

Секція 3. ЕКОНОМІЧНА ТЕОРІЯ ТА ЗОВНІШНЬОЕКОНОМІЧНА ДІЯЛЬНІСТЬ

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УПРАВЛІННЯ ЗАПАСАМИ ПІДПРИЄМСТВА ЗІ СТРАТЕГІЧНОЇ ТОЧКИ ЗОРУ

А.О. Борисова, К.Ю. Величко, Г.М. Шаповал, А.О. Колесник

Проаналізовано існуючі підходи управління запасами підприємства. Акцентовано увагу на необхідності до управління запасами підприємства відповідно до принципів управління, що базуються на вартісно-орієнтованому підході. Запропоновано систему управління запасами підприємства, яка спрямована на визначення їх оптимального обсягу та зниження витрат, пов'язаних із їх утриманням, що зі стратегічної точки зору впливає на вартість підприємства.

Ключові слова: система управління запасами, EОQ-модель, VBEОQ-модель, вартісно-орієнтоване управління.

УПРАВЛЕНИЕ ЗАПАСАМИ ПРЕДПРИЯТИЯ СО СТРАТЕГИЧЕСКОЙ ТОЧКИ ЗРЕНИЯ

А.О. Борисова, Е.Ю. Величко, Г.Н. Шаповал, А.А. Колесник

Проанализированы существующие подходы к управлению запасами предприятия. Акцентировано внимание на необходимости управления запасами предприятия исходя из принципов стоимостно-ориентированного подхода. Предложена система управления запасами предприятия, которая направлена на определение их оптимального объема и снижение затрат, связанных с их содержанием, что со стратегической точки зрения влияет на стоимость предприятия.

Ключевые слова: система управления запасами, EОQ-модель, VBEОQ-модель, стоимостно-ориентированное управление.

ENTERPRISE INVENTORY MANAGEMENT FROM STRATEGIC PERSPECTIVE

A. Borysova, K. Velychko, G. Shapoval, A. Kolesnyk

Existing approaches to inventory management are examined in the paper. The necessity of inventory management according to the principles of value-based management is proved. The system of inventory management from strategic

perspective is developed, which is directed on enterprise value maximization by decreasing inventory holding costs and optimization of inventory storage. The proposed system of value-based inventory management includes four main steps: supplier selection; determining ways for inventories use optimization; needs assessment in certain group of inventory at current stage of production process and enterprise value management. These steps realization should result in the development of recommendations on inventories use optimization for the increase of enterprise value.

Keywords: *inventory management system, EOQ-model, VBEOQ-model, value-based management.*

Statement of the problem. Under market conditions, economic development of enterprises depends on the design and implementation of developed strategies. Taking into account the fact that inventories are key elements of the production process for the most companies and the cost of their purchase, transportation and storage significantly affect the performance of the company, it is expedient to use modern methods of inventory management that most fully allow considering strategic aspects of the company. The experience of the developed countries demonstrates the effectiveness of management strategies based on value-oriented approach.

Value-based inventory management is an element of value-based system of enterprise corporate management. Being a part of enterprise cash flows, costs for inventory purchase and saving influence on net cash flows and enterprise value. Value-based inventory management methodic should be devised to increase enterprise cash flows and thereafter – its value.

Existing approaches to enterprise inventory management are based on inventory optimization, which includes costs for inventory purchase and saving reduction, but do not consider connection between inventory management and the enterprise value.

Review of the latest research and publications. Many domestic and foreign scientists study the issues of strategic and value-oriented management. In particular, A. Thompson [1] studies the question of value-based management. I.A. Blank [6], G.L. Brodetskiy [7], G. Michalski [8], G.A. Semenov [9] and others research the issues of inventory management.

The objective of the article. The issue of inventory management is not solved in strategic aspects of enterprise management, specifically in correlation with the enterprise value. Thus, the purpose of this paper is to elucidate inventory management issue in correlation with the enterprise value and to treat the system of value-based inventory management from strategic perspectives of enterprise development.

Presentation of the research. Literature analysis on inventory management issues showed that EOQ (Economic Order Quantity) model is recommended to be widely used for inventory optimization. Giving the

possibility to minimize total inventory storage costs and ordering costs the model is successfully used for inventory optimization at many enterprises. Nevertheless, there are some restrictions for its use depending on the type of enterprise activity. That is why the model cannot be widely used for inventory optimization.

Scientists transformed EOQ model to correspond to economic conditions and requirements. Thus, such criterion as money value, which changes in time, was added by Russian economist G.L. Brodetskiy for the model transformation. Transformed models give the possibility to increase revenues, by taking into account money value in time, but being based on EOQ model, they have the same restrictions for use as EOQ model has.

Requirements of value-based management were taken into account in VBEOQ (Value Based Economic Order Quantity) model, which was treated by Polish economist G. Michalski by transformation of EOQ model. VBEOQ model enables total inventory storage costs and ordering costs minimization and enterprise value maximization, though the restrictions for its use are the same as for EOQ model [8].

EOQ model can be used only for the optimization of those inventories, which are constantly used and have fixed value of holding costs and ordering costs.

Just in time, system is also widely used for inventory optimization nowadays. It gives the possibility to reduce holding costs to minimal level, though it includes additional costs for timely delivery premium. However, just in time system can be effectively used mainly for those inventories management, which are used in production process very seldom or periodically.

The proposed system of value-based inventory management includes four main steps:

1. Supplier selection.
2. Determining ways for inventories use optimization.
3. Needs assessment in certain group of inventory at current stage of production process.
4. Enterprise value management.

These steps realization should result in the development of recommendations on inventories use optimization for the increase of the enterprise value [1–4].

Supplier selection is realized to get information about suppliers, to assess their reliability and service, which should result in the selection of optimal supplier based on integral indices comparison.

Suppliers' reliability assessment includes the following steps:

1. Suppliers' market assessment and making the list of potential suppliers. At this stage managers should find and analyze information about

the existing and potential suppliers of the enterprise, which includes search of their price lists, location, proposed services, conditions of transportation, discounts system, products quality assessment, reputation on the market of services, the ability to deliver production in time and flexibility in changing delivery terms. The base of the existing and potential suppliers should be formed grounding on the found information.

2. Criteria of suppliers' reliability formation. These criteria include three groups, such as supplier reliability assessment, quality of goods and joint actions with the consumer. At the stage of supplier reliability assessment, the following parameters are to be evaluated: size of delivery, delivery terms, accompanying documents, conditions of goods received. Goods quality is evaluated according to its correspondence to quality standards. Joint actions with the consumer include two parameters – adjusting actions and availability of combined actions. For each of these parameters certain mark is given according to the assessment criteria, which can vary from 0 to 4, depending on the criteria assessment. After criteria assessment the next step of suppliers' reliability assessment starts.

3. Expert assessment of suppliers' rating. Based on parameters assessment according to the assessment criteria determined on the second step, suppliers' rating is formed. To form the rating, each criteria of supplier assessment is multiplied by specific weight of its importance according to the experts' assessment. Then integrated rating of suppliers' reliability is made. According to the integrated rating, the most suitable supplier by criteria of reliability is chosen.

Transport costs assessment is the next stage in the process of supplier assessment. It includes the following steps:

1. Assessment of supplier location includes ranking suppliers by their location. A supplier, located in the nearest place to the enterprise, gets the highest mark.

2. Assessment of suitable routes and transport presence means assessment of supplier's possibility to deliver goods by his transport and assessment of suitable routes (delivery by railway, by sea, by road). These factors are assessed according to the cost of delivery. Delivery with the lowest cost gets the highest mark.

Service value assessment includes the following steps:

1. Comparison of similar goods and services value means ranking enterprises by costs of services, providing by suppliers on goods support. Services with the lowest cost get the highest mark.

2. Assessment of discounts and encouragements system includes ranking suppliers by their ability to provide discounts and encouragements depending on order size, terms of cooperation and other factors. The more discounts supplier can provide the highest mark he gets.

Based on the ratings formed according to three steps of the assessment, integrated rating is formed and optimal supplier is chosen according to this rating. The preference is given to the supplier with the highest rating.

Determining the ways for inventories use optimization includes the following processes: inventories groups' assessment, inventories use effectiveness assessment and assessment of the places of holding goods.

The process of inventories groups' assessment includes the following steps:

1. Inventories classification on groups. At this stage, it is recommended to classify inventories of an enterprise in groups according to the frequency of their use in the production process.

Considering special features of the process, it is proposed to divide inventories of the enterprises on three groups, which may be called *a*, *b* and *c* groups that is similar to three groups of inventory control system [6]. Division of the enterprises inventories into groups for their effective management is presented in the table below. Classification of inventories is based on frequency of raw materials use in the production process. This criterion of classification was chosen based on the enterprise inventories analysis by the following reasons:

- the "most expensive" does not mean the "most required". It means that some inventories of the enterprise may cost a lot, but they are not used in the process every day and enterprise does not need reserve stock for these inventories, so it can be managed accordingly;

- the reserve is needed but not in all cases. Instead of investing money to reserve stock for inventories formation, which may be needed in a month or two, and thus freezing enterprise money, enterprise would better invest them and gain additional profit.

Table presents inventories classification depending on the frequency of their use in production process and corresponding methods of their management.

Received information is given to next stage of inventories use assessment, where the necessity in certain group of inventory at a current stage of production process is evaluated.

2. Expert assessment of inventory group. At this step, inventories are classified according to the requirements to their storage, into three groups: inventories, which should be hold in own stock rooms, in leased stock rooms and inventories, which can be hold at production places. Information received at this stage is given to the stage of evaluating place and conditions of inventories storage.

**Enterprise inventories classification by the intensity
of their use in production**

Group of inventories	Group characteristics	Ways of management
A	Inventories, which are used in the production process seldom, in specific periods	JIT planning system
B	Inventories, which are constantly used in production process, they may be cheaper; they are the background of the production process	Multi-item models of inventory management, transformed to the requirements of firms value maximization
C	Inventories, which are constantly used in the production process, but do not refer to basic materials	EOQ model of inventory optimization

3. Forming of unitary list of inventory groups according to rating. At this stage, the list of inventories is composed grounding on their classification according to needs parameters under constant monitoring. It means that inventories with the most problematic characteristics (special requirements to storage, inventories with high level of brittleness and other inventories with high risk of losses) are to be most carefully monitored, and their size should be minimized.

The effectiveness of inventories use assessment includes three stages:

1. Analysis of inventories supply and use over the previous reporting period. Analysis is carried out based on financial reports data over the previous reporting periods. The goals of this stage are:

- to determine groups of inventories according to their value: the most expensive groups of inventories, inventories with an average cost and inventories with the lowest cost;

- to analyze the frequency of inventories supply and their use in order to extract groups of inventories used ineffectively (exceptionally high level of inventories storage, the volume of the supplied inventories in certain periods was much higher, then the volume of used inventories).

2. Calculation indices of the effectiveness of inventories' use. At this stage, the coefficient of the effectiveness of inventories use is analyzed. Such indices as turnover and profitability are calculated and evaluated.

3. Determination of ineffective inventories use by groups and periods. This stage is devoted to the determination of inventories groups,

which are used ineffectively based on the analysis of previous stages. Concerning the peculiarities of production enterprises activity, the effectiveness of inventories use is also assessed by the periods of production process [7; 9].

The processes of assessing place and conditions of inventories' storage are devoted to the determination of stock rooms effectiveness, which is based on information, received at the second stage. At this step, profitable amount of inventories is determined depending on space needed for inventories' storage. Profitable amount of inventories depends on the available space in own stock rooms, available space in leased stock rooms and amount of inventories, which can be stored at production process places. The main restriction of profitable amount of inventories calculation is that its size should be smaller or equal to the size, available for storage. The recommendation for optimization can be expressed by the following equation (1):

$$\sum_n S_n \leq \uparrow \sum_\beta S_\beta + \downarrow \sum_\gamma S_\gamma + \downarrow \sum_\varepsilon S_\varepsilon, \quad (1)$$

where S_n is a space needed for the groups of inventories storage;

S_β – profitable space of own stock rooms (symbol “ \uparrow ” means that this space should be used at maximum);

S_γ – profitable space of leased stock rooms (symbol “ \downarrow ” means that minimal amount of this space should be used in order to minimize costs concerning lease payments);

S_ε – profitable space of inventories storage out of stock rooms (symbol “ \downarrow ” means that minimal amount of this space should be used in order to minimize costs concerning possible loose of inventories).

The process of assessing the necessity in a certain group of inventory at current stage of production has the purpose to calculate the demanded amount of inventories for each cycle of production process in order to determine the minimum of the demanded inventories and optimal supply scheme. It is necessary to follow some steps to achieve this aim:

1. Analysis of production process.
2. Assessment of the demands in inventories at a certain stage of production process.

The requirements for size of inventories demanded at a certain stage of production process are shown in the following equation (2):

$$\sum_n Q_n \cdot P_n \cdot \left(1 - \frac{\sum D_{mn}}{100} \right) \geq \sum_s Q_s \cdot k_s \cdot P_s \quad (2)$$

where Q_n, Q_s is an amount of inventories in a group;

P_n, P_s – the price of inventories unit in a group;

k_s – insurance coefficient, which equals 1, if insuring amount of inventories is not needed, but it can't be less than 1;

D_{mn} – the possible amount of discounts (%);

$1 \leq n \leq N$, where N is a general amount of inventories groups;

$1 \leq m \leq M$, where M is a general amount of discounts;

$1 \leq s \leq S$, where S is minimum of inventory groups required for the provision of production process.

The process of the enterprise value management includes the following steps:

1. Enterprise value calculation before inventories optimization (V_1).
2. Enterprise value calculation after inventories optimization (V_2).
3. Comparative analysis of values V_1 and V_2 .

Enterprise value calculation and comparative analysis show the effectiveness of value-based system of enterprise inventory management application.

Conclusion. If the enterprise value after inventories optimization is higher than the enterprise value before inventories optimization, it means that recommendations on inventories use optimization can be applied at any enterprise. If the enterprise value after inventories optimization is lower than the enterprise value before inventories optimization, it means that information must be analyzed again, and the other ways of inventories optimization should be found.

Thus, influencing on inventory storage costs and ordering costs, an enterprise can increase cash flows and relatively – enterprise value. The same goal can be achieved by stock rooms optimization, and ensuring reliable relations with suppliers.

Implementation of the developed system of value-based inventory management will contribute to the achievement of enterprise strategic goals by reducing expenses and increasing enterprise value.

Список джерел інформації / References

1. Томпсон А. Стратегический менеджмент. Концепции и ситуации для анализа : [пер. с англ.] / А. Томпсон, А. Стрикленд. – 12-е изд. – М. : Вильямс, 2002. – 928 с.
Tompson, A. (2002), *Strategic Management. Concepts and analysis situations [Strategicheskiiy menedzhment. Kontseptsii i situatsii dlya analiza]*, Vilyams, Moscow, 928 p.
2. Шершньова З. Є. Стратегічне управління / З. Є. Шершньова. – К. : КНЕУ, 2004. – 699 с.
Shersh'n'ova, Z.Ye. (2004), *Strategic management [Stratehichne upravlinnya]*, KNEU, Kyiv, 699 p.
3. Момот Т. В. Оцінка вартості бізнесу: сучасні технології / Т. В. Момот. – Х. : Фактор, 2007. – 224 с.
Momot, T.V. (2007), *Business estimation: modern technologies [Otsinka vartosti biznesu: suchasni tekhnolohiyi]*, Faktor, Kharkiv, 224 p.
4. Щербаков В. А. Оценка стоимости предприятия (бизнеса) / В. А. Щербаков, Н. А. Щербакова. – М. : Омега-Л, 2007. – 286 с.
Scherbakov, V.A. (2007), *Business (enterprises) estimation [Otsenka stoimosti predpriyatiya (biznesa)]*, Omega-L, Moscow, 286 p.
5. Damodaran, A. (2010), *The Dark Side of Valuation: Valuing Young, Distressed, and Complex Businesses*, 2nd ed, FT Press, New Jersey, 590 p.
6. Бланк И. А. Финансовый менеджмент : учебный курс / И. А. Бланк. – 2-е изд., перераб. и доп. – К. : Эльга Ника-Центр, 2006. – 656 с.
Blank, I.A. (2006), *Financial management [Finansovyyiy menedzhment]*, Elga Nika-Tsentr, Kyiv, 656 p.
7. Бродетский Г. Л. Управление запасами : учеб. пособие / Г. Л. Бродетский. – М. : Эксмо, 2008. – 352 с.
Brodetskiy, G.L. (2008), *Reserves management [Upravlenie zapasami]*, Eksmo, Moscow, 352 p.
8. Michalski, G. VBEQ – optymalna z punktu widzenia maksymalizacji wartosci przedsiebiorstwa wielkość zamówienia zapasów, available at : <http://ssrn.com/abstract=997035>
9. Семенов Г. А. Економічний механізм формування та використання оборотного капіталу підприємств : монографія / Г. А. Семенов, А. В. Бугай, О. О. Єропутова. – Запоріжжя : КПУ, 2009. – 364 с.
Semenov, H.A., Bugay, A.V., Yerohutova, O.O. (2009), *The economic mechanism of formation and use of enterprises working capital [Ekonomichnyy mekhanizm formuvannya ta vykorystannya oborotnoho kapitalu pidpryyemstv]*, KPU, Zaporizhzhia, 364 p.

Борисова Аліна Олексіївна, канд. психол. наук, доц., зав. кафедри іноземних мов, Харківський державний університет харчування та торгівлі. Адреса: вул. Клочківська, 333, м. Харків, Україна, 61051. Тел.: (057)349-45-69; e-mail: interhduht@gmail.com.

Борисова Алина Алексеевна, канд. психол. наук, доц., зав. кафедрой иностранных языков, Харьковский государственный университет питания и

торговлі. Адрес: ул. Клочковская 333, г. Харьков, Украина, 61051. Тел.: (057)349-45-69; e-mail: interhduht@gmail.com.

Borysova Alina, Cand. of Psychological Sc., associate professor, head of foreign languages department, Kharkiv State University of Food Technology and Trade. Address: Klochkivska str., 333, Kharkiv, Ukraine, 61051. Tel.: (057)349-45-69; e-mail: interhduht@gmail.com.

Величко Катерина Юрївна, канд. екон. наук, доц., кафедра міжнародної економіки, Харківський державний університет харчування та торгівлі. Адреса: просп. Науки, 77, м. Харків, Україна, 61103. Тел.: 0503018920; e-mail: eklevyna@gmail.com.

Величко Екатерина Юрьевна, канд. экон. наук, доц., кафедра международной экономики, Харьковский государственный университет питания и торговли. Адрес: просп. Науки, 77, г. Харьков, Украина, 61013. Тел.: 0503018920; e-mail: eklevyna@gmail.com.

Velychko Kateryna, Cand. of Econ. Sc., associate professor, department of International Economics, Kharkiv State University of Food Technology and Trade. Address: Nauky av., 77, Kharkiv, Ukraine, 61103, Tel.: 0503018920; e-mail: eklevyna@gmail.com.

Шаповал Галина Миколаївна, канд. екон. наук, доц., кафедра фінансової безпеки, обліку і аудиту, Харківський національний університет міського господарства ім. О.М. Бекетова. Адреса: пров. О. Яроша, 7, м. Харків, Україна, 61045. Тел.: 0506202195; e-mail: galia1986@gmail.com.

Шаповал Галина Николаевна, канд. экон. наук, доц., кафедра финансовой безопасности, учета и аудита, Харьковский национальный университет городского хозяйства им. О.Н. Бекетова. Адрес: пер. О. Яроша, 7, г. Харьков, Украина, 61045. Тел.: 0506202195; e-mail: galia1986@gmail.com.

Shapoval Galyna, Cand. of Econ. Sc., associate professor, department of Financial and Economic Security, Accounting and Audit, O.M. Beketov National University of Urban Economy in Kharkiv. Address: O. Yarosh by-str., 7, Kharkiv, Ukraine, 61045. Tel.: 0506202195; e-mail: galia1986@gmail.com.

Колесник Аліна Олексіївна, канд. техн. наук, доц., кафедра іноземних мов, Харківський державний університет харчування та торгівлі. Адреса: пров. Дербентський, 38, м. Харків. Тел.: (057)349-45-69; e-mail: inmov@hduht.edu.ua.

Колесник Алина Алексеевна, канд. техн. наук, доц., кафедра иностранных языков, Харьковский государственный университет питания и торговли. Адрес: пер. Дербентский, 38, г. Харьков. Тел.: (057)349-45-69; e-mail: inmov@hduht.edu.ua.

Kolesnyk Alina, Cand. of Techn. Sc., associate professor, foreign languages department, Kharkiv State University of Food Technology and Trade. Address: Derbentsky side-str., 38, Kharkiv, Ukraine, 61045. Tel.: (057)349-45-69; e-mail: inmov@hduht.edu.ua.

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