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ЛОГІСТИЧНІ АКТИВИ ТА КОНСЕКВЕНЦІЇ ЇХ ВИКОРИСТАННЯ

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Актуалізована доцільність уточнення категорії «логістичні активи», а також їх структури та показників ефективності використання. Визначено склад основних засобів, які становлять основний інтерес з точки зору логістики стосовно прийнятої у бухгалтерському обліку класифікації, наведено виробничу (технологічну) структуру основних засобів для різних типів підприємств з погляду логістики, проаналізовано склад оборотних активів, які становлять основний інтерес. З метою оцінювання та виявлення резервів підвищення ефективності використання логістичних активів та функціонування загалом логістичної системи та її компонентів сформовано комплекс показників оцінки ефективності їх використання.

Ключові слова: активи, баланс, логістичні активи, основні засоби, запаси, показники ефективності використання логістичних активів.

LOGISTIC ASSETS AND THE CONSEQUENCES OF THEIR PRACTICAL USE

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The article scrutinises the specification pertinence of the category “logistic assets” as well as their structures and performance efficiency indices. In particular, the composition of the fixed assets, constituting the main interest from the point of view of Logistics according to the adopted in accounting classification, is determined; the industrial (technological) structure of fixed assets for different types of enterprises from the point of view of Logistics is provided; the composition of current assets constituting the main interest from the point of view of Logistics is analysed. The complex of indices for measuring logistic assets practical use efficiency has been formed in order to evaluate and identify the reserves of logistic assets efficiency increase and improvement of functioning of the logistic system as a whole and all its components.

Key words: assets, balance sheet, logistic assets, fixed assets, stock, indices of logistic assets efficiency.

Problem formulation. The ability to exist in a competitive environment for each economic organisation depends upon the income it receives as a result of its operational, financial, investment and, in particular, logistic activities. In any business the income is generated by the assets which are the resources capable of stimulating the process of money accumulation or the reduction of its expense [1]. Therefore, the effective management of the enterprise assets and the optimisation of their extent and composition constitute one of the main challenges the management of any business is to respond to.

Logistics is one of strategically significant components of any business development. Since the economic success of any business depends on the adequate organization of this component, there emerges the need to study the mechanisms by which Logistics can secure productive and efficient performance of enterprise resources. On the one hand, this chiefly requires the refinement of the composition of those assets which are to be subjected to primary consideration in the process of logistic activity and, on the other hand, it requires the development of the system of indices that could enable us to assess the effect generated by Logistics while affecting the assets of the enterprise.

Analysis of current research outputs and publications testifies to the fact that the investigation of the issues related to the study of the impact of logistic management of the enterprise on the quality and efficiency of its assets management is insufficient. In most cases, these issues are considered separately or even parallel to each other. For instance, the fundamentals of logistic management are enlarged upon in the following research works [2, 3, 4, 5], and the assets management as a rule is not viewed as an independent sphere of management decision-making, but as a concomitant, middling decisions related to the level of outsourcing rationale, the choice of transport means and transport technology, the formation of the supply chain structure. The issues of assets management are also discussed within the framework of solving the conflict of trade off objectives or, vice versa, as an integral part of financial management, the fundamentals of which are presented in the following researches [6, 7, 8]. A new and more original approach to the systematic evaluation of supply chains productiveness and efficiency was developed by L. Yakymyshyn in the following research [9, p. 298-308]. Generally, at least four main trends of active logistic research in both operational and strategic aspects can be identified, namely: the impact upon the intra-logistic environment (enterprise), the impact upon the inter-logistic environment (supply chains), the impact upon the environment and the impact upon the adjacent spheres of the activity of an enterprise in general. The very last trend as a result of specialisation intensification (the process of the separation of a certain logistic sphere subsequently attaining the autonomous status) is underresearched. Thus, the notion of logistic assets, i.e. the assets which are the main tools for logistic activity impact upon the enterprise performance results, first and foremost requires profound research. The very term of logistic assets is quite often used in business (DuPont's model [10]), but at the same time it is underresearched.

Article objectives: to investigate the composition and structure of logistic assets and develop the complex system of indices for measuring their efficiency.

Presentation of main materials. In accordance with the accounting regulations (standards) [9]: *assets* – these are resources acquired by an enterprise / institution as a result of the past events, the practical use of which is expected to yield economic benefits in the future; *liabilities* – these are debt arrears of the enterprise resulting from the past events, the repayment of which is expected to cause the decrease of enterprise resources, viz. economic benefits; *net worth* – the part of the enterprise assets remaining after the liabilities are discharged.

Property and overall financial condition of any enterprise at a particular stage reflects the balance, i.e. the financial statement of the enterprise / institution that reflects the assets, liabilities and net worth [11].

Balance is of paramount interest for all the users of financial information, since it shows:

- Ü the property owned by an enterprise;
- Ü the enterprise dependence upon external and loan sources of financing;
- Ü the nature of relations between suppliers and purchasers;
- Ü the direction of investment activity of an enterprise and the sources of its funding.

According to the accepted classification of the assets balance cost, the following groups of assets are distinguished:

Group 1 – long-term assets – fixed assets of the enterprise.

Group 2 – short-term assets – circulating assets of the enterprise.

Group 3 – investment in securities and the assets of another enterprise.

Group 4 – assets that are not physical objects, intangible assets.

Assets cost reflects the overall value of the business and, accordingly, the possibility of receiving income from their possession. In this case, assets management involves a complex combination of their evaluation mechanisms, acquisition and realization, which substantiates the possibility of logistic methodology employment.

The management of material flows, that characterise the flow (promotion) of raw materials, materials, semi-finished and finished products, is considered the main aspect of logistic activity. The material flow results from the processes of realisation acquisition. The final stage of the process of material

resource transfer is its warehousing, which presupposes the establishment of reserves, creating the conditions for financial resources formation and retrieval.

Such an interrelation reflects a systemic approach to logistic management, which combines all the stages: from acquisition and warehousing of material resources – to their realisation (Figure 1).

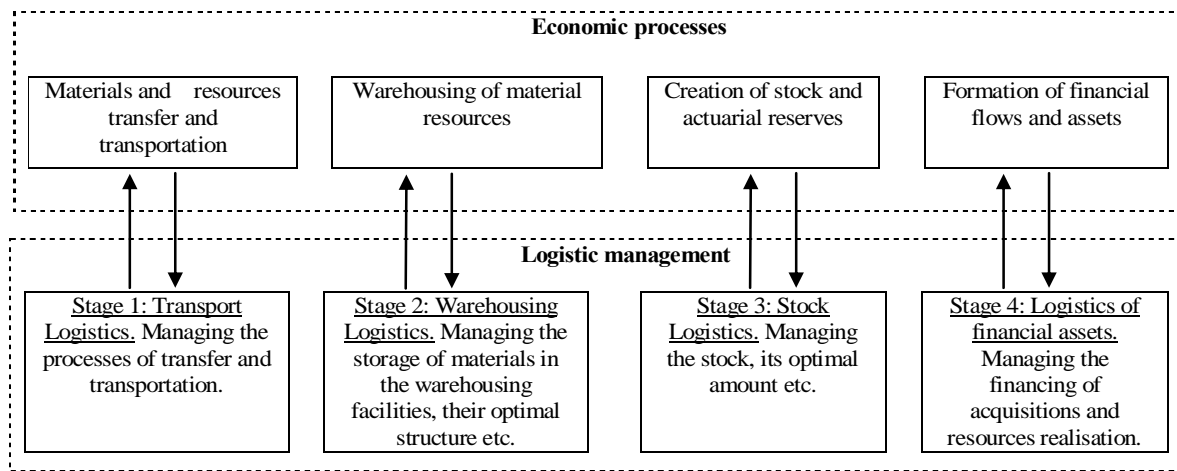


Figure 1. The scheme of interrelations within the system of logistic management [12]

The first and the second groups of assets are viewed as tantamount to material flows, thus they are termed as “*logistic assets.*” By analogy with the commonly used term “assets” we offer its following definition: *logistic assets* – the part of the enterprise resources, which can form the process of money accumulation or the reduction of its expenses in the process of logistic activity.

Logistic assets can constitute a lion's share of all the assets of an enterprise. For example, with distributors they exceed 90% of total assets [13]. These include: *warehousing facilities, transport, equipment, i.e. fixed assets and stock.* Let us consider the structure of logistic assets in details.

According to national accounting standards, fixed assets – these are tangible assets held by the company for the purpose of their exploitation in the process of goods production or supply, services provision, granting on lease or for administrative, social and cultural purposes, the expected useful life or operating cycle (if longer than a year) of these assets should exceed one year.

Fixed assets are attributed to non-current assets of an enterprise, which also include intangible assets, construction in progress, long-term financial investments, debtors’ long-term arrears, deferred tax assets and other non-current assets.

Let us consider the composition of fixed assets which are of prime interest from the point of view of Logistics according to the accepted in accounting classification of groups of fixed assets and other non-current assets (p. 145.1 [14]) (Table 1).

Thus, logistics primarily considers fixed assets which in their turn are the elements of logistic infrastructure of enterprises, including those specialising in logistic activity:

- plots, road / rail ramps, internal roads;
- warehouses;
- localised equipment (machinery, equipment, devices, tools, implements) for goods and information circulation;
- implements and rolling items designed to assist the process of goods warehousing and storage, their transportation and delivery to the consumer.

From the point of view of Logistics the aspectual (technological) structure of fixed assets is quite significant as it characterises the ratio of different groups of fixed assets to their general cost. This structure is quite often discussed as a ratio of active to passive components of fixed assets (Table 2).

It is believed that such a structure of fixed assets is progressive, where the segment of the active part is increasing. At the same time the insufficient number of passive elements affects the efficiency of the

active part of fixed assets, primarily their technical condition and maintenance. Therefore, for the most effective use of fixed assets the company needs to strive to achieve the optimal balance between active and passive parts.

Table 1

Composition of fixed assets constituting the main interest from the point of view of Logistics according to the accepted in accounting classification

Fixed assets according to the accepted in accounting classification	Fixed assets as an object of logistic processes in an enterprise	Fixed assets of logistic enterprises	The task for Logistics
Group 1 – plots	++	++	On the stage of the enterprise establishment – logistic rationale for the choice of business location. On the functioning stage – the analysis of possible options for the change of the location or further positioning of infrastructural elements.
Group 2 – capital expenses on the improvement of land which is not under construction	-	-	-
Group 3 – buildings, constructions, transmission equipment	+++	+++	Warehouse, storage facilities and logistic centres management.
Group 4 – machinery and equipment (including electronic devices and others)	+++	+++	Management of the specialised equipment involved in logistic processes.
Group 5 – vehicles	+++	+++	Management of the process of goods transportation within and outside the enterprise.
Group 6 – tools, devices and implements (furniture)	+	+	Management of the specialised equipment involved in logistic processes.
Group 7 – animals	-	-	-
Group 8 – perennial plants	-	-	-
Group 9 – other fixed assets	-	-	-
Group 10 – library stocks	-	-	-
Group 11 – non-current tangible assets of little value	-	-	-
Group 12 – temporary (denotified) facilities	+	++	Management of the structures erected for the purpose of material flow managing and to support Logistics
Group 13 – natural resources	-	-	-
Group 14 – implements	++	+++	Management of warehousing and storage
Group 15 – rental items	-	+	Management of warehousing and storage
Group 16 – long-term biological assets	-	-	-

Source: elaborated by the authors

Notation conventions:

+++ – significant, long-term interest

++ – significant, temporary interest

+ – insignificant interest

- – lack of interest

Production (technological) structure of fixed assets for different types of enterprises

		Active part	Passive part
The main feature		<i>direct participation in main activity</i>	<i>securing the adequate conditions for carrying out the main activity</i>
Examples	Enterprise	machinery, equipment, tools, devices, gauges etc.	administrative buildings, warehouses, garages, constructions, transmission equipment
	Transport company	trucks and cars, trailers, mobile containers, cranes, loading and unloading machines, industrial and household equipment	administrative buildings, warehouses, garages, constructions, transmission equipment
	Distribution company	warehouse real estate, goods loading / reloading stations, trucks and cars, trailers, mobile containers, cranes, loading and unloading machines, industrial and household equipment	administrative buildings, offices, garages, constructions, transmission equipment
	Logistic company, centre, hub	the complex of warehouse real estate, goods loading / reloading stations, railway and container terminals, trucks and cars, trailers, mobile containers, cranes, loading and unloading machines	offices, garages, constructions, transmission equipment, car service, car wash, the complex of buildings and constructions that offer all the communication facilities (road infrastructure, airport, railway, sea or river port)

Source: elaborated by the authors

The main objectives of Logistics, besides securing the effective use of fixed assets, also include the acceleration of enterprise assets turnover.

One of the main problems, which can be solved by the application of an effective logistic approach to material flows management, is creating conditions which are to secure the acceleration of assets turnover in order to facilitate the reduction of material expenses within the general scope of expenses on production, increase the deallocation of funds from the surplus-term stocks and enhance the efficiency of the enterprise in general [15].

In particular, the introduction of Logistics into the industrial activity affects the current assets in several directions:

- ⊖ reduces the overall amount of reserves;
- ⊖ accelerates the turnover of goods at the warehouse;
- ⊖ facilitates the decrease of debtors arrears;
- ⊖ optimises cyclicity, which affects the acceleration of warehouse and cash turnover.



Decrease of capital invested into the stock, acceleration of capital circulation and profit increase

Current assets – this is money and its not limited in usage equivalents as well as other assets intended for sale or consumption in the course of the operating cycle or within 12 months after the balance sheet date.

The elemental composition of current assets, involved in logistic processes in enterprises, and circulating assets of logistic companies is the following:

- 1) stock;
- 2) notes receivable;
- 3) receivables for goods, scope of work done and services;
- 4) accounts receivable;

- 5) other current receivables;
- 6) current financial investments;
- 7) money and its equivalents;
- 8) other current assets.

Logistics as a discipline dealing with the optimization of material flows in space and time is mainly interested in the inventory constituting the material flow of circulating assets and characterised by the regularity of formation, large amounts and high intensity.

The stock includes work means intended for the treatment, processing, application in manufacturing and for household purposes as well as those work means, considered by the company of low value or as quickly wearing out items. Classification of inventory from the point of view of Logistics is reflected in table 3.

Table 3

Classification of inventory from the point of view of Logistics

Classification features			
Phase division	Functional division	Concentration division	Division according to the level of predictability
1. The stock in supply: <ul style="list-style-type: none"> · materials; · raw materials; · purchasable items. 2. The production stock: <ul style="list-style-type: none"> · semimanufactured products; · semi-finished products; · stock at a workplace. 3. The stock in distribution: <ul style="list-style-type: none"> · final products; · spare parts; · returned products. 	1. The current (cyclic) stock: <ul style="list-style-type: none"> · in supply; · on sales. 2. The stock in the process of: <ul style="list-style-type: none"> · production; · in transit. 3. Guarante estock: <ul style="list-style-type: none"> · in supply; · on sales. 4. Seasonal stock: <ul style="list-style-type: none"> · in supply; · on sales. 5. Stock of aggressive market promotion. 6. Speculative stock: <ul style="list-style-type: none"> · in supply; · in distribution. 7. Dead stock: <ul style="list-style-type: none"> · in supply; · in distribution. 	1. Group A – high concentration of costs: <ul style="list-style-type: none"> · in supply; · in distribution. 2. Group B – medium concentration of costs: <ul style="list-style-type: none"> · in supply; · in distribution. 3. Group C – low concentration of costs: <ul style="list-style-type: none"> · in supply; · on sales. 	1. Group X – high accuracy of demand forecast. 2. Group Y –medium accuracy of demand forecast. 3. Group Z – low accuracy of demand forecast.

Source: [16, p. 210-213]

Assessment of asset management requires the introduction of a system of indices that could enable us to determine the effect generated by Logistics while affecting the enterprise's resources. In our opinion, to assess the efficiency of logistic assets, particularly within groups 1 and 2, it is advisable to apply both: generally accepted indices of assets assessment within the economic analysis of enterprise's property and a number of additional indices that take account of the logistic nature of the assets. The main indices are provided in table 4.

Indices for measuring the efficiency of logistic assets practical use and productivity

Index designation	Formula	Index essence	Positive dynamics / Normative figure
1	2	3	4
Indices for measuring the efficiency of logistic assets practical use (Group 1)			
<i>Logistic assets (fixed assets) profitability</i>	Profit (net / gross) / Average annual cost of logistic assets *100%	The index of logistic assets profitability	Growth
<i>Logistic assets (fixed assets) capital productivity or turnover</i>	Net profit from sales / Average annual cost of logistic assets	This index, also called capital productivity coefficient, characterises the efficiency of logistic assets practical use by the enterprise	Growth
<i>Capital-labour ratio</i>	Average annual cost of logistic assets / The number of staff members	The coefficient indicates the average annual cost of logistic assets (Group 1) per one staff member	Growth, but only on condition that the growth rate is to be lower than the growth rate of production capacity (otherwise the efficiency of the main activity decreases)
Indices of the estimation of logistic assets condition (Group 1)			
<i>The coefficient of logistic assets (fixed assets) destruction</i>	Logistic assets destruction / Prime cost of logistic assets	The index characterises the degree of logistic assets physical and moral wearing out. The coefficient growth testifies to the deterioration of financial and technical condition of the enterprise	Decrease / At least satisfactory technological condition is required
<i>The coefficient of logistic assets (fixed assets) recovery</i>	Balance cost of logistic assets acquired during the period / Balance cost of logistic assets at the end of the period	The coefficient indicates which part of logistic assets available at the end of the accounting period is constituted by new ones	Growth
<i>The coefficient of logistic assets (fixed assets) withdrawal</i>	Balance cost of logistic assets that were withdrawn in the course of the period / Balance cost of logistic assets at the beginning of the period	The coefficient indicates which part of logistic assets was withdrawn in the course of the accounting period	Growth / Decrease
<i>The coefficient of intensive renewal of logistic assets (fixed assets)</i>	Balance cost of logistic assets that were withdrawn in the course of the period / Balance cost of logistic assets acquired in the course of the period	The coefficient indicates the ratio of absolute and relative quantities of logistic assets withdrawal and introduction into the action in the course of the accounting period	Decrease
<i>Logistic assets capacity</i>	Actual capacity / Normative capacity *100%	The coefficient characterises the efficiency of warehousing, transportation and equipment etc.	Growth
Indices of logistic assets productive capacity (Group 1)			
<i>Square, sq. m.</i>	-	The indices of this group characterise logistic assets carrying capacity (capacity) to satisfy the supply, production and sales needs in compliance with the market demands	Depends upon the enterprise needs
<i>Holding capacity, cubic m. or the amount of goods (tonnes)</i>	-		
<i>Carrying capacity, tonnes per 24 hours</i>	-		
<i>Quantity of items</i>	-		
Indices for measuring the efficiency of logistic assets practical use (Group 2)			
<i>Logistic assets (fixed assets) profitability</i>	Profit (net / gross) / Average annual cost of logistic assets *100%	The index of logistic assets profitability	Growth
<i>Materials consumption</i>	Expenses / Production volume	Materials consumption reflects the expenses on goods production. This cost index reflects the degree of materials consumption per one hryvnia of goods produced and indicates the sources of material resources economy	Growth
<i>Material output</i>	Production volume / Expenses	Material output characterises the produced goods per one hryvnia of material resources spent	Growth

Table 4 (continuation)

1	2	3	4
<i>Actual materials consumption</i>	Amount or cost of material resources spent on a separate type of goods produced / Amount or cost of produced goods of this type	The index characterises the amount of material resources spent on a separate type of goods and indicates the sources of material resources economy	Decrease
<i>The coefficient of materials consumption or the coefficient of materials spent</i>	Actual amount of expenses on the actual output / Anticipated amount of expenses on the actual output	The index characterises the economy or extra expenses in comparison with the established norms	If the coefficient < 1, which means that the resources were spent economically, but if it exceeds 1, there were some extra expenses of material resources The optimal coefficient should be equal to 1 or < 1.
<i>Partial indices of materials consumption: specific quantity of metal, fuel, energy, raw materials etc; the level of consumption of different products</i>	Metal, fuel, energy and raw materials consumption = Amount or cost of material resources spent (materials, fuel, energy, raw materials etc.) on a separate type of goods / Amount or cost of produced goods of this type. The degree of material consumption = The cost of all the materials consumed per one product / Wholesale price of one produced item	Partial indices of materials consumption are employed to characterise: - the consumption efficiency of separate types of material resources (metal, fuel, energy, raw materials consumption etc.); - the level of material consumption of separate products as a ratio of all the consumed per one product item materials to its wholesale price	Decrease
<i>The index of the stock of materials turnover</i>	Prime cost of realisation / Average cost of the stock of materials remains	The indices characterising the return of prepayed circulating costs into the stock of materials from the starting point of their collection to the moment of distribution of cash received from the realisation of the ready made products	Growth
<i>The duration of one turnover of material resources</i>	The number of days in the accounting period / The index of the stock of materials turnover	The operational cycle characterises the efficiency of production and commercial activities, namely the duration of the period in the course of which money is on average "frozen" in intangible current assets	Decrease
<i>Operational cycle duration, days</i>	The duration of one turnover of stock of materials + Duration of one turnover of debtors arrears	The index characterises the amount of return waste products out of an overall amount of raw materials and materials used	Decrease
<i>The coefficient of waste products</i>	The cost of return waste products / Overall amount of raw materials and materials used	Indices applied in the policy of waste recycling	Decrease
<i>Waste allowance</i>	Physical unit of measuring the amount of waste or packaging / Time or Cost of return waste / Output figures (raw materials, output, power supply, process parameter)	Is determined by the corresponding branch or adopted in the enterprises regulatory documents	In practice indices ranging from 15 to 35% out of the product cost are accepted.
<i>Expenses on stock maintenance</i>	Expenses on stock maintenance mainly include taxes and insurance + Expenses on stock warehousing (warehouse rent, depreciation reserves, electricity bills, salary of the warehouse staff and expert wages) + Expenses caused by deterioration and senescence as well as theft or (Allowed expenses on stock maintenance * Stock cost) / 2 * 100%	The index characterises the amount of cash frozen in stocks	In particular, the expenses on stock warehousing and its maintenance approximately constitutes 3-5% and 2% of the overall amount of expenses on stock creation and maintenance
<i>The amount of senescent stock</i>	Senescent stocks / The overall amount of stocks	The index characterises the overall amount of non-liquid stocks	Lack or decrease

Source: elaborated on the basis of [12, p.578-584; 17, p.86-88; 18]

Conclusions and further research prospects. Logistic activity to a certain extent affects the main parameters and sources of enterprise competitiveness: expenses, quality, time and flexibility. Therefore, logistic activity should be regarded in the light of its versatile functions, not limited to their logistic nature. In particular, affecting the assets it generates the income and facilitates its reasonable and efficient practical use. At the same time not all the assets are subjected to direct influence of Logistics. The article provides the definition of the notion “logistic assets” and characterises their structure. To secure the efficient assets management, including the management within the logistic activity, it is necessary to create the system of indices that could enable us to determine the effect generated by Logistics while affecting the enterprise's resources. The given research provides the complex of indices for measuring the efficiency of logistic assets practical use. The application of these indices is expected to facilitate the identification and assessment of the reserves of efficiency increase of the logistic system as a whole and its components. This to a certain extent provides further directions for scholarly research concerned with the implementation of the concept of controlling and the development of its dataware on the basis of the provided indices of logistic activity assessment.

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