







# “Assessment of the competitive environment of the health insurance market”

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# ASSESSMENT OF THE COMPETITIVE ENVIRONMENT OF THE HEALTH INSURANCE MARKET

## Abstract

The main purpose of this investigation is to distinguish the problematic tendencies of the health insurance market development in Ukraine and the competitive positions of the leading insurance companies on it. Accordingly, the issues of complex analysis of key indicators of the insurers' competitiveness, and the issues of establishing the factors that determine the level of competition in the market become very urgent. The first 30 insurers out of 50 were taken for the study, and they received about 90% of insurance premiums for voluntary health insurance in Ukraine in 2017. The authors have made the assessment of the competitive environment of the health insurance market of Ukraine using the concentration index and the indicator of market competition, which resulted in defining the advantages and disadvantages of their application. Taking into account that the abovementioned indicators for assessing the competition in the insurance market can provide only approximate results, which indicates the inadequacy of the conclusions about the effectiveness of business processes management on it, the authors offered a scientific methodological approach to assessing the market environment with the use of an integrated indicator of the voluntary health insurance market competitiveness. Herewith, such an integrated indicator is calculated in terms of three segments of the market: sickness insurance; voluntary medical insurance (continuous health insurance); medical expenses insurance, simultaneously taking into account the behavior of two indicators – concentration and market competition. As a result of the research, it was found that the highest level of market concentration is typical for sickness insurance and it indicates a high monopoly in the market in terms of this segment. Thus, the integrated indicator allows to make a comprehensive investigation of market behavior of the market participants and to reveal the problematic tendencies of its competitive environment.

## Keywords

competition, health insurance market, competitive  
environment, competitiveness, integrated indicator

**JEL Classification** I11, I13, I15

## INTRODUCTION

Competition in the health insurance market as an integral part of the market economy characterizes the process of interaction and struggle of the existing companies on it, potential partners and competitors, aimed at ensuring the most favorable position for the market participant, which will provide it with the opportunity to protect against the competitive forces or influence on them for its own benefit, will create better conditions for the realization of insurance services, satisfaction of the client's needs and obtaining the economic remuneration. In order to study the main trends in the development of the health insurance market in Ukraine and the competitive positions of leading insurance companies, it is necessary to characterize the key indicators of the insurers' activity and analyze the factors determining its dynamics, define the level of competition in the market and outline the problems of the relationship between the insurers in a competitive market environment.

Despite a significant number of insurers providing services for voluntary health insurance, it is not possible to consider the health insurance market to be competitive. This is evidenced by a number of factors. Firstly, in 2017, according to the volume of the insurance premiums, the first 30 insurers out of 50 received about 90% of the insurance premiums from voluntary health insurance (continuous health insurance). Secondly, in the national practice, there is no comprehensive approach to assessing the level of competition in the insurance market, considering the lack of methodological and information support.

It should be noted that the insurance law does not contain any registered principles on compliance with the rules of competition in the insurance market; there is no methodology for evaluating a competitive market environment. In order to outline the competitive tendencies in the insurance sector, since 2003, the National Financial Services Commission has introduced a calculation of two competition indicators – the market concentration ratio and the Herfindahl-Hirschman Index. This is a positive aspect in the development of information provision of the insurance market that made it possible to assess the competitive behavior of its participants. In addition, the indicator of market concentration can be calculated independently on the basis of available information of the official website of the National Financial Services Commission. However, in order to assess the competitive environment of the health insurance market and increase the efficiency of business processes management on it, it is advisable to develop a scientific and methodological approach to assessing the market competition using an integrated indicator of the voluntary health insurance market competitiveness, the parameters of which can describe the competitive tendencies of the insurers who dominate on the market, the strategy of their market position and allow to use measures on adoption of reasonable decisions due to the regulation of the health insurance market development.

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## 1. LITERATURE REVIEW

The main goal of the medical insurance market development is improving the medical services system. In this issue, all efforts should be directed at increasing the responsibility and interest of all market entities in the reform process. The result should be a high level of medical care in our country.

In general, taking into account the high importance of the health care system, the development of the insurance market should be formed in the direction of social and economic efficiency. In this case, it is necessary to understand the crucial role of the interrelation of all economic and social processes that occur in our country.

We agree with Tretyak (2017) who believes that the development of the health insurance market is related to the level of stability of the entire economic system, since the health insurance market needs investments.

Zaychuk (2015) focuses on the motivational side of the issue, on the insufficient level of citizens income, on the lack of appropriate insurance traditions.

To assess the competitiveness of the market, it is very important to understand how much services the insurance medicine system should provide. Borisova (2017) has developed a diagnostic model for the socio-economic potential of the health insurance system. This made it possible to assess the direction of developing the health insurance system (Borisova, 2017).

The effectiveness of a company activity depends on many factors. Mamedova (2018) has formed a model that allows to determine the class of the insurance company in terms of competitiveness.

On the other hand, the level of income of insurance companies depends on the income of their clients. Eckles, Saardchom, and Powell (2011) conducted a scientific research of the influence of different types of heterogeneity of the economic system on the performance indicators of firms operating in the market.

When reforming the health insurance market, it is necessary to take into account the experience of those countries that have effectively implemented the changes. Parente (2011) conducted a research of the need of effective information system creation for implementing the basics of health.

We support the ideas of Kozmenko and Lysenko (2014) who believe that an effective health insurance market is impossible without creating an international system for monitoring the quality of health care with the involvement of all stakeholders.

## 2. AIMS

The purpose of the study is to identify (develop) an integrated indicator of the competitiveness assessment of the voluntary health insurance market that will provide comprehensive coverage research of market behavior and competitive environment on it.

## 3. METHODS

The methodological basis of the study is based on systematic and dialectical approaches to the general theoretical comprehension of medical insurance as an important segment of the population insurance protection system. In this research, such methods were used:

- methods of comparative analysis and synthesis – to study modern organizational and methodological approaches to assess the competitive environment of the market;
- observation method – to detect the condition and problems of the health insurance market;
- method of induction and deduction – to assess the level of the health insurance market competitiveness;
- method of system analysis – to substantiate the integrated index of the voluntary health insurance market competitiveness.

## 4. RESULTS

In this article, we will characterize these indicators and determine their advantages and disadvantages. So, the market concentration ratio (market monopolization, CR) is calculated in several ways. The most commonly used is the way where this figure is calculated as the combined share

of the largest market participants for the receipt of insurance/earned premiums (Baranov, 2011; Hamankova, 2009; Yermoshenko, 2006; Pavliuk & Stepanova, 2014).

According to another group of scientists, the concentration of the insurance market should be determined by other criteria: the size of the reinsurance premiums, insurance (reinsurance) payments, reflecting the development of the insurance (reinsurance) activities; the size of assets, capital, reserves, which characterize the financial capabilities of market participants (Bilous, 2013; Kneisler, 2012). We believe that the use of a whole range of criteria in calculating the market concentration indicator allows us to assess the competitive tendencies comprehensively in the insurance market.

However, taking into account the advantages of the concentration coefficient, which consists in the simplicity of the calculations, the availability of the analytical base, this indicator of competition has the main disadvantage – it does not fully characterize the potential of market power, since it is “insensitive” to different variants of shares distribution between the competitors and does not reflect the distribution of shares within the groups of the largest firms (Zhuk, 2011).

The level of market concentration depends on the number of participants on it and their size. The fewer insurance companies operate in the insurance market and the more they vary in size, the higher will be the level of market concentration and monopolization. In addition, the concentration indicator determines the behavior of the insurance market participants, because at its higher level, their dependence on the competitors increases.

The indicator of market competition (Herfindahl-Hirschman Index, HHI) is calculated as the sum of the squares of the shares of all insurance companies operating on the insurance market. The advantage of the Herfindahl-Hirschman index over the concentration coefficient is that it takes into account all subjects of the insurance market; therefore, it assesses the degree of monopolization and the level of market concentration comprehensively. The maximum value of this indicator is 10,000 ( $NNI = 100^2 = 10,000$ ), which indicates the presence of one in-

insurance company, which owns the entire insurance market, that is, the monopolization of the market by one company. The smaller is the index value, the more insurers there are on the market and the more competitive it is considered to be.

In national and foreign practices, the most popular is the methodology according to which the value of the market competition indicator is determined by such a scale (Homellia, 1998; Baye, 2007):

- 1)  $HHI < 1,000$  – the market is assessed as low concentrated and highly competitive;
- 2)  $1,000 < HHI < 1,800$  – the market is considered to be moderately concentrated, and the competition is weak and undeveloped;
- 3)  $HHI > 1,800$  – the high concentration of market power is observed, the market is low competitive (with an approximate value of 10,000, it is reasonable to assume that there is no competition in the market).

The main disadvantage of the market competition indicator is the complexity of the calculations, the need for information on the market share of all insurers. Herewith, the Herfindahl-Hirschman Index does not make it possible to identify the oligopoly of a dominant set of small oligopolists with one or two major competitors, that is an oligopoly opposite to the oligopoly of a dominant company market with a competitive environment (Kneisler, 2012).

It should be noted that the two abovementioned indicators of competition are determined only for the entire insurance market or its two segments – the general insurance market and life insurance market. However, to assess the competitive environment of the voluntary health insurance market and to calculate the real value of these indicators within a single market, it is appropriate to outline the boundaries of this market. Accordingly, the main criterion for choosing the limits of the voluntary health insurance market will be its distribution into markets: health insurance (continuous health insurance), sickness insurance and medical expenses insurance.

The next step is to determine the parameters that are taken as the “size” of the subject of the voluntary health insurance market. For each segment of the

voluntary health insurance market, the main indicators of the size of its participant will be the volume of the insurance premiums and insurance refund payments.

In theory and practice, the scientific and methodological approaches to assessing the concentration of market power, in particular regarding the choice of the number of major insurers are ambiguous. Thus, according to official information of the National Financial Services Commission, the concentration indicators are calculated due to 3, 10, 20, 50, 100, and 200 insurers. In this case, the scale at which it would be possible to estimate the concentration level is not given. Furthermore, according to the method specified in the Law of Ukraine “On protection of economic competition”, the status of economic entities is considered to be monopoly (dominant), in relation to which the combined share (Law of Ukraine of 11.01.2001 No. 2210-III):

- of one entity in the market exceeds 35% ( $CR-1 > 35$ );
- of three or two entities that occupy the largest shares in one market, exceeds 50% ( $50 < CR-3 < 70$ );
- of five or four entities with the largest shares in one market exceeds 70% ( $CR-5 > 70$ ).

According to this Law, the concentration of market power is estimated only due to 1, 3 and 5 market participants, and it cannot determine the real trends of the competitive environment of the health insurance market.

Nechyporuk (2010), taking into account the main principles of the legislation described above, offers his own methodology for assessing the market concentration, where he considers that:

- the market is highly concentrated if the value of the concentration factor is within  $70\% < CR < 100\%$ ;
- the market is moderately concentrated  $35\% < CR < 70\%$ ; and
- it is low concentrated  $CR < 35\%$  (Kneisler, 2012, p. 228).

The share of what number of the largest companies is used to identify these limits is not clear. Kneisler (2012) states that the national insurance market is the market of oligopoly of a dominant set of small oligopolists, and therefore considers it appropriate to assess the market concentration applying the concept of the expected variations of Bowley, which is based on the determination of the concentration level of 4, 8, or 10 largest companies on the market in order to assess the influence degree of their behavior on market functioning.

Bilous (2013) offers a methodology for assessing the competition in the insurance market, based on the application of the concentration index (market share of three insurance companies,  $CR_3$ ) and the Herfindahl-Hirschman Index. Herewith, depending on the values of these indicators, the markets are divided into:

- low concentrated market:  $CR_3 < 45\%$ ;  $HHI < 1,000$ ;
- moderately concentrated market:  $45\% < CR_3 < 70\%$ ;  $1,000 < HHI < 2,000$ ;
- highly concentrated market:  $70\% < CR_3 < 100\%$ ;  $2000 < HHI < 10,000$ .

In our opinion, the scale which is used by the author to classify the markets is not substantiated. Shirinian (2012) uses a similar methodology for assessing the insurance market competitiveness. She formulates an integrated indicator that simultaneously takes into account the behavior of two indicators of  $CR_4$  and HHI:

$$IC = \sqrt{CR_4 \cdot HHI}. \quad (1)$$

The authors consider the abovementioned methodology to be the most suitable for assessing the level of competition in the voluntary health insurance market in the context of its main segments. Confirmation of this is, firstly, the calculation of the concentration index by the criterion of the combined market share of four companies, which is the basis for the classification of the markets of William Shepard, that is decisive for oligopoly markets, including the national insurance market; and secondly, the calculation of the integral index of market competitiveness that optimally combines the behavior of the concentration index and the Herfindahl-Hirschman Index; thirdly, the classification of markets by quantitative and qualitative criteria, which allows a complex and comprehensive assessment of the competition in the voluntary health insurance market.

At first, the concentration indicators of the voluntary health insurance market will be calculated due to selected characteristics (insurance premiums and payments) for its largest participants (the first 30 insurance companies of health insurance market in terms of collected insurance premiums in 2017) and the level of market competition according to the methodology of the National Financial Services Commission and the Antimonopoly Committee will be determined.

Concentration indicators of the health insurance market in terms of continuous health insurance, sickness insurance, medical expenses insurance,

**Table 1.** Concentration indicators of the voluntary health insurance market with pointing out its components according to the selected criteria (as of January 1, 2018), %

Source: Calculated according to the data of Insurance TOP.

Criteria of the market participant/share in the market	$CR_1$	$CR_2$	$CR_3$	$CR_4$	$CR_5$	$CR_{10}$	$CR_{20}$	$CR_{30}$
<b>Medical insurance (continuous health insurance)</b>								
Insurance premiums	15.0	25.5	34.9	43.5	50.0	73.1	90.9	98.3
Insurance payments	16.2	29.4	40.1	49.6	56.0	80.1	93.4	99.9
<b>Sickness insurance</b>								
Insurance premiums	38.6	63.8	76.0	81.3	85.9	95.3	98.4	99.9
Insurance payments	21.5	38.5	51.8	64.4	71.1	93.3	99.0	99.9
<b>Medical expenses insurance</b>								
Insurance premiums	14.9	29.1	43.1	49.5	55.1	74.9	92.9	98.6
Insurance payments	19.0	33.6	45.6	55.7	61.4	84.1	96.3	98.9



in particular by the first company ( $CR_1$ ), by the first two companies ( $CR_2$ ), by the first three companies ( $CR_3$ ), etc., are presented in Table 1.

According to the data of Table 1, the degree of the health insurance market concentration, calculated in terms of its separate segments and selected criteria, is different. So, the highest level of market concentration is in the sickness insurance. The concentration coefficient  $CR_2$  for the first two largest insurers is 63.8%, that is, the share of the first two companies in terms of insurance premiums occupies more than half of the market of this type of insurance. At the same time, due to the insurance payments, the concentration level  $CR_2$  for the first two insurers is lower 38.5%, but  $CR_3$  for the three insurers reaches 51.8%. As a result, two to three insurers on the market provide virtually all the activities of the sickness insurance. In addition, the  $CR_{10}$  index for the first ten,  $CR_{20}$  for the top twenty largest companies that make the sickness insurance, is 95.3%, 98.4% (due to the insurance premiums) and 93.3%, 99.9% (due to the insurance payments). This indicates that the voluntary health insurance market for this segment is highly monopolized.

In accordance with the criteria of the Antimonopoly Committee, which define the monopoly position of the economic entities, the market power is distributed among the participants of the voluntary health insurance market (sickness insurance) in the following way:

- the share of the first largest insurance company in the market in terms of the insurance premiums is 38.6%, and in terms of the size of the insurance payments it is 21.5%;
- the combined share of the first three largest companies is 76.0% and 51.8%;
- the combined share of the first five insurers is 85.9% and 71.1%.

Thus, according to the volume of the insurance premiums, the share of the first largest company is outside the permissible limits ( $CR_1 > 35$ ) and approaches to the critical value, whereas in terms of the insurance payments it is lower than the initial value  $CR_1 > 35$ , indicating a high probability of an

individual dominance in the market. A similar dynamics is typical for the combined share of the first three companies, for which the level of concentration  $CR_3$  is bigger than the norm of 50% according to two criteria, and it characterizes the presence of “hard” oligopoly. In addition, if there is no competition among these major market participants, this indicates a collective monopoly. Under conditions of competition between them that is evidenced by a change in pricing policy, improving the quality of services and the effectiveness of marketing activities, the market should be considered to be a competitive one.

Due to the segments of the voluntary health insurance (continuous health insurance) and medical expenses insurance, the level of concentration for  $CR_1$ ,  $CR_2$  is lower, and its value is within the permissible limits of the competitive environment in accordance with the antitrust laws. Thus, the share of the first large company is 15% (of continuous health insurance) and 14.9% (medical expenses insurance) in terms of the insurance premiums, 16.2% and 19.0% in terms of the insurance payments; the share of two large companies is (25.5% and 29.1%, and 29.4% and 33.6%). However, if you consider the concentration ratio ( $CR_3$ ,  $CR_5$ ,  $CR_{10}$ ), then it is worth noting that the voluntary health insurance market is highly concentrated, in particular,  $CR_5$  (for the insurers of continuous health insurance) is 50% and 56%, while  $CR_5$  (for the insurers of medical expenses insurance) is 55.1% and 61.4%. Thus, there is a tendency according to which five large companies provide more than a half of the insurance premiums and make the overwhelming majority of the insurance payments in the voluntary health insurance market.

Concerning the above mentioned information, it should be noted that the level of concentration of the voluntary health insurance market in all its segments is higher in terms of the insurance payments, and it testifies, on the one hand, the execution of the insurance obligations by the largest insurers under the contracts of health insurance and the distribution of market power between them, on the other hand, the growth of the loss-making nature of these types of health insurance.

The authors calculate the Herfindahl-Hirschman Index in the voluntary health insurance market,

which characterizes the distribution of market power among all its participants. Considering the three main segments of this market, which differ from each other by the main participants, we calculate HHI for each of these segments, showed in Table 2.

**Table 2.** Herfindahl-Hirschman Index in the voluntary health insurance market, calculated on the basis of insurance premiums and payments (as of January 1, 2018)

Source: Calculated according to the data of Insurance TOP.

Feature of the market	HHI
<b>Medical insurance (continuous health insurance)</b>	
Insurance premiums	693.05
Insurance payments	834.79
<b>Sickness insurance</b>	
Insurance premiums	2,344.34
Insurance payments	1,362.97
<b>Medical expenses insurance</b>	
Insurance premiums	816.84
Insurance payments	992.72

Data in Table 2 confirm the significant concentration of the voluntary health insurance market in case of sickness insurance. Thus, according to the HHI indices calculated due to the insurance premiums indicators, this segment of the voluntary health insurance market is highly concentrated ( $HHI = 2,344.34$ , that is  $> 1,800$ ), and it indicates a lack of competition and the presence of a monopoly group of insurers. Herewith, due to the insurance payments of the insurance against sickness, HHI is lower than 1,800, which confirms the moderate concentration of the market and weak competition.

The Herfindahl-Hirschman Index does not exceed 1,000 in the abovementioned scale due to two other market segments (continuous health insurance and medical expenses insurance) that characterize the level of competition among the insurers. This means that the voluntary health insurance market is unconcentrated and competitive according to these components, and it has a dominant set of small oligopolists.

The calculated values of HHI allow to state that an oligopolistic structure of the insurance activity in relation to continuous health insurance and medical expenses insurance is typical for the national voluntary health insurance market.

The authors calculate the integrated indicator of the voluntary health insurance market competitiveness (IC) in terms of its three segments, simultaneously taking into account the behavior of two indicators  $CR_4$  and HHI according to the formula and criteria given in the method of Shirinian (2012). Accordingly, the calculation of the  $CR_4$  indicator in terms of two segments of the voluntary health insurance market (continuous health insurance and medical expenses insurance) as of 2018 corresponds to the second level with a “satisfactory” rating ( $CR_4 = 43.5\%$  and  $CR_4 = 49.5\%$ ). This indicates a moderate concentration of the insurance participants. The HHI values confirm the high competition in these segments of the insurance market. Herewith, a proportional distribution of participants is typical for the market of continuous health insurance that corresponds to the assessment of “good”, and the distribution of insurance services is uneven for the medical expenses insurance market (the assessment is “satisfactory”) (Table 3).

**Table 3.** Competitiveness indicators of the voluntary health insurance market (continuous health insurance, medical expenses insurance and sickness insurance) in 2017

Indicators	Criteria	Characteristics of the market
<b>Medical insurance (continuous health insurance)</b>		
$CR_4 = 43.5\%$	$30\% < CR_4 < 60\%$	The insurance market is moderately concentrated
$HHI = 693.05$	$100 \leq HHI \leq 1,000$	The competition level is high
$IC = 173.63$	$30 < IC \leq 180$	The insurance market is proportionally distributed among the participants. The competitiveness is high
<b>Sickness insurance</b>		
$CR_4 = 81.3\%$	$80\% \leq CR_4 \leq 100\%$	The insurance market is characterized by high concentration
$HHI = 2,344.34$	$200 \leq HHI \leq 5,000$	The competition is not developed
$IC = 436.57$	$350 < IC \leq 650$	The market concentration and monopolization are high. The competitiveness is weak and meets the conditions of monopoly competition
<b>Medical expenses insurance</b>		
$CR_4 = 49.5\%$	$30\% < CR_4 < 60\%$	The insurance market is moderately concentrated
$HHI = 816.84$	$100 \leq HHI \leq 1,000$	The level of competition is high
$IC = 201.08$	$180 < IC \leq 350$	The distribution of insurance services is uneven



The insurance market against the disease is characterized by weak competition and the uneven distribution of insurance services. This is evidenced by the integrated indicator of competitiveness of this segment of the voluntary health insurance market ( $IC \approx 436, 57$ ) and the value of HHI (2,344.34), which corresponds to the third level with an “unsatisfactory” rating. The value of  $CR_4$  indicator is unsatisfactory, which is 81.3%, and characterizes the insurance market as excessively concentrated. Thus, concerning the analysis of the concentration of the reinsurance market participants due to certain criteria, we can make a conclusion that the national market of voluntary health insurance in terms of continuous health insurance and medical expenses insurance is characterized by the presence of a dominant group of small companies, with a moderate concentration of their market power. Herewith, according to the HHI, the level of competition in these segments is high.

Herewith, according to the concentration index, the sickness insurance market is highly concentrated, in addition, a low monopolization is observed, where a monopoly group of large ten companies out of thirty-five took more than 80% of the insurance premiums.

In our opinion, the high level of concentration in the sickness insurance market shows, on the one hand, the positive trends, namely, the growth of confidence of the customers to the insurers who are able to provide a reliable insurance protection and guarantees to fulfill obligations under the insurance contracts and have a certain reputation and image on the market. On the other hand, the domination of large insurers on the voluntary health insurance market makes it possible to take on liability a significant amount of risks, obtaining high profits, that in future may negatively affect their solvency and financial stability in particular, and the effectiveness of the functioning of the national voluntary health insurance market in general.

## CONCLUSION

While assessing the competitive environment of the Ukrainian voluntary health insurance market by using the generally accepted methodology for assessing market concentration and competition in the insurance market, it has been established that: the highest concentration level of the market can be seen in sickness insurance, and it indicates a high monopoly in the market of voluntary health insurance in terms of this segment; due to the segments of voluntary medical insurance (continuous health insurance) and medical expenses insurance, the concentration level is lower, and its value is within the permissible limits of the competitive environment in accordance with the antitrust law. Taking into account the above study, we note that a separate use of the market concentration coefficients and the Herfindahl-Hirschman Index for assessing the competition in the insurance market can only give the approximate results, and it indicates the inadequacy of conclusions received by the analysis in the health insurance market. In order to evaluate the competitive environment of the health insurance market accurately and efficiently, we propose the application of an integrated indicator of the competitiveness of the voluntary health insurance market in its three segments, simultaneously taking into account the behavior of two indicators  $CR_4$  and HHI. We believe that only this integrated indicator allows to investigate the market behavior of the market participants comprehensively and identify the problematic trends in its competitive environment.

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