

Chapter 3

An Excel-based strategic management computer model: The Classic Group and Bacchus Beer

Note

This chapter is taken, with quite a few amendments, from the book STRATEGIC MANAGEMENT: A PC BASED APPROACH, Butterworth - Heinemann 1992.

Strategy modelling using Excel

A characteristic of many strategic analyses is the necessity of providing figures as well as opinions. For example if a certain strategy is followed what will the effect be upon measures such as: ROCE, ROI, Cash Flow, etc. etc. For many people this is a turgid and time consuming business. Also when strategies are being developed it can be useful to run 'What-If' scenarios to try to evaluate the numerical consequences of following a particular strategy. For example if a firm had the strategic options of either increasing prices by 10 per cent, or keeping prices the same or decreasing prices by 10 per cent what would be the financial consequences for each decision. Once again for many people this is a turgid and time consuming business. However, help is at hand.

Help with modelling the strategic process

Today computers and easy to use modelling software – Excel – have been wonderfully useful for building strategy models. The great thing about this approach is that the models can be built by the strategy people themselves rather than relying on 'non-strategy experts'.

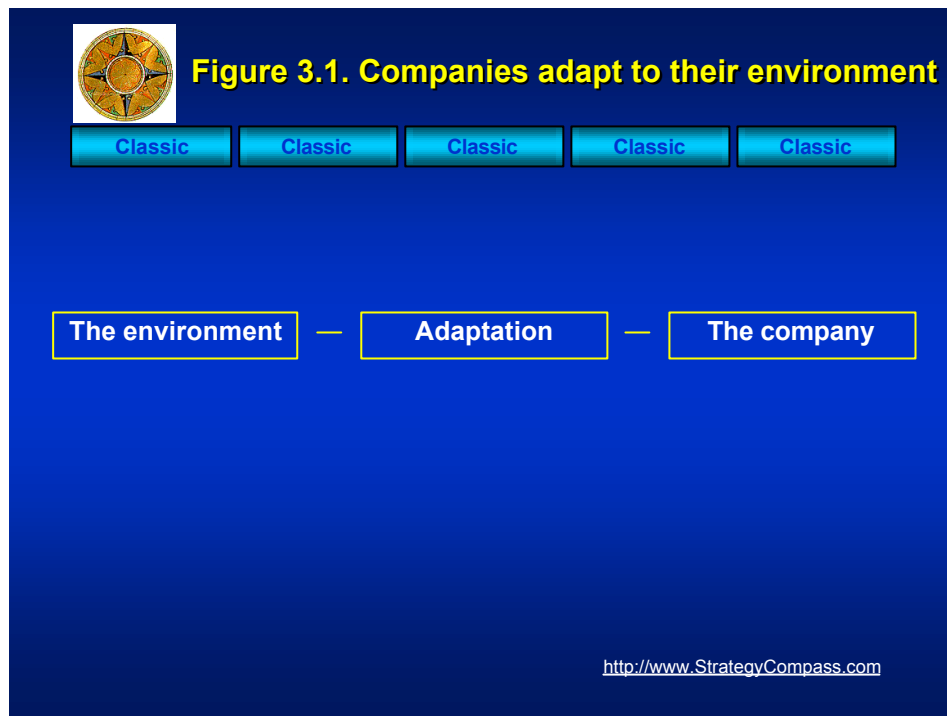
There are two main ways in which you can develop these skills. First read all about the concept of the Classic Group immediately below and then follow the detailed instructions on how to build the Bacchus model. When you build your own version of Bacchus you are likely to make mistakes first time around – so stick at it. Second when you have built the Bacchus model you should be able to extend it and tailor it to your own particular needs or circumstances.

Part I: The Classic Group description and details

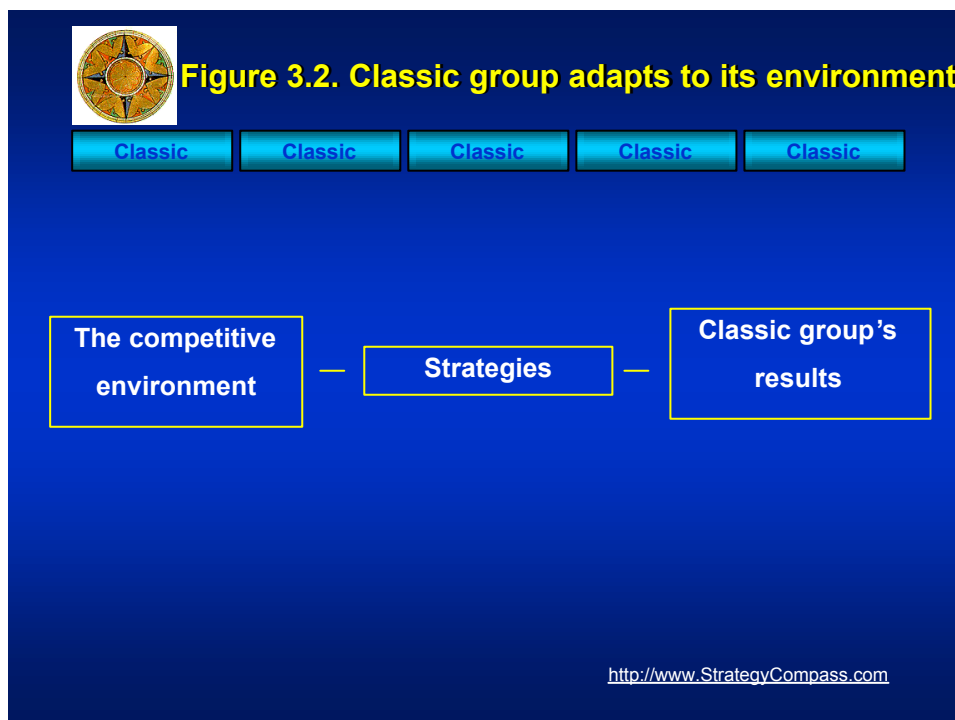
Introduction

The model **The Classic Group** is the kernel of this book and is the organisational and strategic framework within which it is assumed that typical complex corporate planning decisions are made. The objective of the model is to enable planners to see how diverse or related changes in strategies and in the environment can affect a divisionalized company.

The starting point of the model is the assumption that a company can only have sustained success if it they adapts its shape to it to its environments. This is shown schematically in figure 3.1.



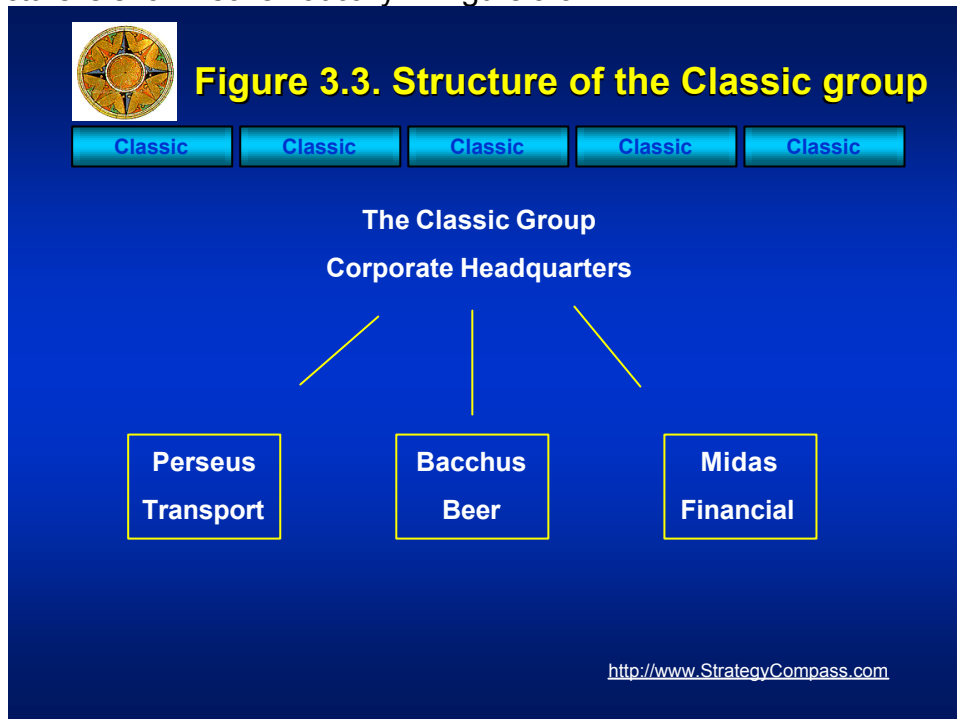
More precisely, the model assumes that there is a divisionalised company called **The Classic Group** and it is adapting its shape through **Strategies** so that it obtains an optimal fit with its **Competitive Environments**. This is shown schematically in Figure 3.2.



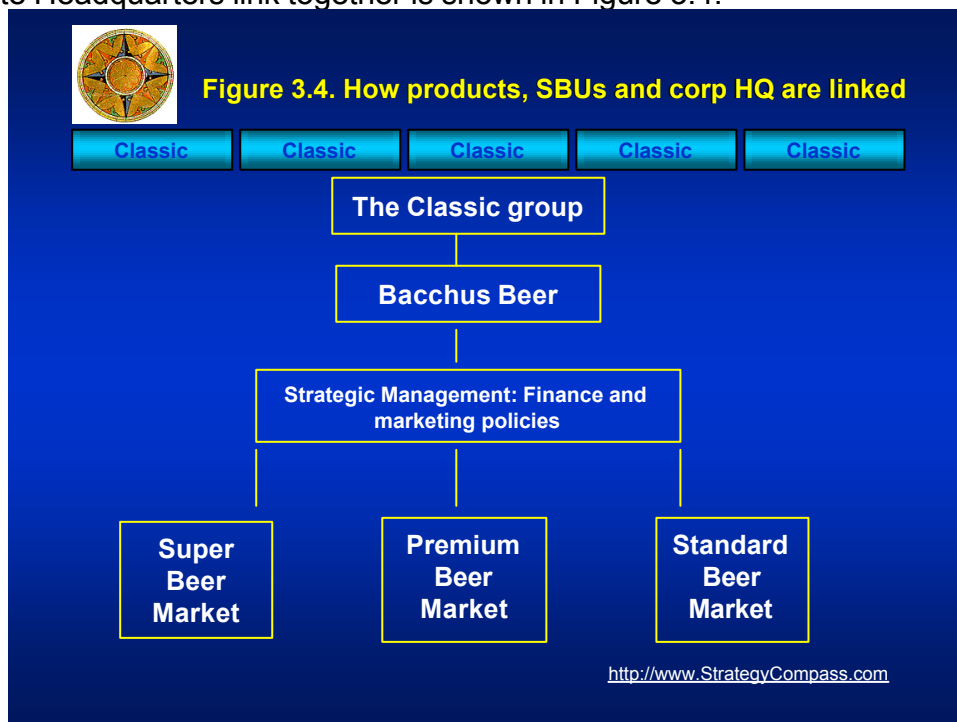
A broad overview of the Classic group and its approach to strategic planning
 The Classic Group is a small divisionalized company which is split into three Strategic Business Units (SBUs) and strategic planning is assumed to take place at two levels: the Corporate Level and the SBU Level.

Strategic planning in the Classic group at the corporate level

The Classic Group's three Strategic Business Units are: Bacchus Beer which is engaged in the brewing business, Perseus Transport which is engaged in transport and distribution and Midas Financial Services which is engaged in financial services. This structure is shown schematically in Figure 3.3.



Each SBU has a number of product or service lines. For example for Bacchus Beer these are Super Beer, Premium Beer and Standard Beer. How Products SBUs and Corporate Headquarters link together is shown in Figure 3.4.



Planning at the corporate level is undertaken by a small team at Corporate Headquarters which does not become involved in shorter-term SBU issues. Rather,

Corporate Headquarters has the view that its function is to set broad corporate parameters, usually in the areas of finance and marketing within which it expects the SBUs to operate. Indeed Corporate Headquarters will only become involved in planning at the SBU level if its assistance is specifically requested by an SBU, or if an SBU is failing to meet corporate parameters.

The main corporate planning functions undertaken are:

- the setting of corporate objectives and the development of long run plans which will enable these objectives to be achieved.
- the implementation of these plans,
- the subsequent control and evaluation of the effectiveness of these plans in meeting corporate objectives.

More specifically, strategic planning at the group level has the following major financial and marketing concerns:

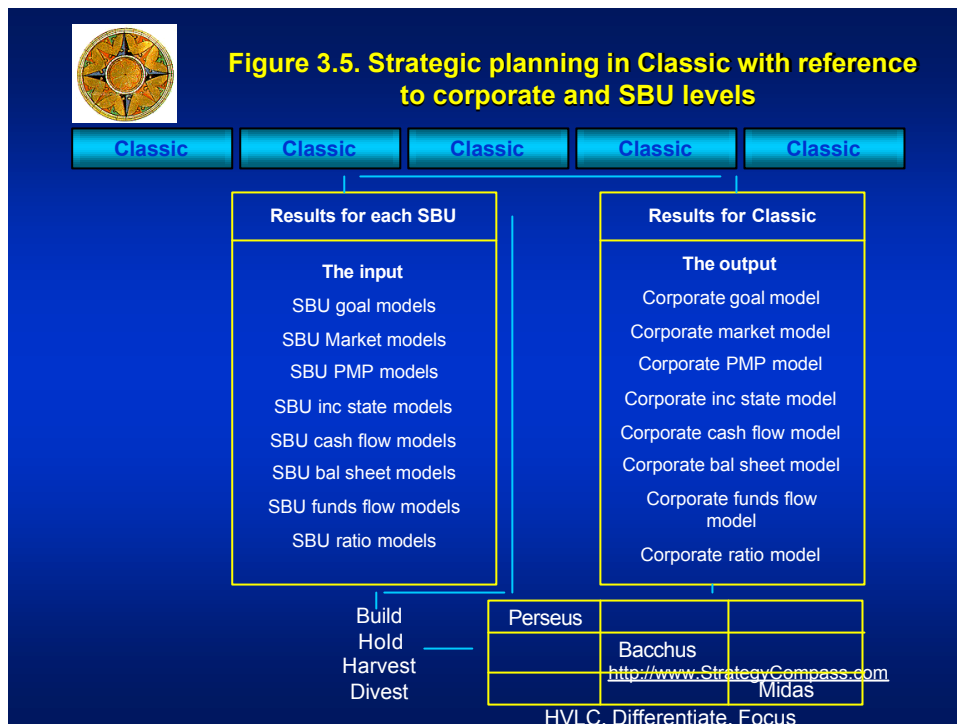
Financial:

- The primary financial objective is the achievement of satisfactory returns and growth for its shareholders and stakeholders through the consolidated operations of its SBUs.
- The achievement of a balanced financial structure through appropriate corporate financing, investment, dividend¹, and cash management policies.

Marketing.

- The primary marketing objective is the achievement and maintenance of a balanced portfolio of SBUs which will ensure that the primary corporate marketing and financial objectives continue to be achieved. Finally Figure 3.5. shows how corporate planning takes place in Classic Group with particular reference to the corporate level. As can be seen the major input for the corporate decisions are the results of the SBUs.

¹It should be noted that The Classic Group does not have the usual centralized policies and procedure for shares, dividends and tax payments: each SBU is assumed to have autonomy (within corporate parameters) for these decisions. A consequence of this is that the corporate share holdings, corporate dividends and corporate tax payments are simply the consolidations of the decisions of the individual SBUs. Classic Group has been structured in this fashion for didactic reasons: it is to enable users of the model greater freedom to make major strategic decisions even when they are using the model at the SBU rather than the Group level. Once the user is familiar with the model, however, it is relatively easy to restructure it to have these decisions taken centrally and to convert the SBUs into Investment Centres, or Profit Centres, or Cost Centres.



Strategic planning in the Classic group at the SBU level

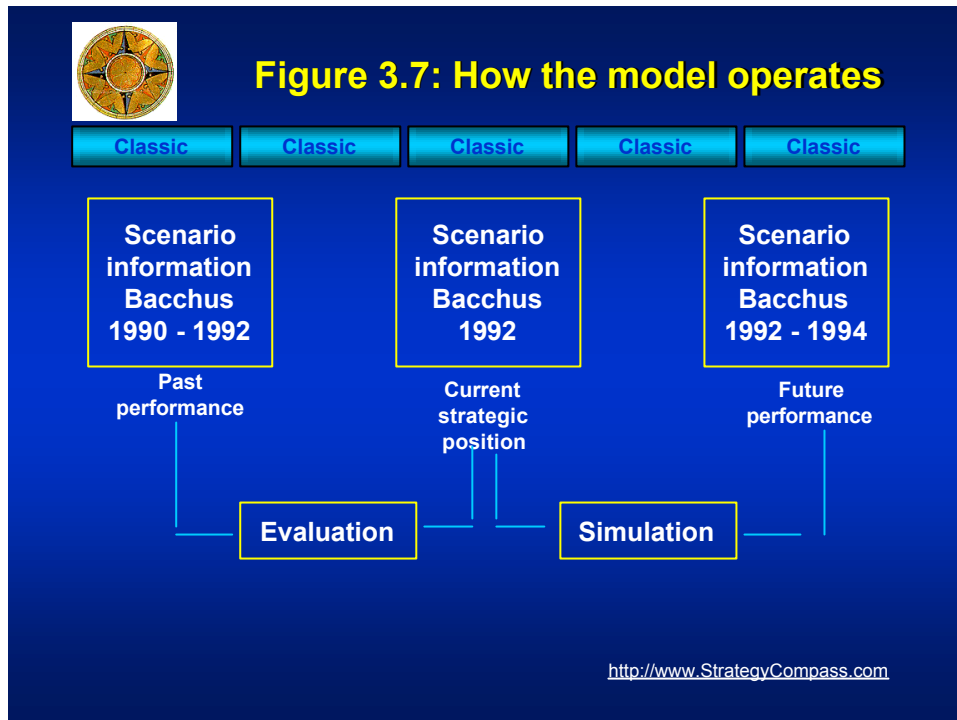
Each SBU is managed fairly independently within the broad corporate parameters set out above, and strategic planning within each SBU is carried out by the SBU's managing director and its top management. The main strategic planning functions are:

- the setting of SBU objectives and the development of long run plans for the SBU with reference to given corporate parameters.
- the implementation of these strategic plans,
- the subsequent control and evaluation of the effectiveness of these plans in meeting SBU objectives.

SBUs are delineated according to the product-market group that they serve as set out above. In fact each SBU has a range of three products or services and associated markets. Figure 3.6. shows schematically the structure of The Classic Group with particular reference to the SBU level.

The operation of the model

The model pivots on the year 1992. Classic Group's results for the years 1990 to 1992 are available and the purpose of the planning exercise is to decide upon alternative environmental scenarios and alternative strategies for the group for the next three years. Then to assess the implications of following alternative strategies and finally to decide upon a preferred strategy. This is shown schematically in Figure 3.7.



Conclusion and comments

The Classic Group is the core of this approach to modelling and this brief exposition and overview has been provided at this stage so that readers may have an overall structural and strategic context in which to view the detailed sub-corporate models upon which The Classic Group is built. On the accompanying disk, because of space limitations just one typical SBU - Bacchus Beer - has been included. An overview of the operation of this SBU is provided next.

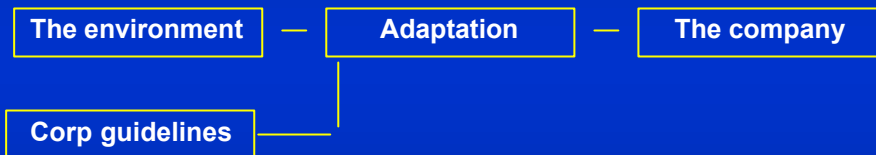
Bacchus beer: an introduction

The objective of this model is to enable planners to see how changes in strategies and in the environment affect a Strategic Business Unit: Bacchus Beer. It should be noted that although this model has been couched in terms of a Strategic Business Unit, the principles can be applied easily in a small or medium sized business or in a public sector organisation.

The starting point of the model is the assumption that an SBU (Bacchus Beer) can only have sustained success if it adapts its shape to fit with its environments and also conform to corporate (Classic Group) guidelines. This is shown schematically in Figure 3.8.



Figure 3.8: How SBUs must adapt their shape to the environment and corporate guidelines



<http://www.StrategyCompass.com>

Details about Bacchus beer

The Planning Process in Bacchus Beer

Bacchus Beer undertakes its own strategic planning under guidelines from The Classic Group and it is carried out by the Bacchus Beer's managing director and top management. The main strategic planning functions are:

- the setting of SBU objectives and the development of long run plans for the SBU with reference to given corporate parameters.
- the implementation of these strategic plans,
- the subsequent control and evaluation of the effectiveness of these plans in meeting SBU and corporate objectives.

Bacchus Beer's Activities

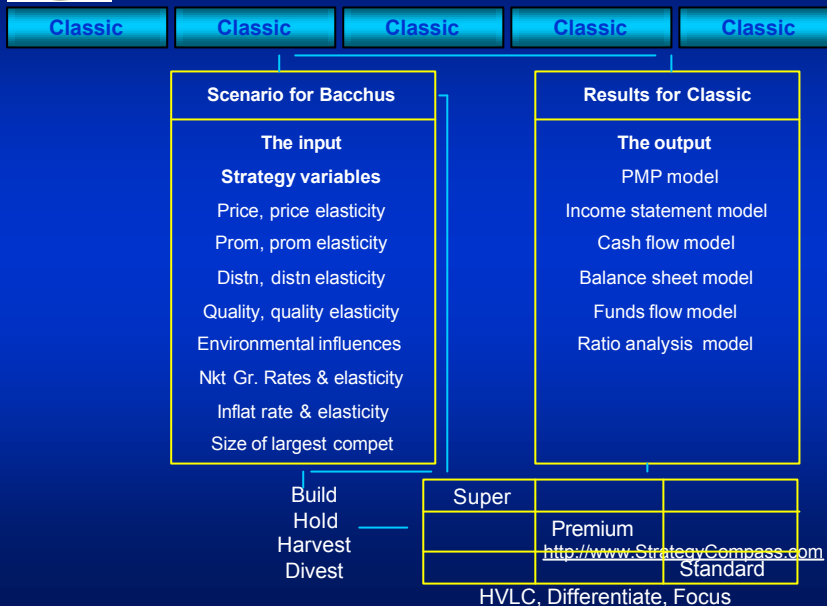
Bacchus Beer has three product lines - Super Beer, Premium Beer and Standard Beer each of which sells in a separate and unique market segment. Figure 3.7. above shows schematically these relationships and also the relationship between Bacchus Beer and Corporate Headquarters.

The strategic planning model employed by Bacchus Beer

In order to help with its strategic planning Bacchus Beer has a strategic planning model which is shown schematically in Figure 3.6.



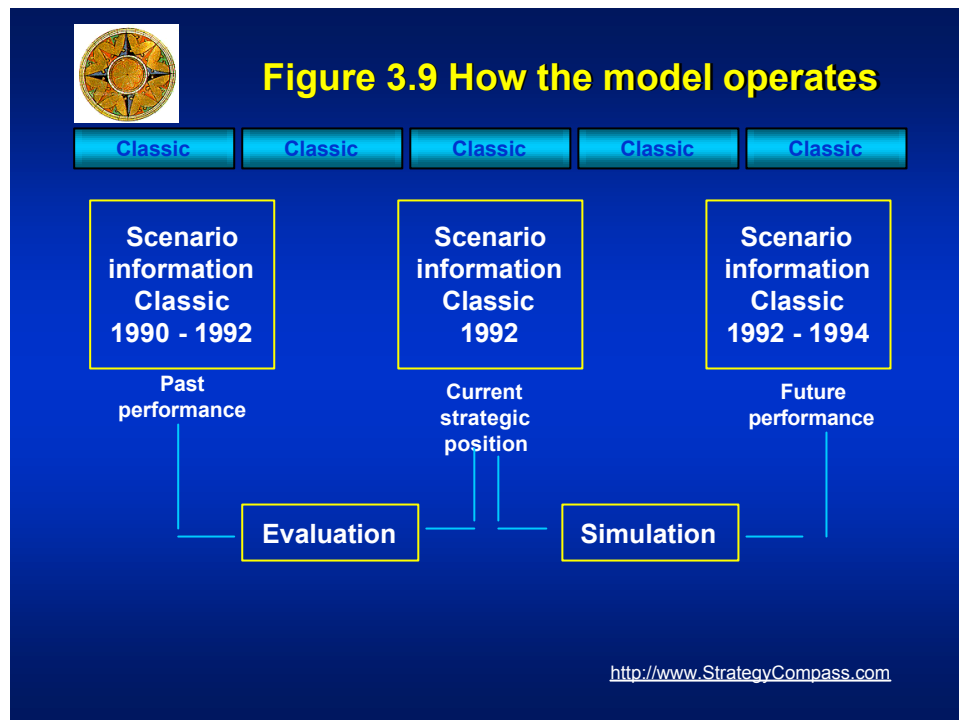
Figure 3.6: Strategic planning in Classic with reference to the SBU level



This model attempts to capture many of the essential elements required for strategic planning and also allows the planners to simulate the effects of alternative future strategies under alternative environmental conditions.

The operation of the model

As with the group model Classic the time at which this model is set is 1992. Bacchus Beer's results for the years 1990 to 1992 are available and the purpose of the planning exercise is to decide upon strategies that the SBU ought to follow for the next three years see the implications at firstly the SBU level and then the Group level, of following these strategies, with the initial assumptions continuing to hold. This is shown schematically in Figure 3.9.



Conclusion

This model is a fundamental building block in the total corporate model. Starting here the user should, ultimately, be able to trace the consequences of strategies for individual products firstly upon the performance of the SBU and finally upon the performance of the Group. The details of the constituent models of Bacchus Beer are considered next.

A note on running the model

One of the features of the model is that this and all the other models is that all the instructions needed to run it are provided on the screen, so it is suggested that you follow the process of strategic planning in Bacchus Beer through running the total planning model now to obtain an overview. Each of the constituent models will be considered in greater detail in later chapters. To obtain an overview run the entire Bacchus model.

Part II The detailed instruction on how to build the models

Bacchus Beer

Welcome to Bacchus Beer.

This is a simple Strategy Model for Managers who know NOTHING about computers.

What is Bacchus Beer?

Bacchus Beer is a Strategic Business Unit in the holding company, The Classic Group. The Bacchus Beer models are a set of strategy models which enable you to simulate alternative environmental scenarios and then to test the financial effects of alternative strategies in your chosen scenarios. The main features of the Bacchus Beer model are:

- * it is very comprehensive
- * it is very simple to share data among various worksheets or models
- * after you have used the models a few times you should be able to start

building your own. The Bacchus Beer Model will provide you with a generic framework for **your own** single SBU models.

More about the Classic Group

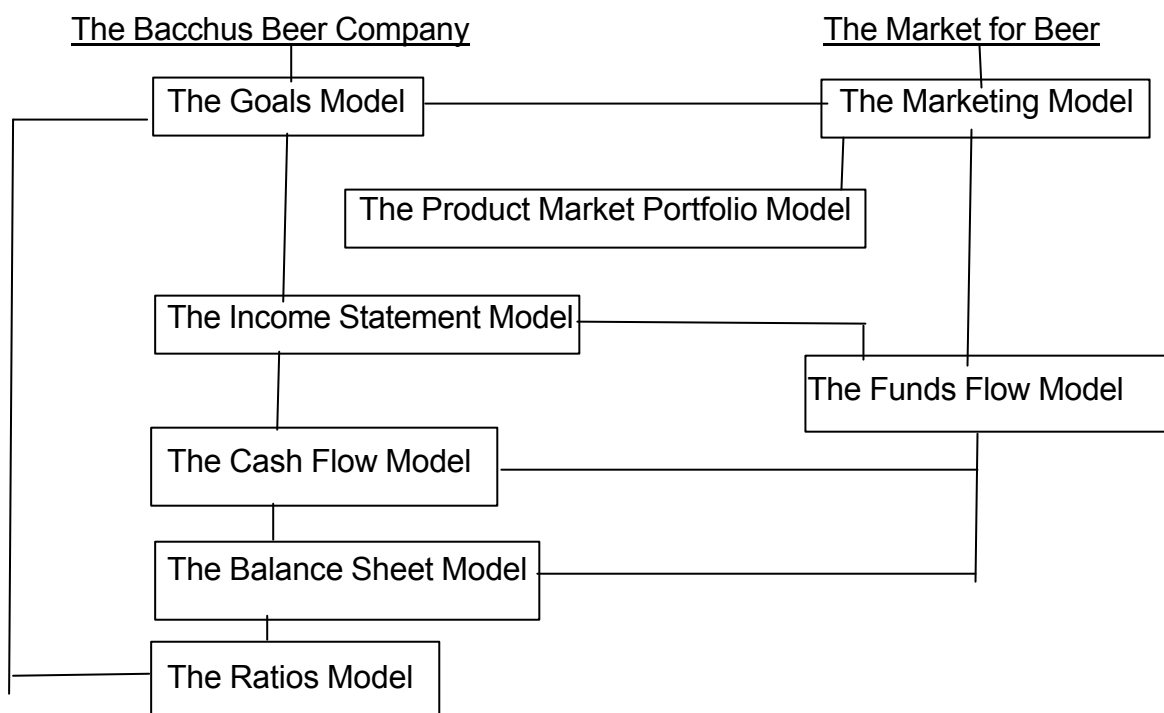
The Classic Group is a holding company which has three divisions or SBUs. these are called Bacchus Beer, Perseus Transport and Midas Financial Services. This was shown schematically above. There is a complete strategy model for each SBU and also an overall consolidated corporate strategy model for The Classic Group, however, in this site you will only be able to use the Bacchus Beer model.

An overall view of the Bacchus Beer model

All the models are linked together and are interdependent. Therefore when you are using them you must follow the order set out below, otherwise you will obtain corrupted results.

Additional information

All the **Input Variables** are taken from the book: **Strategic Management: A PC - Based Approach** by **Patrick B. McNamee** and how the model operates is shown schematically below.



A schematic representation of the Bacchus Beer model

The goals model

Objective

The objective of this model is to set out the goals or targets which the company hopes to achieve trading over the next three years. The time of the model is the end of the company's trading year for 1996 and you are provided with information for the years 1995 to 1999. The objective of building the model is to let you see how to set up a simple goal model which may be used to compare results forecast by the other models in the suite with the targets or goals which you have set.

The task

On a single work sheet called **Goals** in the workbook **Bacchus** build a goal model which sets out the company's Marketing, Financial, Long Term Assets and Liabilities, and Production goals, as set out on **Page 84 of Chapter 5**. The data from this model will later be imported into other models in the suite.

Note 1: The Data in this model and all following models go from 1995 and not 1990 as in the book.

2: The accompanying Worksheets have been printed directly from the relevant models.

Building the model

Load Excel and then save the workbook as **Bacchus**. Next, change the name of the first worksheet to **Goals**. Now it is time to build the model.

There are three parts to this model: The Actual Goals, The Graphs and the Depreciation Calculations. Each of these is now discussed.

The Actual Goals

There are very few calculations in this model and it is mostly concerned with simply displaying targets. All models will have the following types of variables: *Input variables*: these will be the raw data of the model, for example Sales. *Relationship variables*: these will reflect various types of relationships, for example Dividend Payable is a relationship based upon the Dividend Growth Rate. The actual goals can be developed as follows:

Enter the dates

Enter the Marketing and Financial Goals down as far as Dividend Payable.

The First Relationship

Dividend Payable is the first relationship in the model and it should be entered as set out below.

Dividend Payable is a function of the first dividend to be paid and the rate at which it is hoped that dividends will grow, i.e. the 1995 dividend is specified and then multiplied by the Dividend Growth Rate. These relationships can be specified as follows:

1995 Dividend Payable = £100.35

1997 Dividend Payable = 1995 Dividend Payable * (1+1996 Dividend Growth Rate)

1997 Dividend Payable = 1996 Dividend Payable * (1 +1997 Dividend Growth Rate)

Etc.

The Second Relationship

Fixed Assets are the cumulative sum of the difference between Additions and Disposals and this relationship can be specified as follows:

1995 Fixed Assets = 2500+1995 Additions + 1995 Disposals

1996 Fixed Assets = 1995 Fixed Assets + 1996 Additions + 1996 Disposals

1997 Fixed Assets = 1996 Fixed Assets + 1997 Additions + 1997 Disposals

Etc.

The Third Relationship

Share Level is the cumulative sum of Share Issues and this relationship can be specified as follows:-

1995 Share Level = 6000 + 1995 Share Issues

1996 Share Level = 1995 Share Level + 1996 Share Issues

1997 Share Level = 1996 Share Level + 1997 Share Issues Etc.

The Fourth Relationship

Debentures is the cumulative sum of Debenture Issues and this relationship can be specified as follows:

1995 Debentures = 1000 + 1995 Debenture Issues

1996 Debentures = 1995 Debentures + 1996 Debenture Issues

1997 Debentures = 1996 Debentures + 1997 Debenture Issues Etc.

The Fifth Relationship

Long Term Liabilities are the cumulative sum of the Share Level and Debentures and the relationship can be specified as follows:

1995 L T Liabs = 1995 Share Level + 1995 Debentures
1996 L T Liabs = 1996 Share Level + 1996 Debentures Etc
These should be calculated as an Array.

The Sixth Relationship

Volume Total is the cumulative sum of Volume Super, Volume Premium. & Volume Standard and the relationship can be specified as follows:-

1995 Volume Total = 1995 Volume Super + 1995 Volume Premium + 1995 Volume Standard

1996 Volume Total = 1996 Volume Super + 1996 Volume Premium + 1996 Volume Standard

These should be calculated as an Array.

Now format the rows to display percentages and £s as appropriate.

This completes the Goals element of the model.

The Depreciation Calculations

Although these are not goals this is a convenient place and time at which to carry out two depreciation calculations which will be needed for later models.

The calculations are

Annual Depreciation for the Income Statement and

Accumulated Depreciation for the Balance Sheet

Depreciation is assumed to be at 10% per year over 10 years but because the Model has already been running for some years special attention must be paid to building the relationships. The calculations are shown below:-

Annual Depreciation on pre-1995 Additions = £250 for all years

Annual Depreciations on 1995 Additions = 1995 Additions*0.1 then use the Handle function

Annual Depreciation on 1996 Additions = 1996 Additions*0.1 then use the Handle function Etc.

Annual Depreciation for the Income Statement: Use the Autosum function.

1995 Accumulated Depreciation for the Balance Sheet = £450 + Annual Depreciation for the Income Statement 1995.

1996 Accumulated Depreciation for the Balance Sheet = Accumulated Depreciation 1995 + Annual Depreciation for the Income Statement 1996.

1997 Accumulated Depreciation for the Balance Sheet = Accumulated Depreciation 1996 + Annual Depreciation for the Income Statement 1997.Etc. Now format the rows to display £s

The Graphs

Build four graphs on one Worksheet showing:

- The Marketing Goals
- The Financial Goals
- The Assets and Liabilities Goals
- The Production Goals

The Graphs should contain the following information:-

Graph name.

Marketing

Graph variables

Sales

Fixed Assets

Financial

Return on Investment

Return on Equity

Dividend Growth Rate

Assets

Additions
Disposals
Fixed Assets

Production

Volume Premium
Volume Super
Volume Standard

This Worksheet should be named "Goals Graphs."
This completes the **Goals** model and you should now save it.

Bacchus Beer Goals model

	1995	1996	1997	1998	1999
MARKETING GOALS					
TARGET					
Sales	£6,000	£8,000	£14,000	£16,000	£20,000
Return on Sales	10%	10%	10%	10%	10%
FINANCIAL GOALS					
Return on Investment	12%	12%	13%	13%	14%
Return on Equity	25%	25%	25%	25%	25%
Dividend Growth Rate	50%	33%	50%	25%	33%
Dividend Payable	£100.35	£33	£200	£250	£333
ASSETS & LIABILITIES GOALS					
Additions	£1,000	£1,000	£1,000	£1,000	£500
Disposals	£ -	£ -	£ -	£ -	£ -
Fixed Assets	£3,500	£4,500	£5,500	£6,500	£7,000
Share Issues	£300	£300	£300	£300	£300
Share Level	£900	£1,200	£1,500	£1,800	£2,100
Debenture Issues	£500	£500	£500	£500	£500
Debentures	£1,500	£2,000	£2,500	£3,000	£3,500
Long Term Liabilities	£2,400	£3,200	£4,000	£4,800	£5,600
PRODUCTION GOALS					
Volume Premium	150	200	250	320	400
Volume Standard	100	100	100	100	100
Volume Super	100	110	125	150	175
Volume Total	350	410	475	570	675
NUMBER OF EMPLOYEES					
	212	220	320	350	380
HOW DEPRECIATION IS					
Annual Depreciation Pre- 1995	£250	£250	£250	£250	£250
Annual Depreciation on 1995	£100	£100	£100	£100	£100
Annual Depreciation on 1996		£100	£100	£100	£100
Annual Depreciation on 1997			£100	£100	£100
Annual Depreciation on 1998				£100	£100
Annual Depreciation on 1999					£50
Annual Depreciation for Income	£350	£450	£550	£650	£700
Annual Depreciation for Balance	£800	£1,250	£1,800	£2,450	£3,150

The marketing model Objective

The objective of this model is to simulate the marketing environment in which the

company operates. This environment will determine the sales of the company and the sales which are forecast in this model will be imported into other models in the suite. It is therefore of crucial importance that the data and the relationships which obtain *in* this model are correct, as incorrect information springing from this model will corrupt all subsequent models.

The task

Build a marketing model which will forecast the company's sales *volumes* and sales values. The data from this model should be available to be imported into other models when appropriate. This model is set out in **Chapter 7**. Additional Data is given on the following pages.

Setting up the worksheets

Like other models in this suite, this model should be built on three worksheets: Market Inputs, Market Calculations and Market Forecasts. The Market Inputs worksheet contains all the direct entry variables. The Market Calculations worksheet contains intermediate calculations which must be made before the final Market Forecast worksheet can be built.

Change the name of the first worksheet after **Goals Graphs** to **Market Inputs**.

Then change the name of the next worksheet to **Market Calculations**.

The next worksheet should be named **Market Forecasts**

Basic assumptions underlying the model

In the model the core relationships are assumed to be:

$$\text{Sales Value} = \text{Sales Volume} \times \text{Price.}$$

and

$$\text{Sales Volume} = \text{Last Year's Sales Volume} \\ \times \text{Market Growth Rate Factor} \\ \times \text{Inflation Factor} \\ \times \text{Price Factor} \\ \times \text{Promotion Factor} \\ \times \text{Quality Factor} \\ \times \text{Distribution Factor}$$

Thus, this model will compute Sales Value and Sales Volume from the above relationships.

Building the model

There are many more relationships in this model than were in the **GOAL** model.

The relationships can be specified as set out below.

The First Relationship

The **Price Factor** is more complex and has a number of sub-relationships each of which is set out below.

Previous Price Super = Price Super moved 1 column forward as an array.

Change in Price Super = Price Super - Previous price Super, as an array.

Percentage Change in Price Super = Change in Price Super/Previous Price Super, computed as an array.

Price Factor Super = (1 - Percentage Change in Price Super)*Price Elasticity Super, this is computed as an array.

Note: The above relationships should also be used to determine the **factors** for **Premium & Standard**. This note applies also to the following Relationships.

The Second Relationship

The **Promotion Factor** is assumed to be determined by the Promotion Expenditure and the Promotion Elasticity and is shown below.

Previous Promotion Expenditure Super = Promotion Expenditure Super moved 1

column forward as an array.

Promotion Factor Super = Promotion Expenditure Super/Previous Promotion Expenditure Super * Promotion Elasticity Super

This is computed as an array calculation for 1995 to 1999

The Third Relationship

The **Distribution Factor** is assumed to be determined by the Distribution Expenditure and the Distribution Elasticity.

Previous Distribution Expenditure Super = Distribution Expenditure Super moved 1 column forward as an array.

Distribution Factor Super = Distribution Expenditure Super/Previous Distribution Expenditure Super * Distribution Elasticity Super. This is computed as an array calculation for 1995 to 1999

The Fourth Relationship

The **Quality Factor** is assumed to be determined by the Quality Expenditure and the Quality Elasticity and is shown below;-

Previous Quality Expenditure Super = Quality Expenditure Super moved 1 column forward as an array.

Quality Factor Super = Quality Expenditure Super/Previous Quality Expenditure Super * Quality Elasticity Super

This is computed as an array calculation for 1995 to 1999

The Fifth Relationship

The **Market Growth Rate Factor** is determined by the Market Growth Rate and the Market Elasticity and is shown below.

Market Growth Rate Factor Super = (1 + Market Growth Rate Super) * Market Elasticity Super

This is computed as an array calculation for 1995 to 1999.

The Sixth Relationship

The **Inflation Factor** is determined by the Inflation Rate and the Inflation Elasticity as shown below:

Inflation Factor Super = (1 + Inflation Rate) * Inflation Elasticity Super

This is computed as an array calculation for 1995 to 1999.

The Seventh relationship

The **Market Growth Rate Average** is the **Sum** of the three Market Growth Rates **Divided** by 3

Calculate as an array.

The Eighth Relationship

The **Sales Volume** relates all the `marketing factors` together to give a forecast of the sales volume and is set out below;-

1995 Sales Volume Super = 113.77

1996 Sales Volume Super = 1995 Sales Volume Super * (1996 Price Factor Super * 1996 Promotion Factor Super * 1996 Distribution Factor Super * 1996 Quality Factor Super * 1996 Market Growth Rate Factor Super * 1996 Inflation Factor Super)

1997 Sales Volume Super = 1996 Sales Volume Super * (1997 Price Factor Super * 1997 Promotion Factor Super * 1997 Distribution Factor Super * 1997 Quality Factor Super * 1997 Market Growth Rate Factor Super * 1997 Inflation Factor Super)

The rest of this calculation may be computed using the `Autofill` function.

Similar Relationships should be built for Premium & Standard, using the following variables:

1995 Sales Volume Premium = 225.38

1995 Sales Volume Standard = 182.04

Note: The Sales Volumes vary slightly from the book. This is due to the process of rounding figures. The original model ran from earlier years.

The Ninth Relationship

The **Sales Value Super** computes the forecast value of sales for Super and is defined as:

Sales Value Super = Sales Volume Super * Price of Super.

This is computed as an array.

The completed Marketing Calculations worksheet should be as shown in Table 2 below.

The completed Marketing Forecast worksheet should be as shown in Table 3 below.

Using the marketing forecasting model

In order to see the effects of changing your assumptions simply change any of the major influences, i.e. Market Growth Rate, Inflation Rate, Price, Promotion Expenditures, Distribution Expenditures, Quality Expenditures and examine how these changes affect the forecasts.

The Graphs

Build the following four Graphs on one worksheet

Graph name	Graph variables
Distribution	Distribution Expenditure per Pound Super Distribution Expenditure per Pound Premium Distribution Expenditure per Pound Standard
Growth	Market Growth Super Market Growth Premium Market Growth Standard
Promotion	Promotion Expenditure Super Promotion Expenditure Premium Promotion Expenditure Standard
Sales	Sales Value Super Sales Value Premium Sales Value Standard

This completes the **Marketing** Model and you should save it with the above data.

Bacchus Beer Marketing Inputs

	1995	1996	1997	1998	1999
Strategic Decisions					
Price Super	£15	£15	£16	£16	£18
Price Premium	£11	£12	£12	£12	£12
Price Standard	£9	£9	£9	£10	£10
Price Elasticity Super	0.99	0.99	0.99	0.99	0.99
Price Elasticity Premium	0.90	0.90	0.90	0.90	0.90
Price Elasticity Standard	0.95	0.95	0.95	0.95	0.95
Promotion Expenditure Super	£250	£300	£320	£350	£400
Promotion Expenditure Premium	£80	£100	£110	£115	£130
Promotion Expenditure Standard	£55	£70	£80	£85	£120
Promotion Elasticity Super	0.90	0.90	0.90	0.90	0.90
Promotion Elasticity Premium	0.90	0.90	0.90	0.90	0.90
Promotion Elasticity Standard	0.95	0.95	0.95	0.95	0.95
Distribution Expenditure Super	£10	£11	£12	£13	£14
Distribution Expenditure Premium	£12	£13	£14	£15	£16
Distribution Expenditure Standard	£4	£5	£6	£7	£8
Distribution Elasticity Super	0.85	0.85	0.85	0.85	0.85
Distribution Elasticity Premium	0.90	0.90	0.90	0.90	0.90
Distribution Elasticity Standard	0.85	0.85	0.85	0.85	0.85
Quality Expenditure Super	£10	£11	£12	£13	£14
Quality Expenditure Premium	£9	£12	£20	£20	£20
Quality Expenditure Standard	£4	£4	£5	£5	£5
Quality Elasticity Super	1.10	1.10	1.10	1.10	1.10
Quality Elasticity Premium	0.95	0.95	0.95	0.95	0.95
Quality Elasticity Standard	0.95	0.95	0.95	0.95	0.95
Environmental Factors					
Market Growth Rate Super	10%	10%	10%	10%	10%
Market Growth Rate Premium	12%	15%	16%	16%	16%
Market Growth Rate standard	10%	10%	10%	10%	10%
Market Elasticity Super	1.01	1.01	1.01	1.01	1.01
Market Elasticity Premium	1.00	1.00	1.00	1.00	1.00
Market Elasticity Standard	1.00	1.00	1.00	1.00	1.00
Inflation Elasticity Super	0.95	0.95	0.95	0.95	0.95
Inflation Elasticity Premium	1.00	1.00	1.00	1.00	1.00
Inflation Elasticity Standard	1.00	1.00	1.00	1.00	1.00
Inflation Rate	9%	10%	10%	10%	10%
Sales Volume Largest Competitor	150	160	165	180	185
Sales Volume Largest Competitor	300	400	600	700	1000
Sales Volume Largest Competitor	2500	3500	5000	5600	10000

Table 1

Bacchus Beer Marketing Calculations

	1995	1996	1997	1998	1999
STRATEGY DECISIONS					
Price					
Price Super	£15	£15	£16	£16	£18

Previous Price Super	£15	£15	£15	£16	£16
Change in Price Super	£0	£0	£1	£0	£2
Percentage Change in Price	0%	0%	7%	0%	13%
Price Premium	£11	£12	£12	£12	£12
Previous Price Premium	£10	£11	£12	£12	£12
Change in Price Premium	£1	£1	£0	£0	£0
Percentage Change in Price	10%	9%	0%	0%	0%
Price Standard	£9	£9	£9	£10	£10
Previous Price Standard	£8	£9	£9	£9	£10
Change in Price Standard	£1	£0	£0	£1	£0
Percentage Change in Price	13%	0%	0%	11%	0%
Price Elasticity					
Price Elasticity Super	0.99	0.99	0.99	0.99	0.99
Price Elasticity Premium	0.90	0.90	0.90	0.90	0.90
Price Elasticity Standard	0.95	0.95	0.95	0.95	0.95
Price Factor					
Price Factor Super	0.99	0.99	0.97	0.99	0.87
Price Factor Premium	0.81	0.82	0.90	0.90	0.90
Price Factor Standard	0.83	0.95	0.95	0.84	0.95
Promotion Expenditure					
Promotion Expenditure Super	£250	£300	£320	£350	£400
Previous Promotion Expenditure	£220	£250	£300	£320	£350
Promotion Expenditure Premium	£80	£100	£110	£115	£130
Previous Promotion Expenditure	£70	£80	£100	£110	£115
Promotion Expenditure Standard	£55	£70	£80	£85	£120
Previous Promotion Expenditure	£45	£55	£70	£80	£85
Promotion Expenditure Total	£385	£470	£510	£550	£650
Promotion Elasticity					
Promotion Elasticity Super	0.90	0.90	0.90	0.90	0.90
Promotion Elasticity Premium	0.90	0.90	0.90	0.90	0.90
Promotion Elasticity Standard	0.95	0.95	0.95	0.95	0.95
Promotion Factor					
Promotion Factor Super	1.02	1.08	0.96	0.98	1.03
Promotion Factor Premium	1.03	1.13	0.99	0.94	1.02
Promotion Factor Standard	1.16	1.21	1.09	1.01	1.34
Distribution Expenditure					
Distribution Expenditure Super	£10	£11	£12	£13	£14
Previous Distribution Expenditure	£10	£10	£11	£12	£13
Distribution Expenditure Premium	£12	£13	£14	£15	£16
Previous Distribution Expenditure	£11	£12	£13	£14	£15
Distribution Expenditure Standard	£4	£5	£6	£7	£8
Previous Distribution Expenditure	£3	£4	£5	£6	£7
Distribution Expenditure Total	£26	£29	£32	£35	£38
Distribution Elasticity					
Distribution Elasticity Super	0.85	0.85	0.85	0.85	0.85
Distribution Elasticity Premium	0.90	0.90	0.90	0.90	0.90
Distribution Elasticity Standard	0.85	0.85	0.85	0.85	0.85
Distribution Factor					
Distribution Factor Super	0.85	0.94	0.93	0.92	0.92
Distribution Factor Premium	0.98	0.98	0.97	0.96	0.96
Distribution Factor Standard	1.13	1.06	1.02	0.99	0.97

Table 2

Bacchus Beer Marketing Calculations

	1995	1996	1997	1998	1999
Quality Expenditure					
Quality Expenditure Super	£10	£11	£12	£13	£14
Previous Quality Expenditure Super	£10	£10	£11	£12	£13
Quality Expenditure Premium	£9	£12	£20	£20	£20
Previous Quality Expenditure Premium	£7	£9	£12	£20	£20
Quality Expenditure Standard	£4	£4	£5	£5	£5
Previous Quality Expenditure Standard	£4	£4	£4	£5	£5
Quality Expenditure Total	£23	£27	£37	£38	£39
Quality Elasticity					
Quality Elasticity Super	1.10	1.10	1.10	1.10	1.10
Quality Elasticity Premium	0.95	0.95	0.95	0.95	0.95
Quality Elasticity Standard	0.95	0.95	0.95	0.95	0.95
Quality Factor					
Quality Factor Super	1.10	1.21	1.20	1.19	1.18
Quality Factor Premium	1.22	1.27	1.58	0.95	0.95
Quality Factor Standard	0.95	0.95	1.19	0.95	0.95
ENVIRONMENTAL FACTORS					
Market Growth Rate					
Market Growth Rate Super	10%	10%	10%	10%	10%
Market Growth Rate Premium	12%	15%	16%	16%	16%
Market Growth Rate standard	10%	10%	10%	10%	10%
Market Elasticity					
Market Elasticity Super	1.01	1.01	1.01	1.01	1.01
Market Elasticity Premium	1.00	1.00	1.00	1.00	1.00
Market Elasticity Standard	1.00	1.00	1.00	1.00	1.00
Market Growth Rate Factor					
Market Growth Rate Factor Super	1.11	1.11	1.11	1.11	1.11
Market Growth Rate Factor Premium	1.12	1.15	1.16	1.16	1.16
Market Growth Rate Factor Standard	1.10	1.10	1.10	1.10	1.10
Inflation Elasticity					
Inflation Elasticity Super	0.95	0.95	0.95	0.95	0.95
Inflation Elasticity Premium	1.00	1.00	1.00	1.00	1.00
Inflation Elasticity Standard	1.00	1.00	1.00	1.00	1.00
Inflation Rate					
	9%	10%	10%	10%	10%
Inflation Factor					
Inflation Factor Super	1.04	1.05	1.05	1.05	1.05
Inflation Factor Premium	1.09	1.10	1.10	1.10	1.10
Inflation Factor Standard	1.09	1.10	1.10	1.10	1.10
Sales Volume Largest Competitor					
Sales Volume Largest Competitor	150	160	165	180	185
Sales Volume Largest Competitor	300	400	600	700	1000
Sales Volume Largest Competitor	2500	3500	5000	5600	10000
Market Growth Rate Average	11%	12%	12%	12%	12%

Table 2

Bacchus Beer Marketing Forecast

	1995	1996	1997	1998	1999
THE FORECAST SALES					
Sales Value Super	£ 1,707	£ 2,397	£ 2,930	£ 3,637	£ 4,590
Sales Value Premium	£ 2,479	£ 3,889	£ 6,786	£ 6,717	£ 7,157
Sales Value Standard	£ 1,638	£ 2,298	£ 3,474	£ 3,751	£ 5,337
SALES VALUE	£ 5,824	£ 8,584	£ 13,190	£ 14,105	£ 17,084
Sales Volume Super	114	160	183	227	255
Sales Volume Premium	225	324	565	560	596
Sales Volume Standard	182	255	386	375	534
SALES VOLUME	521	739	1135	1162	1385
THE MAJOR INFLUENCES					
Price Super	£ 15	£ 15	£ 16	£ 16	£ 18
Price Premium	£ 11	£ 12	£ 12	£ 12	£ 12
Price Standard	£ 9	£ 9	£ 9	£ 10	£ 10
Promotion Expenditure Super	£ 250	£ 300	£ 320	£ 350	£ 400
Promotion Expenditure Premium	£80	£100	£110	£115	£130
Promotion Expenditure Standard	£ 55	£ 70	£ 80	£ 85	£ 120
Promotion Expenditure Total	£ 385	£ 470	£ 510	£ 550	£ 650
Distribution Expenditure Super	£ 10	£ 11	£ 12	£ 13	£ 14
Distribution Expenditure Premium	£ 12	£ 13	£ 14	£ 15	£ 16
Distribution Expenditure Standard	£ 4	£ 5	£ 6	£ 7	£ 8
Distribution Expenditure Total	£ 26	£ 29	£ 32	£ 35	£ 38
Quality Expenditure Super	£ 10	£ 11	£ 12	£ 13	£ 14
Quality Expenditure Premium	£ 9	£ 12	£ 20	£ 20	£ 20
Quality Expenditure Standard	£ 4	£ 4	£ 5	£ 5	£ 5
Quality Expenditure Total	£ 23	£ 27	£ 37	£ 38	£ 39
Market Growth Rate Super	10%	10%	10%	10%	10%
Market Growth Rate Premium	12%	15%	16%	16%	16%
Market Growth Rate standard	10%	10%	10%	10%	10%
Inflation Rate	9%	10%	10%	10%	10%

Table 3
The product market portfolio
Objective

The objective of this model is to convert conventional marketing data, contained in the marketing model, into product market portfolios for the years 1995 to 1999. The computed figures for these portfolios are shown in Table 2

The task

Build a model which will model the product market portfolios. This model cannot draw product market portfolios, but it can compute the key elements necessary to draw portfolios.

Setting up the worksheets

This model should be built on two worksheets: PMP Calculations worksheet and Product Market Portfolio. The PMP Calculations Worksheet contains intermediate calculations which must be made before the final Product Market Portfolio worksheet can be built.

Data to be imported from the marketing calculations worksheet

The following are pasted into the PMP Calculations worksheet as a special link from the Marketing Calculations worksheet.

Sales Volume Super

Sales Volume Premium

Sales Volume Standard

Sales Volume Largest Competitor Super

Sales Volume Largest Competitor Premium

Sales Volume Largest Competitor Standard

Market Growth Rate Super

Market Growth Rate Premium

Market Growth Rate Standard

Sales Value Super

Sales Value Premium

Sales Value Standard

In the model most of the core relationships are worked computed on the PMP Calculations worksheet as shown below

The First Relationship

Unscaled Radius for Super

This is computed using the formula based on the Square Root of (Sales Value Premium * 0.318181818) The formula is:-

Unscaled Radius for Premium + SQRT(Sales Value Premium * 0.318181818)

Compute this for the first year and then use the handle function for subsequent years.

This procedure may be used to calculate the Unscaled Radius for Super and for Standard.

The Second Relationship

Smallest Circle

This is a Constant and is calculated as the smallest Unscaled Radius for the three Variables.

The Formula is :_

Smallest Circle = MIN(Unscaled Radius for Premium, Super & Standard) over the block of cells.

The Third Relationship

Circle Radius for Super

This a calculation based on : Unscaled Radius for Super **divided by** Smallest Circle.

Calculate this for the first year remembering that the Smallest Circle should be entered as an absolute cell reference.

Compute this for the first year and then use the handle function for subsequent years. Similar calculations may be carried out for Premium and Standard.

These Variables may now be **pasted as special links** to the Product Market Portfolio worksheet.

The Next Variables on the Product Market Portfolio

Market Growth Rate

Market Growth Rates for Premium, Super & Standard may now be **pasted as special links** from the PMP Calculations worksheet.

The Only Relationship on the PMP Calculations worksheet

RMS

RMS for Super is calculated by **dividing** Sales Volume Super **by** Sales Volume Largest Competitor Super.

Compute this for the first year and then use the handle function for subsequent years. Similar relationships may be built for Premium and Standard.

This completes the Product Market Portfolio Model and you should save it with the above data.

Bacchus Beer Product Market Portfolio Calculations

	1995	1996	1997	1998	1999
Unscaled Radius for Super	23.302	27.615	30.531	34.019	38.215
Unscaled Radius for Premium	28.086	35.178	46.465	46.229	47.720
Unscaled Radius for Standard	22.832	27.043	33.249	34.547	41.207
Smallest Circle	22.832				
Circle Radius for Super	1.02	1.21	1.34	1.49	1.67
Circle Radius for Premium	1.23	1.54	2.04	2.02	2.09
Circle Radius for Standard	1.00	1.18	1.46	1.51	1.80

Table 1

Sales Volume Super	114	160	183	227	255
Sales Volume Premium	225	324	565	560	596
Sales Volume Standard	182	255	386	375	534
Sales Volume Largest Competitor Super	150	160	165	180	185
Sales Volume Largest Competitor Premium	300	400	600	700	1000
Sales Volume Largest Competitor Standard	2500	3500	5000	5600	10000
Market Growth Rate Super	10%	10%	10%	10%	10%
Market Growth Rate Premium	12%	15%	16%	16%	16%
Market Growth Rate Standard	10%	10%	10%	10%	10%
Sales Value Super	£1,706.55	£2,396.65	£2,929.52	£3,637.13	£4,589.86
Sales Value Premium	£2,479.18	£3,889.17	£6,785.54	£6,716.68	£7,156.99
Sales Value Standard	£1,638.36	£2,298.42	£3,474.47	£3,750.97	£5,336.71
RMS Super	0.76	1.00	1.11	1.26	1.38
RMS Premium	0.75	0.81	0.94	0.80	0.60
RMS Standard	0.07	0.07	0.08	0.07	0.05

Table 1

Bacchus Beer Product Market Portfolio

	1995	1996	1997	1998	1999
Circle Radius for Super	1.02	1.21	1.34	1.49	1.67
Circle Radius for Premium	1.23	1.54	2.04	2.02	2.09
Circle Radius for Standard	1.00	1.18	1.46	1.51	1.80
Market Growth Rate Premium	12%	15%	16%	16%	16%
Market Growth Rate Super	10%	10%	10%	10%	10%
Market Growth Rate Standard	10%	10%	10%	10%	10%
R.M.S. FOR Premium	0.75	0.81	0.94	0.80	0.60
Super	0.76	1.00	1.11	1.26	1.38
Standard	0.07	0.07	0.08	0.07	0.05

Table 2.

The income statement model

Objective

The objective of this model is to generate an income statement for the company as shown in Table 3 below. It will do this by importing data from the Marketing and the Goals worksheets.

The task

Build a model which will set out an income statement for the company.

Setting up the worksheets

This model should be built on three worksheets- Income Statement Calculations, Income Statements and Consolidated Income Statement. The Income Statements Worksheets are then consolidated on the Consolidated Income Statement Worksheet. Change the name of the first worksheet after Market Forecasts or PMP Worksheet to

Income Statement Calculations

Then change the name of the next worksheet to **Income Statements**.

The Worksheet after that should be named **Consolidated Income Worksheet**.

The Income Statement Calculations Worksheets

These are shown in Tables 1 and 2 below.

Basic assumptions underlying the model

In the model most of the core relationships are worked computed on the Income Statement Calculations worksheet as shown below.

The First Relationship: on the Income Statement Calculations Worksheet

The Cost of Sales

This is really a number of relationships which when taken together will compute the Cost of Sales. Each of these sub-relationships is set out below.

The First Variable required is:-

Cost Factor Super = 0.6. This assumes that the cost of manufacturing is 0.6 of the Sales Value.

Cost Factor Super should be entered on the worksheet at 0.6 for each year.

The next variable needed is the Sales Value Super.

Sales Value Super is imported from the **Marketing** model by being **pasted** in as a **special link**.

The First Sub Relationships are:-

Sales of Super at Cost = Sales Value Super * Cost Factor Super, for all years.

Calculate for the first year and then use the handle function.

Next Sales of Super at Cost = Sales of Super at Cost moved one column backwards.

Calculate for the first year and then use the handle function.

Purchases Super = Sales of Super at Cost + 0.3 * Next Sales of Super at Cost for all years- . Calculate for the first year and then use the handle function.

1995 Opening Stock Super = £589 in 1995

1996 Opening Stock Super = 1995 Closing Stock Super

1997 Opening Stock Super = 1996 Closing Stock Super Etc.

Closing Stock Super = Opening Stock Super + Purchases Super - Sales of Super at Cost, for all years. . Calculate for the first year and then use the handle function.

The Next Variable required is:-

Annual Depreciation Super for the Income Statement, this is imported from the **Goals** model by being **pasted** in as a **special link**.

Direct Labour Super = Sales Value Super* 0. 1, for every year.

The Cost of Sales Super can now be entered. Calculate for the first year and then use the handle function.

Cost of Sales Super = (Opening Stock Super + Purchases Super - Closing Stock Super +Annual Depreciation Super) + Direct Labour Super

Sales Super and Cost of Sales Super can now be **pasted** from the Income Statement Calculations worksheet as a **special link** into the Income Statements worksheet.

Another variable which is required is R. & D. this may be entered as:-

R. & D. Super = £30 for all years

The Second Relationship

Gross Profit

Gross Profit Super=Sales Value Super-Cost of Sales Super, for all years. . Calculate for the first year and then use the handle function.

Inflation Rate can now be **pasted** as a **special link** between Inflation Rate in the Marketing worksheet and the Income Statement Calculation worksheet.

Interest Rate = Inflation Rate * 1.2, for all years. Calculate for the first year and then use the handle function.

Mkting Selling and Distn

Mkting Selling and Distn Super can now be **pasted** as a **special link** between Promotion Expenditure Super in the Marketing worksheet and the Income Statement worksheet

The Third Fourth and Fifth Relationships are on the Income Statements Worksheet, as shown in Table 2 below.

Admin Expenses

Admin Expenses Super = 20 +R. & D. Super + Sales Value Super * 0. 15, for all years. . Calculate for the first year and then use the handle function.

Net Profit before Interest and Tax

Net Profit before Interest and tax Super = Gross Profit Super - (Mkting Selling and Distn Super + Admin Expenses Super), for all years. Calculate for the first year and then

use the handle function.

Interest Payable

To compute Interest Payable Super

Debentures can be **pasted** as a **special link** between Debentures in the Goal worksheet and the Income Statement Calculations worksheet.

Interest Payable = Debentures * Interest Rate, for all years. Calculate for the first year and then use the handle function.

The Remaining Relationships on the Income Statements Worksheet

Net Profit Before Tax

Net Profit Before Tax Super = Net Profit before Interest and Tax Super + interest Payable Super, for all years. Calculate for the first year and then use the handle function.

In order to calculate the Tax Payable and the Dividend Payable you need two additional pieces of data which are:

Tax Rate is assumed to be 35%. This should be entered at the bottom of the Income Statement Calculations worksheet.

Dividend Rate is assumed to be 50%- This should be entered at the bottom of the Income Statement Calculations worksheet.

Tax

This is really two relationships which when taken together will compute Net Profit After Tax.

Each of the relationships is set out below.

Tax Super = IF(Net Profit before Tax Super > 0, Net Profit Before Tax Super * Tax Rate * (-1), 0) for all years.

Calculate for the first year and then use the handle function. Do not use Function Wizard

Net Profit After Tax

Net Profit After Tax Super = Net Profit before Tax Super + Tax Super

Dividend Payable

Dividend Payable Super = IF(Net Profit After Tax Super > 0, Net Profit After Tax Super * Dividend Rate, 0) for all years. Calculate for the first year and then use the handle function.

Do not use Function Wizard.

Unappropriated Profit

Unappropriated Profit Super = (Net Profit After Tax Super - Dividend Payable Super), for all years. Calculate for the first year and then use the handle function.

Retained Earnings

1995 Retained Earnings Super = Unappropriated Earnings Super - £258 for 1995.

1996 Retained Earnings Super = 1996 Unappropriated Earnings Super + 1995 Retained Earnings Super

The Remaining Years may be calculated using the **'Autofill'** function.

Premium & Standard.

Similar relationships to those you have just built, must now be built for Premium & Standard Income Statements. The only variations are as follows;-

1995 Opening Stock Premium = £1038

Purchases of Premium = Sales of Premium at cost + 0.4*Next Sales of Premium at cost for all years.

Cost Factor Premium = 0.6 for all years.

Direct Labour Premium = Sales Value Premium * 0.05 for all years

R. & D. Premium = £20 for all years.

Admin Expenses Premium = 20+R. & D. Premium + Sales Value Premium * 0.1.

1995 Retained Earnings Premium = 1995 Unappropriated Profits + £99.

1995 Opening Stock Standard = £702.

Purchases Standard = Sales of Standard at cost + 0.5*Next Sales of Standard at cost
for all years

Cost Factor Standard = 0.5 *for all years*.

Direct Labour Standard = Sales Value Standard * 0.1 *for all years*.

R. & D. Standard = £15 *for all years*.

Admin Expenses Standard = 45 + R. & D. Standard + Sales Value Standard * 0.05.

1995 Retained Earnings Standard = 1995 Unappropriated Profits + £93.

Consolidated income statement

Having built the Income Statement Calculations Worksheet and the Income Statements Worksheets (showing individual income statements for Super. Premium and Standard) a Consolidated Income Statement should now be built. This is shown in Table 3 below.

Graphs

Various graphs illustrating the Model should now be built, e.g.:-

Graph names

Graph variables.

Sales

Sales
Cost of Sales

Breakdown of Costs

Direct Labour
Admin
Mkting selling & Distn

Profits & Dividends

Net Profit before Interest & Tax
Net Profit before Tax
Net Profit after Tax
Dividend Payable

This completes the **Income Statement Model** and you should now save it.

Bacchus Beer Income Statement Calculations

	1995	1996	1997	1998	1999
SUPER					
Cost Factor Super	0.6	0.6	0.6	0.6	0.6
Sales Value Super	£1 707	£2 397	£2 930	£3 637	£4 590
Sales of Super at Cost	£1 024	£1 438	£1 758	£2 182	£2 754
Next Sales of Super at Cost	£1 438	£1 758	£2 182	£2 754	#N/A
Purchases of Super	£1 455	£1 965	£2 412	£3 008	#N/A
Opening Stock Super	£589	£1 020	£1 548	£2 202	£3 029
Closing Stock Super	£1 020	£1 548	£2 202	£3 029	#N/A
Annual Depreciation Super	£117	£150	£183	£217	£233
Direct Labour Super	£171	£240	£293	£364	£459
R & D Super	£30	£30	£30	£30	£30
Cost of Sales Super	£1 311	£1 828	£2 234	£2 763	#N/A
Gross Profit Super	£395	£569	£696	£874	#N/A
PREMIUM					
Cost Factor Premium	0.6	0.6	0.6	0.6	0.6
Sales Value Premium	£2 479	£3 889	£6 786	£6 717	£7 157
Sales of Premium at Cost	£1 488	£2 333	£4 071	£4 030	£4 294
Next Sales of Premium at Cost	£2 333	£4 071	£4 030	£4 294	#N/A
Purchases of Premium	£2 421	£3 962	£5 683	£5 748	#N/A
Opening Stock Premium	£1 038	£1 971	£3 600	£5 212	£6 930
Closing Stock Premium	£1 971	£3 600	£5 212	£6 930	#N/A
Annual Depreciation Premium	£117	£150	£183	£217	£233
Direct Labour Premium	£124	£194	£339	£336	£358
R & D Premium	£20	£20	£20	£20	£20
Cost of Sales Premium	£1 728	£2 678	£4 594	£4 583	#N/A
Gross Profit Premium	£751	£1 211	£2 192	£2 134	#N/A
STANDARD					
Cost Factor Standard	0.5	0.5	0.5	0.5	0.5
Sales Value Standard	£1 638	£2 298	£3 474	£3 751	£5 337
Sales of Standard at Cost	£819	£1 149	£1 737	£1 875	£2 668
Next Sales of Standard at Cost	£1 149	£1 737	£1 875	£2 668	#N/A
Purchases of Standard	£1 394	£2 018	£2 675	£3 210	#N/A
Opening Stock Standard	£702	£1 277	£2 145	£3 083	£4 417
Closing Stock Standard	£1 277	£2 145	£3 083	£4 417	#N/A
Annual Depreciation Standard	£117	£150	£183	£217	£233
Direct Labour Standard	£164	£230	£347	£375	£534
R & D Standard	£15	£15	£15	£15	£15
Cost of Sales Standard	£1 100	£1 529	£2 268	£2 467	#N/A
Gross Profit Standard	£539	£769	£1 206	£1 284	#N/A
Debentures	£1 500	£2 000	£2 500	£3 000	£3 500
Inflation Rate	9%	10%	10%	10%	10%
Interest Rate	11%	12%	12%	12%	12%
Tax Rate	35%	35%	35%	35%	35%
Dividend Rate	50%	50%	50%	50%	50%

Table 1

Bacchus Beer Income Statements

	1995	1996	1997	1998	1999
SUPER					
Sales Value Super	£1 707	£2 397	£2 930	£3 637	£4 590
Cost of Sales Super	£1 311	£1 828	£2 234	£2 763	#N/A

Gross Profit Super	£395	£569	£696	£874	#N/A
LESS					
Mktina Sellina & Distn Super	£250	£300	£320	£350	£400
Admin Expenses Super	£306	£409	£489	£596	£738
Net Profit before Interest & Tax	-£161	-£141	-£114	-£71	#N/A
Interest Pavable Super	-£54	-£80	-£100	-£120	-£140
Net Profit before Tax Super	-£215	-£221	-£214	-£191	#N/A
Tax Super	£0	£0	£0	£0	#N/A
Net Profit After Tax Super	-£215	-£221	-£214	-£191	#N/A
Dividend Pavable Super	£0	£0	£0	£0	#N/A
Unappropriated Profit Super	-£215	-£221	-£214	-£191	#N/A
Retained Earnings Super	-£473	-£693	-£907	-£1,098	#N/A
PREMIUM					
Sales Value Premium	£2,479	£3,889	£6,786	£6,717	£7,157
Cost of Sales Premium	£1,728	£2,678	£4,594	£4,583	#N/A
Gross Profit Premium	£751	£1,211	£2,192	£2,134	#N/A
LESS					
Mktina Sellina & Distn Premium	£80	£100	£110	£115	£130
Admin Expenses Premium	£288	£429	£719	£712	£756
Net Profit before Interest & Tax	£383	£682	£1,363	£1,308	#N/A
Interest Pavable Premium	-£54	-£80	-£100	-£120	-£140
Net Profit before Tax Premium	£329	£602	£1,263	£1,188	#N/A
Tax Premium	-£115	-£211	-£442	-£416	#N/A
Net Profit After Tax Premium	£214	£391	£821	£772	#N/A
Dividend Pavable Premium	£107	£196	£410	£386	#N/A
Unappropriated Profit Premium	£107	£196	£410	£386	#N/A
Retained Earnings Premium	£206	£402	£812	£1,198	#N/A
STANDARD					
Sales Value Standard	£1,638	£2,298	£3,474	£3,751	£5,337
Cost of Sales Standard	£1,100	£1,529	£2,268	£2,467	#N/A
Gross Profit Standard	£539	£769	£1,206	£1,284	#N/A
LESS					
Mktina Sellina & Distn Standard	£55	£70	£80	£85	£120
Admin Expenses Standard	£142	£175	£234	£248	£327
Net Profit before Interest & Tax	£342	£524	£893	£951	#N/A
Interest Pavable Standard	-£54	-£80	-£100	-£120	-£140
Net Profit before Tax Standard	£288	£444	£793	£831	#N/A
Tax Standard	-£101	-£156	-£277	-£291	#N/A
Net Profit After Tax Standard	£187	£289	£515	£540	#N/A
Dividend Pavable Standard	£94	£144	£258	£270	#N/A
Unappropriated Profit Standard	£94	£144	£258	£270	#N/A
Retained Earnings Standard	£187	£331	£589	£859	#N/A

Bacchus Beer Consolidated Income Statement

	1995	1996	1997	1998	1999
Sales	£ 5,824	£ 8,584	£ 13,190	£ 14,105	£ 17,084
Cost of Sales	£ 4,139	£ 6,035	£ 9,096	£ 9,812	#N/A

Gross Profit	£	1,685	£	2,550	£	4,094	£	4,292	#N/A
LESS									
Mkting Selling & Distn	£	385	£	470	£	510	£	550	£ 650
Admin Expenses	£	736	£	1,013	£	1,442	£	1,555	£ 1,821
Net Profit before Interest & Tax	£	564	£	1,066	£	2,142	£	2,188	#N/A
Interest Payable	-£	162	-£	240	-£	300	-£	360	-£ 420
Net Profit before Tax	£	402	£	826	£	1,842	£	1,828	#N/A
Tax Payable	-£	141	-£	289	-£	645	-£	640	#N/A
Net Profit After Tax	£	261	£	537	£	1,197	£	1,188	#N/A
Dividend Payable	£	131	£	269	£	599	£	594	#N/A
Unappropriated Profit	£	131	£	269	£	599	£	594	#N/A
Retained Earnings	£	239	£	507	£	1,106	£	1,700	#N/A
Tax Rate		35%		35%		35%		35%	35%
Dividend Rate		50%		50%		50%		50%	50%

Table 3

The cash flow model

Objective

The objective of this model is to generate a Cash Flow statement for the company. It will do this by Importing data from the Goal, Marketing and Income Statement worksheets.

The task

Build a model which will set out a Cash Flow statement for the company.

Setting up the worksheets

This model should be built on two worksheets- Cash Flow Calculations and Cash Flow.

The Cash Flow Calculations worksheet contains intermediate calculations which must be made before the final Cash Flow Statement worksheet can be built.

Change the name of the first worksheet after Consolidated Income Statement to **Cash Flow Calculations**.

Then change the name of the next worksheet to **Cash flow**.

The cash flow worksheets

These are shown in Tables 1 and 2 below.

Basic assumptions underlying the model

In the model most of the core relationships are worked computed on the Cash Flow Calculations worksheet as shown below.

The First Relationship on the Cash Flow Calculations Worksheet

Sales Receipts

This is really a number of relationships which when taken together will compute the Sales Receipts. Each of these sub-relationships is set out below.

Sales

This is **pasted** as a **special link** between Sales in the Consolidated Income Statement and the Cash Flow Calculations worksheet

From this variable the Sales Receipts for each year can be calculated- It is assumed that the Sales Receipts, i.e. the cash flowing from Sales in any year are 80% of the

Sales in that year. Thus:

Initials Receipts = Sales * 0.8. *Calculate for the first year and then use the handle function.*

Receipts Carried Forward = Sales *0.2, moved one column forward as an array **but £917 in 1995.**

Sales Receipts = Initial Receipts + Receipts Carried Forward, calculate as an array
Sales Receipts are **pasted** as a **special link** to the Cash Flow worksheet.

The Second Relationship on the Cash Flow Calculations Worksheet

Debtors

Calculate for the first year and then use the handle function.

Debtors = Sales - Initial Receipts

The Third Relationship in the Cash Flow Calculations worksheet

Payments to Creditors

This is a series of relationships which are set out below.

Purchases is **pasted** as a **special link** between the Income Statement Calculations worksheet and the Cash Flow Calculations worksheet, using Purchases Super + Purchases Premium + Purchases Standard.

It is assumed that 70% of the Payments to Creditors are made in the year in which they occur. Therefore

Payments = Purchases * 0.7 *Calculate for the first year and then use the handle function.* Payments carryover = Purchases * 0.3 moved one column forward as an array **but £1183 for 1995.**

Payments to Creditors = Payments + Payments carryover *Calculate for the first year and then use the handle function.*

Payments to Creditors is **pasted** as a **special link** into the Cash Flow worksheet.

The Fourth Relationship on the Cash Flow Calculations worksheet

Interest Paid

This is a function of Interest Payable

Interest Payable is **pasted** as a **special link** from the Consolidated Income Statement worksheet. into the Cash Flow Calculations worksheet

Then Interest Paid is calculated as follows-

Interest Paid = Interest Payable * -1 for all years- *Calculate for the first year and then use the handle function.*

Interest Paid is **pasted** as a **special link** into the Cash Flow worksheet.

The Fifth Relationship on the Cash Flow Calculations worksheet

Dividend Paid is a series of relationships as set out below.

Dividend Payable is **pasted** as a **special link** from the Consolidated Income Statement worksheet into the Cash Flow Calculations worksheet.

It is assumed that 50% of the Dividend Payable will be paid in the current year. Thus:

This Years Element = Dividend Payable*0.5, for all years. Calculate as an array.

Previous Years Element = This Years Element moved forward one year, for all years, **but £45 for 1995.** *Calculate for the first year and then use the handle function.*

Dividend Paid = This Years Element + Previous Years Element, for all years *Calculate for the first year and then use the handle function.*

Dividend Paid is then **pasted** as a **special link** into the Cash Flow worksheet-

The Sixth Relationship on the Cash Flow Calculations worksheet

Tax Paid

Tax Payable is **pasted** as a **special link** from the Consolidated Income Statement worksheet into the Cash Flow Calculations worksheet.

Tax Paid = Tax Payable *1 and moved one year ahead, for all years. *Calculate for the*

first year and then use the handle function, but £96 for 1995.

Tax Paid is then **pasted** as a **special link** into the Cash Flow worksheet.

The Seventh Relationship on the Cash Flow Calculations Worksheet

Creditors

This is a number of relationships which when taken together will compute the variable Creditors.

1995 RSUM Purchases = 1995 Purchases.

1996 RSUM Purchases = 1995 RSUM Purchases + 1996 Purchases. The remaining years may be calculated using the "Autofill" function.

1995 RSUM Payments = 1995 Payments to Creditors

1996 RSUM Payments = 1995 RSUM Payments + 1996 Payments to Creditors.

The remaining years may be calculated using the "Autofill" function

Creditors = 1995 Carryover + (RSUM Purchases - RSUM Payments).

Note: 1995 Carryover is absolute.

The First Relationship in the Cash Flow worksheet

Direct Labour

This is **pasted** as a **special link** between the Income Calculations worksheet and the Cash Flow worksheet, using Direct Labour Super + Direct Labour Premium + Direct Labour Standard.

*The following Variables are all **pasted** as **special links** from different models.*

Mkting Selling and Distn is **pasted** as a **special link** from the Consolidated Income Statement worksheet into the Cash Flow worksheet.

Admin Expenses is **pasted** as a **special link** from the Income Statement worksheet into the Cash Flow worksheet.

Share Issues

This is **pasted** as a **special link** from the Goals worksheet into the Cash Flow worksheet.

Debenture issues

This is **pasted** as a **special link** from the Goals worksheet into the Cash Flow worksheet.

Additions

Additions is **pasted** as a **special link** from the Goals worksheet into the Cash Flow worksheet, using the following formula:-

*Additions = Additions *-I, for all years. Calculate for the first year and then use the handle function. The Second Relationship on the Cash Flow worksheet*

Net Short Term Cash Flows = Sales Receipts -(Direct Labour + Payments to Creditors + Mkting Selling and Distn + Admin Expenses + Interest Paid + Dividend Paid + Tax Paid), *for all years. Calculate for the first year and then use the handle function.*

The Final Relationships on the Cash Flow worksheet

Net Cash Flow = Net Short Term Cash Flows +(Share Issues+Debenture Issues + Additions), *for all years. Calculate for the first year and then use the handle function.*

Cumulative Cash Flow = Rolling Sum of Net Cash Flow.

1995 Cumulative Cash Flow = £2264 + 1995 Net Cash Flow

1996 Cumulative Cash Flow = 1995 Cumulative Cash Flow + 1996 Net Cash Flow

Now use the "Autofill" function.

Graphs

Various Graphs illustrating the Model should now be built e.g.

Graph names

Cash Flows

Graph variables

Net Cash Flow

Cumulative Cash Flow

Cash Out Flows

Payments to Creditors

Direct Labour

Mkting, Selling & Distn

Admin Expenses

Interest Paid

Tax Paid

This completes the Cash Flow model and you should save it with the above data.

Bacchus Beer Cash Flow Calculations

	1995	1996	1997	1998	1999
Sales	£5,824	£8,584	£13,190	£14,105	£17,084
Initial Receipts	£4,659	£6,867	£10,552	£11,284	£13,667
Receipts carried Forward	£917	£1,165	£1,717	£2,638	£2,821
Sales Receipts	£5,576	£8,032	£12,268	£13,922	£16,488
Debtors	£1,165	£1,717	£2,638	£2,821	£3,417
Purchases	£5,270	£7,945	£10,771	£11,966	#N/A
Payments	£3,689	£5,562	£7,539	£8,376	#N/A
Payments Carryover	£1,183	£1,581	£2,384	£3,231	£3,590
Payments to Creditors	£4,872	£7,143	£9,923	£11,607	#N/A
Interest Payable	-£162	-£240	-£300	-£360	-£420
Interest Paid	£162	£240	£300	£360	£420
Dividend Payable	£131	£269	£599	£594	#N/A
This Year Element	£65	£134	£299	£297	#N/A
Previous Years element	£45	£65	£134	£299	£297
Dividend Paid	£110	£200	£434	£596	#N/A
Tax Payable	-£141	-£289	-£645	-£640	#N/A
Tax Paid	£96	£141	£289	£645	£640
RSUM Purchases	£5,270	£13,215	£23,986	£35,952	#N/A
RSUM Payments	£4,872	£12,015	£21,938	£33,545	#N/A
Creditors	£1,581	£2,384	£3,231	£3,590	#N/A

Table 1

Bacchus Beer Cash Flow

	1995	1996	1997	1998	1999
SHORT-TERM CASH INFLOWS					
Sales Receipts	£5,576	£8,032	£12,268	£13,922	£16,488
SHORT-TERM CASH OUTFLOWS					
Direct Labour	£458	£664	£980	£1,075	£1,351
Payments to Creditors	£4,872	£7,143	£9,923	£11,607	#N/A
Mkting Selling & Distn	£385	£470	£510	£550	£650
Admin Expenses	£736	£1,013	£1,442	£1,555	£1,821
Interest Paid	£162	£240	£300	£360	£420
Dividend Paid	£110	£200	£434	£596	#N/A
Tax Paid	£96	£141	£289	£645	£640
Net Short-Term Cash flows	-£1,243	-£1,838	-£1,609	-£2,466	#N/A
OTHER ITEMS					
Share Issues	£300	£300	£300	£300	£300
Debenture Issues	£500	£500	£500	£500	£500
Additions	-£1,000	-£1,000	-£1,000	-£1,000	-£500
Net Cash Flow	-£1,443	-£2,038	-£1,809	-£2,666	#N/A
Cumulative Cash Flow	-£3,707	-£5,745	-£7,554	-£10,220	#N/A

Table 2

The balance sheet model

Objective

The objective of this model is to generate a balance sheet for the company as shown in Table 2 below. It will do this by importing data from the Goals, Marketing Income Statement and Cash Flow worksheets.

The task

Build a model which will set out a balance sheet for the company.

Setting up the worksheets

This model should be built on two worksheets: Balance Sheet Calculations and the Balance Sheet. The Balance Sheet Calculations contains intermediate calculations which must be made before the final Balance Sheet worksheet can be built.

Change the name of the first worksheet after Cash flow worksheet to **Balance Sheet Calculations**.

Then change the name of the next worksheet to **Balance Sheet**.

The balance sheet worksheets

These are shown in Tables 1 and 2 below.

Basic assumptions underlying the model

In the model most of the core relationships are worked computed on the Balance Sheet Calculations worksheet as shown below.

The First Variable on the Balance Sheet Calculations Worksheet

Cumulative Cash Flow

Cumulative Cash Flow: this is **pasted** as a **special link** from the Cash Flow worksheet.

The First Two Relationships on the Balance Sheet Calculations Worksheet

Bank = IF(Cumulative Cash Flow>0,Cumulative Cash Flow, 0). *Calculate for the first year and then use the handle function.* Do not use the Function Wizard.

This is **pasted** as a **special link** into the Balance Sheet Worksheet.

(It is convenient to work out overdraft' at this stage.)

Overdraft = IF(Cumulative Cash Flow<0,ABS (Cumulative Cash Flow), 0),calculate as an array. Overdraft is pasted as a special link between the Balance Sheet calculations Worksheet and the Balance Sheet Worksheet.

The Next Relationships on the Balance Sheet Calculations Worksheet

Dividends Payable

This is computed from a number of sub relationships on the Balance Sheet Calculations Worksheet.

Dividend Payable is pasted as a special link from the Consolidated Income Statement to the Balance Sheet Calculations worksheet.

1995 RSUM Dividend Payable = £108 + 1995 Dividend Payable

1996 RSUM Dividend Payable = 1995 RSUM Dividend Payable + 1996 Dividend Payable.

Calculate the remaining years using the "Autofill" function.

Dividend Paid

This is **pasted** as a special link from the Cash Flow Worksheet.

1995 RSUM Dividend Paid = £63 + 1995 Dividend Paid

1996 RSUM Dividend Paid = 1995 RSUM Dividend Paid + 1996 Dividend Paid.

Calculate the remaining years using the "Autofill" function

Dividends Payable = RSUM Dividend Payable - RSUM Dividend Paid, *for all years.*

Calculate for the first year and then use the handle function.

Dividends Payable is **pasted** as a **special link** between the Balance Sheet Calculations Worksheet and the Balance Sheet Worksheet.

The remaining relationships on the Balance Sheet Calculations worksheet are all imported from the **goals** worksheet :-

Additions

Share issues

Debenture issues

The First Variables on the Balance Sheet Worksheet

Fixed Assets

This is **pasted** as a **special link** from the Goals worksheet.

Accumulated Depreciation

This is **pasted** as a **special link** from the Goals worksheet.

The First Relationship on the Balance Sheet Worksheet

Total Fixed Assets

Total Fixed Assets = Fixed Assets + Accumulated Depreciation, *for all years.*

Calculate for the first year and then use the handle function.

Closing Stock

This is **pasted** as a **special link** from the Income Statement Calculations worksheet, using Closing Stock Super + Closing Stock Premium + Closing Stock Standard for all years. *Calculate for the first year and then use the handle function.*

The Next variables

Debtors

This is **pasted** as a **special link** from the Cash Flow Calculations worksheet

Bank

This **pasted** as a **special link** from the Balance Sheet Calculations worksheet,

The Third Relationships on the Balance Sheet Worksheet

Total Current Assets = Closing Stock + Debtors + Bank

Creditors

Creditors is **pasted** as a **special link** between the Cash Flow Calculations Worksheet and the Balance Sheet Worksheet

Overdraft & Dividends Payable are **pasted** as **special links** from the Balance Sheet Calculations worksheet.

Tax Payable is **pasted** as a **special link** from the Cash Flow calculations worksheet and **multiplied by -1**.

The Fourth, Fifth & Sixth Relationships on the Balance Sheet Worksheet.

Total Current Liabilities = Creditors + Overdraft + Tax Payable + Dividends Payable, use the Sum Wizard.

Net Current Assets = Total Current Assets - Total Current Liabilities, *for all years*

Calculate for the first year and then use the handle function.

Total Net Assets

Total Net Assets = Total Fixed Assets + Net Current Assets. *Calculate for the first year and then use the handle function.*

The Final variables

Share Capital

Share Capital is imported as *Share Level* from the Goals Worksheet for all years.

Retained Earnings

Retained Earnings is pasted as a special link between the Consolidated Income Statement Worksheet and the Balance Sheet Worksheet.

Long Term Liabilities

Long Term Liabilities is imported as Debentures from the Goals Worksheet.

The Final relationships on the Balance Sheet Worksheets

Capital Employed

Capital Employed = Share Capital + Retained Earnings + Long Term Liabilities, *for all years. Calculate for the first year and then use the handle function.*

Difference

Difference = ABS(Capital Employed - total Net Assets), *for all years. Calculate for the first year and then use the handle function.*

Gaphs

Various Graphs should be built to illustrate the Model, e.g.

Assets & Depreciation,

Debtors & Creditors

This completes the Balance Sheet model and you should save it with the above data.

Bacchus Beer Balance Sheet Calculations

	1995	1996	1997	1998	1999
Cumulative Cash Flow	-£3,707	-£5,745	-£7,554	-£10,220	#N/A
Bank	£0	£0	£0	£0	#N/A
Overdraft	£3,707	£5,745	£7,554	£10,220	#N/A
Dividend Payable	£131	£269	£599	£594	#N/A
RSUM Dividend Payable	£239	£507	£1,106	£1,700	#N/A
Dividend Paid	£110	£200	£434	£596	#N/A
RSUM Dividend Paid	£173	£373	£807	£1,403	#N/A
Dividends Payable	£65	£134	£299	£297	#N/A
Additions	£1,000	£1,000	£1,000	£1,000	£500
Share Issues	£300	£300	£300	£300	£300
Debenture Issues	£500	£500	£500	£500	£500

Table 1

Bacchus Beer Balance Sheet

	1995	1996	1997	1998	1999
Fixed Assets	£3.500	£4.500	£5.500	£6.500	£7.000
Accumulated	£800	£1.250	£1.800	£2.450	£3.150
Total Fixed Assets	£2.700	£3.250	£3.700	£4.050	£3.850
Closing Stock	£4.268	£7.293	£10.497	£14.375	#N/A
Debtors	£1.165	£1.717	£2.638	£2.821	£3.417
Bank	£0	£0	£0	£0	#N/A
Total current Assets	£5.433	£9.010	£13.135	£17.196	#N/A
Creditors	£1.581	£2.384	£3.231	£3.590	#N/A
Overdraft	£3.707	£5.745	£7.554	£10.220	#N/A
Tax Payable	£141	£289	£645	£640	#N/A
Dividends Payable	£65	£134	£299	£297	#N/A
Total Current Liabilities	£5.495	£8.552	£11.729	£14.746	#N/A
Net Current Assets	-£61	£457	£1.406	£2.450	#N/A
Total Net Assets	£2.639	£3.707	£5.106	£6.500	#N/A
Share Capital	£900	£1.200	£1.500	£1.800	£2.100
Retained Earnings	£239	£507	£1.106	£1.700	#N/A
Long Term Liabilities	£1.500	£2.000	£2.500	£3.000	£3.500
Capital Employed	£2.639	£3.707	£5.106	£6.500	#N/A
Difference	£0	£0	£0	£0	#N/A

Table 2

Te funds flow model

Obective

The objective of this model is to show the Sources and Applications of the funds generated by the Company. It will do this by importing data from the Goal, Income Statement, Cash Flow and Balance Sheet Models.

The task

Build a model which will show the Funds Flow for the Company.

Setting up the worksheets

This model should be built on two worksheets:-Funds Flow Calculations and Funds Flow. The Funds Flow Calculations worksheet contains intermediate calculations which must be made before the final Funds Flow worksheet can be built.

The funds flow worksheets

These are shown in Tables 1 & 2 below.

Basic assumptions underlying the model

In the model most of the core relationships are worked computed on the Funds Flow Calculations worksheet as shown below.

The First Variable on the Funds Flow Calculations Worksheet

Net Profit Before Interest and Tax

This is **pasted** as a **special link** from the Consolidated Income Statement worksheet.

The First Relationship on the Funds Flow Calculations Worksheet

Income from Operations

This is calculated as an array from Net Profit before Interest and Tax

The Next Variables

Annual Depreciation for Income Statement

This is **pasted** as a **special link** from the Goals worksheet

Annual Depreciation

This is calculated as an array from Annual Depreciation for Income Statement

Debtors

This is **pasted** as a **special link** from the Balance Sheet worksheet

Previous Debtors

This is calculated as an array from Debtors moved one column forward but **£917 for 1995**

Increase or Decrease in Debtors

This is the difference between Debtors and Previous Debtors *Calculate for the first year and then use the handle function.*

Creditors

This is **pasted** as a **special link** from the Balance Sheet worksheet

Previous Creditors

This is calculated as an array from Creditors moved one column forward but **£1183 for 1995**

Increase or Decrease in Creditors

This is the difference between Creditors and Previous Creditors *Calculate for the first year and then use the handle function.*

The Final Relationships

Closing Stock

This is calculated as an array from the Income Statement Calculations worksheet using Closing Stock Super+ Closing Stock Premium+ Closing Stock Standard

Previous Closing Stock

This is calculated as an array from Closing Stock moved one column forward but **£2329 for 1995**

Increase or Decrease in Stock

This is the difference between Closing Stock and Previous Closing Stock *Calculate for the first year and then use the handle function.*

Net Cash Flow

This is **pasted** as a **special link** from the Cash Flow worksheet

Increase or Decrease in Cash Balance

This is calculated as an array from Net Cash Flow.

The Variable on the Funds Flow Worksheet

Income from Operations

This is **pasted** as a **special link** from the Funds Flow Calculations Worksheet.

The following Three Variables are **pasted** as **special links** from the Goals Worksheet.

Share Issues

Debenture Issues

Disposals

Annual Depreciation is **pasted** from the Funds Flow Calculations Worksheet.

The First Relationship on the Funds Flow Worksheet

Total Sources

This is the sum of the first five Variables on the Funds flow worksheet, calculated using the "Autosum" function

The following Variables are **pasted** as **special links**

Additions from the Goals Worksheet

Interest Paid from the Cash Flow Worksheet

Tax Paid from the Cash Flow Calculations Worksheet

Dividend Paid from the Cash Flow Calculations Worksheet

The Next Relationships on the Funds Flow Worksheet

Total Application

This is the sum of the above four Variables on the Funds flow worksheet, calculated using the "Autosum" function

Surplus or Deficit

This is the difference between Total Sources and Total Applications *Calculate for the first year and then use the handle function.*

The following four Variables are all **pasted** as **special links** from the Funds Flow Calculations worksheet:-

Increase or Decrease in Debtors

Increase or Decrease in Creditors

Increase or Decrease in Stock

Increase or Decrease in Cash Balance

The remaining Relationships

Change in Working Capital

This is the sum of the above four Variables on the Funds flow worksheet, calculated using the "Autosum" function

Difference

This is the last relationship on the Funds Flow worksheet and is the difference between Surplus or Deficit and Change in Working Capital. *Calculate for the first year and then use the handle function.*

Graphs

Various Graphs should now be built to illustrate the model e.g.

A Graph showing the four variables which influence the Change in Working Capital, and a Graph showing the influences on Total Sources etc.

This completes the Funds Flow model and you should now save it.

Bacchus Beer Funds Flow Calculations

	1995	1996	1997	1998	1999
Net Profit before Interest & Tax	£564	£1.066	£2.142	£2.188	#N/A
Income from Operations	£564	£1.066	£2.142	£2.188	#N/A
Annual Depreciation for Income	£350	£450	£550	£650	£700
Annual Depreciation	£350	£450	£550	£650	£700
Debtors	£1,165	£1,717	£2,638	£2,821	£3,417
Previous Debtors	£917	£1,165	£1,717	£2,638	£2,821
Inc or Dec in Debtors	£248	£552	£921	£183	£596
Creditors	£1,581	£2,384	£3,231	£3,590	#N/A
Previous Creditors	£1,183	£1,581	£2,384	£3,231	£3,590
Inc or Dec in Creditors	-£398	-£803	-£848	-£359	#N/A
Closing Stock	£4,268	£7,293	£10,497	£14,375	#N/A
Previous Closing Stock	£2,329	£4,268	£7,293	£10,497	£14,375
Inc or Dec in Stock	£1,939	£3,024	£3,204	£3,878	#N/A
Net Cash Flow	-£1,443	-£2,038	-£1,809	-£2,666	#N/A
Inc or Dec in Cash Balance	-£1,443	-£2,038	-£1,809	-£2,666	#N/A

Table 1

Bacchus Beer Funds Flow

	1995	1996	1997	1998	1999
Income from Operations	£564	£1,066	£2,142	£2,188	#N/A
Share Issues	£300	£300	£300	£300	£300
Debenture Issues	£500	£500	£500	£500	£500
Disposals	£0	£0	£0	£0	£0
Annual Depreciation	£350	£450	£550	£650	£700
Total Sources	£1,714	£2,316	£3,492	£3,638	#N/A
Additions	£1,000	£1,000	£1,000	£1,000	£500
Interest Paid	£162	£240	£300	£360	£420
Tax Paid	£96	£141	£289	£645	£640
Dividend Paid	£110	£200	£434	£596	#N/A
Total Applications	£1,368	£1,580	£2,023	£2,601	#N/A
Surplus or Deficit	£346	£736	£1,469	£1,037	#N/A
CAUSED BY					
Inc or Dec in Debtors	£248	£552	£921	£183	£596
Inc or Dec in Creditors	-£398	-£803	-£848	-£359	#N/A
Inc or Dec in Stock	£1,939	£3,024	£3,204	£3,878	#N/A
Inc or Dec in Cash	-£1,443	-£2,038	-£1,809	-£2,666	#N/A
Change in Working	£346	£736	£1,469	£1,037	#N/A
Difference	£0	-£0	£0	-£0	#N/A

Table 2

The key ratios model
Objective

The objective of this model is to generate a set of key ratios for the company as shown in Table 2 below. It will do this by importing data from the Goals, Marketing, Income Statement, Cash Flow and Balance Sheet worksheets.

The task

Build a model which will set out key strategic ratios for the company.

Setting up the worksheets

This model should be built on two worksheets: Key Ratios Calculations and the Key ratios Worksheet. The Key Ratios Calculations contains intermediate calculations which must be made before the final Key Ratios Worksheet can be built.

Change the name of the first worksheet after the Balance Sheet Worksheet to **Key Ratios Calculations**.

Then change the name of the next worksheet to **Key Ratios**.

The key ratios worksheet

These are shown in Tables 1 and 2 below.

Basic assumptions underlying the model

In the model most of the core relationships are worked computed on the Key Ratios Calculations worksheet as shown below.

The First Variables on the Key Ratios Calculations Worksheet

Net Profit Before Tax

Net Profit Before Tax is **pasted** as a **special link** from the Consolidated Income Statement Worksheet

Total Net Assets

Total Net Assets is **pasted** as a **special link** from the Balance Sheet Worksheet.

The First Relationship

Return on Investment

This is computed as follows:

Return on Investment = Net Profit After Tax/Total Net Assets, *for all years. Calculate for the first year and then use the handle function.*

Net Profit After Tax

Net Profit after Tax is **pasted** as a **special link** from the Consolidated Income Statement worksheet.

The Next Variables

Share Capital is **pasted** as a **special link** between the Balance Sheet Worksheet and the Key Ratios Worksheet.

Retained Earnings is **pasted** as a **special link** between the Balance Sheet Worksheet

The Next Relationships

Equity = Share Capital + Retained Earnings, *for all years. Calculate for the first year and then use the handle function.*

Return on Equity = Net Profit Before Tax/Equity, *for all years. Calculate for the first year and then use the handle function.* Format as a %.

Dividend Payable

This is **pasted** as a **special link** from the Balance Sheet Worksheet.

Div one Year Later = Dividend Payable moved one year forward, *for all years Calculate for the first year and then use the handle function.* But £45 for 1995.

Change in Div = Dividend Payable - Div one Year Later, *for all years Calculate for the first year and then use the handle function.*

Dividend Growth Rate = Change in Div/Div one year later *for all years. Calculate for the first year and then use the handle function.* Format as a%.

Dividend Growth Rate is pasted as a special link into the Key Ratios Worksheet.
The following Relationships are complicated calculations and care must be taken when importing variables from other worksheets.

Sales Value Segment Premium

1995 Sales Value Segment Premium = 12320

1996 Sales Value Segment Premium = 1995 Sales Value Segment Premium * (1 + Market Growth rate Premium *from the Market Inputs worksheets*) Now use the "Autofill" function.

Sales Value Segment Standard & Sales Value Segment Super may be calculated similarly but using 1995 Sales Value Segment Standard = 121000 and 1995 Sales Value Segment Super = 16940.

Market Share Premium

Market Share Premium = Sales Value Premium (*from the Income Statements worksheet*) divided by Sales Value Segment Premium *Calculate for the first year and then use the handle function.*

Market Share Standard & Market Share Super may be calculated using the same format.

Value Added is pasted as Gross Profit from the Consolidated Income statement *Calculate for the first year and then use the handle function.*

Investment is pasted as Total Net assets (*from the Balance Sheet worksheet*)

Price Index in 1995 = 100 then

1996 Price Index = Price Index in 1995 * (1 + Inflation Rate (*from the market Inputs worksheet*))

Use the "Autofill" function to fill in the remaining Years.

The First Variables on the Key Ratios worksheet.

Sales is pasted as a special link from the Consolidated Income Statement Worksheet.

Target Sales

This is pasted as a special link from the Goals worksheet

The First Relationship on the Key ratios Worksheet.

Return on Sales

Return on Sales = Net Profit before Tax/Sales, *for all years. Calculate for the first year and then use the handle function.* Format as a %.

More variables.

Target Return on Sales

Target Return on Sales is pasted as a special link from the Goals worksheet.

Return on Investment is pasted as a special link from the Key Ratios Calculations Worksheet.

Target Return on Investment

Target Return on Investment is pasted as a special link between the Goals Worksheet and the Key Ratios worksheet.

Return on Equity

This is pasted as a special link from the Key Ratios Calculations worksheet.

Target Return on Equity

Target Return on Equity is pasted as a special link between the Goals Worksheet and the Key Ratios Worksheet

Dividend Growth Rate.

Dividend Growth Rate is pasted as a special link from the Key Ratios Calculations worksheet.

Target Dividend Growth Rate

Target Dividend Growth rate is **pasted** as a **special link** from the Goals worksheet.

Dividends Payable

Dividends Payable is **pasted** as a **special link** from the Key Ratios Calculations worksheet.

Target Dividend Payable

Target Dividend Payable is pasted as a special link from the Goals Worksheet to the Key Ratios worksheet.

Additions.

This is **pasted** as a **special link** from the Balance Sheet Worksheet.

Target Additions

Target Additions is **pasted** as a **special link** between the Goals Worksheet and the Key Ratios Worksheet

Fixed Assets

Fixed Assets is **pasted** as a **special link** between the Balance Sheet Worksheet and the Key Ratios Worksheet.

Target Fixed Assets

This is **pasted** as a **special link** between the Goals Worksheet and the Key Ratios Worksheet.

Share Issues

Share Issues is **pasted** as a **special link** between the Balance Sheet calculations Worksheet and the Key Ratios Worksheet.

Target Share Issues

Target Share Issues is **pasted** as a **special link** between the Goals Worksheet and the Key Ratios Worksheet.

Debenture Issues

Debenture Issues is **pasted** as a **special link** between the Balance Sheet Worksheet and the Key Ratios Worksheet.

Target Debenture Issues

Target Debenture Issues is **pasted** as a **special link** between the Goals Worksheet and the Key Ratios Worksheet.

Long Term Liabilities

Long Term Liabilities is **pasted** as a **special link** between the Balance Sheet Worksheet and the Key Ratios Worksheet.

Target Long Term Liabilities

Target Long Term Liabilities is **pasted** as a **special link** between the Goals Worksheet as Debentures and the Key Ratios Worksheet.

Other variables which need to entered.

Net Profit Before Tax is **pasted** as a **special link** from the Consolidated Income worksheet

Investment

This is **pasted** as Total Net Assets from the Balance Sheet worksheet as an a array

Marketing to Sales

This is **pasted** as Mkting, Selling & Distn from the Consolidated Income Statement worksheet **and Divided by Sales Calculate for the first year and then use the handle function.**

R & D to Sales

R & D to Sales =SUM(R & Super + R & D Premium + R & D Standard (from the Income Statement calculations worksheet)) **divided** by Sales.

Market Share for all three Variables is **pasted as special links** from the Key Ratios Calculations worksheet.

R.M.S.

R.M.S. for Premium, Super & Standard are **pasted as special links** from the Product Market Portfolio worksheet.

Market Growth Rates for Premium, Standard & Super are **pasted as special links** from the Marketing Inputs worksheet.

Concentration Premium.

Concentration Premium = SUM(Sales Value Premium(from the Market forecast worksheet) + Sales Volume Largest Competitor Premium * Price Premium(both from the Market Inputs worksheet)) **divided by** Sales Value Premium Segment(from the Key Ratios Calculations worksheet).

Concentration Standard & Super may be calculated using similar formulae.

Investment to Value Added

Investment to Value Added = Value Added **divided by** Investment(from the Key Ratios Calculations worksheet.) *Calculate for the first year and then use the handle function.*

Investment to Sales

Investment to Sales = Investment **divided by** Sales *Calculate for the first year and then use the handle function.*

Value Added to Sales

Value Added to Sales = Value Added **divided by** Sales calculated as an array.

Fixed Assets to Sales.

Fixed Assets to Sales.= Fixed Assets(from the Balance sheet worksheet) **divided by** Sales. *Calculate for the first year and then use the handle function.*

Productivity in Current Terms

Productivity in Current Terms = Value Added **divided by** the Number of Employees (from the Goals worksheet) *Calculate for the first year and then use the handle function.*

Productivity in Real Terms

Productivity in Real Terms = Productivity in Current Terms **divided by** Price Index (from the Key Ratios Calculations worksheet) *Calculate for the first year and then use the handle function.*

The Next Four Variables are **pasted as special links** from the Classic Group worksheet, which has keyboard entered Variables and is the last worksheet in the series. These figures are taken from page 147 of the text book.

Corporate position

Sales

Valued added

Net Profit before Interest & Tax

Investment

The Final Four Relationships

Bacchus`s position

Corporate Sales

Bacchus`s Position in relation to Corporate Sales is determined by Bacchus`s Sales & Corporate Sales as shown below :-

Bacchus`s Position Corporate Sales = Sales **divided by** Corporate Sales as an array and formatted as a percentage.

Corporate Value Added

Bacchus`s Position in relation to Corporate Value Added is determined by Bacchus`s Value Added & Corporate Value Added as shown below :-

Bacchus`s Position Corporate Value Added = Bacchus Value Added **divided by** Corporate Value Added as an array and formatted as a percentage.

Corporate Net Profit before Interest & Tax

Bacchus`s Position in relation to Corporate Net Profit before Interest & Tax is determined by Bacchus`s Net Profit before Interest & Tax & Corporate Net Profit before Interest & Tax as shown below :-

Bacchus`s Position Corporate Net Profit before Interest & Tax = Bacchus Net Profit before Interest & Tax **divided by** Corporate Net Profit before Interest & Tax *Calculate for the first year and then use the handle function.* Formatted as a percentage

Corporate Investment

Bacchus`s Position in relation to Corporate Investment is determined by Bacchus`s Investment & Corporate Investment as shown below :-

Bacchus`s Position Corporate Investment = Bacchus`s Investment **divided by** Corporate Investment as an array and formatted as a percentage.

Graphs

Various Graphs should now be built to illustrate the Model, e.g.

Dividend Growth Rates

Return On Investment.

This completes the Key Ratios model and you should now save it.

Bacchus Beer Key Ratios Calculations

	1995	1996	1997	1998	1999
Net Profit before Tax	£402	£826	£1,842	£1,828	#N/A
Total Net Assets	£2,639	£3,707	£5,106	£6,500	#N/A
Return on Investment	10%	14%	23%	18%	#N/A
Net Profit After Tax	£261	£537	£1,197	£1,188	#N/A
Share Capital	£900	£1,200	£1,500	£1,800	£2,100
Retained Earnings	£239	£507	£1,106	£1,700	#N/A
Equity	£1,139	£1,707	£2,606	£3,500	#N/A
Return on Equity	35%	48%	71%	52%	#N/A
Dividends Payable	£65	£134	£299	£297	#N/A
Div one Year later	£45	£65	£134	£299	£297
Change in Div	£20	£69	£165	-£2	#N/A
Dividend Growth Rate	45%	105%	123%	-1%	#N/A
Sales Value Segment					
Premium	£12,320	£14,168	£16,435	£19,064	£22,115
Standard	£121,000	£133,100	£146,410	£161,051	£177,156
Super	£16,940	£18,634	£20,497	£22,547	£24,802
Market Share					
Premium	20%	27%	41%	35%	32%
Standard	1%	2%	2%	2%	3%
Super	10%	13%	14%	16%	19%
Value Added					
Investment	£1,685	£2,550	£4,094	£4,292	#N/A
	£2,639	£3,707	£5,106	£6,500	#N/A
Price Index	100	110	121	133.1	146.41

Table 1

Bacchus Beer Key Ratios

	1995	1996	1997	1998	1999
MARKETING GOALS					
Sales	£5,824	£8,584	£13,190	£14,105	£17,084
Target Sales	£6,000	£8,000	£14,000	£16,000	£20,000
Return on Sales	7%	10%	14%	13%	#N/A
Target Return on Sales	10%	10%	10%	10%	10%
FINANCIAL GOALS					
Return on Investment	10%	14%	23%	18%	#N/A
Target Return on	12%	12%	13%	13%	14%
Return on Equity	35%	48%	71%	52%	#N/A
Target Return on Equity	25%	25%	25%	25%	25%
Dividend Growth Rate	45%	105%	123%	-1%	#N/A
Target Dividend Growth	50%	33%	50%	25%	33%
Dividends Payable	£65	£134	£299	£297	#N/A
Target Dividends Payable	£100	£133	£200	£250	£333
ASSETS AND LIABILITIES					
Additions	£1,000	£1,000	£1,000	£1,000	£500
Target Additions	£1,000	£1,000	£1,000	£1,000	£500
Fixed Assets	£3,500	£4,500	£5,500	£6,500	£7,000
Target Fixed Assets	£3,500	£4,500	£5,500	£6,500	£7,000
Share Issues	£300	£300	£300	£300	£300
Target Share Issues	£300	£300	£300	£300	£300
Debenture Issues	£500	£500	£500	£500	£500
Target Debenture Issues	£500	£500	£500	£500	£500
Long Term Liabilities	£1,500	£2,000	£2,500	£3,000	£3,500
Target Long Term	£1,500	£2,000	£2,500	£3,000	£3,500
KEY STRATEGIC RATIOS					
Sales	£5,824	£8,584	£13,190	£14,105	£17,084
Net Profit before Tax	£402	£826	£1,842	£1,828	#N/A
Return on Sales	7%	10%	14%	13%	#N/A
Investment	£2,639	£3,707	£5,106	£6,500	#N/A
Return on Investment	10%	14%	23%	18%	#N/A
Table 2					

Bacchus Beer Key Ratios

1995	1996	1997	1998	1999
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MARKETING GOALS

Sales	£5,824	£8,584	£13,190	£14,105	£17,084
Target Sales	£6,000	£8,000	£14,000	£16,000	£20,000
Return on Sales	7%	10%	14%	13%	#N/A
Target Return on Sales	10%	10%	10%	10%	10%

FINANCIAL GOALS

Return on Investment	10%	14%	23%	18%	#N/A
Target Return on Investment	12%	12%	13%	13%	14%
Return on Equity	35%	48%	71%	52%	#N/A
Target Return on Equity	25%	25%	25%	25%	25%
Dividend Growth Rate	45%	105%	123%	-1%	#N/A
Target Dividend Growth Rate	50%	33%	50%	25%	33%
Dividends Payable	£65	£134	£299	£297	#N/A
Target Dividends Payable	£100	£133	£200	£250	£333

ASSETS AND LIABILITIES

Additions	£1,000	£1,000	£1,000	£1,000	£500
Target Additions	£1,000	£1,000	£1,000	£1,000	£500
Fixed Assets	£3,500	£4,500	£5,500	£6,500	£7,000
Target Fixed Assets	£3,500	£4,500	£5,500	£6,500	£7,000
Share Issues	£300	£300	£300	£300	£300
Target Share Issues	£300	£300	£300	£300	£300
Debenture Issues	£500	£500	£500	£500	£500
Target Debenture Issues	£500	£500	£500	£500	£500
Long Term Liabilities	£1,500	£2,000	£2,500	£3,000	£3,500
Target Long Term Liabilities	£1,500	£2,000	£2,500	£3,000	£3,500

KEY STRATEGIC RATIOS

Sales	£5,824	£8,584	£13,190	£14,105	£17,084
Net Profit before Tax	£402	£826	£1,842	£1,828	#N/A
Return on Sales Investment	7%	10%	14%	13%	#N/A
Return on Investment	£2,639	£3,707	£5,106	£6,500	#N/A
	10%	14%	23%	18%	#N/A
	1995	1996	1997	1998	1999

STRATEGIC EFFORT

Marketing to Sales	7%	5%	4%	4%	4%
R & D to Sales	1.1%	0.8%	0.5%	0.5%	0.4%
Market Share					
Premium	20%	27%	41%	35%	32%
Standard	1%	2%	2%	2%	3%
Super	10%	13%	14%	16%	19%
R.M.S. FOR					
Premium	0.75	0.81	0.94	0.80	0.60
Standard	0.07	0.07	0.08	0.07	0.05
Super	0.76	1.00	1.11	1.26	1.38

MARKET CHARACTERISTICS

Market Growth Rate Super	10%	10%	10%	10%	10%
Market Growth Rate Premium	12%	15%	16%	16%	16%
Market Growth Rate standard	10%	10%	10%	10%	10%

CONCENTRATION

Premium	47%	61%	85%	79%	87%
Standard	20%	25%	33%	37%	59%
Super	23%	26%	27%	29%	32%

Capital & Prod. Structure

Investment to Value Added	64%	69%	80%	66%	#N/A
Investment to sales	45%	43%	39%	46%	#N/A
Value Added to Sales	29%	30%	31%	30%	#N/A
Fixed Assets to Sales	60%	52%	42%	46%	41%

Productivity in current terms £7.95 £11.59 £12.79 £12.26 #N/A

Productivity in real terms £7.95 £10.54 £10.57 £9.21 #N/A

CORPORATE POSITION

Sales	£149,994	£236,783	£142,250	£318,381
Value Added	£52,532	£83,510	£43,005	£108,452
Net Profit before Interest & Tax	£50,858	£80,950	£41,387	£105,028
Investment	£37,086	£64,847	£78,424	£113,580

BACCHUS`S POSITION

Corporate Sales	3.9%	3.6%	9.3%	4.4%	#DIV/0!
Corporate Value Added	3.2%	3.1%	9.5%	4.0%	#N/A
Corporate N.P.B.I. & T.	1.1%	1.3%	5.2%	2.1%	#N/A
Corporate Investment	7.1%	5.7%	6.5%	5.7%	#N/A

Table 2

