

**GRADING OF INDUSTRIES BY SIZE CRITERION
AND ITS IMPACT ON THEIR PLACE AND ROLE IN ECONOMY
OF AGRICULTURAL ENTERPRISES**

*Irina ARTEMENKO¹, Graduate Student,
Kyiv National Economic University named after V. Hetman*

We find it reasonable to determine the importance (place) of an industry for an enterprise based on such indicators as the share of costs of the industry (production consumed resources) in the total operating costs of the enterprise and the scope of these costs per unit of land area, and to determine the role of an industry based on the share of the operating profit of the industry in the operating profit of the enterprise, the operating profit of the industry per unit of land sales, and the return on sales of the industry products.

According to the place and role of an industry in the economy of an enterprise, a size-based scale of industries was proposed, distinguishing auxiliary, minor, small, supplementary and key industries. It has been proved that enterprises with large-sized land areas normally afford developing minor industries, whereas smaller enterprises place an emphasis on the development of supplementary and key industries.

It has also been established that the place of minor and small industries is overestimated in the economy of enterprises because of their inefficiency as compared to their role and contribution to the development of such enterprises. Conversely, supplementary and especially key industries play a crucial role in ensuring the profitability of production.

Key words: *concentration, production direction of the enterprise, specialization of the company, the size of the industry to the place of the enterprise sector.*

În prezentul articol este cercetată valoarea (locul) industriei pentru întreprindere conform indicatorilor ca pondere a industriei cheltuielilor (resursele de producere și de consum) în costurile totale ale companiei și mărimea acestor costuri pe unitate de suprafață de teren, iar rolul industriei – conform raportului de operare a industriei în profitul întreprinderii, profitul operațional al industriei pe unitate de teren și rentabilitatea vânzărilor de produse ale industriei.

În conformitate cu locul și rolul industriei în economia companiei, este propusă grila industriei în baza dimensiunii acestora, printre care: cele comunale, mărunte, mici, suplimentare și principale. A fost demonstrat faptul că industria mică, de obicei, își permite să dezvolte mai mari dimensiuni de teren pentru companie, în timp ce companiile mai mici se concentrează pe dezvoltarea industriilor principale și suplimentare.

Cuvinte-cheie: *concentrare, direcție de producție a întreprinderii, specializarea companiei, dimensiunea industriei la locul sectorului întreprinderilor.*

Предложено значимость (место) отрасли для предприятия определять по таким показателям, как удельный вес расходов отрасли (производственно-потребленных ресурсов) в общих операционных расходах предприятия и размер этих расходов на единицу земельной площади, а роль отрасли – по удельному весу операционной прибыли отрасли в операционной прибыли предприятия, операционная прибыль отрасли на единицу земельной площади и рентабельность продажи продукции отрасли.

В соответствии с местом и ролью отрасли в экономике предприятия предложена шкала градации отраслей по их размеру, выделив среди них подсобные, мелкие, дополнительные и главные. Доказано, что мелкие отрасли, как правило, позволяют себе развивать большие по размеру земельной площади предприятия, тогда как меньшие предприятия главное внимание сосредоточивают на развитии главных и дополнительных отраслей.

Установлено также, что в экономике предприятия место мелких и малых отраслей через их неэффективность завышается в сравнении с их ролью и вкладом в развитие таких

¹ © Irina ARTEMENKO, artemenkoi@meta.ua

предприятий. И наоборот, роль дополнительных и особенно главных отраслей становится решающей в обеспечении прибыльности производства.

Ключевые слова: концентрация, производственное направление предприятия, специализация предприятия, размер отраслей предприятия, место отрасли предприятия.

JEL Classification: Q1; H50; P17; R5.

Problem statement. Specialization and concentration of production of economic entities are important economic processes in the management system of the agro-industrial complex.

Such terms as “enterprise production line” and “enterprise specialization” are often used in economic literature. Moreover, there is no clear distinction between these concepts, and frequently they are treated as synonyms. Therefore, this aspect of the problem requires additional study with due regard to the size of industries.

The issue of grading of industries by their size has remained underexplored until today, which complicates the problem of determining their place and role in the economy of enterprises, and therefore in the reasoned formation of their industrial structure and clear definition of the production line or specialization of such economic entities. Another question requiring further study is the impact of not only the level of production concentration, but also the “status” of an industry according to its size and role in the enterprise economy on the efficiency of industries.

Analysis of major studies and publications. The questions of specialization and industrial structure of enterprises are predominantly treated in general terms in economic literature. However, the questions of industry size and the impact of industries on the economy of enterprises are considered only in individual works, notably without detailed substantiation of criteria for the classification of such industries according to their size, and without exploration of the effect of different size industries on the economy of enterprises. The substantiation of the methodological approach to determine the production line of enterprises and their specialization remains underexplored.

The insufficient scientific development of the specified issues stipulates the relevance of this article and determines its purpose. The latter consists in substantiating the grading of industries according to their size, defining the indicators of their place and role in the economy of enterprises, distinguishing between the concepts “production line” and “enterprise specialization” on this basis, and determining the impact of the status of industries on production efficiency.

Presentation of the main content. Specialization and concentration of production of economic entities are important economic processes in the business system of the agro-industrial complex. Narrower specialization allows commodity producers to concentrate limited resources on the production of one or several types of technologically connected products and, concurrently, organize it on a larger scale. Thus, these two processes are interconnected and interdependent, which is one of the essential factors of rational production organization and enhancement of profitability of agricultural enterprises.

There are also reasons to believe that the concentration level of an agricultural enterprise of a certain industry and the level of its specialization in the products of this industry are closely interrelated. In general, it can be described with the following tendency: the higher the level of concentration of a particular industry, the higher the level of specialization of an enterprise and the output of products of that industry. We hereby stress that this is only a general tendency which may have significant deviations for certain reasons.

Primarily, it should be noted that in order to achieve the purpose of the article the list and size of industries have been determined in terms of the cash proceeds structure (net income), and the concentration of production was assessed by means of the total volume of sales of a certain industry, the volume of sales per unit of land area, as well as the volume of operating costs incurred by a particular industry. As the importance of industries is far from being the same for an enterprise, a need arises to define their place and role in the economy of such a business entity.

There are economic reasons to believe that the place of an industry in the economy of an enterprise can be displayed by the share of the industry costs (production consumed resources) in the total operating costs of the enterprise and the size of these costs per unit of land area. The role of an industry in the economy of an enterprise is represented by such indicators as the share of the operating profit of the industry in the operating profit of the enterprise, the operating profit of the industry per unit of land sales, and the return on sales of the industry products.

The approach provided to determine the size, place and role of industries creates a scientific foundation for grading industries according to their size and for the distinction between the concepts “production line” and “enterprise specialization”.

Presently, there is no clear distinction in the use of the aforesaid concepts in the literature. There is a viewpoint equating these concepts [2], but we believe that they are different, therefore they should be considered as independent, based on the place and role played by an industry in the economy of an enterprise. This approach solving the present problem requires grading industries by their size. It should be pointed out that according to our observations economic literature contains no studies dedicated to the substantiation of marginal limits which could serve as the basis to identify a particular industry according to its place and role in the economy of an enterprise.

Based on the analysis of factual material on many enterprises in terms of the cash proceeds structure, we have reached the conclusion that it is reasonable to use the following industry size grading scale which is closely correlated with the place and role of industries in the economy of an enterprise (see Table 1):

- auxiliary industries, i.e. industries the products of which are manufactured for internal economic needs and do not assume the commodity form;
- minor industries with the share in the cash proceeds structure up to 5%;
- small industries with the share in the cash proceeds structure from 5 to 10%;
- supplementary industries where such a share is within the range from 10 to 19%;
- key industries with the cash proceeds share of 20% or more.

We consider well-reasoned the point of view according to which the production line of an enterprise is formed by supplementary and key industries of the agricultural enterprise, and that it is reasonable to formulate the name of such a line based on the range of industries the shares of which take the first three places in the descending rank of cash proceeds structure [1, p. 632].

If, for example, only two of all commodity industries of an enterprise meet the criteria of supplementary and key industries, the production line should be formed only based on these two industries.

Specialization of an enterprise is formed only by those key industries which occupy a dominant position in the economy of the enterprise, and hence in the cash proceeds structure. It is commonly believed that if a certain industry occupies 90 percent or more in the cash proceeds structure of an enterprise, the enterprise is highly specialized, and if an industry occupies 50 percent or more, the enterprise specializes in this sole industry. An enterprise specializes in two industries if their total share in the cash proceeds structure is 67 percent or more, with each of the industries occupies at least 25% of the cash proceeds. Finally, an enterprise specializes in three industries if their total share is 75 percent or more, with each of the industries occupies at least 20% [1, p. 634].

Given the above, there are reasons to make such a distinction in the use of the concepts “production line” and “specialization” of an enterprise. In particular, it is reasonable to use the term “enterprise specialization” when an enterprise can be identified as highly specialized or specialized in two or three industries based on the calculated cash proceeds according to the defined criteria. If such identification is not possible, it is justified to use the concept “production line of the enterprise”, as defined according to the previously set out methodical approach.

The study of an impact of the size of industries on their place and role in the economy of an enterprise was conducted using the examples of selected enterprises of Kyiv Region. The results obtained are shown in Table 1.

The obtained study results show that enterprises smaller in size do not afford developing industries smaller in size (minor and small), thus key and supplementary industries dominate in them. Normally, small industries can be developed by enterprises large in land area, while enterprises focusing on a key industry have a smaller land area, using it primarily to ensure functioning of the key industry. The results of this study also demonstrated that small and minor industries have low efficiency, causing the loss of 27.87 and 29.14 UAH/ha, while supplementary and key industries brought profit in the amount of 67.51 and 345.04 UAH/ha. Such an indicator of industry role in the economy of an enterprise as return on sales has a similar tendency – from -23.15% in minor industries to 11.66% in key industries.

Table 1

Grouping of Kyiv Region enterprises according to the size of their industries

Number of enterprises in the groups	Number of industries in the groups of enterprises, total	Number of industries per enterprise	Average cash proceeds per industry, thou. UAH	Share of cash proceeds from industries in total cash proceeds of an enterprise, %	Average agricultural area per enterprise, ha	Proceeds from an industry per ha, UAH/ha	Operating profit from industries, thou. UAH	Operating profit/loss from industries per 1 ha, UAH/ha	Return on sales of an industry, %	Share of industry costs in total costs of an enterprise, %	Average cost of production of an industry per enterprise, thou. UAH
Enterprises with minor industries											
65	202	3	301.7	1.67	2506.3	120.4	-69.85	-27.87	-23.15	2.12	371.57
Enterprises with small industries											
58	101	1.7	1362.3	7.33	2459.4	553.9	-71.67	-29.14	-5.26	8.08	1434.00
Enterprises with supplementary industries											
55	122	2.2	2011.8	13.96	2143.9	938.4	144.72	67.51	7.19	13.74	1867.04
Enterprises with key industries											
76	123	1.6	5571.7	39.58	1883.5	2958.1	649.90	345.04	11.66	37.70	4921.84

Source: Calculated by author based on statistics of enterprises of Kyiv region.

Places of different size industries in the economy of an enterprise draw particular attention. As seen in Table 1, the share of costs of minor and small industries in the total costs of an enterprise (2.12 and 8.08% respectively) is bigger than the share of these costs in the cash proceeds structure (1.67 and 7.33%), which causes their unprofitability. Supplementary and key industries are characterized by the opposite correlation of these indicators, namely 13.74 and 37.7% against 13.96 and 39.58%. Thus, the place of minor and small industries in the economy of an enterprise is overvalued because of their inefficiency as compared to their role and contribution to the development of such enterprises. Conversely, the role of supplementary and especially key industries is crucial to strengthen the economy of business entities.

The concentration factor became one of the most important conditions for the formation of quite different roles of different size industries in the economy of enterprises. In this context, economic interest represents a peculiar progress of concentration indicators – sales per enterprise and costs per enterprise – obtained from minor, small, supplementary, and key industries. If average proceeds of enterprises from a minor industry are taken as 100% (301,700 UAH), the average proceeds from a small industry are 4.5 times higher, the average proceeds from a supplementary industry are 6.7 times higher, and the average proceeds from a main industry are 18.5 times higher (5,571,700 UAH). Concurrently, the increase in concentration in terms of costs is slower: operating costs increased averagely by a factor of 3.86 as compared to this indicator for one minor industry, by a factor of 5 as compared to one supplementary industry, and by a factor of 13.2 as compared to one key industry.

This peculiar progress of the studied concentration indicators was the reason for the reduction of unprofitability of small industries in comparison with minor industries on the one hand, and for the profitability of supplementary industries and significantly higher profitability of key industries on the other hand.

For the purpose of a more detailed study of the impact of concentration on the place and role of an industry in the economy of an enterprise, combination grouping was carried out with the distinction of subgroups for each of the distinguished industries by the size criterion. The subgroups were formed according to the cash proceeds obtained from the respective industry (Table 2).

Table 2

**Grouping of Kyiv Region enterprises according to the size
of their cash proceeds in terms of minor, small, supplementary and key industries**

Cash proceeds from an industry, UAH thou.	Number of industries	Average cash proceeds per industry, thou. UAH	Share of cash proceeds from industries in total cash proceeds of an enterprise, %	Average agricultural area per enterprise, ha	Average cash proceeds per industry per 1 ha, UAH/ha	Operating profit from industries, thou. UAH	Operating profit/loss from industries per 1 ha, UAH/ha	Return on sales, %
Enterprises with minor industries								
Up to 300	128	87.90	0.64	2120.76	41.45	-42.61	-20.09	-48.47
From 301 to 500	35	385.36	2.34	2377.89	162.06	-106.79	-44.91	-27.71
More than 501	39	928.42	2.75	3886.81	238.86	-126.09	-32.44	-13.58
Enterprises with small industries								
Up to 600	28	357.76	6.56	988.51	361.92	-7.18	-7.27	-2.01
From 601 to 800	15	675.09	6.51	1546.61	436.49	-84.58	-54.69	-12.53
More than 801	58	2025.04	7.49	3405.58	594.62	-99.46	-29.21	-4.91
Enterprises with supplementary industries								
Up to 900	33	590.31	12.88	916.61	644.01	8.15	8.90	1.38
From 901 to 1800	32	1238.30	13.74	1516.01	816.82	69.22	45.66	5.59
More than 1801	57	3268.93	14.13	3206.85	1019.36	266.18	83.00	8.14
Enterprises with key industries								
Up to 2000	31	969.90	29.09	648.13	1496.47	130.92	201.99	13.50
From 2001 to 5000	54	3417.29	28.98	1735.03	1969.58	483.22	278.51	14.14
More than 5001	38	12387.47	47.48	3102.39	3992.89	1310.15	422.30	10.58

Source: Calculated by author based on statistics of enterprises of Kyiv region.

According to the results of the study by analytical groupings, the following generalizations can be made. The groups of enterprises with minor and small industries have subgroups with practically the same level of production concentration (volume of product sales): this figure is respectively 385.360 UAH in the second subgroup of the first group (minor industries), and 357.760 UAH in the first subgroup of the second group (small industries). However, the results of functioning of these subgroups of industries differ significantly as to the key indicators of their role in the economy of enterprises. At the same level of concentration of production, minor industries as compared to small industries cause a substantially greater loss per unit of land area (about 45 UAH/ha) with a high level of sales loss ratio (-27.1%), while in small industries these figures are much smaller - 7.27 UAH/ha and 2.01% respectively.

The most probable reason for the lower loss ratio of small industries in comparison with minor industries at the same scale of production is the fact that the management of enterprises pays much less attention to the development of minor industries (their share in the cash proceeds structure is only 2.34%) because of their minor role in the economy of enterprises. Attention of the management to small industries is a little higher as their share in the cash proceeds structure is 6.56%, therefore their loss ratio decreases substantially.

The reasonableness of this generalization increases significantly when comparing the efficiency of functioning of minor industries with a higher level of concentration (the third subgroup of the first group of enterprises with the sales volume of 928.420 UAH) with the efficiency of key industries (the first subgroup of the first group of enterprises) having practically the same level of concentration of production – 969.900 UAH. When the indicated minor industries are unprofitable for enterprises, key industries with the same scale of production are profitable with 13.5% return on sales and 202 UAH mass of profit per 1 ha.

The reason for this phenomenon lies again in different importance (role) of industries – minor and key – in the economy of enterprises. When minor industries occupy only 2.75% in the cash proceeds structure of the specified third subgroup, key industries with the same level of production concentration occupy 29.09% in that structure, i.e. play a significant role in the economy of an enterprise, therefore the management places an emphasis on their development.

Approximately the same tendency is observed between small industries (the second subgroup of the second group) and supplementary industries (the first subgroup of the third group) with the cash proceeds of 675.090 UAH and 590.310 UAH respectively, i.e. they differ substantially according to this concentration indicator. However, because of the different role of these industries in the economy of enterprises, their financial result is the opposite – small industries caused a loss in the amount of 54.69 UAH/ha, while supplementary industries brought a profit of 8.90 UAH/ha. As expected, they are essentially different regarding the share of these industries in the cash proceeds structure of an enterprise, occupying 6.54 and 12.88% respectively.

Based on the results of this study we can make the following important generalizing **conclusion**: the effectiveness of an industry is affected not only by the level of concentration of production, but also a significant impact is made by the status of the industry as to its place and role in the economy of an enterprise.

Conclusions. In the course of economic activity, agricultural enterprises normally develop several industries that can considerably vary according to the place and role in the development of their economy. We find it reasonable to determine the importance (place) of an industry for an enterprise based on such indicators as the share of costs of the industry (production consumed resources) in the total operating costs of the enterprise and the scope of these costs per unit of land area, and to determine the role of an industry based on the share of the operating profit of the industry in the operating profit of the enterprise, the operating profit of the industry per unit of land sales, and the return on sales of the industry products.

According to the place and role of an industry in the economy of an enterprise, a size-based scale of industries was proposed, distinguishing auxiliary, minor, small, supplementary and key industries. This size-based grading of industries became a scientific foundation for the distinction between the concepts “enterprise production line” and “enterprise specialization”.

Studying the impact of the size of industries on their place and role in the economy of enterprises showed that minor and small industries are unprofitable, while supplementary and key industries are profitable and play, especially the key industries, a crucial role in strengthening the economy of enterprises. It has been proved that enterprises with large-sized land areas normally afford developing minor industries, whereas smaller enterprises place an emphasis on the development of supplementary and key industries.

It has also been established that the place of minor and small industries is overestimated in the economy of enterprises because of their inefficiency as compared to their role and contribution to the development of such enterprises. Conversely, supplementary and especially key industries play a crucial role in ensuring the profitability of production.

In addition, it has been proved with the statistical grouping method that the efficiency of an industry is affected not only by the level of concentration of production, but also a significant impact is made by the status of the industry as to its place and role in the economy of an enterprise.

REFERENCES

1. АНДРІЙЧУК, В.Г. *Економіка підприємств агропромислового комплексу*: підручник. Київ: КНЕУ, 2013. 779 с.
2. КАНІНСЬКИЙ, П.К. Особливості розвитку спеціалізації аграрного виробництва в умовах ринкових відносин. В: *Економіка АПК*. 2006, № 10, сс. 43-47.
3. Статистичні дані окремих підприємств Київської області (Богуславський район, Миротинський район, Кагарликський район, Рокитнянський район, Белоцерковський район, Таращанський район) [accessat 04 septembrie 2015]. Disponibil: <http://www.oblstat.kiev.ua/katal/ksv.htm>

Recommended for publication: 10.09.2015