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MARKETING AND MANAGEMENT IN INSURANCE: IMPACT OF INNOVATIONS MEASURES

Abstract. *Nowadays insurance industry has huge innovation potential. Several key vectors for developing the concept of insurance tech include machine learning, business analytics, consumer protection rules, Big Data, artificial intelligence, neural networks, blockchain, and telematics. Technological innovations become widespread only when a community that supports them emerges, and COVID-19 has rapidly accelerated the changes that were already in full swing to a greater extent than any other factor. COVID-19 has helped reinforce the story and illustrate the results that technologies achieve on a large scale. Modern marketing and management approaches in insurance are viewed as an activity to optimize and control the insurance company's innovation and marketing activities. It would allow taking a strategically advantageous position in the insurance market. There are two kinds of insurance marketing: structural and commodity. Structural marketing could help to solve the problem of the economic efficiency of the activity of insurance companies. Commodity marketing helps to improve financial activity and, as a result, to increase profitability. This article summarizes the arguments and counterarguments within the scientific discussion on the place and prospects marketing and management in insurance (strategies, functions, principles) in the context of key innovation metrics. The study's primary purpose is to confirm the hypothesis about the functional link between the level of innovative development of the country and key insurance determinants as drivers for transformation in marketing strategies of insurance companies. In this regard, the array of input data is presented in the form of seven independent variables (regressors), six of which denote innovation measures, one is control variable, and five dependent variables (regressands), which identify the insurance sector. The study of the impact of innovation metrics on the insurance sector of the country in the article is carried out in the following logical sequence: 1) the formation of an array of input data; selection of relevant indicators using Principal Component Analysis; 2) formalization of functional relationships between variables by constructing five-panel Multifactor regression models with Random Effects; and 3) interpretation of the obtained results. Seventeen countries of Central and Eastern Europe were selected as the object of the study for the period from 2004 till 2019. The study empirically confirms the above hypothesis, which is evidenced by the following identified dependences. Key insurance determinants depend on innovation fluctuations. The most significant positive influence on the dependent variables is exercised by the Innovations index, Research and development expenditure, and Patent applications by residents. The study results could be helpful for insurance companies that provide new insurance technologies and seek to optimize activities to support innovative development. The main directions of marketing and management in insurance should be considered from two positions applying new technologies in insurance marketing and introducing new insurance products or services.*

Keywords: insurance marketing, insurance management, insurance technologies, innovations, the Innovations index, innovative development, Principal Component Analysis, Multifactor regression model.

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Introduction. Today, innovation is one of the key drivers of changes in the financial sector. In recent years, new technological developments in finance have come into active use as «FinTech». According to «FinTech,» the concept «InsurTech» is actively used. Various technological innovations, in this case, help reduce transaction costs and significantly improve the process of providing services to consumers. The insurance market is a special society economic structure, certain sphere of monetary relations, where the object of the sale act as insurance protection. The insurance market is a complex integrated system, which includes different structural links. Marketing in insurance could is considering from different points of view. The philosophy of the insurance business focused on the total satisfaction of the needs of policyholders. It is also a method of managing the commercial activities of insurance companies and practical promotion activities of insurance products on the market.

In addition, the widespread use of active Internet connections, various mobile devices, and the development of mobile applications has led to the possibility of reducing barriers to entry into the financial market and increasing competition between financial institutions. Therefore, for some financial market participants, innovative technologies open up new opportunities for development and others. Unfortunately, they could become a destructive force that leads to the destruction of the business. Introducing innovative technologies in the insurer's activities is necessary for its competitive operation in the market. Therefore, its implementation requires an analysis of foreign experience in using many innovative technologies, its adaptation to the specifics of the domestic market, identifying obstacles to their implementation (Vasylieva et al., 2018; 2019). The insurance industry has always been a virtual segment in the direction of technological change. While the banking sector has been actively transformed through digital technologies, insurance has continued to operate in the same way as it did decades before. However, today insurance experts are actively analyzing the nature of modern risks and implementing new digital insurance market formation concepts.

The peculiarity of the marketing strategies of insurance companies is that they are not dynamic. This situation is due to the long life of the insurance product, its specific features. Currently, insurance marketing is forming as a target concept, consumer-oriented. It is based on marketing research of the insurance market in the conditions of development of innovations the traditional insurance portfolio changes. In addition, marketing is integrating into all stages of the insurance company – from creating a new insurance product to its active implementation.

Literature review. The successful implementation of any innovative project depends on scientific and marketing Research. It is tailored to the consumer's needs. The role of innovative technologies in improving the decision-making process in marketing research in insurance is essential. It is relevant for each country in the modern world of globalization (Plastun et al., 2019; 2020; Vorontsova et al., 2020). Every year, there are new theoretical and applied studies on the innovative activities of insurance companies (Stavrova, 2020; Goncharenko, 2020; Kaya, 2021; Umadia and Kasztelnik, 2020; Brown and Kasztelnik, 2020). The key priority of modern financial institutions, including insurance companies, is the reorientation of their activities from product-oriented to customer-oriented. The insured's interests should be in the first place under forming the marketing strategy and planning of the company (Bilan et al., 2019; Kobushko et al., 2020). These facts are stated in the works of Agnihotri and Gupta (2019), Horvath and Balazs (2020), Samoilikova (2020), Aljaloudi and Warrad (2020).

Considering the insurance product in the dimension of the customer-oriented model, the level of satisfaction of the insured with the services provided by the insurance company occurs in terms of its needs, a combination of innovative and traditional insurance products, and sales channels (Vargas-Hernandez and Rodríguez, 2018). Real-time automation of data flow management helps marketing and management professionals to formulate effective customer interaction strategies. One such technology is the Internet of Things (IoT) (Moradi, 2021). The development of cloud technologies and IoT in symbiosis makes it possible to freely monitor the transformation of business flows between the insurance company

and the insured (Giebe et al., 2019). Understanding how the insurance sector responds to economic and societal technological innovations underlies the formation of an effective policy to promote new insurance products (Zolkover and Renkas, 2020; Kasztelnik and Brown, 2020). Many startups in medicine, automobile business, financial activities create new challenges for insurers to form a proposal for new products and services. A clear example of such a situation is the introduction into using the car startup Uber. Compulsory taxi insurance is a problem for modern carriers, as drawing up an insurance contract and making insurance payments is entirely the car owner's responsibility. This situation often provokes opposition from them, as this activity is not the central place of the driver's work. So he is not interested in incurring any additional costs. Another striking example of the fact that the dynamic development of digital technologies is not always exclusively positive for the financial sector is the introduction of a new insurance product of cyber insurance (Didenko and Sidelnyk, 2021). Cyber insurance provides insurance for the risks associated with the loss or damage of information due to various hacker attacks, virus damage, phishing, etc. Unfortunately, the imperfection of the domestic legal framework, the lack of transparent algorithms of action both on the part of the state and insurance companies to promote this insurance product make it almost impossible to use it in Ukraine.

According to marketing and management, the relationship between innovation and insurance market development is not yet deeply researched. As a result, it leads to the achieving the following purpose of this Research – to confirm or refute the hypothesis about the significant functional link between the innovative development in the country and key insurance determinants as a driver for transformation in marketing strategies of insurance companies.

Methodology and research methods. Consider the main stages of the life cycle of an innovative insurance product (Figure 1). There are three main stages: initial, stage of product implementation, and final. Each of the presented stages is characterizing by a precise sequence of steps. Their order of execution could change depending on many factors: internal and external. Thus, the low level of confidence of the insured in the insurance company and the insurance mechanism, in general, has a negative impact on the formation of an innovative product at an early stage. In addition, the low level of development of the network of sales of insurance products and the imperfection of insurance contracts creates difficulties during the implementation phase. As part of the financial market, the insurance market largely depends on various structural economic shifts (inflation rate, bank deposit rates, income level, etc.).

According to structural and commodity marketing, for the successful introduction of a new innovative insurance product, it is necessary:

- change the core of the insurance product (identify new fragments of the insurance product and explore possible risks for target groups);
- change the shell of the insurance product (build a new architecture and design of the insurance product);
- to formulate new target offers (Research of profiles of insurers in social networks for estimation of features and preferences of clients).

The use of such innovative technologies in insurance as telematics, blockchain, Big Data, IoT, and others involves the use of new sales channels of insurance products (online sales, smartphones, tablets, aggregators) and other media of interaction with the client (P2P, M2M, web-interface).

The main principles of marketing in insurance in the context of the introduction of innovative technologies include:

- adaptation of the offer of innovative insurance products to the needs of the insurance market;
- a comprehensive study of the insurance market and consumer demand;
- identification of the functional impact of innovative goods and services on the insurance company.

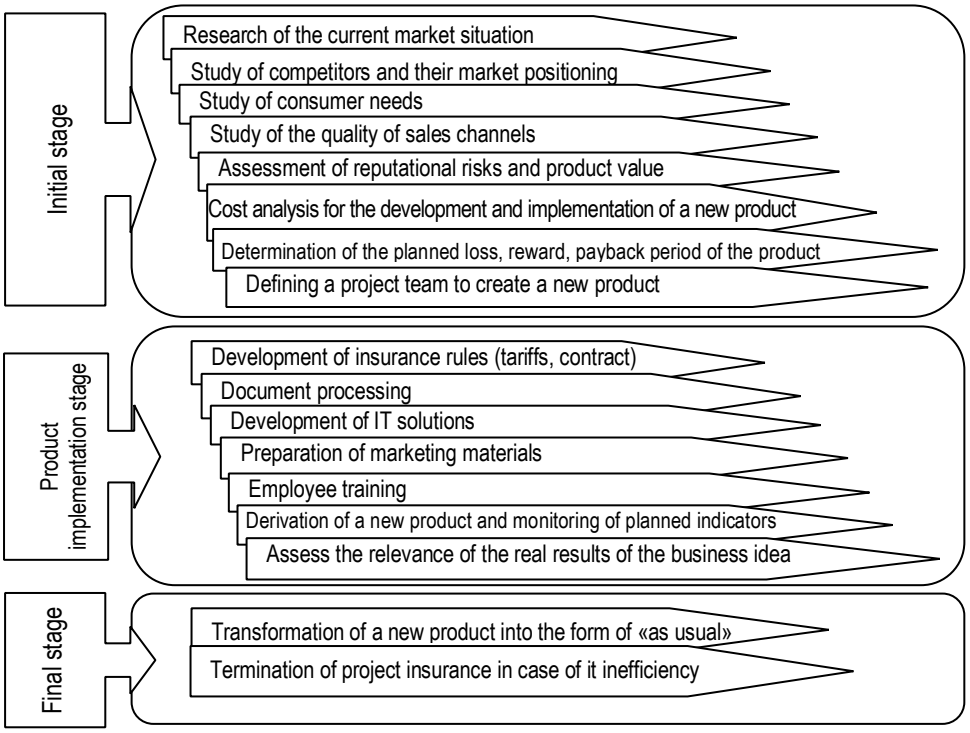

Figure 1. The crusial stages of the life cycle of an innovative insurance product

Sources: developed by the authors.

Transferring insurance marketing and management to the Internet would significantly save interaction between the insurance company and the client. It would eliminate the problem of localization of insurance companies, greatly facilitate obtaining and processing information, reduce the cost of maintaining insurance contracts. All this would reduce the price of the insurance product. The Research of the critical factors impact of innovative development in countries with different economic development on the insurance market determinants is conducting using the special software STATA 12 (Longitudinal/panel data module). This module allows processing panel data. Operators xtreg and areg are using for it. One of the advantages of panel data is that they help avoid «shifting the aggregation» of the data. The survey is conducted immediately in terms of a certain period, among a particular set of countries and indicators. In addition, when working with panel data, freedom degrees increase. It helps to reduce the collinearity between variables. This fact is essential in assessing the model.

The regression model is building for the panel data array. It is generally presenting as follows (1).

$$y_{it} = \alpha + X_{it}^{*}\beta + \nu_{it}, i = 1, \ldots, N; t = 1, \ldots, T, \quad (1)$$

where *i* – serial number of the object of study; *t* – research period; α- free member; β- vector of dimensional coefficients K*1; X_{it}^{*} - vector-row in the matrix K of explanatory variables; ν_{it} - regression error.

$$\nu_{it} = u_i + \varepsilon_{it} \quad (2)$$

where u_i- individual effects of observations;ε_{it}- remnants of the model.

There are two types of panel data models: the model with fixed (Fixed-effects model) and random (Random-effects model) effects. Wald test, Broysch-Pagan test, and Hausman test are used to determine the best variant of the panel model. Principal Component Analysis (PCA) selects the most relevant indicators for the study – a statistical method of systematizing indicators into components relative to factor loads. This method involves defining groups of variables (components). They are interconnecting by hidden connections and could explain the object under study from a particular functional position. The completeness of the factorization must be not less than 70%. It means that the optimal number of components from which to select the most significant indicators, the total variance should exceed 70%, and the Kaiser criterion should exceed 1.

There are follow hypothesis of Research:

- to confirm the hypothesis about the presence of the functional link between the level of innovative development of the country and key insurance determinants as a driver for transformation in marketing strategies of insurance companies;
- to confirm the hypothesis about the formation of marketing strategies in modern insurance companies as both innovative and traditional ways.

To confirm the first hypothesis, a set of panel data was formed from several indicators. These indicators describe the critical determinants of innovative development of the studied countries and indicators that reflect key trends in the insurance market. Seventeen countries from Eastern and Central Europe are considering: Armenia, Azerbaijan, Belarus, Bulgaria, the Czech Republic, Estonia, Georgia, Kazakhstan, Latvia, Lithuania, Moldova, Poland, Romania, Russia, Slovakia, Tajikistan, and Ukraine. The study period covered 2004-2019. All input data are obtaining from the database of the International Monetary Fund and TheGlobalEconomy. Let's consider in more detail those indicators which are taking into consideration. Six indicators (Inv1-Inv6) are selecting as indicators of innovative development. These six indicators and one additional indicator (GDP, C1 – control variable) play independent variables. Ten indicators consider dependent variables. Notably, they are critical determinants of insurance sector development (Ins1 – Ins10). Table 1 presents in more detail all these indicators. As part of the data has absolute units (million dollars) and the other part is relative (%), the normalization should be done. In this case, taking the logarithm is the best option for normalization. This normalization method of the input data is acceptable because, given the goal, there is no need to identify stimulants and disincentives.

Table 1. Array of input data

Indicator symbol	Indicator name	Indicator position
Inv1	Innovation index	Independent variables
Inv2	Research and development expenditure	
Inv3	Information technology exports	
Inv4	High technology exports	
Inv5	High technology exports2	
Inv6	Patent applications by residents	
C1	GDP per capita	Control variable
Ins1	Number of Institutions, Insurance corporations	
Ins2	Number of insurance corporations per 100, 000 adults	
Ins3	Outstanding Deposits, Insurance corporations, of which: Non-life insurance	
Ins4	Outstanding Deposits, Insurance corporations	
Ins5	Number of Policies, Insurance Corporations	
Ins6	Number of Policies, Insurance Corporations, of which: life insurance	Dependent variables

Insurance corporations, of which: Life insurance and annuities entitlements

Continued Table 1

Ins7	Insurance corporations, of which: Life insurance and annuities entitlements	Dependent variables
Ins8	Number of Policies, Insurance Corporations, of which: non-life insurance	
Ins9	Number of non-life insurance policies per 1,000 adults	
Ins10	Number of life insurance policies per 1,000 adults	

Sources: developed by the authors on the basis of data of The Global Economy and IMF.

At the first stage of the study, the dependent variables should be filtered. The Principal Components Analysis is using for it. Based on the values of the cumulative variance (Table 2) and the Kaiser test (Figure 2), the optimal number of components 3 was determined.

Table 2. Eigenvalues and Proportions of Components

Component	Eigenvalue	Difference	Proportion	Cumulative
Comp1	3,48167	0,646415	0,3482	0,3482
Comp2	2,83525	1,09267	0,2835	0,6317
Comp3	1,74258	0,961008	0,1743	0,8060
Comp4	0,781577	0,141427	0,0782	0,8841
Comp5	0,640149	0,309343	0,0640	0,9481
Comp6	0,330806	0,154643	0,0331	0,9812
Comp7	0,176164	0,164455	0,0176	0,9988
Comp8	0,0117081	0,0116342	0,0012	1,0000
Comp9	0,0000738914	0,0000591055	0,0000	1,0000
Comp10	0,000014786	0,000	0,0000	1,0000

Sources: developed by the authors.

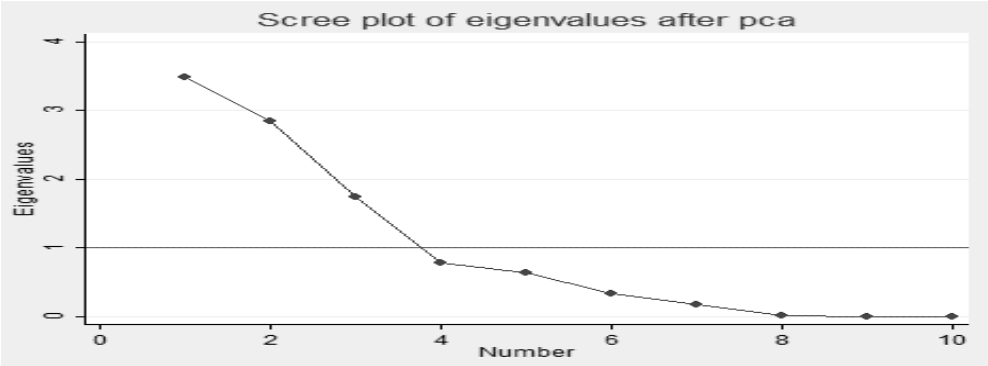

Figure 2. Criteria of Kaiser

Sources: compiled by the authors.

The value of the cumulative variance is 80.6%. It corresponds to the three components, and the red line on the graph indicates the level above which there are also three components. Thus, a further selection of dependent variables would take place from three components. The next step in PCA is to represent the factor loads of the indicators included in each component. The following figure (Table 3) shows only those variables whose factor loads are more significant than 0.3.

Table 3. Components loadings

Variable	Comp1	Comp2	Comp3	Unexplained
Ins1				0,6468
Ins2	0,3305		-0,3187	0,4219
Ins3		0,5355		0,08446
Ins4		0,5573		0,02103
Ins5	0,4912			0,03077
Ins6			0,6658	0,1832
Ins7		0,5256		0,1368
Ins8	0,4946			0,03248
Ins9	0,4999			0,05189
Ins10			0,6011	0,3312

Sources: developed by the authors.

The five variables have a factor load of more than 0.5. So they would participate in the next phase of the study. Five multivariate regression models are constructing for the following dependent variables: Ins3 (Outstanding Deposits, Insurance corporations, of which: Non-life insurance), Ins4 (Outstanding Deposits, Insurance corporations), Ins6 (Number of Policies, Insurance Corporations, of which: life insurance), Ins7 (Insurance corporations, of which: Life insurance and annuities entitlements) and Ins10 (Number of life insurance policies per 1,000 adults).

According to the values of the Broysch-Pagan and Hausman tests, it would be building multifactor regression models with random effects for all dependent variables.

Consider the simulation results (Tables 4-8).

Table 4. Results of a regression model with random effects, which reflects the functional relationship between innovative development and the variable Ins3

Variables	Regression parameter	z-criterion	p-level
Inv1	-3,17	-1,79	0,073
Inv2	2,15	1,08	0,278
Inv3	-9,30	-0,51	0,612
Inv4	-1,32	-1,08	0,280
Inv5	-4,61	-0,58	0,560
Inv6	2,53	2,52	0,012
C1	1,93	0,97	0,332
_cons	1,10	1,80	0,073
R^2=*0,77,* χ^2=20,65 where p=0,0043			

Sources: developed by the authors.

Table 5. Results of a regression model with random effects, which reflects the functional relationship between innovative development and the variable Ins4

Variables	Regression parameter	z-criterion	p-level
Inv1	-4,08	-2,07	0,039
Inv2	3,96	1,68	0,093
Inv3	-6,83	-0,32	0,749
Inv4	-1,67	-1,14	0,254
Inv5	7,36	0,08	0,933
Inv6	3,62	2,99	0,003
C1	1,41	0,64	0,522
_cons	1,38	2,04	0,041
R^2=*0,82,* χ^2=30,01 where p=0,0001			

Sources: developed by the authors.

Table 6. Results of a regression model with random effects, which reflects the functional relationship between innovative development and the variable lns6

Variables	Regression parameter	z-criterion	p-level
lnv1	-4,99	-0,55	0,583
lnv2	3,42	0,17	0,869
lnv3	8,89	0,76	0,450
lnv4	0,6	7,42	0,000
lnv5	-1,6	-0,38	0,703
lnv6	0,91	1,61	0,107
C1	-0,9	-0,74	0,460
_cons	2,35	0,72	0,474
R^2=*0,99,* χ^2=204,32 where p=0,0000			

Sources: developed by the authors.

Table 7. Results of a regression model with random effects, which reflects the functional relationship between innovative development and the variable lns7

Variables	Regression parameter	z-criterion	p-level
lnv1	-8,24	-1,30	0,193
lnv2	1,84	2,57	0,010
lnv3	-2,66	-0,04	0,968
lnv4	-3,8	-0,87	0,386
lnv5	4,24	1,50	0,134
lnv6	1,02	2,80	0,005
C1	-2,3	-0,32	0,747
_cons	2,36	1,07	0,284
R^2=*0,87,* χ^2=34,66 where p=0,0000			

Sources: developed by the authors.

Table 8. Results of a regression model with random effects, which reflects the functional relationship between innovative development and the variable lns10

Variables	Regression parameter	z-criterion	p-level
lnv1	-0,31	-1,87	0,061
lnv2	0,68	0,18	0,854
lnv3	0,81	3,85	0,000
lnv4	0,003	0,20	0,845
lnv5	-0,068	-0,01	0,993
lnv6	0,05	0,48	0,634
C1	-0,20	-0,90	0,369
_cons	1,18	2,00	0,046
R^2=*0,92,* χ^2=38,95 where p=0,0000			

Sources: developed by the authors.

In this case, the value of the criterion of determination for all models is more than 0,77. It indicates a high degree of dependence of these indicators of the insurance market on the determinants of innovation development. The Wald criterion (χ2) helps to assess the statistical significance of the statistical model. If χ2dist.> X2table and the probability p is less than 0,05 (level of confidente 0.95), then the hypothesis of the relationship between the dependent and independent variables is significant. If this condition is the opposite, the relationship is not significant. The obtained values of the Wald criterion for all models meet the specified condition, which indicates the statistical significance of the constructed models. Z-criterion is

using to assess the statistical significance of parameters the regression. The calculated value of the z-criterion is comparing with the tabular value, which is selecting from the corresponding statistical tables for a certain level of significance and freedom degrees. If ttab <trozr., then the coefficient of determination is significant.

The regression equations have the following form (3-7). Рівняння регресії мають наступний вигляд (3-7).

$$ns3 = 1{,}1 - 3{,}17Inv1 + 2{,}15Inv2 - 9{,}3Inv3 - 1{,}32Inv4 - 4{,}61Inv5 + 2{,}53Inv6 + \text{C}11{,}93 \quad (3)$$

$$\text{I}ns4 = 1{,}41 - 4{,}08Inv1 + 3{,}96Inv2 - 6{,}83Inv3 - 1{,}67Inv4 + 7{,}36Inv5 + +3{,}62Inv6 + \text{C}11{,}41 \quad (4)$$

$$\text{I}ns6 = 2{,}35 - 4{,}99Inv1 + 3{,}42Inv2 + 8{,}89Inv3 + 0{,}6Inv4 - 1{,}6Inv5 + 0{,}9Inv6 - \text{C}10{,}9 \quad (5)$$

$$\text{I}ns7 = 2{,}36 - 8{,}24Inv1 + 1{,}84Inv2 - 2{,}66Inv3 - 3{,}8Inv4 + 4{,}24Inv5 + 1{,}02Inv6 - \text{C}12{,}3 \quad (6)$$

$$Ins10 = 1{,}18 - 0{,}3Inv1 + 0{,}68Inv2 + 0{,}81Inv3 + 0{,}003Inv4 - 0{,}068Inv5 + +0{,}05Inv6 - \text{C}10{,}2 \quad (7)$$

Thus, the value of the determination coefficient R2 and the value of the criterion χ2 indicate the reliability of the results. Regarding the statistical significance of regression parameters, a statistically significant relationship is observing with independent variables: Inv1, Inv2, Inv3, Inv4, and Inv6. The following graphs are presenting results from equations 3-7 (Figure 3).

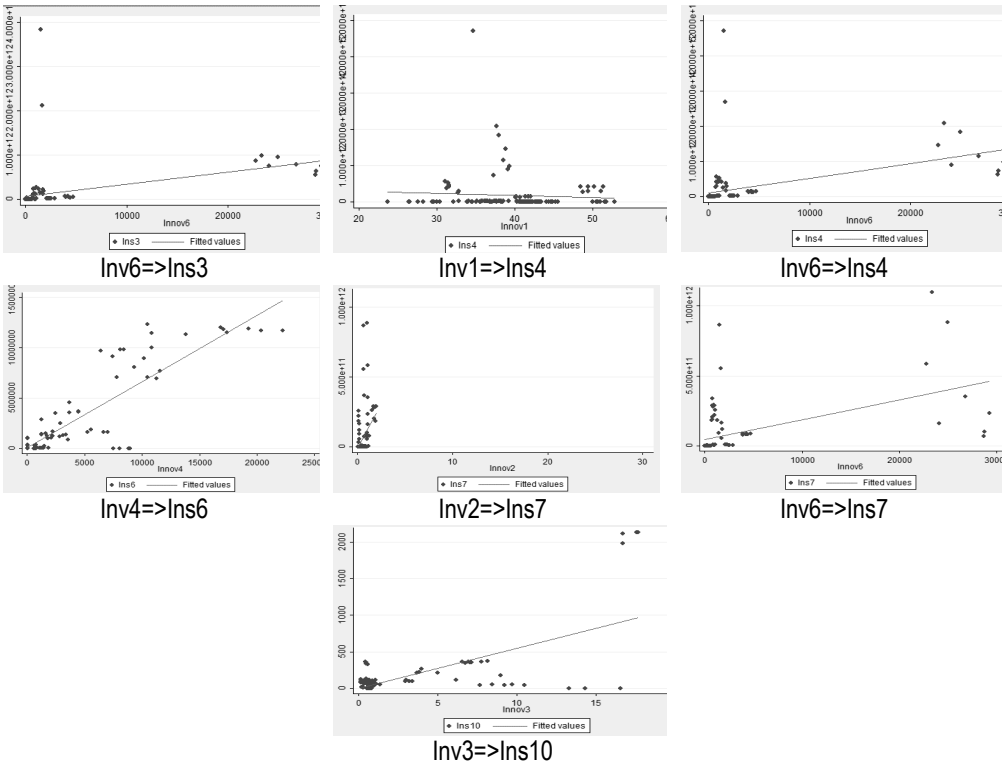

Figure 3. Scattering diagram the dependence of the indicators of the insurance market of the studied countries on the change of indicators of innovative development (statistically significant relationship)

Sources: developed by the authors.

Thus, the nature of the functional relationship the indicators of innovative development of the country with the key determinants of the insurance market could be described by the following dependencies:

- an increase of Patent applications by residents (Inv6) by 1% of the value of Outstanding Deposits, Insurance corporations, of which: Non-life insurance would increase by 2.53%, the value of Outstanding Deposits, Insurance corporations would increase by 3,62 %, indicator Insurance corporations, of which: Life insurance and annuities entitlements would increase by 1,02%;
- increase of the Innovation index (Inv1) by 1% would lead to a decrease in Outstanding Deposits, Insurance corporations by 4,08%;
- an increase of High technology exports (Inv4) by 1% of the value of the indicator Number of Policies, Insurance Corporations, of which: life insurance would increase by 0,6%;
- an increase of Research and development expenditure (Inv2) by 1% Insurance corporations, of which: Life insurance and annuities entities would increase by 1,84%;
- an increase of Information technology exports (Inv3) by 1%, The number of life insurance policies per 1,000 adults would increase by 0,81%.

Conclusions. The key study's hypothesis was to investigate a functional relationship between innovative development and critical determinants of the insurance market. Five multifactorial regression models with random effects for panel data were built. The study involved 17 countries in Eastern and Central Europe during 2004-2016. Principal Component Analysis allowed to select five indicators of insurance market development, which acted as dependent variables: Outstanding Deposits of Insurance corporations, of which: Non-life insurance; Outstanding Deposits of Insurance corporations; Number of Policies of Insurance Corporations, of which: life insurance; Insurance corporations, of which: Life insurance and annuities entitlements and Number of life insurance policies per 1,000 adults. The Research empirically confirms the above hypothesis. The insurance market development depends on the change in the level of innovation in direct proportion to both life insurance and nonlife insurance. Thus, the customer-oriented model that exists in insurance should focus only on innovative products and sales channels and provide the insured with the opportunity to use more familiar (traditional) approaches. It is necessary to consider the fact that some barriers may arise for consumers: low level of trust in insurance companies and digital services, lack of stable Internet and mobile connection, territorial and demographic disparities in insurance, low financial literacy. Therefore, marketing and management in insurance in the digitalization of society should be a kind of hybrid – to combine traditional approaches to the business organization with an innovative approach.

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Маркетинг та менеджмент страхування: вплив інноваційного розвитку

Страхова галузь має величезний інноваційний потенціал розвитку, головним чином, в напрямку машинного навчання, аналітичного прогнозування, правил захисту споживачів, «неструктурованих даних», штучного інтелекту, блокчейну та телематики. Попри те, що технологічні інновації набувають широкого розповсюдження лише за підтримки суспільства, вплив пандемії COVID-19 значно прискорив процес розвитку технологічних інновацій. Таким чином, у статті узагальнено аргументи та контраргументи в рамках наукової дискусії щодо ролі маркетингу та менеджменту в розвитку страхування (стратегії, функції, принципи) у контексті ключових інноваційних показників. Автори відмітили, що маркетинг та менеджмент в страхуванні є діяльністю, яка спрямована на оптимізацію та контроль інноваційної та маркетингової діяльності страхової компанії. Комбінація цих понять дозволить зайняти стратегічно вигідну позицію на страховому ринку. У роботі виділено два види страхового маркетингу, а саме: 1) структурний (спрямований на розв'язання проблеми економічної ефективності діяльності страхових компаній) та 2) товарний (сприяє поліпшенню фінансової діяльності та підвищенню прибутковості). Основною метою дослідження є перевірка гіпотези щодо функціонального зв'язку між рівнем інноваційного розвитку країни та ключовими детермінантами страхування, що є рушійною силою трансформації маркетингових стратегій у страхових

компаній. Вивчення впливу індикаторів інноваційного розвитку на страховий сектор досліджуваних країн у роботі здійснено у наступній логічній послідовності: формування масиву вхідних даних; вибір відповідних показників за допомогою методу головних компонент; формалізація функціональних зв'язків між змінними шляхом побудови п'яти панельних багатофакторних регресійних моделей із випадковими ефектами; інтерпретація отриманих результатів. Емпіричне дослідження проведено на основі панельних даних, сформованих для вибірки з 17 країн Центральної та Східної Європи за 2004-2019 роки. Вхідні дані представлені у вигляді семи незалежних змінних (регресорів), шість з яких є детермінантами інноваційного розвитку, одна – контрольна змінна, та п'ять залежних змінних (регресантів), які ідентифікують страховий сектор. За результатами дослідження емпірично підтверджено висунуту гіпотезу. Встановлено, що найбільш значний позитивний вплив на залежні змінні мають індекс інновацій, витрати на дослідження та розробки, а також заявки на патенти резидентів. Основними напрямками маркетингу та менеджменту у страхуванні є застосування нових технологій у страховому маркетингу та процес впровадження нових страхових продуктів чи послуг. Результати дослідження можуть бути корисними страховим компаніям, які прагнуть оптимізувати діяльність за допомогою інноваційного розвитку.

Ключові слова: маркетинг у страхуванні, менеджмент у страхуванні, страхові технології, інновації, індекс інновацій, інноваційний розвиток, метод головних компонент, багатофакторна регресійна модель.