

STRATEGIC PERFORMANCE MANAGEMENT

PROFESSIONAL 2 EXAMINATION - APRIL 2017

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

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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: 'Colour Group Plc'

John Sullivan was recently appointed CEO of Colour Group Plc - a large divisionalised company formed by the merger of several previously independent companies. On becoming CEO, John spent a number of weeks on what he calls a "meet and greet tour", in which he visited each of the company's divisions for two days to get to know management and other staff, as well as the business. He told you *"I also wanted to get a feel for how well or badly each division is being run, and to watch for signs of any 'lame ducks' among the divisions that might not be paying their way or where a change of manager might be needed"*.

Subsequently John contacted you, as a newly qualified CPA, to ask for your assistance in what he called *"bringing things to the next stage"*. He told you that you have two advantages which he does not possess. The first is your professional accounting background and the capacity for analytical rigour with which it provides you. The second is your lack of any previous involvement with Colour Group Plc, which gives you what John calls *"a detachment, and an ability to be brutal where necessary, which I don't have as a hands-on CEO"*.

After a long conversation with John about the impressions which he formed during his "meet and greet tour", you met with each divisional manager individually. These were more formal and structured than the meetings which John had with the same people, and often involved the divisional managers explaining their performance management systems to you and demonstrating them through accompanying documentation and procedures. After conducting these meetings and reflecting on the outcomes, you requested a follow-up meeting with John so that both of you could determine how to proceed.

At this follow-up meeting you told John: *"The good news is that each of the divisions is being fairly competently run and is generating significant shareholder value. A programme of divestments or firing divisional managers is neither necessary nor advisable. However, in many cases there is scope for a much more rigorous approach on the part of those managers. In quite a few cases, it seems that they are relying on experience, intuition, and textbook knowledge. That approach can result in 'adequate' performance, at least for a while, but I've come across instances where a more analytical approach is possible and would be effective. For example, I've met one division manager who told me that 'my transfer pricing system isn't working but I don't know why'. This type of difficulty could lead to serious recurring underperformance if left unchecked, but in fact there's a lot that can be done to help managers improve the quality of performance management and this will ultimately lead to better financial results"*.

To facilitate the roll-out of this revised approach, John has asked you to begin by addressing issues in a number of divisions as outlined in Questions 1 to 5 on the following pages.

1. The Red Division develops bespoke computer software under contract for customers. The division operates in a “competitive bidding” environment. Specifically, each time a customer needs to commission the development of new software, the customer invites the Red Division to submit a sealed bid stating a fixed price at which the division would be willing to complete the work. If awarded the contract, the division is obliged to complete the work at the fixed price.

Before setting a bid price, the division estimates the likely cost of completing the work. Based on its past experience, the division has developed the following table to indicate the relationship between the division’s estimate of costs and the actual cost of fulfilling contracts:

	Probability
Costs underestimated by 30%	0.2
Costs estimated correctly	0.6
Costs overestimated by 30%	0.2
Total	1.0

It can be assumed that, each time it bids for contracts, the Red Division has only one competitor (Opaque Ltd) which similarly submits a sealed bid stating a fixed price at which it would be willing to complete the work. Opaque Ltd has the same degree of cost estimation error as the Red Division as shown in the table above. Both the Red Division and Opaque Ltd add the same markup percentage (25%) to their cost estimates in arriving at a bid price. It is believed that customers regard the Red Division and Opaque Ltd as providing work of similar quality and consequently award each contract to whichever bidder offers the lower price.

REQUIREMENT:

- (a) The manager of the Red Division has observed that, on average, the actual profit which it earns on software development contracts is substantially less than the 25% markup which it adds to estimated costs when setting the sealed bid prices. Prepare a detailed analysis to show why this is so. (10 marks)
- (b) Prepare calculations to indicate the profit markup which, if added to estimated costs by both bidders (Red Division and Opaque Ltd), would result in the winner achieving an average actual profit of 18% of the actual cost of developing the software. (4 marks)
- (c) The manager of the Red Division believes that the number of competitors will increase significantly over the next two years. He believes that this will make it more difficult for the Red Division to win contracts and will adversely affect profit margins actually achieved, as it will increase the potential for being undercut on price by a competitor which underestimates its costs.

As a way of dealing with this intensified competition, the manager of the Red Division is considering refusing to take part in “sealed bid” processes and instead insisting that customers agree to reimburse actual costs plus an agreed percentage. Critically evaluate this suggestion. Identify and justify more effective responses for dealing with the new competitive situation.

(8 marks)

[Total: 22 Marks]

2. The Blue Division manufactures and sells a food product. A long-established recipe exists for the product and is reflected in the standard cost card. However, it is possible to depart from this recipe somewhat for cost or marketing reasons. The principal cost in the manufacturing process is for the three raw materials used. The following standard cost card shows the following inputs for the manufacture of 30 kilograms of the product:

Raw material type	Amount	Standard price		Cost
A	24 kilograms	@ €9 per kilogram	=	€216
B	10 kilograms	@ €6 per kilogram	=	€60
C	6 kilograms	@ €3 per kilogram	=	€18
Totals	40 kilograms			€294

Last month's production yielded a total of 4,200 kilograms of output and the following raw material inputs were used:

Raw material type	Input amount	Actual price		Cost
A	3,900 kilograms	@ €8.50 per kilogram	=	€33,150
B	1,320 kilograms	@ €6.50 per kilogram	=	€8,580
C	780 kilograms	@ €3.00 per kilogram	=	€2,340
Totals	6,000 kilograms			€44,070

The division's variance analysis system reports only two types of variances in relation to raw materials, namely raw materials price and raw materials usage variances.

REQUIREMENT:

- (a) Based on the information provided construct the division's variance analysis report and (without preparing further calculations) critically evaluate why the materials usage variance is of only limited usefulness in assessing the division's performance in relation to raw materials efficiency. (9 marks)
- (b) Recommend and justify how the division should expand its variance analysis in relation to raw materials. Your answer should include calculations (for last month) of the additional variances which you recommend and a detailed interpretation of their significance. (9 marks)
- (c) Evaluate how else the division might regularly assess the consequences of its decisions in relation to the purchase, use, and mixing of raw materials. Justify your answer in detail. Calculations are not required. (6 marks)

[Total: 24 Marks]

- 3.** The Green Division consists of a number of autonomous profit centres. Some of these profit centres manufacture various types of components while other profit centres manufacture finished consumer products (FCPs). In accordance with what he believes to be best economic practice, the division manager Jim Cox has decreed that the transfer price which applies when components are sold to a FCP profit centre should be the marginal cost of the component (up to the point of transfer) plus the opportunity cost of making the transfer. In recent months, however, Jim has received complaints from the managers of FCP profit centres that the managers of components profit centres have frequently refused to make any components available for transfer, even though spare production capacity exists in the components profit centres. Jim has said "I'm very surprised to hear of this non-cooperation, especially since the transfer pricing rule which I have decreed is the 'optimal' one according to the economics textbooks".

REQUIREMENT:

- (a)** Evaluate the likely reasons for the behaviour identified above, i.e., the refusal of the managers of components profit centres to make any components available for transfer even where spare production capacity exists in the components profit centres. (4 marks)
- (b)** Critically assess in detail, the range of options available to Jim Cox in order to increase the likelihood that the components profit centre managers will behave in a goal congruent way in relation to making components available for transfer. (15 marks)
- (c)** John Sullivan believes that Jim Cox himself may sometimes engage in behaviour which is not goal congruent, and that the performance evaluation system in use may be to blame. As an example, John cites the instance where (in the last week of the most recent financial year) Jim sold trade receivables with a book value of €500,000 to a factoring agency at a discount of €20,000 and immediately remitted the cash proceeds to Colour Group Plc's headquarters. John Sullivan notes that there was no likelihood of any of these debts turning "bad" and that (had the factoring not taken place) the €500,000 could have been collected in full in the normal course of business one month later. Jim receives a fixed annual bonus in a year when the Green Division reaches or exceeds a target level of Residual Income.

Critique the likely reasons why Jim engaged in this behaviour, and recommend and justify changes which John should consider making in terms of Jim's performance is measured and rewarded.

(6 marks)

[Total: 25 Marks]

4. The Grey Division operates a number of manufacturing plants, each of which is evaluated as a profit centre. The division manager has encouraged each plant manager to improve plant utilisation and efficiency by paying particular attention to improving quality and eliminating idle time. However, the Grey Division manager has expressed the view that “this may have gone too far; it’s not clear that cost-benefit considerations have been taken into account sufficiently”. As an example, you are provided with information about the division’s Dublin Manufacturing Plant (DMP) as follows.

DMP manufactures a single product which sells for €24 per unit. When a new plant manager, Ann Fisher, was appointed last January, she observed that output was 15,000 units per month and that 20% of all units produced failed quality control tests and had to be repaired before sale. Each unit produced required 3 machine hours (MH) and 0.75 kilograms of raw material, and each unit repaired required an additional 1.5 MH and 0.3 kilograms of raw material. There is no direct labour input for production or repair. Raw materials are available for purchase in any desired quantity at a cost of €4 per kilogram. Variable overhead costs are €5 per MH worked.

Ann subsequently paid €150,000 to a firm of consultants who significantly reorganised the plant. The consequences of this reorganisation were:

- The percentage of products failing quality control tests was halved.
- Machine times were reduced to 2.4 MH per unit produced and 1.4 MH per unit repaired.

In addition, although machine capacity was believed to be fully utilised each month (both before and after the reorganisation) one consequence of the reorganisation was that 1,300 previously idle MH were brought into use.

REQUIREMENT:

Identify and evaluate the costs and benefits to the division arising from the consultants' reorganisation of the DMP. Your analysis should include (but not be limited to) appropriate calculations.

[Total: 17 Marks]

5. The Yellow Division operates a small chain of retail fashion stores. Goods are sold in three ways, namely (1) “walk-in” transactions at tills in the division’s stores; (2) “click-and-collect” where the customer orders and pays online and later collects the goods in-store; and (3) “home delivery” where the customer orders online and receives a subsequent home delivery.

The division manager recently commissioned a benchmarking exercise in relation to the “realisation costs” for various types of customer transaction. These realisation costs include the costs to the Yellow Division of accepting and processing payment and of delivery of merchandise to store or to the customer’s home, if applicable. An activity based analysis was carried out within the Yellow Division and the results were compared with realisation costs per transaction in both Shadow Stores (a direct competitor with a reputation for cost efficiency) and in the fashion retailing sector generally (as estimated from publicly-available data). The realisation costs for each type of transaction were found to be as follows:

Sales Type	Yellow Division	Shadow Stores	Sector Average
“Walk-in” transaction	€0.25	€0.20	€0.27
“Click-and-collect”	€0.15	€0.18	€0.19
“Home delivery”	€1.50	€1.40	Not known

Yellow Division, Shadow Stores, and most other firms in the sector do not impose any charges on the customer for “click-and-collect” or “home delivery” transactions. However, some retailers accept “click-and-collect” or “home delivery” orders only if they are above a certain minimum transaction value, as follows:

Sales Type	Yellow Division	Shadow Stores	Sector Average
“Click-and-collect”	No minimum	€10 minimum	€8 minimum
“Home delivery”	€30 minimum	€25 minimum	Not known

REQUIREMENT:

Recommend to the Yellow Division manager the actions that should be taken in response to the results of the benchmarking analysis. Your answer to this part should include a detailed response to the suggestion that the Yellow Division should impose a minimum spend for “click-and-collect” transactions while simultaneously reducing its minimum spend for “home delivery” transactions.

[Total: 12 Marks]

[Total: 100 Marks]

END OF PAPER

SUGGESTED SOLUTIONS

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SOLUTION 1

(a) Expected profit margin of successful bidder:

Let "Emin" be the lowest estimate of cost made by any bidder. There are three possible values which "Emin" could take:

Emin = 0.7. This would happen if (i) Red Division underestimated by 30% AND Opaque either estimated costs correctly or overestimated cost by 30%, or (ii) Opaque underestimated by 30% AND Red Division either estimated costs correctly or overestimated cost by 30%, or (iii) both Red Division and Opaque underestimated costs by 30%. HENCE:

$$P(\text{"Emin"} = 0.7) = (0.2)(0.8) + (0.8)(0.2) + (0.2)(0.2) = 0.36.$$

Emin = 1.0. This would happen if (i) Red Division estimated costs correctly AND Opaque overestimated cost by 30%, or (ii) Opaque estimated costs correctly AND Red Division overestimated cost by 30%, or (iii) both Red Division and Opaque estimated costs correctly. HENCE:

$$P(\text{"Emin"} = 1.0) = (0.6)(0.2) + (0.2)(0.6) + (0.6)(0.6) = 0.6.$$

Emin = 1.3. The only circumstances where this can happen is if BOTH Red Division and Opaque overestimate cost by 30%. HENCE:

$$P(\text{"Emin"} = 1.3) = (0.2)(0.2) = 0.04.$$

Hence:

$$EV \text{ of Emin} = (0.36)(0.7) + (0.6)(1) + (0.04)(1.3) = 0.904.$$

Expected profit earned by successful bidder

$$= \text{Bid price} - \text{True cost ["TC"]}$$

$$= (\text{Estimated cost plus 25\% markup}) - TC$$

$$= (TC * 0.904 * 1.25) - TC$$

$$= 0.13TC$$

i.e., 13% of true cost.

- (b)** Profit markup required for an actual profit of 18% of actual cost:

$$\text{Bid price} = 1.18\text{TC}$$

$$\Rightarrow \text{Estimated cost ["EC"]} * (1 + \text{markup}) = 1.18\text{TC}$$

$$\Rightarrow \text{TC} * 0.904 * (1 + \text{markup}) = 1.18 \text{ TC}$$

$$\Rightarrow (1 + \text{markup}) = (1.18 / 0.904)$$

$$\Rightarrow \text{markup} = (1.18 / 0.904) - 1$$

$$\Rightarrow \text{markup} = 0.305$$

i.e., 30.5% of estimated cost.

- (c)** It is not realistic to expect the customer to switch from “sealed bid” to “cost reimbursement” contracts. This would pass all the risk on to the customer, and the customer has no need to accept this risk.

An increase in the number of bidders does increase the risk of being undercut. To offset this and to maintain the same average actual margins as at present, all firms would need to increase the “markups on estimated cost” (as per part [b]). However this may not be feasible for individual firms as there is no guarantee that other bidders will similarly increase their markups on estimated cost.

Another solution which Red Division could engage in without cooperation from competitors is to invest in a more accurate costing system. This would increase Red Division’s average actual profit margins by reducing the average discrepancy between estimated costs (on which bid prices are based) and actual costs.

The increase in risk may be less than it first appears, because Red Division and its existing competitor may enjoy a reputational advantage over new competitors. This may lead to a situation where Red Division (and its existing competitor) win contracts from customers even where new competitors offer lower prices.

Tutorial notes

- Purpose of question: To require candidates to manage uncertainty in business context, including identification of how the expected value principle can be applied to help a firm manage its response to a particular competitive environment (Syllabus Topic 1).
- Options: There is scope for variation within the detailed calculation procedures required in parts (a) and (b) and a variety of valid points could be made in answer to part (c).
- Essential components: Candidates need to be able to select and apply the appropriate techniques to answer parts (a) and (b). In part (c) it is essential that candidates recognise that the intensified competition poses an increased risk and puts downward pressure on profit margins. It is also essential that candidates recognise that “cost reimbursement” rather than “sealed bid” is not a viable alternative contracting model, and that candidates identify viable alternative responses to these business pressures.

SOLUTION 2

(a) Materials Price Variance = $[AP - SP] * AQ$

A	$[\text{€}8.50 - \text{€}9] * 3,900 \text{ kg.}$	=	€1,950 F
B	$[\text{€}6.50 - \text{€}6] * 1,320 \text{ kg.}$	=	€660 U
C	$[\text{€}3 - \text{€}3] * 780 \text{ kg.}$	=	NIL
TOTAL		MPV =	€1,290 F

Materials Use Variance (MUV)

Raw Material	Actual Quantity	Standard Quantity	Standard Price	MUV = $[AQ - SQ] * SP$
A	3,900	$4,200 * (24/30) = 3,360$	€9	€4,860 U
B	1,320	$4,200 * (10/30) = 1,400$	€6	€480 F
C	780	$4,200 * (6/30) = 840$	€3	€180 F
	6,000 kg.	5,600 kg.		€4,200 U

Critical evaluation:

The materials price variances are net favourable (€1,290) but this is more than outweighed by the unfavourable materials use variance of €4,200. At a very general level, we might speculate that the unfavourable MUV may be due to the “downstream consequences” of buying lower-priced raw materials. However, it is difficult to be specific about this because the unfavourable MUV can be due to either of (or a combination of) two different causes. It could be that, because of the poor quality of the cheap raw materials purchased, a higher-than-expected proportion of the raw materials purchased were “lost” in the production process. Another possibility is that there was a deliberate (or inadvertent) shift towards using a more expensive mix of raw materials than is used in the product recipe.

(b) An analysis of the materials use variance into its yield and mix elements will provide the additional insights referred to in part (a) above, as the following calculations show:

Materials Mix Variance (MMV):

Raw Material	Actual Quantity in Actual Mix	Actual Quantity in Standard Mix [24:10:6]	Standard Price	MMV = $[AQ \text{ in Actual Mix} - AQ \text{ in Standard Mix}] * \text{Standard Price Per Kg.}$
A	3,900	3,600	€9	€2,700 U
B	1,320	1,500	€6	€1,080 F
C	780	900	€3	€360 F
	6,000 kg.	6,000 kg.		€1,260 U

Materials Yield Variance (MYV):

- Actual Yield (AY) = 4,200 kg.
- Standard Yield (SY) = $6,000 \text{ kg.} * (3/4) = 4,500 \text{ kg.}$
- Standard RM cost per kilogram of OUTPUT = $[\text{€}294 / 30 \text{ kg.}] = \text{€}9.80.$

$$\begin{aligned}
 \Rightarrow \text{MYV} &= [AY - SY] * [\text{Standard RM cost per kilogram of OUTPUT}] \\
 &= [4,200 - 4,500] * \text{€}9.80 \\
 &= \text{€}2,940 \text{ U.}
 \end{aligned}$$

Note: Alternative calculation of MYV:

	Actual Quantity in standard mix	Standard Quantity, in standard mix	Standard price per kg.	[AQ in standard mix – SQ in standard mix] * Standard price per kilogram
A	3,600	$4,200 * (24 / 30) = 3,360$	€9	€2,160 U
B	1,500	$4,200 * (10 / 30) = 1,400$	€6	€600 U
C	900	$4,200 * (6 / 30) = 840$	€3	€180 U
	6,000 kg.	5,600		Total MYV = €2,940 U

Interpretation:

There are significant yield and mix variances in this case and both are unfavourable. The MYV is the bigger of the two and may indicate a deliberate attempt to apply rigorous standards in production (with no substandard raw material making it into the finished product) or production inefficiencies. The MMV shows a significant change in mix towards using the most expensive raw material. This may have been a matter of deliberate strategy (e.g., to maintain or improve product quality) although the manager should verify that it was a conscious choice and not a costly inadvertent mixing error.

- (c) There have been cost overruns in all areas of raw materials (price, mix, and yield). The company should look for evidence that these are justified through benefits elsewhere in the value chain (especially favourable selling price variance and favourable market share variance). If these are not present, or are less than the unfavourable cost variances, then it seems that the company is incurring extra costs which are not justified in cost-benefit terms.

The company may also choose to use nonfinancial metrics in relation to issues relating to raw materials and suppliers. For example, a switch to more reliable but more expensive suppliers may lead to unfavourable raw materials price variances in the short term with the benefits (in terms of improved quality and bigger market share) not becoming apparent in the financial metrics until later.

Tutorial notes

- Purpose of question: To require candidates to appraise, implement, and extend a variance analysis system in a manufacturing setting, including reference to the need to combine financial and nonfinancial metrics (Syllabus Topics 2 and 4).
- Options: Calculations may validly be laid out in a variety of ways in answers to parts (a) and (b). Various alternative points are acceptable in answer to part (c).
- Essential components: Candidates need to have a thorough knowledge of variance analysis in order to provide the calculations required and assess the information content as required by all three parts of the question. Also it is essential that candidates demonstrate knowledge that variance analysis needs to be detailed (including mix, yield, and interaction effects between materials costs and sales variances) and that it may need to be supplemented by other types of performance measure.

SOLUTION 3

- (a) Where spare capacity exists, the opportunity cost of making the transfer is nil. Therefore, the transfer price is simply the marginal cost incurred by the components division up to the point of transfer.

From the components profit centre's point of view, the transfer price (received) equals the marginal cost (incurred). There is no benefit to the components profit centre from making the transfer, and the components profit centre may feel aggrieved that the transfer price paid by the FCP profit centre is not making any contribution to the profit of the components profit centre or even covering its fixed costs.

- (b) Remedies open to Jim Cox (with critical evaluation):

- Increase the transfer price so that it includes a positive contribution on each unit to the components profit centre. This gives the components profit centre a positive incentive to make components available for transfer. However, by increasing the cost of the component to the FCP (above the incremental cost to the division), it would be likely to reduce the FCP's demand for the component below the level which be optimal for the division as a whole).
- Require the components profit centre to transfer on the basis of the existing transfer pricing formula. However this would take away the autonomy of the component profit centres and would provide them with a plausible argument that they are not free to act as they see fit and that they cannot therefore be held fully accountable for their profits.
- Use a dual pricing structure, so that the components profit centres would receive per-unit reimbursement of the marginal cost (as per the existing transfer price) and a fixed monthly sum provided that the components profit centre supplied the FCP profit centre with as many components as the FCP required (subject to the limit of the amount of components that could be produced using spare capacity). The income from the fixed sum would provide the components profit centre with a guaranteed contribution to its fixed costs and/or profits and would therefore provide it with the incentive to make components available for transfer. The arrangement would also motivate the FCP profit centres to demand the "goal congruent" number of components for transfer, since the marginal cost payable by the FCP profit centres would be the marginal cost incurred by the division as a whole.
- Change the basis of performance evaluation so that the components profit centres would be evaluated as cost centres, i.e., evaluated in terms of their efficiency in relation to cost control and not in terms of profit targets. This seems sensible in the sense that the existing transfer price makes it impossible for the components profit centres to make a profit (or even a positive contribution) on transferred units where spare capacity exists. However this is not a feasible solution in cases where other components are sold at a profit (e.g., to external customers) and is expected to earn profits from doing so.
- Another solution may lie in recognizing and rewarding the "joint" nature of profits when a components profit centre manufactures a component which is then built into a finished consumer product by a FCP profit centre which sells the finished product to a customer. The full amount of the contribution from this sale is the price paid by the customer minus the incremental costs to the organization incurred in the two profit centres. Where spare capacity exists in the components profit centre, the effect of the existing transfer pricing mechanism is to credit all of this contribution to the FCP profit centre and none to the components profit centre. One solution is to credit both profit centres with the full amount of the contribution from the transaction so that they both have an incentive to cooperate. Of course this is "double-counting" of contribution so it should be accompanied by an appropriate reduction (e.g., halving) in the percentage of profits paid as bonus to each managers so that the division does not end up paying twice as much bonus as before.
- Jim Cox might "appeal to the better nature" of the components profit centre managers to transfer on the basis of the existing transfer pricing arrangements, even where spare capacity exists and the transfer price received would therefore do no more than cover the centres' marginal costs. He might support this argument by pointing out that there is no incremental loss to the components profit centre and that there is a benefit to the division as a whole. However, the components profit centres could reasonably reply that their assigned role is to maximize their own profits and that it is not appropriate for them to take actions which would not contribute towards that objective.

- (c) The likely reason is that Jim perceived that the action would increase his reported Residual Income in the current year to a level at or above the target which he otherwise would not have reached.

The factoring discount of €20,000 would have reduced the division's profit by that amount. However, by remitting the proceeds of the factoring to headquarters, Jim reduced the capital invested in the division by the book value of the receivables (€500,000) and thus reduced the finance charge. For example, if the cost of capital were 5% then the reduction in the finance charge ($5\% \times €500K = €25K$) would exceed the €20K cost of the factoring discount and thus increase the Residual Income., potentially above the target level.

John Sullivan should consider introducing some flexibility to how performance is rewarded. In particular if there were to be some "constructive ambiguity" in relation to the target, rather than a completely fixed target as at present, then there would be less incentive for division managers to engage in obviously dysfunctional behaviour nearing the year end.

Another possibility is for bonuses to be linked to a variety of financial and nonfinancial performance measures, to provide a more comprehensive assessment of managerial success. Measures related to debt collection would be relevant in this case (e.g., percentage of trade debts collected from debtors within invoice credit terms). Factoring should be considered a failure in this regard because it involves a cost which ought to be (and is) avoidable. The existing performance management system has rewarded this undesirable behaviour in the most recent financial year.

Tutorial notes

- Purpose of question: To require candidates to critically evaluate systems of transfer pricing and performance evaluation, and to recommended and critically evaluate improvements (Syllabus Topic 3).
- Options: A number of valid alternative arguments may be offered, especially in the answer to part (b)
- Essential components: In parts (a) and (c) it is essential that candidates clearly identify and articulate the likely reasons for the observed behaviours. Part(b) requires identification and critical evaluation as to how the failure of the existing transfer pricing mechanism can be remedied, either "directly" through a different transfer pricing mechanism or "indirectly" by modifying some other aspect of performance evaluation. Recommendations for alleviating the problem identified are also required in the answer to part (c).

SOLUTION 4

Calculation of monthly capacity (MH):

- Previous production time = $(15,000 * 3 \text{ MH}) = 45,000 \text{ MH}$.
- Previous repair time = $(15,000 * 20\% = 3,000 \text{ units} * 1.5 \text{ MH}) = 4,500 \text{ MH}$.
- Hence: total capacity = 49,500 MH.
- Plus idle time brought into use $\Rightarrow$ Total capacity = $49,500 + 1,300 = 50,800 \text{ MH}$

Increase in output:

- Average time per unit produced = $2.4 \text{ MH} + (10\% * 1.4 \text{ MH}) = 2.54 \text{ MH}$.
- Revised output level = $50,800 \text{ MH} / 2.54 \text{ MH} = 20,000 \text{ units}$.
- Hence: increase in monthly output = $20,000 - 15,000 = 5,000 \text{ units}$.

Increase in RM per month:

- Previously:

Production	Repair	Total
$15,000 * 0.75 \text{ kg} = 11,250 \text{ kg}$	$3,000 * 0.3 \text{ kg} = 900 \text{ kg}$	12,150 kg

- Revised:

Production	Repair	Total
$20,000 * 0.75 \text{ kg} = 15,000 \text{ kg}$	$10\% * 20,000 = 2,000 \text{ repairs} * 0.3 \text{ kg} = 600 \text{ kg}$	15,600 kg

- Hence: Increase = $15,600 - 12,150 = 3,450 \text{ kg}$.

Summary of effect on monthly contribution:

Increase in sales	$5,000 \text{ units} * €24 = €120,000$
Increase in direct material cost	$(3,450 \text{ kg} * €4 = €13,800)$
Increase in overhead	$(1,300 \text{ MH} * €5 = €6,500)$
Net increase	€99,700

Further points:

- The fee paid to the consultants was €150,000. As the resulting net increase in contribution is almost €100,000 per month, the exercise was worthwhile because the cost will be recouped in approximately one and a half months.
- The division in general, and DMP in particular, should also benefit in ways which are not reflected in the above figures. Higher production quality can lead to reputational improvement for the plant and its products. Also, production staff and engineers may be motivated and implement small changes to production processes which will decrease failure rates and increase throughput.

Tutorial notes

- Purpose of question: To require candidates to carry out a performance measurement to assess the net effects of a quality improvement initiative (Syllabus Topic 4).
- Options: The calculations can be laid out in a variety of ways. There is some scope for variation in the narrative points made especially in relation to effects which are not captured by the figures.
- Essential components: Candidates need to carry out a detailed quantitative analysis using the data provided. In addition they must highlight the once-off nature of the costs and the recurring nature of the benefits, and the fact that there may be benefits not captured by the figures.

SOLUTION 5

- First, the division manager should take action to determine why the Yellow Division's costs for each transaction type differ from those of competitors. This may lead to a specific recommendation for action. For example, why does it cost €0.25 for the Yellow Division to process a walk-in transaction compared to €0.20 for Shadow Stores? The cause may be easily correctable (e.g., if Yellow Division is paying excessively high bank charges for card transactions) or else an inescapable and not necessarily adverse reflection of differences in the underlying transaction (e.g., Yellow Division's transactions may be bigger and thus attract higher bank charges but also earn a higher contribution). Every transaction has a value as well as a cost.
- The Yellow Division has an advantage in relation to click-and-collect transactions which it should try to exploit, e.g., by improving its website and frequency of customer e-mailings. By these means, Yellow Division may encourage its customers to switch to this type of transaction as well as winning market share from competitors. This transaction is the cheapest of the three types for Yellow Division to process and is one where Yellow Division has a cost advantage over its competitors.
- Homedelivery is noticeably more expensive to process, very likely because of high courier costs which the retailers incurs and do not pass on to customers. The minimum spend discourages this type of transaction, at least for small value transactions where the courier costs might exceed the retailer's contribution on the order. Yellow Division can respond in at least 3 ways (i) try to achieve a €0.10 cost reduction to at least match the cost-efficiency of Shadow Stores; (ii) charge customers for delivery, so as to recover the transaction costs and motivate customers to switch to a different type of transaction which is cheaper to process; (iii) increase the minimum spend (see below).
- The suggestion that the Yellow Division should impose a minimum spend for click-and-collect transactions while simultaneously reducing its minimum spend for home delivery transactions should not be implemented. First, click-and-collect is the cheapest form of transaction, so Yellow Division should be encouraging its customers to switch to this form of transaction rather than erecting barriers to it. Second, there is a possibility that some customers who are prevented from using click-and-collect by the new minimum spend might switch to a rival retailer rather than switching to a different type of purchase from Yellow Division. Third, it is not obvious why Yellow Division would want to decrease the minimum spend for home delivery given that this is the most expensive type of customer transaction to process (and therefore the least desirable transaction from Yellow Division's point of view).

Tutorial notes

- Purpose of question: To require candidates to make use of the results of a benchmarking exercise (Syllabus Topic 5).
- Options: A number of valid alternative recommendations for actions in response to the results of the benchmarking analysis can validly be made.
- Essential components: Candidates need to explain thoroughly why the proposal to impose a minimum spend for click-and-collect transactions while simultaneously reducing its minimum spend for home delivery transactions should not be implemented. They must also justify a number of valid recommendations for actions in response to the results of the benchmarking analysis.