

Case study 14: Mark scheme

Chapter 32: Break-even analysis

Chapter 33: Quality assurance

Chapter 34: Location

Chapter 36: Production planning

Chang's Made-to-Measure Suits

Tony Chang grew up in Hong Kong and moved to Switzerland with his parents when he was in his early teens. His family back in Hong Kong ran a custom-made suit business for the cruise ship trade using high-quality locally sourced luxury materials. Within 24 hours of measuring a client, the factory could produce a suit for delivery to the ship. When he left university, Tony had the idea that he could measure clients in Geneva in a rented shop and email measurements to Hong Kong. There are no other Geneva suppliers of custom suits. He set up his own factory there and custom suits were flown in within one week of orders being placed. The suits could be sold in Geneva for eight times the Hong Kong selling price of \$94. The business thus had the potential for big profits, selling to the rich bankers and businessmen of the Geneva financial district.

Variable costs in Hong Kong for the suits were \$36, and fixed costs there were \$340,000 per annum. In addition to this, Tony had to consider Geneva variable and fixed costs. He estimated that variable costs were around only \$12 per suit. He budgeted \$400,000 Geneva fixed costs, which included marketing and rental costs as well as his salary and the salary of an assistant. For a while, he operated the business out of a Geneva hotel room, but as the business grew he urgently needed to find a permanent shop.

He relied on the suits being of premium quality. He put an experienced manager in place in Hong Kong and suggested using quality assurance methods to support JIT and TQM production. As land in Hong Kong was extremely expensive, it was important to carry minimal stocks in order to avoid the need for a warehouse. The manager also suggested that Tony should investigate something called 'Kaizen' in order to support lean production methods.

SL questions: 20 marks, 35 minutes

- 1 Define the term 'JIT'. (2)
- JIT stands for 'just in time'. This is a form of lean production where goods are made only when there is an order to fill and supplies arrive only when they are needed in order to fulfil orders. Orders are then shipped out as soon as they are made. This means that stock levels are minimal, so expensive warehousing is not needed. However, it also means that the manufacturer may not be able to take advantage of purchasing economies of scale.

Apply **Resources table 3a** mark band descriptors.

- 2 Suggest **two** factors which could influence Tony's choice of a location for his Geneva shop. (4)

- market location – must be near the Geneva financial district
- cost
- personal reasons – convenience for Tony's home location
- room for further expansion
- any other relevant reason(s)

Apply **Resources table 3b** mark band descriptors.

- 3 Explain the difference between quality assurance and quality control for a clothing producer such as Chang's Made-to-Measure Suits. (4)

Quality control involves checking quality at various points in the production process. In suit production this could be after cutting out suits and at key points in the stitching process.

Quality assurance is a system of setting agreed levels of quality to be met at each stage in the manufacturing process, from design to sourcing supplies, to delivery to the final consumer. For suit production this would include self-checking by workers during the production process, which reduces the need for expensive inspection processes or remaking of faulty suits. It can also be a motivating form of job enrichment.

Apply **Resources table 3b** mark band descriptors.

- 4 Calculate the break-even point for Chang's Made-to-Measure Suits. (4)

$$\begin{aligned}\text{Break even} &= \text{total fixed costs} \div (\text{sales price}) - (\text{total variable cost}) \\ &= \$340,000 + \$400,000 \div (8 \times \$94) - (\$36 + \$12) \\ &= \$740,000 \div (\$752 - \$48) \\ &= 1052 \text{ suits}\end{aligned}$$

4 marks:

A full and clear calculation reflecting full understanding of the calculation of a break-even point.

2–3 marks:

One or two errors, but a basic understanding of the calculation of a break-even point.

1 mark:

An attempted calculation showing some understanding of the calculation of a break-even point.

- 5 Analyse internal factors that could influence Chang's Made-to-Measure Suits' chance of success. (6)

Strengths:

- past family experience in the business may be built upon
- there is established demand at the prices set
- the profit margin is big, giving a margin for price changes if there is future competition
- TQM, JIT, lean management and quality assurance give added advantage in maintaining low variable costs
- any other relevant factor

Weaknesses:

- lack of personal experience of running a business
- Tony is far from the factory and has to rely on others to run it efficiently
- Tony's reputation may rely on delivery efficiency, over which he has little control
- use of JIT production probably means that Tony is unable to take advantage of purchasing economies of scale
- any other relevant factor

SL: apply **Resources table 1** mark band descriptors.

For the full 6 marks, the candidate should give a balanced evaluation of both strengths and weaknesses.

HL questions: 25 marks, 45 minutes

- 1 Define the term 'JIT'. (2)

JIT stands for 'just in time'. This is a form of lean production where goods are made only when there is an order to fill and supplies arrive only when they are needed in order to fulfil orders. Orders are then shipped out as soon as they are made. This means that stock levels are minimal, so expensive warehousing is not needed. However, it also means that the manufacturer may not be able to take advantage of purchasing economies of scale.

Apply **Resources table 3a** mark band descriptors.

- 2 Suggest **two** factors that could influence Tony's choice of location for his Geneva shop. (2)

- market location – must be near the Geneva financial district
- cost
- personal reasons – convenience for Tony's home location
- room for further expansion
- any other relevant reason(s)

2 marks:

Two appropriate factors linked to the case study.

1 mark:

One linked factor.

- 3 a** Calculate the break-even point for Chang's Made-to-Measure Suits. **(3)**

$$\begin{aligned}
 \text{Break even} &= \text{total fixed costs} \div (\text{sales price}) - (\text{total variable cost}) \\
 &= \$340,000 + \$400,000 \div (8 \times \$94) - (\$36 + \$12) \\
 &= \$740,000 \div (\$752 - \$48) \\
 &= 1052 \text{ suits}
 \end{aligned}$$

3 marks:

A full and clear calculation reflecting full understanding of the calculation of a break-even point.

1–2 marks:

One or two errors, but a basic understanding of the calculation of a break-even point.

- b** How many suits would Chang's have to sell to make an annual profit before interest and tax of \$100,000? **(3)**

$$\begin{aligned}
 \text{Target output} &= \text{fixed costs} + \text{target profit} \div \text{sales price} - \text{variable cost} \\
 &= (\$340,000 + \$400,000) + \$100,000 \div (8 \times \$94) - (\$36 + \$12) \\
 &= \$840,000 \div \$704 \\
 &= 1194 \text{ suits}
 \end{aligned}$$

3 marks:

A full and clear calculation reflecting full understanding of target output.

1–2 marks:

One or two errors, but a basic understanding of the calculation of target output.

- 4** Tony is using offshoring as a basis for his business. Analyse **two** reasons why it may be an advantage for Tony to do this rather than to make suits in Geneva. **(6)**

- circumventing restrictive laws, e.g. age of workers, minimum wages, working hours
- cost reductions, e.g. land or labour
- lack of locally available experienced labour: there are no other businesses making suits in Geneva
- suit making is close to sources of luxury materials
- any other relevant factor

HL: apply **Resources table 2** mark band descriptors.

5 Evaluate whether use of Kaizen principles is likely to help improve TQM. **(9)**

Define Kaizen: a Japanese word that means continuous improvement. It relies on two basic assumptions: it presumes that workers who do a job every day may know how to improve a process better than managers, and it assumes that big improvements in efficiency or productivity need not always be the result of large capital investment – they can be the result of lots of tiny improvements added together. Therefore improvements in suit production may be initiated by workers and need not be the result of expensive capital investment.

Define TQM: this stands for total quality management. It is the involvement of all employees in the quality improvement process, including the improvement of efficiency and reduction of waste. It is a philosophy of everyone being empowered and responsible for the quality of their work. TQM is thus a key component in lean production and can encompass Kaizen.

Arguments for:

- Kaizen empowers and can motivate workers
- can result in suggestions for improvements that would otherwise have gone unnoticed
- is part of a TQM philosophy that supports production of a high-quality product
- can avoid reliance on increased capital investment as the only way to make improvements in productivity and/or excellence
- any other relevant factor

Arguments against:

- some changes may still be big and expensive to implement
- managers in the local culture may resist the idea that workers may know better than they do
- the Kaizen process takes time and therefore costs money – Tony's business relies on keeping Hong Kong costs low
- Kaizen improvements are often minimal after a certain time
- any other relevant factor

HL: apply **Resources table 2** mark band descriptors.

A justified conclusion is required.