**Activity 2: Impact of the forecast: Answers**

**Comparing stock management practices**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Made-to-stock (MTS)** | | | **Made-to-order (MTO)** | | | **Just-in-time (JIT)** | | |
| **Nominal** | **Low** | **High** | **Nominal** | **Low** | **High** | **Nominal** | **Low** | **High** |
| **Maximum cash in Combined stock** | 59.00 | 60.00 | 60.0 | 9.55 | 7.65 | 9.55 | 7.00 | 13.00 | 6.00 |
| **Max board stock** | 56 | 56 | 56 | 13 | 11 | 13 | 2 | 2 | 2 |
| **Max chip stock** | 56 | 56 | 56 | 11 | 9 | 11 | 2 | 2 | 2 |
| **Max screen stock** | 56 | 56 | 56 | 4 | 4 | 4 | 2 | 2 | 2 |
| **Max case stock** | 56 | 56 | 56 | 13 | 11 | 13 | 2 | 2 | 2 |
| **Max finished items stock** | 46 | 48 | 46 | 4 | 4 | 4 | 7 | 13 | 6 |
| **Maximum production utilisation** | 100% | 100% | 100% | 50% | 50% | 50% | 25% | 25% | 25% |
| **Production days** | 7 | 7 | 7 | 17 | 19 | 20 | 28 | 28 | 28 |
| **Shipping delay days** | 0 | 0 | 0 | 180 | 152 | 216 | 73 | 0 | 72 |

# Review questions

**Stock management**

The approach to how stock is managed can vary based upon the business and the type of stock that is used in the manufacturing process.

Considering each of the stock management processes:

1. **Which stock management approach can be linked to the business having the highest financial implication when considering stock volume?**

Made-to-stock (MTS) – This approach involves producing goods based on forecasted demand and storing them as finished goods inventory.

To meet anticipated demand, businesses often hold significant volumes of stock.

1. **How could this have an impact on the business overall if not managed effectively?**

This leads to substantial financial implications due to:

* storage costs (warehousing, utilities);
* inventory holding costs (insurance, obsolescence, damage);
* capital tied up in inventory;
* risk of overstocking and subsequent write-offs.

1. **Which stock management approach would typically result in there being an increased volume of work in progress?**

Made-to-order (MTO):

* In MTO, components or sub-assemblies are manufactured and held in stock.
* Final assembly occurs only after a customer order is received.
* This means that a significant amount of partially finished goods (WIP) is held in inventory, waiting for final assembly.
* This is especially true when there are many variations of the finished product that utilise a common set of components.

1. **Are there any inherent risks in each stock management approach that could be relevant and how can these be monitored and measured?**

Made-to-stock (MTS):

* Overstocking: Holding too much inventory, leading to obsolescence, spoilage, and increased holding costs.
* Understocking: Running out of stock, resulting in lost sales and customer dissatisfaction.
* Inaccurate demand forecasting: If forecasts are wrong, inventory levels will be misaligned with actual demand.

Made-to-order (MTO):

* Long lead times: Customers may be unwilling to wait for their orders.
* Production delays: Unexpected issues can disrupt production and delay order fulfilment.
* Increased production costs: Customization and small production runs can increase costs.
* Supplier reliability: Delays from suppliers can significantly impact lead times

Just-in-time (JIT)

Supply chain disruptions:

* Reliance on precise, timely deliveries makes JIT vulnerable to disruptions like natural disasters, geopolitical events, transportation delays, or supplier failures.
* A single disruption can halt production.
* JIT is designed for stable and predictable demand. Sudden changes can lead to stockouts or overproduction.
* Inaccurate demand forecasting can have severe consequences.
* Close relationships with a limited number of suppliers create dependence. If a key supplier fails, the entire production line can be affected.
* Defective materials delivered just in time can immediately disrupt production, as there's no buffer stock to compensate.

**Demand estimation**

Within the manufacturing process and stock management, there is an element of forecasting and estimation to determine what may be required in the future. Typically, these estimations are based upon historical data and trends within the sector (historical and predicted) and make the assumption that the process will be without issue.

Considering the manufacturing processes and each of the stock management processes:

1. **How does the demand estimation impact the business overall?**

Production planning and inventory management:

Accurate estimation:

* Allows for efficient production scheduling, minimising overproduction or underproduction.
* Enables optimal inventory levels, reducing storage costs and preventing stockouts.
* Inaccurate estimation leads to excess inventory, tying up capital and increasing storage costs.
* Results in stockouts, causing lost sales, customer dissatisfaction, and potential damage to brand reputation.

1. **What is the impact of a disruption such as a machine breakdown in each of the processes?**

Made-to-stock (MTS)

* Short-term: Disruption is somewhat buffered. If there is already finished goods inventory, sales can continue while the machine is repaired. However, production will be halted, so continued sales will erode available stock.
* Long-term: Prolonged breakdowns can lead to stockouts if the repair time exceeds the rate at which inventory is being sold. This can result in:
  + lost sales if customers are unwilling to wait
  + backorders and delayed fulfillment
  + potential loss of market share to competitors.
* Overall: MTS has a degree of resilience to short-term disruptions, but prolonged breakdowns can severely impact its ability to meet demand.

Made-to-order (MTO)

* Direct impact: A machine breakdown directly delays the production of specific customer orders.
* Customer delays: Customers experience longer lead times and delayed delivery of their orders.
* Order backlog: A backlog of orders can build up while the machine is down.
* Customer dissatisfaction: Delays can lead to frustrated customers, especially if delivery commitments were made.
* Potential contract penalties: In some cases, businesses may face penalties for late deliveries.
* Overall: MTO is highly sensitive to machine breakdowns, as production is directly tied to individual orders.

Just-in-time (JIT)

* Severe disruption: JIT systems are extremely vulnerable to machine breakdowns.
* Production halt: Because JIT relies on a continuous flow of materials and components, a breakdown at any point can stop the entire production line.
* Ripple effect: The disruption can quickly propagate through the supply chain, affecting suppliers and downstream customers.
* Increased costs: Expedited repairs, overtime and potential penalties can increase costs.
* Damage to supplier relationships: Delays caused by breakdowns can strain relationships with suppliers who are expected to deliver precisely on time.
* Overall: JIT is the most susceptible to machine breakdowns due to its lack of buffer inventory and its reliance on a tightly synchronized system.

1. **How does an inaccurate estimate impact on the business? Think about lead time of stock items considering variable costs and the costs associated with transport and storage.**

Impact of overestimation of demand:

* Increased storage costs – If you overestimate demand, you will order or produce more stock than you can sell in a timely manner. This leads to increased storage costs, including:
* warehouse rent or mortgage payments
* utilities (lighting, heating, cooling) for storage facilities
* labour costs for managing and handling the excess inventory
* insurance costs to cover the value of the stored goods.
* Increased risk of obsolescence and spoilage – Excess stock is more susceptible to becoming obsolete, outdated, or going out of fashion. This is especially critical for industries with rapid technological advancements or seasonal products. For perishable goods, overestimation can lead to significant losses due to spoilage.
* Potentially higher transport costs – While overestimation might not always increase transport costs, it could if you initially expedite large orders from suppliers based on the inaccurate forecast.
* Increased variable costs - Holding excess inventory increases variable costs such as:
  + Inventory carrying costs (costs of capital tied up in inventory).
  + Handling costs.
  + Potential for damage or deterioration.

Impact of underestimation of demand:

* Increased Transport Costs – If you underestimate demand, you may need to expedite smaller, more frequent shipments from suppliers to replenish stock quickly. This can lead to significantly higher transportation costs per unit compared to larger, planned shipments. You might incur extra costs for express delivery or air freight.
* Increased variable costs (indirectly):
* Lost sales and reduced revenue, which negatively impacts profitability.
* Potential damage to customer relationships, which can have long-term financial consequences.
* Increased production costs if you have to ramp up production quickly with overtime.
* Lead time issues:
* Stockouts, resulting in lost sales and customer dissatisfaction.
* Delays in fulfilling customer orders, damaging your reputation.
* Difficulty in meeting customer expectations for timely delivery.