

## FIN5FMA – Tutorial 11 - Solutions

### Question One

State whether the following statement is true or false

- (a) A company's debt/equity ratio is always less than 1
- (b) The quick ratio is always less than current ratio
- (c) The return on equity is always less the return on assets

### Solution

- a. False; a firm can have more debt than equity, especially on a book-value basis.
- b. True; assuming the firm has inventory or other current assets.
- c. False; with leverage a firm can increase the return to shareholders.

### Question Two

If a firm's assets of \$10,000 represents 200 days sales, what is it annual sales. What is its assets turnover ratio?

### Solution

$$a. \quad \text{Days in sales} = \frac{\text{Total assets}}{\text{Average daily sales}}$$

$$200 \text{ days} = \frac{\$10,000}{\text{Annual sales}/365 \text{ days}}$$

$$\text{Annual sales} = \frac{\$10,000}{200 \text{ days}} \times 365 \text{ days} = \$18,250$$

$$b. \quad \text{Asset turnover} = \frac{\text{Annual sales}}{\text{Total assets}} = \frac{\$18,250}{\$10,000} = 1.825$$

### Question Three

Here are some data for five companies in the same industry.

	A	B	C	D	E
EBIT	10	30	100	-3	80
Interest Expense	5	15	50	2	1

You have been asked to calculate a measure of times-interest earned for the industry. Discuss the possible ways that you might calculate such a measure. Does changing the method of calculation make a significant difference to the end result.

### Solution

Two obvious choices are:

- a. Total industry EBIT divided by total industry interest payments:

	A	B	C	D	E	Total
EBIT	10	30	100	-3.0	80	217
Interest	5	15	50	2	1	73

$$\text{EBIT} / \text{interest} = 217 / 73 = 2.97$$

- b. Average of the individual companies' ratios:

Company	A	B	C	D	E
EBIT	10	30	100	-3.0	80
Interest	5	15	50	2	1
Times-Interest	2	2	2	-1.5	80

$$\text{Average times-interest-earned ratio} = (2 + 2 + 2 - 1.5 + 80) / 5 = 16.9$$

Clearly, the method of calculation has a substantial impact on the result. The first method is generally preferable. Here, the second method gives too much weight to Company E, which is a large firm with little debt.

#### Question Four

Listed below are some common terms of sale. Can you explain what each term means?

- (a) 2/30, net 60
- (b) 2/5, EOM, net 30
- (c) COD

#### Solution

- a. 2/30, net 60: A 2% discount is offered for payments within 30 days; otherwise, full amount due in 60 days
- b. 2/5, EOM, net 30: A 2% discount is offered for payments within 5 days of the end of the month; otherwise, full payment due within 30 days of the invoice date
- c. COD: Cash on delivery; Full amount due at time of delivery

### Question Five

Jim, the credit manager of VCL Ltd, is reappraising the company's credit policy. VCL sells on terms of net 30. Cost of goods sold is 85% of sales, and fixed costs are a further 5% of sales. VCL classifies customers on a scale of 1 to 4. During the past five years, the collection experience was as follows:

Classification	Default as Percent of Sales	Average collection Period in Days for Non-defaulting Accounts
1	0	45
2	2.0	42
3	10.0	40
4	20.0	80

The interest rate is 15%

- What conclusions (if any) can you draw about VCL's credit policy?
- What other factors should be taken into account before changing this policy?

### Solution

Consider the NPV (per \$100 of sales) for selling to each of the four groups:

Classification	NPV per \$100 Sales
1	$-\$85 + [\$100 \times (1 - 0)] / 1.15^{45/365} = \$13.29$
2	$-\$85 + [\$100 \times (1 - .02)] / 1.15^{42/365} = \$11.44$
3	$-\$85 + [\$100 \times (1 - .1)] / 1.15^{40/365} = \$3.63$
4	$-\$85 + [\$100 \times (1 - .2)] / 1.15^{80/365} = -\$7.41$

If customers can be classified without cost, then VCL should sell only to Groups 1, 2, and 3. The exception would be if non-defaulting Group 4 accounts subsequently became regular and reliable customers (i.e., members of Group 1, 2, or 3). In that case, extending credit to new Group 4 customers might be profitable, depending on the probability of repeat business.

### Question Six

In question five, assume that it costs \$95 to classify each new credit applicant and that an almost equal proportion of new applicants falls into each of the four categories. In what circumstances should Jim not bother to undertake a credit check?

### Solution

By making a credit check, VCL avoids a \$7.41 loss per \$100 sale 25% of the time. Thus, the expected benefit (loss avoided) from a credit check is:

$$\text{Benefit} = .25 \times \$7.41 = \$1.85 \text{ per } \$100 \text{ of sales, or } 1.85\%$$

A credit check is not justified if the value of the sale is less than  $x$ , where:

$$.0185x = \$95$$

$$x = \$5,135$$

### Question Seven

Fogle Manufacturing uses 2,590 switch assemblies per week and then reorders another 2,590. If the relevant carrying cost per switch assembly is \$5.75 and the fixed order cost is \$740, is the company's inventory policy optimal? Why or why not?

### Solution

The carrying costs are the average inventory times the cost of carrying an individual unit, so:

$$\text{Carrying costs} = (2,590/2)(\$5.75) = \$7,446.25$$

The order costs are the number of orders times the cost of an order, so:

$$\text{Order costs} = (52)(\$740) = \$38,480$$

The economic order quantity is:

$$\text{Economic order quantity}(EOQ) = \sqrt{2 \times \text{sales} \times \frac{\text{cost per order}}{C*PP}}$$

$$EOQ = [2(52)(2,590)(\$740)/\$5.75]^{1/2}$$

$$EOQ = 5,887.74$$

The firm's policy is not optimal, since the carrying costs and the order costs are not equal. The company should increase the order size and decrease the number of orders.

### Question eight

TMD store begins each week with 675 phasers in stock. This stock is depleted each week and reordered. The carrying cost per phaser is \$67.75 per year and the fixed order cost is \$310.

- What is the total carrying cost?
- What is the restocking cost?
- Should the company increase or decrease its order size? Describe an optimal inventory policy for the company in terms of order size and order frequency.

### Solution

The carrying costs are the average inventory times the cost of carrying an individual unit, so:

$$\text{Carrying costs} = (675/2)(\$67.75) = \$22,865.63$$

The order costs are the number of orders times the cost of an order, so:

$$\text{Restocking costs} = 52(\$310) = \$16,120$$

The economic order quantity is:

$$\text{EOQ} = [2(52)(675)(\$310)/\$67.75]^{1/2}$$

$$\text{EOQ} = 566.75$$

The number of orders per year will be the total units sold per year divided by the EOQ, so:

$$\text{Number of orders per year} = 52(675)/566.75$$

$$\text{Number of orders per year} = 61.93$$

### Question nine

The SS Bicycle Shop has decided to offer credit to its customers during the spring selling season. Sales are expected to be 700 bicycles. The average cost to the shop of a bicycle is \$650. The owner knows that only 96 percent of the customers will be able to make their payments. To identify the remaining 4 percent, the company is considering subscribing to a credit agency. The initial charge for this service is \$950, with an additional charge of \$15 per individual report. Should the company subscribe to the agency?

### Solution

If the cost of subscribing to the credit agency is less than the savings from collection of the bad debts, the company should subscribe. The cost of the subscription is:

$$\text{Cost of the subscription} = \$950 + \$15(700)$$

$$\text{Cost of the subscription} = \$11,450$$

And the savings from having no bad debts will be:

$$\text{Savings from not selling to bad credit risks} = (\$650)(700)(.04)$$

$$\text{Savings from not selling to bad credit risks} = \$18,200$$

So, the company's net savings will be:

$$\text{Net savings} = \$18,200 - 11,450$$

$$\text{Net savings} = \$6,750$$

The company should subscribe to the credit agency.

### Question Ten

Tom's Toys is currently experiencing a bad debt ratio of 6 percent. Tom is convinced that, with tighter credit controls, he can reduce this ratio to 2 percent; however, he expects sales to drop by 8 percent as a result. The cost of goods sold is 75 percent of the selling price. Per \$100 of current sales, what is Tom's expected profit under the proposed credit standards?

Expected profit under the proposed credit standards = (1-revised Bad debt ratio)\*(revised sales – cost of revised sales)- revised Bad debt ratio\* cost of revised sales

$$\text{Expected profit} = (0.98)(92 - 69) - 0.02(69) = \$21.2.$$

### Question Eleven

Terry's Place is currently experiencing a bad debt ratio of 4 percent. Terry is convinced that, with looser credit controls, this ratio will increase to 8 percent; however, she expects sales to increase by 10 percent as a result. The cost of goods sold is 80 percent of the selling price. Per \$100 of current sales, what is Terry's expected profit under the proposed credit standards?

Expected profit under the proposed credit standards = (1-revised Bad debt ratio)\*(revised sales – cost of revised sales)- revised Bad debt ratio\* cost of revised sales

Expected profit= (0.92)(110 – 88) – (0.08)(88) = 13.2.

### Question Twelve

A customer has ordered goods generating a present value of \$2,400. The present value of production costs is \$1600. Under what conditions should you extend credit if there is no possibility of repeat orders?

$$p(\$2,400 - \$1600) - (1 - p)(\$1600) = 0$$

$$p = 0.67.$$

If the probability of payment exceeds 0.67, you should extend the credit to customer.