








“Assessment of infrastructure entities’ activity on the insurance market”

AUTHORS	Anzhela Ignatyuk  https://orcid.org/0000-0002-9103-6943  https://publons.com/researcher/L-4078-2017 Antonina Sholoiko  https://orcid.org/0000-0003-1239-4281  https://publons.com/researcher/1992061/antonina-sholoiko/ Anastasiia Syzenko  https://orcid.org/0000-0001-8443-7813  https://publons.com/researcher/1709204/anastasiia-syzenko/
ARTICLE INFO	Anzhela Ignatyuk, Antonina Sholoiko and Anastasiia Syzenko (2021). Assessment of infrastructure entities’ activity on the insurance market. <i>Investment Management and Financial Innovations</i> , 18(1), 76-89. doi: 10.21511/imfi.18(1).2021.07
DOI	http://dx.doi.org/10.21511/imfi.18(1).2021.07
RELEASED ON	Monday, 01 February 2021
RECEIVED ON	Wednesday, 30 December 2020
ACCEPTED ON	Wednesday, 27 January 2021
LICENSE	 This work is licensed under a Creative Commons Attribution 4.0 International License
JOURNAL	"Investment Management and Financial Innovations"
ISSN PRINT	1810-4967
ISSN ONLINE	1812-9358
PUBLISHER	LLC “Consulting Publishing Company “Business Perspectives”
FOUNDER	LLC “Consulting Publishing Company “Business Perspectives”



NUMBER OF REFERENCES

43



NUMBER OF FIGURES

0



NUMBER OF TABLES

4

© The author(s) 2024. This publication is an open access article.



BUSINESS PERSPECTIVES



LLC "CPC "Business Perspectives"
Hryhorii Skovoroda lane, 10,
Sumy, 40022, Ukraine
www.businessperspectives.org

Received on: 30th of December, 2020
Accepted on: 27th of January, 2021
Published on: 1st of February, 2021

© Anzhela Ignatyuk, Antonina Sholoiko, Anastasiia Syzenko, 2021

Anzhela Ignatyuk, Doctor of Economics, Professor, Taras Shevchenko National University of Kyiv, Ukraine.

Antonina Sholoiko, Doctor of Economics, Associate Professor, Taras Shevchenko National University of Kyiv, Ukraine.

Anastasiia Syzenko, PhD., Associate Professor, Taras Shevchenko National University of Kyiv, Ukraine.



This is an Open Access article, distributed under the terms of the [Creative Commons Attribution 4.0 International license](https://creativecommons.org/licenses/by/4.0/), which permits unrestricted re-use, distribution, and reproduction in any medium, provided the original work is properly cited.

Conflict of interest statement:
Author(s) reported no conflict of interest

Anzhela Ignatyuk (Ukraine), Antonina Sholoiko (Ukraine),
Anastasiia Syzenko (Ukraine)

ASSESSMENT OF INFRASTRUCTURE ENTITIES' ACTIVITY ON THE INSURANCE MARKET

Abstract

The paper presents an approach to assessing insurance market infrastructure entities' activity that allows identifying gaps and weaknesses and seeking ways of addressing them in the context of revitalization of such emerging insurance markets as Ukrainian. To determine the impact of costs of insurance market infrastructure entities on the financial performance before taxes resulting from insurance activity, the regression formula is used. It demonstrates significant dependence between financial performance before taxes of insurers and costs of accident commissioner services. Based on this, an assessment approach for groups of insurance market infrastructure entities is created. The assessment results suggest that the efficiency of insurance market infrastructure entities in Ukraine is unsatisfactory (135 points out of 390). To develop infrastructure entities of the insurance market in Ukraine, it is expedient to ensure an effective regulatory framework for all insurance infrastructure entities, including registers, reporting, and a requirement to disclose information on their performance.

Keywords assessment of the activity, performance of the infrastructure entities, development of the insurance market

JEL Classification G22, G28, G29

INTRODUCTION

Insurance providers and infrastructure entities of the insurance market operate in close cooperation with each other, affecting the state of the market, the price and the quality of insurance services, and the insurers' financial performance. The more active the infrastructure entities are, the more developed the insurance market is. In emerging countries, insurance market infrastructure most often is not developed. For instance, the insurance market of Ukraine belongs to the developing ones since only 1.5% of GDP is redistributed through the insurance activity, and this is partly explained by inadequate institutional and legal support of both insurance providers and infrastructure entities. Normally, balanced costs of infrastructure entities' services lead to lower expenses and higher quality of the insurance services for the clients. Yet, Ukraine is one of the countries with underdeveloped financial markets, and, therefore, insurers' financial performance derives from the sales of insurance services rather than from the investments. Therefore, the costs of infrastructure entities' services that are part of the insurance provider's activity directly affect their financial results derived from insurance services.

Proper diagnostics of infrastructure entities' activity on the mentioned insurance market has been largely ignored. This indicates the need to assess the activity of insurance market infrastructure entities

of Ukraine to regulate their influence on the financial position of insurers. Such assessment will also help explore the opportunities for reducing infrastructure entities' expenses to lower the insurance costs and make insurance more affordable for consumers.

1. LITERATURE REVIEW AND THEORETICAL FRAMEWORK

The works of the proponents of Marxist, Neoclassical, Keynesian, and New Keynesian political economy barely deal with infrastructure. In other words, roads and factories were integrated into the concept of capital, while objective differences between them were ignored. It was not until 1943 that Paul Rosenstein-Rodan introduced the term 'social overhead capital' (infrastructure) to the economic literature. He also suggested that infrastructure consisted of transportation, communication, and energy resources that contribute indirectly to the development (Rosenstein-Rodan, 1943). Thus, in that case, hard infrastructure was implied.

Later, Aschauer (1989), Gramlich (1994), and Johansson (1993) explored the issue of infrastructure capital; however, the infrastructure services are still ignored. For instance, Johansson (1993, p. 131) viewed infrastructure as "an opportunity for the flows of resources, communication, interpersonal and inter-company contacts, and other types of market interaction". Thus, infrastructure is not seen merely as a basis for material production but also as a foundation for interaction and communication.

At the beginning of the 21st century, Prud'homme (2005) and Lee (2011, p. 12), apart from infrastructure capital, studied the infrastructure services delivered by *infrastructure providers* (infrastructure entities), i.e., the entities that organize and support the functioning of the markets. As a whole, infrastructure providers include exchange houses, trading systems, clearing bodies, and suppliers of market services.

Summarizing existing literature, the infrastructure entities of the insurance market that provide supporting insurance services (consulting, actuary services, risk assessment, and regulation of

claims settlement), intermediary services, etc. can be divided into the following groups:

1. Infrastructure entities providing services exclusively to insurance providers (loss assessors, actuaries). These entities may be referred to as *supporting insurance specialists* (Prykaziuk, 2017, p. 71), though the provision of comprehensive insurance service is impossible without them, and thus it is necessary to refer to them as to accompanying insurance entities.
2. Insurance unions (comprised of insurance providers and infrastructure entities) functioning on the insurance market that do not provide insurance or reinsurance services (actuarial bureaus, associations of insurers and the insured, and others). Hence, such companies provide consulting services, ensure the protection of their members' interests, deliver professional development training, etc.
3. Infrastructure entities providing services for insurance market entities (insurance aggregators, specialized business platforms) and the entities of other markets (audit, judicial, security, IT-companies (Sholoiko, 2017, p. 68), asset management companies (AMC), credit bureaus, rating agencies and others). These entities are also referred to as 'accompanying entities' (Prykaziuk, 2017, p. 71), though the entities mentioned above can also be involved upon demand, and thus they were classified as *involved infrastructure entities*.
4. Infrastructure entities providing institutional and legal support and entitled to exercise control over both main and infrastructure entities. These include regulatory, supervisory, controlling, and enforcement bodies (regulators, commercial courts, arbitral tribunal, financial ombudsman, etc.). These infrastructure entities supervise and regulate insurance market entities' activity and ensure the protection of rights of the insurance services consumers.

5. Insurance and reinsurance intermediaries (their main activity consists in sales of insurance and reinsurance services), involved insurance intermediaries (selling for whom the sale of insurance services is not the main activity), and in the field of insured accident settlement (assistance companies).

There are several methods to assess the performance of insurance market infrastructure entities. For instance, Petrishyna and Kurasova (2014, pp. 209-211) developed the assessment method for the insurance market infrastructure of Ukraine that includes 5 stages: analysis of the insurance market development indices, analysis of the activity of insurers, analysis of the activity of insurance mediators, analysis of the activity of professional organizations, analysis of public regulation in the insurance industry. In the authors' opinion, it has the following shortcomings:

- a) developed infrastructure is a condition for appropriate development of the insurance market, and therefore it is unreasonable to analyze the development of the resultant component while assessing the factorial one, i.e., the infrastructure of the insurance market that has relevant operational effects;
- b) the insurers and the insured are considered main subjects of the insurance market; therefore, it is not necessary to include the analysis of their activity into the assessment of insurance infrastructure;
- c) the suggested methodology does not comprise an integral index of the insurance market infrastructure assessment and therefore fails to identify the level that would correspond to a specific stage of its development;
- d) it was failed to assess the insurance market infrastructure using the suggested components of their methodology.

All mentioned above indicates that this methodology needs further reworking and improvement.

For assessing the activity of particular groups of insurance market infrastructure entities, it is important to consider the practice of energy sector

companies (Deloitte CIS Research Center, 2016) because they have their integrated matrix of criteria and indicators for evaluation insurance brokers activity. However, the scope of such approach is only internal needs of oil and gas companies, which does not allow to assess the performance of insurance brokers as infrastructure entities of the insurance market in general.

Having studied other markets concerning assessment, it is possible to encounter methods dealing with assessing intermediaries' infrastructure (Herasymenko & Pykhanova, 2003). However, it does not contain ranges of acceptable parameter values. Besides, methodologies focusing on individual components of infrastructure do not provide a complete picture of the effectiveness of a specific market's insurance infrastructure entities.

Based on the critical analysis of existing literature, the following approaches were identified used to assess the activity of insurance market infrastructure entities:

- 1) assessment of individual groups of infrastructure entities, and
- 2) assessment of several groups of infrastructure entities.

Therefore this paper aims to assess the activity of all groups of the Ukrainian insurance market infrastructure entities that would allow identifying gaps and weaknesses and seeking the ways of addressing them in the context of revitalization of the Ukrainian insurance market.

For this purpose, the following objectives were defined:

- 1) to undertake a critical analysis of approaches used to assess the activities of insurance market infrastructure entities;
- 2) to design an assessment approach for insurance market infrastructure entities;
- 3) to suggest steps for enhancing the activities of infrastructure entities to strengthen the development of the insurance market in Ukraine.

2. METHODOLOGY

It is appropriate to suggest an assessment approach for appraising the activity of all groups of insurance market infrastructure entities based on several criteria (Table 1).

Table 1 presents the suggested approach for the comprehensive assessment of groups of insurance market infrastructure entities' activity. This approach can be either expanded or collapsed by the number of groups and sets of criteria depending on the purpose and enables to evaluate the infrastructure entities activity by all or by individual criteria.

Based on this approach, a methodology was designed to evaluate the activity of insurance market infrastructure entities that consists of the following stages:

- 1) to determine groups and sets of the infrastructure entities belonging to them, which will undergo the assessment;
- 2) to determine a set of criteria that will be used in the assessment;
- 3) to award points from 5 to 1 for each type of infrastructure entity and its compliance to individual assessment criterion, where:
 - '5' is fully compliant;
 - '4' is acceptably compliant;
 - '3' is satisfactorily compliant;
 - '2' is unsatisfactorily compliant;

- '1' means that there are some projects, plans, and programs aimed to form and support the activity of infrastructure entities;
 - '0' means that there are no projects, plans, and programs aimed to form and support the activity of infrastructure entities;
- 4) to determine total vertical scores (i.e., by each assessment criterion) by each group of infrastructure entities and their totals – aggregated vertical point;
 - 5) to determine total horizontal scores (i.e., by each infrastructure entity and by individual groups of infrastructure entities and their totals – aggregated horizontal point that equals the corresponding vertical one;
 - 6) to determine the activity level (horizontally) as a ratio of total points awarded to each group of infrastructure entities to the maximum possible number of points (calculated by multiplying the number of infrastructure entities belonging to a certain group by the maximum point of 5) multiplied by 100;
 - 7) to determine the activity level (vertically) as a ratio of total points awarded to each infrastructure entity to the maximum possible number of points (calculated by multiplying the number of assessment criteria by the maximal point of 5) multiplied by 100;
 - 8) to determine the comprehensive activity level of all insurance market infrastructure entities by dividing the vertical aggregated point by the maximum possible number of points (calculated by multiplying the number of infra-

Table 1. Approach to assess the activity of the groups of insurance market infrastructure entities

Source: Developed by the authors.

Group of infrastructure entities (II)	Assessment Criterion (AC)					Total points	Level,%
	AC ₁	AC ₂	AC ₃	...	AC _n		
II ₁	...	...	...	...	...	Σ AC ₁	L ₁
II ₂	...	...	...	...	...	Σ AC ₂	L ₂
II ₃	...	...	...	...	...	Σ AC ₃	L ₃
...
II _m	...	...	...	...	...	Σ AC _m	L _m
Total points	Σ AC ₁	Σ AC ₂	Σ AC ₃	...	Σ AC _n	Aggregated point (rank)	
Level (L), %	L ₁	L ₂	L ₃	...	P _n	Aggregated activity level	

structure entities belonging to all the groups, by the number of assessment criteria, and by maximum point of 5) multiplied by 100;

- 9) to assess the activity level (vertically, horizontally, or comprehensively), where 90-100% is the high activity level of groups of insurance market infrastructure entities; 75-89% is acceptable level; if 60-74% is satisfactory level; and 0-59% unsatisfactory level (i.e., not meeting the market requirements).

The suggested assessment approach shall help analyze the strengths and weaknesses of existing insurance market infrastructure entities and, according to the theory of constraints, to identify the areas that require primary attention in planning and taking actions aimed at improvement and development of insurance market infrastructure.

This paper presents the assessment findings, based on the suggested method, of insurance market infrastructure entities of Ukraine undertaken for the following groups: intermediaries, accompanying insurance entities, insurance unions, involved infrastructure entities, and regulatory, supervisory, controlling, and enforcement entities. For the diagnostics purposes, such criteria as regulatory framework, availability of specialized registers or databases, and disclosure of performance data (i.e., published financial results) were selected.

To determine the impact of costs of the insurance market infrastructure entities of Ukraine on the financial performance resulting from insurance activity before taxes, the following regression formula was used:

$$y_t = \beta_0 + \beta_1 x_{1t} + \beta_2 x_{2t} + \beta_3 x_{3t} + \beta_4 x_{4t} + \varepsilon_t, \quad (1)$$

where y_t is the financial performance resulting from insurance activity before taxes (chosen based on testing data) (UAH 1,000), β_i , $i = 0, 1, 2, 3, 4$ is regression coefficient, x_1 is agent premiums (UAH 1,000), x_2 is services of accident commissioners (UAH 1,000), x_3 is the assistance entities services (UAH 1,000), x_4 is the revenue from sales of insurance services (UAH 1,000), ε_t is model error.

3. RESULTS

First of all, it is appropriate to explore the current state of insurance market infrastructure entities in Ukraine by analyzing them in groups and considering the dynamics in their growth rate (Table 2).

Analyzing the data given in Table 2, one may identify the following issues in the functioning of insurance market infrastructure entities:

- 1) lack of registers and/or databases with information on the number of infrastructure entities, i.e., insurance agents, involved insurance intermediaries, assistance companies, loss assessors (survey agents, claim adjusters, average adjusters), insurance aggregators (comparison websites/data portals for insurance products with an option of purchasing if there is integration with the direct distribution channels of insurers (Erastov, 2017, p. 71));
- 2) no financial ombudsman, insurance payment guarantee fund, insurance record bureau, and insurance repository (that could take care of the emission, service, and control of all digital insurance policies and serve as an alternative to the classical web-based online insurance (Malik & Erastov, 2016, p. 18).

Yet, the availability of information on other insurance market infrastructure entities of Ukraine does not mean that there are no institutional issues related to their operations.

Concerning insurance agents belonging to the *intermediaries* group, their work is regulated by obsolete regulations that do not meet the requirements of the 2016/97/EU Directive of Jan 20, 2016 that was supposed to be implemented into the legislation of Ukraine as envisaged in the Draft Law of Ukraine "On insurance" adopted in its first reading in 2016. Therefore, the regulatory framework is currently at an unsatisfactory level (2 points). Registers and/or databases exist only for the insurance agents that mediate the compulsory insurance of civilian responsibility for vehicle owners, but this information is not publicly available (1 point). Individual indicators of insurance agent performance are published in the consolidated reports of insurers, which is not sufficient for their

Table 2. Growth rates of insurance market infrastructure entities of Ukraine, 2011–2019

Source: Prepared by the authors based on the data from the National Securities and Stock Market Commission; the National Commission for State Regulation of Financial Services Markets (National CSRFMS).

Infrastructure entity	Year									Growth rate 2019/2011 (%)
	2011	2012	2013	2014	2015	2016	2017	2018	2019	
1	2	3	4	5	6	7	8	9	10	11
I. Intermediaries										
Insurance agents	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Insurance and reinsurance brokers	n/a	60	56	51	51	57	56	61	62	3
Non-resident brokers	3	4	7	10	10	18	19	20	20	567
Involved insurance agents	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Assistance companies	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
II. Accompanying insurance entities										
Insurance surveyors	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Accident commissioners	50	203	370	370	370	370	304	333	283	466
Loss adjusters	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Average adjusters	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Actuaries	17	23	28	30	34	38	78	40	44	159
III. Insurance unions										
Associations of insurers	4	4	4	4	4	4	5	5	5	25
Associations of insured	1	1	2	2	2	2	2	2	2	100
Associations of insurance intermediaries	1	1	1	1	1	1	1	1	1	0
Associations of insurance risk and loss assessors	2	2	2	2	2	2	3	3	3	50
Associations of actuaries	1	1	1	1	1	1	1	1	1	0
IV. Involved infrastructure entities										
Auditors	860	828	89	143	156	165	136	141	84	-90
Asset management companies *	344	344	348	343	380	309	295	300	303	-12
Ranking agencies	8	8	8	8	8	8	8	8	8	0
Credit bureaus	7	7	8	9	8	7	7	7	7	0
Temporary administrators	35	31	21	32	36	38	38	38	38	9
Entities owning and managing business platforms **	x	x	1	1	3	3	3	3	3	200
Insurance aggregators	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
V. Regulatory, supervisory, controlling, and enforcement entities										
Regulators	1	1	1	1	1	1	1	1	1	0
Other regulatory entities	15	15	15	15	15	15	15	15	15	0

Note: * Data as of March 31 of each year; ** own data.

comprehensive analysis. Therefore, the disclosure of performance data is scored at 2 points.

Legal framework for insurance and reinsurance brokers remains at the same level as that for the insurance agents (2 points). According to the Draft Law of Ukraine “On insurance”, reinsurance shall be subject to licensing (2015). In such a case, the Law has to provide definitions for both ‘reinsurance intermediation’ and ‘reinsurance intermediary’.

Unlike the insurance agents, insurance and reinsurance brokers’ performance results are open

and published (5 points). According to the national legislation, the registration of insurance and reinsurance brokers, state register of insurance and reinsurance brokers (Resolution of the State CSRFMS, 2004), and the database of insurance and/or reinsurance non-resident brokers who indicated their intention to do their business in Ukraine (other registries and lists consist of information about 20 such brokers in 2019) are mandatory (5 points). In 2019, the State Register of Insurance and Reinsurance Brokers, managed by the National CSRFMS, listed 62 brokers. One of the main indicators of insurance broker activity

development is the number of insurance and reinsurance brokers per one insurer. For instance, by the end of 2019, this indicator was 0.27 in Ukraine, while in Europe, it reached 80 (Insurance business mag, 2017; Insurance Europe, 2017). Therefore, in Ukraine, insurance brokers' activity is poorly developed since they collect only 1% of gross insurance payments.

As for involved insurance intermediaries, in case it represents one of the main activities of a bank or a travel agency, then it is regulated by the specialized Laws of Ukraine "On banks and banking" (2000) and "On tourism" (1995). Yet, in Ukraine, there are currently no restrictions for the involved insurance intermediaries who operate as sales channels for insurance services. This needs to be changed under the European practice (0 points). In other words, the operations of the involved insurance intermediaries in Ukraine have to be based on certain limitations concerning the sales of insurance products and require additional regulation in terms of reporting added activity (0 points). Since there are no such requirements in Ukraine today, there are no available data on the revenue from sales of their insurance services either (0 points).

An assistance company is an intermediary acting as a mediator between an insurance company and its clients if the insured event occurs. One issue that assistance companies face in Ukraine is that their activity is not regulated. Yet, the Draft Law of Ukraine "On insurance" assigns the 'assistance insurance' (2015) to the 18th class (1 point). It is necessary to emphasize that in the EU, according to the EU legislation, the assistance services are provided by the insurance companies, whereas in Ukraine, this is done by assistance companies. Conversely, in the EU countries, it is seen as an insurance risk and is, therefore, a liability of the insurer. Therefore, Ukraine should take steps to integrate the European experience of assistance insurance regulation to ensure consumer protection since the number of services covered by assistance companies is constantly growing.

As for accompanying insurance entities, they comprise professional assessors who take an active part in signing insurance policies on the stage of underwriting and loss assessors involved

in insurance accident regulation. It is noteworthy that the Ukrainian insurance legislation does not specify the status of insurance surveyors, loss adjusters, and average adjusters. The Merchant Marine Code of Ukraine (1995, pp. 277, 288) stipulates that "average adjusters determine the accident by request of interested party and define the proportion of loss distribution. ... The general accident is recognized as a loss caused by the costs incurred or donations made deliberately to save a ship, charter, and cargo from the general danger. The general average is distributed among the ship, charter, and cargo proportionately to its cost". The Draft Law of Ukraine "On insurance" stipulates that "persons, providing services associated with insurance (average commissioners, loss adjusters, average adjusters, survey agents, and assistance companies)' are subjects to oversight (2015) (1 point). Thus, currently, there are no registers, databases (0 points), or any published data on the activity of these infrastructure entities (0 points). As a rule, an expert is involved in assessing the actual cost of the object and the amount of loss on the stages of underwriting and loss settlement.

The activity of accident commissioners is partly regulated (2 points). Accident commissioners are responsible for determining the cause of an insured event and the amount of loss as well as for checking the insurer actions (Resolution of the State CSRFMS, 2011, p. 1.2) in cases prescribed by the Law of Ukraine "On compulsory insurance of civil liability of owners of land vehicles" (LIGA:ZAKON, 2004).

"The cause of insured event and the amount of loss is determined by a person that received the Qualification Certificate registered in the database of the National CSRFMS" (Resolution of the State CSRFMS, 2011). Currently, Ukraine has 300 certified accident commissioners with valid certificates, and among them 63 persons certified to determine the causes of an insured event and the amount of loss in agriculture (crop production); and 237 persons certified to determine the cause of an insured event and the amount of loss in vehicle accidents, excluding railroad transport. It was awarded 3 points since the register includes only accident commissioners related to these two types of insurance (National CSRFMS, 2019).

As Gabidulin (2013) suggests, these experts "... must be in every district and there is a total of 490 districts in Ukraine", excluding those currently not controlled by the government. Thus, the insurance market infrastructure is underdeveloped in terms of the number of accident commissioners for different types of insurance. Performance of accident commissioners can be seen in the consolidated reports of insurers, and therefore it was awarded 2 points for the availability of this information.

It is important to draw attention to the fact that the Law of Ukraine "On compulsory insurance of civil liability of owners of land vehicles" stipulates that "the amount of loss in connection with damage or physical destruction of roads, road facilities, and other tangible assets, is determined based on an accident report or a statement of loss assessment report completed by accident commissioner, assessor or expert, in according with the legislation" (2004, p. 31.1). Interestingly, this Law assigns accident commissioners at the same level as assessors or experts, i.e., in Ukraine, accident commissioners also act as loss adjusters (in agriculture (crop production) and transport, excluding railway).

The Law "On Valuation of Property, Property Rights, and Professional Valuation Activities in Ukraine" stipulates that "the citizens of Ukraine, foreigners, and stateless persons who passed the qualification exam and received a Qualifying Certificate can become assessors..." (2001, p. 6). "The valuation of property is compulsory in the events of: [...] defining losses or amount of compensation in cases prescribed by law" (2001, p. 7). There are 2,707 loss assessors in the register of the subjects of valuation activities managed by the Public Property Fund of Ukraine (2020). The share of services rendered by accident commissioners in assessing insured events does not exceed 20% of assessors and experts' total services. It is known that the cost of accident commissioner services affects the performance of insurer before taxes along with other factors, e.g., assistance entities services, commissions for insurance intermediaries, revenues from insurance services. Therefore, to quantify the degree of this impact, an econometric study was undertaken. For this purpose, insurers' performance before taxes is chosen as a

main variable for the analysis since this indicator is key in identifying the efficiency of insurers.

The findings are interpreted using several exogenous indicators. Since the period from 2008 to 2018 with quarterly data structure was chosen, the primary task is to single out the impact of inflation that made the national currency depreciate by three times. Therefore, it was decided to level all indicators to prices of the base period of the 4th quarter of 2007.

After testing the model for adequacy, the significance of coefficients, and model specification, the final model has slightly modified:

$$y_t = -1351958 - 396.06x_{2t} + 0.91x_{4t}, \quad (2)$$

$$R^2 = 0.72, \quad DW = 1.998,$$

where coefficient of determination (R^2) is 0.72 and Durbin-Watson statistic (DW) equals 1.998.

The model has no autocorrelation and no heteroscedasticity of residuals; it is stable and appropriate for further analysis (Appendix A). According to the model, an increase in costs of accident commissioner services by UAH 1,000 shall lead to a decrease of the insurer's performance before taxes UAH 396,06 thousand. Therefore, insurers must be interested in replacing accident commissioner services with remote or digital ones, e.g., by introducing the so-called electronic EuroProtocol in compulsory motor third-party liability insurance. Similarly, an increase in earnings from the sale of insurance services by UAH 1,000 results in an increase in financial performance before taxes by UAH 910. Accordingly, potential costs account for only 9% of insurer turnover, which indicates their growth in profitability from additional revenues. This means that insurers will try to boost sales of insurance services using all promising distribution channels (e.g., online sale of insurance services).

It is noteworthy that a forensic expert is involved in case of a disagreement between the insurer and insured concerning the amount of loss and the sum of insurance recovery. This expert conducts an investigation "based on specific knowledge of physical objects, phenomena, and processes that may contain information about the facts of the case that is under preliminary investigation or

court trial” (LIGA:ZAKON, 1994, p. 1). This practice is common in Ukraine.

Specific requirements are set and specified for actuaries (5 points). If actuaries obtain the right to certify actuarial calculations, it is also appropriate for them to ensure their professional liability. The Ukrainian database (5 points) contains information about 44 persons certified to conduct actuary calculations (National CSRFSM, 2019). However, information on their performance is not published (0 points). Considering that by the end of 2019, there were 233 insurers in Ukraine, it means only about 1 actuary per 5 insurers, which is a very low indicator signaling the underdevelopment of the insurance market infrastructure.

Concerning various types of insurance associations, they are regulated by the general law (3 points), while the associations of insurers are also regulated by the Law of Ukraine “On insurance” (1996) (4 points). The National CSRFSM does not have a register or database of insurers’ associations (0 points). Therefore, it leads to their unrestrained growth and inefficient use of resources. Varying amounts of information on their performance can be found on the official websites and/or published on social media accounts (evaluated on average at 3 points).

Normally, both general and special laws regulate involved infrastructure entities’ activities in a particular field. For instance, the functioning of the Credit History Bureau is regulated by the Law of Ukraine “On organisation and circulation of credit histories” (2015), “On personal data protection” (2010), and “On information” (1992). Since credit histories contain personal data protected by the law, insurers have very limited access to this data for insurance scoring purposes (4 points). The National Commission for Financial Services manages a single register of credit history bureaus (5 points), but the statistics on requests to the bureau and the number of credit histories is relatively limited (2 points).

The latest Law of Ukraine “On Audit of Financial Reporting and Audit Activities” (2017) regulates the activity of auditors (5 points). And since October 1, 2018, the Audit Chamber of Ukraine manages the register of audit firms and auditors who are entitled to audit financial entities (5 points), but the information published by the Chamber of Auditors of

Ukraine relates to the general amount of auditing services (2 points).

Operations of Asset Management Companies (AMC) and ranking agencies are regulated by the general law and by regulations on proper management of assets and ranking of insurers (5 points). The register of AMCs and ranking agencies can be found on the official website of the National Securities and Stock Market Commission (5 points). Information on the performance of AMCs is available for a fee (Financial services almanac, 2019) (3 points), and information on the performance of ranking agencies can be found on their official websites (3 points).

The Law of Ukraine “On Financial Services and Public Regulation of Financial Services Markets” stipulates the requirements for temporary administrations and reasons for their appointment (2001) (4 points). The National CSRFSM is a database of individuals certified to temporarily administer insurers (5 points). Consolidated information on temporary administrations’ performance in insurance companies is not published. On the other hand, the decisions to appoint temporary administration are published on the website of the National CSRFSM (2 points).

General law regulates the operations of entities that own and manage business platforms dealing with insurance (4 points). Therefore, there are no specialized registers or databases (0 points). Information about the business platform is normally published on its official website, but it is not always complete, consolidated, or updated (3 points).

Currently, the National CSRFSM does not regulate insurance aggregators’ work, and therefore there are no registers, databases, or information on them (0 points for each assessment criterion).

As for regulatory, supervisory, controlling, and enforcement entities, Ukraine has no insurance histories bureau or insurance repository (0 points for each assessment criterion). There are draft laws “On financial ombudsman” (2017, but in 2019 the draft was canceled) (0 points for each criterion) and “On insurance payment guarantee fund” (also 1 point for legal framework criterion and 0 for the other two) (2019).

The activity of the National CSRFMS is regulated by the law (2001, 2011) (5 points). The Commission manages registers of financial entities and some other registers and databases (4 points). Information on the performance of the Commission is published in annual reports.

The consolidated findings of the diagnostics of infrastructure entities are presented in Table 3.

The analysis of scoring presented in Table 3 suggests that in 2019 the efficiency of insurance market infrastructure entities in Ukraine is unsatis-

Table 3. Efficiency of insurance market infrastructure entities in Ukraine, 2019

Source: Calculated by the authors based on data of the regulators.

Group of infrastructure entities	Assessment criteria (maximum 5 points for each of them)				
	Regulatory framework	Registers or databases	Disclosed performance	Total points	Level (%)
I. Intermediaries					
Insurance agents	2	1	2	5	33
Insurance and reinsurance brokers	2	5	5	12	80
Involved insurance agents	0	0	0	0	0
Assistance companies	1	0	2	3	20
Total (I)	5	6	9	20	33
Level (I), %	25	30	45	33	X
II. Accompanying insurance entities					
Insurance surveyors	1	0	0	1	7
Accident commissioners	2	3	2	7	47
Loss adjusters	1	0	0	1	7
Average adjusters	1	0	0	1	7
Actuaries	5	5	0	10	67
Total (II)	10	8	2	20	22
Level (II), %	40	32	8	22	X
III. Insurance unions					
Associations of insurers	4	0	3	7	47
Associations of insured	3	0	0	3	20
Associations of insurance intermediaries	3	0	0	3	20
Associations of insurance risk and loss assessors	3	0	0	3	20
Associations of actuaries	3	0	0	3	20
Total (III)	20	0	6	26	29
Level (III), %	67	0	20	29	X
IV. Involved infrastructure entities					
Credit bureaus	4	5	2	11	73
Auditors	5	5	2	12	80
Asset management companies	3	5	3	11	73
Ranking agencies	3	5	3	11	73
Temporary administrators	3	5	2	10	67
Entities owning and managing business platforms	4	0	3	7	47
Insurance aggregators	0	0	0	0	0
Total (IV)	16	0	3	19	25
Level (IV), %	64	0	12	25	X
V. Regulatory, supervisory, controlling, and enforcement entities					
Regulators	5	4	4	13	87
Financial ombudsman	0	0	0	0	0
Insurance payment guarantee fund	1	0	0	1	7
Insurance Histories Record Bureau	0	0	0	0	0
Insurance Repository	0	0	0	0	0
Total (V)	6	4	4	14	19
Rate (V), %	24	16	16	19	X
Total (I–V)	59	43	33	135	35
Level (%)	45	33	25	35	X

factory (135 points out of 390). This brings us to the conclusion that insurance entities' market experiences stagnations and has little effect on the total score that remains at 35%.

4. DISCUSSION

The results of this research enable us to assess the performance of groups (intermediaries; accompanying insurance entities; insurance unions; involved infrastructure entities; regulatory, supervisory, controlling, and enforcement entities) of infrastructure entities of the insurance market in Ukraine in general by such criteria as regulatory framework, availability of specialized registers or databases and disclosure of performance data. The score of the activity efficiency of each group of infrastructure entities of the insurance market and total score is less than 50%, which is not satisfactory.

Analyzed data visualize the existing gaps and problem areas on the market of insurance infra-

structure of Ukraine. The primary concern to be addressed is the need to level up the currently underperforming indicators to the market average to yield positive effects. According to the theory of constraints, low capacity of one of the indicators limits the general capacity of the process. Currently, the bottlenecks include the lack of registers and databases of infrastructure entities and lack of market transparency since information on these entities' performance is not published. Thus, the urgent directions for further improvement in this area are eliminating mentioned gaps.

Most other investigations in the field of assessment of infrastructure entities of the insurance market are devoted primarily to the activity of insurance intermediaries (agents and brokers) without quantitative assessment. Suggested research is one of the first attempts to show a complete picture of the insurance market infrastructure entities' general assessment.

CONCLUSION

In this paper, a comprehensive assessment of the activity of insurance market infrastructure entities of Ukraine was made. For this purpose, the approach to assess the groups of insurance market infrastructure entities' activity was created. It let to identify gaps and weaknesses of the infrastructure (lack of institutional environment and transparency of activity) in the context of revitalization of the Ukrainian insurance market. Previous research is limited by considering the activity of insurance and reinsurance intermediaries, whereas this research is devoted to all groups of insurance market infrastructure entities accompanied by scores of their activity.

The findings suggest that to improve infrastructure entities' performance and stimulate the development of insurance market, the first step should be the adoption of the Law of Ukraine "On insurance", which would provide a regulatory framework for all insurance infrastructure entities. The Law should enforce mandatory registers and/or databases of infrastructure entities and enhance infrastructure entities' accountability by disclosing information on their performance obligatory. This enables further research in the field of assessing infrastructure entities of the insurance market and the impact of infrastructure entities on the insurance market development.

AUTHOR CONTRIBUTIONS

Conceptualization: Antonina Sholoiko, Anzhela Ignatyuk.

Data curation: Antonina Sholoiko.

Formal analysis: Antonina Sholoiko, Anastasiia Syzenko.

Investigation: Anzhela Ignatyuk.

Methodology: Antonina Sholoiko.

Project administration: Anzhela Ignatyuk.

Supervision: Anzhela Ignatyuk.
 Visualization: Anastasiia Syzenko.
 Writing: Anastasiia Syzenko.
 Writing – review & editing: Anastasiia Syzenko.

ACKNOWLEDGMENT(S)

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

REFERENCES

- Ashauer, D. (1989). Is Public Expenditure Productive? *Journal of Monetary Economics*, 23(2), 177-200. [https://doi.org/10.1016/0304-3932\(89\)90047-0](https://doi.org/10.1016/0304-3932(89)90047-0)
- Deloitte CIS Research Center. (2016). *Global insurance broking: Oil and gas industry*. Retrieved from <https://www2.deloitte.com/content/dam/Deloitte/ru/Documents/financial-services/global-insurance-broking-oil-and-gas-industry-en.pdf>
- Economics Concepts. (1943). *Big Push Theory By Rosenstein Rodan and Economic Development*. Retrieved from http://economicsconcepts.com/big_push_theory.htm
- Erastov, V. I. (2017). Insurance aggregators as a part of insurance market. *Scientific Herald of Kherson University. The series "Economics"*, 23(3), 68-72.
- Financial services almanac: an information and analytical reference book. (2017). Ukraine Business, Kyiv.
- Gabidulin, I. (2013). Accident commissioners, surveyors and adjusters and their place in the insurance market of Ukraine. *Forinsurer*. Retrieved from <http://forinsurer.com/public/13/01/02/4553>
- Gramlich, E. (1994). Infrastructure Investment: A Review Essay. *Journal of Economic Literature*, 32(3), 1176-1196. Retrieved from <https://www.jstor.org/stable/2728606?seq=1>
- Herasymenko, N. M., & Pykhanova, S. A. (2003). Comprehensive assessment of the trading infrastructure of the market for industrial goods of the Khabarovsk Territory. *Practical marketing*, 7. Retrieved from <http://www.cfin.ru/press/practical/2003-07/04.shtml>
- Insurance business mag. (2017). "Staggering" number of insurance brokers and agents in Europe, says report. Retrieved from <https://www.insurancebusinessmag.com/uk/news/breaking-news/staggering-number-of-insurance-brokers-and-agents-in-europe-says-report-71187.aspx>
- Insurance Europe. (2017). *Industry information*. Retrieved from <https://www.insuranceeurope.eu/insurancedata>
- Johansson, B. (1993). Infrastructure, accessibility and economic growth. *International Journal of Transport Economics*, 20(2), 131-156. Retrieved from <https://www.jstor.org/stable/42747236?seq=1>
- Lee, R. (2011). *Running the World's Markets: The Governance of Financial Infrastructure*. Princeton University Press.
- LIGA:ZAKON. (1994). *The Law of Ukraine "On Judicial Examination"* 25.02.1994 No 4038-XII. Retrieved from http://search.ligazakon.ua/l_doc2.nsf/link1/Z950176.html
- LIGA:ZAKON. (1995). "Merchant Marine Code of Ukraine" 23.05.1995 No 176/95-BP. Retrieved from http://search.ligazakon.ua/l_doc2.nsf/link1/Z950176.html
- LIGA:ZAKON. (2001). *The Law of Ukraine "On Valuation of Property, Property Rights, and Professional Valuation Activities in Ukraine"* 12.07.2001 No 2658-III. Retrieved from http://search.ligazakon.ua/l_doc2.nsf/link1/T012658.html
- LIGA:ZAKON. (2004). *The Law of Ukraine "On compulsory insurance of civil liability of owners of land vehicles"* 01.07.2004 No 1961-IV. Retrieved from http://search.ligazakon.ua/l_doc2.nsf/link1/T041961.html
- LIGA:ZAKON. (2011). *Resolution of the State Commission for Regulation of Financial Services Markets "On approval of qualification requirements for persons engaged in determining the causes of the insured event and the amount of losses (accident commissioners)"* 19.05.2011 No 285. Retrieved from http://search.ligazakon.ua/l_doc2.nsf/link1/RE19429.html
- LIGA:ZAKON. (2011). *Decree of the President of Ukraine "On National Commission for State Regulation of Financial Services Markets"* 23.11.2011 p. No 1070. Retrieved from http://search.ligazakon.ua/l_doc2.nsf/link1/U1070_11.html
- Malik, M. Yo., & Erastov, V. I. (2016). Introduction of insurance repository as an alternative of internet insurance in classical meaning: legislation aspects. *Economics*, 181, 17-24. Retrieved from <https://doaj.org/article/47311a0c5e324040851e8e0d84c439f3?>
- Minfin. (2017). *Number of banks in Ukraine*. Retrieved from <http://index.minfin.com.ua/bank/stat/count.php>
- National Bank of Ukraine. (2019). *Performance indicators of non-*

- bank financial services market participants*. Retrieved from <https://bank.gov.ua/ua/statistic/supervision-statist/data-supervision#6>
22. Petrishyna, T. O., & Kurasova, V. S. (2014). Methodology of analysis of the infrastructure of the insurance market of Ukraine. *Economic Studios*, 4(04), 209-211.
 23. Pikus, P. V. et al. (2015). *Interdisciplinary Dictionary of Insurance and Risk Management*. Kyiv: Logos.
 24. Prud'homme, R. (2005). Infrastructure and development. In *Proceedings of the Annual Bank conference "Bank conference on Development Economics: 2004* (pp. 153-181). The World Bank and Oxford University Press, Washington.
 25. Prykaziuk, N. V. (2017). *Insurance system of Ukraine: theory, methodology, practice*. Kyiv: Logos.
 26. Sholoiko, A. S. (2017). European vector of development of non-insurance intermediaries in Ukraine. *Economics*, 5(194), 66-71. Retrieved from <https://ideas.repec.org/a/scn/pnoeeq/194a10.html>
 27. State Property Fund of Ukraine. (2017). *Register of subjects of valuation*. Retrieved from <http://www.spfu.gov.ua/ua/list/spf-estimate-registers-subjects.html?page=292&per-page=10>
 28. The National Securities and Stock Market Commission. (2017). *Asset Management Companies*. Retrieved from <https://www.nssmc.gov.ua/asset-management/>
 29. The National Securities and Stock Market Commission. (2017). *Rating agencies*. Retrieved from <https://www.nssmc.gov.ua/rating-agencies/>
 30. The Verkhovna Rada of Ukraine. (1992). *The Law of Ukraine "On information"* 02.10.1992, No 2657-XII. Retrieved from <http://zakon1.rada.gov.ua/laws/show/2657-12>
 31. The Verkhovna Rada of Ukraine. (2000). *The Law of Ukraine "On banks and banking"* 07.12.2000 No 2121-III. Retrieved from <http://zakon2.rada.gov.ua/laws/show/2121-14>
 32. The Verkhovna Rada of Ukraine. (2001). *The Law of Ukraine "On Financial Services and Public Regulation of Financial Services Markets"* 12.07.2001, No 2664-III. Retrieved from <http://zakon2.rada.gov.ua/laws/show/2664-14/page>
 33. The Verkhovna Rada of Ukraine. (2004). *Resolution of the State Commission for Regulation of Financial Services Markets "On Approval of the Regulation on the Registration of Insurance and Reinsurance Brokers and the State Register of Insurance and Reinsurance Brokers"* 28.05.2004, No 736. Retrieved from <http://zakon5.rada.gov.ua/laws/show/z0801-04>
 34. The Verkhovna Rada of Ukraine. (2007). *Resolution of the State Commission for Regulation of Financial Services Markets "On approval of the Procedure and requirements for the implementation of mediation activities in Ukraine on the conclusion of insurance contracts with non-resident insurers"* 25.10.2007 No 8170. Retrieved from <http://zakon3.rada.gov.ua/laws/show/z1288-07>
 35. The Verkhovna Rada of Ukraine. (2010). *The Law of Ukraine "On protection of personal data"* 1.06.2010, No 2297-VI. Retrieved from <http://zakon2.rada.gov.ua/laws/show/2297-17>
 36. The Verkhovna Rada of Ukraine. (2015). *The draft law of Ukraine "On insurance"* 06.02.2015, No 1797-1. Retrieved from http://w1.c1.rada.gov.ua/pls/zweb2/webproc4_2?pf3516=1797-1&skl=9n
 37. The Verkhovna Rada of Ukraine. (1995). *The Law of Ukraine "On tourism"* 15.09.1995 No 324/95-BP. Retrieved from <http://zakon3.rada.gov.ua/laws/show/324/95-bp>
 38. The Verkhovna Rada of Ukraine. (2017). *The Law of Ukraine "On Audit of Financial Reporting and Audit Activities"* 21.12.2017 p. No 2258-VIII. Retrieved from <http://zakon5.rada.gov.ua/laws/show/2258-19>
 39. The Verkhovna Rada of Ukraine. (2017). *The draft law of Ukraine "On financial ombudsman"* 22.02.2018 No 8055. Retrieved from http://w1.c1.rada.gov.ua/pls/zweb2/webproc4_1?pf3511=63512
 40. The Verkhovna Rada of Ukraine. (2017). *The draft law of Ukraine "On the insurance payment guarantee fund under life insurance contracts"* 27.11.2014 No 0958. Retrieved from http://w1.c1.rada.gov.ua/pls/zweb2/webproc4_1?pf3511=52410
 41. The Verkhovna Rada of Ukraine. (1996). *The Law of Ukraine "On insurance"* 07.03.1996, No 85/96-VR. Retrieved from <http://zakon1.rada.gov.ua/laws/show/85/96-%D0%B2%D1%80>
 42. The Verkhovna Rada of Ukraine. (2015). *The Law of Ukraine "On organization and Circulation of Credit Histories"* 28.06.2015 No 2704-IV. Retrieved from <http://zakon1.rada.gov.ua/laws/show/2704-15>
 43. Zaletov, O. M. (2014). Conceptual bases of macro prudential of supervision and regulation of insurance activities. *Economics*, 156, 30-34.

APPENDIX A

Table A1. Validity of the model

Variable	Coefficient	Std. error	t-statistic	Prob.
X4	0.908771	0.094207	9.646534	0.0000
X2	-396.0636	92.94437	-4.261297	0.0001
C	-1351958.	181788.8	-7.436968	0.0000
R-squared	0.722036	Mean dependent var		388084.7
Adjusted R-squared	0.707406	S.D. dependent var		480038.9
S.E. of regression	259662.4	Akaike info criterion		27.84251
Sum squared resid	2.56E+12	Schwarz criterion		27.96789
Log likelihood	-567.7714	Hannan-Quinn criter.		27.88817
F-statistic	49.35411	Durbin-Watson stat		1.998253
Prob(F-statistic)	0.000000			