

**MARK PLAN AND EXAMINER'S COMMENTARY**

The mark plan set out below is that used to mark these questions. Markers are encouraged to use discretion and to award partial marks where a point was either not explained fully or made by implication. More marks are available than could be awarded for each requirement. This allows credit to be given for a variety of valid points which are made by candidates. The answers provided are more comprehensive than would be possible in the time available for candidates. They have been prepared to accommodate a wide range of possible answers and interpretations by candidates.

**Question 2 – West Water Inc****General comments**

The scenario in the question is a company (WW) which operates in the water industry in Holakia, a developed country.

The water industry in Holakia is currently regulated and comprises four large companies (including WW), each of which has a geographical monopoly of one region of Holakia. Regulation is currently set by government, which determines the price that can be charged.

However, the water industry is about to be deregulated, allowing price competition between the four companies and new entrants into the water retail market.

Important factors in the water industry are sustainability and environmental issues. WW holds itself out to be a market leader on sustainability issues.

**2.1a**

West Water has the second highest price of the four water companies, with only East Water (EW) charging more. North Water (NW) charges the least at \$1.45 per cu metre, which is 6.45% lower than WW.

As WW has the second highest price, it will have had the second highest infrastructure costs. However, these are historic fixed costs, rather than marginal costs.

As water is a homogeneous product, price elasticity of demand is likely to be high. This means that any company charging above the lowest priced competitor is likely to suffer a significant fall in demand.

Also, switching is easy for customers and, if they are informed and engaged, they are likely to switch to the lowest cost provider. Currently this is North Water (NW) so, if NW and the three other companies do not change their prices, NW could potentially win all Holakia customers and be the monopoly supplier for the country. This would leave the other three water companies only as wholesalers, gaining only the lower wholesale price which is significantly lower than the retail price. This appears unsustainable and unwise for the other three companies and so it is unlikely to be an equilibrium position.

An alternative is that, in order to compete with NW, the other three water companies lower their prices to \$1.45 so all companies have this same price and there is no price incentive for customers to switch. This would mean a significant reduction in price, revenue and profit for WW compared with its existing price of \$1.55.

An alternative is that NW will increase its price, as it is no longer constrained by the regulator and the new equilibrium for all four water companies could tend towards a new higher NW price. The four companies could then compete in non-price terms (eg, customer service).

The industry could then be characterised as an oligopoly. This could lead to tacit collusion amongst the water companies where they, by implicit agreement, all raise their prices to a common high price (eg perhaps the \$1.70 being charged by EW), so each is attempting to retain its existing customers, but at a higher price. This is likely to increase WW's revenue and profit (and that of the industry) unless the collusion is challenged by the regulator. Competition could be based on non-price factors.

**Examiner's comments**

To address short-term pricing issues, a majority used the 4Cs framework, but other approaches included elasticity of demand and Porter's generic strategies. Of those who considered the latter, most recognised

that cost leadership would be a necessary approach, given the homogenous nature of the product and the new competitive environment, with low switching costs for end-users.

Many weaker candidates failed to use any of the data provided in the question. This complete disregard for the data was both disappointing and perplexing. As a general rule, if there are numbers in the question, there should be numbers in the answer.

Weaker candidates resorted to general discussion about pricing approaches (eg, price skimming, price penetration, cost plus pricing), normally failing to show relevance and any degree of application.

### 2.1b

According to Porter, five competitive forces influence the state of competition in an industry. These collectively determine the profit (ie, long-run return on capital) potential of the industry as a whole.

The nature of the issue in Holakia is to consider the impact (ie the 'change in') competitiveness, rather than the 'level' of competitiveness.

#### **New entrants**

Prior to deregulation each of the four water companies had a regional monopoly based on regulation and ownership of the infrastructure for supplying water and sewerage services to water users located in their region.

The scale of each of the four water companies mitigated against new entrants as the initial capital investment in infrastructure is significant and any new regional market would need to be shared with the incumbent. There were also regulatory barriers to entry relating to pricing and permission to supply.

Therefore, despite the product (water/sewerage services) being homogeneous, the barriers to entry prior to deregulation were high, which decreased industry competitiveness and increased industry profitability.

Following deregulation, the impact on the potential for new entrants to enter the wholesale market is limited, as similar economies of scale and scope are likely to continue to be relevant given the amount of investment needed.

Entry into the retail market is however easier as it is permitted by the regulator and does not require large scale infrastructure investment. Only the abilities to purchase wholesale water and sewerage services and to sell to, and invoice, customers are necessary. The barriers to entry in this retail sector have been significantly reduced following deregulation, which will increase industry competitiveness, compete down prices and reduce industry profits.

#### **Substitutes**

A substitute is a product/service produced by another industry which satisfies the same customer needs.

In this case, there are no credible substitutes for water supplies either before or after deregulation so there is little impact.

#### **Bargaining power of buyers/customers**

Prior to deregulation, customers (either individually or collectively) had little power as there were regional monopolies, enforced by regulation, giving customers no power to switch between water suppliers and no power to negotiate prices which were set by the regulator.

After deregulation, most customers are small and so still have little power individually, compared with the four large water companies acting as water retailers.

However, as the switching costs are low, prices are transparent and water is a homogeneous product, then, following deregulation, customers *collectively* have significant power over suppliers from their ability to change suppliers easily to seek the lowest price.

#### **Bargaining power of suppliers**

Water itself is naturally supplied from rainwater, but suppliers also relate to the infrastructure. Much of the infrastructure costs (eg, building reservoirs and installing pipes) was historic and hence do not affect current competitiveness of the industry, before or after deregulation.

Costs of leasing land are significant and the government is a monopoly supplier of land for water companies. The government is therefore a powerful large monopoly supplier and can exert pressure on the four water companies.

After deregulation, the wholesale water companies become suppliers to the retail water companies as they will then be separated (prior to deregulation there was no distinction between retail and wholesale).

As the four companies are of equal size, there is significant, but equal, power of the companies in their role as wholesale suppliers. In the longer term, even if one or two companies come to dominate the retail market through competitive advantage, the wholesale market will remain distributed fairly evenly through historical ownership of infrastructure between the four companies.

Potential new retail entrants are likely to be much smaller than the four incumbent water companies. In their role as wholesalers, the four existing companies will therefore exercise some supplier power over the new retailers in determining wholesale prices for water to be sold to the retail companies, but these are still regulated. This is despite the lack of differentiation in the product. The fact that wholesale water will be a major cost to a new retail entrant will be a major factor increasing the existing four companies' power in the wholesale market.

### Competitive rivalry

Prior to deregulation, there is almost no rivalry between the four water companies as they are regional monopolies and cannot sell to each other's customers. This is indicated by the wide price variance for what is a homogeneous product.

After deregulation the competitiveness may be considerable due to:

- Easy switching by customers
- Homogeneous product (water/sewerage services)
- Transparent prices
- High fixed costs and low variable costs (marginal costs are insignificant for one customer)
- Stagnant and mature market as it is limited to supplying the Holakia population with a stable product with no imports or exports (so competing for the same market).
- High exit barriers as water wholesale companies are bound into high costs for leasing land in long term contracts.

A counter-argument is however that after deregulation the industry would be an oligopoly if new entrants have a small market share. In this case the four major companies, through mutual self-interest, may have limited price competition and (as noted above) prices are kept high by tacit collusion between the main participants in the industry.

### Examiner's comments

The majority displayed an understanding of Porter's Five Forces model in terms of its structure, and the need to focus discussion on the industry, rather than the firm. However, only the better candidates framed their answer in terms of the 'impact' of (or the 'changes' in) each of the Five Forces as a result of deregulation.

In the detail of applying the Five Forces model there was evidence of fundamental misunderstanding by some weaker candidates. Examples included:

- considering new entrants to the wholesale market, rather than retail market. Sometimes, the new retail market was ignored all together. This often led to the conclusion that the threat of new entrants was low given the high barriers to entry.
- the threat of substitutes was sometimes misunderstood, by stating that substitutes were rival firms.
- stating that firms would begin to engage in transporting water between regions.
- covering only some elements of the model, instead of considering all five aspects.

Total possible marks	22
Maximum full marks	20

**2.2**

Expected cost savings with technology from an environmental pollution event (excess costs of a major event without technology, above one with technology \$160m - \$60m):

Expected value of excess costs of a major event:

$$[(0.06 \times £100m) + (0.94 \times £4m)] = \mathbf{\$9.76m}$$

*Alternative:*

$$\$13.36m - \$3.6m = \mathbf{\$9.76m}$$

*Where:*

$$\$13.36m = (0.06 \times £160m) + (0.94 \times £4m)$$

$$\$3.6m = (0.06 \times £60m)$$

$$\text{Expected number of events per year} \quad 4/100 = 0.04$$

Expected annual cost of environmental pollution events:

$$£9.76m \times 0.04 = \mathbf{\$390,400}$$

The annual financial cost of the new technology is **\$1.1m** which is far higher than the annual expected environmental pollution event costs.

*Tutorial note:*

*There are alternative acceptable ways of performing appropriate calculations including determining the costs over 25 years or 100 years.*

**Qualitative evaluation**

The annual new technology cost at £1.1m is significantly greater than the expected cost of an environmental pollution event of £390,400 per year. Ignoring non-financial factors, if the company is risk-neutral, then accepting the risk and not investing in technology is the preferred solution.

However, most companies are risk averse and would consider risk mitigation strategies even where their expected cost is higher than accepting the risk.

Arguments favouring investment in technology:

- Scale. The cost of a major environmental pollution event, if it did occur, is significant at £160m. This may significantly impact operations requiring divestment to finance the major environmental pollution event costs. Technology would only avoid the first £100m of such costs, but the remaining £60m may be manageable within liquid resources.
- The reputational damage from an environmental pollution event may cause customers to move to other companies and government to impose fines and other sanctions.
- There may be a much higher occurrence of environmental pollution events than estimated in the data provided.
- The proportion of major incidents may be higher than expected.
- If an environmental pollution event occurs and costs are high, then going concern may be in doubt creating further indirect costs.
- Investment in technology to avoid environmental pollution events would enable WW to show that it is environmentally responsible in having invested to avoid environmental damage. This would give some credibility to the statement in the annual report that WW is an “an industry leader in corporate responsibility and environmental sustainability”.
- From a public interest perspective, avoidance of an environmental pollution event would protect third parties.

Arguments against investment in technology:

- Higher cost. The new technology has a higher expected cost than accepting the risk of an environmental pollution event.
- Present value (liquidity). Investment in new technology is payable at the beginning of the period whereas environmental pollution event may be payable in some years' time, resulting in a lower present value and less pressure on liquidity.
- Unavoidable events and costs. Even with the new technology major events are not avoidable and some costs remain unavoidable, such as financial costs of \$60m on a major environmental pollution event.
- Insuring against an environmental pollution event would be an alternative to investing in new technology. However, while insurance compensates for the direct financial cost of the event it does not decrease the probability of it occurring and therefore does not reduce the reputational damage risk.

#### *Advice*

Although the expected cost is higher from investment in new technology than from accepting the risk, it makes credible the claims in the annual report and WW being an "an industry leader in corporate responsibility and environmental sustainability". It is also in the public interest.

It also mitigates against the low probability, but high impact, effects of a major event which, if it does occur, may severely damage the company.

Investment in the new technology is therefore recommended based on the data provided.

#### **Examiner's comments**

As expected, there was a variable quality of answers to the financial calculations. Most approached the problem by expressing their answers over a 100-year period.

Of those who understood expected values, many forgot to include the prior probability of 0.04 of a pollution event occurring.

Weaker efforts ignored probabilities and expected values completely, or even made no attempt at any calculations.

A number of different acceptable calculation methods were used including: the annualised expected cost; the expected cost over 25 years; and the expected cost over 100 years.

The better answers displayed understanding of the nature of the risks facing the firm, for example in terms of low probability and high impact. The best efforts also combined this with an understanding of risk mitigation choices and risk appetite. Most of these concluded that the firm would be risk averse, given the seriousness of the consequences for the firm should any pollution event occur - i.e reputation damage, potential fines and environmental impacts.

Only a minority considered alternative risk mitigation methods to the new technology - e.g. insurance.

The depth of discussion regarding the technology was often not comprehensive enough and while most identified the obvious points (costs, reputational impact etc.) it was surprising to see so few applied some scepticism to the costs and probabilities provided. Given how simplified this information was, over an extended timescale, one would expect more professional scepticism here.

Many candidates adopted a financial and non-financial structure to their answer to this question.

Total possible marks	16
Maximum full marks	15