PERFORMANCE OPERATIONS

The senior examiner for paper P1 offers a step-by-step guide to tackling a topic that’s likely to crop up at every level: a project appraisal.

The arrival of the 2010 CIMA syllabus resulted in significant changes to the content of the syllabus for paper P1. The section of the previous (2005) P1 syllabus covering the control and performance measurement of responsibility centres and most of the section on budgeting were transferred to paper P2. The P1 syllabus now includes: project appraisal (25 per cent) and dealing with uncertainty (15 per cent), both of which were previously in the old P2 paper; and managing short-term finance (20 per cent), which was in the old P7 paper.

You need to have a thorough knowledge of project appraisal techniques throughout your CIMA studies – they are first examined at certificate level. You should expect to be

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**Part (a) of question four from paper P1, May 2010 (edited)**

An airport is modernising its facilities in anticipation that passenger numbers will rise by 10 per cent a year because a low-cost airline has opened new routes to it.

The airport has one food outlet, which sells cold food only, so the management is considering opening a restaurant that would sell a range of hot meals. The cost of fitting out the restaurant, which would need to be fully refurbished after four years, is estimated at $350,000. It is expected to have a residual value of $30,000 by then.

A consultancy has conducted a feasibility study costing $30,000. Its findings on expected revenue and contribution from the restaurant are as follows:

- **Average revenue per customer:** $9.
- **Average variable cost per customer:** $5.
- **Demand in the first year:** 500 customers a day. Demand for the restaurant is expected to rise in line with passenger numbers. The airport is open 360 days a year.
- **Other relevant information** is listed below.

1. **Staffing the restaurant**
   
   Four employees will be required in the first two years. Another person will be needed in years three and four. The average annual salary will be $20,000 per head.

2. **Overheads**
   
   The annual budgeted fixed overhead of the airport that will be apportioned to the restaurant is $80,000. The annual overhead apportioned to the cold food outlet will be $30,000.

Overheads are expected to rise by the following annual amounts as a direct result of the opening of the restaurant: electricity, $40,000; advertising, $20,000; and auditing, $10,000.

3. **The cold-food outlet**

   The average contribution from the sale of cold food is $2.50 per customer. If the restaurant is not opened, it’s expected that the cold-food outlet will sell to 1,200 people a day in the coming year and that customer numbers will rise in line with passenger numbers.

   If the restaurant is opened, the consultancy expects sales from the cold-food outlet to fall by 40 per cent in the first year and then to increase in line with passenger numbers.

   The airport’s finance director has provided the following taxation information:

   - **Tax depreciation:** 25 per cent reducing balance a year.
   - **The first year’s tax depreciation allowance** is used against the first year’s net cash inflows.
   - **The taxation rate is 30 per cent of taxable profits.** Half of the tax is payable in the year in which it arises and the balance is paid the following year.
   - **Any taxable losses resulting from this investment can be set against profits made by the airport company’s other business activities, since the organisation as a whole is profitable.**

   The airport uses a post-tax cost of capital of 8 per cent a year to evaluate projects of this type. Inflation can be ignored.

   You are required to calculate the net present value of the restaurant project (16 marks).
required to apply them in exams all the way up to the final T4 part B Case Study paper. These methods are used extensively in practice, too, and as a management accountant you will need to be able to apply them to real situations.

May’s exam included a 25-mark question on project appraisal. I will take you through part (a) of the question in detail (see panel, page 42). It would be good practice for you to attempt the question first and then compare your answer with the following suggested approach and the solution shown in table 3 on page 46.

As with any other question, you must first read carefully through the full scenario and the requirements before you start any calculations. Ensure that you understand exactly what you’re being asked to do by checking the verbs used in the question – are you being asked to “calculate”, “advise” or “evaluate”, for example? These all mean different things, so they require different approaches. The list of verbs and their definitions are included on the last page of the question paper.

The question in the May 2010 paper has quite a detailed scenario. It’s about a regional airport that’s considering opening a restaurant to cater for an anticipated increase in passenger numbers. You are told that the restaurant will need to be refurbished after four years and that the asset will have a residual value of $30,000. So now you know the length of the project and that in year four you will have a cash inflow of $30,000 in respect of the residual value (see line 2 of table 3). You next need to identify, from the information given, which of the revenue and costs are relevant to the investment appraisal.

The initial investment of $350,000 is clearly a relevant cost and should be included in the analysis in year zero (see line 1 of table 3). But the consultant’s fee of $30,000 is not relevant. This is a sunk cost – ie, it has already been incurred. It can’t affect the cost of the project whether it goes ahead or not, so it should be omitted from the analysis.

You are then given information on the expected contribution from opening the restaurant. The year-one contribution is:

$$500 \text{ passengers} \times 360 \text{ days} \times \$4 \text{ contribution per passenger} = \$720,000.$$  

Some candidates calculated the revenue and variable costs separately. That’s fine, as long as you remember to take one from the other, but it is much quicker to calculate the contribution per passenger and use this figure. Note that the airport is open for only 360 days a year. A number of students used 365 days to calculate the revenue – not a big error, but an example of their failure to read the question properly.

That gives you the revenue for the first year, but you’re also told that revenue will increase in line with passenger numbers, which are forecast to rise by 10 per cent a year. All you need to do, therefore, is increase the contribution year on year by 10 per cent (see line 3 of table 3).

Staff costs are $20,000 per employee a year. There will be four employees in years 1  Calculating the tax depreciation

<table>
<thead>
<tr>
<th>Time</th>
<th>Reducing balance ($)</th>
<th>Tax depreciation ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 1</td>
<td>350,000</td>
<td>87,500</td>
</tr>
<tr>
<td>Year 2</td>
<td>262,500</td>
<td>65,625</td>
</tr>
<tr>
<td>Year 3</td>
<td>198,750</td>
<td>49,219</td>
</tr>
<tr>
<td>Year 4</td>
<td>147,656</td>
<td>147,656 – 30,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>320,000</td>
</tr>
</tbody>
</table>

2  Calculating the tax payments

<table>
<thead>
<tr>
<th></th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net cash flows ($)</td>
<td>138,000</td>
<td>166,800</td>
<td>178,480</td>
<td>213,328</td>
</tr>
<tr>
<td>Tax depreciation ($)</td>
<td>(87,500)</td>
<td>(65,625)</td>
<td>(49,219)</td>
<td>(117,656)</td>
</tr>
<tr>
<td>Taxable profit ($)</td>
<td>50,500</td>
<td>101,175</td>
<td>129,261</td>
<td>95,672</td>
</tr>
<tr>
<td>Taxation at 30% ($)</td>
<td>15,150</td>
<td>30,353</td>
<td>38,778</td>
<td>28,702</td>
</tr>
</tbody>
</table>
one and two, and five employees in years three and four, so calculating that is no problem (see line 5 of table 3).

The overhead costs are a bit more complicated. Again, it is important to understand which of the costs are relevant and which aren’t. Any apportioned or absorbed fixed costs are generally not relevant to an investment decision. The only fixed costs that are relevant are the “incremental” fixed costs – ie, the fixed costs that are going to increase as a result of opening the restaurant. In this case the only relevant overheads are the cost of the electricity, advertising and audit – ie, $70,000 a year (see line 6 of table 3).

You then come to the cold-food outlet. This was a tricky area for candidates and caused some of them a few problems. Opening the restaurant will cause a reduction in sales at the cold-food outlet – ie, it gives rise to an opportunity cost. What you’re trying to calculate is the financial effect on the existing business of opening the restaurant. Once you have recognised this, calculating the opportunity cost is straightforward. First, you need to work out the existing contribution of the cold-food outlet as follows: 1,200 passengers x 360 days x $2.50 = $1,080,000. The new restaurant will result in a 40 per cent reduction in sales at the cold-food outlet, so the opportunity cost is $1,080,000 x 40% = $432,000. This has to be deducted from cash flows and will also need to be adjusted for the increase in passenger numbers (see line 4 of table 3).

You have now worked out all the cash flows except the tax payments. The question gives information on how to treat tax and you should ensure that you read this especially carefully. The first thing to do is calculate the tax depreciation. The initial investment was $350,000 and you’re told that tax depreciation is available at 25 per cent on the reducing balance. The allowances can be calculated as shown in table 1 on page 42. The only complication arises in year four. In the final year you need to calculate the balancing allowance. This represents the reducing balance less any residual value for the equipment, which was $30,000 (see line 2 of table 3). A good way to check is to add up the tax depreciation that you have calculated and make sure that it totals the investment minus any residual value.

Now that you have calculated the tax depreciation figures, you can deduct these from the project’s cash flows and then calculate the tax payments. Table 2 on page 42 shows this calculation. This is simply 30 per cent of the taxable profit – ie, the cash flows – minus the tax depreciation. Don’t forget that you need to check when the tax is payable. The question tells you that half is payable in the year in which it arises and the other half is payable the following year (see lines 8 and 9 of table 3).

An alternative approach, which many candidates used, is to calculate the tax effect of the tax depreciation separately. This is fine, but you must remember that it is a taxable benefit: it should be added to the cash flows and the benefit needs to be phased in the same way as the tax payments.

You now have the net cash flows after tax and all that’s left to do is calculate the present value for each year and the net present value for the project. You need to know the company’s cost of capital or required rate of return, because that’s the rate you will use to discount the cash flows. The question states that the company’s post-tax cost of capital is 8 per cent, so you can look up the present value tables and obtain the discount factors for years one to four at a discount rate of 8 per cent (see line 11 of table 3). Lastly, multiply the net cash flows after tax by the discount rate and calculate the net present value (see the last line of table 3).