

УДК 339.37
JEL Classification: G58;821

Dubnytskyj V.I., Lobodenko A.V., Babenko V.G.

PRACTICAL ASPECT OF ZONAL COMPETITION DIAGNOSTICS IN RETAIL

Ukrainian State University of Chemical Technological, Dnipro

The procedure of diagnostics of zonal competition in retail trade with the use of diagnostic approaches and procedures is offered. Diagnosis in author's interpretation is the totality of analytical, evaluating and forecasting procedures that in complex allow us to make a synthetic conclusion about the direction of the enterprise development and adapt the existing management mechanisms and the behavior of the enterprise, taking into account external limits. within the frames of the study complex analysis and evaluation of the vector of retail development were carried out by applying the hierarchical system of indicators of macro-diagnostics, mezo-diagnostics and micro-diagnostics on the basis of cluster and statistical regression analysis procedures. We developed and tested the methodology for assessing the change in the competitive positions of the participants on the principles of vector algebra, which made it possible to quantitatively measure the impact of structural elements of the research on the competitive dynamics of enterprises, which were as objects of evaluation. the description of the possibilities of diagnosing the dominant position of market participants on the basis of the convolution method is given, which in turn allows us to propose a structural and hierarchical method for assessing the competitive behavior of retail operators on the basis of the hierarchy analysis method. Procedure of diagnostics of zonal competition was proposed, which made it possible to increase the practical significance of diagnostic tools in the activities of local operators.

Keywords: zonal competition, retail trade, market structure, competitive struggle, diagnostics.

Introduction

Modern trends in the development of economic systems are characterized not only by the manifestation of crisis processes, but also by the increased attention of theorists and practitioners to the management of competitive advantages on a dynamic basis. [1, 2, p. 12-20]. The reason is obvious: existing theoretical models of competitive markets are only partially capable of equipping entrepreneurs with adequate tools for assessing the effectiveness of approved competitive solutions in the conditions of forms complexity and direction of interaction between business structures.

At the same time, in most cases, regional and local consumer markets are characterized not by the same type of competitive situation, but by in total, which forms the structure of the market. However, the results of such structure evaluating within the existing methods and models of analysis are static. Under assumption of formation of the analytical base for monitoring the changes in these indicators (number of participants, market shares, assortment, etc.), we will not be able to obtain a coherent picture of competitive development. Therefore, full information on dynamic changes in competition is

proposed to be evaluated using diagnostic approaches and procedures. Diagnostics in the author's interpretation is a totality of analytical, evaluation and forecasting procedures that in complex allow us to make a synthetic conclusion about the direction of the enterprise development and to adopt the existing management mechanisms and the behavior of the enterprise, taking into account external limits (conditions of competitive struggle).

Basic material presentation

The retail of the market situation of retail enterprises and organizations should be carried out taking into account their area of activity, as they compete in this competition zone. In retail practice, there are organizations operating on a scale and industry or several regional markets (national section) of a specific regional or consolidated local market (regional section). Two areas of diagnostics of competitive positions of the participants should be defined as a network form of competition, since in this case we deal with the network operators of the retail market. Shops, in turn, are subdivided, as has already been mentioned, into enterprises of local urban significance (local section) and areas of the residential zone (zonal section).

The retailer development of a network format in our country requires a detailed analysis of regional differentiation, population size, differences in economic nature, and infrastructure development. Consequently, the network operators will develop and implement, in our opinion, the relatively specific regional markets for their competitive strategies. The basic number of retail organizations is still operating at regional or local markets. The specific market situation is determined by the competitive relationship between retail enterprises and organizations that trade in goods of one functional purpose or interchangeable ones. The type of market situation depends on the scale of the market. If in the local market, for example, the situation is characterized as a pure monopoly, then in the regional market, including this local, it can already be represented in the form of oligopoly or monopolistic competition.

Taking this in account, the meaning and content of the analysis of market situations vary significantly depending on the level at which the market carries out this analysis and who and for what purpose it conducts. Analyzing the market situation in the service area of the retail company in the residential zone, it should be in mind that the competition in this case is limited to one-profile shops specializing in the areas where they are interspersed.

In retail practice, the area of service of residential area store is taken in the form of a circle of 500 m in radius. According to R. Markin who is the American specialist in the field of retail, «the definite level of competition between the stores is achieved when the aggregate of store service areas is closed by hexagons» [3, p.45-49].

Naturally, these paradigms are simple, since the service area is the result of a competition between stores and their configuration has dynamic character. In addition, the service area itself is only an indicative value, since according to the same author, about 10% of the population buys goods outside of the service of their stores.

Importance of describing market situation has the proportion of the store's share in the service area. As already noted, the service area is always specific for to each store. It is quite difficult to precisely determine the volume of trade in this discrete zone from the total turnover of the local market.

In this regard, in order to determine the share of the store in the service area [4, p. 88], it is believed that the indicator of retail turnover per resident should be used. In the conditions of a market situation such as a pure monopoly, the share of a store in the service area can be noted as the ratio of the turnover of the store in the calculation of a single resident of this zone to the average trade turnover of the population of the local market. The situation is considerably

more complicated if the area of service of the store is characterized by situations such as oligopoly or monopolistic competition. In this case, the effect of determining the share of a store in the service area is appropriate to use the following methodological approach. In a market situation such as oligopoly or monopolistic competition, competition in the service area of researched shop occurs primarily in the sectors formed by the product space of competing stores' services. In diagram form represented in this way (Fig. 1).

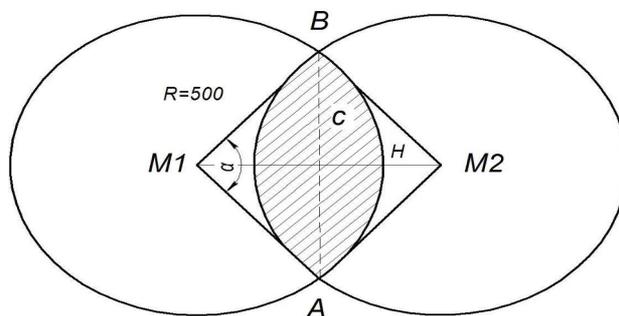


Fig. 1. Scheme of the competitive market of stores M1 and M2 (the same radius of influence intraspecific competition)

There is a question about the nature and intensity of competition in the competitive sector, in our case we consider it as a zonal one. There are two ways to solve this problem. The first involves a direct survey of the population living in the territory of such a sector, the so-called price audit.

Naturally, this method is time-consuming, long-lasting and extravagant. The second is based on a theoretical analysis of the situation. It should be noted that in such complicated socio-economic system as the system of retail enterprises, in most cases, it is necessary to seek not only optimal decisions, but also acceptable, taking into account the time and means necessary for decision-making. With this in mind, the methodological approach we are proposing is as follows. Since the area of service of the store of the residential zone is represented in the form of a circle of 500 m in radius, the area of competitive sector (S_{zc}) can be determined by the formula

$$S_{zc} = R^2 \left(\frac{\pi\alpha}{180} - \sin \alpha \right), \quad (1)$$

where R – radius of store service zone, 500 m; α – angle degree of competitive influence (30° – 150°) (in this case, the smaller α , the more distant are stores M1 and M2 from each other, the weaker the competition).

Next, the intensity of the zonal competition between the two points of trade is determined as the

ratio of the area competition zone (S_{zc}) to the total area of the service area, which for an individual case is the same for two stores:

$$I_{zc} = \frac{S_{zc}}{S_{ser}} = \left(\frac{\pi\alpha}{180} - \sin \alpha \right) / \pi, \quad (2)$$

where I_{zc} – intensity of zonal species competition; S_{zc} – zone (area) of direct zonal competition of two shops, m^2 ; S_{ser} – area of service zone based on radius $R=500$, m^2 .

However, such a summary approach does not consider account the fact that the zones of influence of two retail stores may be different, which is the result of differences in the range, form and level of competitive advantage. In this case, the assessment of the intensity of competition in the service areas needs to be specified, since the obvious situation is that when a two-fold increase in the radius of the service area (Fig. 2) leads to a significant decrease in competitive pressure for a strong participant and, conversely, to an increase in competitive pressure for the weak.

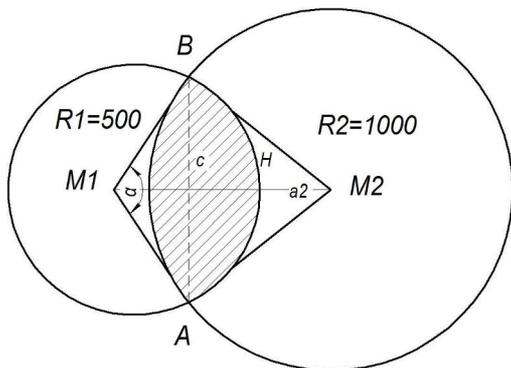


Fig. 2 - Scheme of the competition market of stores M1 and M2 (different service radius - inter-competition competition)

The results of step-by-step iterations (Table 1, Fig. 3) show that with a decrease in the distance between sales points competitive pressure increases, it is absolutely natural. The source of increasing

competitive pressure is decrease in the number of buyers, since the zones of influence overlap more strongly, then quantitatively expressed in the growth of the value of competition intensity indicator.

In the situation of interspecific competition, the formula for calculating the area of zonal competition will look:

$$S_z^n = S_{sz1}^{nr1} + S_{sz2}^{nr2} = \frac{1}{2} R_1^2 \left(\frac{\pi\alpha_1}{180} - \sin \alpha_1 \right) + \frac{1}{2} R_2^2 \left(\frac{\pi\alpha_2}{180} - \sin \alpha_2 \right), \quad (2)$$

where S_{sz1}^{nr1} , S_{sz2}^{nr2} – area of the crossing of the competitive influence of stores M1 and M2 according to the service radius $R_1=500$ m and $R_2=1000$ m; α_1 , α_2 – competitive influence angle.

Estimation of intensity in a situation of fundamentally different radius of service ($R_1=500$ m; $R_2=1000$ m) is calculated on the basis of formulas (2 and 3), but in the denominator there is the area of service for each store, respectively:

$$I_{zr}^{nr1} = \frac{S_{zr}^n}{S_{zr}^{nr1}}, \quad I_{zr}^{nr2} = \frac{S_{zr}^n}{S_{zr}^{nr2}}, \quad S_{zr}^n = S_{sz}^{nr1} + S_{sz}^{nr2}, \quad (4)$$

where I_{zr}^{nr1} , I_{zr}^{nr2} – the intensity of zonal interspecific competition for stores with different service radii; S_{zr}^n – zone (area) of interspecific zonal competition for stores.

The results of assessing the intensity of interspecific zonal competition are presented in Table 2.

The results have once again confirmed that in a situation with a different impact on the consumer (different service radii), a small-radius company will experience high competition pressure. For a player with a new format of competitive advantage and, consequently, a more significant area of influence

Table 1
Results of an assessment of the intensity of zonal competition for the zone of service of two stores with radii $R=500$ m ($S_{ser}=785000$ m^2)

Iterations (competitive assessment)	Competitive influence angle $\alpha = 2\arccos\left(1 - \frac{1}{R}\right)$	Distance between stores $H=2(R-h)$	Chord's height $h = R\left(1 - \cos\frac{\alpha}{2}\right)$	Area of sector $S_{sec} = \frac{\pi R^2 \alpha}{360}$	Area of segment $S_{seg} = \frac{1}{2} R^2 \left(\frac{\pi\alpha}{180} - \sin \alpha \right)$	Area of competitive zones $S_{zc} = 2S_{seg}$	Competitive zones intensity $I_{zc} = \frac{S_{zc}}{S_{ser}}$
1(very low)	30^0	966	17	65449	2949	5898	0,0075
2(low)	60^0	866	67	130899	22646	45292	0,0576
3(average)	90^0	708	146	196349	71349	142698	0,1817
4(high)	120^0	500	250	261799	153546	307092	0,3912
5(very high)	$150^{0\circ}$	260	370	327249	264749	529498	0,6745

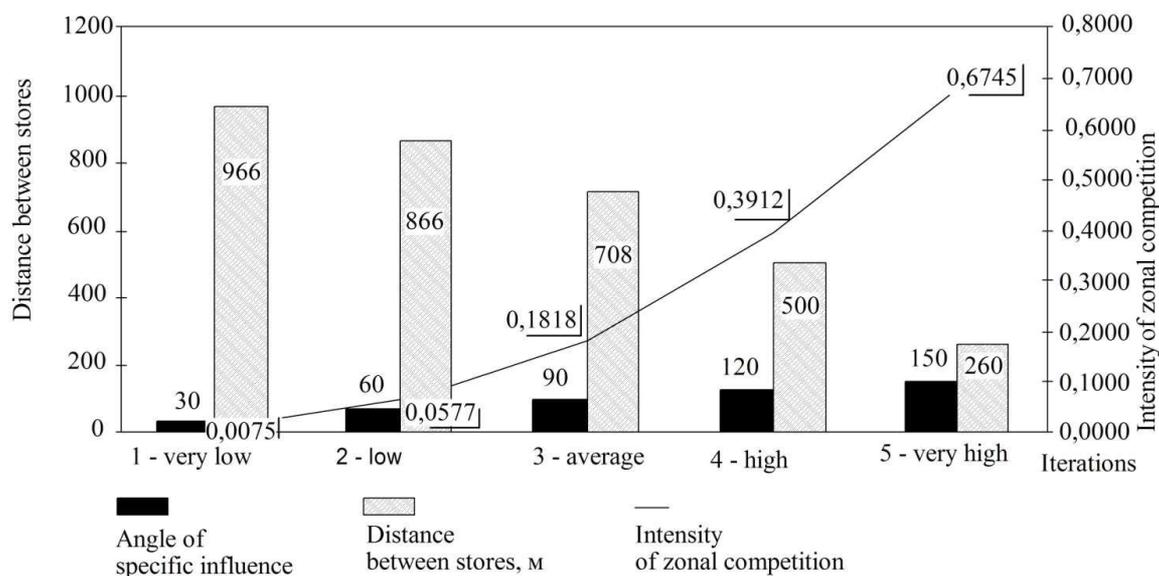


Fig. 3 - Graphic interpretation of the results of the assessment of zonal competition intensity

and level of competitive pressure can be considered insignificant [5].

This methodological approach allows obtaining relevant information on the distribution of the population that lives in the competitive sector between competing stores and thereby determine the number of potential buyers in the service area of researched store. In turn, this gives an opportunity to calculate the volume of goods turnover per resident and, comparing it with a similar indicator in general on the local market, to determine the share of the store in the service area.

It should be considered that the maximum value of the turnover of the investigated store, possibly in the case of unconditional competitive advantage, is equal to the average turnover per resident in the local market, multiplied by the number of population in the service area of the store.

Competitive relations in retail are largely determined by the market behavior of competitors. For stable regional and local markets, shopping areas with existing architectural building of micro-districts, saturated with the retail trade network, in many cases, monopolistic behavior of competitors is characteristic, that is, presence of agreements on relations with suppliers, in price policy, advertising measures, etc. This is due to the fact that in these

conditions to achieve a decisive advantage of a market position in its favor to none of the competitors is practically impossible.

On the contrary, in the absence of retail space, markets (mass housing construction), the relationships of retail enterprises and organizations are only formed and are often characterized by competitive behavior, which is expressed in the expansion of the network of trading units, active price and non-price competition.

Conclusions

Thus, the author's position regarding the formation of the diagnostic component of the competitive dynamics of the market relied on the following basic elements:

- within the frames of the study complex analysis and evaluation of the vector of retail development were carried out by applying the hierarchical system of indicators of macro-diagnostics (national level), mezo-diagnostics (regional level) and micro-diagnostics (enterprises of the retail sector of the separate region) on the basis of cluster and statistical regression analysis procedures;

- we developed and tested the methodology for assessing the change in the competitive positions of the participants on the principles of vector algebra, which made it possible to quantitatively measure the

Table 2

Results of intensity assessment of interspecific zonal competition for the zone of service of two stores with radii $R_1=500$ m and $R_2=1000$ m

Competitive stores, (H=1116 m)	Radius of service zone, R	Competitive influence angle, α	Area of segment, S_{seg}	Service zone, S_{ser}	Intensity of interspecific zonal competition, I_{zc}
M1	500	120	153546	785000	0,3110 (high)
M2	1000	60	90586	3140000	0,0777 (very low)
Total			244132		

impact of structural elements of the research on the competitive dynamics of enterprises, which acted as objects of evaluation;

– procedures for the diagnostic study of the influence of competitive advantages on network development with application of the principles of fuzzy logic in the assessment of network expansion projects are allocated;

– the description of the possibilities of diagnosing the dominant position of market participants on the basis of the convolution method is given, which in turn allows us to propose a structural and hierarchical method for assessing the competitive behavior of retail operators on the basis of the hierarchy analysis method;

– procedure of diagnostics of zonal competition was proposed, which made it possible to increase the practical significance of diagnostic tools in the activities of local operators.

REFERENCES

1. Gavrish O.M. Some aspects of modeling the competitive dynamics of the enterprise [Electronic resource] – Access: http://npbu.gov.ua/portal/UMSU/2008-01/08_gomiia.htm
2. Kindeyeva V.N. Business environment and dynamic assessment of the competitiveness of the product // *Izvestiya SPBYEF*. – Spb. – 2007. – № 3. – P.12-20.
3. Markin R. Retail Management. – M. *Economika*, – 1980. – 270 p.
4. Apopij V.V. Internal trade and agroindustrial complex of Ukraine: Efficiency of Interaction: [monograph]. – Lviv: vyd-vo LKA, – 2007. – 350 p.
5. Zagornaya T.O. Diagnostics of zonal competition in retail trade // *European Applied Sciences*/-Stuttgart, Germany: ORT Publishing. – 2013. – Vol 2, – № 10. – P.107-110.

Received: 10.05.2018

Reviewer: Ass. prof.: prof. V.P. Kolesnikov

ПРАКТИЧНИЙ АСПЕКТ ДІАГНОСТИКИ ЗОНАЛЬНОЇ КОНКУРЕНЦІЇ В РОЗДРІБНІЙ ТОРГІВЛІ

Дубницький В.І., Лободенко А.В., Бабенко В.Г.

Запропоновано процедуру діагностики зональної конкуренції в роздрібній торгівлі з використанням діагностичних підходів і процедур. Діагностика в авторській інтерпретації – це сукупність аналітичних, оціночних і прогнозних процедур, які в сукупності дозволяють зробити синтетичний висновок про вектор розвитку підприємства і адаптувати існуючі управлінські механізми і поведінку підприємства з урахуванням зовнішніх обмежень (умов конкурентної боротьби). В межах дослідження виконано комплексний аналіз та оцінювання вектора розвитку роздрібно торгівлі шляхом застосування ієрархічної системи показників макродіагностики, мезодіагностики та мікродіагностики на основі процедур кластерного та статистичного регресійного аналізу. Розроблена та апробована методика оцінювання зміни конкурентних позицій учасників на принципах векторної алгебри, що дало можливість у кількісному вимірі з'ясувати вплив структурних елементів дослідження конкурентної динаміки розвитку підприємств, що виступали в якості об'єктів оцінювання. Надана характеристика можливостям діагностики домінуючої позиції учасників ринку на основі методу згортки, що в свою чергу дозволило запропонувати структурно-ієрархічний метод оцінювання конкурентної поведінки роздрібних операторів на основі методу аналізу ієрархій. Запропонована процедура діагностики зональної конкуренції сприяє підвищенню практичної значимості інструментів діагностування в діяльності локальних операторів.

Ключеві слова: зональна конкуренція, роздрібна торгівля, структура ринку, конкурентна боротьба, діагностика.

ПРАКТИЧЕСКИЙ АСПЕКТ ДИАГНОСТИКИ ЗОНАЛЬНОЙ КОНКУРЕНЦИИ В РОЗНИЧНОЙ ТОРГОВЛЕ

Дубницький В. И., Лободенко А.В., Бабенко В.Г.

Предложена процедура диагностики зональной конкуренции в розничной торговле с использованием диагностических подходов и процедур. Диагностика в авторской интерпретации – это совокупность аналитических, оценочных и прогнозных процедур, которые в совокупности позволяют сделать синтетический вывод о векторе развития предприятия и адаптировать существующие управленческие механизмы и поведение предприятия с учетом внешних ограничений (условий конкурентной борьбы). В рамках исследования проведен комплексный анализ и оценку вектора развития розничной торговли путем применения иерархической системы показателей макродиагностики, мезодиагностики и микродиагностики на основе процедур кластерного и статистического регрессионного анализа. Разработана и апробирована методика оценки изменения конкурентных позиций участников на принципах векторной алгебры, что дало возможность в количественном измерении выявить влияние структурных элементов исследования конкурентной динамики развития предприятий, выступавших в качестве объектов оценки. Дана характеристика возможностям диагностики доминирующей позиции участников рынка на основе метода свертки, что в свою очередь позволило предложить структурно-иерархический метод оценки конкурентного поведения розничных операторов на основе метода анализа иерархий. Предложенная процедура диагностики зональной конкуренции способствует повышению практической значимости инструментов диагностики в деятельности локальных операторов.

Ключевые слова: зональная конкуренция, розничная торговля, структура рынка, конкурентная борьба, диагностика.