Efficient stocks administration in the frame of the present economic crisis

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Abstract

The economic-financial crisis made its presence felt through more or less shy signals. All companies from the international and national market started to feel the crisis's negative effects, several declaring bankruptcy, or diminishing temporary their activity. The consequences are multiples: the unemployment's rate increase, the decreasing of the purchase power and reducing the goods demand from the luxury ones up to the one for consumption etc. Under these circumstances, companies have to avoid the immobilization of financial resources in products stocks that cannot be sold in the near future period, because otherwise would attract the danger of costs increasing, cashing decrease and generation of loses that may endanger the companies capacity of surpassing the present crisis. Therefore, all companies, no matter their size, should find during this period means of efficient stocks administration.

Keywords

stocks, administration, efficiency, Just-In-Time method, economic crisis

Cod JEL: M41

Introduction

During present economic period, costs decreasing become a purpose for all companies. Besides, Pogonaru F., the president of The Business Men Association from Romania (AOAR) declared in an interview that starting with 2009 the main word would be "costs reduction". [1]

From the total costs structure, a significant part is connected to stocks constitution and maintenance. For instance, "in the case of retail companies – a majority in Romania – the cost associated to the held stocks constitutes, regularly, the biggest average in its costs." It is understood, therefore, that in the context of the present crisis, "a rigorous and efficient stocks administration, based on maintaining their lowest level, is on long run an instrument of risks' administration to which companies are exposed during this period (the liquidities lack risk, costs increase risk, of incomes diminishing, of profitableness decrease)". [2]

Objectives followed in stocks administration

[1] Budescu, F. (2009), *Pogonaru: 2009, an de reducere a costurilor*, 04 February 2009, http://www.ziare.com, accessed on 21 July 2009.

[2] Cavusoglu, M. and Mut, L. (2008), *Gestiunea eficientă a stocurilor – o necesitate pentru depăşirea crizei actuale,* 18 November 2008, http://www.crediteuropeimm.ro/informatii. php?info=1024 &type=articole, accessed on 21 July 2009.

In stocks administration, the *followed objectives* are risks minimization, respective the avoidance of stock rupture apparition as well as creation of too bulky stocks, and profitability maximization, meaning the purchasing of minimum costs for stocking and neutralization.

To realize it is necessary to take into consideration:

- *consumption rhythm* – meaning stocks exits, with influence on the predictions from the supply domain; "any stock is alimented by a *supply flux* and it is designed for satisfaction of a *demand flux*". [3]
- *supply cadence* – represents the annual orders numbers through which the materials supply is demanded; in order to realize the stock administration at the lowest costs, the optimal cadence supply should be established.
- *active stock (economic quantity)* - is the quantity entered in stock at every entrance and afterwards consumed; this depends on the demand's certainty degree: when is known, the level of the active stock =demand; when is random, the level of active inventory=predicted demand.
- *safety stock* – has the purpose of insuring the production activity continuity (the stock rupture avoidance under different circumstances such as a demand bigger than the predicted one).
- *safety average* – indicates the consumption time of the safety inventory.
- *critical safety stock (resupply inventory)* – represents the stock level in the moment when the order should be launched. The interval between the order's launching and its delivery date it is called supply interval. Under the situation when a delivery should be realized and the stock becomes null or at a certain value (precise), the critical stock becomes minimal. The stock rupture appears when it is consumed without realizing the order. The critical stock comprises the safety inventory, if the latter exists.

Main costs attracted by products stocking

Any enterprise follows the *stocking costs minimization,* in whose componence the following categories of expenses are found:

- *supply cost* that represents the acquisition cost (purchase price + transport-supply expenses + other accessory expenses), or the costs of launching an order (administrative expenses, a part of the fix expenses), or the goods' production costs;
- *tenure cost* formed of expenses with stocking (amortization, rents, insurance, security etc.), maintenance expenses, stocks manipulation and insurance, to this a financial component being added, respective the capitals immobilization in stocks.
- *overstocking cost* that appears when exists stocks surplus; this receives zero value if in the near period the stock supply is absorbed without loss;
- *rupture stock (the lack of stocks)* supposes supplementary expenses with supply from another supplier (more rapid) to which penalties may be added due to clients for not paying their orders in time, special transports, lost sales etc. If the lack of stock affects the internal demand, the consequences may reach to technical unemployment, the rupture cost being proportional to stock lack period;
- *surpass cost* intervenes if the enterprise disposes of stocks bigger than supply capacity;

Under normal activity conditions, the most important among the stocking costs is the lack of stock cost.

In practice, the enterprises cannot identify exactly each of these categories of costs (the rupture cost is difficult to evaluate), therefore the determination of an optimum active cost is imposed, as well as the determination of the optimum time interval between two deliveries, the purpose being the optimization of total socking cost.

[3] Ionaşcu, I., Filip, A.T. and Mihai, S. (2006), *Control de gestiune*, ediția a II-a Editura Economică, Bucureşti, p 161-172.

For costs optimization, specific literature presents different mathematical methods, among which we remind:

(a) *graphical representation* – on an axis the order date, delivery date and the delays are followed, and on the other one the stock value as aginst the minimum stock is represented;

(b) *determinist patterns (certain data)*– comprise:

➲ *Wilson's pattern* – that supposes the determination of an optimum supply rhythm, demand and delivery terms are known in advance, the safety stock not being necessary; this pattern does not admit penury. The calculation relations are:

CT =	Supply cost (C x CA)	+	Launching cost (Ca x CA/SA)	+	Tenure cost (Cs x SA/2)

The optimum number of orders in one year:

$$n^x = \sqrt{\frac{Cs \cdot CA}{2CA}}$$

The optimum interval between 2 orders:

$$T^x = \frac{360}{n^x}$$

CT = the total yearly stocking cost;
C = the unitary acquisition cost, independent from the volumes ordered for every supply;
Ca = the launching cost attached to every order, independent form volume;
Cs = the cost of holding a product unit on a certain time period;
CA = the yearly constant demand, expressed in pieces;
SA = active stock.

There should be underlined that the *Wilson's pattern* is pure an economic one, characteristic to firms from the beginning of the century. The resulted data are based on a constant demand on time unit, undelayed, a constant acquisition cost, a periodical extern and punctual supply rhythm.

➲ *determinist pattern admitting the materials penury* - having on its basis Wilson's pattern, starts from the idea that, under certain circumstances, the clients accept to delay their demand (the enterprise may grant different reductions, for it meaning penalties). Therefore, the penury cost appears as a component of the total stocking cost. The calculation relations for this care are:

CT =	Supply cost	+	Launching cost	+	Tenure cost	+	Penury cost

$$CT = C \cdot CA + Ca \cdot \frac{CA}{VC} + Cs \cdot \frac{SA^2}{2 \cdot VC} + Pn \cdot \frac{(VC - SA)^2}{2 \cdot VC}$$

The optimum value of an order (VC^x):

$$VC^x = \sqrt{\frac{2 \cdot Ca \cdot CA}{Cs}} \cdot \sqrt{\frac{Cs + Pn}{Pn}}$$

The optimum active stock (SA^x):

$$SA^x = \sqrt{\frac{2 \cdot Ca \cdot CA}{Cs}} \cdot \sqrt{\frac{Pn}{Cs + Pn}}$$

The determinist pattern supposes that exists a constant demand in time, but it can be postponed, the acquisition cost is constant and the external supply rhythm is periodic and punctual.

(c) *probabilistic pattern* – it comprises the patterns with random demand and fixed economic period, the matrixes patterns applicable to a discreet random demand with fixed period.

Just-In-Time – stocks administration method adapted to present economic conditions

"*Just-In-Time*" system is a stocks administration principle that allows the their reduction up to the minimum level that allows the maintaining of continuity of activity fluxes developed by companies. Applied correctly, this system may lead to a significant improvement of a company's investments efficiency and profitableness. The system supposes that the products would be ordered or realized exactly in the moment when exist demands, no earlier nor later. In order to realize this aspect, it is vital the existence of a fast communication between the existent stock consumption and new requires of products.
The majority of enterprises is oriented for stock administration towards the *Just-In-Time* method because the concepts that are at its basis are:

- simplicity is followed;
- the quality of process is essential;
- the work environment is in continuous improvement;
- the high level of stocks represent a resources immobilization and may cover an unqualified work;
- any activity or function that cannot add value to the product should be reduced or eliminated;
- goods should be produced only when there are necessary;
- staff should be multiqualified and should contribute to efficiency increase and products quality.

The implementation of Just-In-Time operational environment imposes to enterprise the implementation of an operational system that would comprise seven elements: (a) stocks elimination; (b) production's planning and programming pull-through system; (c) lots fractioning; (d) installations' fast and inexpensive adjustment; (e) creation of flexible work cells; (f) formation of multiqualified labor force; (g) maintenance of high levels of process quality.
But, in order to apply this method, the enterprises should solve other *internal problems*: adjustment culture (Japanese talk about "zero adjustment time"); creation of tight relations with the suppliers; rapid change and adjustment processes for installations; multivalent machines and employees.

Conclusions

Under the present crisis conditions, in order to surpass the difficult period and with the purpose of attracting liquidities and diminishing stocks generating costs, the companies should try to apply the *"sell what you have"* principle launched by DELL Company and applied with success by many other companies.
For stock efficient administration, companies may orientate towards Just-in-Time method, that would help them to reduce significantly the stocking costs, to avoid the investment of financial resources in hard to sell stocks and, in consequence, to increase their activity efficiency.
Another aspect important to be taken under consideration in stocks constitution is the application of a differentiated policy in what the supply products is concerned. This should be made taking into consideration their importance in generating profit for the company: according to commercial addition/profit average, the demand/supply frequency, the cashing flux for sold products etc. As consequence, in order to obtain an efficiency of stock administration activity the identification of main types of products from a companies portfolio is important:

- *group A* – approximately 10% from the number of products that make to stocking object, but which contribute in proportion of 70% to realization of companies incomes;
- *group B* - approximately 20% from the number of products whose contribution to company's performance is also 20%;

- *group C* – comprising a very big number of products, approximately 70 % from the total number of products, but whose cumulated contribution to company's incomes and profits does not surpasses 10%.

By realization of such classification, it would be more easy for companies to orientate towards the supply with those products that would assure the highest profit average and that would have the shortest cash flow cycle.

In order to support the enterprises the stock administration informatics applications come, already existent on the Romanian market, that allow in any moment: stocks visualization with recouping on departments/types of products etc.; stock analysis; establishing of crisis stock; lists of quantitative/value stocks at the current date or any anterior date etc.

In conclusion, through a continuous monitoring of stocks and stocking costs, the stock administration activity will gradually transform in an activity of profitableness administration, insuring the Romanian companies' survival and the exist from the present crisis situation.

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