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Market share and financial results of insurance companies: The case of the UE-15 countries

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ABSTRACT

Objective: The objective of the article is to examine the relationship between insurance market share and the financial results of insurance companies. We formulated the following research question: Is an insurance company's market position (market share) influenced by its financial results? If so, which ones?

Research Design & Methods: The scope of research covers insurance companies operating in the insurance markets of the EU-15 countries. We surveyed the insurance companies with the largest market share. The research period covered the years 2012-2021. We compiled the data on the insurance markets of the EU-15 countries based on the OECD Statistics database and the financial data characterising the insurance companies selected for the study – based on the ORBIS Database. We used STATISTICA 13 and GRETL software to compile the survey results. We used the method of analysis of scientific literature – domestic and foreign, statistical and econometric methods and own observations.

Findings: The research has made it possible to answer the research questions. Financial results influence the market position of an insurance company. This means that financial performance was one of the determinants of an insurance company's market position. This is indicated both by the analysis of the literature on the subject, where some studies confirm the existence of a relation between market position, measured by insurance market share, and the financial results of insurance companies and by our research covering the EU-15 insurance market.

Implications & Recommendations: The research conducted will serve insurance companies and insurance market institutions – in financial management strategies, as well as by policyholders and beneficiaries of insurance contracts, i.e. consumers – in consumer decision-making.

Contribution & Value Added: The study fills a research gap in the determinants of the efficiency of insurance companies and, in particular, the issue of the relation between the market share of a single operator and its financial results. They also contribute to the development of research in insurance finance falling within the discipline of economics and finance. The study of a homogeneous group of insurance companies – with the largest share in a given national market – as well as the study of the insurance market of the EU-15 countries, which should be considered stable with an established market structure, should be regarded as innovative.

Article type:	research article
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INTRODUCTION

The structure of the market, competition in the insurance sector, and the profitability and financial performance of insurance companies are important economic issues that we can analyse in many aspects. The determinants of the financial efficiency of the insurance sector are of interest not only at the level of individual insurance companies, but are also important in macroeconomic terms, as

well as in relation to policyholders and beneficiaries of insurance contracts. The macroeconomic perspective relates to financial security issues and affects supervisory policy, while the microeconomic perspective affects sales policy. Clearly, the two approaches are interlinked. It seems that an important determinant of the financial performance of insurance companies is their market share, which contributes to improving or increasing the efficiency of insurance companies through economies of scale. Scholars have conducted research in this area for a long time, for various actors, including in the insurance sector. However, they are of a fragmented nature, as they either refer to selected, mostly national insurance markets (among others: Marjanović and Popović (2020) – Serbian insurance market, Jedlicka and Jumah (2006) – Austrian insurance market) or to selected groups of insurance companies (among others: Cole *et al.* (2015) – health insurance companies in USA, Pope and Ma (2008) – non-life insurance markets of 23 countries). They also cover different research periods, often too short (among others: Guendouz and Ouassaf (2018) – 6 years, Al-Arif and Firmansyah (2021) – 8 years). Research to date does not clearly indicate that there is a relation between insurance market share and the financial results of insurance companies. Some studies indicate the existence of such a relationship, *e.g*. Varga and Madari (2023), Bukowski and Lament (2021). Others do not confirm the impact of an insurance company's market position on its financial results, *e.g.* Ofori-Boateng *et al.* (2022); Derbali and Jamel (2018). Noteworthy, research to date has mainly focused on validating the structure-conduct-performance (SCP) paradigm. The undertaken subject matter extends previous research in this area in relation to insurance markets by reviewing the relative market power (RMP) paradigm, which examines the relation between the market share of a single operator and its financial results. The study of a homogeneous group of insurance companies – with the largest share in a given national market – as well as the study of the insurance market of the EU-15 countries, which should be considered stable with an established market structure, should be considered innovative and fills a research gap in this area.

The research aims to analyse the relation between insurance market share and the financial results of insurance companies. For the purpose of the article, we formulated the following research question: Are insurance companies' market positions (market share) influenced by their financial results? If so, which ones?

The subject scope of the research includes insurance companies operating in the insurance markets of the EU-15 countries. We surveyed the insurance companies with the largest market share. The research period covers the years 2012-2021.

We compiled the data on the insurance markets of the EU-15 countries from the OECD Statistics database, while financial data characterising the insurance companies selected for the study – from the ORBIS Database. We used STATISTICA 13 and GRETL software to compile the survey results. The article uses the method of analysis of scientific literature – domestic and foreign, statistical and econometric methods, and own observations.

The article is structured as follows: the first part of the article presents a review of specialist literature, the second part describes the research methodology, and the third part reports on empirical findings and discusses the findings.

LITERATURE REVIEW

The theory of efficient structure hypothesis (ESH) explains the relation between the market structure and the financial results of business entities. It has been described, inter alia, by Hicks (1935), Demsetz (1973, 1974), and Peltzman (1977). The efficiency hypothesis proposed by Demsetz (1973) argues that larger firms benefit from economies of scale and that higher efficiencies enable them to capture a larger market share. The positive relationship between competition and financial performance supports the efficiency hypothesis, according to which competition and financial performance are further enhanced by the market share gains of efficient firms. Research on ESH indicates that there is a relationship between competitiveness, concentration, and financial performance. Berger (1995) explained the relationship between market structure and financial performance as

the SCP paradigm, whereby in highly concentrated markets firms may set prices that are less favourable to consumers as a result of imperfect competition in the markets. Research in this area concerns the relationship between market structure and financial performance. Scholars assume that greater market power consisting of lower market competition leads to higher profitability. A complement to the SCP model, and at the same time an alternative explanation of the theory of ESH, is the relative market power (RMP) paradigm, according to which firms with well-differentiated products can increase their market share and use their market power in product pricing, thereby achieving windfall profits. The developer of RMP was Smirlock (1985) who concluded that there is no relationship between market structure and profitability, but rather it is between the market share of an individual operator and its profitability. Some literature considers competition, often measured as the number of firms in the market, while others focus on concentration.

Studies related to the assessment of the relationship between market structure and financial performance are also the subject of research in relation to insurance companies. Table 1 presents the selected results from a survey of the literature in this area.

The literature analysis shows that the topic of the relation between market structure (insurance, market share) and the financial performance of insurance companies is an important research area, analysed in many aspects, to different extents and with different effects. Some studies indicate the existence of such a relationship, *e.g.* Varga and Madari (2023), Bukowski and Lament (2021), Ben-Dhiab (2021), Akhtar (2018), Ortyński (2016). Others do not confirm the impact of insurance company size on its financial performance, *e.g.* Ofori-Boateng *et al.* (2022); Derbali and Jamel (2018); Moro and Anderloni (2014), Berry-Stölzlea *et al.* (2011). In the absence of research clearly indicating the existence or not of an influence of the market position of an insurance company on its financial results, we formulated the following question:

> Are insurance companies market positions (market share) influenced by their financial results? If so, which ones?

The analysis of the conducted studies shows that they cover diverse insurance markets. Most of the studies cover single national markets, among others, the Hungarian insurance market – Varga and Madari (2023), the Polish insurance market – Bukowski and Lament (2021), Ortyński (2016), Romanian insurance – Burca and Batrinca (2014). Some studies involve a larger sample and include the European insurance market – Berry-Stölzlea *et al.* (2011) and Moro and Anderloni (2014), and the US insurance sector – Cummins and Nini (2002). We can also identify studies on selected segments of the insurance market, *e.g.* life insurance – Al-Arif and Firmansyah (2021), Bukowski and Lament (2021), non-life insurance – Choi and Weiss (2005), Berry-Stölzlea *et al.* (2011) and health insurance – Cole *et al.* (2015).

Noteworthy, as Table 1 presents, the research to date has mainly focused on validating the SCP paradigm. It would be reasonable to address the topic of verifying the RMP paradigm, which examines the relationship between the market share of a single operator and its financial performance in relation to insurance markets. This was the focus of the research, the results of which we will present in the following sections.

In conclusion, the research to date on the relationship between market structure and the financial performance of insurance companies is a poorly recognized research topic. The research to date is fragmented, *i.e.* it often refers to selected national markets or selected segments of the insurance market. It would be reasonable to examine the relationship between the market share of a single insurance company and its financial performance (a verification of the RMP paradigm). The research should cover relatively homogeneous insurance markets, but in a broader sense than just the national market, thus eliminating the legal and financial differences associated with conducting insurance business in a diverse economic environment. It would therefore be necessary to examine similar groups of insurance companies operating in a relatively homogeneous insurance market but covering a wider scope than just the national market.

Table 1. Market share as a determinant of insurance companies' profitability and financial results

Year	Authors	Scope of research	Results of research
2023	Varga, Madari	Hungarian insurance market between 2010 and 2019.	The structure of the insurance market influences the profitability of insurance companies.
2022	Ofori-Boateng, Ohemeng, Boro, Agyapong	29 Ghanaian general insurance companies between 2008 and 2019.	The structure of the insurance market does not influence the profitability of insurance companies.
2021	Bukowski, Lament	Polish life insurance companies between 2004 and 2019.	The structure of the insurance market influences the financial effectiveness of life insurance companies.
2021	Ben.-Dhiab	20 Saudi insurance companies from 2009 to 2017.	The company size and profitability of insurance companies are positively correlated but their impacts is not statistically significant.
2021	Ambaw, LiJuan	17 Ethiopian insurance companies from 2005 to 2020.	The size of an insurance company, market share, and age of the company significantly influence the financial results.
2021	Al-Arif, Firmansyah	Islamic life insurance industry in Indonesia between 2012 and 2019.	The market structure influences the profitability of the Islamic life insurance industry.
2020	Marjanović, Popović	14 Serbian insurance companies between 2006 and 2016.	Market share has a statistically significant effect on the insurance company's financial results, as measured by the ROA.
2018	Derbali, Jamel	19 Tunisian insurance companies.	The company size does not influence the profitability of insurance companies.
2018	Akhtar	8 Insurance companies operating in Saudi Arabia between 2010 and 2015.	Market share affects the efficiency of Saudi insurance companies. The structure of the insurance market influences the profitability of insurance companies.
2018	Guendouz, Ouassaf	6 insurance companies operating in Saudi Arabia from 2010 to 2016.	The size of the insurance company has a significant impact on the profitability of insurance companies.
2016	Ortyński	Polish insurance companies 2006 and 2013.	The size of the insurance company positively influences the profitability of Polish insurance companies.
2015	Cole, He, Karl	All health insurers operating in all states from 2002 to 2010.	There is a positive relationship between market concentration and health insurers' profits.
2014	Burca, Batrinca	Romanian insurance sector during the period 2008-2012.	Some specific factors, such as company size affect the financial results of the insurance company.
2014	Moro, Anderloni	198 European insurance companies from 2002 to 2014.	The size of the asset negatively influences ROA.
2013	Yuvaraj, Abate	9 Ethiopian insurance companies from 2003 and 2011.	The company size positively affects the profitability of insurance company.
2012	Pervan, Ćurak, Marijanović	The insurance companies from Bosnia and Herzegovina between 2005 to 2010.	The company size has a significant impact on ROA.
2011	Berry-Stölzlea, Weiss, Wende	Non-life insurance sector for 12 European countries from 2003 to 2007.	The structure of the insurance market does not influence the profitability of insurance companies.
2008	Pope, Ma	Non-life insurance markets of 23 countries.	The structure of the insurance market influences the profitability of insurance companies
2006	Jedlicka, Jumah	52 Austrian companies from 2002 to 2003.	The structure of the insurance market influences the profitability of insurance companies.
2005	Choi, Weiss	American non-life insurance companies from 1992 and 1998.	There exists a relationship between market share and financial results in non-life insurance companies.
2003	Adams, Buckle	47 Bermuda insurance companies during 1993-1997.	The size of the insurance company has no substantial impact on its financial results
2002	Cummins, Nini	The US insurance sector from 1993 to 1998.	The size of the insurance company has a significant impact on ROA – larger companies generate higher profits.

Source: own study.

RESEARCH METHODOLOGY

The research aimed to analyse the relationship between insurance market share and the financial results of insurance companies. We studied insurance companies operating in the insurance markets of the EU-15 countries. We compiled the data on the studied insurance markets based on the OECD Statistics database. We used them to present the structure of the insurance market of the EU-15 countries (Table 2).

Table 2. The structure of the UE-15 insurance markets in 1999-2021

Specification	Years				
	2001	2006	2011	2016	2021
Gross written premium (US Dollar, Million)					
AT – Austria	12 117.868	21 272.486	25 978.234	20 647.127	28 202.254
BE – Belgium	18 530.611	37 148.925	40 871.687	30 431.826	41 070.564
DK – Denmark	30 431.826	23 669.081	33 844.253	33 498.134	46 770.715
FI – Finland	5 374.673	7 809.245	10 132.502	10 011.939	6 051.734
FR – France	122 085.052	292 646.034	289 081.939	314 250.561	362 503.823
DE – Germany	166 058.671	264 402.328	255 708.473	294 660.464	396 718.174
GR – Greece	2 379.899	6 004.015	6 893.276	3 908.444	5 330.032
IE – Ireland	14 764.005	45 848.191	44 591.479	54 181.801	58 729.076
IT – Italy	73 682.546	147 497.278	156 981.595	151 423.405	168 471.187
LU – Luxembourg	5 468.714	14 697.399	19 176.113	20 288.771	34 796.097
NL – Netherlands	39 546.522	57 360.201	58 654.211	77 358.138	97 957.043
PT – Portugal	7 150.265	16 204.446	15 642.457	12 079.183	15 574.432
ES – Spain	38 685.822	72 289.847	86 378.201	73 654.743	76 473.056
SE – Sweden	20 245.837	30 864.775	28 062.491	39 107.022	73 097.394
GB – United Kingdom[1]	230 521.626	525 857.922	339 364.898	403 794.037	445 432.153
EU-15	787 043.937	1 563 572.173	1 411 361.809	1 539 295.595	1 857 177.734
Share in the UE-15 insurance market (%) (1)					
AT – Austria	1.54	1.36	1.84	1.34	1.52
BE – Belgium	2.35	2.37	2.89	1.98	2.21
DK – Denmark	3.88	1.52	2.39	2.18	2.52
FI – Finland	0.68	0.49	0.72	0.65	0.33
FR – France	15.51	18.72	20.48	20.42	19.52
DE – Germany	21.09	16.91	18.12	19.15	21.36
GR – Greece	0.31	0.38	0.49	0.25	0.29
IE – Ireland	1.87	2.94	3.16	3.52	3.16
IT – Italy	9.36	9.43	11.12	9.83	9.07
LU – Luxembourg	0.69	0.94	1.36	1.32	1.87
NL – Netherlands	5.03	3.67	4.16	5.03	5.27
PT – Portugal	0.91	1.05	1.11	0.78	0.84
ES – Spain	4.92	4.62	6.12	4.78	4.12
SE – Sweden	2.57	1.97	1.99	2.54	3.94
GB – United Kingdom[2]	29.29	33.63	24.05	26.23	23.98
EU-15	100.00	100.00	100.00	100.00	100.00

Note: The share of the gross written premium of a given country in the gross premiums written of the EU-15 (data in %).
Source: own study based on OECD Statistics.

The analysis of the structure of the EU-15 insurance market shows that it has remained broadly constant throughout the period under review. The dominant market shares in the EU-15 belong to UK, Germany, France, Italy, and Spain. Of course, there are changes in the market shares of individual

[1] From 2020 leaving the EU.
[2] From 2020 leaving the EU.

countries, but these should be considered negligible. This means that the surveyed insurance market is stable with an established market structure. Similar conclusions are also drawn from studies by Swiss Re (2023) and Bukowski and Lament (2020).

We pursued the primary research objective by assessing the insurance market share in relation to the financial performance of selected insurance companies operating in the EU-15. For the purpose of the article, we formulated the following research question: Are insurance companies' market positions (market share) influenced by their financial results? If so, which ones? For the study, we selected insurance undertakings with the greatest importance for the insurance market in a given country. We attempted to select insurance undertakings so that they corresponded to the structure of the EU-15 insurance market. Table 3 shows the structure of the surveyed insurance undertakings.

Table 3. Structure of the surveyed insurance companies by EU-15 country

No.	Country	Number of insurance companies	Share of insurance companies in total number of research insurance companies (%)
1.	AT – Austria	2	5.41
2.	BE – Belgium	2	5.41
3.	DK – Denmark	2	5.41
4.	FI – Finland	1	2.70
5.	FR – France	4	10.81
6.	DE – Germany	4	10.81
7.	GR – Greece	2	5.41
8.	IE – Ireland	2	5.41
9.	IT – Italy	3	8.10
10.	LU – Luxembourg	2	5.41
11.	NL – Netherlands	3	8.10
12.	PT – Portugal	2	5.41
13.	ES – Spain	3	8.10
14.	SE – Sweden	1	2.70
15.	GB – United Kingdom	4	10.81
	Total	**37**	**100.0**

Source: own study.

We collected financial data characterising the insurance companies selected for the study from the ORBIS Database. The time scope of the study covered the years 2012-2021 – the data available in the database ORBIS covers a period of 10 years.

We assumed a dependence between the insurance market structure and the financial results of insurance companies. To this end, we constructed a panel model. Market share of insurance companies measured with gross written premium. It is the dependent variable (explicated feature). We chose gross premiums written to assess the market position of the insurance company. This is the most commonly used category to assess market share, next to asset value. Other studies confirm this, *e.g.* Ortyński (2016), Kramaric *et al.* (2017), Batool and Sahi (2019). Moreover, reports by the Polish Financial Supervision Authority (2023) and the Polish Chamber of Insurance (2023) use gross premiums written as the main category for assessing the market position of an insurance company. We chose variables for assessing the financial results of insurance companies based on previous research as well as the company's own observations. The literature analysis shows that researchers can measure the financial performance and profitability of insurance businesses in different ways. Typically, in empirical studies, scholars measure profitability using ROA, ROE, or a combination of the above-mentioned measures is used. Studies confirming it are *e.g.* Lee (2014), Kramaric *et al.* (2017), Kripa and Ajasllari (2016). Moreover, the analysis of the research results shows that the financial performance of insurance companies can be influenced by decisions and actions located in different areas. They are both macroeconomic and microeconomic in nature. However, they largely depend on the specifics of the financial management of insurance companies, *i.e.* factors specific only to this type of entity. We should regard the following as important determinants of the financial

result of insurance companies: technical and insurance provisions, investments and their profitability, loss ratio, reinsurance, as well as costs of insurance activity. Solvency issues, assessing the level of financial security, are also not without significance. Previous research findings confirm it, *e.g.* Lament (2019), Batool and Sahi (2019), Bukowski and Lament (2021), Burca and Batrinca (2014), Ben-Dhiab (2021), Ofori-Boateng *et al.* (2022). Moreover, scholars measure the financial results of insurance companies measured by technical results, ROE, ROS, ROA, and ROI. There are independent variables. Furthermore, the elements influencing the assumed market structure of insurance companies are total investments, capital and surplus, net premiums written, total underwriting expenses and solvency ratio. Table 4 presents the methods of calculating these variables.

Table 4. Methods of calculating the variables analyses

Variable	Variable designation	Method of calculating the variable
Market share	$MS_{i,t}$	Gross written premium in an insurance company in euro/year* 100/ Gross written premium in an insurance market of country in euro/year.
Total investments	$INV_{i,t}$	Total investments in an insurance company in mln euro/year.
Capital and surplus	$CS_{i,t}$	Capital and surplus in an insurance company in mln euro/year.
Net premiums written	$PN_{i,t}$	Net premiums written in an insurance company in mln euro/year.
Total underwriting expenses	$CL_{i,t}$	Total underwriting expenses in an insurance company in mln euro/year.
Technical results	$TR_{i,t}$	Technical results in an insurance company in mln euro/year.
Return on equity ratio (ROE)	$ROE_{i,t}$	Net profit in an insurance company in mln euro/year * 100/ Equity in an insurance company in mln euro/year.
Return on sales ratio (ROS)	$ROS_{i,t}$	Net profit in an insurance company in mln euro/year * 100/ Gross written premium in an insurance company in mln euro/year.
Return on assets ratio (ROA)	$ROA_{i,t}$	Net profit in an insurance company in mln euro/year * 100/ Assets in an insurance company in mln euro/year.
Return on investments ratio (ROI)	$ROI_{i,t}$	Profit of investments in an insurance company in mln euro/year *100/Investments in an insurance company in mln euro/year.
Solvency ratio	$SOLV_{i,t}$	Own funds in an insurance company in mln euro/year * 100/ Net premiums written in an insurance company in mln euro/year.

Source: own study.

Table 5 presents the basic statistics of the study variables.

The analysis of the shares in the national insurance markets for individual insurance companies showed that they vary considerably, as illustrated in the basic statistics for the variable MSi,t (market share). The analysis of the minimum and maximum values evidences it as the values were respectively 1.9% and 39.1% (Table 5). This indicates the structural diversity of the surveyed insurance markets due to their size. The studied insurance markets vary in terms of their size, as well as the associated number of insurance companies, which affects their structure and the market shares of the insurance companies operating in them.

We have built the following panel data model:

$$lnMS_{i,t}=a_1+a_2 lnINV_{i,t}+a_3 lnCL_{i,t}+ a_4 lnPN_{i,t}+ u_{i.t} \quad (1)$$

where:

$MS_{i,t}$ - market share (%);
$INV_{i,t}$ - total investments (mln EUR);
$CL_{i,t}$ - total underwriting expenses (mln EUR);
$PN_{i,t}$ - net premiums written (mln EUR);
ln - natural logarithm;
$u_{i.t}$ - joint random factor.

Table 5. Basic statistics concerning the variables studied of the insurance companies active in UE-15 countries in 2012–2021

Specification	$MS_{i,t}$	$INV_{i,t}$	$CS_{i,t}$	$PN_{i,t}$	$CL_{i,t}$	$TR_{i,t}$	$ROE_{i,t}$	$ROS_{i,t}$	$ROA_{i,t}$	$ROI_{i,t}$	$SOLV_{i,t}$
N importance	370	370	370	370	370	370	370	370	370	370	370
Average	15.55	101045.05	8946.00	10018.02	13165.08	778.04	11.05	14.36	1.57	1.12	16.02
Median	13.05	36371.15	3571.06	2862.79	3633.38	182.15	11.25	8.54	1.02	0.36	10.42
Maximum	39.10	748059	65126.00	90308.00	115401.00	10167.00	67.48	300.18	9.29	9.97	66.05
Minimum	1.90	181.55	-11.74	12.23	26.39	-962.00	-467.24	-129.09	-28.12	-0.01	-4.35
Variance	90.86	2.47E+10	156188873	246264969	447201328	1938570	765.35	1042.15	5.86	3.13	235.08
Standard deviation	9.53	157229.1	12497.55	15692.83	21147.14	1392.32	27.66	32.28	2.42	1.77	15.33
Coefficient of variation	61.26	155.60	139.69	156.64	160.63	178.95	250.15	224.67	153.67	157.48	95.66

Note:

$MS_{i,t}$ – market share (%);
$INV_{i,t}$ – total investments (mln EUR);
$CS_{i,t}$ – capital and surplus (mln EUR);
$PN_{i,t}$ – net premiums written (mln EUR);
$CL_{i,t}$ – total underwriting expenses (mln EUR);
$TR_{i,t}$ – technical results (mln EUR);
$ROE_{i,t}$ – return on equity ratio (%);
$ROS_{i,t}$ – return on sales ratio (%);
$ROA_{i,t}$ – return on assets ratio (%);
$ROI_{i,t}$ – return on investments ratio (%);
$SOLV_{i,t}$ – solvency ratio (%).

Source: own study based on STATISTICA 13.

We built the model using stepwise regression with backward elimination. As a criterion, we have taken collinearity and correlation between independent variables and explanatory variables. We used weighted least squares (WLS) as the method of model's estimation. This was because of the existing heteroscedasticity and autocorrelation.

RESULTS AND DISCUSSION

The model explained the market share of insurance companies measured by gross written premium in insurance companies as dependent on ten independent variables:

- $INV_{i,t}$ – total investments (mln EUR);
- $CS_{i,t}$ – capital and surplus (mln EUR);
- $PN_{i,t}$ – net premiums written (mln EUR);
- $CL_{i,t}$ – total underwriting expenses (mln EUR);
- $TR_{i,t}$ – technical results (mln EUR);
- $ROE_{i,t}$ – return on equity ratio (%);
- $ROS_{i,t}$ – return on sales ratio (%);
- $ROA_{i,t}$ – return on assets ratio (%);
- $ROI_{i,t}$ – return on investments ratio (%);
- $SOLV_{i,t}$ – solvency ratio (%).

Noteworthy, we rejected some of the variables that were to be accepted for model estimation. This was due to the existing relationships between variables mainly concerning correlation and collinearity. Variables depicting typical financial results of insurance companies and their measures – profitability ratios, calculated for different ranges, were not included. Table 6 shows the results of the model estimation.

Table 6. Results of model estimation: WLS, using 333 observations. Included 37 cross-sectional units. Dependent variable: l_MS. Weights based on per-unit error variances

Variable	Coefficient	Std. Error	t-ratio	p-value	
const	2.30872	0.124029	18.61	<0.0001	***
l_INV	0.321094	0.0176362	18.21	<0.0001	***
l_CL	-0.338248	0.0219817	-15.39	<0.0001	***
d_PN	1.28626e-011	4.81512e-012	2.671	0.0079	***
Statistics based on the weighted data					
Sum squared resid		324.9876	S.E. of regression		0.993883
R-squared		0.572949	Adjusted R-squared		0.569055
F(3, 329)		147.1333	P-value(F)		1.80e-60
Log-likelihood		-468.4513	Akaike criterion		944.9027
Schwarz criterion		960.1353	Hannan-Quinn		950.9768
Statistics based on the original data					
Mean dependent var		2.543191	S.D. dependent var		0.668036
Sum squared resid		126.2095	S.E. of regression		0.619367
Test for normality of residual					
Null hypothesis:			error is normally distributed		
Test statistic:			Chi-square(2) = 13.1297		
			with p-value = 0.001409		

Note: *** The variable is significant at the significance level of 0.01; ** The variable is significant at the significance level of 0.05; * The variable is significant at the significance level of 0.1.

$INV_{i,t}$ – total investments (mln EUR);

$CL_{i,t}$ – total underwriting expenses (mln EUR);

$PN_{i,t}$ – net premiums written (mln EUR).

Source: own study.

The results of model's estimation indicated that all independent variables were statistically significant and the signs are in accordance with theory and hypothesis. In 57.29%, the model explained the variability of the explanatory variable, *i.e.* market share ($MS_{i,t}$). In the case of panel models, it is a good result. The variables which influenced the variability of market share ($MS_{i,t}$) were total investments ($INV_{i,t}$) total underwriting expenses ($CL_{i,t}$) and net premiums written ($PN_{i,t}$). The model estimation results indicated that all variables were statistically significant, influencing the market share of insurance companies operating in the EU-15 insurance market in 2012-2021. This means that the market share of insurance companies is influenced by market variables related to their financial economy and financial management. This is consistent with the results of the research conducted by Pope and Ma (2008). We studied both developed and developing groups of countries. The study covered the period from 1996 to 2003. We surveyed non-life insurance companies from 23 countries and confirmed that the structure of the insurance market influences the profitability of insurance companies. The research also showed that the presence of foreign insurers significantly changed the dynamics of non-life insurance markets. Moro and Anderloni (2014) and Berry-Stölzlea *et al.* (2011) also conducted research in relation to a similar study group. According to them, the structure of the insurance market does not influence the profitability of insurance companies. Moro and Anderloni (2014) studied insurance companies operating in the main European markets between 2004 and 2012. Their results show that financial performance, as measured by return on equity and return on assets, is influenced by insurance-specific characteristics as well as country institutional characteristics. Berry-Stölzlea *et al.* (2011) conducted a study in the non-life insurance sector in 12 European countries between 2003 and 2007. Comparing the studies mentioned above, we can see that they have in common the subject scope of the studies, which includes non-life insurance. The differences lie in the period of study and the geographical scope of the insurance markets studied. Pope and Ma's (2008) research, which confirmed the existence of a relationship between market structure and the financial performance of insurance companies, concerns a diverse group of countries, *i.e.* developed and developing countries. The studies by Moro and Anderloni (2014) and Berry-Stölzlea *et al.* (2011) did not confirm the existence of a relationship between market position and the financial performance of insurance companies covering European insurance markets. This implies that in more developed insurance markets, market position is not influenced by financial performance but by other factors. This indicates a more level playing field and the need for other non-financial competitive factors. In insurance markets that are more diverse in terms of development, the market position of insurance company is influenced by its financial performance. This demonstrates the importance of financial factors in competition between insurance companies and their importance in consumer decision-making.

Our research concerned a homogeneous group of EU-15 countries, *i.e.* well-developed insurance markets, but included both life and non-life insurance companies. However, the results do not coincide with the studies by Berry-Stölzlea *et al.* (2011) and Moro and Anderloni (2014) on a similar research group. This may be due, firstly, to a different research period. Secondly, their research covered insurance companies with the largest share of a given national market for the EU-15 countries. This may mean that the financial performance of insurance companies with the largest market share influences their market position. Therefore, this is one of the factors of competition between insurance companies which influence consumer decisions.

The conducted research helped to answer the research question: Are an insurance companies' market positions (market share) influenced by their financial results? If so, which ones? Financial results influence the market position of an insurance company operating in the EU-15 market. These include investments, underwriting expenses, and net premiums written.

Therefore, we confirmed that there is a correlation between market structure and the financial results of insurance companies operating in a market with a stable and established structure. In the case studied, this was the EU-15 market.

CONCLUSIONS

The research showed that the financial results of insurance companies affect their market position, as measured by their share of the insurance market. This is indicated both by the literature analysis as some studies confirm the existence of a relationship between market position, as measured by the insurance market share, and the financial results of insurance companies, and by own research covering the EU-15 insurance market. According to the results of the model estimation, variables which influence the variability of market share ($MS_{i,t}$) were total investments ($INV_{i,t}$), total underwriting expenses ($CL_{i,t}$), and net premium written ($PN_{i,t}$). This means that the market position of the surveyed insurance companies, as measured by their share of the insurance market, depends on the scale and efficiency of their investment activities, the value of the costs they incur and the value of their net insurance premiums, *i.e.* adjusted for the reinsurer's share, indicating that risk management policies, including the scope and efficiency of reinsurance programmes, are important.

The research fills a research gap in the determinants of the efficiency of insurance companies and, in particular, the study of the relationship between the market share of a single operator and its financial performance. It also contributes to the development of research in insurance finance falling within the discipline of economics and finance. Moreover, we should regard as innovative the study of a homogeneous group of insurance companies – with the largest share in a given national market – as well as the study of the insurance market of the EU-15 countries, which should be considered stable with an established market structure.

The research can serve insurance companies and insurance market institutions in financial management strategies. It can also help policyholders and beneficiaries of insurance contracts, *i.e.* consumers, in consumer decision-making.

The limitation of the study is the assessment of the insurance companies with the largest share in a given national market. These are entities with a stable market position, which contributes to the strengthening of business results. Therefore, the impact of financial results on market position can be two-way. A limitation is also the lack of consideration of the specificities of insurance companies resulting from their scope of business and the study of the most developed insurance market – the EU-15. Further research should concern insurance companies – separately life and non-life, in relation to insurance markets other than EU-15. The separate subjecting of life and non-life insurers to examination is due to the peculiarities of both the insurance contracts themselves and the associated different financial management rules. Therefore, it would be appropriate to identify the determinants of the financial efficiency of insurance companies, considering their specificities arising from the scope of their business and determining the importance of their size (market share) for their financial performance. Researchers would need to conduct such studies for reasonably homogeneous insurance markets of more than national scope. This will be the subject of our further research.

REFERENCES

Adams, M., & Buckle, M. (2003). The determinants of corporate financial performance in the Bermuda insurance market. *Applied Financial Economics*, *13*(2), 133-143. https://doi.org/10.1080/09603100210105030

Akhtar, M.H. (2018). Performance analysis of Takaful and conventional insurance companies in Saudi Arabia. *Benchmarking: An International Journal, 25*(2), 677-695. https://doi.org/10.1108/BIJ-01-2017-0018

Al -Arif, M.N.R., & Firmansyah, B. (2021). Market structure and profitability: evidence in the Indonesian Islamic insurance industry. *International Journal of Business and Society, 22*(2), 1004-1014. https://doi.org/10.33736/ijbs.3778.2021

Ambaw, Z.M., & LiJuan S. (2021). The micro economic determinants of insurance profitability in Ethiopian insurance industry - evidenced from life and non-life insurance products. *Journal of Insurance and Financial Management*, *5*(1), 87-123.

Batool, A., & Sahi, A. (2019). Determinants of financial performance of insurance companies of USA and UK during global financial crisis (2007-2016). *International Journal of Accounting Research, 7*(1), 2-9. https://doi.org/10.35248/2472-114X.19.7.194

Ben-Dhiab, L. (2021). Determinants of insurance firms' profitability: an empirical study of Saudi insurance market. *Journal of Asian Finance, Economics and Business, 8*(6), 235-243. https://doi:10.13106/jafeb.2021.vol8.no6.0235

Berger, A.N. (1995). The profit-structure relationship in banking—tests of market-power and efficient-structure hypotheses. *Journal of Money Credit and Banking*, *27*, 404-431. https://doi.org/10.2307/2077876

Berry-Stölzlea, T.R., Weiss, M.A., & Wende, S. (2011). *Market structure, efficiency, and performance in the European property–liability insurance industry*. American risk and insurance association meeting. Retrieved from www.aria.org/meetings/2011%20papers/Market_Structure_in_EU_insurance_markets%20072311.pdf on May 17, 2021.

Bukowski, S.I., & Lament, M. (2021). Market structure and financial effectiveness of life insurance companies. *European Research Studies Journal, 24*(2B), 533-545. https://doi.org/10.35808/ersj/2248

Bukowski, S.I., & Lament, M. (2020). Foreign capital impact on insurance market development in EU-15 countries. *Entrepreneurial Business and Economics Review*, *8*(3), 205-219. https://doi.org/10.15678/EBER.2020.080312

Burca, A.M., & Batrinca, G. (2014). The determinants of financial performance in the Romanian insurance market. *International Journal of Academic Research in Accounting*, *Finance and Management Sciences*, *4*(1), 299-308. https://doi.org/10.6007IJARAFMS/v4-i1/637

Choi, B.P., & Weiss, M.A. (2005). An empirical investigation of market structure, efficiency, and performance in property-liability insurance. *Journal of Risk and Insurance*, *4*(72), 635-673. https://doi.org/10.1111/j.1539-6975.2005.00142.x

Cole, C.R., He, E., & Karl, J.B. (2015). Market structure and the profitability of the U.S. Health insurance marketplace: a state-level analysis. *Journal of Insurance Regulation*, *34*(4), 1-29. Retrieved from https://content.naic.org/sites/default/files/inline-files/JIR-ZA-34-04-EL.pdf on June 17, 2021.

Cummins, J.D., & Nini, G.P. (2002). Optimal capital utilization by financial firms: evidence from the property-liability insurance industry. *Journal of Financial Services Research*, *21*, 15-53. https://doi.org/10.1023/A:1014369617192

Demsetz, H. (1973). Two systems of belief about monopoly. In Goldschmid, H.J., Mann, H.M., Weston, J.F (Eds.) *Industrial concentration: the new learning* (pp. 164-184). Boston: Little Brown.

Derbali, A., & Jamel, L. (2018). Determinants of performance of Tunisia insurance companies: case of life insurance. *International Journal of Productivity and Quality Management, 24*(4), 531-542. https://doi.org/10.30560/rfm.v1n1p1

Guendouz, A.A., & Ouassaf, S. (2018). Determinants of Saudi Takaful insurance companies profitability. *Academy of Accounting and Financial Studies Journal*, *22*(5), 1-24. Retrieved from www.abacademies.org/articles/Determinants-of-Saudi-Takaful-Insurance-Companies-Profitability-1528-2635-22-5-280.pdf on June 23, 2023.

Hicks, J.R. (1935). Annual survey of economic theory: the theory of monopoly. *Econometrica*, *3*(1), 1-20.

Jedlicka, L., & Jumah, A. (2006). The Austrian insurance industry: a structure, conduct and performance analysis. *Economics series*, *189*. Institute for Advanced Studies. Retrieved from https://ideas.repec.org/cgi-bin/htsearch?q=The+Austrian+Insurance+Industry%3A+A+Structure%2C+Conduct+and+Performance+Analysis on June 23, 2023.

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. https://doi.org/10.52950/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. https://doi.org/10.26417/ejms.v1i1.p352-360

Lament, M. (2019). *Raportowanie niefinansowe a wyniki finansowe zakładów ubezpieczeń.* Warszawa: CeDeWu.

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. Retrieved from https://archive.aessweb.com/index.php/5002/article/view/1191 on June 23, 2023.

Marjanović, I., & Popović, Ž. (2020). Profitability determinants of insurance companies in the Republic of Serbia. In: *Economic and financial challenges for Balkan and Eastern European countries* (pp. 133-159). Springer, Cham.

Moro, O., & Anderloni, L. (2014). Non-life insurance economic performance - an empirical investigation. *Journal of Economics & Management*, *18*, 159-177.

OECD Statistics. Insurance Statistics. Retrieved from https://stats.oecd.org, on August 15, 2023.

Ofori-Boateng, K., Ohemeng, W., Boro, E.H., & Agyapong, E.K. (2022). Efficiency, market structure and performance of the insurance industry in an emerging economy. *Cogent Economics & Finance*, *10*, 2068784. https://doi.org/10.1080/23322039.2022.2068784

ORBIS Database. Bureau van Dijk. A Moody's Analytics Company.

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. https://doi.org/10.3386/w0163

Pervan, M., Ćurak, M., & Marijanović, I. (2012). Dynamic panel analysis of B&H insurance companies' profitability. *Recent Researches in Business and Economics, 1*, 158-163.

Polish Chamber of Insurance (2023). *Insurance figures in 2022.* Retrieved from https://piu.org.pl/en/insurance-figures-in-2022/ on May 12, 2023.

The Polish Financial Supervision Authority (2023). *Annual bulletin. Insurance market 2022*. Retrieved from https://www.knf.gov.pl/en/REPORTS_AND_ANALYSIS/Insurance/Annual_data/2022 on May 12, 2023.

Pope, N., & Ma, Y.L. (2008). The market structure – performance relationship in the international insurance sector. *Journal of Risk and Insurance*, *75*(4), 947-966. https://doi.org/10.1111/j.1539-6975.2008.00292.x

Smirlock, M. (1985). Relationship between concentration and profitability in banking. *Journal of Money, Credit and Banking*, *17*(1), 69-83.

Swiss Re (2023). *World insurance: stirred, and not shaken*. Zurich: Swiss Re Institute, Sigma 3, 1-65.

Varga, V., & Madari, Z. (2023). The Hungarian insurance market structure: an empirical analysis. *Central European Journal of Operations Research, 31*, 927-940. https://doi.org/10.1007/s10100-023-00842-8

Yuvaraj, S., & Abate, G. (2013). A study on the financial performance of insurance companies in Ethiopia. International. *Journal of Marketing, Financial Services and Management Research*, *2*(7), 138-150.

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