

# CONSIGNMENT STOCK CONCEPT IN THE CZECH REPUBLIC

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**Abstract:** The concept of Consignment Stock is a very important logistic technique for short-term asset management as it is a completely innovative approach. This concept is crucial for helping manage inventories in which the supplier furnishes the inventory and maintains a stock of material in the buyer's possession. This paper deals mainly with analysis finding of usage and share of the Consignment Stock concept usage in the Czech Republic and defining obstacles and gains before/during/after the implementation of Consignment Stockage. The analysis is based on a quantitative survey held in the Czech Republic.

**Keywords:** consignment stock concept, just-in-time, inventory management, vendor inventory management.

## **1. Introduction The Consignment Stock (CS)**

(CS) inventory policy is becoming an important strategy that companies adopt to face new manufacturing and supply chain management challenges. A CS policy implies great collaboration between the buyer and supplier, pushing them towards a complete exchange of information and a consistent sharing of management risks (De Matta, 2014). The CS policy is already widespread in a number of industrial realities and it is obtaining raised consensus in both small and large contexts, since it offers a partial solution to the 'cycle time reduction' problem and avoids any shortage of materials through enhanced communication between suppliers and buyers. The technique in fact allows partners, the vendor and the buyer, to reduce management costs and increase their flexibility. In particular, the buyer virtually removes the procurement lead time, since the responsibility of the replenishment lies completely with the vendor, who keeps a stock of its property at the buyer's plant: the buyer uses the stock of materials according to his daily production requirements. Outsourcing of materials can easily incorporate the CS policy to enhance supply chain operations (Battini, 2010). CS is a logistic technique in which the vendor, instead of the buyer, is in charge of managing the buyer's inventory and triggering replenishment orders. This makes possible a partial suppression of the vendor's warehouse, which can be replaced by that of the buyer (Braglia, 2013). In particular, the buyer virtually removes the procurement lead time, since the responsibility of the replenishment lies completely with the vendor, who keeps a stock of its property at buyer's plant: the buyer uses the stock materials according to his daily production requirements (Abdel-Malek, Kullpattaranirun, Nathavanij, 2005). Consignment Stock (CS) is an innovative approach to supply and stock management, based on a strong and continuous collaboration between vendor and buyer to create a "win-win" situation, where both partners have equal gains (Battini, 2010). There is an obvious advantage for buyers. They have available stock and they can pay later for that. For sellers there is a very high certainty of supply and demand turnover when the stocks are with customers and the sale is almost guaranteed. And also they save space in their own warehouses. It also saves time to every part of the deal, because stock is being ordered by system which often uses min max method.

## 2. Basic elements of consignment stock

CS is a logistic technique in which the vendor, instead of the buyer, is in charge of managing the buyer's inventory and triggering replenishment orders. This makes possible a partial suppression of the vendor's warehouse, which can be replaced by that of the buyer. Consequently, it is possible to minimize both the ordering and the stock holding costs of the buyer, because materials formally owned by the vendor can be collected (that is, purchased) by the buyer only upon demand. On the other hand, the vendor gets visibility regarding the customer's demand and can use this precious information to schedule production and replenishment orders in an optimal way (Braglia,2013). In a CS policy, the buyer incurs stocking costs, since the materials are located in the buyer's plant, but does not sustain financing cost, since the item is purchased only when needed. In fact, since the item is formally purchased upon demand, the vendor sustains the financial costs of the capital immobilized until that moment. The vendor also receives a number of advantages. First of all, the average stock is reduced leaving more available space for stocking new items. Moreover, the vendor increases his production management flexibility since he is no longer constricted by consecutive close orders. For these reasons, a CS policy aims to reduce management and logistic complexity of the stocks and to ensure at the same time a constant availability of materials in order to eliminate stock-out risks. (Battini, 2010). With regard to the basic description of the Consignment Stock concept, it is explained in Figure 1 below. Firstly, the Consignment stock itself is housed at buyers' plants. Further, the buyer consumes delivered goods according to the daily production request. The information surrounding daily consumption data is exchanged with supplier. Additionally, vendor delivers the needed material according to the data exchange with the buyer enabling production planning. Finally, in the last step of the cycle, consignment stock refilling is performed by the vendor, including stock data update. 1 Corresponding author: pe.vrbova@gmail.com 375 Fig. 1. Consignment stock concept Source: (Battini,2010) Production and delivery of a schedule determined so as to minimize the total annual cost of the entire supply chain. Whenever something is produced, it is sent to the seller, who then sells the products in individual doses. Implementation of the consignment warehouse in cooperation seller and the buyer must be a fixed order. In order to avoid the production of the additional costs, should each machine to produce the maximum capacity (Braglia, 2013).

### 2.1. Consignment stock MIN a MAX concept

Supplier is responsible for keeping the buyer's inventory between a maximum (S) and a minimum level (s) and he also supports any additional cost due to stock-outs if his stock management strategy is not suitable to assure the required service level (Braglia,2013). In CS model a vendor can freely decide interval and volume of replenishment orders. The only requirement is that inventory in customer's warehouse stays between a minimum required level s and a maximum level S. Both s and S are agreed in a contract between vendor and customer (Valentini, Zavanella, 2003). The following Table 1. explains supplier's and customer's interests in stock level setting. Table 1 Stock level related motivation for the supplier and the customer Desired (s, S) and related motivation for supplier and the company s level S level Supplier ↓ Keep as low as possible It represents a capital "frozen" in the company's warehouse, which determines as opportunity cost ↑ Keep as high as possible It consists in a space offered by company to stock products, thus freeing space in own warehouses.

Consequently, production flexibility may be increased Company  $\uparrow$  Keep as high as possible It is a sort of safety stock which enables a higher service level, whereas its economic burden is borne by supplier  $\downarrow$

Keep as close as possible to  $s$  level There is a need for limiting the space occupied by the products and for reducing the problems linked to their management and handling Source: (Valentini, Zavanella, 2003) In Table 1  $s$  represents the minimum inventory level allowed in the CS contract. A Supplier's motivation is to negotiate the  $s$  level as low as possible. The lower the  $s$  level is the less of a supplier's capital is potentially tied in the goods. In proportion, high  $s$  level means high safety stock for the customer. High  $s$  level is customer's advantage.  $S$  stands for the maximum allowed inventory level. While the supplier prefers a high  $S$  level to increase his or her operational flexibility, an  $S$  level close to  $s$  level is preferable for the customer. A Customer's total storage costs rise when more goods are stored in his or her premises (Rauvola, 2010). CS is preferably used for products characterized by constant consumption. Nonstandard products and prototypes are not to be included in CS programs (Valentini, Zavanella, 2003).

## **2.2. Benefits of Consignment stock concept**

According to Graham (2015), first, the primary benefit that can be derived from a consignment agreement is that it allows the consignee to save money on inventory costs. As the consignee, you do not need to put money on the goods that you sell. You pay the consignor only after you have sold the merchandise. This could mean improved cash flow on the part of the consignee. Next, consignment can actually save you time because you do not have to wait for new 376 inventory every time you run out of stock. Typically, the person or company that consigned the goods will automatically replenish your inventory right after you sell some or all of the consigned goods. It is in the best interest of the consignor to keep the agent well-supplied. Third, a consignment agreement is more convenient compared to a drop shipping arrangement where the retailer only takes orders and does not hold any inventory from the supplier. The consignee will have the merchandise on hand, easily accessible and ready for sale. Moreover, the consignee does not have to worry about goods running out of stock indefinitely, as resupplying the inventory happens regularly under a consignment setup (Graham, 2015). Piasecky (2000) claims that the key benefit to the customer should be obvious; he does not have to tie up his capital in inventory. This does not mean that there are no inventory carrying costs for the customer; he does still incur costs related to storing and managing the inventory. So what's in it for the supplier? This is where the benefits may not be so obvious - or may not even exist. The supplier has the product or group of products for which believe they will sell and fall into the hands of end users mainly. The trick is that before we get products for end consumers, we need to get to the stock to the retailer. Traders are hesitant whether or not to store products because they do not have complete confidence in the suppliers do not want to invest money and risk to keep them in stock remained something that is not for sale (Lee, 2005). In Table 2, there are specified particular benefits separated from both a supplier's and a customer's perspective. With regard to benefits for the vendor, Battini (2010) deals mostly about the optimization of transport, of production sizes due to the fact that the entire planning of transport and lot sizes is to the domain of the vendor in accordance with real consumption data availability, as provided by the buyer. Furthermore, there are additional benefits for the vendor such as increased space availability and a long term contractual relationship. From the buyer's end, the main advantages are generally: materials are always on hand despite reduced management costs covered

by vendor; procurement lead times are drastically reduced in case of optimal deliveries from vendor; the production mix is more flexible and payments are due only in the case of material quantities which are consumed.

### **2.3. Responsibility of vendor and buyer Increasingly, competition has forced companies to seek stronger cooperation and strengthen the relations with its suppliers.**

One example of such cooperation is cooperation between two partners which will help to minimize costs and maximize profits of the entire system. Many researches showed that joint decisions business partners lead to the effective functioning before deciding if every man for himself within the same organization (Lee, 2005). These responsibilities affect the costs that each one of the players incurs in the future. Table 3 distinguishes the major responsibilities of Vendor and Buyer according to Zahran (2015).

#### **Summary of the responsibilities for the vendor and the buyer for consignment stock agreements**

Responsibility	Vendor	Buyer
Product ownership	✓	✓
Physical loss, damage, theft, or defect	✓	✓
Unused, unsold, or expired products	✓	✓
Inspection of delivered items	✓	✓
Periodic inventory review, or audit	✓	✓
Inventory management	✓	✓
Reporting, and order initiation	✓	✓
Product pricing	✓	✓
Stock level management, and usage invoice	✓	✓
Payment by the due date	✓	✓
Storage space requirement	✓	✓

Source: (Zahran, 2015) 377

#### 2.4. Risks associated to Consignment stock concept

Consignment stock may become disadvantageous if it brings about discrepancies in the records of both vendor and buyer.

Above might refer also to risks associated to Consignment stock concept. Since for product ownership, it is vendor responsibility, he/she also has to deal with unused, unsold or expired products that might cause very high costs. The party supplying the stock faces the biggest risks under a consignment agreement. For one, the consignor will not receive any money until part or all of the consigned stock has been sold. In effect, the consignor's cash flow may suffer as more money is spent on manufacturing the goods, while cash coming in may be too slow to cover subsequent production runs. Next, the consignor may be exposed to higher product returns if the agents or consignees simply allow the goods to rot or become damaged in warehouses. After all, the consignee does not have any money invested in the consigned merchandise. Without a good profit sharing agreement, the consignee may not be too keen on pushing the consignor's products in the market. In addition, since resupplying or restocking the consignment inventory is done regularly, there is a risk of overstocking or duplicate inventories. This could be detrimental for both the consignor, who would have more goods sitting idly in the agent's warehouse, and for the consignee, who may spend more on inventory storage costs. Lastly, the record keeping systems of the party consigning the goods and the retailer or agent are not always the same (Graham, 2015). On the other hand, since buyer is responsible for storage of the materials, physical loss, damage, theft or defect, there is a huge responsibility of buyer and it is required. To provide inspection of delivered items by buyer as well. Buyer might avoid potential risks by periodic inventory review or audits. For the consignee, any misplaced item could mean paying for something that has not generated a profit. Meanwhile, inconsistencies on the consignor's side could lead to lost merchandise (Graham, 2015).

### 3. Methodology

There exists a plethora of research, studies, analyses, and formulas dealing with Consignment Stock, albeit mainly from theoretical point of view. By the way of contrast, there is little that is known about real usage - in terms of a practical adoption. It is therefore the main objective of this paper to specify and find out the share of the Consignment Stock concept usage in the Czech Republic and define obstacles and gains before/during/after the Consignment Stock implementation. For the purpose of this paper, a quantitative survey was held in the Czech Republic as the main data collection source. The research was held in the period between March and May 2016 and obtained in the Czech Republic. A field survey was used to investigate the research questions and a structured questionnaire was utilized as the main data collection. Respondents/companies were selected both randomly and according to companies sampled in previous researches (71 companies). Companies were contacted as sampled from various industries and of different sizes and annual sales, in order to complete the questionnaire. Out of 118 companies addressed in various areas of business, 33 companies did not reply or refused to participate. Therefore, 85 replies were compiled.

#### 4.1. Advantages of CS concept from the supplier's point of view

Table 5 demonstrates the main advantages of CS concept adoption from the supplier's point of view. The major advantage can be identified as increased flexibility in deliveries (49%) as confirmed by almost half of respondents. Another advantage was determined to be the optimization of production sizes (25%). Due to the fact that each delivery is generally paid for following the actual consumption and consequently paid on a regular basis on contracted credit terms that may defer the capital expenditure for up to and over 3 months. One fifth of respondents also agreed that there is a huge advantage found in the diminished responsibility and time spent within orders and deliveries (20%).

Advantage	Nr. answers	% of answers
Optimization of production sizes	21	25%
More flexible deliveries	42	49%
Less responsibility and time /effort spent within orders and deliveries	17	20%
Others	5	6%
Total	85	100%

Source: (Author)

#### 4.2. Advantages from the buyer's point of view

Table 6 shows the most significant advantages of the Consignment Stock concept from the buyer's point of view. Buyers find the following aspects as the most pervasive advantages of Consignment Stockage in almost equal measure – reducing the cost of business capital (18%), flexible response to a customer's requests (15%), continuous availability of goods for customer (16%) and continuity of the production process (14%).

Advantage	Nr. answers	% of answers
Continuity of the production process	12	14%
Flexible response to customer's requests	13	15%
Reducing the cost of business capital	15	18%
Reduction of transportation and administrative costs	9	11%
Continuous availability of the goods for customer	14	16%
Customer payments after a real mat. consumption	11	13%
Inventory cost reduction and new form of production planning	5	6%
New way of partnership between customer and supplier	5	6%
Others	1	1%
Total	85	100%

Source: (Author)

### 4.3. Disadvantages from the supplier`s point of view

Table 7 shows the most significant disadvantages of CS from the supplier`s point of view. More than one third of all the respondents agreed, that the crucial disadvantage is the fact that suppliers need to deal with high bound capital in stock costs (35%) reserved for buyers. Furthermore, it is of great importance for suppliers to bear in mind risks and disadvantages associated with the need of regular inventory checking (22%), maintaining warehoused stock levels (20%), the entire responsibility for planning and delivery, etc. (21%).

Disadvantage	Nr. answers	% of answers
High bound capital in stocks	30	35%
Keep a stock in warehouse	17	20%
Entire responsibility for production planning, delivery, etc.	18	21%
Regular inventory checking	19	22%
Others	1	1%
Total	85	100%

Source: (Author)

4.4. Disadvantages from buyers` point of view

Table 8 shows the most significant disadvantages of CS from the buyer`s perspective. Buyers as respondents of this survey are mostly worried about the risks inherent with supplier reliability (40%). Trust, reliability and proper partnership are more than required in this kind of cooperation, due to the fact that in the event of low supplier reliability and delays, production stoppage and additional costs or penalties might ensue. More than a third of buyers listed as disadvantageous cases of claims and returns of goods (30%) as acquired goods would have already been invoiced and similarly, less responsibility for (and therefore, control over) deliveries (26%) which relates to the aforementioned risk of supplier reliability.

Disadvantage	Nr. answers	% of answers
Risk of supplier reliability	34	40%
Claims, returned goods	26	31%
Less responsibility for deliveries	22	26%
Others	3	4%
Total	85	100%

Source: (Author)

## 5. Discussion

The concept of Consignment Stock is an innovative approach, requiring an established and solid cooperation and partnership between both parties to the transaction. Given the vast amount of research dealing with the mainly theoretical concept of Consignment Stock, the main aim of this paper was to discover practical advantages and disadvantages of the consignment stock concept from both the supplier`s and buyer`s perspective. With regard to the supplier`s benefits, it has been determined that mainly the advantages listed centre around optimization of production sizes, increased flexibility in deliveries (more frequent and smaller deliveries) and less responsibility and time/effort spent within the ordering and delivery phases of the transaction (since the supplier is fully responsible for all these actions). From a buyer`s perspective, the main benefits identified revolve around the reduction of the cost of operational capital, continuous availability of goods, and increased flexibility in responses to the customer`s request. In determining supplier disadvantages, it was discovered that these mainly centre around the high bound capital in stocks (supplier invests capital into both goods in the consignment stock and also goods within their internal production and warehouse in order to be ready to supply once the reorder levels in the buyers` consignment stock are reached); regular inventory checking, and the entire responsibility for production planning and deliveries. For buyers, the main disadvantages identified, mainly centre around the risks inherent with supplier reliability (in the event of which major additional costs could arise due to cessation of production, express transport costs, delays etc.), claims and returned goods (with the ensuing bureaucracy and time wastages in identifying goods that would have already been invoiced and considered as consumed), less responsibility for (and therefore control over) deliveries.

## 6. Conclusion

This article mainly focuses on analysis finding of usage and definition of obstacles and gains before/during/after the Consignment Stock implementation. For the purpose of this paper, a quantitative survey held in the Czech Republic was used as the main method of data collection, with a deeper focus on identifying advantages and disadvantages of the Consignment Stock concept itself for both suppliers and buyers. This paper is considered as just a part of the complete research dealing with risks related to the Consignment Stock concept implementation. This work helped to identify 380 weak gaps that might be found as potential risks to avoid for the future implementation of Consignment Stock. Future work will focus on finding out what difficulties, obstacles and risks were found before, during and after the consignment stock implementation.

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