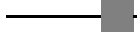


Stocks and Inventories



Overall aims

This chapter gives a broad introduction to inventory management. It discusses the ideas behind stocks and their control, and sets the scene for the rest of the book.

It is fair to say that most people do not pay much attention to stocks until they want to buy something that is unavailable. Then, when they do think about stocks, they probably imagine stores of goods held by shops or manufacturers. In practice, though, stocks are a vital part of every organization. The stocks can be anything from knowledge through to rubble, and the organization can be anything from individuals providing a professional service through to global manufacturers. At a personal level we all keep stocks of food in the larder, clothes in the wardrobe, fuel in the car, money in the bank, information in books. The aims of the first chapter is to give some definitions for inventory management, show why stocks are held, and say why they are so important.

Views about stocks have changed markedly over the past few years. The prevailing view now is that they are expensive, a waste of resources, and should, whenever possible, be eliminated. In practice, this is rarely possible, as stocks continue to perform an essential service. A more realistic view is that they should perform this service at minimum cost. A problem, of course, is defining an appropriate service level and corresponding cost and this varies across organizations and their circumstances. Manufacturers may boast (wrongly) of working with 'zero inventory' but shops boast about having 'the biggest stock of carpets in . . .'. The aim of inventory management, then, is not to eliminate stocks, but is to use the best policies that help achieve the overall aims of the organization. The book describes how to do this.

Review of important points

- Stocks are the materials that are stored by an organization until they are needed. An inventory is a list of the items kept in stock. Inventory management (stock management, etc.) is a broad term that includes all decisions related to the stocks. In reality, people use different terms to describe similar activities. There is, for example, a trend to use 'inventory' to mean the same as 'stock' (the

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normal convention in America), while inventory control (stock control, etc.) has become the broader management function.

- Every organization holds stock, and we are not just talking about the stocks of raw materials and work in progress that are held by manufacturers. About 80 per cent of the population of developed economies work in services, and these hold the majority of stocks.
- The materials held are not just tangible goods, but can be any combination of goods and intangible resources. Data, knowledge, expertise and experience have to be stored just like anything else, and these bring their own problems.
- Overall stock consists of numbers of units held of each item. The stock level of each item follows a cycle that falls to meet customer demand and rises with replenishment from suppliers. Customers are anyone (or thing) that reduces stock levels, while suppliers are anyone (or thing) that increases stocks.
- The main purpose of holding stock is to give a cushion between supply and demand. There are many reasons why such a cushion is needed, often – but not necessarily – related to variability or uncertainty.
- For convenience, we often talk about stocks of raw materials, work in progress, finished goods, spare parts and consumables. This is the usual convention, but there are several alternatives.
- Individual organizations can see themselves as contributing to a flow of materials along supply chains. One view has ‘stock as the lubrication that eases the flow of materials’. These chains come in different forms, and with different requirements of stocks.
- Logistics or supply chain management is the function with overall responsibility for the movement of materials, and inventory management is often – but not inevitably – seen as one activity within logistics.
- There are several important trends in logistics that directly affect inventory management. These include the increasing co-operation between organizations within a supply chain, e-business, outsourcing non-core activities, TQM, improved customer service, etc. These often cause specific trends within inventory management, such as the growth of JIT, cross-docking and postponement.
- The trends affecting inventory management have effects not only within individual organizations, but on a broader, national scale. Aggregate stocks are generally falling, but they respond to other influences, such as the overall business cycle.

Project

The aim of this project is to get people thinking about stocks and their broad effects. There are three more immediate aims. The first is to show the importance of stocks at a national level. Stocks might amount to 20 per cent – or perhaps 40 per cent – of

a country's GDP. These are clearly a significant investment which has to be carefully managed. The second aim is to illustrate the overall trends in stocks. In recent years most organizations have looked for ways of reducing their stock levels, and this has a clear effect at national levels, with almost every country reporting lower aggregate stocks. This trend generally reflects management practices, but there are other short-term effects caused by economic disruption, business cycles, interruption of supplies, etc. The third aim is to suggest the different requirements of aggregate stocks. Even if an organization sees a way of working with lower stocks, the local infrastructure might not be good enough to implement it. There are always problems with interpreting international figures, but countries with stronger economies seem to have lower stocks (as a proportion of GDP) than those which are developing.

Discussion questions

1.1 *Is it true that every organization holds stock?*

Yes. If we take a broad view of stocks, every organization must hold stocks of some kind. There are, of course, many differences in the kinds stock, items, purpose, aims, amounts held, policies, and so on – but there are always stocks.

1.2 *Organizations hold stock to give a cushion between operations. But this stock is expensive, so a better approach would solve any problems and do away with the need for this buffering. Does this seem a reasonable suggestion? If it is, how could we do away with the need for buffers?*

It seems a very reasonable suggestion, and this is the basis of lean operations, JIT and other approaches that we meet later. The problem, of course, is translating this good idea into practice. Realistically, there is no way of avoiding the mismatches that make stocks necessary. While crops only grow in set seasons, or deliveries are made by the truckload, or products are made in batches, or customers want differing amounts, or the weather changes – or a huge range of other factors have an effect – then stocks become inevitable.

1.3 *Organizations in a supply chain can never really co-operate, as they compete for available money. Customers should use every available means to pay the lowest price for materials; suppliers should charge the highest prices they can get. Is this a more realistic view of relationships in a supply chain?*

It is certainly an important consideration. The predominant view is that supply chains rather than organizations compete, so each organization should improve its operations to help the whole chain. In practice, an organization might gain by improving its operations but it can also gain by charging its customers more and paying its suppliers less. Its ability to do this depends on the power in the chain. A strong retailer, for example, will simply switch suppliers if prices rise. There are many questions to consider here, including competition, alternative products, availability of suppliers, power in the supply chain, flexibility, and so on.

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- 1.4 *Many trends in business have a direct impact on stock management. What do you think are the most important trends at the moment?*

The chapter has discussed a number of these, including co-operation in the supply chain, improving communications (particularly through e-business), improving customer service, concentration of ownership, outsourcing of non-core activities, increasing environmental concern. There are, of course, many other general trends, and specific ones within certain industries. Although we can make informed judgements, it is difficult to say which of these – or others – will have the most impact over the long term.

- 1.5 *Stock levels are inevitably declining. Eventually we will be able to work without any stock at all. Do you think this is true?*

It might seem possible for some organizations to eventually work without any stock but this seems unlikely. Even the most intangible service needs a stock of knowledge or skills. It is more likely that over the long term stocks will decline to a stable level that still allows effective operations. This is likely to be far lower than current stock levels. An alternative view is that low stocks can only be achieved with efficient transport, and if the cost of transport increases, it becomes beneficial to increase stocks. Then there may be a longer-term trend back to higher stocks.

- 1.6 *Why have the stocks in some countries fallen faster than in other countries?*

This is largely caused by the structure of the economy (with manufacturers being able to reduce stocks more quickly than services), knowledge and skills of managers (who must have the ability to design operations that work with lower stock), availability of resources and infrastructure (needed to implement and support new operations), competition (giving an impetus to change), efficiency of operations (with less efficient ones finding improvements easier than more efficient ones), and a range of other factors.

Copies of diagrams

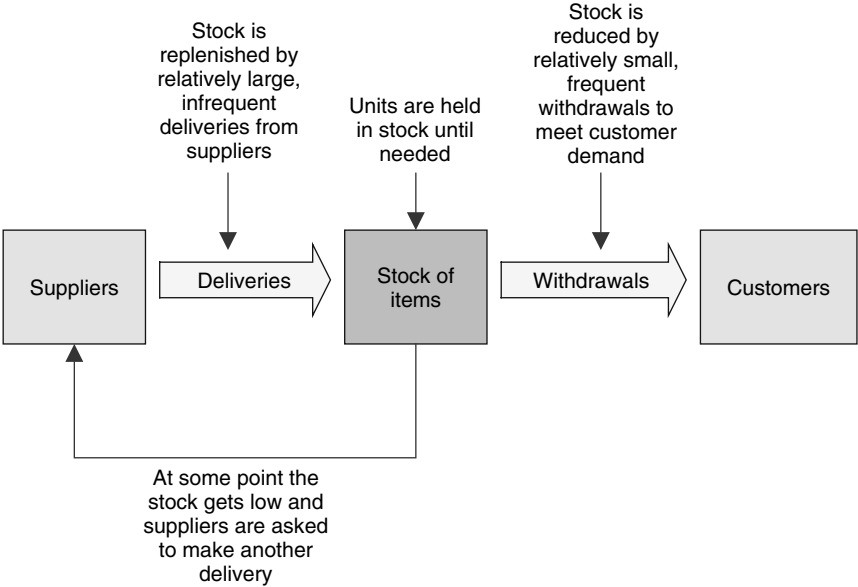


Figure 1.1 A typical use of stock

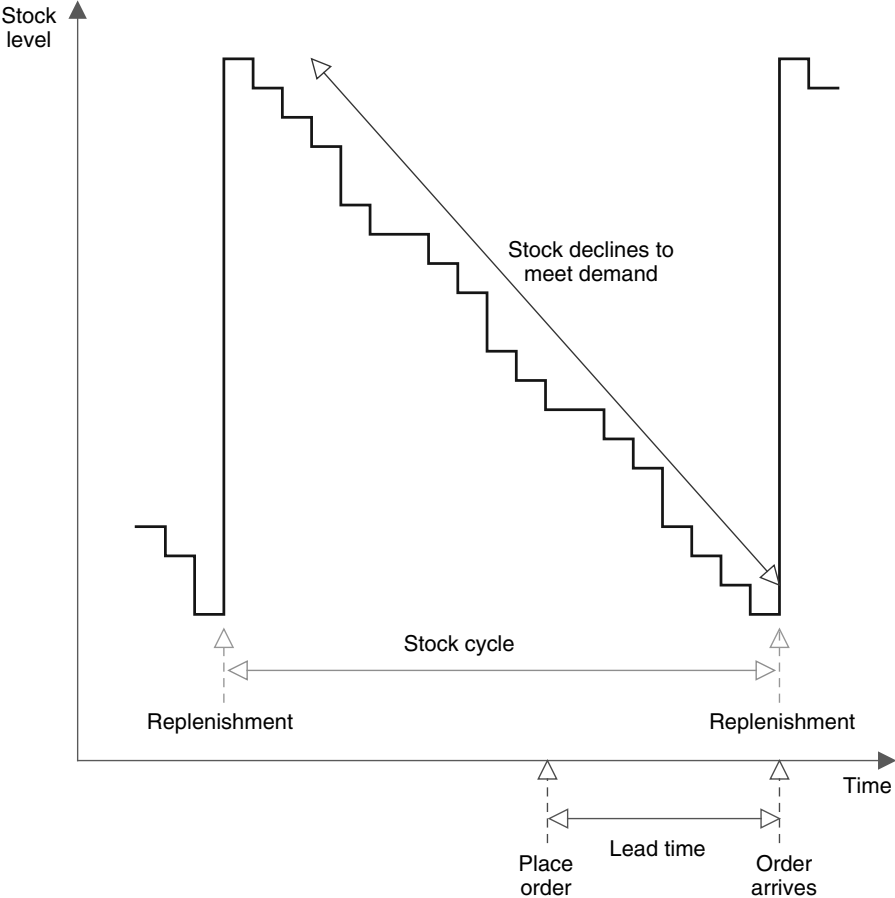


Figure 1.2 Stock levels in a typical cycle

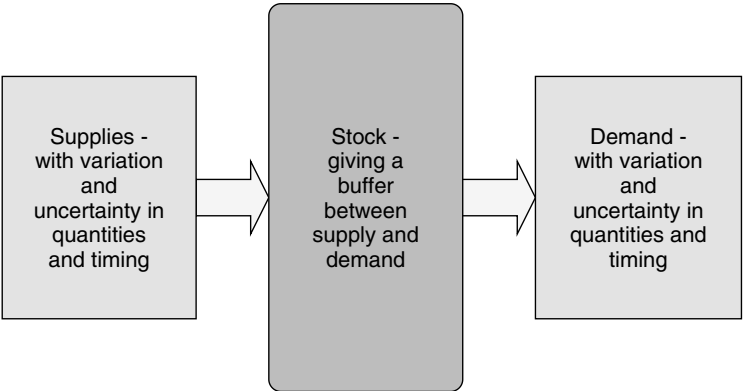


Figure 1.3 Stock gives a buffer between supply and demand

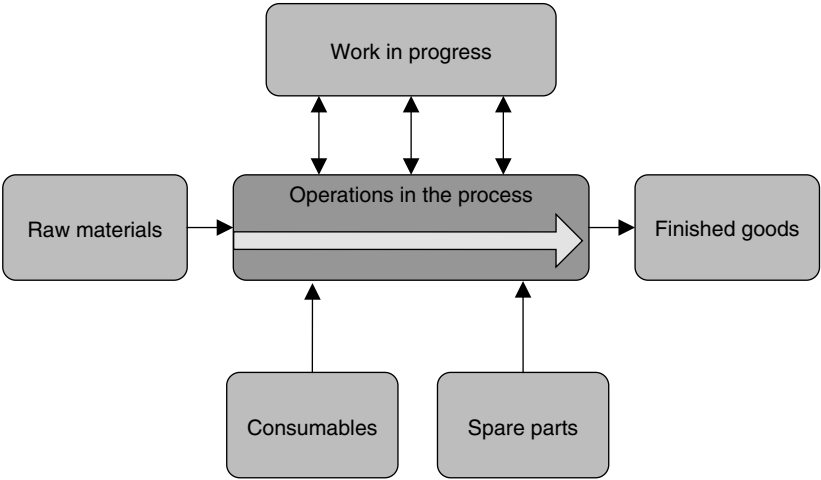


Figure 1.4 Different types of stock

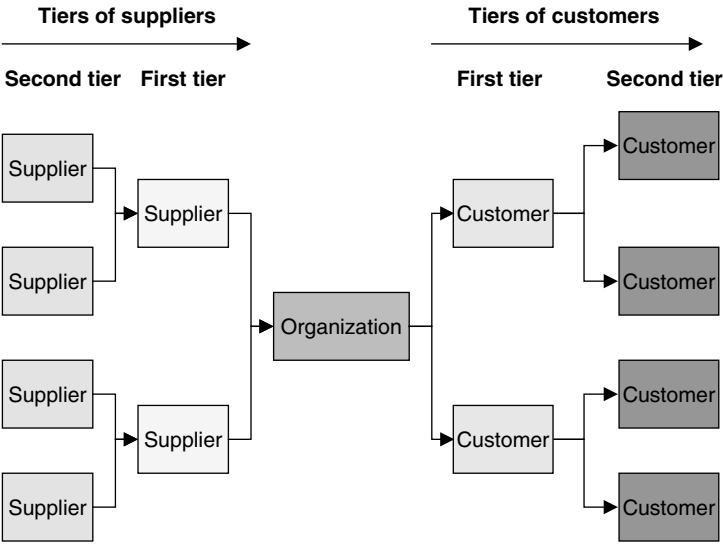


Figure 1.5 A simplified supply chain

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	A	B	C	D	E	F	G	H	I	J
1	Week		1	2	3	4	5	6	7	8
2										
3	Customer									
4		Demand	10	20	10	10	10	10	10	10
5										
6	Retailer									
7		Demand	10	20	10	10	10	10	10	10
8		Opening stock	10	10	20	10	10	10	10	10
9		Closing stock	10	20	10	10	10	10	10	10
10		Buys	10	30	0	10	10	10	10	10
11										
12	Local wholesaler									
13		Demand	10	30	0	10	10	10	10	10
14		Opening stock	10	10	30	30	20	10	10	10
15		Closing stock	10	30	30	20	10	10	10	10
16		Buys	10	50	0	0	0	10	10	10
17										
18	Regional wholesaler									
19		Demand	10	50	0	0	0	10	10	10
20		Opening stock	10	10	50	50	50	50	40	30
21		Closing stock	10	50	50	50	50	40	30	20
22		Buys	10	90	0	0	0	0	0	0
23										
24	Manufacturer									
25		Demand	10	90	0	0	0	0	0	0
26		Opening stock	10	10	90	90	90	90	90	90
27		Closing stock	10	90	90	90	90	90	90	90
28		Makes	10	170	0	0	0	0	0	0

Figure 1.6 Effect of varying demand in worked example

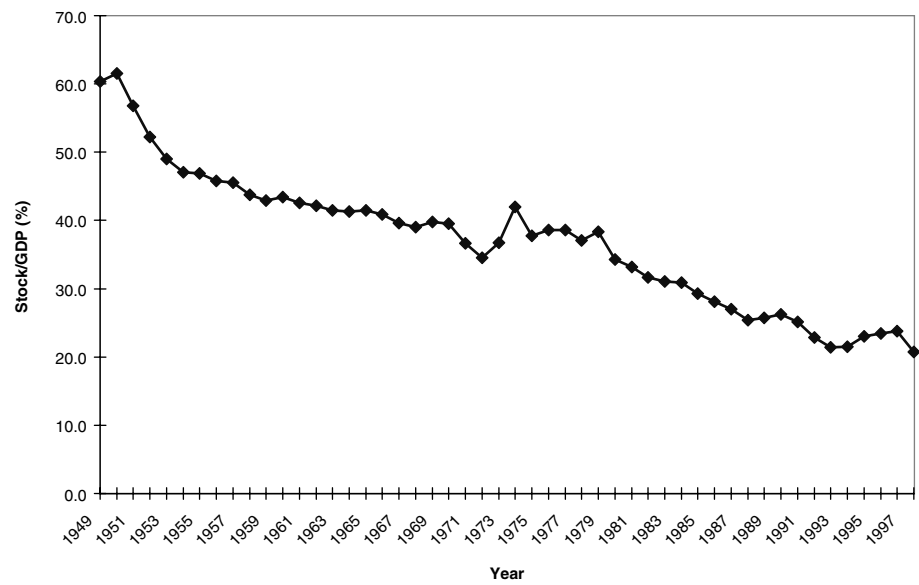


Figure 1.7 Aggregate stock as a percentage of GDP for the UK

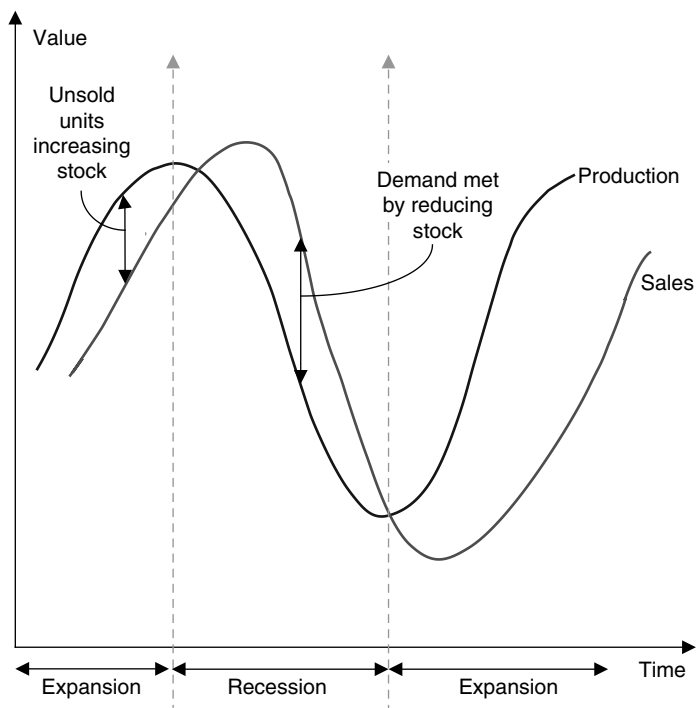


Figure 1.8 Stock levels in a business cycle

