The marketing channel structure:
A case of chemical industry company

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Article Info	ABSTRACT
	The subject of the research are peculiarities of marketing channels structure of industrial company that operates in the chemical industry. The main research activities were focused on the basis of Ukrainian power and chemical association PJSC "Sumykhimprom". The methodical approach of the study is based on analytic and descriptive approach and is aimed at providing a case study. Thus, the goal of the study is to provide an empirical study on auditing the company's marketing channel system and on identifying the current status of marketing channels members. The study suggests that marketing channels function effectively when taking into account the interests of all marketing channel members (manufacturer, intermediaries, end users). The choice of a marketing channel depends on the company's planned sales and profits, available resources, positioning strategies, the intensity of geographical coverage, industry specifics. Marketing channels of PJSC "Sumykhimprom" are grouped in terms of distribution geography into three groups: 1) distributors in the European market; 2) distributors in Ukrainian market and in neighboring countries; 3) distributors in the market of distant foreign countries. The research results allow to form the optimal structure of marketing channels, which simultaneously takes into account the interests of the manufacturer, as well as the consumer. Recommendations to transform the marketing channels structure of PJSC "Sumykhimprom" are formed.

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1. Introduction

Significant competition and the need to provide effective long-term business interactions with customers and other market players require rapid response to changes in the environment. From this perspective, the problem of the formation of an effective system of company's marketing channels, aimed at quick and with minimal risks of selling products and services, is up to date.

There is no consensus in the concept definition. There has been a consistent attempt by researchers in the field to introduce the concepts as follows: sales channel, distribution channel and marketing channel.

In The Handbook of Channel Marketing by Edwin Lee the concept "sales channel" is used. It is describes as a specific kind of connecting path between a business and its customers. The researcher emphasizes that sales channel "is a specific set of resources (people, methods, and materials) with which a manufacturer sells its products to customers" [13].

In [3] the development of the enterprise distribution system as part of the enterprise's supply chain based on its regional logistics potential was investigated. In [4] the research of enterprise's distribution system based on

the analysis the degree of impact on the logistics service products in the supply chain and identification indicators that require high level control of the company during transferring the amount of supply outsourcer was provided.

From this perspective, marketing distribution policy has been determined as a set of procedures and the operations aimed at the effective planning, organization, management and control of products' (services') delivery to customers to satisfy their requirements and to receive revenue according to logistic regulations. The sales channel concept is understood as the path from the goods' manufacturer directly to the end user without any intermediaries. This is the shortest channel. But, at the same time, the distribution channel is more complex concept. The distribution channel consists of a supply channel and a marketing channel and is a consistently structured set of interconnected channel members (suppliers, manufacturers, intermediaries and consumers of goods) that are united to achieve a common goal and to provide the creation and bringing of goods to their final user. It should be noted that the mandatory condition is to take into account the interests of each member through satisfaction of needs and requests.

In this context, it is suggested that the supply channel is a consistently organized set of legal entities or individuals (i.e. suppliers of raw materials, suppliers of semi-finished products, suppliers of components, etc.) which ensure the creation of goods.

In [20] it is emphasized that for marketing channels to succeed in a competitive marketplace, independent marketing organizations must pool individual resources to achieve collective goals through a connected system. Researches point out that a marketing channel operates as a team, sharing resources and risks to move products and resources from their point of origin to their point of final consumption.

In [19] marketing channel is defined as "a set of interdependent organizations involved in the process of making a product or service available for use or consumption". The marketing channel is seeing as a system or complex network with three key entities: manufacturers, intermediaries, end-users.

The marketing channel is a consistently structured set of intermediaries (retail and wholesale, shipping and forwarding companies); they transfer goods from a specific manufacturer to its end consumers taking into account the interests of each member to meet their needs.

That is, a system where products and ownership transfer from level to level (from the intermediary to the intermediary), and, as a result, reach the end consumer. That is, the author positions this channel in relation to others not in terms of its parameters, but in terms of marketing. This means, taking into account a marketing concept. According to, the marketing concept is the most important to meet the consumers' needs. At the same time, we consider as a consumer not only the end-user (the consumer who uses products for final consumption or further production), but also intermediaries who temporarily own products on their way to end-user. Only in this way marketing channel (from its beginning to the end) completely corresponds to the concept of marketing. In addition, we believe that, taking into account the interests of only one group (namely, the consumer), the distribution activities provide poor performance. Thus, in order for the marketing channel to function effectively, it is also necessary, for instance, to minimize the costs of the manufacturer and the intermediary.

To simplify the consideration of the proposed approach, we suggest the "marketing link" concept – a direct path of the product from the previous to the next marketing channel member. The marketing channel consists of marketing links and, in turn, each marketing link includes only two members ("manufacturer – intermediary", "intermediary – intermediary" or "intermediary – end user").

To build an effective marketing channels system the theoretical and methodological basis on marketing channels management must be considered. Thus, in [23] six "classic" distribution channel paradigms are covered. These paradigms (disintermediation, functional shifting, channel flows, discrepancy in assortment, conflict, and power) must be considered by channel managers responsible for designing and managing channel structures (mono- or multichannel) to make products and services conveniently available all over the world. Models and srtategies of marketing channels formation are considered in [2; 9; 17; 22; 24]. Auditing marketing channels is aimed at evaluating available channel members on different criteria. Basically all auditing methods identify the capability to provide service outputs efficiently [19; 20; 22]. Criteria for evaluating marketing channels can be formed on the basis of different approaches: from the manufacturer's point of view [10], from the position of clients or intermediaries [14], and on the basis of the integrated approach [7; 12; 21]. In general, the choice of a marketing channel depends on the company's planned sales and profits, available resources, positioning strategies, the intensity of geographical coverage, industry specifics.

The study [5] provides the research of the influence of projects' financing in the scientific and educational spheres on the level of scientific and methodological base in the structure of marketing support and development of directions for strengthening the innovative products distribution system.

In [16; 26] the problems and perspectives of integration of Ukrainian companies into international market of services were revealed. The research of [1] on the problems of international integration of Ukraine gave the opportunity to determine priority scenarios of its development.

This study is aimed to conduct an empirical study on auditing the company's marketing channel system and on identifying the current status of marketing channels members. The main research activities were focused on PJSC "Sumykhimprom" – a power and chemical association. PJSC "Sumykhimprom" is positioned as a basic company in chemical industry of Ukraine in the segment of phosphorus chemical fertilizers [18].

2. Materials and methods

The methodical approach in this study is based on analytic and descriptive approach and is aimed at providing a case study. In this study to identify consumers' needs and to analyze marketing channels from the consumer's point of view the expert assessment method was used [6]. Given that the PJSC "Sumykhimprom" works on B2B market a group of experts was formed by persons who represent the companies that buy products of PJSC "Sumykhimprom" through existed marketing channels. The group of experts was formed of consumers with the longest history of cooperation with the company through its marketing channels. They purchase goods in large shipments and are positioned on the market as stable and reliable.

The weight characteristics were calculated on the basis of [8] by the Equations (1) and (2):

$$W_i = \frac{\sum_{j=1}^{m} W_{ij}}{\sum_{i=1}^{n} \left(\sum_{j=1}^{m} W_{ij} \right)}, \tag{1}$$

$$W_{ij} = \frac{C_{ij}}{\sum_{i=1}^{n} C_{ij}}, \tag{2}$$

in which, W_i – the total weight given by the experts to the indicator i; m – number of experts; n – number of indicators; W_{ij} – rank, set by the expert j for the indicator i; C_{ij} – an estimation of the relative weight (in points), set by the expert j for the indicator i.

The levels of correspondence of individual characteristics of marketing channels members to the requirements of consumers were calculated by the Equation (3).

$$P_i = W_i \cdot \frac{\sum_{i=1}^{m} B_i}{m}, \tag{3}$$

in which, P_i – the level of the characteristics compliance of marketing channels members to the requirements of consumers; W_i – the weight of the characteristic i; B_i – the expert assessment of the characteristics compliance of marketing channels members to the requirements of consumers, points; m – the number of experts involved, persons; i – the identifier of characteristics.

The level of correspondence of the set of studied characteristics of marketing channels members to the customers' requirements was calculated by the Equation (4):

$$P = \sum_{i=1}^{n} P_i, \tag{4}$$

in which, n – the number of studied characteristics.

To determine the consistency of the experts opinions the statistical tools were used [15; 25].
In [11] the mathematical approach to deal with uncertainty transformation for fuzzy to random or random to fuzzy data was provided. The research recalls basic classic probability and cumulative distribution facts as well as elementary fuzzy distributions results.

3. Results and discussion

PJSC "Sumykhimprom" has complex marketing channels structure as it cooperates with many intermediaries, which is explained by the specifics of the products' range and sales geography. In the framework of this study marketing channels (MCh) of PJSC "Sumykhimprom" are grouped in terms of distribution geography. In this context, there are three types of marketing channels of the company: 1) distributors in the European market (i.e., Germany, Italy, etc.); 2) distributors in Ukrainian market and in neighboring countries (i.e., Republic of Belarus, Poland, etc.); 3) distributors in the markets of distant foreign countries (i.e., Canada, Malaysia etc.). Table 1 contains the key financial results of marketing channels' members of PJSC "Sumykhimprom" in 2016.

Table 1: Financial results of marketing channels' members of PJSC "Sumykhimprom"

Member of marketing channel	Product sales, volumes*	Service costs for members*	The profit of PJSC "Sumykhimprom" from the marketing channels members*
1. Distributors in the European market			
MCh 1.1	5893.57	4267.90	1625.67
MCh 1.2	41993.53	7496.00	34497.53
MCh 1.3	52691.72	13543.00	39148.72
2. Distributors in Ukrainian market and in neighboring countries			
MCh 2.1	35623.16	11269.4	24353.76
MCh 2.2	54607.63	5190.80	49416.83
MCh 2.3	66731.08	3789.91	62941.17
MCh 2.4	210055.08	2698.25	207356.83
MCh 2.5	123048.79	3249.00	119799.79
MCh 2.6	35137.68	4135.00	31002.68
MCh 2.7	73537.52	1769.00	71768.52
3. Distributors in the markets of distant foreign countries			
MCh 3.1	196625.29	23789.50	172835.79
MCh 3.2	179001.07	4569.67	174431.40
MCh 3.3	195120.53	5009.30	190111.23
MCh 3.4	84377.80	5498.40	78879.40
MCh 3.5	31970.26	2400.00	29570.26
MCh 3.6	29140.30	1462.87	27677.43
In total	1415555.01	100138.00	1315417.01

* Parameters are expressed as thous. UAH.
Source: Own calculations.

Calculations, presented in Tables 1-5, were adjusted for the coefficient k due to requirements of commercial confidentiality of the analyzed enterprise. All trends and characteristics of business processes are saved. The value of the coefficient k is classified and is known only to the authors of the article.
Assesses the effectiveness of marketing channels structure of PJSC "Sumykhimprom" was prrovided based on two points of view: the manufacturer and the consumers. The obtained results allow us not only to determine whether the marketing channel structure for the manufacturer meets the requirements of the marketing channel structure for the consumer, but also to form the optimal structure of marketing channels for the company.
The data to determine the marketing channel structure was taken from Table 1. Using the profit volumes data, the frequency of cooperation with members of marketing channels has been found. These lead to identification of the marketing channel structure for PJSC "Sumykhimprom" (see Table 2).
The marketing channel structure for the manufacturer was calculated by the Equation 5:

$$STR_{manufacturer\,i} = \frac{Pr_i}{T_{sum}} \cdot 100\% \tag{5}$$

in which, $STR_{manufacturer\,i}$ – a weight of marketing channel member i in marketing channel structure for the manufacturer , %; Pr_i– the profit of PJSC "Sumykhimprom" from the marketing channel member $i,$ thous. UAH; T_{sum} – the total profit of PJSC "Sumykhimprom" from the marketing channels members, thous. UAH.

After identifying the marketing channel structure for PJSC "Sumykhimprom", the marketing channel structure from the consumer's point of view was considered. As it declared above the expert assessment method was used. Initially, the experts provided a qualitative analysis in the framework of expert assessment. The results revealed the list of the most important characteristics of the channels. List of these characteristics was formed using the questionnaire which was filled in by the company's consumers. Thus, the most significant characteristics of the channel are: width and depth of product range; the level of prices for products; the level of service; the level of employees qualification; terms and conditions of products supply; conditions of product storage; convenience of location; payment terms.

Table 2: Marketing channel structure for the manufacturer (a case of PJSC "Sumykhimprom")

Member of marketing channel	The profit of PJSC "Sumykhimprom" from the marketing channels members *	Marketing channel structure for the manufacturer, %
1. Distributors in the European market		
MCh 1.1	1625.67	0.12
MCh 1.2	34497.53	2.62
MCh 1.3	39148.72	2.98
2. Distributors in Ukrainian market and in neighboring countries		
MCh 2.1	24353.76	1.85
MCh 2.2	49416.83	3.76
MCh 2.3	62941.17	4.78
MCh 2.4	207356.83	15.76
MCh 2.5	119799.79	9.11
MCh 2.6	31002.68	2.36
MCh 2.7	71768.52	5.46
3. Distributors in the markets of distant foreign countries		
MCh 3.1	172835.79	13.14
MCh 3.2	174431.40	13.26
MCh 3.3	190111.23	14.45
MCh 3.4	78879.40	6.00
MCh 3.5	29570.26	2.25
MCh 3.6	27677.43	2.10
In total	**1315417.01**	**100.00**

* Parameters are expressed as thous. UAH.
Source: Own calculations.

The next stage of analysis provides for a quantitative analysis. Table 3 indicates the results of an expert evaluation of MCh 3.6. The values of concordance coefficient (W) and Pearson criterion (X^2) show the consistency of expert opinion.

The level of correspondence of individual characteristics of the marketing channels' members to the requirements of consumers was established.

The following scale was used when interviewing experts:

− 1 point – the low level of the characteristics' compliance of marketing channels members to the requirements of consumers;

− 2 points – the level of the characteristics' compliance of marketing channels members to the requirements of consumers is below the average;

− 3 points – the neutral (medium) level of the characteristics' compliance of marketing channels members to the requirements of consumers;

− 4 points – the level of the characteristics' compliance of marketing channels members to the requirements of consumers is above the average;

− 5 points – the high level of the characteristics' compliance of marketing channels members to the requirements of consumers.

Table 3: The results of an expert assessment

| The channel characteristics | Weight | Expert assessment of characteristics, points | | | | | | | | | | | | The level of correspondence | W | X² |
		Expert 1	Expert 2	Expert 3	Expert 4	Expert 5	Expert 6	Expert 7	Expert 8	Expert 9	Expert 10	Expert 11	Expert 12			
Width and depth of product range	0.07	1	1	1	2	2	1	1	2	1	1	1	2	0.09		
The level of prices for products	0.19	4	3	4	4	3	3	4	3	4	3	4	4	0.68		
The level of service	0.18	3	3	3	3	3	4	3	4	4	4	4	3	0.62		
The level of employees qualification	0.08	2	1	1	2	1	2	1	2	1	2	1	2	0.12	0.63	52.66
Terms and conditions of products supply	0.15	4	2	3	3	3	3	2	3	3	3	3	3	0.45		
Conditions of product storage	0.07	1	1	1	1	1	2	1	2	2	1	1	1	0.08		
Convenience of location	0.09	2	2	2	1	1	2	2	2	2	2	2	1	0.16		
Payment terms	0.16	3	2	3	4	4	3	3	3	4	2	3	3	0.50		
The level of correspondence of the set of studied characteristics of marketing channels members to the customers' requirements														**2.72**	-	-

Source: Own calculations.

An expert assessment for the rest of the marketing channel members was carried out in a similar way.
The marketing channels structure for the consumer was defined on the basis of the results of expert assessment of all members (see Table 4).

Table 4: Marketing channel structure for the consumer (a case of PJSC "Sumykhimprom")

Member of marketing channel	The level of correspondence of characteristics of marketing channels members to the customers' requirements	Marketing channel structure for the consumer, %
1. Distributors in the European market		
MCh 1.1	1.62	2.98
MCh 1.2	3.35	6.15
MCh 1.3	4.12	7.57
2. Distributors in Ukrainian market and in neighboring countries		
MCh 2.1	3.33	6.12
MCh 2.2	3.55	6.52
MCh 2.3	3.77	6.93
MCh 2.4	4.33	7.95
MCh 2.5	3.49	6.41
MCh 2.6	2.81	5.16
MCh 2.7	4.15	7.62
3. Distributors in the markets of distant foreign countries		
MCh 3.1	4.13	7.59
MCh 3.2	4.01	7.37
MCh 3.3	4.27	7.84

MCh 3.4	3.25	5.97
MCh 3.5	1.54	2.83
MCh 3.6	2.72	5.00
In total	**54.44**	**100.0**

Source: Own calculations.

The marketing channel structure for the consumer was calculated by the Equation 6:

$$STR_{consumer\,i} = \frac{C\,r_i}{Cr_{sum}} \cdot 100\% \tag{6}$$

in which, $STR_{consumer\,i}$ – a weight of marketing channel member i in marketing channel structure for the consumer, %; Cr_i– the level of correspondence of characteristics of marketing channel member i to the customers' requirements, points; Cr_{sum} – the total level of correspondence of characteristics of marketing channels members to the customers' requirements, points.

The level of correspondence of the marketing channel structure for the manufacturer and the marketing channel structure for the consumer was determined by calculating the deviation between them. The optimal marketing channels structure is presented in Table 5.

To calculate deviation and the optimal marketing channels structure Equations (7) and (8) were used:

$$Dev = \pm \left| STR_{manufacturer\,i} - STR_{consumer\,i} \right| \tag{7}$$

$$STR_{opt\,i} = \frac{STR_{manufacturer\,i} + STR_{consumer\,i}}{2} \tag{8}$$

Table 5: The deviation calculation between the marketing channel structure for the manufacturer and the marketing channel structure for the consumer

Member of marketing channel	Marketing channel structure for the manufacturer, %	Marketing channel structure for the consumer, %	Deviation, %	The optimal marketing channels structure, %
1. Distributors in the European market				
MCh 1.1	0.12	2.98	±2.86	1.55
MCh 1.2	2.62	6.15	±3.53	4.39
MCh 1.3	2.98	7.57	±4.59	5.27
2. Distributors in Ukrainian market and in neighboring countries				
MCh 2.1	1.85	6.12	±4.27	3.98
MCh 2.2	3.76	6.52	±2.76	5.14
MCh 2.3	4.78	6.93	±2.15	5.85
MCh 2.4	15.76	7.95	±7.81	11.86
MCh 2.5	9.11	6.41	±2.7	7.76
MCh 2.6	2.36	5.16	±2.8	3.76
MCh 2.7	5.46	7.62	±2.16	6.54
3. Distributors in the markets of distant foreign countries				
MCh 3.1	13.14	7.59	±5.55	10.36
MCh 3.2	13.26	7.37	±5.89	10.31
MCh 3.3	14.45	7.84	±6.61	11.15
MCh 3.4	6.00	5.97	±0.25	6.09
MCh 3.5	2.25	2.83	±0.58	2.54
MCh 3.6	2.10	5.00	±2.9	3.55
Total deviation			**± 57.41**	**100.0**

Source: Own calculations.

The study identified that according to the compliance criterion the PJSC "Sumykhimprom" marketing channels can be described with the situation of partial nonconformity *(51% ≤ 57,41% ≤ 75%)* for the manufacturer and for the customer.

Also, as it can be seen from the Figure 1, to form the optimal structure of marketing channels company has to pay more attention to distributors in the European market.
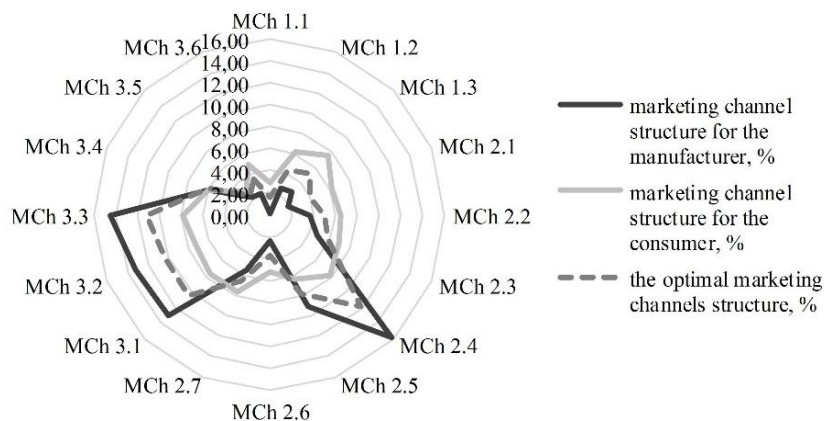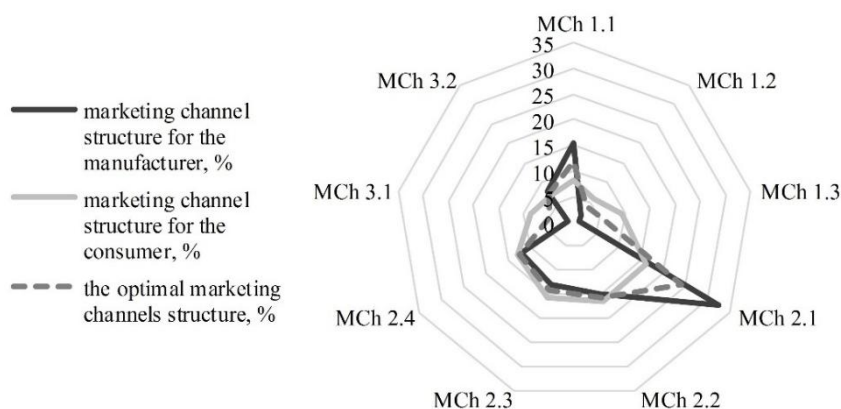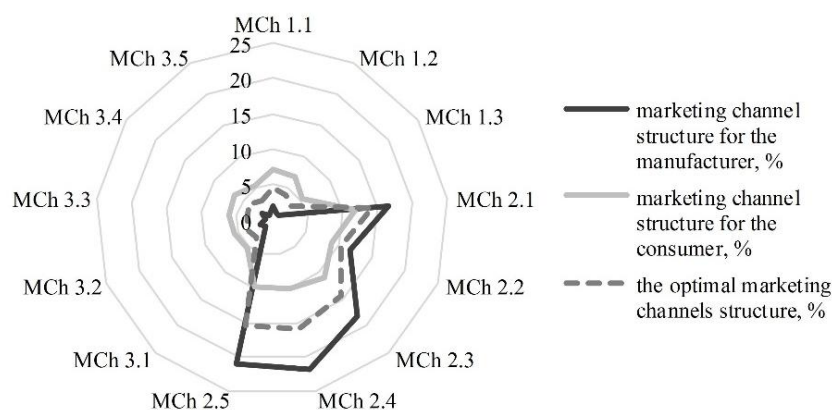

Figure 1: Marketing channel structure for the manufacturer, marketing channel structure for the consumer and the optimal marketing channels structure of the PJSC "Sumykhimprom"
Source: Own calculations.

To deepen this research, the marketing channels structure of PJSC "Sumykhimprom" was compared with marketing channels structures of its main competitors – "PC "POLYSAN" company (Figure 2) and PJSC "Azot" (Figure 3).

Figure 2: Marketing channel structure for the manufacturer, marketing channel structure for the consumer and the optimal marketing channels structure of the "PC "POLYSAN" company (Sumy, Ukraine)
Source: Own calculations.

Figure 3: Marketing channel structure for the manufacturer, marketing channel structure for the consumer and the optimal marketing channels structure of the PJSC "Azot" (Cherkasy, Ukraine)

Source: Own calculations.

According to the Figure 2, just like marketing channels structure of the PJSC "Sumykhimprom", marketing channels structure of the PJSC "Azot" (Cherkasy, Ukraine) can be described with the situation of partial nonconformity *(51% ≤ 74,69% ≤ 75%)* for the manufacturer and for the customer.

At the same time, marketing channels structure of the "PC "POLYSAN" (Sumy, Ukraine) company is in the situation of partial conformity *(26% ≤ 48,93% ≤ 50%)* for the manufacturer and for the customer.

4. Conclusion

We have determined the size of the deviation between marketing channels structure for the consumer and manufacturer that operate in three markets – European; Ukrainian and neighboring countries; distant foreign countries. This allows not only to establish the difference between two points of view (the manufacturer and the consumer) on the optimal channel structure (that is, the relative number of different intermediaries whose services are appropriate to use in the process of product distribution in different markets), but also to form the optimal structure of marketing channels, which simultaneously takes into account the interests of the manufacturer, as well as the consumer.

According to the research results PJSC "Sumykhimprom" needs to increase sales volumes on the European market through existing intermediaries and to find new intermediaries that are more responsive to consumer estimates. The reason is that European market is very important from the consumers' point of view, but the manufacturer has insufficient presentation on this market. E.g., through the MCh 1.2 PJSC "Sumykhimprom" receives only 2.62% of its total profit, but this marketing channel importance for customer is 6.15%. The same situation is with MCh 1.1 (0.12 and 2.98% respectively) and MCh 1.3 (2.98 and 7.57% respectively).

In Ukraine and neighboring countries, PJSC "Sumykhimprom" can improve its marketing channels structure in two ways. First, company can reduce sales volumes through MCh 2.4 and MCh 2.5, since according to consumers' estimates, the intermediaries received low consumers' ratings – 7.95 and 6.41 respectively. Also, taking into account that these marketing channels are profitable and generate 15.76 and 9.11% of total benefit, manufacturer can upgrade MCh 2.4 and MCh 2.5, e.g., make better conditions for product storage in MCh 2.4 and expand and deepen product range in MCh 2.5. For all other intermediaries, it is necessary to increase sales volumes insignificantly, as they are valuable for consumers.

In the market of distant foreign countries, through MCh 3.4 and MCh 3.5 PJSC "Sumykhimprom" receives 6.00 and 2.25% of its total profit respectively, and importance of these channels for customers is 5.97 and 2.83 respectively. So, in MCh 3.4 and MCh 3.5 marketing channel structure for the manufacturer meets the requirements of the marketing channel structure for the consumer. And it is necessary to maintain sales volume through MCh 3.4 and MCh 3.5.

The sales volume through other intermediaries in the market of distant foreign countries better to reduce to meets consumer's requirements or manufacturer can work on their improvement, e.g, lower the price in MCh 3.1, make better conditions for product storage and lower price in MCh 3.2, increase level of employee's qualification in MCh 3.3. Also, it's very important to search for new intermediaries as distant foreign countries markets are fast growing and very prospective.

PJSC "Azot" (Cherkasy) just like PJSC "Sumykhimprom" has some problems with its marketing channels structure. In this case, marketing channels structure from the manufacturer point of view partly differ from the marketing channels structure from the consumers' point of view. It is also necessary to improve marketing channels structure immediately. E.g., PJSC "Azot" (Cherkasy) must examine its relationships with distributors in the European market and in the markets of distant foreign countries regularly and carefully as these markets are important for customers, but company has insufficient presentation on them.

"PC "POLYSAN" (Sumy) company has almost excellent marketing channels structure. The reason is that channels structure from the manufacturer point of view is close to the marketing channels structure from the consumers' point of view. But company needs to audit and control its marketing channels structure to avoid all possible bottlenecks. First of all, company needs to pay attention to MCh 1.1 and MCh 2.1.

In further researches the distribution strategy of chemical industry company will be evaluated.

Acknowledgements

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