

STRATEGIC PERFORMANCE MANAGEMENT

PROFESSIONAL 2 EXAMINATION - AUGUST 2018

NOTES:

You are required to answer **ALL** Questions.

PRESENT VALUE TABLES ARE PROVIDED

Time Allowed

3.5 hours plus **20 minutes** to read the paper.

Examination Format

This is an open book examination. Hard copy material may be consulted during this examination subject to the limitations advised on the Institute's website.

Reading Time

During the reading time you may write notes on the examination paper, but you may not commence writing in your answer booklet.

Marks

Marks for each question are shown. The pass mark required is 50% in total over the whole paper.

Answers

Start your answer to each question on a new page.

You are reminded to pay particular attention to your communication skills, and care must be taken regarding the format and literacy of your solutions. The marking system will take into account the content of your answers and the extent to which answers are supported with relevant legislation, case law or examples, where appropriate.

Answer Booklets

List on the cover of each answer booklet, in the space provided, the number of each question attempted. Additional instructions are shown on the front cover of each answer booklet.

THE INSTITUTE OF CERTIFIED PUBLIC ACCOUNTANTS IN IRELAND

STRATEGIC PERFORMANCE MANAGEMENT

PROFESSIONAL 2 EXAMINATION - AUGUST 2018

Time Allowed: 3.5 hours, plus **20 minutes** to read the paper.

You are required to answer **ALL** Questions.

**Read the following case study
and answer the questions which follow.**

Case study: ‘Mercator Group Plc’

You have recently been appointed to the board of Mercator Group Plc. The Group has been reporting profits for many years, but you are aware that it is widely regarded as one of the “underachievers” of the Irish stock market. You are determined to play your part in enabling the Group to improve its financial performance.

A colleague of yours, who has been a director of the Group for many years, has suggested to you that the problem may lie in what she calls “*inadequate pressure on divisions to achieve excellent financial performance ... in some divisions, there is virtually a tradition of achieving mediocre financial performance and then trying to convince the board that the performance is much better than it really is ... what really concerns me is that some division managers are not only getting away with it, they may even believe their own propaganda ... they may really think that they are achieving excellent financial performance even though the truth is very different*”.

Shortly after you joined the board, you arranged a series of one-to-one meetings between yourself and individual division managers. These were, in principle, “getting-to-know-you” meetings with no particular agenda, and you carefully avoided a confrontational tone. However, you took the opportunity to obtain division managers’ views on your colleague’s idea that there is not much real pressure for high performance from division managers. Somewhat to your surprise, you ascertained that many division managers (although never overtly critical of themselves or named colleagues) did acknowledge that “some divisions get away with repeatedly poor performance” and expressed surprise that such divisions did not come under more pressure from the board to improve their performance.

Following on from this series of meetings, you decided to brief the board of the Group on a number of issues arising from strategic performance management techniques used in various divisions of the company. To address these issues, you are required to answer the five questions on the following pages.

1. The **Western Division** produces and sells two quite similar products ('A' and 'B') which both require the same grade of labour and raw materials. The division manager acknowledges that the division's most recent financial year has been disappointing, and, she has provided you with what she considers to be the key financial indicators of the division's performance, as follows:

	Budget	Actual
Sales	€1,674,000	€1,284,320
Net profit	€277,000	€143,440
Market share	10%	9.2%

The division manager has said she is *"determined to look on the bright side ... sales exceeded the €1.25m barrier ... even though the total market shrank in size, nevertheless our division's market share held up fairly well ... I'm confident that I can get my superiors to look favourably on the division's performance"*.

In your judgement, a more thorough analysis of the division's performance in the most recent financial year is needed. To facilitate this, you have obtained the following detailed budget and actual data for the division:

	Budget	Actual
Units produced and sold (Product A)	78,000	55,200
Selling price per unit (Product A)	€15	€15.20
Units produced and sold (Product B)	42,000	36,800
Selling price per unit (Product B)	€12	€12.10
Raw material kilograms, per unit of Product A	2	2.1
Raw material kilograms, per unit of Product B	1.2	1.4
Direct labour hours, per unit of Product A	0.5	0.55
Direct labour hours, per unit of Product B	0.2	0.2
Raw material price per kilogram	€4	€4.10
Wage rate per direct labour hour	€11	€10.80
Fixed overheads	€50,000	€47,000

REQUIREMENT:

- (a) Present a detailed variance analysis in which you reconcile the budgeted and actual net profit of the division in as much detail as is possible from the information provided. Assume that a marginal (variable) costing system is used. (18 marks)
- (b) Critically evaluate both the performance of the division and the comments of the division manager. Illustrate your answer to this part using data from your answer to part (a) above and any other relevant information. (8 marks)

[Total: 26 Marks]

2. The **Central Division** operates a chain of retail hardware stores. For a number of years this division has been the Group's best performer in terms of turnover and profitability. One concern for the board, however, is that some other divisions, such as the Finished Goods Division (FGD) and the Components Division (C-Div), have apparently been able to get away with quite average financial performance. This is on the grounds that they are strategically important to the success of the Central Division. You are concerned that this assertion should not go unchallenged.

The FGD has been a persistent loss-maker in recent months, but justifies continued existence on the grounds that its product is in strong demand in Central Division's stores. FGD sells all its output to Central Division for €114 per unit of finished product, and Central Division has no alternative supplier. Furthermore, the manager of FGD has pointed out that FGD is a major customer for the output of (C-Div) which has been very profitable in recent months. *"In these ways", says the manager of FGD, "we are in the unfortunate position that most of our contribution to the Group's profits is reflected in other divisions' bottom lines rather than our own".*

The following specific information is available. C-Div manufactures its full capacity of 9,000 components per month. 70% of these components are sold to FGD (which manufactures one unit of its product from each component) and the other 30% are sold to external customers. Costs in each division are as follows:

	FGD	C-Div
Marginal costs	€45 per unit of finished product (plus transfer price paid for component)	€40 per component
Fixed costs	€80,000 per month	€70,000 per month

At present, FGD buys all its components from C-Div, but FGD has recently been approached by a potential external supplier who has offered to supply components of the same quality for €65 each. In addition, C-Div has been approached by one of its existing customers, who offers to buy (at a price of €62 each) all of the components which C-Div currently sells to FGD each month; €62 is also the price at which C-Div sells components to external customers at present.

REQUIREMENT:

- (a) Assess whether, from the viewpoint of the Group, it is optimal that C-Div and FGD should continue to trade with each other. Also, determine and justify the range of transfer prices which will motivate these two divisions to engage in goal-congruent behaviour in this regard. In answering this part, assume that only short-term financial considerations are relevant. (6 marks)
- (b) Calculate the profit (or loss) per month of C-Div and FGD, assuming that a transfer price of €62 per component applies to units transferred between these two divisions. (8 marks)
- (c) Assume now that it is strategically important to the Group that the Central Division should be able to source products by means of the existing supply chain. Suggest appropriate options as to what changes could be made to the current system of evaluating the performance of the other divisions, and make a clear recommendation (with justifications) as to which option(s) should be implemented. (10 marks)

[Total: 24 Marks]

3. The **Eastern Division** operates a small chain of car maintenance garages which specialise in checking customer vehicles in advance of the National Car Test (NCT). Clients are charged a flat fee for the check, and the Division also sells small replacement items (such as bulbs, windscreen wipers, etc.). However, the Eastern Division does not sell 'big-ticket' items such as tyres, so if the check reveals that these need to be replaced then the customer is advised to have such work done elsewhere.

The manager of the Eastern Division, Alice O'Regan, is proud of the fact that the division has experienced improvement (albeit on a modest scale) on what she describes as 'basic financial indicators.' These are summarised below:

	Current year	Previous year
Turnover	€517,500	€500,000
Net profit	€101,000	€100,000
Bad debts	€100	€200

The inflation rate has been 4% per annum in both the current and previous year. Alice O'Regan has stated that, from the beginning of the current year, the Division has refocused its marketing efforts to attract proportionately more vehicles which are likely to pass the NCT on the first attempt. For example, from the beginning of the current year, Eastern Division no longer checks any vehicles more than eight years old, nor does it check certain car brands which are known to have poor NCT pass rates.

With some reluctance, Alice has accepted your request to supplement the 'basic financial indicators' with a balanced scorecard. The following is an extract from that balanced scorecard:

	Current year	Previous year
Customer themes:		
Number of vehicles checked	9,000	10,000
Market share	20%	25%
% of vehicles checked which subsequently passed the NCT on the first attempt	90%	75%
Internal process themes:		
First pass yield (see note below)	89%	90%
Average test completion time	90 minutes	120 minutes
Learning & growth themes:		
Staff turnover rate	30%	20%
Training expenditure	€45,000	€40,000

* First pass yield: At the end of each vehicle check, a basic quality control analysis is carried out to confirm that the test has been properly performed (if not, the test must be repeated at no charge to the customer). The first pass yield is the percentage of vehicles where this confirmation is achieved.

REQUIREMENT:

- (a) Critically assess the performance of the Eastern Division, using only the 'basic financial indicators' above. (6 marks)
- (b) Appraise the performance of the Eastern Division as fully as possible using the extract from the balanced scorecard provided above. (10 marks)
- (c) Critically evaluate the decision to refocus the Division's marketing efforts so as to attract proportionately more vehicles which are likely to pass the NCT on the first attempt. (7 marks)

[Total: 23 Marks]

4. The **Northern Division** produces snacks which are sold at outdoor events. The selling price is €2.50 per snack. All units are produced on the day of the outdoor event (before demand is known) as the snack is a perishable food product. Any unsold snacks must be disposed of at the end of the event day, at no cost or benefit to the Division. The costs which the Division incurs are as follows:

Raw materials:	€0.80 per snack produced.
Sales commission:	€0.50 per snack sold.
Fixed costs per day:	€3,000 if 5,000 snacks per day are produced; €4,000 if 8,000 snacks per day are produced; €4,900 if 10,000 snacks per day are produced.

On the basis of past experience, the Northern Division has estimated the following probability function for the possible levels of demand on a typical event day:

Total demand (number of snacks)	5,000	8,000	10,000
Probability:	0.3	0.6	0.1

In deciding how many snacks to produce on a typical event day, the Northern Division proceeds in the following manner. First, a payoff table is developed. Second, the Division manager uses the payoff to make a decision based on the “maximin” criterion.

REQUIREMENT:

- (a) Advise as to the optimal number of snacks which the Northern Division should produce on a typical event day. (7 marks)
- (b) Critically evaluate the suggestion that ‘expected value’ would be more appropriate than ‘maximin’ as a basis for making decision, and show the additional shareholder value which would be generated if the decision were to be based on “expected value” rather than ‘maximin’. (10 marks)

[Total: 17 Marks]

5. The **Southern Division** operates a number of publishing ventures. Many of these involve products which are distributed in both physical and digital forms. For example, the Division publishes local newspapers throughout Ireland which are available in both physical form and through the Division's website. It also publishes music, both as CDs and through music streaming services. Southern Division monetises digital content by charging consumers for online access to newspapers and by charging streaming services for access to music for which Southern Division owns the rights.

The Division manager, Bob Jackson, has noticed two trends in recent years. The first is what he calls a "drift" in consumer preferences away from physical products towards equivalent digital forms. The second is harder to quantify, but consists of what Bob believes to be an increasing disinclination by consumers to pay for digital content. As regards the latter, Bob explains that the problem is not so much "piracy" in the pure sense, but rather a trend among consumers to use free websites for news content and music (rather than buy online subscriptions), and a tendency for consumers to share subscriptions (e.g., where one person purchases a digital subscription and then makes the login details available to several family members and friends).

REQUIREMENT:

Critically evaluate FOUR alternative strategies which Bob Jackson could adopt in order to protect Southern Division's total revenue and profits, given the trends identified above.

[Total: 10 Marks]

[Total: 100 Marks]

END OF PAPER

SUGGESTED SOLUTIONS

THE INSTITUTE OF CERTIFIED PUBLIC ACCOUNTANTS IN IRELAND STRATEGIC PERFORMANCE MANAGEMENT

PROFESSIONAL 2 EXAMINATION - AUGUST 2018

SOLUTION 1

(a) Sales price variance (SPV):

	Actual price (AP)	Standard price (SP)	Actual quantity (AQ)	Variance = (AP – SP) * AQ
A	€ 15.20	€ 15	55,200	€ 11,040 F
B	€ 12.10	€ 12	36,800	€ 3,680 F
				€ 14,720 F

Sales volume variance (SVV), sales quantity variance (SQV), and sales mix variance (SMV):

Sales volume variance (SVV)

Sales volume variance (SVV) – Product A:

Actual quantity (AQ)	Budget quantity (BQ)	Standard contribution per unit (SCPU)	Variance = (AQ – BQ) * SCPU
55,200	78,000	€ 15 – (2*€ 4) – (0.5*€ 11) = € 1.50	€ 34,200 U

Sales volume variance (SVV) – Product B:

Actual quantity (AQ)	Budget quantity (BQ)	Standard contribution per unit (SCPU)	Variance = (AQ – BQ) * SCPU
36,800	42,000	€ 12 – (1.2*€ 4) – (0.2*€ 11) = € 5	€ 26,000 U

Total SVV = € 34,200 U + € 26,000 U = **€ 60,200 U.**

Note: It is not essential to present the above calculation of the SVV. It is sufficient to calculate the SQV and SMV and add them together to arrive at the SVV.

Sales Quantity Variance (SQV):

- Total actual quantity = 55,200 + 36,800 = 92,000.
- Total budget quantity = 78,000 + 42,000 = 120,000.
- Standard mix = 78:42 = 0.65:0.35 between A and B.
- Budgeted weighted average contribution per unit:
= (€ 1.50 * 65%) + (€ 5 * 35%) = € 2.725
- SQV = (92,000 – 120,000) * Budgeted wtd average contribution per unit
= (92,000 – 120,000) * € 2.725 = € 76,300 U

OR:

	Actual Quantity, in standard mix [0.65:0.35]	Standard Quantity, in standard mix [0.65:0.35]	Standard contribution per unit	Variance
A:	59,800	78,000	€1.50	€27,300 U
B:	32,200	42,000	€5	€49,000 U
	92,000	120,000		Total SQV = €76,300 U

Sales Mix Variance (SMV):

	Actual Quantity, in actual mix	Actual Quantity, in standard mix [0.65:0.35]	Standard contribution per unit	[AQ in actual mix – AQ in standard mix] * Standard contribution per unit
A:	55,200	59,800	€1.50	€6,900 U
B:	36,800	32,200	€5	€23,000 F
	92,000	92,000		Total SMV = €16,100 F

Breakdown of total SQV and into market share & market size variances:

Market size variance:

Actual market size = $92,000 / 9.2\% = 1,000,000$ units.

Budget market size = $120,000 / 10\% = 1,200,000$ units.

Market size variance:

Actual market size	Budget market size	Standard share of actual market (SSAM)	Standard contribution per unit (weighted average)	Variance = (Change in market size) * SSAM * standard profit per unit
1,000,000	1,200,000	10%	€2.725	$200,000 * 10\% * €2.725 = €54,500$ U

Market share variance:

Actual units sold = 92,000 units.

Standard share of actual market (SSAM) = $10\% * 1,000,000 = 100,000$ units.

Market share variance:

Actual units sold	Standard share of actual market (SSAM)	Standard contribution per unit (weighted average)	Variance = (Actual units sold – SSAM) * standard profit per unit
92,000	100,000	€2.725	$8,000 * €2.725 = €21,800$ U

Cost variances

Raw materials price variance (RMPV): NIL

Actual price (AP) paid per kg	Standard price (SP)	Actual usage (AU) in kg	Variance = (AP - SP) * AU
€4.10 per kg	€4 per kg	$(55,200 * 2.1 = 115,920) + (36,800 * 1.4 = 51,520) = 167,440$	$€0.10 * 167,440 = €16,744$ U

Raw materials usage variance (RMUV):

Actual quantity (AQ)	Standard quantity (SQ)	Standard price (SP) per kg	Variance = (AQ – SQ) * SP
167,440	(55,200 * 2 = 110,400) + (36,800 * 1.2 = 44,160) = 154,560	€4	(167,440 – 154,560) = 12,880) * €4 = €51,520 U

Labour wage rate variance (LWRV):

Actual wage rate (AWR)	Standard wage rate (SWR)	Actual hours (AH)	Variance = (AWR – SWR) * AH
€10.80 per hour	€11 per hour	(55,200 * 0.55 = 30,360) + (36,800 * 0.2 = 7,360) = 37,720	€0.20 * 37,720 = €7,544 F

Labour efficiency variance (RMUV):

Actual hours (AH)	Standard hours (SH)	Standard wage rate	Variance = (AH – SH) * SWR
37,720	(55,200 * 0.5 = 27,600) + (36,800 * 0.2 = 7,360) = 34,960	€11	(37,720 – 34,960) = 2,760) * €11 = €30,360 U

Fixed overhead variance:

Actual FO	Budget FO	Variance
€47,000	€50,000	€3,000 F

Reconciliation:

Budgeted net profit		€277,000
Sales price variance		€14,720 F
Market size variance	€54,500 U	
Market share variance	€21,800 U	
Sales quantity variance	=====	€76,300 U
Sales mix variance		€16,100 F
Sales volume variance		=====
Raw materials price variance		€60,200 U
Raw materials usage variance		€16,744 U
Labour wage rate variance		€51,520 U
Labour efficiency variance		€7,544 F
Fixed overhead Variance		€30,360 U
		€3,000 F
Actual net profit		€143,440

- (b) The division manager's comments display a worrying complacency and a lack of ambition. Actual sales fall short of budget sales by more than 25%, yet the manager's response is simply to say that actual sales exceed a cutoff (€1.25M) which is defined ex post and is in sense the target. Similarly, it is worrying that the manager apparently regards it as "good enough" to "lose just a little" market share; it is necessary to retain and expand market share, all the more so when the market is shrinking. Finally, it is worrying that the division manager does not even mention profits, which are only just over half of the budgeted level. This indicates that there are "cost" problems as well as "revenue" problems, yet the division manager shows no awareness of these cost problems or the need to fix them.

To be fair to the manager, one of the adverse factors affecting both sales and profits is uncontrollable by the division and the manager, i.e., market size. However given the large size of this variance (€54,500 U) it is a matter of concern that there is no evidence that anything has been successfully done to offset it (e.g., by increasing market share). There is the danger than in the long run the company may decide that (if the large and unfavourable market size variance persists) then there is a solid economic case for closing the division.

Continuing with the revenue side, if the division manager wants to make a convincing case that she and her division have performed well, there are some detailed variances which support that contention. In particular, there are significant favourable variances for sales prices and also of sales mix, so the manager may well have been trying not only to achieve price growth but also shift consumer demand to the higher-contribution (but lower-priced) Product B and away from Product A. By pointing to these variances the division manager can show that she has been acting in a goal-congruent way.

On the costs side, there are unfavourable variances totalling approximately €100,000 and favourable variances totalling somewhat less than €11,000. In this light, it is perhaps not surprising that the division manager prefers to draw attention to revenues rather than costs as measures of divisional performance. But this is a difficult line of argument to sustain. A division manager is, by the nature of her job, responsible for costs as well as revenues (hence, profits) and not just revenues alone. Second, if the division manager tried to suggest that these cost overruns were uncontrollable (and hence likely to recur) then this would weaken the “economic” case for the division to be kept in operation.

Tutorial notes

Purpose of question: To ask candidates to use advanced variance analysis techniques to financially assess performance, and to identify the weaknesses in a division manager’s rather selective and limited evaluation of her division. (Syllabus Topics 2 & 3).

Options: Part (a) requires candidates to conduct the analysis in as much detail as is possible from the information provided, so there is relatively little scope for variation in that part (apart from variations in the sequence of calculations and other small differences). There is scope for variation in the specific arguments made in part (b), although the fundamental flaws of the division manager’s comments and the essential messages coming from the variance analysis must be brought out.

Essential components: Comprehensive variance analysis, including the breakdown of sales quantity/mix and market size/share, are essential in part (a). In part (b) it is essential to point out the weaknesses in the division manager’s comments and to identify the essential messages from the variance analysis.

SOLUTION 2

(a) Number of components transferred = $70\% \times 9,000 = 6,300$.

If these were NOT transferred, but sold externally instead:

- o Incremental revenue (C-Div) = $6,300 \times \text{€}62$
- o Incremental cost of components (FGD) = $6,300 \times \text{€}65$
- o Incremental cost to group = $6,300 \times \text{€}3$

Any transfer price in the range €62 to €65 is likely to motivate the two divisions to trade with other. In particular:

- o $TP > \text{€}62 \Rightarrow$ more lucrative for C-Div to sell to FGD than to the customer who is offering the €62 price.
- o $TP < \text{€}65 \Rightarrow$ cheaper for FGD to buy from C-Div than to buy from the external supplier.

(b)

	C-Div	FGD
External sales	$9,000 \times 30\% = 2,700 \text{ units} \times \text{€}62 = \text{€}167,400$	NIL
Transfer revenue	$6,300 \text{ units} \times \text{€}62 = \text{€}390,600$	$6,300 \text{ units} \times \text{€}114 = \text{€}718,200$
Total sales	€558,000	€718,200
Transfer cost paid		$6,300 \text{ units} \times \text{€}62 = \text{€}390,600$
Marginal costs, excluding transfer price	$9,000 \times \text{€}40 = \text{€}360,000$	$6,300 \times \text{€}45 = \text{€}283,500$
Fixed costs	€70,000	€80,000
Profit (loss)	€128,000	(€35,900)

(c) The problem is that FGD is (as the division manager suggest) forced to make a loss while its partners are profitable. Examples of possible options:

- Change the transfer prices between C-Div and FGD, within the acceptable range as defined in part (a). However this would be unlikely to be effective in increasing goal congruence. The figures in part (b) assume a €62 transfer price, and the acceptable range (which would facilitate goal congruence) is €62 to €65. This would imply an increase in the transfer price, thus increasing C-Div's profits and FGD's losses, this making the problem worse.
- Changing the transfer price in FGD's favour (i.e., lowering it) would remove the incentive for C-Div to engage in goal congruent behaviour. C-Div would prefer to sell externally for €62 than transfer internally for a price below this figure.
- Divisions could be "ordered" to trade with each other. However this would take away divisional autonomy and would enable divisions to claim (rightly) that their performance resulted at least partly from what they were ordered to do rather than the outcome of the division managers' choices.
- Increase the transfer price at which FGD sells to Central Division. No information is available to enable us to assess the suitability (or otherwise) of the €114 transfer price but if the product is truly "strategically important" then it is reasonable for FGD to expect to share in the profits which it generates.
- If neither its "buying" nor "selling" transfer prices can be altered, then FGD can reasonably argue that it is unable to make a profit. A different basis of performance evaluation may be appropriate, e.g., cost centre evaluation.
- Implement changes to some of the transfer pricing arrangements, e.g., FGD to receive lump-sum profit transfers (from C-Div and/or Central Division) in return for accepting or making transfers of the number of units required by the other division in that month. This can facilitate optimal levels of transfer while ensuring that all divisions are able to earn a profit.

Tutorial notes

Purpose of question: To require candidates to develop, and to identify the consequences of, a transfer pricing scheme, including identification of the necessity to change the ways in which performance is evaluated in the light of supply chain considerations. (Syllabus Topics 3 & 4).

Options: The main scope for variation comes in part (b), where a variety of suggestions for changes to the performance evaluation system will be accepted provided they are consistent with the brief defined in the question and are fully justified.

Essential components: In parts (a) and (b) it is essential that candidates provide the (largely quantitative) analysis requested with clear workings. In part (c) it is essential for candidates to make and justify appropriate and effective suggestions in line with the brief defined in the question.

SOLUTION 3

(a) Turnover: $\text{€}517,500 / \text{€}500\text{K} = 1.035 \Rightarrow 3.5\%$ increase.

Net profit: $\text{€}101\text{K} / \text{€}100\text{K} = 1.035 \Rightarrow 1\%$ increase.

Bad debts: $\text{€}100 / \text{€}200 = 0.5 \Rightarrow 50\%$ decrease.

Analysis:

- o Neither turnover nor net profit has kept pace with inflation (4%) so real growth has been negative.
- o The fact that net profit (1%) has grown much more slowly than turnover (3.5%) is especially disappointing, e.g., it may well suggest significant growth in overheads.
- o It would be wrong to attach much significance to the change in bad debts. This change is impressive in percentage terms but trivial in absolute amount, e.g., it may represent just 1 or 2 transactions.

(b) **Customer themes:**

Number of vehicles tested: Reduced by 10% (10,000 $\rightarrow$ 9,000). While the division may be “relaxed” about this (especially since it is actively discouraging some types of customer) this would be a complacent attitude since certain key underlying problems are evident (see below).

For example, average revenue per vehicle tested has increased from ($\text{€}500\text{K} / 10,000 = \text{€}50$) to ($\text{€}517,500 / 9,000 = \text{€}57.50$). Since the refocusing implies an increased proportion of newer vehicles (which are less likely to need replacement parts) this almost certainly reflects a very significant increase in the basic check fee. It is not clear that customers will accept such high prices in future periods, especially since Eastern Division accepts (in effect) only vehicles which have a high probability of passing the NCT in the first place.

Similarly the increase in % of vehicles subsequently passing the NCT is not especially impressive. Customers are likely (with some justification) to ascribe this to the fact that older (or other “problem”) vehicles are not being accepted for checking

Finally in the customer themes section, the decrease in market share (25% to 20%) is a negative indicator which the division cannot afford to be complacent about. While the division may attribute this to its attempts to turn away “unwanted” customers, the incompatibility of this goal with basic financial targets is clear.

For example it was stated in part (a) that the revenue growth was minimal and below inflation. What makes this trend even less impressive is that it occurred despite very significant growth in market size which (if managed properly) should have made it easy to add more revenues, as the following calculation of market size indicates:

Current year market size	Previous year market size	Change from previous year to current year
$\text{€}517,500 / 20\% = \text{€}2,587,500$	$\text{€}500\text{K} / 25\% = \text{€}2,000,000$	29.375% increase

(c) **Internal process themes:**

First pass yield (FPY): In one way, it is disappointing that the FPY actually decreased by one percentage point. Given the change in focus, it might be expected that vehicles would (on average) be easier to test and therefore the FPY would increase.

However, it could be that the end-of-check quality control analysis is now being done more thoroughly, so more defects are becoming evident. If this is the case then the check is redone and the probability of the vehicle subsequently passing the NCT (and the customer being satisfied) is increasing.

Average test completion time: This may reflect the fact that the selected vehicles are quicker to test given the elimination of “older” and “problem” vehicles. If so there may be a cost saving, although there is no evidence of this yet in the basic financial indicators.

Learning & growth themes:

Staff turnover rate: It is a matter of concern that this has increased by half, as the skill levels and productivity of individual staff members are likely to increase with experience. This may be a major cause of the very disappointing growth in profits as indicated in part (a).

Training expenditure: One interpretation is that the €5K increase (€40K → €45K) arises as a consequence of the high staff turnover rate, as new staff members require training in the division's procedures. If staff turnover were to stabilise, then it would be easier to attribute an increase in training expenditure to an investment in improving the skill levels of long-serving staff and this would bring benefits in the long term.

Tutorial notes

Purpose of question: To require candidates to carry out a detailed analysis of a performance measurement model, including both financial and nonfinancial metrics, and consisting principally of balanced scorecards which are provided in the question. (Syllabus Topic 4).

Options: There is considerable scope for variation in the points made, especially in answering Requirement (b), although the essential components indicated below must be provided.

Essential components: Candidates must carry out the analysis using the “basic financial indicators” in part (a) and in particular must point out (i) the disappointing nature of the trend in turnover and net profit and (ii) the fact that, having regard to materiality, bad debts are not a significant indicator in this case. In part (b) it is essential to identify the fundamentally disappointing underlying trends in relation, and the somewhat more ambiguous patterns in relation to the other themes.

SOLUTION 4

(a) Payoff table:

	Demand = 5,000	Demand = 8,000	Demand = 10,000
Produce 5,000	$(€2.50 * 5,000) -$ $(€0.80 * 5,000) -$ $(€0.50 * 5,000) -$ $€3,000$ $= €3,000$	$€3,000$	$€3,000$
Produce 8,000	$(€2.50 * 5,000) -$ $(€0.80 * 8,000) -$ $(€0.50 * 5,000) -$ $€4,000$ $= \text{Minus } €400$	$(€2.50 * 8,000) -$ $(€0.80 * 8,000) -$ $(€0.50 * 8,000) -$ $€4,000$ $= €5,600$	$€5,600$
Produce 10,000	$(€2.50 * 5,000) -$ $(€0.80 * 10,000) -$ $(€0.50 * 5,000) -$ $€4,900$ $= \text{Minus } €2,900$	$(€2.50 * 8,000) -$ $(€0.80 * 10,000) -$ $(€0.50 * 8,000) -$ $€4,900$ $= €3,100$	$(€2.50 * 10,000) -$ $(€0.80 * 10,000) -$ $(€0.50 * 10,000) -$ $€4,900$ $= €7,100$

Maximin $\Rightarrow$ Division will produce 5,000 snacks on a typical event day ($\Rightarrow$ guaranteed payoff at least €3,000).

(b) Critical evaluation:

Expected value is an appropriate criterion for maximising the long run average (and total) value of a repeated decision.

Northern Division seems to be in exactly this situation, taking the same decision (about how many snacks to produce) on each event day. Therefore, the division can maximise its long-run payoff by concentrating on maximising the average payoff on each event day, and following the expected value rule will enable it to do that.

The maximin approach which is currently used, is effective for maximising the worst possible payoff on a specific day. But this is suboptimal because of the focus on a specific day; it does not maximise the overall payoff from repeated decisions on repeated event days

Additional shareholder value from using EV rather than maximin:

EV (Produce 5,000) = €3,000.

EV (Produce 8,000)
 $= (\text{MINUS } €400 * 0.3) + (€5,600 * 0.6) + (€5,600 * 0.1) = €3,800.$

EV (Produce 10,000)
 $= (\text{MINUS } €2,900 * 0.3) + (€3,100 * 0.6) + (€7,100 * 0.1) = \text{MINUS } €1,700.$

Hence:

- o To maximise shareholder value $\Rightarrow$ Produce 8,000 $\Rightarrow$ EV = €3,800.
- o With maximin $\Rightarrow$ Produce 5,000 $\Rightarrow$ EV = €3,000
- o Extra shareholder value from switching to EV basis = €3,800 - €3,000 = €800.

Tutorial notes

Purpose of question: To require candidates to demonstrate an ability to measure and manage uncertainty, including application of the “maximin” and “expected value” techniques and a critical evaluation of the suggestion that “expected value” is more appropriate in the specific circumstances of this division (Syllabus Topic 1).

Options: There is some scope for variation in the layout of calculations in both parts, although this scope is limited by the fact that the question is quite specific as to what is required. In Requirement (b), there is some limited scope for explaining why EV is more appropriate than maximin in this particular case.

Essential components: As regards calculations, candidates must carry out the necessary calculations for the payoff table, maximin, expected value, and increase in shareholder value. Also, it is essential that in part (b) candidates' explanation as to why EV is more appropriate should refer to the specific circumstances of this case (especially the repeated nature of the decision) and should not consist simply of a “generic” defence of EV.

SOLUTION 5

Four alternative strategies:

- Attempt to resist or reverse the “drift” of consumers towards digital (and away from physical) content. There is some evidence that this is possible and may already be happening spontaneously, e.g., with sales of e-books having apparently peaked and sales of paper books now increasing at the expense of e-books.

However this is more of an “industry trend” which it may be difficult for an individual firm or division to encourage to any significant degree. In principle Southern Division could make a decision to make its products available in physical forms only, but this would be very risky. In particular, customers who prefer digital content may forego Southern’s content altogether; there is no guarantee that they will revert to the paper versions.

- Attempt to derive revenue streams in a different way rather than by charging subscriptions. For example, many news websites and music sites have a “free-at-the-point-of-use” model, and they make their money through advertising. The fact that the websites are free to use increases the web traffic volume, which in turn increases the scope for generating significant advertising revenues.

In principle a website might try to generate advertising and subscription revenue, but this may not be acceptable to paid subscribers.

- Adopt technological solutions to limit the ability of consumers to undermine the subscription model. For example many sites (Netflix; Google Play Music; etc) allow only one device at a time to use a single subscription to a paid service (unless a premium subscription has been purchased). This increases the likelihood that multiple users will each buy their own subscriptions.

- Focus on markets for digital products where buyers are more likely to abide by the terms of the subscription. For example, many digital publishers sell “institutional subscriptions” to bodies such as libraries, and this has several advantages from the publisher’s point of view. First, typically a maximum number of users (who must be logged in to the library website) can avail of the subscription at any one time, and this limit is rigidly imposed by the library software. Second, the institution will typically pay an institutional subscription rate commensurate with the number of users, albeit one which also reflects an institutional discount. Third, libraries and other institutions typically subscribe to both digital and printed versions of the same publications, so there is a “double revenue stream” for the publisher

Probably the main limitation of this solution is that it is likely to be limited in scope. First, the number of libraries and other institutions is relatively small compared to the whole population. Second, libraries are typically only interested in certain types of publications (e.g., they are unlikely to subscribe to celebrity-focused magazines) so the suitability of this solution depends on the nature of Southern Division’s publications.

Tutorial notes

Purpose of question: To require candidates to explore the implications of developments in information technology and e-commerce (Syllabus Topic 5), with particular reference to a division attempting to protect its revenue and profit streams.

Options: A variety of options is acceptable in answer to this question, subject to the “essential components” below

Essential components: Candidates need to identify four alternative strategies which would enable this division to protect its revenue and profit streams in the specific circumstances outlined, and to critically evaluate those strategies.