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Market Structure and Financial Effectiveness of Life Insurance Companies

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Abstract:

Purpose: *The objective of the article is to invistigate how market structure influenced the financial effectiveness of life insurance companies (Branch I).*
Design/Methodology/Approach: *A critical review of literaturę is undertaken, contens of factors which influence financial effectiveness of insurance companies are analysed, and econometric methods are applied. A panel model is constructed and results of its estimation are analysed.*
Findings: *The research assumed the existence of a relationship between the share in the insurance market and the financial efficiency of life insurance companies. ROE (Return On Equity) was adopted as the dependent variable (explained feature) measuring the financial efficiency of insurance companies. The share in the insurance market, measured by gross written premium, was considered one of the explanatory variables. The results of model's estimation indicated that all independent variables are statistically significant and the signs are in accordance with theory and hypothesis. The main variable which influence the variability of ROE is share in the market measured by gross written premium.*
Practical Implications: *The results may be taken advantage of life insurance companies. They indicate factors of financial effectiveness life insurance companies.*
Origiality/Value: *The paper contains the authors' original research into a representative group of life insurace companies, that can be generalised to the entite population. The study will contribute to the developmet of theories concerning factors of the financial effectiveness of insurance companies.*

Keywords: *Insurance market, effectiveness of insurance companies, Efficient Structure Hypothesis (ESH).*

JEL codes: *G22, G32, M21.*

Paper type: *Research article.*

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1. Introduction

The issue of financial effectiveness research is one of the basic problems of economics, still valid due to the changing conditions of business activity and the diversity of business entities. One of the important categories of financial effectiveness measurement is the financial result and its measures. Usually, ROA (Return On Assets) or ROE (Return On Equity), Lee (2014), Malik (2011), Born (2011), are used to measure the financial performance of insurance companies.

Factors influencing the financial effectiveness of insurance companies are mainly related to their financial economy and financial management of the insurance company (Bukowski and Lament, 2021). These include, among others, cost-intensity of the conducted activity, profitability of investments, level of reinsurance and the size of the insurance company. These areas are of a microeconomic nature. It should be noted that the effectiveness of the conducted activity is also influenced by macroeconomic factors, however, their importance is mainly important in international comparisons. The issue of financial effectiveness of insurance companies was the subject of research conducted, inter alia, by Lee (2014), Ortyński (2016), Kramaric *et al.* (2017), Berhe and Kaur (2017).

One of the important factors influencing the effectiveness of the conducted activity is the size of the insurance company, and thus the insurance market structure. The relationship between the market structure and the financial results of business entities is explained by the theory of ESH (Efficient Structure Hypothesis). It has been described, inter alia, by Hicks (1935), Demsetz (1973; 1974) and Peltzman (1977). The analysis of dependencies between structure of the insurance market and financial effectiveness of insurance companies is the prime objective of research presented in this paper.

This required us to find answer to the following research question, does the market share have a statistically significant impact on the financial effectiveness of insurance companies from the Polish insurance market?

When analyzing the financial effectiveness of insurance companies, it is worth paying attention to the differentiation of insurance companies in terms of the scope of activity and the resulting different risk profiles that affect financial results. This is confirmed by the principles of the supervisory assessment of KNF (2020) conducted by the Polish Financial Supervision Authority, as well as the research conducted by Geneva Association (2010) on risk profiles in insurance and research on the impact of risk profiles on the financial results of insurance companies (Lament, 2019a). This is the reason why a homogeneous group of life insurance companies (Branch I) was tested.

The following research hypothesis was formulated the structure of the insurance market affects the financial effectiveness of live insurance companies.

In search of answers to the formulated research question and in order to verify the research hypothesis, we will undertake a critical review of literature, analyse contents of factors that influence the effectiveness of insurance companies, and employ econometric methods. Next, we will construct a panel model and analyse results of its estimation. The share in the insurance market measured by gross written premium is treated as one of independent variable that influence the effectiveness of the life insurance companies measured with ROE (Return On Equity). Moreover, the following factors are assumed to affect the effectiveness of life insurance companies (explanatory variables), cost levels as measured with loss, costs of acquisition, and the combined ratios, profitability of investments, share of foreign capital as well as levels of reinsurance measured with the retention ratio.

We will use annual data concerning the financial results of life insurance companies operating on the Polish insurance market in 2004-2019 provided by the Polish Chamber of Insurance (PIU). The analysis of the obtained results was carried out using the STATISTICA 12 and GRETL software. This study will contribute to the development of theories concerning factors of the effectiveness of insurance companies.

The study is structured as follows. The first part of the article presents a review of specialist literature, factors influencing the financial effectiveness of insurance companies. The second part describes the data and the research methods, while the third part reports on empirical findings, and the fourth discusses the findings.

2. Literature Review, Factors Influencing the Financial Effectiveness of Insurance Companies

The conducted studies of the subject literature in the field of factors influencing the financial result of insurance companies confirm their diversity. These include, in particular, factors such as (Bukowski and Lament, 2021, 169-170):

- The size of the insurance company, measured by its share in the insurance market. Research shows that large insurance companies have a better market position, operate on a larger scale and therefore achieve better financial results. This is confirmed by research conducted, among others, by Doumpos *et al.* (2012) and Kramaric *et al.* (2017). Kripa and Ajasllari (2016) in their studies showed that the size of the insurance company did not affect financial results.
- The effectiveness of investment activities, measured by the investment profitability ratio. This was confirmed by research conducted by Lee (2014).
- The cost intensity of the conducted activity, measured by the loss ratio, acquisition costs ratio, and the combined ratio. This is confirmed by research conducted, among others, by Fiegenbaum and Thomas (1990), Wu *et al.* (2007), Hifza (2011), Doumpos *et al.* (2012).

- The level of reinsurance, measured by the retention ratio (withholding the insurance premium). Research conducted by Olajumoke (2012) showed the negative impact of reinsurance on the financial results of insurance companies. The positive impact of reinsurance on the effectiveness of risk management in an insurance company was demonstrated in studies conducted by Adams (1996).
- The Foreign Direct Investment, measured with the share of foreign capital in the share capital of a given insurance company. According to Kozak (2011), the financial results of insurance companies are positively influenced by the share of foreign capital, and according to Lee (2014), membership in a capital group.

For the financial results of insurance companies as an institution of public trust significantly affects image and public relations. This is confirmed by the results of studies conducted by Ngatia (2014). Yadav *et al.* (2016), and Lament (2019b) showed no relationship between the financial results of insurance companies and the image-related aspects presented in CSR (Corporate Social Responsibility) reports.

It seems that one of the significant factors influencing the financial effectiveness of insurance companies is the level of market concentration. The relationship between them is explained by the theory of the effective market structure - Efficient Structure Hypothesis (ESH). It has been described, inter alia, by Hicks (1935), Demsetz (1973; 1974) and Peltzman (1977). It assumes a positive impact of concentration on financial results and financial effectiveness. Concentrated markets are those in which highly efficient economic entities operate. This is due to lower operating costs, which are characteristic of more efficient entities with a greater market share.

Greater operational efficiency contributes to maximizing the profit for shareholders by maintaining the current prices and the size of the company or reducing prices, and thus increasing the company's market share. Increasing efficiency leads to increased concentration. Therefore, the size of the market share approximates the degree of operational efficiency and therefore it is positively correlated with profitability. Research on the verification of the ESH theory in relation to insurance companies was carried out by, among others Bukowski and Lament, (2020):

- Caroll (1993) - insurance companies offering employee insurance, operating in the years 1980-1987 on the American market, were tested. The research showed no relationship between the market share and the financial results of insurance companies.
- Chidambaran, Pugel, and Saunders (1997) - the research was conducted in relation to non-life insurance, but the study did not include individual results of insurance companies, but analysis was made at the state level. The conducted research confirmed the existence of a relationship between market share and financial results.

- Bajtelsmit and Bouzouita (1998) - motor insurance companies operating in the years 1984-1992 on the American market were tested. It has been proven that market concentration leads to a higher level of profitability.
- Choi and Weiss (2005) - non-life insurance companies operating in the years 1992-1998 on the American market were tested. The conducted research confirmed the existence of a relationship between market share and financial results.
- Bukowski and Lament (2020) - insurance companies from the Polish insurance market (life and non-life insurance companies) operating in the years 2004-2018 were tested. The conducted research confirmed that the share in the insurance market has a statistically significant positive effect on the return on equity.
- Otyński and Pypeć (2021) – non-life insurance companies from the Polish insurance marketoperating in the years 2010-2018 were tested. The main conclusion of the study is that the non-life insurance market operates under conditions of monopolistic competition with high role of large companies.

The discussed topic should be considered poorly understood in relation to the insurance market, especially the Polish one. The conducted research does not clearly indicate the existence of a relationship between the market share and the financial results of insurance companies, however, the positive impact was indicated in five out of the six analyzed studies. Taking into account the above, the following research hypothesis was formulated: the structure of the insurance market affects the financial effectiveness of insurance companies.

The goals and principles of the operation of insurance companies are largely influenced by the scope of the conducted activity - life insurance (Branch I) and property and other personal insurance (Branch II), which determines various risk profiles of an insurance company and affects the results of the conducted activity.

According to a study by the Geneva Association (2010) carried out in Europe, the risk profile of insurance companies varies. In life insurance companies, the dominant type of risk is market risk, accounting for 41% of the total risk, and credit risk, accounting for 23% of the total risk. Insurance risk, which might seem to be the most important type of risk, constitutes only 17% of the total risk. Insurance risk is the dominant type of risk in non-life insurance companies, accounting for 45% of the total risk.

Life insurance companies, as entities concluding long-term contracts and which are obliged to achieve a certain rate of return on investments, are more exposed to financial risk, expressed in the form of market and credit risk. This risk is mainly related to assets and is related to the management of the investment portfolio. Non-life insurance companies are most exposed to insurance risk. They mainly conclude short-term contracts, the effects of which are more difficult to forecast than in life

insurance. Additionally, their financial results depend mainly on the degree of implementation of insurance contracts (loss ratio). This means that the main factor differentiating insurance entities is the insurance activity and the related subject of insurance, as well as the specificity of the offered insurance products.

The subject of insurance in Branch I is protection against the financial consequences of the insured's death or reaching a certain age, as well as deposit activity, where the value of the benefit depends on the savings accumulated on the insured's account. The subject of insurance in Branch II is the property interest in the form of property and property rights as well as other personal insurance.

Therefore, there are many differences between the insurance companies of Branch I and Branch II, resulting from the specificity of the insurance products offered, which affect the principles of financial management and the financial result. Therefore, the research of effectiveness of insurance companies should be carried out separately for life and non-life insurance companies with regard to the their risk scope. In our study we will be analyze life insurance companies.

3. Data and Methods

Annual financial figures of life insurance companies (Branch I) operating in the Polish market in 2004-2019, collected by the Polish Chamber of Insurance (PIU), are utilised in this study. Selection of the insurance companies to study is purposive. Insurance companies active in the entire time surveyed are chosen. Thus, insurance companies that commenced or discontinued their activities in those years are not taken into consideration. The insurance companies examined are characterised in Table 1.

Table 1. *Characteristics of the insurance companies studied - life insurance companies of the Polish insurance market in 2004-2019*

Specification	Life insurance companies studied (Branch I)	Insurance companies studied by form of business	
		Joint stock	Mutual insurance company
Number of insurance companies	20	18	2
Structure (%)	100.0	90.0	10.0

Source: *The authors' own research on the basis of PIU. Database, https://ibd.piu.org.pl.*

Shares of the life insurance companies studied in the overall number of insurance companies and in the number of life insurance companies active in the Polish market in 2004-2019 are contained in Table 2 and in Figures 1 and 2. On average, they constituted approximately 30% of all insurance companies operating in the Polish market and approximately 70% of life insurance companies (Branch I) operating in

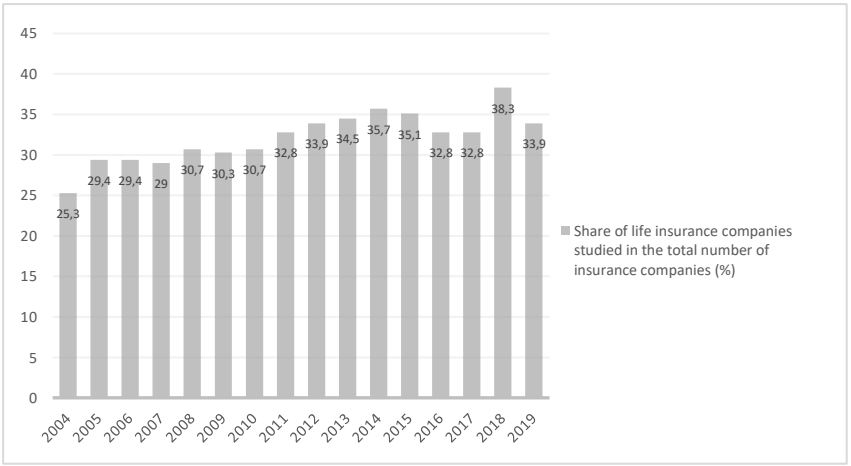
the Polish market. The sample can be therefore assumed to be representative and the results can be generalised to all life insurance companies in the Polish market.

Tabela 2. *Share of life insurance companies studied in the total number of insurance companies of the Polish insurance market in 2004-2019*

Specification	Years															
	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19
Number of insurance companies in the Polish insurance market																
Total	79	68	68	69	65	66	65	61	59	58	56	57	61	61	60	59
By range of activities: Life insurance - Branch I	37	31	32	32	29	30	30	28	28	27	26	27	27	27	26	25
Non-life insurance - Branch II	42	42	36	37	36	36	35	33	31	31	30	30	34	34	34	34
By form of business: Joint stock	70	58	59	60	56	57	57	53	51	50	48	47	50	50	49	48
Mutual	9	10	9	9	9	9	8	8	8	8	8	10	11	11	11	11
Share of life insurance companies studied in the total number of insurance companies (%)																
In total	25.3	29.4	29.4	29.0	30.7	30.3	30.7	32.8	33.9	34.5	35.7	35.1	32.8	32.8	38.3	33.9
In life insurance companies (Branch I)	54.1	64.5	62.5	62.5	68.9	66.7	66.7	71.4	71.4	74.1	76.9	74.1	74.1	74.1	76.9	80.0
By form of business: Joint stock	25.7	31.0	30.5	30.0	32.1	31.6	31.6	34.0	35.3	36.0	37.5	38.3	36.0	36.0	36.7	37.5
Mutual	22.2	20.0	22.2	22.2	22.2	22.2	25.0	25.0	25.0	25.0	25.0	20.0	18.2	18.2	18.2	18.2

Source: *The authors' own research on the basis of PIU. Database, https://ibd.piu.org.pl.*

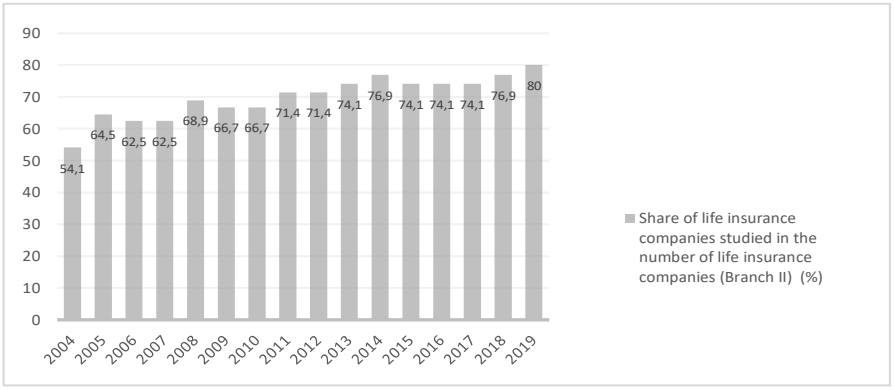
Figure 1. *Share of life insurance companies studied in the total number of insurance companies of the Polish insurance market in 2004-2019 (%)*



Source. *Own study.*

A dependence is assumed between insurance market structure and effectiveness of life insurance companies. A panel model was constructed to this end. Effectiveness of life insurance companies measured with ROE (Return On Equity) is the dependent variable (explicated feature). Share in the insurance market measured by gross written premium is independent variable. It is additionally assumed effectiveness of life insurance companies is influenced by: cost levels as measured with loss, costs of acquisition, and the combined ratios, profitability of investments, share of foreign capital as well as levels of reinsurance measured with the retention ratio. Methods of calculating these variables are set out in Table 3.

Figure 2. *Share of life insurance companies studied in the number of life insurance companies (Branch I) of the Polish insurance market in 2004-2019 (%)*



Source. *Own study.*

Table 3. *Methods of calculating the variables analysed*

Variable	Variable designation	Method of calculating the variable
ROE	$ROE_{i,t}$	Net profit * 100/ Equity
Share in the insurance market	$K_{i,t}$	Gross written premium in a given insurance company *100/Gross written premium for all insurance companies (insurance market)
Reinsurance levels – retention ratio	$R_{i,t}$	Written premium net of reinsurance * 100 / Gross written premium
Net loss ratio	$D_{i,t}$	(Claims and benefits paid net of reinsurance +/-Change in provisions against outstanding claims and benefits net of reinsurance) * 100/ Earned premium net of reinsurance
Share of acquisition costs in gross written premium	$AC_{i,t}$	Acquisition costs * 100 / Gross written premium
Combined ratio	$CR_{i,t}$	(Claims paid net of reinsurance + costs of insurance activities net of reinsurance + other technical costs net of reinsurance + dividend paid) * 100/ Earned premium net of reinsurance
Profitability of investments	$RI_{i,t}$	Profit of investments*100/Investments
Share of foreign capital in total capital	$KZ_{i,t}$	Foreign capital *100/Total capital

Source: *The author's own compilation.*

The model explains effectiveness of life insurance companies measures by ROE as dependent on seven independent variables:
K - share in the insurance market measured by gross written premium
R – retention ratio
D – nett loss ratio
AC - share of acquisition costs in gross written premium
CR – combined ratio
RI – profitability of investments
KZ – share of foreign capital in total capital.

Key descriptive statistics that characterise the variables are shown in Table 4.

Table 4. *Basic statistics concerning the variables studied in life insurance companies of the Polish insurance market in 2004-2019*

Specification	ROE	K	R	D	AC	CR	RI	KZ
Average	0,114591	0,020806	0,970156	0,608369	0,807931	1,036703	0,048162	0,755340
Median	0,097500	0,007215	0,993000	0,523000	0,191500	0,929000	0,046000	1,000000
Maximum	0,653000	0,220640	1,090000	3,876000	179,0000	6,191000	0,530000	1,000000
Minimum	-0,57700	0,00	0,61700	0,00	0,00	0,103000	-0,09300	0,00
Variance	0,035804	0,001423	0,003548	0,203586	99,90498	0,408217	0,001952	0,159060
Standard deviation	0,189220	0,037728	0,059562	0,451205	9,995248	0,638919	0,044186	0,398823

Source: *The authors' own research on STATISTICA 12.*

Explanation:
ROE – return on equity
K - share in the insurance market measured by gross written premium
R – retention ratio
D – nett loss ratio
AC - share of acquisition costs in gross written premium
CR – combined ratio
RI – profitability of investments
KZ – share of foreign capital in total capital.

4. Model and Empirical Results

We have built following panel data model for purpose of verification hypothesis:

$$ROE_{i,t} = a_1 + a_2 K_{i,t} + a_3 R_{i,t} + a_4 CR_{i,t} + u_{i,t} \quad (1)$$

Where:
$ROE_{i,t}$ – return on equity
$K_{i,t}$ –share in the insurance market measured by gross written premium
$R_{i,t}$ – retention ratio
$CR_{i,t}$ – combined ratio.

Model was built with using step wise regression with backward elimination. As a criterion we have taken collinearity and correlation between independent variables and explanatory variable. We used Weighted Least Squares (WLS) a method of model's estimation. It was dictated by existing heteroscedasticity and autocorrelation. Results of the model estimation are shown in Table 5. The results of model's estimation indicated that all independent variables are statistically significant and the signs are in accordance with theory and hypothesis. The model in 40,4 % explain the variability of the explanatory variable ROE. In the case of panel models it is a quite well result. The main variable which influence the variability of ROE is share in the market measured by gross written premium.

Table 5. *Model: WLS, using 320 observations. Included 20 cross-sectional units. Dependent variable: ROE. Weights based on per-unit error variances*

Specification	Coefficient	*Std. Error*	*t-ratio*	*p-value*	
Const.	−0.173773	0.113389	−1.533	0.1264	
K	1.79327	0.149840	11.97	<0.0001	***
R	0.300307	0.114282	2.628	0.0090	***
CR	−0.0538733	0.0104235	−5.168	<0.0001	***
Statistics based on the weighted data:					
Sum squared resid		302.9169	S.E. of regression		0.979080
R-squared		0.404388	Adjusted R-squared		0.398734
F(3, 316)		71.51560	P-value(F)		2.53e-35
Log-likelihood		−445.2823	Akaike criterion		898.5647
Schwarz criterion		913.6380	Hannan-Quinn		904.5837
Statistics based on the original data:					
Mean dependent var		0.114591	S.D. dependent var		0.189220
Sum squared resid		8.453892	S.E. of regression		0.163563
Test for normality of residual					
Null hypothesis: error is normally distributed					
Test statistic:		Chi-square(2) = 29.5818			
		with p-value = 3.77038e-007			

Source: *Own research on GRETL.*

The model estimation results also indicated the variables - retention ratio and combined ratio as statistically significant, influencing the effectiveness of life insurance companies operating on the Polish insurance market in 2004-2019. This means that the financial performance and effectiveness of insurance companies is mainly influenced by financial variables related to their financial economy and financial management. This is consistent with the results of the research conducted by Adams (1996), whose demonstrated positive impact of reinsurance on the effectiveness of risk management in an insurance company, and the results of the research conducted by Fiegenbaum and Thomas (1990), Wu *et al.* (2007), Hifza (2011) and Doumpos *et al.* (2012), which confirmed influence costs on financial effectiveness of insurance companies.

5. Conclusion

The conducted research allowed for a positive verification of the formulated research hypothesis, the structure of the insurance market affects the financial effectiveness of life insurance companies. The results of model estimation indicate that the financial effectiveness of life insurance companies, measured by ROE, are statistically significantly and influenced by share in the insurance market, measured by the gross written premium. This means that the research hypothesis has been positively verified. This is consistent with the results of the research conducted by

Chidambaran, Pugel and Saunders (1997), Bajtelsmit and Bouzouita (1998), Choi and Weiss (2005), and Bukowski and Lament (2020).

However, attention should be paid to the different scope of entities subject to examination. In this paper we analyzed life insurance companies. This group of insurance companies has not been subject to such research so far. Research conducted by Chidambaran, Pugel, and Saunders (1997) concerned non-life insurance companies. Bajtelsmit and Bouzouita (1998) were research motor insurance companies. Research conducted by Choi and Weiss (2005), concerned non-life insurance companies, similarly to research conducted by Chidambaran, Pugel, and Saunders (1997). Bukowski and Lament (2020) tested life and non-life insurance companies as a one group. The analysis of insurance companies in terms of their financial effectiveness should take into account the scope of activity.

Scope of activity of insurance companies influence on the different risk profiles and financial results. Therefore, the research of effectiveness of insurance companies should be homogeneous with regard to the their risk scope. This has not been included in previous studies. Our reaserch covered homogeneous group of insurance companies - only life insurance companies.

Further research should concern insurance companies – separately life and non-life, in relation to insurance markets other than Polish. This will be the subject of further research by the authors.

References:

Adams, A. 1996. The reinsurance decision in life insurance firms: an empirical test of the risk-bearing hypothesis. Accounting & Finance, 36(1), 15-30. DOI:10.1111/j.1467-629X.1996.tb00296X.

Bajtelsmit, V.L., Bouzouita, R. 1998. Market Structure and Performance in Private Passenger Automobile Insurance. Journal of Risk and Insurance, 3(65), 503-514.

Berhe, T.A., Kaur, J. 2017. Determinants of insurance companies' profitability analysis of insurance sector in Ethiopia. International Journal of Research in Finance and Marketing, 7(4), 124-137.

Born, P.H. 2011. Insurer profitability in different regulatory and legal environments. Journal of Regulatory Economics, 19(3), 211-237. DOI:10.1023/A:1011161805740.

Bukowski, S., Lament, M. 2021. Determinanty efektywności finansowej zakładów ubezpieczeń w Polsce. In: Gospodarka XXI wieku – wyzwania sektorowe, (Eds) Lament M., Bukowska, J., CeDeWu, Warszawa, (in Polish).

Bukowski, S., Lament, M. 2020. Konkurencja w sektorze ubezpieczeniowym w świetle teorii efektywnej struktury rynkowej – ESH (Efficient Structure Hypothesis). In: Pieniądz, instrumenty i instytucje finansowe, (Eds) Franek S., Adamczyk A., Uniwersytet Szczeciński, Szczecin, (in Polish).

Carroll, A.M. 1993. An Empirical Investigation of the Structure and Performance of the Private Workers'Compensation Market. Journal of Risk and Insurance, 2(60), 185-207.

Chidambaran, N.K., Pugel, T.A., Saunders, A. 1997. An Investigation of the Performance of

the U.S. Property-Liability Insurance Industry. Journal of Risk and Insurance, 2(64), 371-381.

Choi, B.P., Weiss, M.A. 2005. An Empirical Investigation of Market Structure, Efficiency, and Performance in Property-Libility Insurance. Journal of Risk and Insurance, 4(72), 635-673.

Demsetz, H. 1973. Industry Structure, Market Rivalry, and Public Policy. Journal of Law and Economics, 1(16), 1-9.

Demsetz, H. 1974. Two Systems of Belief About Monopoly. In: Industrial Concentration: The New Learning, (Eds) Goldschmid, H.J., Mann, H.M., Weston, J.F. Little Brown, Boston.

Doumpos, M., Gaganis, C., Pasiouras, F. 2012. Estimating and explaining the financial performance of property and casualty insurers: A two-stage analysis. The Business and Economics Research Journal, 5(2), 155-170.

Fiegenbaum, A., Thomas, H. 1990. Strategic groups and performance: The U.S. insurance industry. 1970-1984. Strategic Management Journal, 11(3), 197-215. DOI:10.1002/smj.4250110303.

Geneva Assiociation. 2010. Systemic risk in insurance. Geneva Assiociation, Geneva.

Hicks, J.R. 1935. Annual Survey of Economic Theory: The Theory of Monopoly. Econometrica, 3(1), 1-20.

Hifza, M. 2011. Determinants of insurance companies' profitability in Pakistan. Journal of International Academic Research, 1(3), 315-320.

KNF. 2020. Metodyka rocznego badania i oceny nadzorczej (BION) zakładów ubezpieczeń i zakładów reasekuracji za 2019 r. Komisja Nadzoru Finansowego, Warszawa, (in Polish).

Kozak, S. 2011. Determinants of profitability of non-life insurance companies in Poland during integration with the European Financial System. Electronic Journal of Polish Agricultural Universities, 14(1), 25-38.

Kramaric, T.P., Miletic, M., Pavic, I. 2017. Profitability determinants of insurance markets in selected Central and Eastern European countries. International Journal of Economic Sciencies, VI(2), 100-123. DOI: 10.20472/ES.2017.6.2.006.

Kripa, D., Ajasllari, D. 2016. Factors affecting the profitability of insurance companies in Albania. European Journal of Multidisciplinary Studies, 1(1), 352-360.

Lament, M. 2019a. Profil ryzyka zakładu ubezpieczeń a wyniki finansowe. In: Zarządzanie w warunkach ryzyka, (Ed.) Śliwiński, A., Szkoła, Główna Handlowa, Warszawa, (in Polish).

Lament, M. 2019b. Raportowanie niefinansowe a wyniki finansowe zakładów ubezpieczeń. CeDeWu, Warszawa, (in Polish).

Lee, Ch.Y. 2014. The effects of firm specific factors and macroeconomics on profitability of property-liability insurance industry in Taiwan. Asian Economic and Financial Review, 4(5), 681-691.

Malik, H. 2011. Determinants of insurance companies profitability: an analysis of insurance sector of Pakistan. Academic Research International, 1(3), 315-321.

Ngatia, S.W. 2014. The effect of Corporate Social Responsibility on financial performance of insurance companies in Kenya. University of Nairobi, Nairobi.

Olajumoke, O. 2012. The determinants of the profitability of insurance companies in Nigeria. University of Bath, Nigeria.

Ortyński, K., Pypeć, M. 2021. Competition in the Polish Non-Life Insurance Market. In: Competitiveness and Economic Development in Europe. Prospects and Challenges. (Eds) Bukowski, S., Hyz, A., Lament, M. Routledge, London and New York.

Ortyński, K. 2016. Determinants of profitability of general insurance companies performance in Poland. Central European Review of Economics & Finance, 12(2), 53-66.

Peltzman, S. 1977. The Gains and Losses From Industrial Concentration. Journal of Law and Economics, 2(20), 229-263.

PIU, Database. Retrieved from https://ibd.piu.org.pl.

Wu, Z., Desheng, S.V., Lianga, N. 2007. Simultaneous analysis of production and investment performance of Canadian life and health insurance companies. Computers and Operations Research, 34(1), 123-128.

Yadav, R.K., Jain, R., Singh, S. 2016. An overview of Corporate Social Responsibility (CSR) in insurance sector with special reference to Reliance Life Insurance. World Scientific News, 45(2), 196-223.