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THE CONCEPT OF THE EFFECTIVENESS AND EFFICIENCY OF SUPPLY MANAGEMENT: A THEORETICAL FRAMEWORK AND EMPIRICAL APPLICATION

The supply management is a complex and demanding phenomenon which each manufacturing enterprise has to face in order to maintain its position on the more and more saturated market. Therefore, in this paper the author makes a clear distinction between effectiveness and efficiency concepts and on this basis presents a proposal of measurement procedure which can be used to evaluate the supply process. Theoretical considerations are supported by the empirical application which verifies the usefulness of the proposed method.

1. Introduction

Supply management is a key part of business activity of each manufacturing company operating nowadays on the market. It influences both the continuity of the production process and the level of incurred costs which are fundamental aspects for each entity willing to achieve a success. As it involves not only the internal processes of the enterprise but also its external environment, including the cooperation with different stakeholders, the issue becomes even more significant and demanding. That is why it is worth to answer the questions how the supply management can be evaluated and in what way its effectiveness and efficiency can be measured. To consider a problem in a wider range, we should take into account not only the results of the involved processes but also their inputs. Therefore, the main problem discussed in this paper is the differentiation between the effectiveness and efficiency of supply management as well as the design of a procedure of their measurement. The goal of this work is realized by the proposition of the indicators which can be used in the supply process evaluation.

In the paper, the definition and difference between effectiveness and efficiency concepts in management science are firstly presented. Then, the effective-

ness and efficiency indicators used in the measurement procedure are proposed and characterized. Finally, the short assessment of the evaluation method is presented and concise conclusions are drawn.

2. The concept of effectiveness and efficiency in supply management

In order to propose some indicators which can be used to measure the effectiveness and efficiency of supply management we must clearly define what these concepts mean and what the difference between them is. These problems have been already discussed in literature many times but despite this fact we can conclude that it is still quite equivocal subject due to a high variety of interpretations. That is why first of all some definitions of management concept are reviewed and recalled and then, after describing the complexity and significance of this background, definitions of the effectiveness and efficiency are discussed.

Ricky Griffin defined management as a set of activities (including planning, decision making, organizing, leading and controlling) directed to the resources of organization (human, financial, physical and informational) and performed in order to achieve its goals in an effective and efficient way [1]. According to Józef Penc, management can be understood as a set of decisive activities which in consequence provide the best possible effects at the existing operating conditions, simultaneously ensuring the control of the company's resources. He claimed that to achieve the best possible results the management should be efficient, effective and socially responsible [2]. Andrzej Koźmiński described the management concept in quite creative way, defining it as a journey through a chaos, during which the managers are supposed to take control over diversity and transform any potential conflict into cooperation [3]. Peter Drucker, on the other hand, believed that the management is much more extensive concept and it should not be limited only to the scope of an enterprise. He claimed that it can be treated as a valuable resource of not only a company but even of a country as it can lead to overall economic and social development of the entity. Drucker drew even a presumption that the reason of the underdevelopment of some countries is caused by a poor management (in his considerations he called them the undermanaged countries) [4].

The supply management considered in this paper is a branch of the management science which refers to the subsystem of procurement logistics. Its main goal is a coordination of all processes related to the flow of materials from a supplier to a particular enterprise that would provide the availability of all needed materials used in the production process at the right time, at the right quantity and of the right quality. Therefore, the supply management deals with different

logistics problems such as material requirements' planning, decision making process whether to buy or to make, suppliers selection process, orders controlling, goods receiving or materials warehousing [5].

Analyzing the available management literature, we can see that it is strongly connected with the concepts of effectiveness and efficiency. Unfortunately, sometimes these terms are used interchangeably which can mislead a reader and make an impression that there is no merits-related difference between them. Furthermore, another difficulty in distinguishing these terms is caused by different nomenclature used in Polish and English languages. To organize knowledge in this field, the reference to Peter Drucker and Tadeusz Kotarbiński can be very helpful. Drucker, engaged in the field of economics, defined the effectiveness (pol. *skuteczność*) as "doing the right thing" and the efficiency (pol. *efektywność*) as "doing the thing right". It means that the former one refers to the results and effects of particular activities while the latter one concerns the resources which were used in a process. Although these terms seem to be equivalent to one another, Drucker believed also that "Doing the right thing is more important than doing things right" [6]. This indicates that according to his observations, the impact should be placed first on the effectiveness, and only then on the efficiency. Such an approach is called teleological which means that the overriding objective of undertaken activities is the realization of the intended goal. Kotarbiński, who was, on the other hand, involved in the field of praxeology, pointed out three components which in his mind defined the efficaciousness (pol. *sprawność*). Two of them are the effectiveness and the efficiency. He described the latter term as the economy (pol. *ekonomiczność*) and he believed that depending on the undertaken activities it can take a form of capability (pol. *wydajność*) or cost-saving (pol. *oszczędność*) [7]. A third component defining the efficaciousness is profitability (pol. *korzystność*) which can be measured as the difference between value of achieved results and value of incurred costs [8]. Due to its complexity, efficaciousness takes into account both the concurrence with a goal and the obtained results. Nevertheless, it is worth emphasising that the efficacious activity must be at least effective, even in the slightest degree, to be economic or profitable [9]. If it is not, these two remaining components become irrelevant. This means that the activity cannot be ineffective and efficacious at the same time. Because of this fact in order to evaluate the overall efficaciousness of some operations, the hierarchy regarding the effectiveness has to be established in the first run and in case of obtaining the same results for different actions, the hierarchy regarding the efficiency or profitability should be set in the second run.

A measure of the effectiveness is a ratio between the result and assumed goal. Accessing the degree of effectiveness of undertaken actions, we can distinguish effective, partially effective, ineffective, counter-effective or neutral (neither effective nor ineffective) activities [9]. Referring to the supply management

concept, the difference between them can be described on the example of the situation when a particular company sets a target to reduce the value of stock with raw materials by 10% till the end of next month. Obviously, the activity will be evaluated as effective if at the end of the month the stock value is reduced by 10% or more. If the value is reduced only by 5%, the activity will be treated as partially effective. If the stock value remains the same till the end of the month, the activity will be regarded as ineffective. If the company decides in the meantime to increase its purchases and as a result the stock value will increase instead of decreasing, such an activity will be defined as counter-effective as it not only will not bring closer the entity to the intended goal but it will even move it away from it. Finally, if the company decides in the interim to hire a new warehouseman, such an activity will be neutral from the viewpoint of stock value reduction as it will have no impact on goal realization. Despite the fact that the above example shows that the effectiveness is gradable, Kotarbiński noted that in some cases it is not subject to gradation. The example can be a purchase of a new machine as it can be bought or not, there is no possibility of making it more or less bought. Such type of effectiveness is called the purposefulness (pol. *celowość*) and respectively such kind of ineffectiveness is called unpurposefulness [3]. In some cases, the measurement of the effectiveness can be difficult due to a necessity of proper definition of exact target. Not all of them can be measured because of their qualitative nature. In such cases the descriptive measures instead of numerical have to be used. Another problem with measuring the effectiveness relates to the difficulty with defining the range of time in which the goal should be fulfilled [10]. This is because no rigid frameworks are stated in this aspect and the decision should be made according to current needs of the accessed entity.

A measure of the efficiency is a bit more complex issue as it depends on the perspective from which it is considered. In the traditional sense it can be calculated as a mathematical ratio of the involved inputs to obtained outputs. This financial perspective is consistent with Kotarbiński viewpoint who described the efficiency as the economy. In the resource sense the impact is placed on the most efficient usage of available resources. That is why this case corresponds with the views of Drucker who believed that efficiency is the assessment of the way of resources allocation. Finally, in the strategic-organizational sense the attention is focused on the evaluation of all elements which influence the efficiency of the overall business activity. This is the most general perspective in which the descriptive methods of evaluation are mostly used. In the mathematical approach the efficiency can be calculated according to one of three following formulas [11]:

- Efficiency as the economy: $\frac{outputs}{inputs}$, the ratio has a nature of a stimulant (the-greater-the-better) and its highest possible value is desired. If it is higher than 1, it means that achieved results are greater than incurred inputs.
- Efficiency as the profitability: $outputs - inputs$, the equation has a nature of a stimulant which means that its greater value corresponds with its greater efficiency. If it is greater than 0, it means that expenditures involved are smaller than achieved effects.
- Efficiency as the return on investment (ROI): $\frac{outputs-inputs}{inputs}$, the ratio has a nature of a stimulant and its result is usually expressed in percent (after multiplication the result by 100%).

Similarly as in the case of effectiveness, while accessing the efficiency of undertaken actions, we can distinguish efficient, neutral, inefficient and counter-efficient activities. If the value of outputs is greater than the value of inputs (ratio greater than 1), the activity can be defined as efficient. If the value of inputs is equal to value of outputs (ratio equal to 1), the activity is neutral, which means that it is neither efficient nor inefficient. If the value of outputs is smaller than the value of inputs (ratio smaller than 1), the activity is perceived as inefficient. The activity can be also defined as counter-efficient if it is not only inefficient but the inputs involved make it really difficult or even impossible to achieve the desired objective. Providing the example of counter-efficient action from the supply management field, which is considered in this work, we can imagine a situation when a company sets a goal to reduce the value of stock with spare parts and in the meantime decides to buy a new machine to its factory. The purchase of new equipment is associated with the necessity of buying at least fast-moving parts, recommended by the manufacturer, to protect the company against the production stop in case of some part's usage or machine failure. This means that the company will not be able to reduce the stock value and probably it will even need to increase it. That is why the activity of buying a new machine can be defined in this case as counter-efficient. Next issue which is strongly related to the efficiency of undertaken actions is economization of activities. It is about increasing the efficiency of undertaken operations by the entity by looking for and finding some new, more efficient (economical) solutions. We can distinguish three types of economization [9]:

- Capability: $\frac{Outputs \rightarrow maximum}{Inputs = constans}$, when the outputs are maximized and inputs are kept constant.
- Cost-saving: $\frac{Outputs = constans}{Inputs \rightarrow minimum}$, when the inputs are minimized and outputs are kept constant.

– Extraordinary: $\frac{Outputs \rightarrow maximum}{Inputs \rightarrow minimum}$, when the outputs are maximized and inputs are minimized.

First two cases have been already mentioned while referring to the considerations of Tadeusz Kotarbiński. The last case is the least frequently used but it can be observed in the enterprise for example after replacing the manual work with the automatic one.

After these theoretical considerations, we can conclude that effectiveness and efficiency are two separate terms and they should not be used interchangeably. The main goal of the supply management is ensuring the availability of all needed materials used in the production process on time and therefore the effectiveness indicators proposed in next part of this paper are strongly connected with this objective. The efficiency indicators, on the other hand, relate to involved inputs including mainly a level of incurred costs.

3. Effectiveness and efficiency indicators

As it has been already mentioned, the main objective of the supply management is to ensure the availability of needed materials at the right time, quantity and of the right quality. Therefore, the indicators proposed within the effectiveness concept relate to these criteria.

The first indicator measures a degree of purchase orders realization by the suppliers. The indicator can be calculated according to the following formula:

$$Orders\ fulfillment = \frac{number\ of\ completed\ orders}{number\ of\ all\ submitted\ orders} \quad (1)$$

The second indicator relates to the punctuality of deliveries and it takes following form:

$$Reliability\ of\ deliveries = \frac{number\ of\ orders\ delivered\ on\ time}{number\ of\ completed\ orders} \quad (2)$$

Both considered indicators have a nature of a stimulant which means that their highest possible values are desired. In both cases the ratios can take values from 0 to 1.

Next indicator concerns the quality of purchased materials and measures a share of faulty or divergent deliveries. By faulty we mean deliveries which are damaged due to inappropriate packaging, improper way of transport or human negligence. Divergent deliveries are these which are inconsistent with purchase order. The indicator's formula is as follows:

$$Divergence\ of\ deliveries = \frac{number\ of\ faulty\ or\ divergent\ deliveries}{number\ of\ completed\ orders} \quad (3)$$

Next indicator referring to the same criteria, which is quality, measures the share of complaints, so namely defects detected during the use of the purchased material. It takes the following form:

$$Share\ of\ complaints = \frac{number\ of\ complaints}{number\ of\ completed\ orders} \quad (4)$$

Both of the above indicators are destimulants (the-lower-the-better) so their lowest possible values from the range <0,1> are desired.

Next two indicators are connected with the warehouse management which is part of supply management. The first one relates to the share of non-rotating materials, which are goods with which no material movement is considered through a specified period of time. It takes a following form:

$$Share\ of\ non-rotating\ materials = \frac{number\ of\ non-rotating\ goods}{number\ of\ all\ goods\ on\ stock} \quad (5)$$

The second one relates to the share of materials out of stock, which are goods whose actual state in the warehouse equals to 0. It can be calculated according to the following formula:

$$Share\ of\ materials\ out\ of\ stock = \frac{number\ of\ goods\ out\ of\ stock}{number\ of\ all\ goods\ on\ stock} \quad (6)$$

Both proposed indicators have a nature of destimulants which means that their lowest possible values from the range from 0 to 1 are desired.

The efficiency indicators, on the other hand, relate not only to the results of undertaken activities but also to the inputs involved. In the proposed ratios the inputs are synonymous to the level of incurred costs.

The first indicator relates to the rotation of materials on stock which means their consumption over a specified period of time. It can be calculated according to the following formula:

$$Rotation\ of\ materials = \frac{value\ of\ exchanged\ goods}{value\ of\ all\ goods\ in\ the\ warehouse} \quad (7)$$

It has a nature of a stimulant and it can take values from 0 to 1.

Next indicator which can be used to measure the efficiency of the processes concerns the level of unplanned costs. Unplanned expenditures mean costs associated with any usage of material from the stock which was not planned in advance. The ratio takes a following form:

$$Share\ of\ unplanned\ costs = \frac{value\ of\ unplanned\ goods\ usage}{value\ of\ all\ used\ goods} \quad (8)$$

Share of unplanned costs is a destimulant so its lowest possible value from the range from 0 to 1 is desired.

The last indicator proposed to measure the efficiency relates to savings rate achieved by the organisation. It is strongly connected with the efficiency of people responsible for conducting negotiations. The indicator's formula looks as follows:

$$Savings\ rate = \frac{value\ of\ received\ discounts}{initial\ value\ of\ negotiated\ offers} \quad (9)$$

It is a stimulating factor of efficiency and it takes values from the range <0,1.

4. Measurement procedure

The proposed method of effectiveness and efficiency measurement includes nine different indicators which relate to spare parts supply process and warehouse management. To check their usefulness they should be applied in a real case and verified. Therefore, the main question to be answered in this part of the paper is whether the proposed indicators allow for the evaluation of the supply management in the operating company.

To answer this question the research was conducted in the production enterprise which is one of the leading manufacturers of home appliances not only in Europe but also in the global market. Unfortunately due to company's policy in the extent of sharing data they had to be changed as there was no permission for their publication. Therefore, all data gathered from the company was multiplied by a factor which was adjusted in a way not to change completely a direction of the results and their way of changing but only their values. Indicators are calculated quarterly in majority for three last years (2013-2015) and in individual cases for two last years (2014-2015). This depends on the availability of data provided by the company.

Data concerns the activities performed within the scope of the maintenance department which is responsible for assuring the availability of spare parts for machinery operating in the enterprise. According to American Production and Inventory Control Society spare parts are the modules, components or elements which are designed to replace the original parts without any additional changes and modifications [12]. We can divide them on three main groups [13]:

- Substitutes: parts or products which can be used to exchange some damaged, worn or missing parts,
- Consumables: parts or products which are subject to wear as a consequence of machinery continuous work and which are not suitable for repair (mostly from the economic perspective),
- Fast-rotating parts: parts or products which are standardized and commonly used; they should be listed by a machine's manufacturer in the technical documentation provided with the equipment.

Spare parts management is a real challenge for each production enterprise as the demand for spares is varied in time and it is often very difficult to predict. Furthermore, due to high technical complexity of some products, the waiting time for order's realization is sometimes very long. Moreover, in some of thriving businesses where the impact is put on the innovativeness, the machinery operating on the company's premises keeps changing due to continual modifications and enhancements. That is why the list of spare parts kept on stock has to be reviewed regularly and updated according to the current needs.

Now let's move on to the analysis of the spare parts supply process by using the previously proposed indicators. First four effectiveness indicators are calculated only for two last years as the company did not archive earlier data connected with the realization of purchase orders. The first indicator, which is called orders fulfilment, measures the share of purchase orders which were successfully realized by the suppliers. The obtained results are presented on the following diagram.

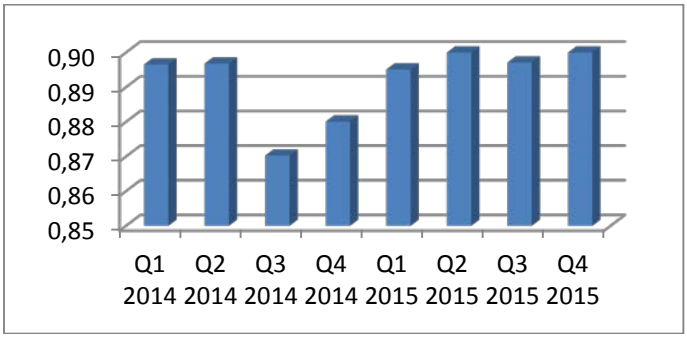

Figure 1. Orders fulfilment
Source: own study.

Orders fulfilment is a stimulant whose value cannot exceed 1. The above data seems to be satisfactory in this field as the average value equals to 0.89. This means that the company cooperates with reliable suppliers who fulfil their contracts. The low result of this indicator could be caused by the unexpected problems of stakeholders resulting in the inability to realize the purchase order such as the change of price or delivery terms in the meantime (in case when the supplier is not a manufacturer) or even supplier's financial bankruptcy. Sometimes the low effectiveness in this case could be also caused by the buyer's distraction in the form of referring to out-of-date quotation or ordering greater amount of goods than the supplier is able to supply.

Next indicator which is reliability of deliveries tells even more about suppliers' loyalty and reliability. The results look as follows:

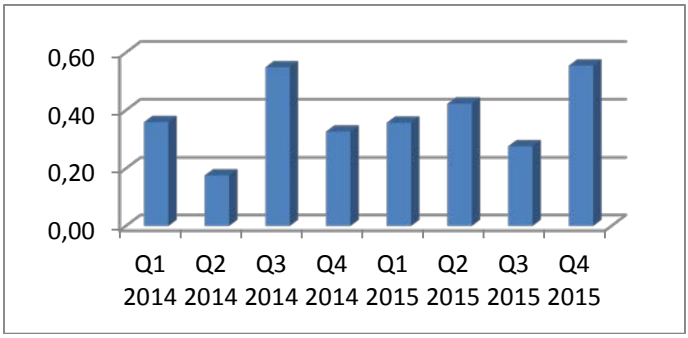

Figure 2. Reliability of orders
Source: own study.

Similarly to previous indicator, the punctuality of orders is a stimulant, nevertheless, in this case the results of the ratio are much worse. Most of them have value below 0.5 which means that less than a half of purchase orders was delivered on time. Such a low result can have different reasons. One of them relates to change of delivery terms by the manufacturer which were not taken into account by the supplier during the creation of a quotation. If the supplier is the manufacturer, the problem can be caused by improper assessment of its production capabilities. Another reason may relate to way of transport which can delay a delivery as a consequence. Finally, the purchase order which is sent to the supplier can be treated as a SPAM message and rejected or just omitted due to sheer volume of mail messages. It is crucial to remember that the punctuality of deliveries is extremely important as it influences the continuity of production process which is the overriding aim of each production company.

Next indicator measures the divergence of deliveries and its values are presented on the below diagram.

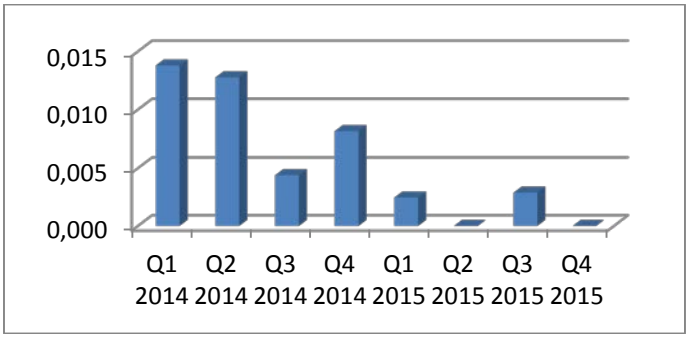

Figure 3. Divergent deliveries
Source: own study.

As the ratio has a nature of a destimulant we can see that received results are the evidence of high effectiveness of the process in this field. Furthermore, over these eight quarters the situation seems even to keep improving. It demonstrates the suppliers' reliability in terms of preparation and packing of deliveries. The high value of this indicator could be a reason of mistakes made by people responsible for shipments, disorder in the process of order realization or negligence on the side of transport companies.

The last indicator which refers to the relationships with suppliers is the share of complaints. Its results are gathered on the following diagram.

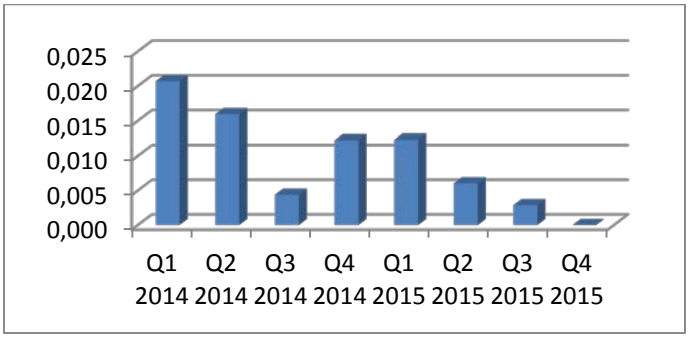

Figure 4. Share of complaints
Source: own study.

Similar to previous indicator, it is a destimulant. Thus, its values should be fully satisfactory for any entity. They are all below 0.025 which shows that the complaints have a place really occasionally. It means that the company puts emphasis on the quality while choosing the suppliers and succeeds in making such choices. The higher value of this indicator could be the warning sign for the enterprise which should lead to current suppliers' overview and market research with the aim of finding some better solutions. Nevertheless, we should not forget that this ratio relates to complaints which can be detected and reported only after the use of a particular good. As most of products are under warranty for two years, it means that most of the results which are presented above can still change for worse.

Next two indicators which were proposed to measure the effectiveness relate to the warehouse management. The first one is the share of non-rotating materials.

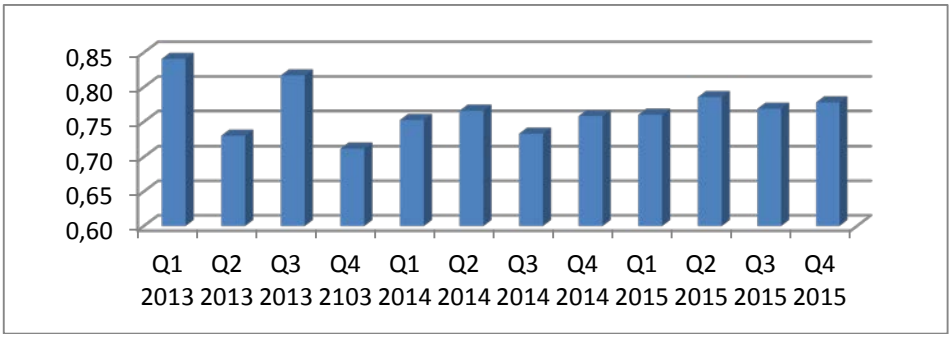

Figure 5. Share of non-rotating parts
Source: own study.

It is a destimulant with the possible range of values from 0 to 1 so as it can be seen on a diagram the results are rather negative. During the research the non-rotating part was defined as the material with which no material movement, neither receipt nor discharge, has been concerned through a period of one quarter, which means that their availability has not changed through that time. The high values of this indicator are not only costly for the company but can be also very risky. The parts which do not rotate on stock are equivalent to frozen money. What is more, they are subject to damage or to become obsolete and unusable due to technical reasons and technological changes. Moreover, after two years most of them loose the guarantee which means that the part which will be used after two or more years will not be subject to complaint even if some problems are detected.

The second indicator in this group is the share of materials out of stock.

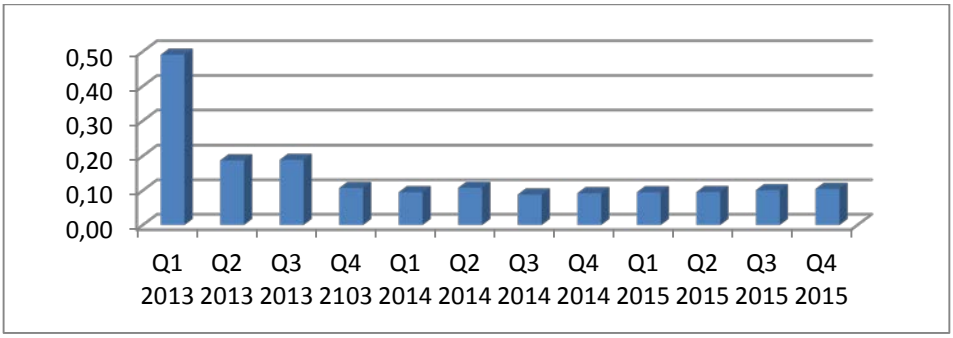

Figure 6. Share of parts out of stock
Source: own study.

As it has a nature of a destimulant, we can conclude that most of results, except for Q1 in 2013, are quite satisfactory (below 0.2). Sudden decrease in the second quarter of 2013 could be caused by a significant increase in spare parts' orders quantity (replenishment of stock) or by a thorough review of stock and cancellation of materials which should be no longer procured. High value of this indicator can be caused by the negligence of the employees who after taking the last part from the stock do not report the need of their reorder or by the incorrect statement of reorder points. It is crucial to remember that they should take into account not only the frequency of spare parts usage but also the average time of delivery and level of safety stock. It results from the following formula [14]:

$$ROP = \bar{d} * L * SS \tag{10}$$

where *d* is an average demand, *L* is a lead time and *SS* is a safety stock level.

Next three indicators which are presented in this work relate to efficiency measurement. The first one is the rotation of spare parts and it refers to a value of parts which have been replaced in the company's machinery. The results are following.

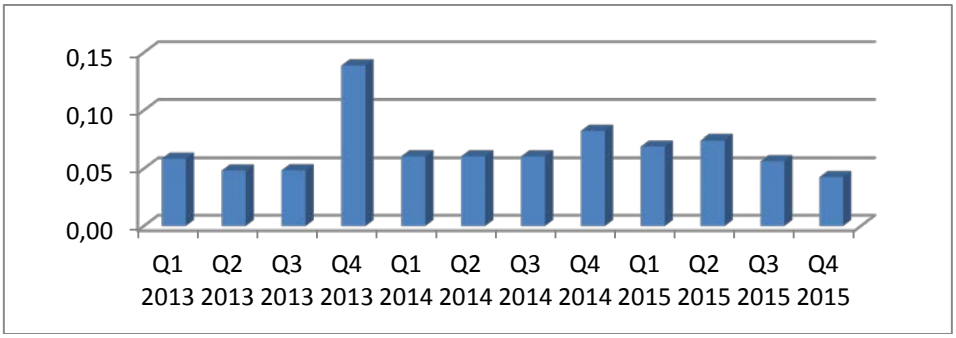

Figure 7. Rotation of spare parts
Source: own study.

The rotation of spare parts is a stimulant so its greatest possible value from 0 to 1 is desired. The average value for considered data equals to 0.15 which can be treated as rather poor result. It means that the majority of materials are kept on stock for a long time and only small part of them rotates regularly. It may indicate that company operates in a precautionary manner in the field of spare parts procurement process and it has a number of materials kept "just in case". Such a policy raises some risks that have been already discussed while presenting the results of the share of non-rotating materials' indicator. Taking into consider-ations above results we should also try to interpret the differences between quarters. The highest values indicate the increase in parts replacements which could be the reason of breakdowns or some preventive activities. The lowest

values demonstrate the periods when the components exchanges were less frequent or less expensive (indicator takes into account the value of parts not their quantity).

Next indicator is the share of unplanned costs and it allows checking what part of the costs associated with the parts exchanges was unplanned. Therefore, by the analysis of results of this indicator in the comparison with the previous one, we are able to evaluate if the rotation of spare parts is influenced more by unplanned machine's failures or planned preventive inspections.

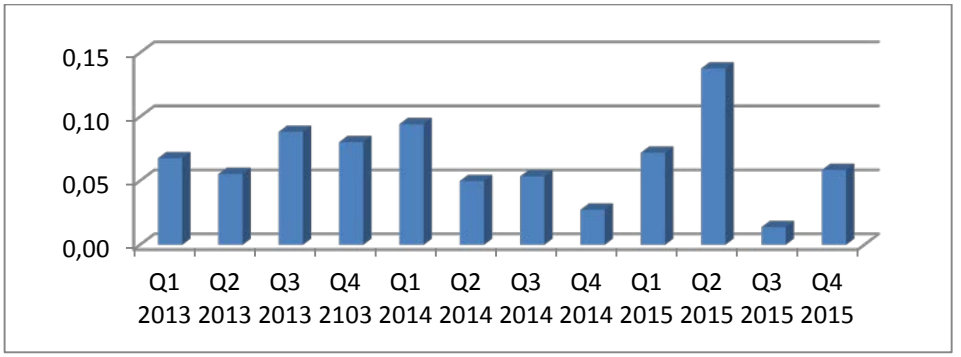

Figure 8. Share of unplanned costs
Source: own study.

Share of unplanned costs is a destimulant as it is easier to manage the costs which are possible to plan and predict. Unplanned costs or any activities raise many difficulties for managers. As it can be seen on the above diagram the least efficient period from the unplanned costs perspective is the second quarter of 2015. Its value is twice as high as the average of all results. It means that in that period the company had problems with the machinery which resulted in many expensive spares exchanges. Nevertheless, we can access positively the conducted repairs as in the next quarter, which is the third quarter of 2015, the lowest result of the indicator is reached. The average value of share of unplanned costs' indicator is equal to 0.07 which is a good result confirming earlier assumptions about precautionary policy of the company also in relation to machines inspections and some preventive actions.

The last indicator is savings rate and it relates to the efficiency of purchasing department which is responsible for negotiations.

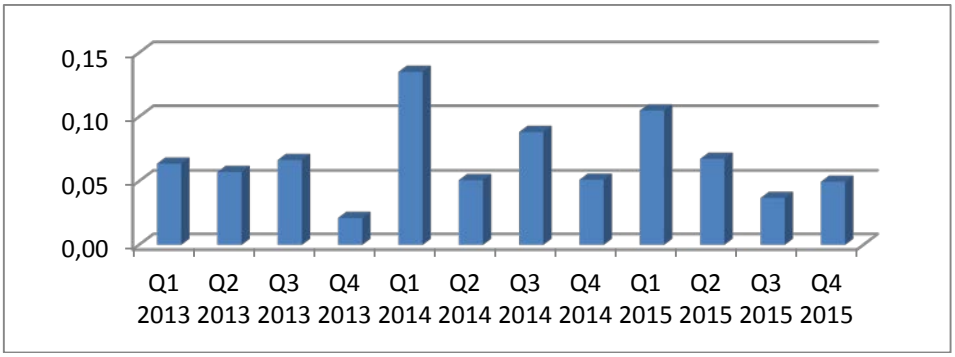

Figure 9. Savings rate
Source: own study.

It has a nature of a stimulant so its greatest possible values are desired. As this indicator can achieve only positive values not greater than 1, the average value which is equal to 0.07 seems not to be fully satisfactory for the entity. Nevertheless, we should take into account that the suppliers who prepare the quotations usually take into account at once the length and strength of the cooperation with the entity and establish the prices on the basis of this knowledge. Therefore the savings rate takes into account only additional discounts which the purchasing department get after some further conversations with stakeholders. As we can see on a diagram the best results are achieved in the first quarters of the considered years and the worst in the fourth ones. It may be the result of the budget possibilities of suppliers who at the beginning of the year seem to be more willing to negotiate.

5. Discussion and conclusion

Monitoring the process of supply management appears to be crucial from the viewpoint of today's economy and increasing competition in the global market. Therefore, the main goal of the theoretical part of this work was to propose the evaluation method of the supply management through a clear differentiation of effectiveness and efficiency terms and a creation of measuring indicators. The main purpose of the empirical part of this paper was, on the other hand, to test previously proposed method and verify its usefulness.

The proposed method of the measurement seems to have both the strengths and some limitations. First of all, it takes into account both the goal realization and inputs involved so it focuses on the main target of supply management – ensuring the availability of materials while maintaining the lowest possible costs. Furthermore, this measuring procedure enables the identification of the aspects

which still need special monitoring and introducing some changes as well as the issues which are the evidence of high effectiveness and efficiency of the process. The former ones can lead to some reflection and in consequence to creation of some improvement plan. Moreover, this measuring method enables further analysis of the process for example with the use of some statistical methods such as ANOVA test used to identify the existence of trend or seasonality in the time series.

Unfortunately, it is not deprived of some weaknesses. Taking into account the considered case it is still difficult to access unequivocally the process of the supply management in the researched entity. There are few reasons of such a situation. One of them concerns data which is quite limited (in some cases it covered only two years) and it relates to spare parts supply process which is difficult to manage and evaluate because of its volatility and unpredictability. Another reason relates to the measuring procedure which requires a multidimensional approach and in consequence poses some problems with the interpretation of the results. As there are proposed both the effectiveness and efficiency indicators and some of them suggest process' effectiveness and efficiency while others show something opposite, it becomes difficult to draw and present some synthetic conclusions in the end. Therefore, this work can be treated as conducive to further reflection on supply management concept and creation of the synthetic measurement method of its effectiveness and efficiency.

Literature

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POJĘCIE EFEKTYWNOŚCI I SKUTECZNOŚCI W ZARZĄDZANIU ŁAŃCUCHEM DOSTAW: TEORETYCZNE ROZWAŻANIA I EMPIRYCZNE ZASTOSOWANIE

Streszczenie

Zarządzanie łańcuchem dostaw jest złożonym i wymagającym zjawiskiem, któremu musi stawić czoła każde przedsiębiorstwo produkcyjne chcące utrzymać swoją pozycję na coraz bardziej nasyconym rynku. Dlatego też w artykule autor dokonuje klarownego rozróżnienia między pojęciami efektywności i skuteczności i na tej podstawie przedstawia propozycję metody pomiarowej umożliwiającej ocenę procesu zaopatrzeniowego. Teoretyczne rozważania podparte są empirycznym zastosowaniem, które weryfikuje użyteczność zaproponowanej metody.