

December 2012

QP Module B – Corporate Financing

Ernst & Young – Mock Exam (5 December 2012)

Suggested Answers

Question Paper	
<i>Time allowed</i>	3 hours
This paper is divided into two sections	ALL questions are compulsory
<u>Section A</u>	Case study questions
<u>Section B</u>	Essay/Short questions

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Answer 1Decline in liquidity

Comparing the two Financial positions, it is noted that BHP has suffered a fall in liquidity – cash balances have fallen sharply from \$30 million in 2011 (seems rather high) to just \$2 million in 2012 while an overdraft of \$4 million has appeared, reflecting a reduction in net cash resources of \$32 million.

However, BHP's profitability remains satisfactory, indicating that the decline in liquidity has been required to finance the acquisition of assets.

Analysis of the financial statements reveals that BHP has been able to invest its \$60 million of profits during the year to fund a substantial net increase in property, plant and equipment of \$60 million, in order to support an increase in production.

As well as an increase in property, plant and equipment, BHP has invested an extra \$16 million in inventory and a further \$20 million in accounts receivable. This substantial investment in working capital is partially offset by an increase in accounts payable (\$4 million).

As no additional external long-term finance has been raised, so the increased investment in property, plant and equipment and working capital has had to be financed by a significant reduction in cash balances and by opening a bank overdraft, reflecting the heavy net outflow of liquid resources.

Symptoms of over-trading

Over-trading is the term applied to a company which rapidly increases its turnover without having sufficient long-term capital backing.

To fuel its growth, the company may have extended too much credit to customers or invested too heavily in inventory so that cash is coming in too slowly to meet financial obligations.

BHP's figures have been checked against the common symptoms of over-trading:

- Rapid increase in turnover? BHP's turnover has been increased by 33% from 2011 to 2012.
- Fall in liquidity? BHP was, and still is, quite liquid, if not in terms of cash. The current ratio falls from $(\$90/\$40)$ million = 2.25 to $(\$98/\$48)$ million = 2.04 which is not a serious decline in liquidity, though the extent of the decline in the quick ratio from $\$[(90-28)/40]$ million = 1.55 to $\$[(98-44)/48]$ million = 1.125 might give more cause for concern, especially as the bulk of its quick assets $(\$52/\$4)$ million = 96% are in the form of accounts receivable.
- Sharp increase in asset utilisation? The sales-to-fixed assets ratio has remained steady at 1.33 (2011: $\$(240/180)$ million, 2012: $\$(320/240)$ million) because the increase in sales has been supported by an increase in fixed assets, suggesting that the output increase was well planned.

Hong Kong

- Increase in inventory in relation to turnover? This increases from \$(28/240) million = 11.67% (43 days) to \$(44/320) million = 13.75% (50 days), unusual but not dramatic.
- Increase in debtors? BHP's accounts receivable rise as a percentage of sales from \$(32/240) million = 13.33% (49 days) to \$(52/320) million = 16.25% (59 days). This does seem a significant loosening of control over accounts receivable.
- Increase in account payable period? Purchases at 50% of cost of sales rise from \$70 million to \$90 million. The ratio of accounts payable to purchases rises sharply from \$(10/70) million = 14.29% (52 days) to \$(20/90) million = 22.22% (81 days). The trade credit period is considerably longer (81 days) than the accounts receivable collection period (59 days), suggesting that the company is exploiting suppliers in order to enhance sales.
- Increase in short-term borrowing and a decline in cash balance? Clearly this has happened.
- Increase in gearing? Taking the ratio of debt-to-equity (debenture plus overdraft) as the measure, gearing has actually fallen (from \$(40/190) million = 21.1% to \$(44/250) million = 17.6%) despite the opening of the overdraft, primarily due to the increase in equity via retentions.
- Fall in the profit margin? The operating profit margin (operating profit-to-sales) actually increases slightly from \$(100/240) million = 41.66% to \$(140/320) million = 43.75%, though there is a marginal fall in the ratio of profit after tax-to-sales from \$(76/240) million = 31.67% to \$(100/320) million = 31.25%. This does not suggest that BHP is using aggressive price discounting in an attempt to increase sales.

It seems that BHP's liquidity is under pressure, but it displays by no means all the classic signs of over-trading. The company might consider issuing further long-term securities if it wishes to support a further sales surge.

If sales are expected to stabilise, the recent increase in capacity might be sufficient to produce the desired output, enabling the liquidity position to be repaired via operating cash flow, which was substantial in 2012, before allowing for financing of the capital investment.

Answer 2

The value of the two options available to BHP to speed up collection from accounts receivable can be compared as follows:

The value of discount for BHP

At end-May 2012, accounts receivable were \$52 million. The accounts receivable collection period was $\$52 \text{ million} / \$320 \text{ million} \times 365 = 59$ days.

- The 2% discount would lower this to 10 days for 50% of customers, reducing average days to collect accounts receivable to $(50\% \times 59) + (50\% \times 10) = 34.5$ days.
- Hence, average accounts receivable would become $34.5 \times \$320 \text{ million} / 365 = \30 million.
- The interest saving would be $18\% \times (52 \text{ million} - 30 \text{ million}) = \4 million per annum.
- The cost of the discount would be $(2\% \times 50\% \times \$320 \text{ million}) = \$3.2$ million.
- Hence the net benefit would be $(\$4 - \$3.2) \text{ million} = \$0.8$ million

This corresponds to about 0.6% of current operating profit.

The value of factoring for BHP

The days to collect accounts receivable would be reduced from 59 days to 45 days, i.e. 14 days. The reduction in accounts receivable would thus be $(14/365) \times \$320 \text{ million}$, i.e. \$12.3 million.

- Interest saving thereon would be $(18\% \times \$12.3) \text{ million}$, i.e. \$2.2 million.
- Administrative savings would be \$2 million.
- But service charge would be $(1.5\% \times \$320) \text{ million}$, i.e. \$4.8 million.

Net benefits would $\$(2.2 + 2 - 4.8) \text{ million}$, i.e. $-\$0.6$ million (actually an expense)

Comments

The figures from the two activities imply that the discount policy is preferable, but this relies on the appropriate percentage of customers actually taking up the discount and paying on time.

Given that, currently, days to collect accounts receivable stand at 59 days, it seems rather optimistic to expect that half of BHP's customers will be so impressed by the discount as to advance settlement by 49 days.

Conversely, the value of using the factor depends on whether the factor succeeds in lowering BHP's days to collect accounts receivable. The factors, by utilising information about customers obtained from operating the sales accounts of other firms, may also provide a more efficient collection of debts than BHP, though there may be adverse goodwill implications.

Hong Kong

Customers may resent the intervention of a (possibly heavy-handed) third party, and the knowledge that BHP is using a factor may suggest that it is suffering from liquidity problems. Since the figures imply that the discount policy is preferable and its impact on the customers is less than the introduction of a factor, it is recommended to adopt the discount policy in order to speed up the collection from customers.

Answer 3(a)

Costs and quoted prices for the GC and the EP using labour hours to absorb overheads:

	GC \$	EP \$
Materials	3,500	8,000
Labour	300hrs x \$15/hr 500hrs x \$15/hr	
	4,500 7,500	
Overheads	300hrs x \$10/hr (W1) 3,000 500hrs x \$10/hr	5,000
Total cost	11,000	20,500
Quoted price	16,500	30,750

(W1). Overhead absorption rate is calculated as \$400,000/40,000hrs = \$10/hr

Answer 3(b)

Costs and quoted prices for the GC and the EP using ABC to absorb overheads:

	GC \$	EP \$
Materials	3,500	8,000
Labour	300hrs x \$15/hr 500hrs x \$15/hr	7,500
Overheads		
- Supervisor (W2), (W3)	180	1,080
- Planners (W2), (W3)	280	1,400
- Property (W2), (W3)	1,800	3,000
Total cost	10,260	20,980
Quoted price	15,390	31,470

(W2)

	Costs	Number of drivers	Cost per driver
Supervisor	90,000	500	180
Planners	70,000	250	280
Property	240,000	40,000	6

(W3)

	Supervisor \$180	Planner \$280	Property \$6
Cost per driver (W2)			
GC	180 x 1 = 180	280 x 1 = 280	6 x 300 = 1,800
EP	180 x 6 = 1,080	280 x 5 = 1,400	6 x 500 = 3,000

Hong Kong

Answer 3(c)

The pricing policy is a matter for BHP to decide. They could elect to maintain the current 50% mark-up on cost and if they did the price of the GC would fall by around 7% in line with the costs. This should make them more competitive in the market.

They could also reduce the prices by a little less than 7% (say 5%) in order to increase internal margins a little.

It is possible that the issue lies elsewhere. If the quality of the work or the reputation and reliability of the builder is questionable then reducing prices is unlikely to improve sales. It is conceivable that BHP has a good reputation for EP but not for GC, but more likely that a poor reputation would affect all products. Equally poor service levels or lack of flexibility in meeting customer needs may be causing the poor sales performance. These too will not be 'corrected' by merely reducing prices.

It is also possible that the way salesmen discuss or sell their products for the GC is not adequate so that in some way customers are being put off placing the work with BHP.

BHP is in competition and it perhaps needs to reflect this in its pricing more (by 'going rate pricing') and not seek to merely add a mark-up to its costs.

BHP could try to penetrate the market by pricing some jobs cheaply to gain a foothold. Once this has been done the completed EP or GC could be used to market the business to new customers.

The price of the EP would also need consideration. There is no indication of problems in the selling of the EP and so BHP could consider pushing up their prices by around 2% in line with the cost increase. On the figures in my answer the price goes up for a typical extension to \$31,470 from \$30,750 a rise of \$720. This does not seem that significant and so might not lose a significant number of sales.

The reliability and reputation of a builder is probably more important than the price that they charge for a job and so it is possible that the success rate on job quotes may not be that price sensitive.

Answer 4(a)

The coupon rate on the new debt

When issuing new bond, it is usually issued at par, thus market value of RMB400m is raised and thus also the par value.

The coupon rate should be the same as the yield for four-year debt at 6%, as the investment banks suggest that at a yield of 6% (5.10% + 0.9%) that this would guarantee that the issue would be taken up by their institutional clients.

Answer 4(b)

Impact of the new debt upon the company's market valuation and its cost of debt

The issue of the new debt can only be achieved at the cost of a reduction in our company's credit rating and/or a consequent increase in its cost of debt capital. Using our current market gearing ratio the current amount of debt in issue is calculated as follows:

Gearing = 25%

Market value of equity = 75% = RMB1,200m

Thus, the existing market value of our company debt is RMB400 million. Given that the coupon (4%) and the current market yield (3.5% plus 50 basis points) are the same then the current market value is also its par value.

The yield on the new debt would be 5.1% plus 50 basis points to give 6%. If the new debt is issued at par at this yield of 6% then the market value of the existing debt will fall in line with the decrease in the company's credit rating and the consequential increase in yield to 4.4% (3.5% + 0.9%)

Coupon payment = 4% x RMB400m = RMB16m pa

Market value of existing debt

$$\begin{aligned} &= \text{RMB16m (annuity factor: } n = 3, r = 4.4\%) + \text{RMB400m } (1.044)^{-3} \\ &= \text{RMB16m } (2.754) + \text{RMB400m } (0.879) \\ &= \text{RMB395.66m} \end{aligned}$$

On the assumption that the new debt is taken up at par then the new market value of total debt in issue will rise to RMB795.66 million (RMB400m + RMB395.66m).

The firm's effective cost of debt capital is calculated by weighting the yields of the two components of debt and then adjusting for tax:

$$\begin{aligned} &[400/795.66 \times 6\% + 395.66/795.66 \times 4.4\%] \times (1 - 0.17) \\ &= 4.32\% \end{aligned}$$

Hong Kong

The firm's current cost of debt capital is $4\% \times (1 - 0.17) = 3.32\%$ so the increase in gearing will raise the firm's cost of debt capital (after tax) by 100 basis points (or 1%). However, this increase is in part due to the longer term to maturity on the new borrowing rather than the increase in the credit spread and the firm might wish to consider extending the term depending upon the yield curve and rates beyond four years.

Answer 4(c)

The advantages and disadvantages of this mode of capital financing.

Debt finance is a relatively low cost method of raising long term finance. Under traditional theory we would expect higher gearing to generate improvements in the firm's cost of capital given the benefit of the tax shield. However, the cost of debt capital consists of the risk free rate and the credit spread. In this case we are proposing to alter our capital structure by taking on longer term debt and thus the advantages of higher gearing are to a certain extent obscured.

Pecking order (in prefer order) theory suggests that debt finance should be preferred to new equity finance and is normally taken by the market as a signal that management believe that the company is undervalued. In the context of an efficient market this is doubtful but it is certainly the case that there are strong agency effects through debt. Debt will exert a greater discipline over our action than equity finance and tends to suppress opportunistic investment and over consumption of perks.

From a transactions costs perspective, debt tends to be preferred for the acquisition of general assets with high marketability and equity for intangibles and highly specific assets. In the airline business finance of this level is normally for aeroplane acquisitions which do have a reasonably active second hand market.

Answer 5(a)

Contribution per unit = $3.00 - 1.65 = \$1.35$ per unit
 Total annual contribution = $20,000 \times 1.35 = \$27,000$ per year
 Annual cash flow after fixed costs = $27,000 - 10,000 = \$17,000$ per year
 Payback period = $50,000/17,000 = 2.9$ years
 (Assuming that cash flows occur evenly throughout the year)

The payback period calculated is greater than the maximum payback period used by Edwin plc of two years and on this basis should be rejected. Use of payback period as an investment appraisal method cannot be recommended, however, because payback period does not consider all the cash flows arising from an investment project, as it ignores cash flows outside of the payback period. Furthermore, payback period ignores the time value of money.

The fact that the payback period is 2.9 years should not therefore be a reason for rejecting the project. The project should be assessed using a discounted cash flow method such as net present value or internal rate of return, since the project as a whole may generate an acceptable return on investment.

Answer 5(b)

Calculation of project net present value

Annual cash flow = $((20,000 \times (3 - 1.65)) - 10,000) = \$17,000$ per year
 Net present value = $(17,000 \times 3.605) - 50,000 = 61,285 - 50,000 = \$11,285$

Alternatively:	PV (\$)
Sales revenue: $20,000 \times 3.00 \times 3.605 =$	216,300
Variable costs: $20,000 \times 1.65 \times 3.605 =$	(118,965)
	97,335
Contribution	(50,000)
Initial investment	(36,050)
Fixed costs: $10,000 \times 3.605 =$	11,285
Net present value:	11,285

Sensitivity of NPV to sales volume

Sales volume giving zero NPV = $((50,000/3.605) + 10,000)/1.35 = 17,681$ units

This is a decrease of 2,319 units or 11.6%

Alternatively, sales volume decrease = $100 \times 11,285/97,335 = 11.6\%$

Sensitivity of NPV to sales price

Sales price for zero NPV = $((50,000/3.605) + 10,000)/20,000 + 1.65 = \2.843

This is a decrease of 15.7p or 5.2%

Alternatively, sales price decrease = $100 \times 11,285/216,300 = 5.2\%$

Hong Kong

Sensitivity of NPV to variable cost

Variable cost must increase by 15.7p or 9.5% to \$1.81 to make the NPV zero.

Alternatively, variable cost increase = $100 \times 11,283/118,965 = 9.5\%$

Sensitivity analysis evaluates the effect on project net present value of changes in project variables. The objective is to determine the key or critical project variables, which are those where the smallest change produces the biggest change in project NPV. It is limited in that only one project variable at a time may be changed, whereas in reality several project variables may change simultaneously. For example, an increase in inflation could result in increases in sales price, variable costs and fixed costs.

Sensitivity analysis is not a way of evaluating project risk, since although it may identify the key or critical variables, it cannot assess the likelihood of a change in these variables. In other words, sensitivity analysis does not assign probabilities to project variables. Where sensitivity analysis is useful is in drawing the attention of management to project variables that need careful monitoring if a particular investment project is to meet expectations. Sensitivity analysis can also highlight the need to check the assumptions underlying the key or critical variables.

Answer 5(c)

Expected value of sales volume:

$$(17,500 \times 0.3) + (20,000 \times 0.6) + (22,500 \times 0.1) = 19,500 \text{ units}$$

$$\text{Expected NPV} = (((19,500 \times 1.35) - 10,000) \times 3.605) - 50,000 = \$8,852$$

Since the expected net present value is positive, the project appears to be acceptable. From earlier analysis we know that the NPV is positive at 20,000 per year, and the NPV will therefore also be positive at 22,500 units per year.

The NPV of the worst case is:

$$(((17,500 \times 1.35) - 10,000) \times 3.605) - 50,000 = (\$882)$$

The NPV of the best case is:

$$(((22,500 \times 1.35) - 10,000) \times 3.605) - 50,000 = \$23,452$$

There is thus a 30% chance that the project will produce a negative NPV, a fact not revealed by considering the expected net present value alone.

The expected net present value is not a value that is likely to occur in practice: it is perhaps more useful to know that there is a 30% chance that the project will produce a negative NPV (or a 70% chance of a positive NPV), since this may represent an unacceptable level of risk as far as the managers of Edwin plc are concerned. It can therefore be argued that assigning probabilities to expected economic states or sales volumes has produced useful information that can help the managers of Edwin to make better investment decisions. The difficulty with this approach is that probability estimates of project variables or future economic states are likely to carry a high degree of uncertainty and subjectivity.

Answer 6(a)

The objectives of working capital management are profitability and liquidity. The objective of profitability supports the primary financial management objective, which is shareholder wealth maximisation. The objective of liquidity ensures that companies are able to meet their liabilities as they fall due, and thus remain in business.

However, funds held in the form of cash do not earn a return, while near-liquid assets such as short-term investments earn only a small return. Meeting the objective of liquidity will therefore conflict with the objective of profitability, which is met by investing over the longer term in order to achieve higher returns.

Good working capital management therefore needs to achieve a balance between the objectives of profitability and liquidity if shareholder wealth is to be maximised.

Answer 6(b)

Cost of current ordering policy of PGA Co

Ordering cost = $€250 \times (625,000/100,000) = €1,563$ per year

Weekly demand = $625,000/50 = 12,500$ units per week

Consumption during 2 weeks lead time = $12,500 \times 2 = 25,000$ units

Buffer stock = re-order level less usage during lead time = $35,000 - 25,000 = 10,000$ units

Average stock held during the year = $10,000 + (100,000/2) = 60,000$ units

Holding cost = $60,000 \times €0.50 = €30,000$ per year

Total cost = ordering cost plus holding cost = $€1,563 + €30,000 = €31,563$ per year

Economic order quantity = $((2 \times 250 \times 625,000)/0.5)^{1/2} = 25,000$ units

Number of orders per year = $625,000/25,000 = 25$ per year

Ordering cost = $€250 \times 25 = €6,250$ per year

Holding cost (ignoring buffer stock) = $€0.50 \times (25,000/2) = €0.50 \times 12,500 = €6,250$ per year

Holding cost (including buffer stock) = $€0.50 \times (10,000 + 12,500) = €11,250$ per year

Total cost of EOQ-based ordering policy = $€6,250 + €11,250 = €17,500$ per year

Saving for PGA Co by using EOQ-based ordering policy = $€31,563 - €17,500 = €14,063$ per year

Answer 6(c)

Money market hedge

PGA Co should place sufficient dollars on deposit now so that, with accumulated interest, the six-month liability of \$250,000 can be met. Since the company has no surplus cash at the present time, the cost of these dollars must be met by a short-term euro loan.

Six-month dollar deposit rate = $3.5/2 = 1.75\%$

Current spot selling rate = $1.998 - 0.002 = \$1.996$ per euro

Six-month euro borrowing rate = $6.1/2 = 3.05\%$

Dollars deposited now = $250,000/1.0175 = \$245,700$

Cost of these dollars at spot = $245,700/1.996 = 123,096$ euros

Euro value of loan in six months' time = $123,096 \times 1.0305 = 126,850$ euros

Hong Kong

Forward market hedge

Six months forward selling rate = $1.979 - 0.004 = \$1.975$ per euro

Euro cost using forward market hedge = $250,000/1.975 = 126,582$ euros

Lead payment

Since the dollar is appreciating against the euro, a lead payment may be worthwhile.

Euro cost now = $250,000/1.996 = 125,251$ euros

This cost must be met by a short-term loan at a six-month interest rate of 3.05%

Euro value of loan in six months' time = $125,251 \times 1.0305 = 129,071$ euros

Evaluation of hedges

The relative costs of the three hedges can be compared since they have been referenced to the same point in time, i.e. six months in the future. The most expensive hedge is the lead payment, while the cheapest is the forward market hedge. Using the forward market to hedge the account payable currency risk can therefore be recommended.

*** End of Mock Exam ***
(ANSWERS)