

Part of The
Working Capital
Management
in Practice
Series

INVENTORY

A practical guide to
optimize your
inventory

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The N|A Working Capital Management in Practice Series

Optimizing your trade receivables

Optimizing your trade payables

Optimizing your inventory

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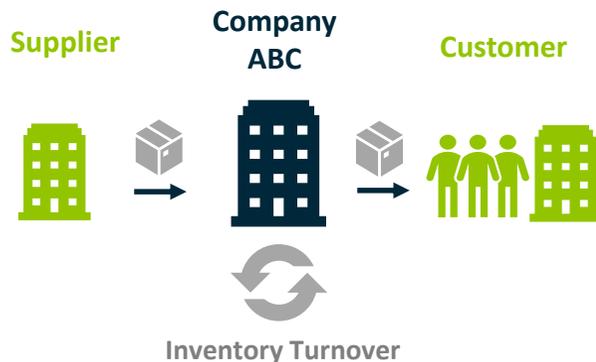
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Introduction

Inventory is the lifeblood of the supply chain. It's what flows from node to node. And at each node it's critical to figure out that perfect balance of supply and demand, or else suffer severe consequences. If you have too little inventory you risk lost sales and customers from "out of stocks." If you have too much inventory you'll need more of everything—more space, more transportation, more handling, more labor, and more money. Optimizing your inventory level can be a complicated process.

For companies looking to take on the challenge of inventory optimization, here are several important activities that help you mastering this challenge.



Creating insight

Are you able to break down your inventory into the three major categories - safety, replenishment and excess stock? This breakdown makes it easier to make sound decisions about appropriate levels for each of these three areas.

A way to create this insight is applying the ABC-LMH method (often referred to as the 9-cell methodology). With this methodology you segment your stock keeping units (SKUs) in terms of their demand variability (Low, Medium and High) and in terms of their share in turnover (A-units covering 80% of turnover or consumption, B-units covering 15% and C-units 5%). The demand variability is calculated using the following equation:

$$\frac{\sigma_d}{D_{avg}}$$

, where σ_d = standard deviation of demand

and D_{avg} = average demand.

This results in a 9-cell model (see fig 1) that allows you, for instance, to examine the number of SKUs per cell, the average inventory per cell or the average Day of Inventory Outstanding per cell. The 9-cell breakdown of your inventory provides you already with valuable information for

optimizing your inventory. It facilitates, amongst others, discussions regarding assortment rationalization, slow moving inventory, service level differentiation etc.

# SKUs	L	M	H	Total
A	681	474	81	1236
B	577	801	198	1576
C	253	1262	1031	2546
Total	1511	2537	1310	5358

Figure 1. Example of 9-cell - # of SKUs

The next step is to calculate your optimal target inventory level for each SKU. There are several mathematical formula's available to calculate your target inventory level. One of the most common used model is the following:

Target stock = Cycle stock + Safety stock, whereby

$$\text{Cycle stock} = \frac{ROQ}{2},$$

where ROQ (re-order-quantity) = $\frac{\text{annual volume in units}}{\text{order frequency}}$, and

$$\text{Safety stock} = Z \times \sqrt{\left(\frac{PC}{T_1} \times \sigma d^2\right) + (\sigma_{LT} \times D_{avg})^2}$$

Z = Z-score (value related to the desired service level)

PC = performance cycle, another word for lead-time

T_1 = time used for calculating standard deviation of demand

σd = standard deviation of demand

D_{avg} = average demand

σ_{LT} = standard deviation of lead-time

By using these formula's, you will easily quantify your excess inventory and thus your inventory improvement potential per cell. An analysis of excess inventory often shows that its major root causes are associated with long lead times, high MOQs (minimum order quantities), poor demand forecasting accuracy and no service level differentiation. In the next section, we will discuss each of these topics in more detail.

The right parameters

1. Reduce lead times

This can be done in different ways. It could be useful to look at your lead times in separate stages to identify where time can be saved. There may be lengthy lead times in the ordering process and so it may be worth reviewing how your

your company orders from its suppliers. Is stock ordered at the same time each month? Are there system limitations that don't allow stock to be ordered when needed? Is there any way these limitations can be solved, for example by updating technology?

Furthermore, the supplier side of lead times may also present some inefficiencies. Therefore, it is important to work together with suppliers to help them reduce their own lead times, potentially looking at ways to forecast and map out future demand so that they also have the resources in place to cope with fluctuations in your company's demand.

2. Reduce MOQs

Meeting the minimum order quantity requirements set by manufacturers can be a real challenge. This is especially true for Chinese manufacturers or other low-cost manufacturing countries that tend to have relatively high quantity requirements. Such factories often have a hard time making good profit margins, so they have to increase their minimum order quantity to reduce the risk associated with each order. As a result, getting them to lower their minimum order quantity can be difficult, but that doesn't make it impossible. Here are some ways you can do it.

Before anything else, try negotiating for a lower minimum order quantity. However, since Chinese manufacturers are almost always reluctant to lower the minimum order quantity, you shouldn't totally rely on this as your only option. Keep in mind that most manufacturers don't hold any stock and will manufacture a product for every order, so remember to keep your negotiation reasonable. It's impossible for a factory to initiate the whole manufacturing process just to make 10 products but a reduction of the minimum order quantity from 10000 to 7000 may be feasible.

If negotiations for low MOQs fail, offer to pay a higher price for the products to offset the lower profit margins that come with small MOQs. It's easy to calculate the costs associated with holding excess stock. The outcome of this calculation will give you a good indication of the price level you are willing to pay. In addition, when introducing a new product, make sure you compare the expected product demand with the required MOQ!

3. Improve forecasting

Demand forecasting is key to inventory optimization. If your company can successfully forecast demand fluctuations, then there is less need for safety stock which ties up resources. Try

using simple methods, supported by historical demand data. For example, items with a low demand variability (AL, BL, CL) can be easily forecasted with the use of historical demand. However, forecasting of items with a medium to high demand variability can be a real challenge.

For these items, it is recommended to set-up a S&OP (Sales and Operational Planning)-process. This process includes monthly meetings with managers from all major operational departments – sales, marketing, procurement/purchase, manufacturing and finance – to discuss the demand forecast (accuracy).

4. Differentiate service levels

Service level requirements significantly impact the required safety stock. However, the question is whether all stocked items should have the same service level. Do your C-items really require the same service level as your A-items? Probably not!

The goal is to maximize resources on the more profitable A-items, while minimizing the resources used on the less profitable C items. By differentiating the service level for different SKUs your overall safety stock will decrease.

Assortment rationalization

Applying the 9-cell methodology will often show that your inventory contains a relative high number of C-items. It is not uncommon that these C-items represent 50% of your total SKUs while only contributing 5% of turnover / consumption. This raises the question whether you need all these items in your inventory. The answer is probably not.

Together with sales and marketing you need to review these items and decide whether to keep them in the assortment. If a C-item needs to be part of the assortment, you might consider having it “on-demand” rather than “stocked”. In this way you are able to optimize your inventory level while still having the item available for your customers.

Slow moving & obsolete

While it makes sense to focus on your more profitable fast movers, you can't ignore your slower-moving items. Every day that these items are not used or sold, they occupy space, utilize labor and resources, run the risk of obsolescence, and in many cases get in the way of your more popular items. Slow moving items are often the

the results of an unsuccessful product being rejected by the market or by poor demand forecast management as product life cycle stages change. Once identified, try to accelerate sales with the help of your marketing and sales teams before the items become obsolete. When these items reach the obsolete stage of their life cycle, it's typically too late to take actions that will result a profitable return on that investment. Often such inventory is reduced by selling it below cost price, donating it to charitable organizations, or scrapping.

Using software

Small companies with a narrow assortment and a relative low stock level can handle their inventory management quite easily with excel. But when inventory levels increase and become a significant part of a company's working capital, it pays off to invest in specific inventory optimization tools.

These tools have been gaining ground in recent years as companies seek to evaluate their inventory and determine the best policies for each product at each node in their supply chain. They are typically stand-alone software tools that use data from WMS and ERP systems and take

into account demand variability, supply variability, and replenishment parameters to determine how much inventory to hold in order to guard against that variability. An example of a supplier of these software tools is **Slimstock**. They are the market leader in Europe when it comes to inventory optimization with more than 600 customers (www.slimstock.com).

Keeping your cash

Whether you need to rationalize your complete assortment or simply want to reduce your slow moving and obsolete stock, the process begins by understanding your current situation through conducting an analysis of your transactional data. From there, you can identify the steps you need to take to structurally improve your inventory.

Beyond simply helping you identify areas for improvement, the working capital professionals of Norsk Arbeidskapital work with your teams to implement new processes, monitor and track your performance and share specific action items your employees can take to optimize your inventory. You work hard to earn your cash. Isn't it time to keep your cash working hard for you?

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www.norskarbeidskapital.no

[info@norskarbeidskapital](mailto:info@norskarbeidskapital.no)

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