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The methodology of competition assessment

Abstract

Introduction. Since competition influences all the spheres of economic life, its research is scattered among different fields of economic science and different research areas.

The purpose of the article is to systematize existing approaches to competition assessment, based on single multidimensional methodological approach, to make economic competition research at the micro-, meso- and macrolevels better managed and presented, as well as to develop comprehensive system of indicators to assess the state of economic competition.

Results. Having used the Porter's diamond model, the authors divided three dimensions of competition research: horizontal (within the relevant market or stack of related markets), vertical (within the process chain), and potential competition dimension (within all the markets in the economy due to the capital flow between them that provides competitive pressure on the participants of the relevant market). The sets of indicators of the relevant type of competition are identified within every research dimension. Combined use of these indicators allows us to determine current state of competition in the market, and to verify the results obtained. The aggregated system of competition indicators is introduced to ensure comprehensive and more profound analytical support for managerial decisions.

Keywords: Horizontal Competition; Vertical Competition; Potential Competition; Indicators of Competition Assessment

JEL Classification: D47; L11; L25

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Методологія оцінки рівня розвитку конкуренції

Анотація

В статті здійснено систематизацію наявних підходів до оцінки рівня конкуренції, в основу якої покладено модель п'яти сил конкуренції М. Портера. На основі цієї моделі виокремлено три площини дослідження конкуренції: горизонтальну, вертикальну та площину потенційної конкуренції. В рамках кожної площини дослідження визначено набір індикаторів оцінки рівня відповідного типу конкуренції, які інтегровано в єдину агреговану систему багатовимірною дослідження конкуренції.

Ключові слова: горизонтальна конкуренція; вертикальна конкуренція; потенційна конкуренція; індикатори оцінки рівня розвитку конкуренції.

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Методология оценки уровня развития конкуренции

Аннотация

В статье на базе модели пяти сил конкуренции М. Портера систематизированы существующие подходы к оценке уровня конкуренции. Выделены три плоскости исследования конкуренции: горизонтальная, вертикальная и плоскость потенциальной конкуренции. Для каждой плоскости исследования определен набор индикаторов оценки уровня соответствующего типа конкуренции, которые, в свою очередь, интегрированы в единую агрегированную систему мультиплоскостного исследования конкуренции.

Ключевые слова: горизонтальная конкуренция; вертикальная конкуренция; потенциальная конкуренция; индикаторы оценки уровня развития конкуренции.

1. Introduction

Competition is the driving force behind every economic system at large and for every market in particular. Thus, persistent academic interest to the study of the competition is natural. However, changes in historical and economic context of economic competition determine the profoundness of the problems related to the research at theoretical and practical levels, within both macro- and microeconomics. When consumers, businesses, and governments (represented by their competition agencies) are facing new challenges, they push for update of research methodological framework of competition phenomenon.

2. Brief Literature Review

The elements of theory of competition were already formulated in the classical political economy (see A. Smith (1776) [1], D. Ricardo (1817) [2]). Its further development occurred in the neoclassical economics. Discussion on industrial organization by Harvard and Chicago schools (Mason (1939) [3], Bain (1951) [4], Galbraith (1952) [5], Harberger (1954) [6], Stigler (1968) [7]) resulted in the first instrumental approaches to assessment of competition. These instruments range from Structure, Conduct and Performance paradigm (hereinafter - SCP-Paradigm), elaborated by E. Mason (1939) [5], J. Bain (1951) [3], A. Harberger (1954) [6], R. Rosenthal (1980) [8], and others to specific methods of the market concentration assessment. Articulation of Contestable markets theory by W. Baumol, J. Panzar and R. Willig (1982) [9] inspired the rise of number of alternative approaches to barriers for potential competition assessment. Behavioural analysis of the competitive relations was developed by S. Salop and J. Stiglitz (1977) [10], F. Hayek (1978) [11]. Each of these basic approaches is in wide use nowadays. We may name few works by K. J. Elzinga and D. E. Mills (2011) [12], L. Correa and P. Crocioni (2012) [13], J. Tirole and E. Glen Weyl (2012) [14], S. Littlechild (2014) [15], N.-P. Schepp and A. Wambach (2016) [16], and B. Hintermann (2017) [17]. The downside of these studies is their fragmentation, as they focus only on some dimensions of competition. There is a lack of true multidimensional research in contemporary economic studies, at least at macro- and meso- level of economic analysis. The microeconomic studies of competition, primarily marketing researches, while sometimes multidimensional, are mainly defined by the need to ensure competitiveness of certain services or goods. They are unable to create proper methodological basis for the complex study of competition. There is no single methodological approach in modern economic science that would combine the abovelisted studies into a single instrumental system of the competition assessment.

3. The purpose of the paper is to systematize the existing approaches to the competition assessment within single multidimensional methodological approach. Such an approach facilitates integral economic competition research at micro-, meso- and macrolevels, as well as allows developing a comprehensive system of indicators for competition assessment.

4. Results

To achieve our purpose, we are to combine the industrial organization theory insights in competition assessment with the multidimensional approach to investigation of economic competition at the microlevel. We are using Porter's five competitive forces model, better known as «Porter's diamond model», as methodological basis of our research (Porter, 1998) [18].

Porter listed five forces as key factors of competition:

- 1) industry rivalry;
- 2) threat of new entrants (potential rivals);
- 3) threat of substitute products;
- 4) bargaining power of suppliers;
- 5) bargaining power of buyers.

This approach covers a much wider range of competition sources than traditional approaches of the industrial organization, while it is not widely

used for the assessment of competition in the market or in the economy at large in order to ensure public welfare.

Analysing the Porter's diamond model from the instrumental point of view, we see some duplications. Methodological approaches to assessment of firms' interaction within the process chain are similar at different stages: between suppliers of resources and producers of intermediate goods, as well as producers of intermediate goods and end-use products, and so on. It refers to the scope of supply contracts' analysis, and to the framework of their conclusion. The same is relevant to potential competition. It can be referred both to the investors seeking to enter the industry, and the producers of substitutes of the relevant product. However, differences in the sources of potential competition are not critical for the division of different approaches to its assessment. There are less methodological dimensions of the competition assessment than the competitive forces. They could be represented in the following dimensions: horizontal, vertical and the dimension of potential competition. The first two cover the actual competition between players of certain markets and industries. The third is industrial neutral, but it has an impact on the actual competition. It restrains firm's monopolistic behaviour and determines the trends of market development. (see Figure 1).

While three basic dimensions of competition analysis are determined, let us systematize existing indicators of competition assessment in compliance with them.

The horizontal dimension of the competition assessment involves the analysis of structural framework and behavioural manifestations of competition within the relevant market. It is the most elaborated one in the industrial organization, being the result of SCP-Paradigm evolution. It is also widely used in the regulatory practice of competition agencies. Some of the latter even have special rules for consideration of horizontal concentration.

Following the relevant achievements, we can identify such indicators for horizontal competition assessment:

- I. Market concentration indicators to determine the structural framework of competition, starting with the number of market participants, and the market share controlled by its largest players. Among them are: concentration ratio (CR), the Herfindahl-Hirschman index (HHI), the Rosenbluth index (Hall - Tideman index).
- II. Indicators of market shares' non-uniformity to determine the background of structural market dominance through the balance of market shares of its participants. They are: market shares' variability index, market entropy, the Gini coefficient.
- III. Indicators of market power to determine the dominant firms' ability to exploit their market power effectively. These indicators illustrate not the structural, but behavioural approach to the competition research. They are:

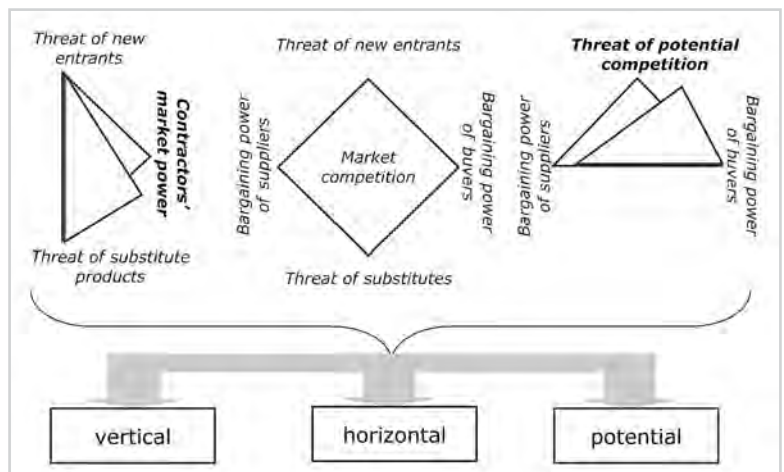


Fig. 1: Methodological dimensions of competition assessment (based on the Porter's diamond model)

Source: Elaborated by the authors

the Lerner Index, the Bain Index, the Tobin's Q Ratio, the Papandreou coefficient, the Rothschild Index (details for these indices' calculation are available at [19]).

The first two groups of indicators provide a structural framework analysis of horizontal competition, while the third group - behavioural one, which is based on the exploitation of the market power that is manifested in the price increase, the profit growth, the value of market capitalization, and the market reallocation between the rivals and their products.

The last group of indicators may also be used as indirect evidence of the potential competition effectiveness. The authors of the Contestable markets theory (W. Baumol, J. Panzar and R. Willig) noted that easy market entry and exit ensures low prices at a marginal cost, free capital flow between industries and protection against production inefficiency regardless the structure of the market (W. Baumol, 1982) [9]. This means that such a market is defined by the absence of:

- overestimated price, which increase over the marginal cost is a key element of market power assessment under the Lerner Index;
- monopoly profit, which is underlying the Bain index;
- market capitalization overage, caused by a monopoly profit that is used as a market power indicator with the Tobin's Q Ratio;
- investment restrictions (including restrictions on productive capacity), which assess the degree of market power with the Papandreou coefficient;
- critical value of switching costs, that differentiate the elasticity of single firm's residual demand, pushing up the value of the Rothschild Index.

Residual and cross elasticities of demand, determining measure of product differentiation, can be used as independent indicators of potential competition of the substitutes. The more goods are differentiated, the more they differ from each other, and the more expectable is a creation of some separate horizontally adjacent markets. Within narrow markets, the firms can occupy a monopoly (dominant) position, or at least have much more market power than they would have while operating in the wider integrated market. In this context, the usual indicators of market boundaries determination convert into indicators of barriers to switching demand, which measure the potential competition effectiveness. This means that apart from demand elasticity we can still use:

- consumers switching rate, calculated on the base of the SSNIP-test results;
- price correlation between potential substitutes.

Usually these indicators are not used for assessment of the potential competition, while the capacity of their use is still high enough. The reason is the nature of competition between the substitutes that manifests through the adjacent markets' merge. The study by G. Pylypenko (2014) on the telecommunication markets' evolution is the evidence of the latter. She grounds the integration of markets of fixed-line and mobile telephony in Ukraine, and merger of Ukrainian phone and broadband markets with the use of correlation analysis [20]. It is a classic example of enhancing the potential competition at the hands of substitutes under innovation process. The higher the correlation coefficient is the more effective is potential competition. If the index exceeds value of 0.9, the markets merge and potential competition between the parties of integrated market becomes a real one. In this case, the number of relevant market participants increased, and potential competition can already be measured by the use of classical instruments of entry barriers assessment under the Bain approach. It involves the calculation of:

- market entry index - ratio of the new entrants to the total number of market participants;
- market penetration index - ratio of the new entrants to the total volume of market sales;
- market exit index - ratio of firms that exit the market to the total number of market participants [21].

Alternative Stigler approach to assessment of the barriers to potential competition provides the evaluation of market entry costs, and can be used both in the classic version (market entry of new rivals), and in the case of close substitutes creation. Due to the similarity of these substitutes to the relevant good in the terms of utilitarian purpose, quality characteristics, consumer awareness, etc., the consumer demand flows from incumbent firms to their potential rivals [7]. The ratio of such costs to the average value of industry profit is known as another potential competition indicator - the index of market entry probability [19].

Turning to the third methodological dimension of competition assessment, the vertical one, it is necessary to touch upon institutional analysis. The institute of bargaining power is key determinant of vertical competition; it is defined by the ability by the company to pressure the counterpart to establish desired terms of contract. The largest total surplus (as a measurement of public welfare) is correlating with the situation of equal bargaining power by both parties. In such a case, the agreement results in the establishing of the competitive equilibrium, regardless the high concentration of vertically related markets.

This approach origins from the Galbraith theory of countervailing power under the bilateral monopoly as an alternative to the perfect competition issue in the high concentrated industries [5].

To answer the question about the effectiveness of such equipoise, as well as the question about the density of competition in the process chain, we have to assess the ratio of parties' rates of return, or the index of relative market power. The latter was developed by us in the previous publications to overcome the problem of information asymmetry in the issues of vertical competition assessment. The index comes with the ratio of parties' market power, estimated with their Lerner indices [22].

The structural framework of vertical competition can be determined by the ratio of the indices of market concentrations (for example, the Herfindal-Hirschman Indices) for different vertically related markets. This ratio is known as the coefficient of buyer's market power.

All three indicators share uniform nature, and are methodologically identical. If their value is close to 1, we may claim the appropriate state of vertical competition to provide public welfare, in correspondence to Galbraith's countervailing power model. The more deviation from the value 1, the weaker vertical competition is.

Summarizing the above said, we have developed the aggregated three-dimensional system of indicators of competition assessment (see Figure 2). It is aimed to assess the competition regardless of the sources of the latter, specific way and area of its manifestation. It includes the scope of interrelated indicators for assessment of:

- traditional way of competition between the participants of the relevant market for their share;
- vertical competition between the parties for the larger portion of sector profit;
- threat of potential competition that restrains the dominant firms' ability to abuse their market position, on the one hand, and estimates the efficiency of resources allocation through the assessment the softness of capital flow within the economy, on the other hand.

5. Conclusion

We found out three dimensions of competition: horizontal, vertical and potential. The first one describes the competition between the incumbents of relevant markets. The second one - between the companies from vertically linked markets, which are the counterparts of each other. The last one - between the companies that are neither sellers of the same products, no contractors of each other, but they are interdependent through the restraining effect of their potential to enter the same market under certain conditions.

Comprehensive study of the competition must cover all of its three dimensions. Most contemporary methodologies allow addressing only part of the competition, and just aggregated three-dimensional system of indicators of

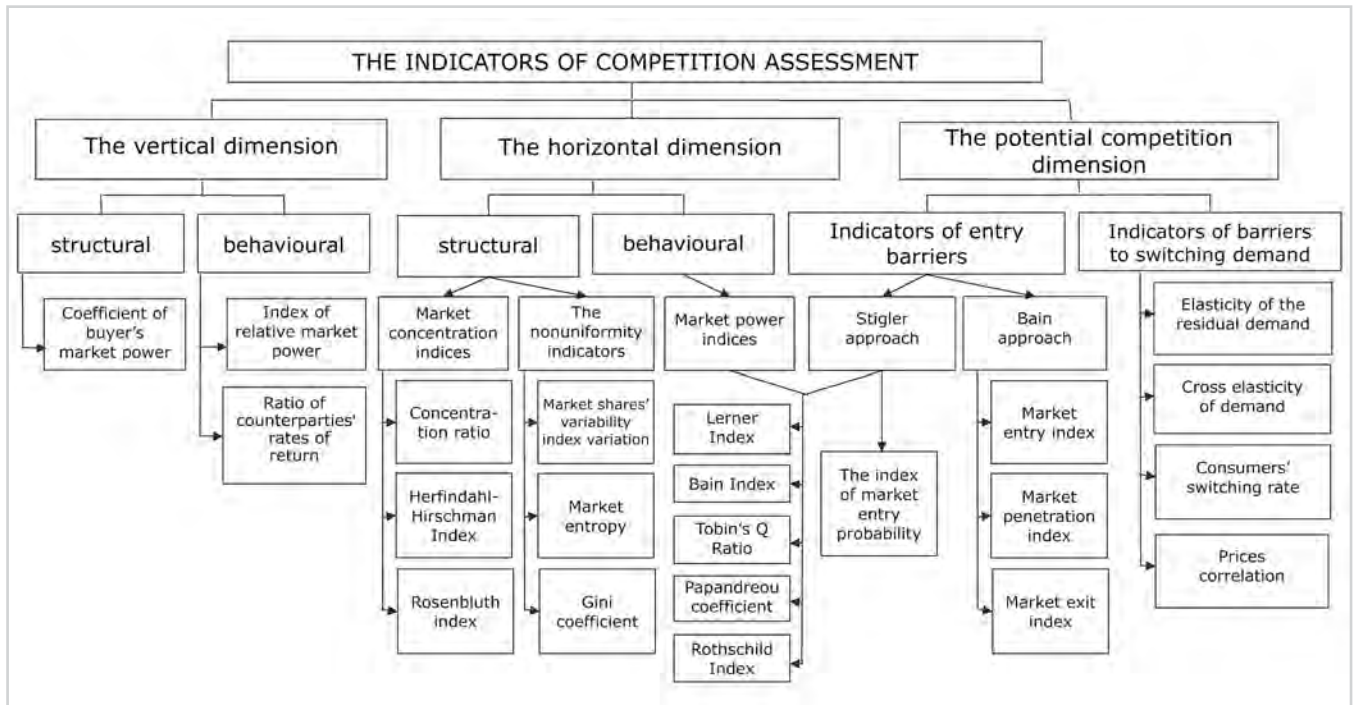


Fig. 2: The aggregated three-dimensional system of indicators of competition assessment

Source: Created by the authors based on the data of [4; 9; 12-17; 20; 22; 23]

competition assessment (displayed on Figure 2) is adequate to this complex task. It combines assessment of the pressure force of competition from current and potential competitors, as well as counterparts from the perspective of structural background of competition, with the prospects of its behavioural indicators. Indeed, this methodology of competition assessment is constructed in the way to provide the self-reflection. The cross-dimensional analysis of the competition phenomenon allows to assess the effectiveness of the

structural framework of competition through the behavioural analysis of the results of resources' goods' and profits' allocation, and to address the failures of the competitive model of profit allocation within the process chain with the study of the structural framework of competition in the vertically related markets. Thus it reduces the risk of incorrect competition assessment, and therefore, the risk of unfounded managerial decision by different market participants, from individual to government regulators.

References

- Smith, A. (1776; 2007). *The Wealth of Nations: An Inquiry into the Nature and Causes of the Wealth of Nations*. Petersfield, Hampshire: Harriman House. Retrieved from <http://www.econlib.org/library/Smith/smWN.html>
- Ricardo, D. (1817). *On the Principles of Political Economy and Taxation*. London: John Murray, Albemarle-Street. Retrieved from <http://www.econlib.org/library/Ricardo/ricP.html>
- Mason, E. (1939). Price and Production Policies of Large-Scale Enterprises. *American Economic Review*, 29(1), 61-74. Retrieved from <http://www.jstor.org/stable/1806955>
- Bain, J. S. (1951). Relation of Profit Rate to Industry Concentration: American Manufacturing, 1936-1940. *Quarterly Journal of Economics*, 65(3), 293-324. doi: <https://doi.org/10.2307/1882217>
- Galbraith, J. K. (1952). *American Capitalism. The Concept of Countervailing Power*. Boston: Houghton Mifflin Company.
- Harberger, A. (1954). Monopoly and Resource Allocation. *American Economic Review*, 44, 77-87. Retrieved from https://www.researchgate.net/publication/227387538_Monopoly_and_Resource_Allocation
- Stigler, G. J. (1968). *The Organization of Industry*. Homewood Ill: Richard Irwin.
- Rosenthal, R. W. (1980). A Model in which an Increase in the Number of Sellers Leads to a Higher Price. *Econometrica*, 48(6), 1575-1579. Retrieved from <http://www.jstor.org/stable/1912828>
- Baumol, W. J., Panzar, J. C., & Willing R. D. (1983). Contestable Markets: An Uprising in the Theory of Industry Structure: Reply. *American Economic Review*, 72(3), 491-496. Retrieved from <http://www.jstor.org/stable/1808145>
- Salop, S., & Stiglitz, J. (1977). Bargains and Ripoffs: A Model of Monopolistically Competitive Price Dispersion. *Review of Economic Studies*, 44(3), 493-510. doi: <https://doi.org/10.2307/2296903>
- Hayek, F. A. (2002). Competition as Discovery Procedure. *The Quarterly Journal of Austrian Economics*, 5(3), 9-23. https://mises.org/sites/default/files/qjae5_3_3.pdf
- Elzinga, K. J., & Mills, D. E. (2011). The Lerner Index of Monopoly Power: Origins and Uses. *The American Economic Review*, 101(3), 558-564. Retrieved from <https://www.jstor.org/stable/29783806>
- Correa, L., & Crocioni, P. (2012). Can evidence of pricing power help market power assessment? Broadband Internet in Ireland and the Netherlands. *Telecommunications Policy*, 36(5), 419-433. doi: <https://doi.org/10.1016/j.telpol.2011.11.014>
- Glen Weyl, E., & Tirole, J. (2012). Market Power Screens and Willingness-to Pay. *The Quarterly Journal of Economics*, 127(4), 1971-2003. doi: <https://doi.org/10.1093/qje/qjs032>
- Littlechild, S. (2014). The Competition Assessment Framework for the Retail Energy Sector: Some Concerns about the Proposed Interpretation. *European Competition Journal*, 10(1), 181-202. doi: <https://doi.org/10.5235/17441056.10.1.181>
- Schepp, N.-P., & Wambach, A. (2016). On Big Data and Its Relevance for Market Power Assessment. *Journal of European Competition Law & Practice*, 7(2), 120-124. doi: <https://doi.org/10.1093/jeclap/lpv091>
- Hintermann, B. (2017). Market Power in Emission Permit Markets: Theory and Evidence from the EU ETS. *Environmental and Resource Economics*, 66(1), 89-112. doi: <https://doi.org/10.1007%2Fs10640-015-9939-4>
- Porter, M. E. (1998). *On Competition*. Boston: Harvard Business School.
- Gerasymenko, A. G. (2012). *Analysis and Control of Concentration of Undertakings*. Kyiv: Kyiv National University of Trade and Economics (in Ukr.).
- Pylypenko, G. M. (2014). Innovations and Market Power: Investigation of Correlation on the Market of Telecommunication. *Ekonomichnyi visnyk natsionalnoho hirnychoho universytetu (Economic Bulletin of the National Mining University)*, 48(4), 161-166 (in Ukr.).
- Bain, J. S. (1954). Economies of Scale, Concentration and the Condition of Entry in Twenty Manufacturing Industries. *American Economic Review*, 44(1), 15-39. Retrieved from <https://www.jstor.org/stable/1803057>
- Gerasymenko, A. G. (2014). *Market power: sources, extent and effects*. Kyiv: Kyiv National University of Trade and Economics (in Ukr.).

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