condition and Results of Operations.***

These two sources are excellent starting points in constructing a company's business plan and in performing a business environment and strategy analysis.

Important questions here are, can amazon.com be

- Certain of the future of consumer and business computing needs?
- Certain its input costs will not increase?
- Sure how competitors will react?

These and other questions add risk to our analysis. While all actions involve risk, some actions involve more risk than others. Financial statement analysis helps us estimate the degree of risk, or uncertainty and helps us to be better informed and to take better decisions.

While information taken from financial statements does not provide perfect answers, it does help us to gauge the soundness of a company's business opportunities and strategies and to better understand its financing, investing and operating activities.

Exercise 44 Explore the various sources we have just mentioned for amazon.com and highlight what you consider are the main points for us to focus on.

4.5 Financing Activities

A company requires financing to carry out its business plan. amazon.com needs financing to buy the items it sells, for capital expansion, paying its employees, acquiring complementary companies and technologies and for research and development. Financing activities refer to methods that companies use to raise the money to pay for these needs. Because of their magnitude and their potential for determining the success or failure of a venture, companies need to take care in acquiring and managing financial resources.

There are two main sources of external financing

- equity investors (also called owners or shareholders) and
- creditors (lenders)

Decisions concerning the composition of financing activities depend on conditions existing in financial markets. For the larger company, financial markets are potential sources of financing. In looking to financial markets, a company considers several issues, including

- the amount of financing necessary
- sources of financing (owners or creditors)
- timing of repayment and structure of financing agreements.

Decisions on these issues determine a company's organisational structure, affect its growth, influence its exposure to risk and determine the power of outsiders in business decisions.

Exercise 45 Create a graph or other illustration that tells us the sources of finance of our two companies, amazon.com and Apple Inc. Keep your illustrations simple but consider the message you are trying to convey as you construct them. Include current liabilities, non current liabilities and total equity in your illustrations and take just the final year's data from your database.

Here is my suggestion: a panel chart for amazon.com

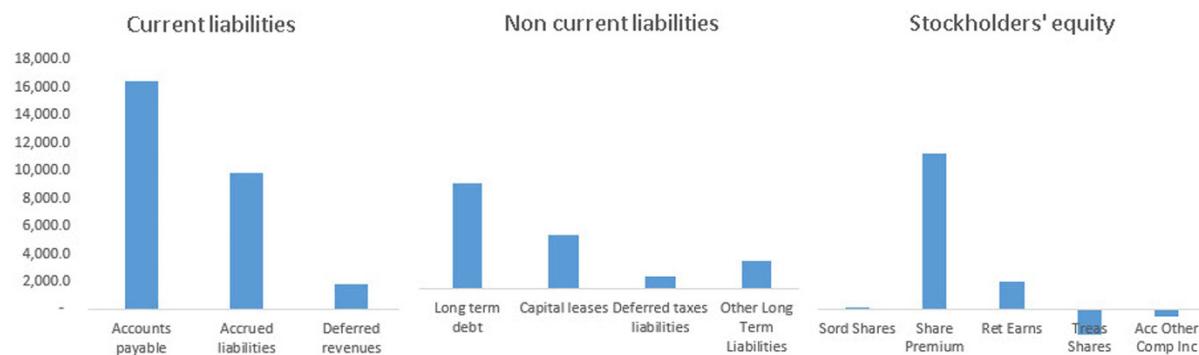


Figure 17 amazon.com Panel Chart for Liabilities and Equity

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Alternatively, also for 2014:



Figure 18 amazon.com Column Chart for Liabilities and Equity

Exercise 46 Fill in the gaps in the following sentences:

Looking at the results of **Exercise 45** we can see that amazon.com's balance sheet shows total creditor financing of \$____ billion, which is about ____% of its total financing. Of this amount, around \$____ billion is long term liability financing, while the remaining \$____ billion is operating creditor financing.

Exercise 47 We already know a great deal about amazon.com and Apple Inc so let's explore the relationship between loan coupons and the success or otherwise of the business. Compare coupon rates for amazon.com and Apple Inc and make any comments you think are appropriate.

By combining the amazon.com and Apple Inc coupon and maturity dates I prepared this graph.



Figure 19 amazon.com and Apple Inc Coupon v Maturity Dates

What you should notice is that the coupons for amazon.com are generally higher than the coupons for Apple Inc. What this suggests is that the bond market sees Apple Inc as a safer company to lend money to than amazon.com. Remember the idea: the greater the risk, the greater the return.

Exercise 48 Fill in the gaps in the following text by referring to amazon.com's 2014 financial statements.

Amazon.com invested \$____ billion in current assets (____% of total assets) and \$____ billion in property, plant and equipment (____% of total assets). Its remaining assets include other long term assets and intangibles and they amount to \$ ____ billion.

4.6 Operating Activities

Operating activities represent the *carrying out* of the business plan given its financing and investing activities. Operating activities involve at least five possible components:

1. Research and development
2. Procurement
3. Production
4. Marketing
5. Administration

A proper mix of the components of operating activities depends on the type of business, its plans and its input and output markets. Management decides on the most efficient and effective mix for the company's competitive advantage.

Operating activities are a company's primary source of earnings. Earnings reflect a company's success in buying from **input markets** and selling in **output markets**. How well a company does in devising business plans and strategies and deciding the mix of operating activities, determines its success or failure. Analysis of earnings figures and their component parts, reflects a company's success in efficiently and effectively managing business activities.

Exercise 49 Fill in the gaps for 2014 for amazon.com. amazon.com earned net income of \$_____ billion in 2014. This number by itself is not very meaningful. Instead, it must be compared with the level of investment used to generate these earnings. amazon.com's return on start of year total assets of \$____ billion is ____% (that is, \$____ billion/\$____ billion): which is a **superior/inferior** return.

5 Correlation and Correlation Matrices

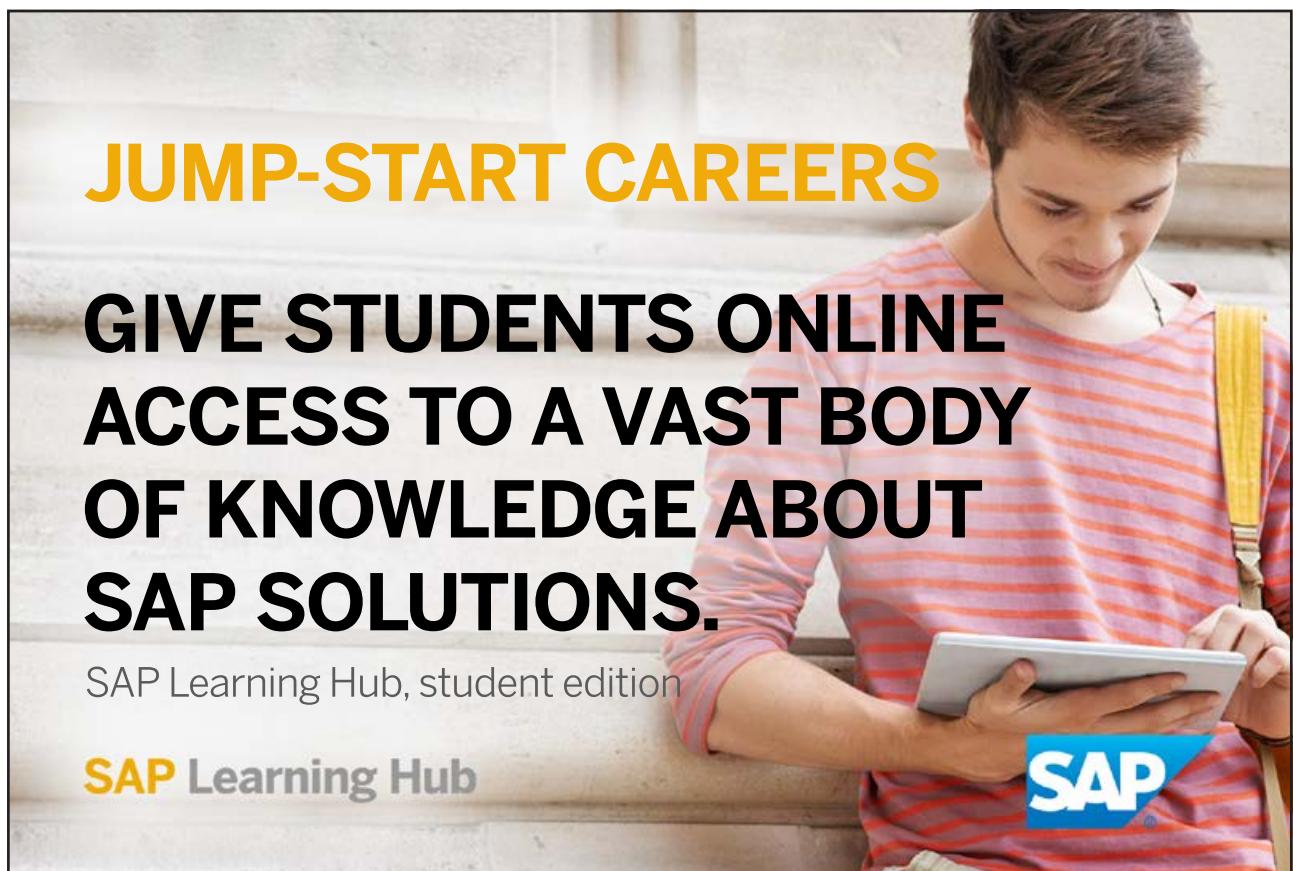
We are going to use correlation matrices now to enhance our analysis but you need to know what correlation is and what a correlation matrix is first!

5.1 Correlation

Correlation refers to the relationship between two or more variables. If one variable increases or decreases a lot as we increase or decrease another variable, the degree of correlation between these two variables is high. If a variable doesn't change as we increase or decrease another variable then we say that there is no correlation.

5.2 Excel: CORREL(array_1,array_2)

In the Excel file that accompanies this chapter, *correl_matrix_students.xlsx*, there are several examples for you to follow: on tabs perfect_1 to perfect_4 you will find a fully developed exercise for you to work through. The following four graphics show you what is in the trainer's file...for you to do!



The advertisement features a young man in a striped shirt sitting on stone steps, looking at a tablet. The text overlay reads:

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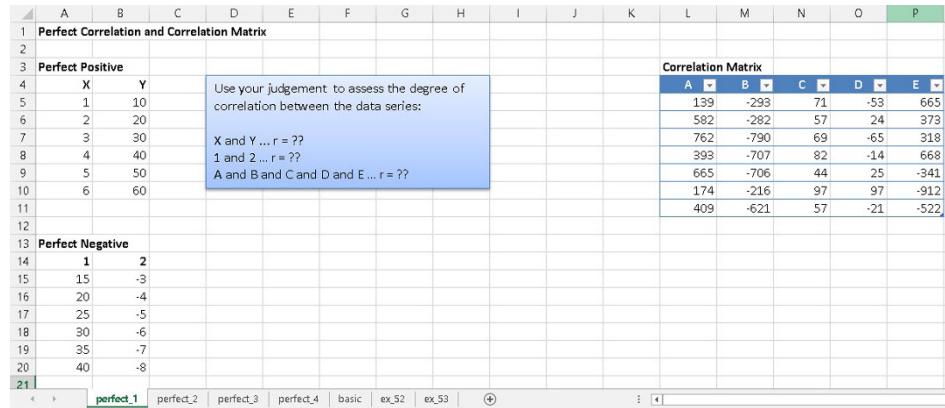


Figure 20 Perfect Correlation Example 1

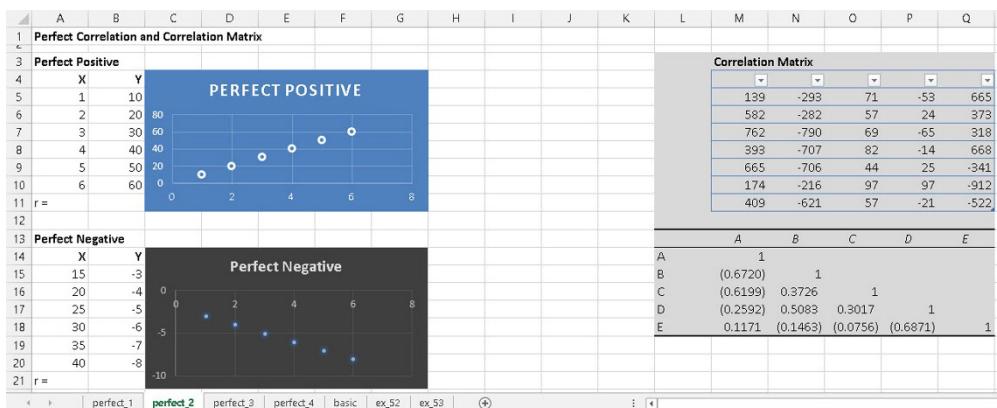


Figure 21 Perfect Correlation Example 2

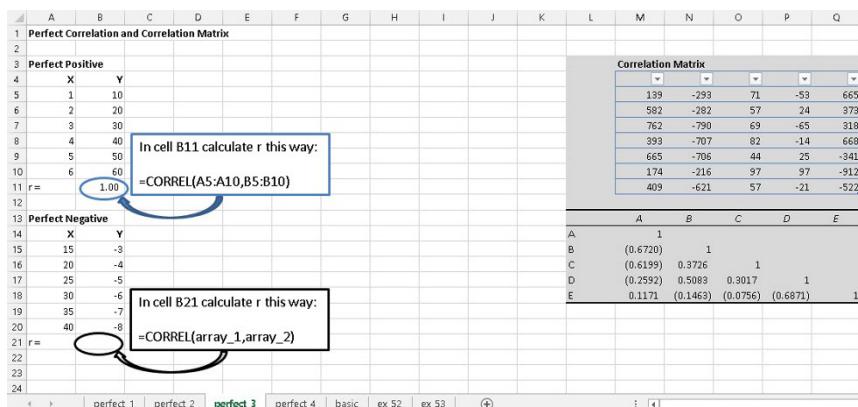
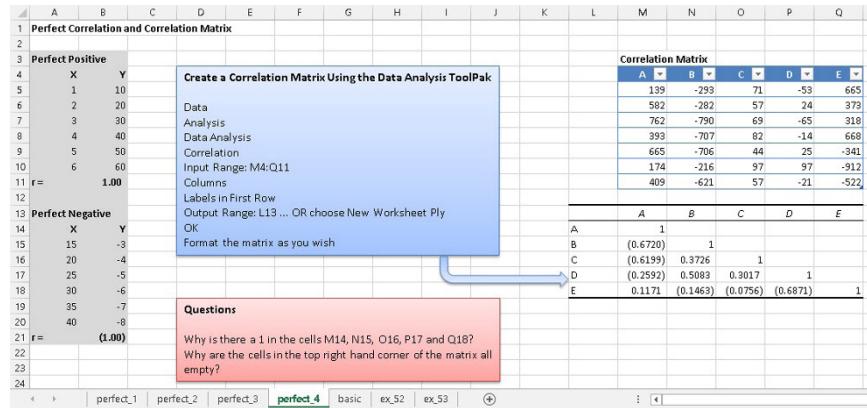
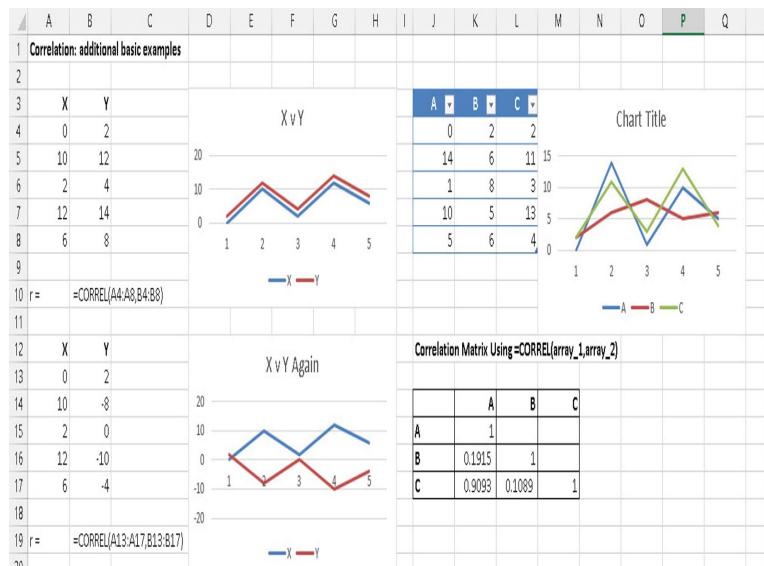


Figure 22 Perfect Correlation Example 3

**Figure 23** Perfect Correlation Example 4

In the rest of that Excel file you will see the following examples: we find the value of correlation, the coefficient of correlation, r , by using =CORREL(array_1,array_2) and it tells us whether there is a statistical relationship between the two variables, x and y .

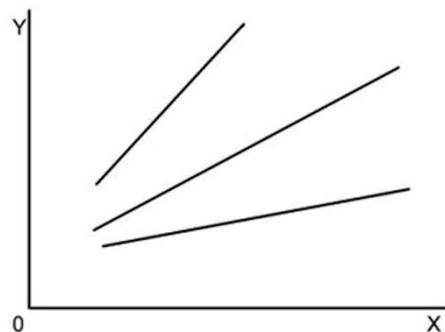
Consider these two examples:

**Figure 24** Perfect Positive and Negative Correlation

In the first example, the formula in cell B10 =CORREL(A4:A8,B4:B8) = 1

In the second example, the formula in cell B19 =CORREL(A13:A17,B13:B17) = -1

If the answer = $r = 1$ then it is telling you this (note there are three lines here just for demonstration but they all have $r = 1$):

Perfect Positive Correlation where $r = 1$ **Figure 25** Perfect Positive Correlation Graph

In our first simple example notice that the lines on the graph are not straight but they are parallel to each other.



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The advertisement features a man wearing glasses and a suit, looking down at a white tablet device he is holding. The SAP logo is visible in the bottom right corner of the image.

If the answer = $r = -1$ then it is telling you this (note, again, there are three lines here just for demonstration but they all have $r = -1$):

Perfect Negative Correlation where $r = -1$

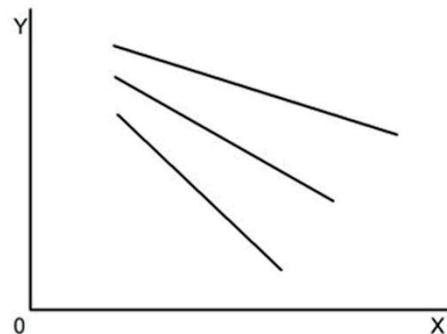


Figure 26 Perfect Negative Correlation Graph

In our first simple example notice that the lines on the graph are not straight but they are just about mirror images of each other.

If the answer = $r = 0$ then it is telling you something like this:

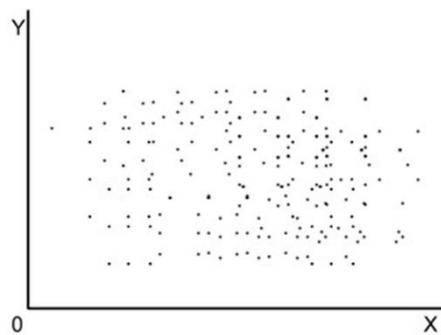


Figure 27 Zero Correlation Graph

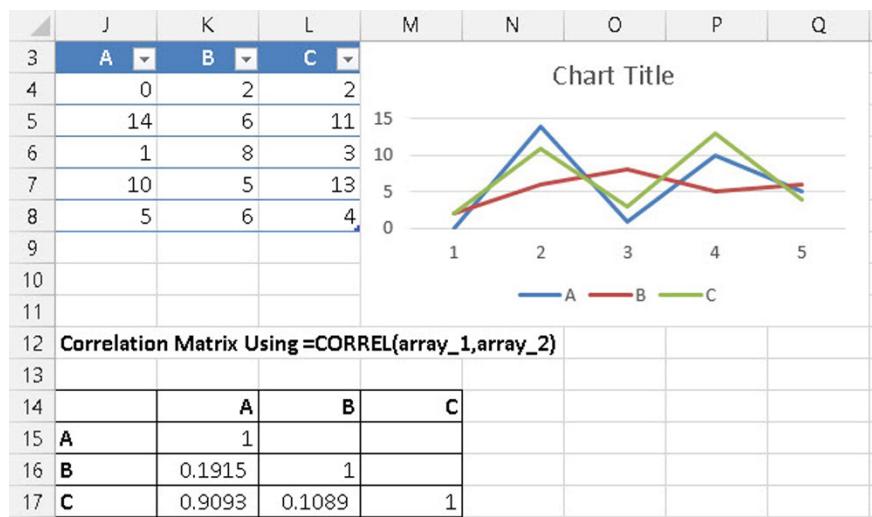
More often than not, r is not exactly equal to 1 or -1 or 0 but something in between. This means that correlation can be low or high or very high...positive or negative.

In our third example, we have put the r values in a **correlation matrix** and

$r = 0.1915$ for A v B...very low

$r = 0.1089$ for B v C...very low

$r = 0.9093$ for A v C...very high

**Figure 28** Correlation Matrix: more than two variables

I explain the correlation matrix below in the section *Data Analysis ToolPak add-In*.

The meaning of r is quite clear, however:

- If r is positive it means that as we increase values of X, values of Y increase too: as quickly or as slowly as the value of r suggests.
- If r is negative it means that as we increase values of X, values of Y decrease: as quickly or as slowly as the value of r suggests.
- If r is zero it means that as we increase values of X, values of Y can change in any one of a large number of ways.

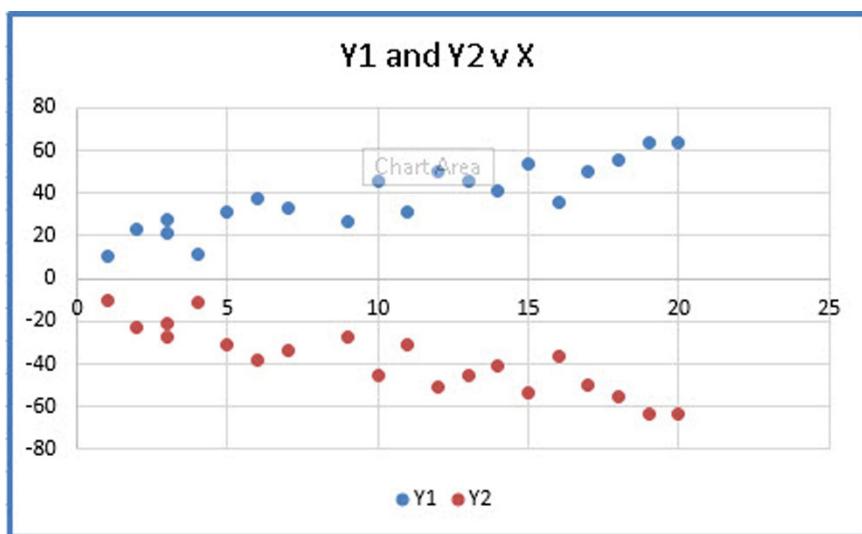
Exercise 50 Take the table that follows and use Excel to find the coefficient of correlation, r, for X1 v Y1 and X1 v Y2. Plot the data on one or two graphs and interpret your results.

X	Y1	Y2
2	22.90	-22.90
10	45.78	-45.78
7	33.49	-33.49
17	49.77	-49.77
14	40.94	-40.94
16	36.18	-36.18
3	21.05	-21.05
12	50.57	-50.57
11	31.32	-31.32
15	53.76	-53.76
18	55.66	-55.66

3	27.61	-27.61
4	11.15	-11.15
1	10.11	-10.11
6	37.90	-37.90
5	31.08	-31.08
13	45.48	-45.48
19	63.83	-63.83
20	63.60	-63.60
9	27.01	-27.01

Table 12 Data for Exercise 50

Your graph could look like this:

**Figure 29** Possible Graph for Exercise 50

Exercise 51 Take the table that follows and use Excel to find the coefficient of correlation, r, for X v Y1 and X v Y2. Plot the data on two graphs and interpret your results as we are trying to find the best relationship between Machine (X1) and Labour Hours (X2) and Indirect Labour Costs (Y).

Week	Machine Hours (X1)	Direct Labour Hours (X2)	Indirect Factory Labour Costs (Y)
1	68	30	1,190
2	88	35	1,211
3	62	36	1,004
4	72	20	917
5	60	47	770
6	96	45	1,456
7	78	44	1,180
8	46	38	710

9	82	70	1,316
10	94	30	1,320
11	68	29	752
12	48	38	963

Table 13 Data for Exercise 51

Exercise 52, Find the values of r for the three variables in exercise 51.

Depending on how you answered exercise 52, it's time to look at the Data Analysis ToolPak Excel AddIn: see the next section.

5.3 Data Analysis ToolPak Add-In

Install the Data Analysis ToolPak in Excel 2013:

File

Options

AddIns to see this dialogue box:



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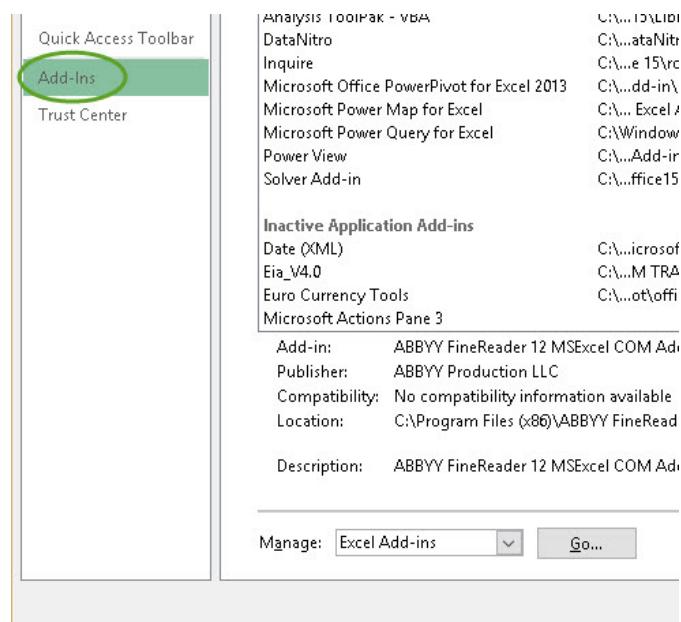
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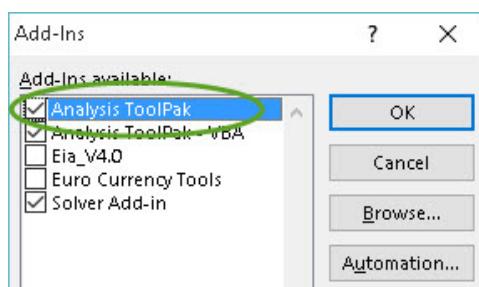
The advertisement features a man in a suit and tie, looking down at a tablet he is holding. The SAP logo is visible in the bottom right corner of the image.

**Figure 30** File, Options, Addins...

Click Go...at the bottom where it says Manage Excel AddIns...

**Figure 31** Excel Add-ins...Go...

Click Analysis ToolPak:

**Figure 32** Select Analysis ToolPak

OK

The Button for the Data Analysis ToolPak will always be in the top right hand corner of the Data Tab:



Figure 33 Data Analysis is always here on the Data Tab

Now, to create your Correlation Matrix:

Data

Data Analysis

Correlation

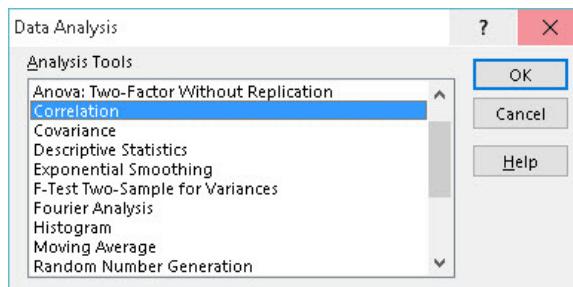


Figure 34 Data Analysis Correlation

OK

Exercise 52 Manually				
	A	B	C	D
1	Week	Machine Hours (X1)	Direct Labour Hours (X2)	Indirect Factory Labour Costs (Y)
2				
3				
4	1	68	30	1,190
5	2	88	35	1,211
6	3	62	36	1,004
7	4	72	20	917
8	5	60	47	770
9	6	96	45	1,456
10	7	78	44	1,180
11	8	46	38	710
12	9	82	70	1,316
13	10	94	30	1,320
14	11	68	29	752
15	12	48	38	963
16				
17				

Correlation

Input
Input Range: \$B\$3:\$D\$15

Grouped By: Columns Rows

Labels in first row

Output options
 Output Range: \$E\$17 New Worksheet Ply: New Workbook

Figure 35 Setting up the Correlation Analysis

OK

You will be given this:

	Machine Hours (X1)	Direct Labour Hours (X2)	Indirect Factory Labour Costs (Y)
Machine Hours (X1)	1		
Direct Labour Hours (X2)		1	
Indirect Factory Labour Costs (Y)	0.825606744	0.318677097	1

Figure 36 Correlation Matrix Output

Which you can tidy to become this:

	Indirect Factory Labour Costs (Y)	Machine Hours (X1)	Direct Labour Hours (X2)
Indirect Factory Labour Costs (Y)	1		
Machine Hours (X1)	0.8256	1	
Direct Labour Hours (X2)	0.3187	0.1237	1

Table 14 Formatted Correlation Matrix

There you are: interpret that!

If you are using Excel for Mac 2008 or 2011 there is no ToolPak for you and you need to do this: set up a table with column and row headers as you see here then enter the following formulas.

Correlation Matrix

	Machine Hours (X1)	Direct Labour Hours (X2)	Indirect Factory Labour Costs (Y)
Machine Hours (X1)	1		
Direct Labour Hours (X2)		=CORREL(B4:B15,C4:C15)	1
Indirect Factory Labour Costs (Y)	=CORREL(B4:B15,D4:D15)	=CORREL(C4:C15,D4:D15)	1

Table 15 Programming a Correlation Matrix Manually

Which gives:

Correlation Matrix

	Machine Hours (X1)	Direct Labour Hours (X2)	Indirect Factory Labour Costs (Y)
Machine Hours (X1)	1		
Direct Labour Hours (X2)	0.1237	1	
Indirect Factory Labour Costs (Y)	0.8256	0.3187	1

Table 16 Correlaton Matrix After Formatting

If you have never seen a correlation matrix before just ask yourself the questions

- why is there a number 1 in a line like we see here?
- why are the cells in the top right corner of the matrix empty?

You could do that in Excel for Windows too since this is a very basic example. However, for larger problems, it would take you a long time to set up any correlation matrix where there are, for example, more than five or six variables.

Exercise 53 Here are the correlation matrices of our two companies, amazon.com and Apple Inc insofar as they relate to sales, net income and retained earnings. **Explain** what these two correlation matrices might be telling us about those two companies.

Amazon.com	Revenue	Net income	Retained earnings	Apple Inc	Revenue	Net income	Retained earnings
Revenue	1			Revenue	1		
Net income	-0.5053	1		Net income	0.9894	1	
Retained earnings	0.8879	-0.1187	1	Retained earnings	0.9815	0.9902	1

Table 17 amazon.com and Apple Inc Correlation Matrix for Analysis

The advertisement features a woman with dark hair tied back, wearing a white button-down shirt, looking thoughtfully upwards while holding an open book. The background is a bright, slightly overexposed outdoor scene with a clear blue sky. The SAP logo is visible in the bottom right corner of the image area.

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6 Technical and Fundamental Analysis

Individuals who apply active investment strategies primarily use **technical analysis**, **fundamental analysis**, or a combination.

- **Technical analysis**, or charting, searches for patterns in the price or volume history of a stock to predict future price movements.
- **Fundamental analysis**, which is more widely accepted and applied, is the process of determining the value of a company by analysing and interpreting key factors for the economy, the industry and the company. A main part of fundamental analysis is evaluation of a company's financial position and performance.

A Technical Analysis Chart

I just took the following chart at random from a web search for technical analysis images. You can see some of what they do with their analysis: segment their candlestick charts to isolate different trends and so on.



Figure 37 Technical Analysis Chart
<http://www.istockanalyst.com/articles/technical/tech3.gif>

Consider the following **Candlestick, Volume Open High Low Close, Graph** for amazon.com for July 2015:

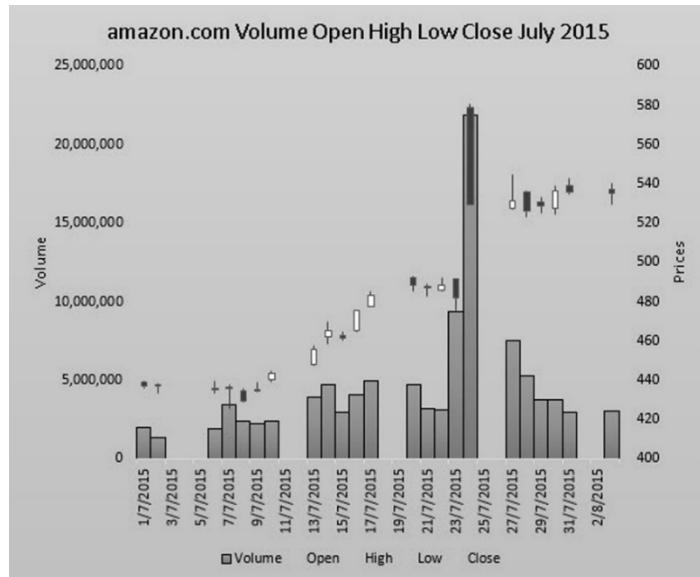


Figure 38 amazon.com Candlestick, Volume Open High Low Close, Graph

What trends seem to be apparent in the above chart on which the large columns at the bottom are **volumes of shares traded** day by day, ranging from 2.0 million to 21.9 million shares?

You can find that graph in the file *amzn_candlestick.xlsx*



Fundamental Analysis

A major goal of fundamental analysis is to determine intrinsic value, also called fundamental value. Intrinsic value is the value of a company (or its share) determined through fundamental analysis without reference to its market value (or share price). While a company's market value can equal or approximate its intrinsic value, this is not necessary. An investor's strategy with fundamental analysis is straightforward: buy when a stock's intrinsic value exceeds its market value, sell when a stock's market value exceeds its intrinsic value and hold when a stock's intrinsic value approximates its market value.

To determine intrinsic value, an analyst must forecast a company's earnings or cash flows and determine its risk. This is achieved through a comprehensive, in depth analysis of a company's business prospects and its financial statements. Once a company's future profitability and risk are estimated, the analyst uses a valuation model to convert these estimates into a measure of intrinsic value. Intrinsic value is used in many contexts, including equity investment and share selection, **initial public offerings (IPOs)**, **private placements** of equity, **mergers and acquisitions** and the buying/sale of companies without **traded securities**.

Fundamental Analysis According to Investopedia

Fundamental analysis serves to answer questions, such as:

1. Is the company's revenue growing?
2. Is it actually making a profit?
3. Is it in a strong enough position to beat...its competitors in the future?
4. Is it able to repay its debts?
5. Is management trying to "cook the books"?

Of course, these are very involved questions and there are literally hundreds of others you might have about a company. It all really boils down to one question: Is the company's share a good investment? Think of fundamental analysis as a toolbox to help you answer this question.

Source: <http://www.investopedia.com/university/fundamentalanalysis/fundanalysis1.asp#ixzz3oRmIa100>

Our ratio analysis section, see later, is essentially fundamental analysis.

Exercise 54 As a warm up exercise, take a look at any company with which you are familiar and try to answer the questions just shown under the fundamental analysis heading:

1. Is the company's revenue growing?
2. Is it actually making a profit?
3. Is it in a strong enough position to beat...its competitors in the future?
4. Is it able to repay its debts?
5. Is management trying to "cook the books"?

Some of these questions seem simple to answer but others, such as questions three and five in that list, can be difficult and sometimes impossible for an outsider to answer.

If you don't have any company data of your own, apply the questions again to amazon.com and Apple Inc. Otherwise, take a look at these web sites that provide a lot of free financial information:

<https://www.google.com/finance>

<http://finance.yahoo.com/market-overview/>

<http://www.morningstar.com/>

<http://markets.ft.com/research/markets/companies-research>

Please note, I am not recommending these sites in any way other than as potential sources of free information. Some services on at least two of those sites must be paid for but I have no financial interest in your decision to subscribe to them.

7 Financial Statements: basic analysis

7.1 Financial Statements Reflect Business Activities

At the end of a period, typically a quarter or a year, financial statements are prepared to report on financing and investing activities at that point in time and to summarize operating activities for the preceding period. This is the role of financial statements and the object of analysis. It is important to recognise that financial statements report on financing and investing activities at a point in time, whereas they report on operating activities for a period of time.

7.1.1 Balance Sheet

The accounting equation is the basis of the accounting system:

$$\text{Assets} = \text{Liabilities} + \text{Equity}$$

- The left hand side of this equation relates to the resources controlled by a company, or assets. These resources are investments that are expected to generate future earnings through operating activities. To engage in operating activities, a company needs financing to fund them.
- The right hand side of this equation identifies funding sources.
- Liabilities are funding from creditors and represent obligations of a company or, alternatively, claims of creditors on assets.
- Equity (or shareholders' equity) is the total of
 - funding invested or contributed by owners (contributed capital) and
 - accumulated earnings in excess of distributions to owners (retained earnings) since the inception of the company.

From the owners' or shareholders' point of view, equity represents their claim on company assets. A slightly different way to describe the accounting equation is in terms of sources and uses of funds. That is, the right hand side represents sources of funds (either from creditors or shareholders, or internally generated) and the left hand side represents uses of funds.

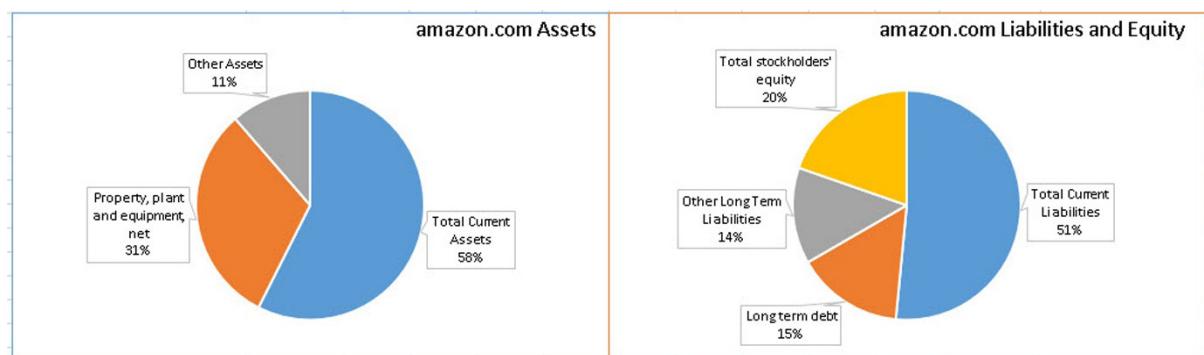


Figure 39 amazon.com Assets, Liabilities and Stockholders' Equity

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Assets and liabilities are separated into current and non current amounts. Current assets are expected to be converted to cash or used in operations within one year or the operating cycle, whichever is longer. Current liabilities are obligations the company is expected to settle within one year or the operating cycle, whichever is longer. The difference between current assets and current liabilities is called **Working Capital**.

Remember the accounting equation is at a point in time. Operating activities arise over a period of time and are not reflected in this equation. However, operating activities can affect both sides of this equation. That is, if a company is profitable, both investing (assets) and financing (equity) levels increase. Similarly, when a company is unprofitable, both investing and financing decline.

Exercise 55 Prepare graphs to illustrate the asset, liability and equity situation of Apple Inc for 2014 and comment on any differences between amazon.com and Apple Inc.

7.1.2 Income Statement

An income statement measures a company's financial performance between balance sheet dates. It represents the operating activities of a company. The income statement provides details of revenues, expenses, gains and losses of a company between balance sheet dates. The bottom line, earnings (also called net income or profit), indicates the profitability of the company.

Earnings reflects the return to equity holders for the period under consideration, while the line items of the statement detail how earnings are determined. Earnings approximate the increase (or decrease) in equity before charging any distributions to and contributions from equity holders. For income to measure change in equity exactly, we need a slightly different definition of income, called comprehensive income.

AMAZON.COM INC (AMZN) INCOME STATEMENT

Fiscal year ends in December. USD in millions except per share data.	2014-12	2013-12	2012-12
Revenue	88,988	74,452	61,093
Cost of revenue	62,752	54,181	45,971
Gross profit	26,236	20,271	15,122
Operating expenses			
Sales, General and administrative	16,650	12,847	9,723
Other operating expenses	9,408	6,679	4,723
Total operating expenses	26,058	19,526	14,446
Operating income	178	745	676
Interest Expense	210	141	92
Other income (expense)	(79)	(98)	(40)
Income before income taxes	(111)	506	544
Provision for income taxes	167	161	428

Other income	37	(71)	(155)
Net income from continuing operations	(241)	274	(39)
Cumulative effect of accounting changes			
Net income	(241)	274	(39)
Net income available to common shareholders	(241)	274	(39)
Earnings per share			
Basic	(0.52)	0.60	(0.09)
Diluted	(0.52)	0.59	(0.09)
Weighted average shares outstanding (million)	2014-12	2013-12	2012-12
Basic	462	457	453
Diluted	462	465	453
EBITDA	4,845	3,900	2,795

Table 18 amazon.com Income Statements 2012–2014Source: <http://financials.morningstar.com/income-statement/is.html?t=MSFT®ion=usa&culture=en-US>

The income statement includes several indicators of profitability:

Gross profit is the difference between sales and cost of sales (also called cost of goods sold). It indicates the extent to which a company is able to cover the costs of its products. This indicator is not especially relevant for service and technology companies where production costs are a small part of total costs.

Earnings from operations refers to the difference between sales and all operating costs and expenses. It usually excludes financing costs (interest) and taxes.

Earnings before taxes, as the name implies, represents **earnings from continuing operations** before the provision for income tax.

Earnings from continuing operations is the income from a company's continuing business after interest and taxes: it is also called earnings before extraordinary items and discontinued operations.

Earnings are determined using the **accruals basis of accounting**. Under accruals accounting, revenues are recognised when a company sells goods or renders services, regardless of when it receives cash. Similarly, expenses are matched to these recognised revenues, regardless of when it pays cash.

Exercise 56 Fill in the missing information in the sentences that follow.

The income statement of amazon.com, titled statement of income, for the three years 2012 to 2014 is shown above. amazon.com's revenues in 2014 amounted to \$____ billion. Of this amount, \$____ billion are costs of operations and other expenses, yielding net income of \$____ billion. amazon.com's earnings have been _____ during these three years despite a healthy increase in revenues, suggesting that the company is still _____.

7.1.3 Statement of Shareholders' Equity

The statements of retained earnings, comprehensive income and changes in capital accounts are called the **Statement of Changes in Shareholders' Equity**. This statement is useful in identifying reasons for changes in equity holders' claims on the assets of a company. amazon.com's statement of stockholders' equity for the most recent year is shown in their annual report for 2014 is shown below.

An advertisement for SAP Learning Hub. On the left, large text reads "MAXIMIZE PRODUCTIVITY" in orange and "HELP YOUR ENTIRE ORGANIZATION BUILD EXPERTISE IN SAP SOFTWARE." in black. On the right, a woman with long dark hair is seen from the side, looking down at her smartphone. In the bottom left corner, the text "SAP Learning Hub" is displayed, and in the bottom right corner, the SAP logo is shown.

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AMAZON.COM, INC.
CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY
(in millions)

	Common Stock			Additional Paid-In Capital	Accumulated Other Comprehensive Income (Loss)	Retained Earnings	Total Stockholders' Equity
	Shares	Amount	Treasury Stock				
Balance as of January 1, 2012	455	\$ 5	\$ (877)	\$ 6,990	\$ (316)	\$ 1,955	\$ 7,757
Net loss	—	—	—	—	—	(39)	(39)
Other comprehensive income	—	—	—	—	77	—	77
Exercise of common stock options	4	—	—	8	—	—	8
Repurchase of common stock	(5)	—	(960)	—	—	—	(960)
Excess tax benefits from stock-based compensation	—	—	—	429	—	—	429
Stock-based compensation and issuance of employee benefit plan stock	—	—	—	854	—	—	854
Issuance of common stock for acquisition activity	—	—	—	66	—	—	66
Balance as of December 31, 2012	454	5	(1,837)	8,347	(239)	1,916	8,192

Figure 40 amazon.com Stockholders' Equity 2014a

Net income	—	—	—	—	—	274	274
Other comprehensive income	—	—	—	—	54	—	54
Exercise of common stock options	5	—	—	4	—	—	4
Repurchase of common stock	—	—	—	—	—	—	—
Excess tax benefits from stock-based compensation	—	—	—	73	—	—	73
Stock-based compensation and issuance of employee benefit plan stock	—	—	—	1,149	—	—	1,149
Balance as of December 31, 2013	459	5	(1,837)	9,573	(185)	2,190	9,746
Net loss	—	—	—	—	—	(241)	(241)
Other comprehensive loss	—	—	—	—	(326)	—	(326)
Exercise of common stock options	6	—	—	2	—	—	2
Excess tax benefits from stock-based compensation	—	—	—	6	—	—	6
Stock-based compensation and issuance of employee benefit plan stock	—	—	—	1,510	—	—	1,510
Issuance of common stock for acquisition activity	—	—	—	44	—	—	44
Balance as of December 31, 2014	465	\$ 5	\$ (1,837)	\$ 11,135	\$ (511)	\$ 1,949	\$ 10,741

Figure 41 amazon.com Stockholders' Equity 2014b

Exercise 57 Fill in the missing information in the sentences relating to the Consolidated Statement of Stockholders' Equity that follow.

During this period, shareholders' equity changes were due mainly to _____ and the repurchasing stock (treasury shares) and. amazon.com details these changes under _____ headings:

Common Shares and Additional Paid In Capital together represent Contributed Capital and are often collectively called share capital (many analysts also net Treasury Stock in the computation of share capital). The change in amazon.com's retained earnings is especially important because this account links consecutive balance sheets through the income statement. For example, consider amazon.com's collective retained earnings increase from \$_____ billion in 2013 to \$_____ billion in 2014. This increase of \$_____ billion is explained by net earnings of \$_____ billion minus dividends of \$_____ billion. Because dividends almost always are distributed from retained earnings, the retained earnings balance often represents an upper limit on the amount of potential dividend distributions.

Statement of Comprehensive Income

amazon.com includes separate information for **comprehensive income**. Comprehensive Income is a measure of the ultimate *bottom line* income, that is, changes to shareholder's equity excluding transactions involving exchanges with shareholders. amazon.com's 2014 comprehensive income is \$(567) million. In addition to net income, comprehensive income includes certain adjustments classified as other comprehensive income. The largest constituent of other comprehensive income, is \$325 million for Foreign Currency Translation Adjustments, Net of Tax.

AMAZON.COM, INC.
CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME
(in millions)

	Year Ended December 31,		
	2014	2013	2012
Net income (loss)	\$ (241)	\$ 274	\$ (39)
Other comprehensive income (loss):			
Foreign currency translation adjustments, net of tax of \$(3), \$(20), and \$(30)	(325)	63	76
Net change in unrealized gains on available-for-sale securities:			
Unrealized gains (losses), net of tax of \$1, \$3, and \$(3)	2	(10)	8
Reclassification adjustment for losses (gains) included in "Other income (expense), net," net of tax of \$(1), \$(1), and \$3	(3)	1	(7)
Net unrealized gains (losses) on available-for-sale securities	<u>(1)</u>	<u>(9)</u>	<u>1</u>
Total other comprehensive income (loss)	<u>(326)</u>	<u>54</u>	<u>77</u>
Comprehensive income (loss)	<u><u>\$ (567)</u></u>	<u><u>\$ 328</u></u>	<u><u>\$ 38</u></u>

Figure 42 amazon.com Statement of Comprehensive Income 2012–2014

Exercise 58 Compare changes in Net Income and changes in Comprehensive Income for amazon.com for the period 2012 to 2014: both in \$ and % terms and.

7.1.4 Statement of Cash Flows

Earnings do not typically equal net cash flows, except over the life of a company. Because accruals accounting gives numbers different from cash flow accounting and we know that cash flows are important in business decisions, there is a need for reporting cash inflows and outflows. For example, analyses involving reconstruction and interpretation of business transactions often require the statement of cash flows. Also, certain valuation models use cash flows. The statement of cash flows reports cash inflows and outflows under three headings for a company's activities over a period of time:

- Operating
- Investing
- Financing

Exercise 59 Fill in the missing information in the sentences relating to amazon.com's statement of cash flows, as shown below.

amazon.com's 2014 cash balance increases by \$_____ billion, from \$_____ billion to \$_____ billion. Of this increase in net cash, amazon.com's operating activities provided \$_____ billion, its investing activities used \$_____ billion and its financing activities used \$_____ billion.

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AMAZON.COM INC (AMZN) Statement of CASH FLOW

Fiscal year ends in December. USD in millions except per share data.	2014-12	2013-12	2012-12
Cash Flows From Operating Activities			
Net income	(241)	274	(39)
Depreciation & amortization	4,746	3,253	2,159
Investments losses (gains)	(3)	1	(9)
Deferred income taxes	(316)	(156)	(265)
Stock based compensation	1,497	1,134	833
Accounts receivable	(1,039)		(861)
Inventory	(1,193)	(1,410)	(999)
Accounts payable	1,759	1,888	2,070
Accrued liabilities	706	736	1,038
Other working capital	741	(447)	275
Other non-cash items	185	202	(22)
Net cash provided by operating activities	6,842	5,475	4,180
Cash Flows From Investing Activities			
Investments in property, plant, and equipment	(4,893)	(3,444)	(3,785)
Acquisitions, net	(979)	(312)	(745)
Purchases of investments	(2,542)	(2,826)	(3,302)
Sales/Maturities of investments	3,349	2,306	4,237
Net cash used for investing activities	(5,065)	(4,276)	(3,595)
Cash Flows From Financing Activities			
Long-term debt issued	6,359	394	3,378
Long-term debt repayment	(1,933)	(1,011)	(588)
Excess tax benefit from stock based compensation	6	78	429
Common stock issued			
Repurchases of treasury stock			(960)
Other financing activities			
Net cash provided by (used for) financing activities	4,432	(539)	2,259
Effect of exchange rate changes	(310)	(86)	(29)
Net change in cash	5,899	574	2,815
Cash at beginning of period	8,658	8,084	5,269
Cash at end of period	14,557	8,658	8,084
Free Cash Flow			
Operating cash flow	6,842	5,475	4,180
Capital expenditure	(4,893)	(3,444)	(3,785)
Free cash flow	1,949	2,031	395

Table 19 amazon.com Statements of Cash Flow 2012–2014Source: <http://financials.morningstar.com/income-statement/is.html?t=MSFT®ion=usa&culture=en-US>

Exercise 60: getting ready for detailed analysis

Before we work through the formal analysis of financial statements, let's take a look at some structured and basic exercises first:

Accounting Information	Company A	Company B		
Sales	21,546.36	2,387.09		
Total Costs	13,205.07	1,192.69		
Profit as a percentage of sales				
	Company A	Company B	Company C	Company D
Contract costs	52,839.00	81,610.00	135,514.00	107,732.00
Mark up %				
Mark up \$				
Selling price of contract	85,176.47	104,379.19	235,523.33	263,081.54
Profit Margin				
	Company 1	Company 2	Company 3	Company 4
Sales	150,717.82	221,435.49	108,405.79	258,819.48
Operating Costs	78,458.00	136,773.00	62,990.00	108,338.00
Mark up %				
Mark up \$				
Profit Margin				
SABIC Income Statement for the years ended 31st December				
	20X1	20X0	Change \$	Change %
Sales	189,898	151970		
Cost of Sales	127,768	103423		
Gross Profit	62,130	48547		
Selling, General and Administration Expenses	13,292	10654		
Profit from Operations	28,838	37893		
Investment and Other Income	2,039	1256		
Financial Charges	2,992	3394		
Net Profit before Interest and Taxation	47,885	35754		
SABIC Profit Margin Schedule				
	20X1	20X0		
Gross Profit margin				
Profit from Operations Margin				
NPIT Margin				

Table 20 Getting Ready for Detailed analysis Exercise!

The rest of this section gives you your first exposure to **Five Important Sets of Tools for Financial Analysis:**

1. Comparative financial statement analysis
2. Common size financial statement analysis
3. Ratio analysis
4. Cash flow analysis
5. Valuation

Exercise 61

Use this Exercise to help you to appreciate and understand the work of this section before you work on the larger problems in the spreadsheet file.

1. Express the following income statement information in common size percentages and assess whether this company's situation is favourable or unfavourable.

Harbison Corporation

Comparative Income Statements

for the years ended 31st December

	2016	2015
Sales	720,000	535,000
Cost of Goods Sold	475,200	280,340
Gross Profit	244,800	254,660
Operating Expenses	151,200	103,790
Net Income	93,600	150,870

Table 21 Harbison Income Statements 2015–2016



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2. Common size and trend percentages for JBC Company's sales, cost of goods sold and expenses follow:

	COMMON SIZE %			TREND %		
	2016	2015	2014	2016	2015	2014
Sales	100.0%	100.0%	100.0%	104.4%	103.2%	100.0%
Cost of goods sold	62.4	60.9	58.1	112.1	108.2	100.0
Expenses	14.3	13.8	14.1	105.9	101.0	100.0

Table 22 JBC Company Common Size and Trend Data

Determine whether net income increased, decreased, or remained unchanged in this three year period.

3. Selected comparative financial statements of Cohorn Company follow:

COHORN COMPANY

Comparative Income Statement (\$000)
For Years Ended December 31, 2010–2016

	2016	2015	2014	2013	2012	2011	2010
Sales	1,594	1,396	1,270	1,164	1,086	1,010	828
Cost of goods sold	1,146	932	802	702	652	610	486
Gross profit	448	464	468	462	434	400	342
Operating expenses	340	266	244	180	156	154	128
Net income	108	198	224	82	278	246	214

Table 23 Cohorn Company Income Statements 2010–2016

COHORN COMPANY

Comparative Balance Sheet (\$000) December 31, 2010–2016

Assets	2016	2015	2014	2013	2012	2011	2010
Cash	68	88	92	94	98	96	99
Accounts receivable, net	480	504	456	350	308	292	206
Merchandise inventory	1,738	1,264	1,104	932	836	710	515
Other current assets	46	42	24	44	38	38	19
Long-term investments	0	0	0	136	136	136	136
Plant and equipment, net	2,120	2,114	1,852	1,044	1,078	960	825
Total assets	4,452	4,012	3,528	2,600	2,494	2,232	1,800
Liabilities and Equity							
Current liabilities	1,120	942	618	514	446	422	272
Long-term liabilities	1,194	1,040	1,012	470	480	520	390
Common stock	1,000	1,000	1,000	840	840	640	640
Other contributed capital	250	250	250	180	180	160	160
Retained earnings	888	780	648	596	548	490	338
Total liabilities and equity	4,452	4,012	3,528	2,600	2,494	2,232	1,800

Table 24 Cohorn Company Balance Sheets 2010–2016

Required

- a) Compute trend percentages for the individual items of both statements using 2010 as the base year.
- b) Analyse and comment on the financial statements and trend percentages from part a.
4. Assume you are an analyst evaluating Mesco Company. The following data are available in your financial analysis (unless otherwise indicated, all data are as at 31st December Year 5):

Retained earnings, 31st December Year 4	\$98,000
Gross profit margin ratio	25%
Acid test ratio	2.5 to 1
Noncurrent assets	\$280,000
Days' sales in inventory	45 days
Days' sales in receivables	18 days
Shareholders' equity to total debt	4 to 1
Sales (all on credit)	\$920,000
Common stock: \$15 par value; 10,000 shares issued and outstanding; issued at \$21 per share	

Table 25 Mesco Company Data for Analysis**Required**

Using these data, construct the 31st December Year 5, balance sheet for your analysis. Operating expenses (excluding taxes and cost of goods sold for Year 5) are \$180,000. The tax rate is 40%. Assume a 360 day year in ratio computations. No cash dividends are paid in either Year 4 or Year 5. Current assets consist of cash, accounts receivable and inventories.

5. You are an analyst reviewing Foxx Company. The following data are available for your financial analysis (unless otherwise indicated, all data are as at 31st December Year 2):

Current ratio	2	Days' sales in inventory	36 days
Accounts receivable turnover	16	Gross profit margin ratio	50%
Beginning accounts receivable	\$50,000	Expenses (excluding cost of goods sold)	\$450,000
Return on end-of-year common equity	20%	Total debt to equity ratio	1
Sales (all on credit)	\$1,000,000	Noncurrent assets	\$300,000

Table 26 Foxx Company: build the Balance Sheet

Required

Using these data, construct the 31st December Year 2, balance sheet for your analysis. Current assets consist of cash, accounts receivable and inventory. Balance sheet classifications include cash, accounts receivable, inventory, total noncurrent assets, total current assets, total current liabilities, total noncurrent liabilities and equity.

6. You are planning to analyse Voltek Company's 31st December Year 6, balance sheet. The following information is available:
 1. Opening and closing balances are identical for both accounts receivable and inventory.
 2. Net income is \$1,300.
 3. Times interest earned is 5 (income taxes are zero). Company has 5% bonds outstanding and issued at par.
 4. Net profit margin is 10%. Gross profit margin is 30%. Inventory turnover is 5.
 5. Days' sales in receivables is 72 days.
 6. Sales to end of year working capital is 4. Current ratio is 1.5.
 7. Acid test ratio is 1.0 (excludes prepaid expenses).
 8. Plant and equipment (net) is \$6,000. It is one third depreciated.
 9. Dividends paid on 8% non participating preferred stock are \$40. There is no change in common shares outstanding during Year 6. Preferred shares were issued two years ago at par.

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10. Earnings per common stock are \$3.75.
11. Common stock has a \$5 par value and was issued at par.
12. Retained earnings at 1st January Year 6, are \$350.

Required

- a) Given the information available, prepare this company's balance sheet as at 31st December Year 6 (include the following account classifications: cash, accounts receivable, inventory, prepaid expenses, plant and equipment (net), current liabilities, bonds payable and stockholders' equity).
- b) Determine the amount of dividends paid on common stock in Year 6.

Let's use more of amazon.com's data and we will add other companies as we expand our analysis:

Open the file *amazon_2014_ann.xlsx* in which you will find seven years' worth of annual data.

I have put together worksheets that help us to respond to the tools 1 to 4 given above. In the worksheet, changes annual there are calculations of

Absolute changes from year to year eg $88,988 - 74,452 = 14,536$ = Change in \$m from 2013 to 2014
 Relative changes from year to year eg $(88,988/74,452-1)*100 = 19.52\%$ = % change from 2013 to 2014

I have used conditional formatting to highlight all negative changes and the biggest positive change for each line item in all three financial statements.

7.2 The Financial Ratio Analysis of Organisations

In this section we will begin by considering a series of basic examples that will help you to build a picture: how to begin to analyse the financial statements of an organisation. We will carry out our analysis under the following headings:

- Profitability
- Liquidity
- Return on assets and capital employed
- Working capital management

7.2.1 Some Basic Analysis

Exercise 62 Give a brief analysis of the following summary: it relates to **amazon.com** and is taken from the file *amazon_results.xlsx* **summary** tab and provides just a snapshot for us to begin our analysis of an organisation.

	A	B	C	D
1	amazon.com summary results	2014-12	2013-12	2012-12
2	Revenue	88,988	74,452	61,093
3	Gross profit	26,236	20,271	15,122
4	Operating income	178	745	676
5	Net income	(241)	274	(39)
6	Inventories	8,299	7,411	6,031
7	Total current assets	31,327	24,625	21,296
8	Total assets	54,505	40,159	32,555
9	Total Current Liabilities	28,089	22,980	19,002
10	Total liabilities	43,764	30,413	24,363
11	Long term debt	8,265	3,191	3,084
12	Total stockholders' equity	10,741	9,746	8,192
13	Basic Earnings per share	(0.52)	0.60	(0.09)
14	Cash Dividend per Share	-	-	-
15	Closing Share Price	355	359	2,366
16	Shares Issued (billions)	465	459	454

Figure 43 amazon.com Summary Results

Note: amazon.com says, *We have never declared or paid cash dividends on our common stock. We intend to retain all future earnings to finance future growth and, therefore, do not anticipate paying any cash dividends in the foreseeable future. The Company currently does not offer a Direct Stock Purchase Plan.* <http://phx.corporate-ir.net/phoenix.zhtml?c=97664&p=irol-faq#6991>

Ratios and their Interpretation

In this section we will identify and evaluate a series of ratios from the amazon.com data above: then we will try to interpret what we have found:

Firstly, the ratios themselves: the following table shows the name of some of the most common ratios in ratio analysis together with their formulas. You will also see the results of the ratios of 2014 (2014-12 means that amazon.com's financial year end is at the end of December each year).

Exercise 63 Complete the table below by calculating the ratios for 2012 and 2013.

P	Q	R	S	T
		2014-12	2013-12	2012-12
19 Ratio Name	Ratio Formula			
20 Gross Profit Margin	Gross profit/Revenue	29.48%		
21 Operating Income Margin	Operating income/Revenue	0.20%		
22 Net Income Margin	Net income/Revenue	-0.27%		
23				
24 Return on Total Assets	Operating income/Total assets	0.33%		
25 Return on Capital employed	Net income/Total stockholders' equity	-2.24%		
26				
27 Working Capital	Total current assets -Total Current Liabilities	3,238		
28 Current Ratio	Total current assets/Total Current Liabilities	1.12		
29 Acid Test Ratio	(Total current assets - Inventories)/Total Current Liabilities	0.82		
30				
31 Debt to Equity	Long term debt/Total stockholders' equity	76.95%		

Figure 44 amazon.com Ratio Analysis Worksheet

Exercise 64 Say what you think about amazon.com's profitability performance for the three years for which you have data and ratio results.

Exercise 65 Here are the results from the **summary** tab of the *amazon_results.xlsx* file we have been using for ten years, in Sparkline format. Does this additional information help you with your analysis of the company?

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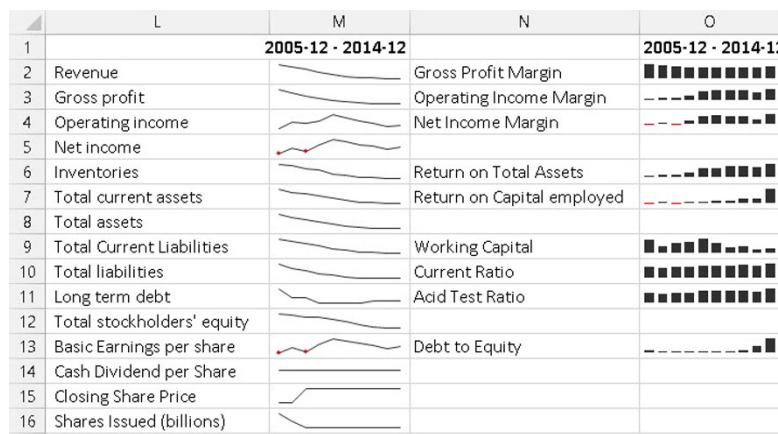


Figure 45 amazon.com Sparklines Data Ten Years

Two Big Questions

Now that you have started to consider ratio analysis, have you considered **the big question** you must ask first?

The big question is...what business is amazon.com in?

The **second big question** is...who am I and what do I want to know from the ratios? Am I

- An investor looking after my investment?
 - A manager of amazon.com?
 - A government department such as the tax man?
 - A researcher?
 - An author with books for sale on the amazon.com web site?
 - And so on

Who I am will guide my thoughts

Exercise 66

- a) Compare and comment on the percentage change in revenues with the percentage change in operating profits from the following information for amazon.com:

	AB	AC	AD	AE	AF
	Rates of Change	Formula	2005-12 to 2014-	2005-12 to 2013-	2005-12 to 2012-
33	Change in revenues	Revenues year n+x/Revenues 2005 (n)	948.15%	776.94%	619.59%
35	Change in operating profits	Operating Profit n+x/Operating Profit 2005(n)	-58.80%	72.45%	56.48%

- b) Evaluate the dividends paid out by the company over the last ten years
- c) How would you summarise amazon.com's equity base over the last ten years? See the table that follows question part d.
- i. Increased consistently
 - ii. Decreased consistently
 - iii. Increased in stages
 - iv. Decreased in stages

- a) Evaluate amazon.com's return on equity ratio and the debt to equity ratio (gearing or leverage) over the ten years:

	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM
37	Net Income and Total Equity (USD millions)	2014-12	2013-12	2012-12	2011-12	2010-12	2009-12	2008-12	2007-12	2006-12	2005-12
38	Net Income	-241	274	-39	631	1152	902	645	476	190	359
39	Total stockholders' equity	10741	9746	8192	7757	6864	5257	2672	1197	431	246

Exercise 67 Projecting Interest Expense

Over the last two years, 2013–2015, amazon.com has borrowed large amounts of money: \$8.75 billion. These **corporate bonds** range in size from \$750 million to \$1.50 billion and are set out in the table below.

- a) The file *amazon_bonds_students.xlsx* has also been created for this task and the other three tasks that follow:

Your **first task** is to prepare a schedule of interest payments and redemptions for these bonds assuming they go to term and interest payments are due on the dates derived from their issue dates.

Coupon	Maturity	Ratings Moody	Ratings S&P	Yield	Amount	Payment Frequency (x per year)	First Payment
2.6	5/12/2019	Baal	AA-	2.451	1,000,000,000	2	15/6/2015
3.3	5/12/2021	Baal	AA-	3.016	1,000,000,000	2	15/6/2015
3.8	5/12/2024	Baal	AA-	3.725	1,250,000,000	2	29/5/2013
4.8	5/12/2034	Baal	AA-	4.783	1,250,000,000	2	5/6/2013
4.95	5/12/2044	Baal	AA-	5.014	1,000,000,000	2	15/6/2015
0.65	27/11/2015	Baal	AA-	0.779	750,000,000	2	27/5/2013
1.2	29/11/2017	Baal	AA-	1.459	1,000,000,000	2	29/5/2013
2.5	29/11/2022	Baal	AA-	3.031	1,500,000,000	2	5/6/2015

- b) your **second task** is to prepare an XY Scatter graph showing the expected life of the bonds against their coupon and current yields and comment on your graph:



Figure 46 amazon.com Coupon v Maturity Dates

Exercise 68 Ratings and Inter Firm Comparison

- a) what is the significance of the ratings by Moody and S&P?
 - b) compare the data for *amazon.com* with the corporate bonds data for **Apple Inc** that you will also find in the file *amazon_bonds_students.xlsx*

A woman with dark hair tied back, wearing a white blouse, is looking upwards and to the right with a thoughtful expression. She is holding an open book or document in her hands, which is slightly blurred. The background is a bright, clear blue sky.

Exercise 69 Analysis of Apple Inc

Using the data you see below for Apple Inc, carry out the same analysis for Apple Inc as you carried out for amazon.com earlier.

	A	B	C	D
1	Apple Inc summary results	2014-12	2013-12	2012-12
2	Revenue	182,795	170,910	156,508
3	Gross profit	70,537	64,304	68,662
4	Operating income	52,503	48,999	55,241
5	Net income	39,510	37,037	41,733
6	Inventories	2,111	1,764	791
7	Total current assets	68,531	73,286	57,653
8	Total assets	231,839	207,000	176,064
9	Total current liabilities	63,448	43,658	38,542
10	Total liabilities	120,292	83,451	57,854
11	Long term debt	28,987	16,960	-
12	Total stockholders' equity	111,547	123,549	118,210
13	Basic Earnings per share	6.49	5.72	6.38
14	Cash Dividend per Share			
15	Closing Share Price			
16	Shares Issued (billions)			

Figure 47 Apple Inc Summary Data

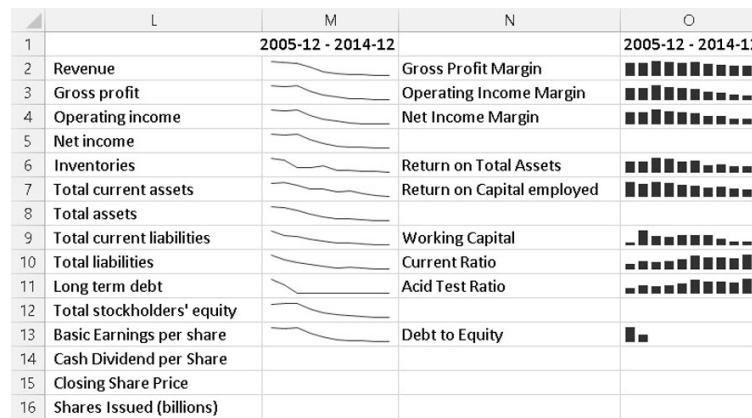
Complete the table below by calculating the ratios for 2012 and 2013.

	P	Q	R	S	T
19	Ratio Name	Ratio Formula	2014-12	2013-12	2012-12
20	Gross Profit Margin	Gross profit/Revenue	38.59%		
21	Operating Income Margin	Operating income/Revenue	28.72%		
22	Net Income Margin	Net income/Revenue	21.61%		
23					
24	Return on Total Assets	Operating income/Total assets	22.65%		
25	Return on Capital employed	Net income/Total stockholders' equity	35.42%		
26					
27	Working Capital	Total current assets - Total current liabilities	5,083		
28	Current Ratio	Total current assets/Total current liabilities	1.08		
29	Acid Test Ratio	(Total current assets - Inventories)/Total current liabilities	1.05		
30					
31	Debt to Equity	Long term debt/Total stockholders' equity	25.99%		

Figure 48 Apple Inc Ratio Analysis Worksheet

Exercise 70 Say what you think about Apple Inc's performance for the three years for which you have data and ratio results.

Exercise 71 Here are the summary results of Apple Inc for ten years, in Sparkline format. Does this additional information help you with your analysis of the company?

**Figure 49** Apple Inc Sparklines Data Ten Years**Exercise 72**

- a) Compare and comment on the percentage change in revenues with the percentage change in operating profits from the following information for Apple Inc:

	AB	AC	AD	AE	AF
33	Rates of Change	Formula	2005-12 to 2014-	2005-12 to 2013-	2005-12 to 2012-
34		Year	10 to 11	9 to 10	8 to 9
35	Change in revenues	Revenues year n+x/Revenues 2005 (n)	1212.15%	1126.83%	1023.45%
36	Change in operating profits	Operating Profit n+x/Operating Profit 2005(n)	3082.00%	2869.64%	3247.94%

Figure 50 Apple Inc Sensitivity: revenues v operating profits

- b) Evaluate the dividends paid out by the company over the last ten years
- c) How would you summarise Apple Inc's equity base over the last ten years? See the table that follows question part d.
- i. Increased consistently
ii. Decreased consistently
iii. Increased in stages
iv. Decreased in stages

- d) Evaluate Apple Inc's return on equity ratio and the debt to equity ratio (gearing or leverage) over the ten years:

AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM
Rates of Change	Formula	2005-12 to 2014-12	2005-12 to 2013-12	2005-12 to 2012-12	2005-12 to 2011-12	2005-12 to 2010-12	2005-12 to 2009-12	2005-12 to 2008-12	2005-12 to 2007-12	2005-12 to 2006-12	2005-12 to 2005-12
34											
35	Change in revenues	Revenues year n+x/Revenues 2005 (n)	1212.15%	1126.83%	1023.45%	677.04%	368.20%	207.98%	133.14%	72.32%	38.65% 0.00%
36	Change in operating profits	Operating Profit n+x/Operating Profit 2005(n)	3082.00%	2869.64%	3247.94%	1947.68%	1014.24%	611.52%	280.30%	167.21%	48.67% 0.00%
37											
38		Net Income and Total Equity (USD millions)	2014-12	2013-12	2012-12	2011-12	2010-12	2009-12	2008-12	2007-12	2006-12 2005-12
39		Net income	39510	37037	41733	25922	14013	8235	4834	3496	1989 1335
40		Total stockholders' equity	111547	123549	118210	76615	47791	91640	21030	14532	9984 7466

Figure 51 Apple Inc ROCE and Debt to Equity Ten Year Analysis

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8 Financial Statements Analysis: in detail

This section contains the following discussions

1. Comparative financial statement analysis
2. Common Size Financial Statement Analysis
3. Ratio analysis
4. Cash Flow Analysis
5. Valuation

8.1 1 Comparative financial statement analysis

Create a table of analysis of *amazon.com* in such a way that it can be used as a template for the analysis of any other company. Set out your work in a logical and meaningful way:

6. Create absolute and relative change information
7. Create summaries of your analyses
8. Highlight your findings: look at the conditional formatting results for help here
9. Illustrate your work in the most appropriate way
10. **If you are a spreadsheet enthusiast**, create functions and formulas that generate comments and highlights automatically, to help you with the following exercise:
11. will give you the results of at least one more company so that you can test any additional work you do here.

By the way, as you work on this exercise you will find out what these symbols mean:

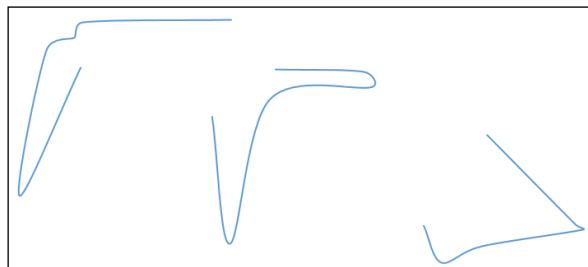


Figure 52 Abstract Art?

Look at the **ratios_annual** and the **changes_annual** work sheets in the *amazon_2014_ann.xlsx* file and look for trends **across the years** (horizontal analysis), look for things that might appear good or odd **in each column** (vertical analysis).

There is a work sheet called **peers** which contains comparative ratio and other data for the companies that www.morningstar.com believes are amazon.com's competitors.

The **descr_stats** work sheet shows the descriptive statistics for the Peer information and you can see how I have set up conditional formatting by using check boxes to compare those companies with a market capitalisation of greater than the mean and those with capitalisation of greater than the median. You need to assess which of the two measures is most appropriate.

The **peer_correl** work sheet contains a correlation matrix which indicates the correlation coefficients for all 10 variables in the **peers** work sheet. Consider the extract from that matrix below, for example, where $r = 0.1685$ for market capitalisation v net income. That is since r varies from -1 to +1, a value of 0.1685 is very low, showing a very weak statistical relationship between the two

	<i>Market Cap Mil</i>	<i>Net Income Mil</i>	<i>Price/Sales</i>
<i>Market Cap Mil</i>	1		
<i>Net Income Mil</i>	0.1685	1	
<i>Price/Sales</i>	0.5770	0.4845	1

Table 27 amazon.com Correlation Matrix

Look at the rest of the matrix and see what insights you can get from it: my cut off point is that I like to see a minimum r value of 0.75 or -0.75 before I can conclude that a relationship is strong: there are only three such values in this matrix, conditionally formatted green: take a look and try to explain why their relationships might be strong.

What about those symbols, then, that I showed at the start of this section? You won't believe them but here they are in context:

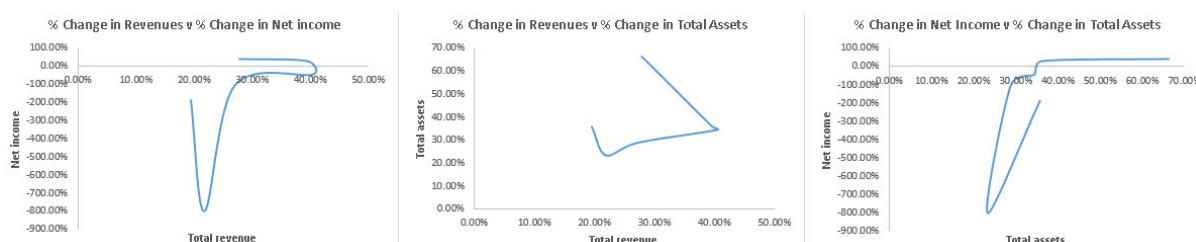


Figure 53 Abstract Art Revealed!

Those symbols show what you get when you try to understand amazon.com's profitability.

Incidentally, amazon.com recently announced its third quarter results for 2015: sales of \$25 billion for the quarter but profit of just \$79 million: that is just 0.13% of sales.

8.2 2 Common Size Financial Statement Analysis

12. Generate a common size statement template for amazon.com's
 - a) Income Statement
 - b) Balance Sheet
 - c) Statement of Cash flow
13. Comment on what you find
14. Use your template in the common size analysis of the second company that I will give to you.

8.3 Creating Common Size Statements

Common Size Income Statement

Take an Income statement for one, two or more years

For each year find every line item as a percentage of that year's sales value

For example:

Common Size	\$	%	Long hand	Excel
Sales	50,000	100.00%	$50000/50000*100$	=E4/E\$4
Cost of Sales	35,000	70.00%	$35000/50000*100$	=E4/E\$4
Gross Profit	15,000	30.00%	$15000/50000*100$	=E4/E\$4
Administration	2,500	5.00%	$2500/50000*100$	=E4/E\$4
Selling	1,750	3.50%	$1750/50000*100$	=E4/E\$4

Figure 54 Common Size Income Statement Guidance

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Common Size Balance Sheet

Take a Balance Sheet for one, two or more years
 For each year find every line item as a percentage of
 that year's total asset value for assets and as a percentage of total
 liabilities and equity for them.
 For example:

Common Size	\$	%	Long hand	Excel
Inventories	3,500	9.03%	$3500/38750*100$	=G9/G\$16
Receivables	2,500	6.45%	$2500/38750*100$	=G10/G\$16
Bank	4,000	10.32%	$4000/38750*100$	=G11/G\$16
Total Current Assets	10,000	25.81%	$10000/38750*100$	=G12/G\$16
Property, Plant and Equipment	25,000	64.52%	$25000/38750*100$	=G13/G\$16
Intangibles	3,750	9.68%	$3750/38750*100$	=G14/G\$16
Total Non Current Assets	28,750	74.19%	$28750/38750*100$	=G15/G\$16
Total Assets	38,750	100.00%	$38750/38750*100$	=G16/G\$16
Payables	2,000	5.16%	$2000/38750*100$	=G17/G\$25
Accruals	1,100	2.84%	$1100/38750*100$	=G18/G\$25
Loans	3,000	7.74%	$3000/38750*100$	=G19/G\$25
Total Current Liabilities	6,100	15.74%	$6100/38750*100$	=G20/G\$25
Debt	12,500	32.26%	$12500/38750*100$	=G21/G\$25
Long Term Creditors	7,500	19.35%	$7500/38750*100$	=G22/G\$25
Total Non Current Liabilities	20,000	51.61%	$20000/38750*100$	=G23/G\$25
Equity	24,850	64.13%	$24850/38750*100$	=G24/G\$25
Total Liabilities and Equity	38,750	100.00%	$38750/38750*100$	=G25/G\$25

Figure 55 Common Size Balance Sheet Guidance

Common Size Statement of Cash Flows

Take a Statement of Cash Flows for one, two or more years
 For each year find every line item as a percentage of
 that year's Cash From Operations
 For example:

Common Size	\$	%	Long hand	Excel
Net Income	6,000	50.42%	$6000/11900*100$	=L28/L\$31
Non Cash Adjustments	2,000	16.81%	$2000/11900*100$	=L29/L\$31
Changes in working capital	3,900	32.77%	$3900/11900*100$	=L30/L\$31
Cash from Operations	11,900	100.00%	$11900/11900*100$	=L31/L\$31
Investing				
Net cash from investing activities	(4,000)	-33.61%	$-4000/11900*100$	=L33/L\$31
Financing				
Net Cash from financing activities	6,000	50.42%	$6000/11900*100$	=L35/L\$31
Net Cash	13,900	116.81%	$13900/11900*100$	=L36/L\$31
Opening cash balance	(9,900)	-83.19%	$-9900/11900*100$	=L37/L\$31
Closing cash balance	4,000	33.61%	$4000/11900*100$	=L38/L\$31

Figure 56 Common Size Statement of Cash Flows Guidance

Exercise 73

Create common Size Statements for the following examples:

Income Statement	Year 2 \$	Year 1 \$
Sales	123,116	73,371
Cost of Sales	115,027	62,314
Gross Profit	13,336	11,057
Administration	5,459	4,844
Selling	2,840	2,641
Balance Sheet	Year 2 \$	Year 1 \$
Inventories	8,500	6,872
Receivables	4,454	3,948
Bank	8,001	4,132
Total Current Assets	20,955	14,952
Property, Plant and Equipment	36,846	30,494
Intangibles	7,076	6,656
Total Non Current Assets	43,922	37,150
Total Assets	64,877	52,102
Payables	3,229	2,857
Accruals	1,417	1,289
Loans	7,412	4,061
Total Current Liabilities	12,058	8,207
Debt	30,719	23,494
Long Term Creditors	13,474	12,132
Total Non Current Liabilities	44,193	35,626
Equity	32,742	24,683
Total Liabilities and Equity	64,877	52,102
Statement of Cash Flow	Year 2 \$	Year 1 \$
Net Income	14,344	10,866
Non Cash Adjustments	4,307	2,655
Changes in working capital	10,350	7,082
Cash from Operations	29,001	20,603
Investing	—	—
Net cash from investing activities	(13,438)	(7,947)
Financing	—	—
Net Cash from financing activities	15,786	9,755
Net Cash	31,349	22,411
Opening cash balance	(24,324)	(19,132)
Closing cash balance	8,001	4,132

Table 28 Create Common Size Statement from these...

8.4 3 Ratio analysis

There are potentially thousands of ratios that we could find and calculate for any situation. The following examples are the ones most often calculated for a basic evaluation of a company. The ratios can be grouped under various headings:

- 15. Credit Risk Analysis
- 16. Liquidity
- 17. Capital Structure and Solvency
- 18. Profitability Analysis
- 19. Return on Investment
- 20. Operating Performance
- 21. Asset Utilisation
- 22. Valuation
- 23. Market Measures

The advertisement features a woman with long dark hair, wearing a light grey sleeveless top, standing by a large window and looking at her smartphone. The background shows a bright, modern interior with a view of trees outside. The text 'MAXIMIZE PRODUCTIVITY' is displayed in large orange capital letters at the top left. Below it, the text 'HELP YOUR ENTIRE ORGANIZATION BUILD EXPERTISE IN SAP SOFTWARE.' is displayed in large black capital letters. At the bottom left, the text 'SAP Learning Hub' is shown in yellow and grey. At the bottom right, the SAP logo is displayed.

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The first thing we should do is to create a template that we can use whenever we have data to analyse. This means at least two things:

- Having a standard input sheet or table
- Having a standard output sheet or table into which the ratio results are put

You will use the amazon.com spreadsheet for this exercise.

Exercise 74

1. DW plc's year end balance sheets show the following:

	2016	2015	2014
Cash	30,800	35,625	36,800
Accounts receivable, net	88,500	62,500	49,200
Merchandise inventory	111,500	82,500	53,000
Prepaid expenses	9,700	9,375	4,000
Plant assets, net	277,500	255,000	229,500
Total assets	518,000	445,000	372,500
Accounts payable	128,900	75,250	49,250
Long term notes payable secured by mortgages on plant assets	97,500	102,500	82,500
Common stock, \$10 par value	162,500	162,500	162,500
Retained earnings	129,100	104,750	78,250
Total liabilities and equity	518,000	445,000	372,500

Table 29 DW plc Balance Sheets

Required

Compare the year end short term liquidity position of DW plc at the end of 2016, 2015 and 2014 by computing the:

- a) current ratio and
- b) acid test ratio.

Comment on the ratio results.

2. Refer to the information in part 1 about DW plc. The company's income statements for the years ended 31st December 2016 and 2015 show the following:

	2016	2015
Sales	672,500	530,000
Cost of goods sold	410,225	344,500
Other operating expenses	208,550	133,980
Interest expense	11,100	12,300
Income taxes	8,525	7,845
Total costs and expenses	(638,400)	(498,625)
Net income	34,100	31,375
Earnings per share	2.10	1.93

Table 30 DW plc Income Statements

Required

For the years ended 31st December 2016 and 2015, assume all sales are on credit and then compute the following:

- a) collection period
 - b) accounts receivable turnover
 - c) inventory turnover and
 - d) days' sales in inventory. Comment on the changes in the ratios from 2015 to 2016.
3. Refer to the information in parts 1 and 2 about DW plc. Compare the long term risk and capital structure positions of the company at the end of 2016 and 2015 by computing the following ratios:
- a) total debt ratio
 - b) times interest earned

Comment on these ratio results.

4. Refer to the financial statements of DW plc in parts 1 and 2. Evaluate the efficiency and profitability of the company by computing the following:
- a) net profit margin,
 - b) total asset turnover
 - c) return on total assets

Comment on these ratio results.

5. Refer to the financial statements of DW plc in parts 1 and 2. The following additional information about the company is known:

Common stock market price 31st December 2016	15.00
Common stock market price 31st December 2015	14.00
Annual cash dividends per share in 2016	0.60
Annual cash dividends per share in 2015	0.30

To help evaluate the profitability of the company, compute the following for 2016 and 2015:

- a) return on common stockholders' equity
- b) price earnings ratio on December 31 and
- c) dividend yield.

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The advertisement features a central headline 'FAST ADOPTION, FAST ROI' in bold orange letters. Below it is a large, bold black text block: 'EQUIP BUSINESS USERS TO ADOPT SAP SOLUTIONS.'. Underneath this, the text 'SAP Learning Hub, user edition' is written in a smaller, dark gray font. In the bottom left corner, the 'SAP Learning Hub' logo is displayed. On the right side of the ad, there is a photograph of a young man with short brown hair, smiling broadly while looking down at his smartphone. He is wearing a light blue button-down shirt. The SAP logo is visible in the bottom right corner of the image area.

8.5 4 Cash Flow Analysis

8.5.1 Relevance of Cash

Cash is the most liquid of assets and offers a company both liquidity and flexibility. Cash is at both the beginning and the end of a company's operating cycle, which are to convert various assets such as inventories into yield receivables from credit sales. The operating cycle is complete when the collection process returns cash to the company.

Our analysis of financial statements recognises that accrual accounting differs from cash based accounting. Yet net cash flow is the end measure of profitability. It is cash, not income, that ultimately repays loans, replaces equipment, expands facilities and pays dividends. Accordingly, analysing a company's cash inflows and outflows and their operating, financing and investing sources, is one of the most important investigative exercises. Cash analysis helps to assess liquidity, solvency and financial flexibility.

- Liquidity is the nearness to cash of assets and liabilities.
- Solvency is the ability to pay liabilities when they mature.
- Financial flexibility is the ability to react and adjust to opportunities and adversities.

We can get *some* information on the sources and uses of cash by comparing one balance sheet with the next together with a period's income statements. However, a comprehensive picture of cash flows is really only derived from the statement of cash flows (SCF). The cash flow statement is important to analysis and provides information to help users answer questions such as:

- How much cash is generated from or used in operations?
- What expenditures are made with cash from operations?
- What is the source of cash for debt repayments?
- How is the increase in investments financed?
- What is the source of cash for new non current assets?
- Can we say what cash from new financing has been used for?

Users of financial statements analyse cash flow to answer these and many similar questions. The statement of cash flows is key to the reconstruction of many transactions, which can be an important part of the analysis. Analysis of the cash flow statement requires our understanding of the accounting measures underlying its preparation and presentation.

We have already seen how accounting fundamentals work, at the very beginning of this book: go back there to refresh your memory if you think you need to!

8.5.2 Reporting by Activities

The statement of cash flows reports cash receipts and cash payments in three sections:

- Operating
- Financing
- Investing

Operating activities are the earnings related activities of a company, they include the net inflows and outflows of cash resulting from related operating activities like

- Extending credit to customers
- Investing in inventories and
- Obtaining credit from suppliers.

Operating activities relate to income statement items and to balance sheet items relating to operations: usually working capital accounts like receivables, inventories, prepayments, payables and accrued expenses.

Investing activities are the means of

- Acquiring and
- Disposing of

non cash assets. These activities involve assets expected to generate income for a company, such as

- Acquisition and disposal of Property, Plant and Equipment
- Investment in securities
- Lending funds and
- Collecting the principal on these loans

Financing activities are the means of

- Contributing
- Withdrawing
- Servicing funds to support business activities.

They include

- Borrowing and repaying funds with bonds and other loans
- Contributions and withdrawals by owners and
- Return/dividends on investment.

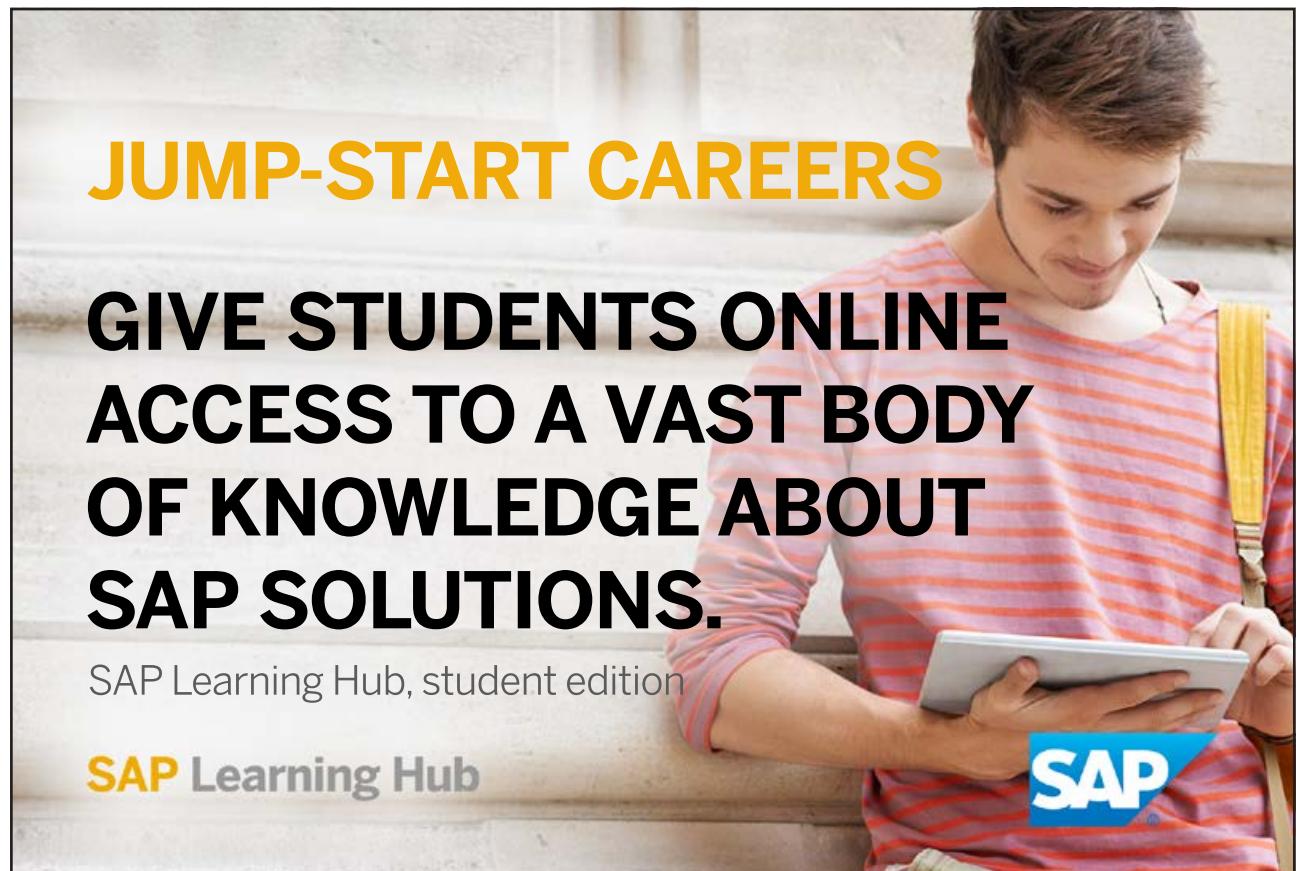
8.5.3 The Statement of Cash Flows

Let's look at a Statement of Cash Flows: again we will use amazon.com because they are a very well known organisation:

Exercise 75

AMAZON.COM INC (AMZN) Statement of CASH FLOW

Fiscal year ends in December. USD in millions except per share data.	2014-12	2013-12	2012-12
Cash Flows From Operating Activities			
Net income	(241)	274	(39)
Depreciation & amortization	4,746	3,253	2,159
Investments losses (gains)	(3)	1	(9)
Deferred income taxes	(316)	(156)	(265)
Stock based compensation	1,497	1,134	833
Accounts receivable	(1,039)		(861)
Inventory	(1,193)	(1,410)	(999)
Accounts payable	1,759	1,888	2,070
Accrued liabilities	706	736	1,038
Other working capital	741	(447)	275
Other non-cash items	185	202	(22)
Net cash provided by operating activities	6,842	5,475	4,180
Cash Flows From Investing Activities			



The advertisement features a young man in a striped shirt sitting on stone steps, looking down at a tablet he is holding in his hands. The background shows a blurred outdoor setting with other people. Overlaid text includes "JUMP-START CAREERS", "GIVE STUDENTS ONLINE ACCESS TO A VAST BODY OF KNOWLEDGE ABOUT SAP SOLUTIONS.", "SAP Learning Hub, student edition", and the SAP logo.

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Investments in property, plant, and equipment	(4,893)	(3,444)	(3,785)
Acquisitions, net	(979)	(312)	(745)
Purchases of investments	(2,542)	(2,826)	(3,302)
Sales/Maturities of investments	3,349	2,306	4,237
Net cash used for investing activities	(5,065)	(4,276)	(3,595)
Cash Flows From Financing Activities			
Long-term debt issued	6,359	394	3,378
Long-term debt repayment	(1,933)	(1,011)	(588)
Excess tax benefit from stock based compensation	6	78	429
Common stock issued			
Repurchases of treasury stock			(960)
Other financing activities			
Net cash provided by (used for) financing activities	4,432	(539)	2,259
Effect of exchange rate changes	(310)	(86)	(29)
Net change in cash	5,899	574	2,815
Cash at beginning of period	8,658	8,084	5,269
Cash at end of period	14,557	8,658	8,084
Free Cash Flow			
Operating cash flow	6,842	5,475	4,180
Capital expenditure	(4,893)	(3,444)	(3,785)
Free cash flow	1,949	2,031	395

Table 31 amazon.com Statement of Cash Flows

Match the descriptions above with this summary statement of cash flows for the years 2012–2014 for amazon.com:

- What did it generate from operations?
- How much has the company spent on CAPEX, capital expenditure?
- Has it received or paid out money to its financiers/shareholders?

8.5.4 Analysis of the Statement of Cash Flows

Since conditions vary from company to company, it is difficult to formulate a standard analysis of cash flows. Nevertheless, certain common ideas exist.

First, our analysis must establish the major past sources of cash and their uses.

A common size analysis of the statement of cash flows aids in this assessment.

In estimating trends, it is useful to total the major sources and uses of cash over a period of a few years since annual or quarterly reporting periods are often too short for meaningful inferences. For example, financing of major projects often spans several years. In evaluating sources and uses of cash, the analyst should focus on questions like:

- Are asset replacements financed from internal or external funds?
- What are the financing sources of expansion and business acquisitions?
- Is the company dependent on external financing?
- What are the company's investing demands and opportunities?
- What are the requirements and types of financing?
- Are managerial policies (such as dividends) highly sensitive to cash flows?

Exercise 76

Take a look at the above questions and apply them to amazon.com: what are your findings?

8.5.5 Alternative Cash Flow Measures

Some analysts compute **net income plus depreciation and amortization** as a crude alternative to operating cash flow: one variant of this measure is the popular EBITDA (earnings before interest, taxes, depreciation and amortisation). EBITDA suffers from several problems:

1. The add back of depreciation is sometimes interpreted to mean that the expense is not legitimate. That is incorrect. The using up of long term depreciable assets is a real expense that must not be ignored.
2. Some interpret the depreciation add back to indicate that cash has been provided for the replenishment of the long term assets. That is also incorrect. The add back of depreciation expense does not generate cash. It merely cancels out the noncash expense from net income as discussed above. Cash is provided by operating and financing activities, not by depreciation.
3. Net income plus depreciation ignores changes in working capital accounts that comprise the remainder of net cash flows from operating activities. Yet changes in working capital accounts often comprise a large portion of cash flows from operating activities. Examination of working capital components provides insight into the persistence of operating cash flows.

Oversimplification of operating cash flows by the use of net income plus depreciation, EBITDA, or the like, misinterprets the nature of depreciation expense and ignores valuable information that is revealed by examination of changes in working capital accounts.

Exercise 77

Calculate EBITDA for amazon.com just to compare it with the real cash flow from operations figures!

8.5.6 Free Cash Flow

A useful addition to the statement of cash flows is the computation of **free cash flow**. While there is disagreement on its exact definition, one of the more useful measures of free cash flow is:

$$\begin{aligned} & \text{Cash flows from operations} \\ \text{Less:} & \text{ Net capital expenditures required to maintain productive capacity} \\ \text{Less:} & \text{ Dividends on preferred stock and common stock (assuming a payout policy)} \\ = & \text{ **Free cash flow (FCF)**} \end{aligned}$$

Another definition that is widely used and similar in concept is:

$$\text{FCF} = \text{NOPAT} - \text{Change in NOA}$$

This definition defines free cash flows to the firm as **net operating profits after tax** (NOPAT) less the increase in **net operating assets** (NOA). The increase in NOA includes the change in working capital for net cash flows from operations and the increase in long term operating assets (similar to the second line in the formula presented above). The focus, however, is on the company as a whole, without regard to its financing. Consequently, dividends (a financing activity) are not considered.



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The advertisement features a man wearing glasses and a suit, looking down at a white tablet he is holding in his hands. He appears to be focused on the screen. The background is slightly blurred, showing what looks like an office environment. The SAP Learning Hub logo is visible in the bottom right corner of the advertisement area.

Positive free cash flow reflects the amount available for business activities after allowances for financing and investing requirements to maintain productive capacity at current levels. Growth and financial flexibility depend on adequate free cash flow. We must recognize that the amount of capital expenditures needed to maintain productive capacity is generally not disclosed. Rather it is part of total capital expenditures, which are disclosed, but can include outlays for expansion of productive capacity. The statement of cash flows does not separate capital expenditures into maintenance and expansion components.

Exercise 78

Use both of the definitions of free cash flow just given and find amazon.com's free cash flow: interpret and explain your results.

8.5.7 Specialised Cash Flow Ratios

8.5.8 Cash Flow Adequacy Ratio

The **cash flow adequacy ratio** is a measure of a company's ability to generate sufficient cash from operations to cover capital expenditures, investments in inventories and cash dividends. To remove cyclical and other random influences, a three year total is typically used in computing this ratio. The cash flow adequacy ratio is calculated as:

$$\frac{\text{Three year sum of cash from operations}}{\text{Three year sum of capital expenditures, inventory additions and cash dividends}}$$

Investment in other important working capital items like receivables is omitted because they are financed primarily by short-term credit (such as growth in accounts payable). Accordingly, only additions to inventories are included. Note in years where inventories decline, the downward change is treated as a zero change in computing the ratio.

Proper interpretation of the cash flow adequacy ratio is important.

A **ratio of 1** indicates the company exactly covered these cash needs without a need for external financing.

A **ratio below 1** suggests internal cash sources were insufficient to maintain dividends and current operating growth levels.

Exercise 79

For 2012, 2013 and 2014 the cash flow adequacy ratio for amazon.com is...how much?

Find the adequacy ratio for 2010 to 2014 now: is the situation better or worse?

8.5.9 Cash Reinvestment Ratio

The **cash reinvestment ratio** is a measure of the percentage of investment in assets representing operating cash retained and reinvested in the company for both replacing assets and growth in operations. This ratio is computed as:

$$\frac{\text{Increase in fixed assets} + \text{Increase in working capital}}{\text{Net income} + \text{Non cash expenses} - \text{Non cash sales} - \text{Dividends}}$$

Please note: other assets includes goodwill and other intangible assets

In a high growth situation, a company should not only be reinvesting 100% of its cash flow, but also scrambling to line up additional funding for yet more reinvestment.

Cash flow analysis is primarily used as a tool to evaluate the sources and uses of funds.

Cash flow analysis provides insights into how a company is obtaining its financing and deploying its resources. It also is used in cash flow forecasting and as part of liquidity analysis.

Exercise 80

Fill in the gaps in the following two paragraphs:

*amazon.com's statement of cash flows is a useful starting point for cash flow analysis. amazon.com generated \$_____ billion from operating activities. It then used \$_____ billion for investing activities, primarily for capital expenditure and payment for acquisitions. amazon.com also received \$_____ billion from debt issuance. Overall, amazon.com's financing activities resulted in a net cash **in/outflow** to the tune of \$_____ billion. After accounting for foreign currency exchange rate fluctuations, amazon.com's cash flow **in/decreased** by \$_____ billion during 2014.*

*This preliminary analysis shows that amazon.com generated **a little/a lot of** cash flows from its operations. After using some of it for capital expenditure and acquisitions, the rest of the generated cash was _____.*

While this simple analysis of the statement of cash flows conveys much information about the sources and uses of funds at amazon.com, it is important to analyse cash flows in more detail for a more thorough investigation of amazon.com's business and financial activities.

8.6 5 Valuation

8.6.1 Valuation Models

The value of a security is equal to the present value of its future payoffs discounted at an appropriate rate. The future payoffs from a debt security are its interest and principal payments.

A bond contract precisely specifies its future payoffs along with the investment horizon. The value of a bond at time t , or B_t , is computed using the following formula:

$$B_t = \frac{I_{t+1}}{(1+r)^1} + \frac{I_{t+2}}{(1+r)^2} + \frac{I_{t+3}}{(1+r)^3} + \dots + \frac{I_{t+n}}{(1+r)^n} + \frac{F}{(1+r)^n} +$$

where I_{t+n} is the interest payment in period $t+n$, F is the principal payment (usually the debt's face value) and r is the investor's required interest rate or yield to maturity.

When valuing bonds, we determine the expected (or desired) yield based on factors such as current interest rates, expected inflation and risk of default. Here's an example of debt valuation:

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Example

On 1st January Year 1, a company issues \$100 of eight year bonds with a year end interest (coupon) payment of 8% per year. On 1st January Year 6, we are asked to compute the value of this bond when the yield to maturity on these bonds is 6% per annum.

Solution

These bonds will be redeemed on 31st December Year 8. This means the remaining term to maturity is three years. Each year end interest payment on these bonds is \$8, computed as 8% * \$100 and the end of Year 8 principal payment is \$100. The value of these bonds as at 1st January Year 6, is computed as:

$$B_t = \$105.35 = \frac{8}{(1 + 0.06)^1} + \frac{8}{(1 + 0.06)^2} + \frac{8}{(1 + 0.06)^3} + \frac{100}{(1 + 0.06)^3}$$

In a spreadsheet that accompanies these notes, *amazon_bonds.xlsx*, we find that finance web sites provide all the corporate bond information for companies like amazon.com that we can use. Using the above technique we find that the value of one of amazon.com's bonds is \$99.462 when the web site suggests it should be \$99.245. The difference arises from arithmetic but it does suggest that these techniques are used in real life!

8.6.2 Equity Valuation

The basis of equity valuation, like debt valuation, is the present value of future payoffs discounted at an appropriate rate. Equity valuation, however, is more complex than debt valuation. This is because, with a bond, the future payoffs are specified and essentially certain. With equity, the investor has no claim on predetermined payoffs: for example, amazon.com has a stated dividend policy of never paying a cash dividend!

Instead, the equity investor looks for two main payoffs:

- Dividend payments and
- Capital appreciation

Capital appreciation denotes change in equity value, which in turn is determined by future dividends, so we can simplify this task to state that the value of an equity security at time t , or V_t , equals the sum of the present values of all future expected dividends:

$$V_t = \frac{(D_{t+1})}{(1 + k)^1} + \frac{(D_{t+2})}{(1 + k)^2} + \frac{(D_{t+3})}{(1 + k)^3} + \dots$$

where D_{t+n} is the dividend in period $t+n$ and k is the cost of capital. This model is called the **dividend discount model**. This equity valuation formula is in terms of *expected* dividends rather than *actual* dividends. We use expectations instead of actual dividends because, unlike interest and principal repayments in the case of a bond, future dividends are neither specified nor determinable with certainty. This means our analysis must use forecasts of future dividends to get an estimate of value.

Exercise 81

Amazon.com pays no dividends so let's try a theoretical example to use the dividend discount model:

An investor plans to hold DW plc's stock for 3 years. In that time period, DW plc plans to grow at a rate of 6% in the first two years and 3% thereafter. DW plc's last dividend was \$0.25. Given a rate of return of 10%, what is the value of DW plc's common stock at the end of the three year time period?

8.6.3 Free Cash Flow to Equity Model

Free cash flows to equity are defined as cash flows from operations less capital expenditures plus increases (minus decreases) in debt. They are cash flows that are free to be paid to equity investors and, therefore, are an appropriate measure of equity investors' payoffs.

$$V_t = \frac{(FCFE_{t+1})}{(1+k)^1} + \frac{(FCFE_{t+2})}{(1+k)^2} + \frac{(FCFE_{t+3})}{(1+k)^3} + \dots$$

The **free cash flow to equity model** computes equity value at time t by replacing expected dividends with expected free cash flows to equity:

where $FCFE_{t+n}$ is free cash flow to equity in period $t+n$ and k is cost of capital.

Exercise 82

Back to amazon.com: find the value of amazon.com using its ten year data by using the Free Cash Flow to Equity Model formula assuming that $k = 7.5\%$

$$V_t = \frac{(FCFE_{t+1})}{(1+k)^1} + \frac{(FCFE_{t+2})}{(1+k)^2} + \frac{(FCFE_{t+3})}{(1+k)^3} + \dots$$

where $FCFE_{t+n}$ is free cash flow to equity in period $t+n$ and k is cost of capital.

8.6.4 Residual Income Model

The **residual income model** computes value using accounting variables. It defines equity value at time t as the sum of current book value and the present value of all future expected residual income:

$$V_t = BV_t + \frac{(RI_{t+1})}{(1+k)^1} + \frac{(RI_{t+2})}{(1+k)^2} + \frac{(RI_{t+3})}{(1+k)^3} + \dots$$

Where:

BV_t is book value at the end of period t ,

RI_{t+n} is residual income in period $t+n$ and k is cost of capital. **Residual income** at time t is defined as comprehensive net income minus a charge on beginning book value

$$= RI_t = NI_t - (k * BV_{t-1}).$$

While both of these models overcome some problems in using dividends, they still assume the shares will survive indefinitely. To derive value using a **finite** horizon (say, 5 or 10 years), we must replace the present value of future dividends beyond a particular future date by an estimate of **continuing value** (also called **terminal value**).



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Unlike forecasts of payoffs for the finite period that often are derived using detailed prospective analysis, a forecast of continuing value is usually based on simplifying assumptions for growth in payoffs. While forecasting continuing value often is a source of much error, its estimation is required in equity valuation.

Note that all three models, dividend discount, free cash flow to equity and residual income, are identical and exact in assuming an indefinite life. Therefore, choosing a valuation model is based on practical considerations in finite horizon setting. Moreover, an important criterion is to choose a valuation model least dependent on continuing value.

While the free cash flow to equity and dividend discount models work well under certain circumstances in finite horizons, the residual income model usually outperforms both. Illustration 1.6 shows the mechanics of applying the dividend discount model, the free cash to equity model and the residual income model.

Exercise 83

At the end of year 2014, Beagle Co owns 51% of the equity of Retriever, an entirely equity financed company. By agreement with Retriever's shareholders, Beagle agrees to acquire the remaining 49% of Retriever shares at the end of year 2019 at a price of \$25 per share. Retriever also agrees to maintain annual cash dividends at \$1 per share through 2019. An analyst makes the following projections for Retriever. At this same time (end of year 2014), we wish to compute the intrinsic value of the remaining 49% of Retriever's shares using the alternative valuation models (assume a cost of capital of 10%).

(in \$ per share)	2014	2015	2016	2017	2018	2019
Dividends	-	1.00	1.00	1.00	1.00	1.00
Operating cash flows	-	1.25	1.50	1.50	2.00	2.25
Capital expenditures	-	-	-	1.00	1.00	-
Increase (decrease) in long term debt		(0.25)	(0.50)	0.50		(1.25)
Net income	-	1.20	1.30	1.40	1.50	1.65
Book value	5.00	-	-	-	-	-

Table 32 Beagle Co Per Share Data

9 Benchmarking of Financial and Non Financial Performance

Introduction

David Parmenter, a well known KPI expert from New Zealand says, “*Many companies are working with the wrong measures, many of which are incorrectly termed key performance indicators (KPIs). Very few organisations really monitor their true KPIs. The reason is that very few organisations, business leaders, writers, accountants and consultants have explored what a KPI actually is.*”

Most of what follows in this section is inspired by David Parmenter.

There are three types of performance measures, see the following diagram:

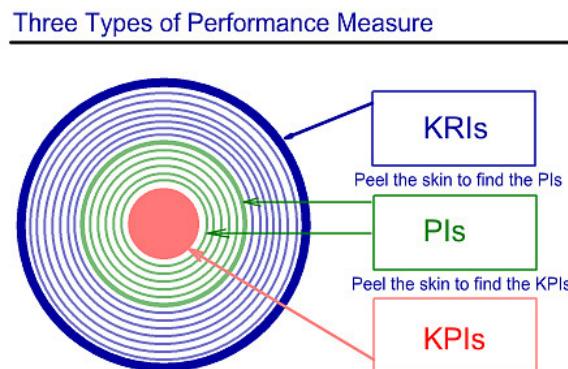


Figure 57 Three Types of Performance Measure KRI, PI, KPI

An onion analogy can be used to describe the relationship of these three measures. The outside skin describes the overall condition of the onion, the amount of sun, water and nutrients it has received; how it has been handled from harvest to supermarket shelf. However, as we peel the layers off the onion, we find more information. The layers represent the various performance indicators and the core, the key performance indicators.

1. **Key result indicators (KRIs)** tell you how you have done in a perspective.
2. **Performance indicators (Pis)** tell you what to do.
3. **Key Performance Indicators** tell you what to do to increase performance dramatically.

Many performance measures used by organisations are thus an inappropriate mix of these three types.

9.1 Key Performance Indicators

9.1.1 Key Result Indicators

What are *KRIs*? KRIs are measures that have often been mistaken for KPIs, including:

- Customer satisfaction
- Net profit before tax
- Profitability of customers

Exercise 84

Give two more examples of KRIs

The common characteristic of these measures is that they are the result of many actions. They give a clear picture of whether you are traveling in the right direction. They do not, however, tell you what you need to do to improve these results. Thus, KRIs provide information that is ideal for the board (ie those not involved in day to day management).

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A car's speedometer provides a useful analogy. The board will simply want to know the speed the car is traveling. However, management needs to know more information since the traveling speed is a combination of what gear the car is in and the revolutions per minute (RPMs) of the engine. Management might even be concentrating on completely different measures, such as how economically the car is performing (miles per gallon), or how hot the engine is running. These are two completely different gauges and are performance indicators or might even be KPIs.

KRIs typically cover a longer period of time than KPIs; they are reviewed on monthly/quarterly cycles, not on a daily/weekly basis as KPIs are. Separating KRIs from other measures has a profound impact on reporting, resulting in a separation of performance measures into those impacting governance and those impacting management. That is, an organisation should have a governance report (ideally in a dashboard format), consisting of up to ten measures providing high level KRIs for the board and a balanced scorecard (BSC) comprising up to 20 measures (a mix of KPIs and PIs) for management.

In between KRIs and the true KPIs are numerous performance indicators. These complement the KPIs and are shown with them on the scorecard for the organisation and the scorecard for each division, department and team.

Performance indicators that lie beneath KRIs could include:

- Profitability of the top 10% of customers
- Net profit on key product lines
- Percentage increase in sales with top 10% of customers
- Number of employees participating in the suggestion scheme

Exercise 85

From what you have already read, try to define what you mean by PIs...

9.1.2 Key Performance Indicators

What are *KPIs*?

KPIs represent a set of measures focusing on those aspects of organisational performance that are the most critical for the current and future success of the organisation.

KPIs are rarely new to the organisation. They have either not been recognized or were “gathering dust” somewhere unknown to the current management team. KPIs can be illustrated by two examples:

9.1.3 Example: An Airline KPI

This example concerns a senior BA official, who set about turning British Airways (BA) around in the 1980s by reportedly concentrating on one KPI. He was notified, wherever he was in the world, if a BA plane was delayed. The BA manager at the relevant airport knew that if a plane was delayed beyond a certain “threshold,” they would receive a personal call from the BA official. It was not long before BA planes had a reputation for leaving on time. This KPI affected all six of the BSC perspectives. Late planes:

- Increased cost in many ways, including additional airport surcharges and the cost of accommodating passengers overnight as a result of planes being “curfewed” due to noise restrictions late at night
- Increased customers’ dissatisfaction and alienation of those people meeting passengers at their destination (possible future customers)
- Contributed more to ozone depletion (environmental impact) as additional fuel was used in order to make up time during the flight
- Had a negative impact on staff development as they learned to replicate the bad habits that created late planes
- Adversely affected supplier relationships and servicing schedules resulting in poor service quality
- Increased employee dissatisfaction, as they were constantly “firefighting” and dealing with frustrated customers

9.1.4 Example: A Distribution Company

A CEO of a distribution company realized that a critical success factor for their business was trucks leaving as close to capacity as possible. A large train truck capable of carrying more than 40 tons was being sent out with small loads as dispatch managers were focusing on “delivering in full on time” to customers.

Each day by 9 am the CEO received a report of those trailers that had been sent out underweight. The CEO called the dispatch manager and asked whether any action had taken place to see if the customer could have accepted the delivery on a different date that would enable better utilization of the trucks. In most cases the customer could have received it earlier or later, fitting in with a past or future truck going in that direction. The impact on profitability was significant.

Just with the airline example, staff did their utmost to avoid a career limiting phone call with their CEO!

Seven Characteristics of KPIs

From extensive analysis and from Parmenter's discussions with over 1,500 participants in his KPI workshops, covering most organisation types in the public and private sectors, he defines seven KPI characteristics:

1. Nonfinancial measures (not expressed in dollars, yen, pounds, euros, etc.)
2. Measured frequently (eg daily or 24/7)
3. Acted on by the CEO and senior management team
4. Understanding of the measure and the corrective action required by all staff
5. Ties responsibility to the individual or team
6. Significant impact (eg affects most of the core critical success factors [CSFs] and more than one BSC perspective)
7. Positive impact (eg affects all other performance measures in a positive way)

Exercise 86

Explain any two of these seven characteristics to someone who is considering implementing a system of KPIs in their organisation.

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When you put a dollar sign on a measure, you have already converted it into a **result indicator** (eg daily sales are a result of activities that have taken place to create the sales). The **KPI lies deeper** down. It may be the number of visits to contacts with the key customers who make up most of the profitable business.

KPIs should be **monitored 24/7, daily**, or perhaps weekly for some. A **monthly, quarterly or annual measure cannot be a KPI**, as it cannot be *key* to your business if you are monitoring it well after the *horse has bolted*. KPIs are therefore current or future oriented measures as opposed to past measures (eg number of key customer visits planned in next month or a list by key customer of the date of the next planned visit). When you look at most organisational measures, they are very much past indicators measuring events of the last month or quarter. These indicators cannot be and never were KPIs.

All good KPIs make a difference; they have the CEO's constant attention, with daily calls to the relevant staff. Having a *career limiting* discussion with the CEO is not something the staff wants to repeat and in the airline case, innovative and productive processes were put in place to prevent a recurrence.

A KPI should tell you what action needs to take place. The British Airways late plane KPI communicated immediately to everyone that there needed to be a focus on recovering the lost time. Cleaners, caterers, ground crew, flight attendants and liaison officers with traffic controllers would all work some magic to save a minute here and a minute there, while maintaining or improving service standards.

A KPI is deep enough in the organisation that it can be tied to an individual. In other words, the CEO can call someone and ask why. Return on capital employed has never been a KPI, as it cannot be tied to a manager: it is a result of many activities under different managers.

A good KPI will affect most of the core CSFs and more than one BSC perspective. In other words, when the CEO, management and staff focus on the KPI, the organisation scores goals in all directions.

A good KPI has a flow on effect. An improvement in a key measure within the CSF of customer satisfaction would have a positive impact on many other measures. Timely arrival and departure of planes gives rise to improved service by ground staff, as there is less "fire-fighting" to distract them from a quality and caring customer contact.

Lead and Lag Confusion

Many management books that cover KPIs talk about "lead and lag indicators"; this merely clouds the KPI debate. Using the new way of looking at performance measures, we dispense with the terms *lag* (outcome) and *lead* (performance driver) indicators. At seminars, when the audience is asked "Are the late planes in the air KPI, a lead indicator, or a lag indicator?" The vote count is always evenly split. Surely, this is enough proof that *lead* and *lag* labels are not a useful way of defining performance measures.

KRIs replace outcome measures, which typically look at activity over months or quarters. PIs and KPIs are now characterized as either past, current, or future focused measures. The new concept called *current measures* refers to those monitored 24/7 or daily, for example, sales made yesterday. You will find your KPIs in your organisation are either current or future oriented measures.

Parmenter says that in workshops he asks participants to write a couple of their major measures in the worksheet shown in the table below, **Past/Current/Future Performance Measures Analysis Worksheet**, and then restate the measure in the other tenses. Take time out now and restate three measures.

The lead/lag division did not focus adequately enough on current or future-oriented measures. If quality improvements are to happen, the number of initiatives that are about to come online in the next week, two weeks, or month must be measured. If we want to increase sales, what is important to know is the number of meetings that have already been organized/scheduled with our key customers in the next week, next two weeks or next month.

Past Measures	Current Measures	Future Measures
Last week/two weeks/ month/quarter	24/7 and daily	Next day/week/month/ quarter
For example, number of late planes last week/last month	For example, planes over two hours late (updated continuously)	For example, number of initiatives to be commenced in the next month/ two months to target areas that are causing late planes

Table 33 Past/Current/Future Performance Measures Analysis Worksheet

10/80/10 Rule

Kaplan and Norton recommend no more than 20 KPIs. Hope and Fraser suggest fewer than 10 KPIs. The 10/80/10 rule is a good guide. That is, there are about 10 KRIs, up to 80 PIs and 10 KPIs in an organisation (see the table below, **10/80/10 Rule**). Very seldom are more measures needed and in many cases even fewer.

For many organisations 80 PIs will at first appear totally inadequate. Yet on investigation, you will find that separate teams are actually working with variations of the same indicator, so it is better to standardize them (eg a “number of training days in the last month” performance measure should be consistently applied with the same definition graph).

Many KPI project teams will also, at first, feel that having only 10 KPIs is too restrictive and may wish to increase KPIs to 30. With careful analysis these will soon be reduced to the 10 suggested unless the organisation is made up of many businesses from very different sectors, in which case the 10/80/10 rule can apply to each diverse business, providing it is large enough to warrant its own KPI rollout.

Importance of Timely Measurement

Before proceeding further, we will look at the importance of measurement. The use of measurement varies widely across the world.

Key result indicator (10)	Tells you how you have done in a perspective
Performance indicator (80)	Tells you what to do
Key performance indicator (10)	Tells you what to do to increase performance dramatically

Table 34 10/80/10 Rule

It is essential that measurement be timely. Today, a KPI provided to management that is in excess of five days old is useless. KPIs are prepared in real time, with even weekly ones available by the next working day. The suggested reporting framework of performance indicators is set out in Exhibit 1.4.

One or two KPIs should be updated daily or even 24/7 (as in the British Airways case).

Most organisations will have five essential KPIs, which must be reported weekly at least (excluding the daily or 24/7 KPIs identified above). Performance measures that focus on completion should be included. Projects that are running late and overdue reports should be reported to the senior management team each week. Such reporting will revolutionize project and task completion in your organisation.

The advertisement features a woman with long dark hair, wearing a grey sleeveless top, standing in front of a large window with a view of trees. She is looking down at her smartphone. The background is bright and airy. The text is overlaid on the left side of the image.

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Exhibit 1.4 Suggested Reporting Framework

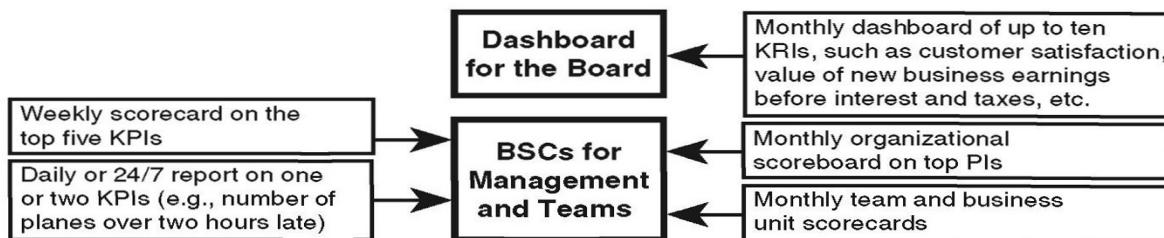


Figure 58 Suggested Reporting Framework

The remaining performance measures should be reported monthly and include a team and business unit BSC.

9.2 Management Models That Have a Profound Impact on KPIs

9.3 Balanced Scorecard

The ground breaking work of Kaplan and Norton brought to management's attention that performance needed to be measured in a more holistic way. They came up with four perspectives that have been increased to five or even six various organisations. For example, Kaplan and Norton's work on strategic mapping alludes to the importance of employee satisfaction and the environment/community perspectives. The latter is important because it means the BSC now incorporates all triple bottom line issues (see the table, **Six Perspective Balanced Scorecard**, below).

1 FINANCIAL	3 CUSTOMER	5 ENVIRONMENT/COMMUNITY
Use of assets, optimization of working capital	Increase customer satisfaction, targeting customers who generate the most profit	Supporting local businesses, linking with future employees, community leadership
2 INTERNAL	4 LEARNING AND GROWTH	6 EMPLOYEE SATISFACTION
Delivery in full on time, optimizing technology, effective relationships with key stakeholders	Empowerment, increasing expertise and adaptability	Positive company culture, retention of key staff, increased recognition

Table 35 Six Perspective Balanced Scorecard

Exercise 87

Now that you have heard of one, what, then, is a Balanced Scorecard?

9.4 Beyond Budgeting Management Model

It is easy for the BSC, with its financial and non financial measures, to develop into yet another fixed performance contract and eventually result in the same dysfunctional behaviour that we see with the annual planning process.

The adoption of the beyond budgeting management model will enhance the power of the BSC. Companies worldwide are beginning to recognize that existing budget processes are not satisfactory. They have been used since the Romans planned and budgeted their invasion of northern Europe! The budget process is often seen as a hindrance to management rather than being beneficial. An international survey of chief financial officers (CFOs) in 1998 by the US consulting firm Hackett Benchmarking & Research found that almost 90% of CFOs were dissatisfied with their budget process and that the annual budget was not linked to organisational strategy. KPIs are a step in the right direction.

Hope and Fraser, the management gurus behind the ***Beyond Budgeting Movement***, have stated that not only is the budget process a time consuming, costly exercise generating little value, but also and more importantly, it becomes a major limiting factor on how your organisation can perform. They provide examples of companies that have broken free from the budget constraint and achieved success well beyond expectations. Organisations that go beyond budgeting are empowering their front line staff, the very thing that KPIs require. In other words, KPIs will be enhanced with the removal of the budget process.

Establishment of a quarterly rolling planning regime, wherein management both sets out their expenditure requirements for the next 18 months and seeks approval for expenditure planned for the next three months, is a key requirement (see the table, **How Quarterly Rolling Planning Works for an Organization with a Year End that Falls at the End of a Traditional Calendar Quarter**, below).

9.5 Converting Reports from Information Memorandums to Decision Based Reports

Many management reports are not management tools; they are merely memorandums of information. As a management tool, management reports should encourage timely action in the right direction. Organisations need to measure and report on those activities on which the board, management and staff need to focus. The old adage “What gets measured gets done” is still true.

For management reporting to become a management tool, monthly reporting must be combined with daily and weekly reporting. It is of little help to tell the senior management team that ***the horse has bolted*** halfway through the following month. If management is told immediately ***the stable door has been left open***, most are soon able to close it.

This has a profound impact on the KPI reporting that needs to be timely, brief and informative.

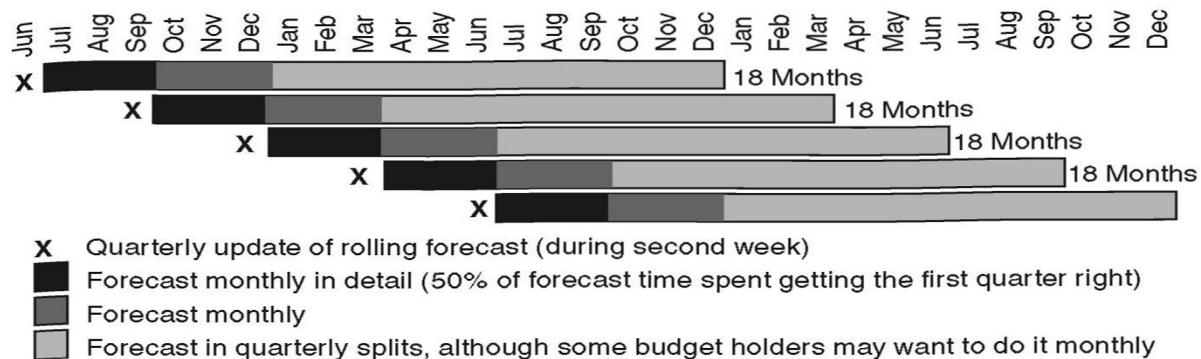


Figure 59 How Quarterly Rolling Planning Works for an Organisation with a Year End that Falls at the End of a Traditional Calendar Quarter

Exercise 88

Beyond Budgeting can be a great source of liberation and empowerment for some organisations. Find examples of organisations that have used the Beyond Budgeting system and explore the successes they claim to have had.

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9.6 Definitions

The following definitions are listed in order of importance:

Performance measure. Throughout this manual, the term performance measure refers to an indicator used by management to measure, report and improve performance. These are classed as either a key result indicator, a performance indicator, or a key performance indicator.

Balanced scorecard. A term first introduced by Kaplan and Norton describing how one needs to measure performance in a more holistic way. One needs to see an organisation's performance in a number of different perspectives. For the purposes of this manual there are six perspectives in a balanced scorecard (see the table, **Six Perspective Balanced Scorecard**, above).

Oracles and top guns. Oracles in an organisation are those grey haired individuals who have seen it all before. They are often considered to be slow, ponderous and, quite frankly, a nuisance by the new management. Often, they are retired early or made redundant only to be rehired as contractors at twice the previous salary when management realizes they have lost too much institutional knowledge. Their considered pace is often a reflection that they can see that an exercise is futile as it has failed twice before!

The *top guns* are young, fearless and precocious leaders of the future who are not afraid to go where *angels fear to tread*. These staff members have not yet achieved management positions.

The mixing of the oracles and young guns benefits both parties and the organisation. The young guns learn much and the oracles rediscover their energy being around these live wires!

Empowerment. For the purposes of this book, *empowerment* is an outcome of a process that matches competencies, skills and motivations with the required level of autonomy and responsibility in the workplace.

Senior management team (SMT). The senior management team is comprised of the CEO and all direct reports.

Better practice. This is the efficient and effective way management and staff undertake business activities in all key processes: leadership, planning, customers, suppliers, community relations, production and supply of products and services, employee wellbeing and so forth.

Best practice. This is a commonly misused term, especially as what is best practice for one organisation may not be best practice for another, albeit in the same sector. Best practice is where better practices, when effectively linked together, lead to sustainable *world class* outcomes in quality, customer service, flexibility, timeliness, innovation, cost and competitiveness.

Benchmarking. Benchmarking can be defined as an ongoing, systematic process to search for international better practices, compare against them and then introduce them, modified where necessary, into your organisation. Benchmarking may be focused on products, services, business practices and processes of recognised leading organisations.

Reference: DAVID PARMENTER (2007) *Key Performance Indicators Developing, Implementing and Using Winning KPIs* John Wiley & Sons Inc Chapter 1.

10 Review Annual Report and Accounts

For this and the following two sections you will be given extracts from one or more annual reports to work on.

We have already concerned ourselves with the review and analysis of financial data so in this section we will consider aspects of the following:

- non financial data
- notes of explanation

10.1 Non Financial Data

Examples of non financial data can be found in Figure 60 relating to one company's Balanced Scorecard metrics:

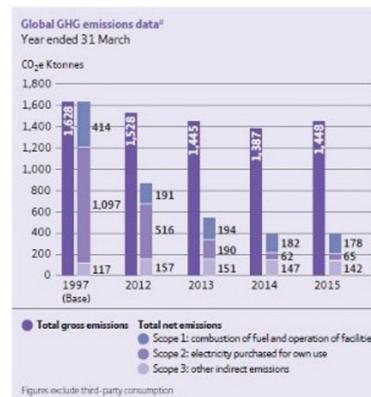
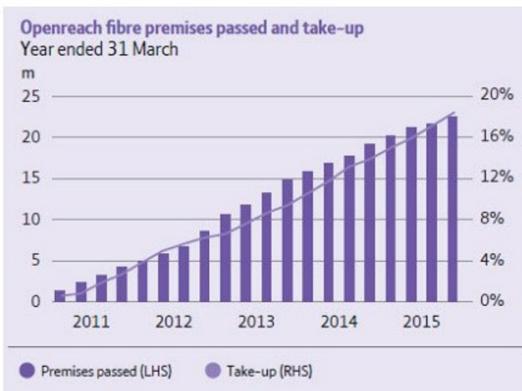
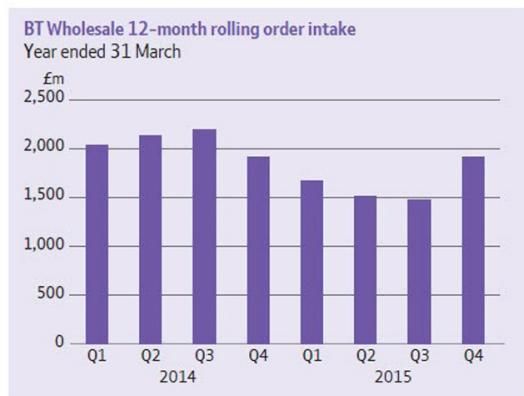
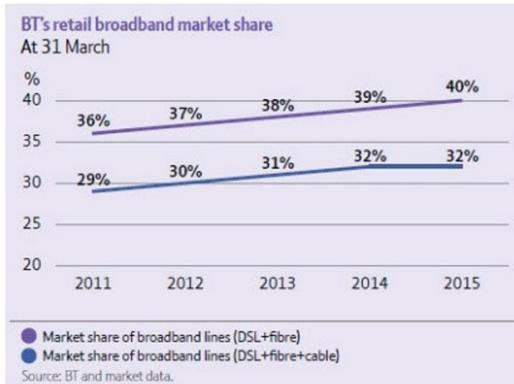
Financial performance	profitability liquidity capital structure market ratios
Competitiveness	relative market share and position sales growth measures of the customer base
Resource utilisation	productivity (input: output) efficiency (resources planned: consumed) utilisation (resources available: consumed)
Quality of service	overall service indicators measures of the twelve determinants of service quality: reliability, responsiveness, aesthetics, cleanliness, comfort, friendliness, communication, courtesy, competence, access, availability, security
Innovation	proportion of new to old products and services new product and service sales levels
Flexibility	product/service introduction flexibility product/service mix flexibility volume flexibility delivery flexibility

Figure 60 Examples of Non Financial Data

Exercise 89

Download an organisation's Annual Report and Accounts and find other examples of non financial data to review.

Here are some examples from BT Group plc, the UK telecommunications provider.



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10.2 Reviewing the Annual Report for Evidence of Trends and Strategies

10.2.1 Qualitative analysis of financial and non financial data

We will use the Chairman's letter from the amazon.com annual report and accounts 2014 as the basis of our discussion here.

10.2.2 2014 Chairman's letter from the amazon.com

Locate the file *AMAZON_2014_chair_letter.pdf* in the notes that accompany this chapter: it is the annual letter to stockholders from the CEO of amazon.com for 2014.

Exercise 90

Summarise the CEO's letter under the four headings you will find in the letter:

- Marketplace
- Amazon Prime
- Amazon Web Services
- Career Choice

In your summaries, stress the aspects of the qualitative analysis of both financial and non financial data.

Conclude by saying whether you think this letter is credible. Do you think the CEO is being open and honest? Do you feel that amazon.com is in good hands for the future?

10.2 Identify trends and strategies contained in financial and non financial data and reports

Exercise 91

In the **BT Group plc** annual report for 2014 there are many tables of data showing five year results. Find the file *trends_fin_nonfin_2015_BT_ann_rep.pdf* in the notes to this chapter and review what you see there. Create your own summaries, possibly including graphs and charts, to highlight what you have found. The key headings from this file include:

Selected Financial Data

Summary group income statement

Summary group balance sheet

Financial and Operational Statistics

Financial statistics

Financial ratios

Operational statistics

Exercise 92

By contrast to the work of exercise 91, here are some data from amazon.com that is completely different from the BT Group plc data and tables

- a) The summary five year income statement and highly summarised balance sheets for five years follow: comment on what you see here, include graphs and charts and any other device that you feel will enhance your message.

Item 6. Selected Consolidated Financial Data

The following selected consolidated financial data should be read in conjunction with the consolidated financial statement and the notes thereto in Item 8 of Part II, "Financial Statements and Supplementary Data," and the information contained in Item 7 of Part II, "Management's Discussion and Analysis of Financial Condition and Results of Operations." Historical results are not necessarily indicative of future results.

	Year Ended December 31,				
	2014	2013	2012	2011	2010
	(in millions, except per share data)				
Statements of Operations:					
Net sales	\$ 88,988	\$ 74,452	\$ 61,093	\$ 48,077	\$ 34,204
Income from operations	\$ 178	\$ 745	\$ 676	\$ 862	\$ 1,406
Net income (loss)	\$ (241)	\$ 274	\$ (39)	\$ 631	\$ 1,152
Basic earnings per share (1)	\$ (0.52)	\$ 0.60	\$ (0.09)	\$ 1.39	\$ 2.58
Diluted earnings per share (1)	\$ (0.52)	\$ 0.59	\$ (0.09)	\$ 1.37	\$ 2.53
Weighted average shares used in computation of earnings per share:					
Basic	462	457	453	453	447
Diluted	462	465	453	461	456
Statements of Cash Flows:					
Net cash provided by (used in) operating activities	\$ 6,842	\$ 5,475	\$ 4,180	\$ 3,903	\$ 3,495
Purchases of property and equipment, including internal-use software and website development	(4,893)	(3,444)	(3,785)	(1,811)	(979)
Free cash flow (2)	\$ 1,949	\$ 2,031	\$ 395	\$ 2,092	\$ 2,516
December 31,					
	2014	2013	2012	2011	2010
	(in millions)				
Balance Sheets:					
Total assets	\$ 54,505	\$ 40,159	\$ 32,555	\$ 25,278	\$ 18,797
Total long-term obligations	\$ 15,675	\$ 7,433	\$ 5,361	\$ 2,625	\$ 1,561

- (1) For further discussion of earnings per share, see Item 8 of Part II, "Financial Statements and Supplementary Data—Note 1—Description of Business and Accounting Policies."
- (2) Free cash flow, a non-GAAP financial measure, is defined as net cash provided by operating activities less cash expenditures for purchases of property and equipment, including internal-use software and website development, both of which are presented on our consolidated statements of cash flows. See Item 7 of Part II, "Management's Discussion and Analysis of Financial Condition and Results of Operations—Results of Operations—Non-GAAP Financial Measures" for additional information as well as alternative free cash flow measures.

Figure 61 amazon.com Selected Financial Data

- b) Comment on the usefulness of the data in the following table and explain what you think they mean for the average stockholder.

The following summarizes our principal contractual commitments, excluding open orders for purchases that support normal operations, as of December 31, 2014 (in millions):

	Year Ended December 31,						Thereafter	Total
	2015	2016	2017	2018	2019			
Operating and capital commitments:								
Debt principal and interest	\$ 1,842	\$ 323	\$ 1,322	\$ 310	\$ 1,272	\$ 9,403	\$ 14,472	
Capital leases, including interest	2,060	1,727	1,030	178	89	98	5,182	
Finance lease obligations, including interest	110	112	115	117	119	1,056	1,629	
Operating leases	868	791	728	634	549	2,343	5,913	
Unconditional purchase obligations (1)	489	435	351	118	38	3	1,434	
Other commitments (2) (3)	928	333	160	140	90	845	2,496	
Total commitments	\$ 6,297	\$ 3,721	\$ 3,706	\$ 1,497	\$ 2,157	\$ 13,748	\$ 31,126	

Figure 62 amazon.com Capital Commitments 2015–2019



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- c) Summarise the following table: the aim is to simplify the table for the average non financial manager.

The following table provides information about our current and long-term cash equivalent and marketable fixed income securities, including principal cash flows by expected maturity and the related weighted average interest rates as of December 31, 2014 (in millions, except percentages):

	2015	2016	2017	2018	2019	Thereafter	Total	Estimated Fair Value as of December 31, 2014
Money market funds	\$ 10,718	\$ —	\$ —	\$ —	\$ —	\$ —	\$ 10,718	\$ 10,718
Weighted average interest rate	0.09%	—%	—%	—%	—%	—%	0.09%	
Corporate debt securities	85	131	154	22	—	—	392	401
Weighted average interest rate	1.05%	1.05%	1.48%	1.65%	—%	—%	1.25%	
U.S. government and agency securities	1,865	342	156	19	1	—	2,383	2,406
Weighted average interest rate	0.33%	0.79%	1.11%	1.91%	2.17%	—%	0.46%	
Asset backed securities	19	43	7	—	—	—	69	69
Weighted average interest rate	0.64%	0.95%	1.10%	—%	—%	—%	0.88%	
Foreign government and agency securities	1	27	49	—	—	—	77	80
Weighted average interest rate	0.04%	0.05%	—%	—%	—%	—%	0.02%	
Other securities	12	10	7	4	—	—	33	33
Weighted average interest rate	0.48%	1.01%	1.23%	0.57%	—%	—%	0.81%	
	\$ 12,700	\$ 553	\$ 373	\$ 45	\$ 1	\$ —	\$ 13,672	
Cash equivalent and marketable fixed income securities								\$ 13,707

Figure 63 amazon.com Estimated Fair Value of Cash Equivalent and Marketable Fixed Income Securities

Sensitivity Analysis in Forecasting Financial Statements

Sensitivity analysis means that we take a figure and change it or watch it change. We then take a related or other figure and monitor any change to it. We might then see that, for example, sales increased by 3% over the year but profits fell by 1%. Or that total assets increased by 12% and cost of goods sold rose by 8%.

We might be able to draw conclusions from these changes in that we might conclude they are highly correlated and they are linked. Alternatively, that any patterns we see are spurious and not to be trusted or repeated.

Exercise 93

Take the following base data and make the changes that are suggested below them to see the possible impacts these changes might have which in turn might suggest the sensitivity of, for example, changes in profitability or cash flow to changes in costs, assets, equity or even non financial results.

DW plc Year Ended 31st December 2016 (\$m)	
	Base Case
Sales	2,110
Cost of goods sold	1,161
Selling, general and administrative expense	528
Depreciation	121
Research and development	84
Total costs and expenses	1,894
Operating Income	216
Interest expense	34
Interest (income)	(5)
Earnings before Income Taxes	187
Provision for Income Taxes	64
Net Income	123

Table 36 DW plc Base Case Data

Given the base case above, calculate the:

1. independent effects of a 1% increase in Gross Margin, a 1% decline in the tax rate, and a 5% increase in Sales.
2. independent effects of a 2% increase in Gross Margin, a 2% decline in the tax rate, and a 5% decrease in Sales.
3. composite effects of a 5% increase in Sales, a 2% decline in Gross Margin, a 5% increase in SG&A as % of Sales, and a 2% decline in the tax rate.
4. independent effects of a 1% increase in Gross Margin, a 1% increase in the tax rate, and a 5% increase in Sales.
5. composite effects of a 5% increase in Sales; a 2% decline in Gross Margin, a 3% increase in SG&A as % of Sales, and a 2% decline in the tax rate.