
Answers

1 (a) Individual business

A number of behavioural factors, to do with the individual company as well as the sector as a whole, may lead to Matravers Tech being valued higher than appears to be warranted by rational analysis of its future prospects. One possible factor is the asking price, even if it is not a fair one, may provide a reference point which significantly influences the purchaser's valuation of the business.

The fact that Matravers Tech is available for purchase may help raise its price. Purchasers may see this as a rare opportunity to buy an attractive business in this retail sector. This will be made more likely if investors have loss aversion bias, a desire to buy Matravers Tech now because otherwise the opportunity will be lost.

Matravers Tech being offered for sale will mean that information about the company, showing it in a positive light, will be available for purchasers. This could result in availability bias, investors taking particular note of this information because they can readily obtain it, rather than other information which may be more difficult or costly to find.

Sector

There are a number of possible behavioural reasons why share prices in this sector appear generally higher than rational analysis indicates. One is the herd instinct, investing in the sector because other investors have also been buying shares, not wishing to make judgements independently of other investors.

The herd instinct may be generated by previous share price movements. Investors may believe once prices start rising in the sector, they will continue to do so indefinitely.

Following fashion may also be a factor. Fund managers who wish to give the impression that they are actively managing their portfolio by making regular changes to it, may have a preference for companies which appear up-to-date and are currently popular. This may be linked to an expectation that sales of technologically-advanced goods are likely to generate high returns.

There is also confirmation bias, the idea that investors will pay attention to evidence which confirms their views that the sector is a good one in which to invest, and ignore evidence which contradicts their beliefs. In the past, technology companies have been valued using methods which support the beliefs of investors that they are of high value, rather than traditional methods, such as cash flow analysis, which suggest a lower business value is more realistic.

(b) (iv) Report to the board of directors, Westparley Co

This report evaluates whether the acquisition of Matravers Co would be beneficial to Westparley Co's shareholders by estimating the future value generated by Matravers Co (i.e. Matravers Home currently), the proceeds from selling Matravers Tech and the additional value created from synergies immediately after the companies are combined.

Strategic fit

The strategic case for taking over the business appears to be strongest for the out-of-town stores and the online business. The acquisition would provide an additional out-of-town presence for Westparley Co. Better usage in the out-of-town stores could generate higher returns. Having the food and home businesses on the same site could generate some cross-sales between the two. Possibly combining the two companies' online presence and investing further could mean Matravers Home benefiting from the factors which have driven strong performance by Westparley Co.

Taking over the city centre stores, even the successful ones, seems to have less strategic logic, however. Westparley Co would be taking on a high cost burden. The success of the food business in city centres is doubtful, as food shops sited there will be less convenient for customers who do not live in the city centres, and Westparley Co has marketed itself as being easily accessible for customers. There is, perhaps, wider incompatibility between the two businesses. The food business is characterised by quick shopping for often a limited number of items, whereas purchases in the home business, particularly of larger items, are likely to take longer and site convenience be less of an issue.

Financial aspects

Based on the predictions for future cash flows and required premiums from Matravers Co's shareholders, the acquisition would add value to Westparley Co's shareholders, if, and only if, the excess value on selling Matravers Tech and the synergies are both largely achieved. Together they add up to \$2,400m (\$558m + \$1,842m) compared with total added value of \$1,897m. There are questions about the estimates for these figures and also the estimates for the future free cash flows of the current Matravers Home business.

Synergies

Most of the additional value is due to synergies and it is difficult to see how the synergies are calculated. There is likely to be scope for some administrative savings. However, operational cost synergies appear less obvious as the two companies are operating in different retail sectors. Any synergy figures will also have to take account of costs in achieving synergies, such as store closure costs, and also commitments such as leases which may be a burden for some time. Synergies may also not be achieved because of lack of co-operation by staff or problems integrating the two businesses.

Current Matravers Home business

The suggested increase in cash flows appears doubtful for a number of reasons. If stores being closed are making positive cash flow contributions, these will have to be replaced. Whether they can be is doubtful given the problems in this part of the retail sector. It may be a more profitable use of store space to have an area for food sales, but the food sales generated in Matravers Co's shops may take business from Westparley Co's existing shops. Similarly, increased online sales may be at the expense of sales in stores.

Sale of Matravers Tech

There is no indication of how interested buyers will be in the business. The industry price-earnings (P/E) ratio used may be an average which does not reflect Matravers Tech's circumstances. It would be better to find a P/E ratio for a proxy company with similar financial and business risk. As Matravers Tech would not be listed, this would suggest a discount to the P/E ratio should be applied. Since also Westparley Co has an estimate of future free cash flow, potential buyers may be able to come up with their own estimates and base the price they are prepared to pay on their estimates.

Other assumptions

One important assumption is the 15% premium expected to be required by Matravers Co's shareholders. Other assumptions made in the calculations include operating profit margin and tax rates remaining constant and cash flows being assumed to increase to perpetuity. Incremental capital investment is assumed to be accurate. It is assumed that the cost of debt will remain unchanged and that the asset beta, cost of equity and cost of debt can be determined accurately. Given all the assumptions, Westparley Co should carry out sensitivity analysis using different assumptions and obtaining a range of values.

Conclusion

On the assumptions made, the acquisition appears to add financial value for the shareholders of Westparley Co. However, the figures are subject to a significant number of uncertainties and the strategic logic for buying the whole Matravers business appears unclear. On balance, Westparley Co may want to consider a more limited acquisition of just the out-of-town stores if these are available, as their acquisition appears to make better strategic sense.

Report compiled by:

Date

Appendix 1 Estimate of additional value created from sell-off of Matravers Tech (b) (i)

Share of pre-tax profit = $20\% \times \$1,950\text{m} = \390m

After-tax profit = $\$390\text{m} \times (1 - 0.28) = \281m

Proceeds from sell-off based on P/E ratio = $\$281\text{m} \times 18 = \$5,058\text{m}$

Excess value from sell-off = $\$5,058\text{m} - \$4,500\text{m} = \$558\text{m}$

Appendix 2 Estimate of combined company cost of capital (b) (ii)

Matravers Co asset beta = 0.75

Westparley Co asset beta

Market value of debt = $1.05 \times \$26,000\text{m} = \$27,300\text{m}$

Market value of equity = $4,000 \text{ million} \times \$8.50 = \$34,000\text{m}$

Asset beta = $1.02 \times (34,000)/(34,000 + (27,300 \times 0.72)) = 0.65$

Combined company, asset beta

Market value of Matravers Co equity = $\$12,500\text{m}$

Asset beta = $((0.75 \times 12,500) + (0.65 \times 34,000))/(12,500 + 34,000) = 0.68$

Equity beta = $0.68 ((34,000 + (27,300 \times 0.72))/34,000) = 1.07$

Combined company cost of equity = $3.5\% + (1.07 \times 8\%) = 12.1\%$

Combined company cost of capital = $((34,000 \times 12.1\%) + (27,300 \times 9.8\% \times 0.72))/(34,000 + 27,300) = 9.9\%$, say 10%

Appendix 3 Estimate of the value created for Westparley Co's shareholders (b) (iii)

Cash flows, years 1 to 4

Year	1 \$m	2 \$m	3 \$m	4 \$m
Sales revenue	43,260	44,558	45,895	47,272
Profit before interest and tax	2,596	2,673	2,754	2,836
Tax	(727)	(748)	(771)	(794)
Additional capital investment	(630)	(649)	(669)	(689)
Free cash flows	1,239	1,276	1,314	1,353
Discount factor	0.909	0.826	0.751	0.683
Present value of free cash flows	1,126	1,054	987	924

Present value years 1 to 4 = \$4,091m

Present value year 5 onwards $((\$1,353m \times 1.02)/(0.1 - 0.02)) \times 1 \cdot 10^{-4} = \$11,781m$

Total present value = \$4,091m + \$11,781m = \$15,872m

Synergies

Year	1 \$m	2 \$m	3 \$m
Free cash flows	700	750	780
Discount factor	0.909	0.826	0.751
Present value of cash flows	636	620	586

Present value of synergies = \$1,842m

Amount payable for Matravers Co's shares = \$12,500m $\times 1.15 = \$14,375m$

Value attributable to Matravers Co's investors = \$14,375m + \$6,500m = \$20,875m

Value attributable to Westparley Co shareholders = present value of cash flows + proceeds from sell-off + value of synergies – value to Matravers Co's investors

= \$15,872m + \$5,058m + \$1,842m – \$20,875m = \$1,897m

(c) Calculation of gearing

If gearing is calculated on the basis of market values, a fall in the share price will result in the level of gearing rising. Westparley Co's board may be worried about a fall in the share price given the problems affecting many companies' share prices in the retail sector and the possibility that the stock market may react adversely to the acquisition.

Directors' preferences

Directors may have their own preferences about financing. They may be able to choose a mix of sources and a level of gearing which reflects these preferences. Directors may be concerned about too high a burden of payment to finance providers, in terms of cost or ultimately repayment of debt. They may not wish to commit the company to conditions imposed by finance providers. By contrast, they may be concerned about how a change in the shareholder base as a result of a share issue may impact upon their own position. Directors may also be concerned about the impression given by their choice of finance. Pecking order theory states that equity issue is seen as the last resort for financing, so if the purchase is financed by an equity issue, it may be seen as a sign of a lack of confidence by directors that Westparley Co can sustain its current share price.

Costs and cash flows

Gearing decisions may not just be determined by their own preferences but by external conditions or constraints. Choosing more debt could lower the overall cost of capital, due to lower cost and tax relief, making investments such as Matravers Co appear more profitable. Higher levels of debt may result in the cost of equity rising, reducing the overall impact on the cost of capital. Against that, higher levels of debt mean increased finance cost commitments, even though Westparley Co may need further cash for investment in stores. This may be an important concern if interest rates are high. By contrast, dividends to shareholders do not have to be paid when returns are low or money is required for investment, although failure to meet dividend expectations may result in the board being pressurised by shareholders.

Availability

The availability of finance may also be a significant issue, particularly if an acquisition has to be completed quickly. An equity issue may take time to arrange and require shareholder approval. Sufficient debt finance may be difficult to obtain if lenders feel that Westparley Co already has significant commitments to debt finance providers. The timescale over which finance is available may be significant. Westparley Co may seek longer-term finance if existing debt finance is due to be repaid soon or if significant cash is needed for short-term investment, not just in Matravers Co's stores, but also in Westparley Co's existing stores.

Mix

Other external factors may influence the mix of finance chosen. Westparley Co's directors may be concerned about keeping the level of gearing at or below the industry average, because of finance providers becoming worried if gearing exceeds industry

levels. Keeping debt as a significant element in overall finance may act as a deterrent to acquirers becoming interested in making a bid for Westparley Co. Directors may also not have a target figure in mind but be content if gearing is within a range of values.

2 (a) Rationale for hedging policy

Within the framework of Modigliani and Miller, Boullain Co's CEO is correct in stating that a company's hedging policy is irrelevant. In a world without transaction or agency costs, and where markets are efficient and information symmetrical, hedging creates no value if shareholders are well diversified. Shareholder value may even be destroyed if the costs associated with hedging exceed the benefits.

However, in the real world where market imperfections exist, including the transaction costs of bankruptcy and other types of financial distress, hedging protects shareholder value by avoiding the distress costs associated with potentially devastating foreign exchange fluctuations.

Active hedging may also benefit debt-holders by reducing the agency costs of debt. A clearly defined hedging policy acts as a signalling tool between shareholders and debt-holders. In this sense, hedging allows for higher leverage and a lower cost of debt and reduces the need for restrictive covenants.

Communication of policy with stakeholders

Even when foreign exchange risks are hedged, the funding of variation margin payments on exchange traded futures can create financial distress. A well communicated hedging strategy allows debt providers to make informed decisions about Boullain Co's ability to service its debt.

Agency costs and the risk of financial distress also impact the expected wealth of employees who, unlike shareholders, may not enjoy the risk reduction benefits of a diversified portfolio. A consistent hedging policy reduces the risks faced by employees which may serve to benefit Boullain Co in the form of motivational and productivity improvements.

Customers and suppliers have claims on a company which create shareholder value but are conditional upon Boullain Co's survival. Suppliers may invest in production systems which create value in the form of lower costs. For customers, these claims reflect promises of quality and after-sales service levels which enable Boullain Co to charge higher prices. In both cases, shareholder value is created as long as the customers and suppliers believe these claims will be honoured. One way of achieving this is by implementing a hedging strategy and communicating it to stakeholders.

In conclusion, management should attempt to communicate the principles underlying its hedging strategy and the benefits to shareholder value in the form of reduced agency and distress costs. In this way, stakeholders can make informed decisions about the potential risks and impact on their expected wealth.

(b) Forward contract

$$\$18,600,000 \times 0.8729 = \text{€}16,235,940$$

Futures

Buy September € futures

Calculation of futures price

$$\text{Spot rate (US\$/€1)} = 1/0.8707 = 1.1485$$

$$\text{Predicted futures using spot rate} = 1.1422 + ((1.1485 - 1.1422) \times 1/7) = 1.1431$$

$$\text{Or using futures: } 1.1422 + ((1.1449 - 1.1422) \times 1/3) = 1.1431$$

Number of contracts

$$\text{Expected receipt} = \$18,600,000 / 1.1431 = \text{€}16,271,542$$

$$\text{Number of contracts} = \text{€}16,271,542 / \text{€}200,000 = 81.4, \text{ say } 81 \text{ contracts}$$

$$\text{Amount underhedged} = \$18,600,000 - (81 \times \text{€}200,000 \times 1.1431 \text{\$/€}) = \$81,780$$

$$\text{Receipt at forward rate} = \$81,780 \times 0.8729 \text{\$/€} = \text{€}71,386$$

Outcome

	€
Futures (81 x 200,000)	16,200,000
Forward market	71,386
	16,271,386

Options

September € call options

Number of contracts

$$\text{Payment} = \$18,600,000 / 1.1420 \text{\$/€} = \text{€}16,287,215$$

$$\text{Number of contracts} = \text{€}16,287,215 / \text{€}200,000 = 81.4, \text{ say } 81 \text{ contracts}$$

Premium

$$\text{Premium} = 81 \times \text{€}200,000 \times 0.0077 \text{\$/€} = \$124,740$$

$$\text{Translate at spot} = \$124,740 \times 0.8711 \text{\$/€} = \text{€}108,661$$

Amount underhedged = \$18,600,000 – (81 x €200,000 x 1.1420\$/€) = \$99,600

Receipt at forward rate = \$99,600 x 0.8729€//\$ = €86,941

Outcome

	€
Options (81 x €200,000)	16,200,000
Premium	(108,661)
Forward market	86,941
	16,178,280

Recommendation

The forward and futures contracts fix the exchange rate with the futures contract generating a slightly higher euro receipt compared to the forward. However, the futures contract is exposed to basis risk and is marked-to-market daily. The initial margin and variation margins need to be funded and would impact cash flow in the short term.

The option outcome of €16,178,280 provides a worst-case scenario based on the option being exercised. The option premium is expensive which results in a lower receipt if the option is exercised. Unlike the forward and futures contracts, however, the option allows Boullain Co to retain the upside whilst also protecting against the downside risk. Based on the forward and futures markets, the dollar is expected to strengthen and it is therefore unlikely the option would be exercised.

The final hedging choice depends on the board's attitude to risk. However, assuming there is no default risk associated with the forward contract, this may be the best choice under the circumstances. The board may also wish to consider the possibility of not hedging since the dollar is expected to strengthen.

(c) Marking-to-market

Initial margin = maintenance margin = \$3,500 x 81 = \$283,500

1 March:

$((1.1410 - 1.1422)/0.0001) \times \$20 \times 81 = \$19,440$ loss

Maintenance margin is 100% of initial margin:

Therefore variation margin = \$19,440

2 March:

$((1.1418 - 1.1410)/0.0001) \times \$20 \times 81 = \$12,960$ profit

3 March:

$((1.1433 - 1.1418)/0.0001) \times \$20 \times 81 = \$24,300$ profit

In order to reduce counter-party risk, Boullain Co deposits the initial margin of \$283,500 with the clearing house when the futures position is opened. The notional profit or loss at each day's closing settlement price is added to or subtracted from the margin account balance. If the margin account balance falls below the level of the maintenance margin, Boullain Co is required to deposit additional funds to top up the margin account.

Boullain Co makes a notional loss at the end of the first day and would therefore pay a variation margin to return the margin account to the level of the specified maintenance margin. Since Boullain Co makes a notional profit on the subsequent two days, the amount in the margin account will be greater than the specified maintenance margin and no variation margin is required. The profit on each of those days may be withdrawn in cash.

3 (a) (i) Net present value (NPV): All figures are in \$ms unless otherwise indicated

Year	1	2	3	4	5
Contribution (w1)		15.00	16.07	17.21	18.43
Fixed costs		(8.70)	(8.96)	(9.23)	(9.51)
Tax allowable depreciation		(2.40)	(2.40)	(2.40)	(2.40)
Balancing adjustment					(2.40)
Taxable profits		3.90	4.71	5.58	4.12
Taxation (20%)		(0.78)	(0.94)	(1.12)	(0.82)
Add back depreciation		2.40	2.40	2.40	4.80
Investment cost	(12.00)				
Cash flows	(12.00)	5.52	6.17	6.86	8.1
Discount factors (12%)	0.893	0.797	0.712	0.636	0.567
Discounted cash flows	(10.72)	4.40	4.39	4.36	4.59
NPV		7.02			

Workings

Working 1 (w1): Contribution

Year	2	3	4	5
Volume (000s)	3.00	3.15	3.31	3.47
Contribution per unit (\$000s)	5.00	5.10	5.20	5.31
Contribution (\$m)	15.00	16.07	17.21	18.43

(ii) Incorporating finance director's objections

Expected NPV of chief engineer's proposal:

PV of years 2–5 = \$17.74m

60% PV of years 2–5 = \$10.64m

Expected PV of years 2–5 = $(0.8 \times \$17.74m + 0.2 \times \$10.64m) = \$16.32m$

Expected NPV = \$16.32m – \$10.72m = \$5.6m

(iii) Alternative option NPV

Annuity factor (12%, t2 – t8) = $4.968 - 0.893 = 4.075$

PV of years 2–8 = $4.075 \times \$3.43m = \$13.98m$

NPV = \$13.98m – \$10.72m = \$3.26m

Therefore, it is more beneficial to follow the chief engineer's proposal.

(iv) Apply for regulatory approval or sell

Next, consider decision to sell to Gepe Co now or continue with application for regulatory approval.

NPV of sale to Gepe Co now = \$4.3m

Expected NPV = $0.7 \times \$5.6m + 0.3 \times (0.893 \times \$1.0m) = \$4.19m$

Therefore, more beneficial to sell immediately to Gepe Co.

Recommendation:

Immediate sale to Gepe Co for \$4.3 million.

Comments

Based on the chief engineer's assumptions, the project generates a positive NPV of \$7.02 million and should therefore be accepted in preference to the option to sell the concept for \$4.3 million. On the other hand, when the finance director's objections are incorporated into the appraisal, the expected NPV is only \$4.19 million and should therefore be rejected in favour of the option to sell.

It should be noted that the expected NPV of \$4.19 million is an average. In other words, it is the average NPV if the project is carried out repeatedly which may not be useful in the case of a one-off development opportunity. Based on the calculations above, there is a 30% chance that the NPV will be only \$893,000, which may pose a risk the directors are not prepared to take. The directors' attitude to risk will be an important factor in the final decision.

Furthermore, the analysis largely depends upon the values of the probabilities prescribed, the range of possible outcomes and the accuracy of the revenue and cost assumptions. Sensitivity analysis may be useful in testing the impact of variations in each of these variables on the final outcome.

- (b) Whilst Hathaway Co's investment plans are based on a detailed analysis of all cost and revenue assumptions, projects lambda and kappa highlight failings in the appraisal and implementation phases.

Capital investment monitoring

Capital investment monitoring involves reviewing the implementation of an investment project to ensure it progresses according to the original investment plan, timescale and budget. This involves assessing the risks associated with the implementation phase and identifying deviations from the investment plan so that remedial action can be taken where necessary. Controls should be established to ensure effective delivery of the project.

Effective investment monitoring may have avoided the cost overruns and time delays experienced by Hathaway Co's project lambda. The appointment of a project manager would have ensured ownership of the project and provided accountability for time delays and cost increases. The original investment plan, including cost estimates, provides a benchmark against which actual performance can be assessed. An effective monitoring system would ensure that any changes to the cost estimates would be justified and authorised. Where significant deviations are encountered, it may be necessary to terminate the project. A project steering committee would ensure greater scrutiny and accountability and oversee the implementation phase.

Post-completion audit

A post-completion audit is an objective, after the fact, appraisal of all phases of the capital investment process regarding a specific project. Each project is examined from conception until as much as a few years after it has become operational. It examines the rationale behind the initial investment decision, including the strategic fit, and the efficiency and effectiveness of the outcome. The key objective is to improve the appraisal and implementation of future capital investment projects by learning from past mistakes and successes.

An effective post-completion audit may have identified the reasons behind the failure of Hathaway Co's project kappa to achieve its forecast revenues. By comparing the actual project outcome with the original projections, an audit will examine whether the benefits claimed prior to approval ever materialise. The audit is not an academic exercise; an effective audit would identify failings and help Hathaway Co learn from past mistakes as well replicate its successes. Project kappa's principal failing seems to be the inaccuracy of the revenue assumptions. An audit would establish the reasons behind that failing and identify ways in which this can be addressed. For example, it is possible the initial assumptions failed to predict future competitor actions or the full range of potential economic scenarios. In this way, Hathaway Co's managers benefit by learning how to appraise investment proposals more accurately and implement them more efficiently than before.

(Note: Credit will be given for alternative and valid discursive comments)

		<i>Marks</i>
1	(a) 1–2 marks per relevant point (examples may include asking price, opportunity to purchase and information available is positive, herd instinct, following fashion and confirmation bias)	Max <u>6</u>
	(b) (i) Share of pre-tax profit	1
	After-tax profit	1
	Proceeds from sell-off	1
	Comparison with free cash flow valuation	<u>1</u>
		4
	(ii) Westparley Co MV debt and equity	1
	Westparley Co asset beta	1
	Combined company asset beta	1
	Combined company equity beta	1
	Combined company cost of equity	1
	Combined company cost of capital	<u>1</u>
		6
	(iii) Sales revenue	1
	Profit before interest and tax	1
	Tax	1
	Additional capital investment	1
	PV of free cash flows years 1–4	1
	PV of free cash flows year 5 onwards	2
	Present value of synergies	1
	Premium payable	1
	Value attributable to Westparley Co's shareholders	<u>1</u>
		10
	(iv) Strategic value	3–4
	Financial value	2–3
	Estimations made	3–4
	Assumptions made	<u>3–4</u>
		Max <u>12</u>
	Professional marks for part (b)	
	Report format	1
	Structure and presentation of the report	<u>3</u>
		4
	(c) 1–2 marks per relevant point (examples may include available security, available tax relief, shareholder attitude to debt, industry norms)	Max <u>8</u>
		Total <u>50</u>

		<i>Marks</i>	
2	(a) Rationale for hedging policy	3-4	
	Communication of policy with stakeholders	3-4	
	Max	<u>7</u>	
(b)	Forward	1	
	Buy September futures	1	
	Number of futures contracts	1	
	Predicted futures rate	1	
	Underhedge futures	1	
	Buy September calls	1	
	Option premium	1	
	Futures outcome	1	
	Outcome	1	
	Discussion and recommendation	2-3	
	Max	<u>11</u>	
(c)	Initial and/or maintenance margins	1	
	Daily profit or loss calculations	3	
	Explanation	3	
		<u>7</u>	
	Total	<u>25</u>	
3	(a) (i)	Contribution	2
		Fixed costs	1
		Tax (including tax allowable depreciation)	2
		NPV	1
			<u>6</u>
	(ii) Expected NPV	<u>2</u>	
	(iii)	Alternative option NPV	2
		Decision outcome	1
		<u>3</u>	
	(iv)	Decision	2
		Comments	4
		<u>6</u>	
	(b)	Capital investment monitoring:	
		Rationale	2
		Benefits	2-3
		Post-completion audit:	
		Rationale	2
Benefits	2-3		
	Max	<u>8</u>	
	Total	<u>25</u>	