

Financial Strategy – May 2002

Question One

Background of company

KL Group plc provides a range of products and services for sale in the United Kingdom and overseas. Its shares are listed on the London Stock Exchange and are widely held, although institutions hold the majority of shares. The company is structured as a group of wholly-owned subsidiaries. Each subsidiary specialises in a particular product or service.

Financial data

Key data for the year to 31 December 2001 is as follows:

Turnover	£850 million
Earnings	£105 million
Shares in issue	250 million
Share price as at today (21 May 2002)	331 pence
Weighted Average Cost of Capital (WACC) for the Group	14% (nominal net of tax rate)

Company objectives

The company has two stated objectives:

- to increase operating cash flow and dividends per share year-on-year by at least 5%
- to increase the wealth of our shareholders whilst respecting the interests of our employees, customers and other stakeholders and operating to the highest ethical standards.

Future plans

The directors are considering establishing a new subsidiary company, KL15, to process industrial waste. The subsidiary will require a factory. The directors have identified that the factory used by a long-established subsidiary, KL3, is currently operating at only 50% capacity. This factory could be converted for use by the new subsidiary at a cost of £1.3 million. KL3's annual net (after-tax) earnings are £1.5 million. This subsidiary's operations would cease immediately the decision to proceed with KL15 is taken as it will take some months to convert the factory.

However, the company is aware that the government is reviewing the environmental controls currently in operation for waste processing and it is possible that tougher regulations will be introduced. Industry spokesmen are attempting to argue that current controls are adequate. Nevertheless, the directors of the KL Group plc wish to consider the situation should these tougher controls be introduced and two alternative methods of equipping the new subsidiary have been proposed by the company's technical advisers.

The company has sufficient cash available from a recent disposal to finance the capital costs of the new subsidiary under either alternative.

Alternative 1

This alternative will equip the factory to process waste to the highest environmental standards that the government regulations might impose. This would require the purchase of very expensive, specialised machinery from the USA. This machinery would have to be ordered and delivery time is approximately 6 months, which would coincide with completion of the factory conversion. The cost of this machinery is currently US\$12 million but the price of the equipment is likely to rise by 5% over the next 6 months. If an order is placed immediately (year 0), together with a 50% deposit, the supplier will hold today's price. The balance of the purchase price is payable 6 months after installation. The current exchange rate, US\$ to £1 sterling, is 1.45. Inflation in the USA is forecast to be 4% over the next 12 months. In the UK it is forecast

This equipment is not likely to need replacement for at least 8 years.

Forecast revenues for KL15 under this equipment alternative are as follows. The probabilities are based on forecasts of the economy in the UK and the main overseas trading areas where the KL Group plc hopes to sell its services.

	<i>Year 1</i> <i>(6 months of operating)</i>			<i>Year 2</i>			<i>Year 3</i>		
Revenues (£m)	0.5	2.5	3.5	8.5	10.5	12.5	10.5	13.5	16.0
Probability	0.4	0.5	0.1	0.4	0.5	0.1	0.4	0.5	0.1
Expected revenues (£m)	1.8			9.9			12.55		

The probabilities of sales for year 2 or 3 and beyond are assumed to be independent of the achievement of the previous year's sales.

The costs are as follows:

- Cash operating costs are expected to have a fixed element of £1.5 million each year starting as soon as the factory starts work, plus a variable element of 30% of sales revenue. A full year's fixed costs will be charged to production in year 1.
- Redundancy payments of £1.2 million will be necessary for staff from the KL3 subsidiary. These would be payable immediately.
- The costs of the factory conversion will be incurred during the 6 months following the decision to proceed but, for simplicity, it can be assumed that these are paid at the end of year 1.
- The availability of capital allowances and other tax reliefs mean that no tax is likely to be payable until year 4. For year 4 onwards a rough estimate suggests 20% of annual net cash flows (revenue less cash operating costs) will be payable in tax.

Alternative 2

To plan for a continuation of, or modest improvement to, current regulations and produce accordingly. This alternative has greater flexibility as there is a much larger market, worldwide, for processing waste at a lower and therefore much cheaper specification. The capital cost to the KL Group plc would also be much lower at £2.5 million. Equipment for this alternative is readily available in the UK and can be bought when the factory conversion is completed. However, the equipment is likely to need to be replaced in 6 years' time from the date of purchase.

The revenues shown below are forecast using similar methods as used in Alternative 1. However, sales will be made to a wider range of customers, many in developing countries.

	<i>Year 1</i> <i>(6 months of operating)</i>			<i>Year 2</i>			<i>Year 3</i>		
Revenues (£m)	3.5	4-5	5-5	4.5	6.5	7.5	8.5	9.5	11.5
Probability	0.2	0.6	0.2	0.2	0.6	0.2	0.2	0.6	0.2,
Expected revenues (£m)	4.5			6.3			9.7		

Costs are as follows:

Fixed cash operating costs will be £1.2 million each year; variable costs will be 15% of sales revenue.

With this alternative, there will be fewer redundancies from KL3 and the associated costs will be only 20% of those for Alternative 1.

Costs of factory conversion are as Alternative 1.

Tax relief will be similar to Alternative 1, that is, no tax will be payable until year 4 when tax will become payable at 20% of annual net cash flow (revenue less cash operating costs).

Question One

Required:

(a) Calculate net present values for the new subsidiary (KL15) under the two alternatives, using whatever assumptions you think are appropriate. Include brief comments on your assumptions.

(15 marks)

(b) Assume you are the company's financial manager. Write a report to the directors that:

(i) discusses how the new subsidiary and the two alternatives might contribute to the attainment of the Group's objectives. Refer to the figures you have calculated in answer to part (a) where appropriate.

(10 marks)

(ii) analyses and discusses the various types of risk and limitation involved in each alternative.

(10 marks)

(iii) recommends which, if either, of the alternatives should be chosen. Your recommendation should take into account all aspects of your evaluation as discussed in parts (b) (i) and (b) (ii) of this question.

(5 marks)

You should provide any additional calculations that you consider appropriate to support your discussion and analysis.

(Total for part (b) = 25 marks)

(c) Option pricing theory was originally developed to apply to share prices. The theory can also be applied to capital investment options, sometimes known as "real options".

Discuss the option features involved in the KL Group plc's decision and explain, briefly, the benefits of including such options in the investment appraisal process.

(10 marks)

(Total = 50 marks)

Answer to Question One

Requirement (a)

Calculations of NPVs

Alternative 1

Item	Year	0	1	2	3
		£m	£m	£m	£m
Revenue		0	1.8	9.9	12.55
Less: Costs					
Factory conversion			-1.30		
Equipment		-4.14	-4.08	(note 1)	
Redundancy costs		<u>-1.20</u>			
Operating costs			-2.04	-4.47	-5.265
Net cash flows		-5.34	-5.62	5.43	7.29
Discount rate @ 14%		1.000	0.877	0.769	0.675
Discounted cash flows		-5.34	-4.93	4.18	4.92

Net present value of cash flows for first 3 years of operations = £-1.20 million

One approach to the calculation of terminal value would be to assume, conservatively, that cash flows would only maintain for 8 years, that is until the first date the equipment may need to be replaced. The figures would be:

NPV to end year 3	-1.18	
PV of after-tax cash flows from year 4 to year 8	13.52	(note 1)
Less: Opportunity cost of KL3 from year 1 to year 8	<u>-6.96</u>	(note 2)
Total NPV	<u>5.39</u>	million
£m -1,18		

Notes:

1 As the supplier is in the US and is quoting a price in US\$, the payment due in six months' time will be US\$6 million (1.47 (the exchange rate that might be expected in twelve months' time given the information on inflation rates given in the question) = £4.08 million).

2 This is £7.29 million multiplied by 80% (year 3's after-tax cash flow) multiplied by the appropriate year's discount factor for each of the years' 4 to 8.

3 This is £1.5 million multiplied by the eight-year 14% cumulative present value factor (4.639).

Alternative 2

Item	Year	0	1	2	3
		£m	£m	£m	£m
Revenue (see workings)			4.5	6.3	9.7
Less: Costs					
Factory conversion			-1.30		
Equipment		-2.50			
Redundancy costs		-0.24			
Operating costs			-1.875	-2.145	-2.655
Net cash flows		-2.74	1.33	4.16	7.05
Discount rate @ 14%		1.000	0.877	0.769	0.675
Discounted cash flows		-2.74	1.17	3.20	4.76

Net present value of cash flows for first 3 years of operations = £6.39 million

As with Alternative 1, one approach to the calculation of terminal value would be to assume that cash flows would only maintain for 6 years, that is until the first date the equipment is likely to need to be replaced. The figures would be:

NPV to end year 3	6.39
PV of after-tax cash flows from year 4 to year 6	8.84 (note 1)
Less: Opportunity cost of KL3 from year 1 to year 6	-5.83
Total NPV	9.40m

Notes:

1. This is £7.05 million (year 3's net cash flow) multiplied by the appropriate year's discount factor for each of the years' 4 to 6.
2. This is £1.5 million multiplied by the six-year 14% cumulative present value factor (3'889).

Comments on assumptions

- 1 That the WACC is the appropriate discount rate to use in the evaluation. This may not be the case and is discussed further in requirement (b), the report.
- 2 For Alternative 1, we accept the supplier's offer to pay a 50% deposit to hold constant purchase price in US\$. This may not be to our advantage and is discussed further in requirement (b), the report.
- 3 K3 would continue to earn £1.5 million a year indefinitely. This may not be realistic, but provides an estimate that can be adjusted when we fine tune the evaluation.
- 4 Cash flows beyond the third year of operations are estimated assuming year 3's cash flows. Again, this may not be realistic, but provides a basis for discussion.

Requirement (b)

Report

To: Directors of KL Group pic
From: Financial Manager
Subject: New subsidiary - KL15
Date: 21 May 2002

Introduction

You have asked me to prepare a report for discussion on the proposed establishment of a new subsidiary. This report addresses the following issues:

Estimated net present value of KL 15 under 2 alternatives;
Contribution to attainment of group objectives;
Analysis and discussion of risks and constraints involved in each alternative;
Recommendation of a preferred alternative.

Estimated value for KL 15

Two alternatives have been proposed for equipping the factory. Alternative 1 assesses the revenues and costs assuming we purchase advanced equipment from the USA. Alternative 2 assumes we use "old" technology with minor improvements.

Workings for the revenues and costs for both alternatives are shown in appendix A (answer to requirement (a)). In summary, the NPV for Alternative 1 is between £5.39m and £16.18m and between £9.04m and £22.88m for Alternative 2, depending on method of calculating values beyond year 3.

(i) Contribution to the attainment of the Group's objectives

The new subsidiary is small and will increase Group turnover by little more than 1 % in the first full year of operations under Alternative 1 and around 0,7% under Alternative 2, assuming current group turnover remains constant or increases. In year 1, Alternative 2 will make a small contribution to cash flow, but Alternative 1 cash flows are negative. The loss of KL3's earnings will not be compensated in the first year of operations and so, in the immediate future, the proposal will be detrimental to the Group's objectives. The question must be asked whether the Group could not expend its resources, both financial and human, more effectively. There will be little impact on dividends under either alternative.

In respect of the second objective, both alternatives would contribute to some extent. Using the estimated conservative figures in section 1, and shareholder value analysis, and assuming all other things are held constant, the effect on the company's market capitalisation would be as follows.

	Alternative 1 £m	Alternative 2 £m
Current market value of the KL Group plc	827.50	827.50
Value of KL 15	5.39	9.40
Total	832.89	836.90
Revised share price	333 pence	335 pence
Current share price	331 pence	331 pence
Increase	2 pence	4 pence

Both alternatives would add to shareholder wealth, but the increase is negligible. However, in theory, any increase would contribute to the first part of our second objective, and there is little to choose between them in respect of contribution to this objective. Alternative 2 would minimise the adverse effects on the workforce, but it is not as beneficial to the environment as Alternative 1.

The two alternatives do, of course, have to be weighed against the continuation of KL3's operations. However, as KL3 is operating at only 50% capacity and has an NPV below both alternatives, then discontinuation of this subsidiary's operation seems a logical decision. No information is given on whether any action could be taken to increase KL3's productivity. It has to be assumed that this subsidiary is in decline, but it is worth asking the question.

In the end, the decision must take into account other factors such as relative risks and future strategy of the group.

(ii) Risks and constraints involved in each alternative

Risks fall into four broad categories: financial, commercial, political and operational! technological.

Financial

In an investment appraisal, the choice of discount rate may be used to adjust for the risk of the investment. The use of the WACC might be inappropriate and not reflect the relative risks of the two alternatives. We could use the CAPM to determine the specific risk-adjusted discount rate. This would involve finding a proxy company in a similar industry whose beta is published, which may be difficult.

Payback could also be used to judge risk. On the figures here, Alternative 1 would not pay back until early in year 4. Alternative 2 begins to pay back early in year 3.

A second risk is the cost of the equipment under Alternative 1. If we take the supplier's offer, we are insuring against the possibility of a price rise and also against the possibility that the US\$ will rise in value against the £. However, inflation rate forecasts suggest that the US economy is likely to perform worse than the UK's, which suggests that the \$ will weaken. My calculations assume we do pay the deposit with the balance 12 months' later (delivery time is 6 months and the remaining 50% is payable 6 months after installation.) On my assumptions, this shows a windfall "profit" of £38,000, ignoring discounting. This decision needs further consideration and we need to decide whether paying 50% of the purchase price 6 months' earlier than necessary, but locking us into a guaranteed price in US\$, is financially more advantageous than any alternative use of our money for those six months.

There are exchange risks involved with revenue flows under Alternative 2 because the customers are more diverse and many are in developing countries. If this alternative is chosen, we need to address this issue and determine appropriate hedging strategies for dealing with less developed countries.

It must also be recognised that the equipment for Alternative 2 needs replacing before the equipment for Alternative 1. In theory, this should be built into the evaluation, but we have insufficient information at this stage to make any accurate quantified assessment. There is also a technological risk aspect here as environmental issues are constantly evolving and it is possible that what is "state of the art" now will be obsolete or inadequate in a relatively few years' time.

There are also different risk profiles in respect of estimates of revenues. Alternative 1 has the greater risk of achieving only the lower estimates, whereas that of Alternative 2 has greater probability of achieving the medium estimates. Alternative methods of risk assessment, such as the use of sensitivity analysis or simulation, could be considered to inform management decisions.

Political

There is a UK-based political uncertainty surrounding regulatory issues, as noted in the scenario, but there are further political risks with Alternative 2 because the customer base includes many customers in developing countries.

Commercial

The commercial risk with Alternative 1 is that there are fewer customers, which might leave us vulnerable and dependent. The risk with Alternative 2 is that many are in developing countries and may cause credit management problems.

Operational/Technological

The risk here is that the equipment under Alternative 2 becomes unusable because of changed regulation. Allowing for regulatory issues is, to some extent, frustrated by the political uncertainty. However, this is a fact of commercial life and one option is to plan for the "worst case" scenario - in commercial terms. Pursuing Alternative 1 might be the least-risk option here, despite having the lowest NPV, and could be turned to the company's advantage in terms of corporate image and PR.

(iii) Recommendation

On the basis of the increase in shareholder wealth, Alternative 2 is to be preferred. This also means fewer staff are made redundant. On these criteria, this alternative contributes most to the Group's second objective. On environmental issues, Alternative 1 would contribute more.

The risk issues make the decision "six of one and half a dozen of the other", as discussed in the last section, but on balance Alternative 1 is probably less risky.

Neither alternative will contribute much to the Group's objective to increase both EPS and DPS by 5% each year. The question has to be asked whether we should be pursuing the establishment of such a small subsidiary unless there are other issues of which I am unaware, for example the effect on another subsidiary.

Signed: Financial Manager

Appendix to Report

Note 1 - Calculation of cost of new equipment under Alternative 1

Assuming ordered and deposit paid now

50% (US\$6 million) paid as deposit now at spot rate, 1.45	4.14
50% (US\$6 million) paid in twelve months' time at $\frac{1.47 \times 1.45 \times 1.04}{1.025}$	4.08
Total	<u>8.22</u>

Assuming ordered now, but no deposit paid

50% (US\$6.3 million x 1'05) paid in six months' time at 1.46	
(1.45 x $\frac{1.04}{1.025}$)	4.31
50% (US\$6.3 million x 1'05) paid in twelve months' time at 1.47	<u>4.29</u>
	<u>8.60</u>

Requirement (c)

In the context of investment decisions, there are three options to be considered:

- 1 The abandonment option;
- 2 The timing option;
- 3 The strategic option.

1 Abandonment option

Major investment decisions involve heavy capital commitments and are largely irreversible; once the initial capital expenditure is incurred, management cannot turn the clock back and act differently. Because management is committing large sums of money in pursuit of higher, but uncertain, payoffs, the option to abandon, or "bailout", should things look grim can be valuable.

Abandonment possibilities can reduce the riskiness of a project and increase the expected NPV of certain types of project which would otherwise produce large negative NPVs if they could not be abandoned in the event that things do not work out. Also, the investment could be repeated.

In the case of KL 15, the company could defer payment of the equipment for Alternative 1 and risk the 5% increase in cost. This is a high price to pay for an abandonment option on an investment that will have already incurred some capital costs, redundancy payments and loss of earnings from the closure of KL3. In the case of Alternative 2, the equipment can be purchased any time. There will have been some expenditure made as soon as the decision is taken, but as the factory conversion will take six months, the company can choose to abandon the capital expenditure at any time within those six months.

2 Timing option

The example here not only introduces an abandonment option, it also raises the option to "wait and see". Management may have viewed the investment as a "now or never" opportunity, arguing that in highly competitive markets there is no scope for delay: money is made by staying ahead of the competition. In effect, this amounts to viewing the decision as a call option which is about to expire on the new plant for the capital investment outlay. If a positive NPV is expected, the option will be exercised, otherwise the option lapses and no investment is made.

The option to defer the decision by, say, one year until the outcome of the government's deliberations on environmental issues becomes known, makes obvious sense. An immediate investment would yield either a negative NPV - in which case it would not be taken up - or a positive NPV. Delaying the decision by a year to gain valuable new information is a more valuable option. This helps us to understand why management sometimes does not take up apparently wealth-creating opportunities; the option to wait and gather new information is sufficiently valuable to warrant such delay.

3 Strategic investment options

Certain investment decisions give rise to follow-on opportunities that are wealth creating. New technology investment is particularly difficult to evaluate. Managers refer to the high level of intangible benefits associated with such decisions. What they really mean is that these investments offer further investment opportunities (for example, greater flexibility).

