Impact of the COVID-19 pandemic on the operations of Polish insurance companies in section II

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***Abstract*— The impact of the pandemic on the economy is undeniable, most business entities have recorded losses, How did insurance companies in Poland present themselves against this background? Are the results achieved in the pre-pandemic period significantly different from those achieved during the pandemic? What is their financial condition? This article attempts to answer this question. The source of empirical information was data made available by the supervisory authority, and the analysis concerned non-life insurance companies (section II). The study provided a rather surprising conclusion - the average values of profitability, and claims ratios did not differ significantly between the periods 2018-2019, 2020-2021 i 2022-2023. It allows concluding that the COVID-19 pandemic had a quite insignificant impact on the situation of the insurers analyzed.**

Keywords— insurance companies, profitability, claims, pandemic

I. INTRODUCTION

The COVID-19 pandemic, which is a negative macroeconomic shock, has had a significant impact on the activities of companies from many sectors of the economy, including the financial market and the condition of insurers. For example, in the period from March to June 2020, the profits of Ghanaian insurance companies decreased by approx. 16%, written premiums – by nearly 17%, and claims increased by over 38%, which had a significant negative impact on the financial condition of such entities (Babuna P., at al., 2020). It is worth noting, however, that the financial market of this country is at a lower level of development than in Europe. The countries of the Old Continent in terms of the impact of the pandemic situation on the economic situation of insurance companies was analyzed, among others, by K. Puławska. It identified the impact of the pandemic on the decrease in the average return on assets. In general, her results differed significantly between individual countries – for example, the author stated that there was no negative impact of the pandemic on the situation of insurers in Poland, and that it occurred in Germany, Belgium or Italy (Puławska K., 2021).

According to Farooq et al., the rates of return on shares of German insurers, among others, recorded declines of several dozen percent. However, the negative impact of the pandemic affected life insurance companies to a greater extent than non-life insurers (Farooq et al., 2021). U.S. non-life insurers generated significant operating losses in response to COVID-19. However, such companies maintained a similar level of market capitalization as before the pandemic, issuing capital and reducing dividends (Berry-Stölzle T., Esson M., 2023). Insurance companies operating on the Chinese market, as in the case of Ghana, recorded significant declines in written premiums. However, as in the case of German insurers, property insurance companies turned out to be more resilient (Wang Y., 2020).

To sum up, insurance companies from different parts of the world have been affected by the impact of the COVID-19 pandemic to varying degrees. This study focuses on the assessment of the impact of the pandemic on the operations of Polish insurers. The area of profitability and loss ratio was taken into account. The analysis was carried out on the example of insurance companies of section II, examining the period 2018-2023.

II. PROFITABILITY RATIOS IN THE ASSESSMENT OF THE SITUATION OF INSURANCE AND REINSURANCE UNDERTAKINGS.

The financial result is a measure that has always been the most synthetic parameter of business results. The net profit presented in the profit and loss account is an indicator of the

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profitability of the actions taken. An entity that makes a profit is perceived positively on the market, the one that brings losses is the opposite. Making a profit is the main factor stimulating business activity (Dressler Z., 2014). The profit and loss account is a source of information about the profitability of a given entity, if the entity shows a profit, it is said to be profitable, if a loss is said to be deficit. Profitability is a broader concept that encompasses both possibilities.

When talking about profitability analysis, as a rule, profitability ratios are examined, illustrating the financial efficiency of business activity, as well as information about the speed of return of the funds and capital involved. With regard to insurance companies, it is worth extending the audit due to investment activity, which plays an equal role in addition to insurance and reinsurance activities. The specificity of the insurance activity causes a significant shift in time of revenues and related costs, and it is deposits that are the basic source of securing the insurer's solvency. Therefore, it is important to take into account investment activity when examining profitability.

Insurance companies prepare the profit and loss account in two parts (one part is the technical result, the other is the overall result), and the reinsurance company even in three parts (two technical accounts and one general account). These reports differ in the location of investment activity, which in the life insurance division is a component of the technical result, and in the non-life insurance division it is included in the general result. This differentiation is an important element in the analysis of the profitability of an insurance company, because the technical result resulting from the first part of the profit and loss account has different content. The technical result in Section I consists of four segments of the insurance company's activity: insurance activity, reinsurance, other technical activity and investment activity. The technical result in section II is poorer by the latter element. When analyzing the profitability of an insurance company, it is possible to compare companies with each other only within a given department.

The ratios most often used in the study of the profitability of insurance companies include the ratios presented in Table 1.

TAB. 1: PROFITABILITY RATIOS OF AN INSURANCE COMPANY

Indicator name	Indicator formula
Technical profitability ratio	$\frac{technical\ result}{gross\ written\ premium} x100$
Net return on sales ratio	$\frac{net\ income}{gross\ written\ premium} x100$
Return on investment ratio	$\frac{investment\ income}{total\ deposits} x100$
Return on assets ratio	$\frac{net\ income}{assets} x100$
Return on equity ratio	$\frac{net\ income}{equity} x100$

Source: B.Jonczyk, H. Ogrodnik, D. Szewieczek, M. Wieczorek, K. Znaniecka, Financial analysis of an insurance company, Publishing House of the University of Economics in Katowice, Katowice 2006, pp.112-113

However, in practice, there are many variations of these indicators that differ from each other. And so, with regard to the first indicator on the website of the supervisory authority, in the reports on the state of the insurance market, you can find a formula in which the premium earned on the deductible (The premium earned on the deductible is the first item in both technical accounts called "premiums". It is determined as gross written premium less the reinsurer's share in the premium and adjusted for a change in the premium provision and a change in the reinsurer's share in the premium reserve) (i.e. revenue commensurate with costs) is used in the denominator. Regardless of the formula, this indicator is a stimulant, i.e. the higher the value, the better, and if the value increases from year to year in a longer period of time, it is interpreted positively.

The return on investment ratio and the average return on investment ratio are basically variations of the same indicator with the same interpretation as a stimulant. The only difference between them is the denominator, in which the first form uses the value of deposits at the end of the period, and the second form uses the average value of deposits from a given period. The supervisory authority's reports include only the latter form, which seems to be a better reflection of the profitability of investment activities.

The return on assets and return on equity ratios have the average value of assets and equity, respectively, used in the denominator of the formulas. These indicators have the same interpretation as in the case of traditional analysis.

III. COST LEVEL RATIOS IN THE ASSESSMENT OF THE FINANCIAL SITUATION OF AN INSURANCE COMPANY.

Cost analysis is one of the most interesting elements of the entire ratio analysis. Each unit, striving to improve the efficiency of its management, must analyze the level of its costs in relation to selected categories of the profit and loss account. Cost level indicators answer the general question of how many costs are necessary to generate a unit of revenue. The general form of such a relationship is:

$$\frac{cost}{revenue\ form\ sales} x100$$

Cost analysis can be done at different levels of detail, from the level of the share of individual costs in revenues to the level of the share of the total costs of the entity in revenue. Observation of changes in such indicators over the years will allow us to determine the direction of change. Of course, the most favorable situation is a decreasing trend. The lower the value of the cost level, the better the efficiency of a given unit can be assessed, which means that these indicators are classified as destimulants.

Compensation is the most important cost of insurance business, and in addition, it is the most difficult to predict and plan. The occurrence of damage covered by insurance is independent of the insurance company, which can only try to minimize their value by conducting preventive activities. Loss ratios have no equivalents in the standard ratio analysis, they are included in the group of cost level indicators. The loss ratio also plays an important role in determining the value of certain technical provisions. Its general formula is the ratio of compensation to premium. It is important to use comparable categories to calculate the value of the indicator. In practice, there are two varieties of this indicator, which are presented in Table 2 (identical formulas are included in the reports of the

supervisory authority), although four variants are possible, as both the premium and the compensation come in four varieties (Premium, i.e. income from core insurance and reinsurance activities, comes in four varieties: as gross written premium, written premium on deductible, gross earned premium and premium earned on deductible. The same applies to the category of compensations, they are as follows: gross claims and benefits, gross deductibles, gross claims, and gross deductibles, and gross deductibles.)

TAB. 2.: LOSS RATIOS

Indicator name	Indicator formula
Gross loss ratio	$\frac{gross\ claims\ for\ the\ reporting\ period}{gross\ earned\ premium}$x100
Loss ratio on deductible	$\frac{claims\ on\ net\ for\ the\ reporting\ period}{contribution\ earned\ on\ deductible}x100$

Gross claims for the reporting period = gross claims +/- change in the provision for claims not paid
Claims on net for the reporting period = gross claims and benefits paid – the reinsurer's share in claims +/- change in the balance of the provision for claims not paid -/+ change in the reinsurer's share in the provision for claims not paid
Source: B. Jonczyk et.al. , op. cit. p. 109

The loss ratio provides the analyst with information on what part of the gross premiums earned in a given period was allocated to the payment of claims. Therefore, its value should not exceed 100%, as this would mean the need to add funds for the payment of compensation from funds other than current income. Observation of the level of the loss ratio in the cross-section of individual insurance groups also allows for the identification of the most and least profitable insurance. In this way, it also makes it possible to assess the accuracy of the calculation of insurance premiums (Jończyk B., et. al, 2006). In insurance companies of section II, the loss ratio on own should be at the level of 70 – 80% and in section I at the level of 30 – 40%, (Wanat – Połeć E. at al, 2001) but these are only recommended levels.

The profitability and loss ratios presented above were used in an empirical study aimed at assessing the impact of the pandemic on the situation of selected insurance companies.

IV. EMPIRICAL STUDY

The empirical analysis focuses on the assessment of the differentiation of the value of selected profitability ratios and the loss ratio of Polish insurers in section II. The audit period covers the years 2018-2023, which is dictated by the purpose of the analysis – to assess changes in the financial condition of selected insurers through the prism of the impact of the COVID-19 pandemic. The period 2018-2019 is treated as pre-pandemic, the years 2020-2021 – as the period of the COVID-19 pandemic, and the years 2022-2023 – as the years after the pandemic.

Descriptive statistics were initially calculated, correlations between individual indices were estimated, and a test of the differentiation of means was performed. Due to the significant variability of the values of individual indicators, it was decided to remove outliers from the sample – 1 with the highest and the lowest value for a given variable in a given subperiod. Descriptive statistics for variables after excluding outliers are presented in Table 3.Table 3.: Descriptive statistics for selected indicators for 2018-2023

		Min.	Max.	Av.	St. Dev.	Cov.	Q1	Q2	Q3
ROA	2018	0,1%	2,7%	1,4%	0,7%	0,53	0,7%	1,6%	2,0%
	2019	0,5%	4,1%	2,1%	1,1%	0,53	1,4%	1,6%	2,8%
	2020	0,5%	3,6%	2,0%	1,0%	0,49	1,2%	1,9%	2,8%
	2021	0,0%	3,6%	1,9%	1,1%	0,56	1,4%	2,2%	2,6%
	2022	-0,5%	3,9%	1,4%	1,1%	0,78	0,8%	1,6%	2,0%
	2023	-1,3%	4,0%	1,7%	1,4%	0,82	1,1%	1,7%	2,4%
ROE	2018	0,5%	16,5%	7,3%	5,1%	0,70	3,2%	5,9%	12,1%
	2019	1,5%	23,1%	11,8%	7,1%	0,60	6,1%	12,7%	16,9%
	2020	1,1%	17,4%	9,1%	4,5%	0,49	5,6%	10,1%	12,2%
	2021	0,3%	20,5%	10,9%	6,9%	0,63	4,1%	13,3%	16,5%
	2022	-3,1%	29,6%	10,3%	9,2%	0,89	3,6%	7,9%	15,9%
	2023	-16,2%	18,8%	8,7%	8,6%	0,98	6,8%	10,7%	14,1%
ROS	2018	0,1%	14,6%	4,6%	3,8%	0,82	2,5%	2,9%	5,0%
	2019	1,2%	11,0%	5,9%	2,7%	0,46	4,5%	5,8%	7,9%
	2020	0,9%	12,1%	6,0%	3,1%	0,51	4,0%	5,0%	8,3%
	2021	0,1%	21,7%	6,4%	5,4%	0,85	2,8%	5,5%	8,4%
	2022	-0,9%	14,1%	4,1%	3,9%	0,95	2,0%	3,6%	5,4%
	2023	-2,5%	10,3%	3,9%	3,2%	0,82	2,7%	3,4%	4,9%
ROD	2018	0,8%	3,1%	1,8%	0,7%	0,36	1,3%	2,0%	2,2%
	2019	0,7%	3,9%	2,1%	0,8%	0,37	1,8%	1,9%	2,4%
	2020	0,8%	2,4%	1,6%	0,5%	0,34	1,1%	1,7%	2,1%
	2021	0,3%	2,6%	1,4%	0,7%	0,50	1,0%	1,5%	2,0%
	2022	1,8%	4,2%	2,8%	0,8%	0,27	2,1%	2,7%	3,5%
	2023	2,8%	5,6%	3,7%	0,9%	0,24	3,1%	3,4%	4,5%
SZ_B	2018	21,3%	81,4%	49,8%	15,3%	0,31	46,4%	49,8%	56,5%
	2019	26,2%	84,7%	52,3%	15,1%	0,29	48,6%	51,8%	57,7%
	2020	20,6%	61,1%	47,0%	11,7%	0,25	41,2%	48,9%	55,8%
	2021	13,9%	62,5%	40,7%	15,6%	0,38	27,8%	46,5%	50,3%
	2022	20,2%	63,4%	47,3%	15,1%	0,32	33,2%	52,0%	60,0%
	2023	24,9%	62,2%	48,1%	11,6%	0,24	45,9%	52,4%	54,7%
SZ_U	2018	26,0%	81,6%	56,1%	16,3%	0,29	48,7%	58,3%	65,5%
	2019	25,1%	66,8%	50,8%	15,0%	0,29	35,5%	55,9%	62,4%
	2020	25,7%	66,1%	47,9%	13,5%	0,28	36,3%	48,5%	61,7%

	Min.	Max.	Av.	St. Dev.	Cov.	Q1	Q2	Q3
2021	17,7%	65,1 %	47,2 %	15,9%	0,34	37,3 %	50,9 %	61,4 %
2022	26,7%	64,8 %	51,8 %	13,3%	0,26	39,6 %	57,5 %	62,4 %
2023	28,0%	68,4 %	54,4 %	11,5%	0,21	49,4 %	59,5 %	62,0 %

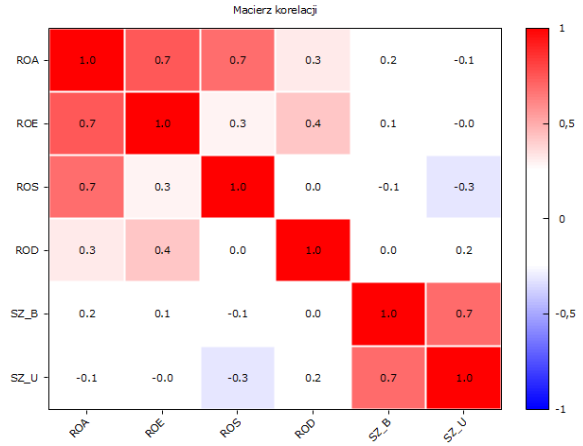
where:

ROA – return on assets, ROE – return on equity, ROS – return on net sales, ROD – profitability on investment activities, SZ_B – gross loss ratio, SZ_U – loss ratio on excl. – arithmetic mean, Odch. – standard deviation, Zm. – coefficient of variation, Q1, Q2, Q3 – quartile 1, 2 and 3, respectively.
Source: *In-house analysis using the Gretl package based on reports published on the website of the supervisory authority* www.knf.gov.pl *and data from the Orbis BvD Info database.*In 2018-2023, the analyzed insurance companies in section II generated positive financial results on average – the average and median technical profitability, assets or equity were at a positive level. The same was true for the third quarters, which means that the percentage of the analyzed insurers making losses did not exceed 25% in any of the years covered by the analysis. In the case of most of the profitability ratios studied, based on the analysis of descriptive statistics (especially the arithmetic mean and the median), it is not possible to clearly determine whether these variables reached values significantly different from the pre- or post-pandemic periods. The exception in this context is the return on deposits – in the case of this variable, the highest averages and medians (as well as the highest values of quartiles 1 and 3 and the lowest volatility ratios) were recorded in 2022-2023, in the period treated as post-pandemic. On the other hand, in the period 2022-2023, the lowest minimum values were observed for the ROA, ROE and ROS variables. Moreover, in these years, the coefficients of volatility were on average higher than in the periods 2018-2019 and 2020-2021.

Loss ratios were much less volatile than profitability ratios. The gross loss ratio was on average 41-52% in relation to the premiums received, while the loss ratio on deductible was 47-56% on average. In the case of both loss indices, the lowest values of the arithmetic mean and the median were in the pandemic period. The maximum values of the loss ratio were at a level not exceeding 85%, which can be considered as a manifestation of a relatively safe (appropriately low) level of claims paid in relation to premiums. Interestingly, the highest maximum values were recorded in 2018, in the pre-pandemic period.

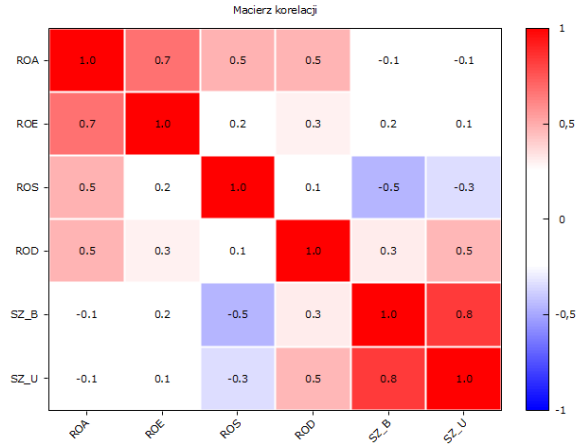
In general, the profitability and loss ratio among the surveyed entities can be assessed rather positively – most of the insurers in section II generated positive financial results, maintaining the loss ratio at a relatively safe level. It is also worth paying attention to the interconnections of the analyzed indicators, insight into what the correlation analysis provides. Correlations between indices (excluding outliers) are shown in Fig. 1-3. Statistically significant, strong positive correlations in each of the analysed periods occurred between the return on assets, equity and net sales ratios. Moreover, they were the strongest in the 2022-2023 period. The return on investment index also showed a positive relationship with other profitability ratios, but they were at a much lower level. Since insurance companies most often invest their assets in real estate and on the financial market, any slowdown in these areas will be reflected in reduced return on investments. Such a period of reduction was the time of the pandemic, where the financial market stagnated, and in 2022-2023 a decisive recovery. The gross loss ratio and the net loss ratio in each period were also characterized by a strong positive relationship, which indicates a relatively low share of reinsurance utilization.

FIGURE 1.: CORRELATION MATRIX FOR THE ANALYZED VARIABLES FOR THE PERIOD 2018-2019



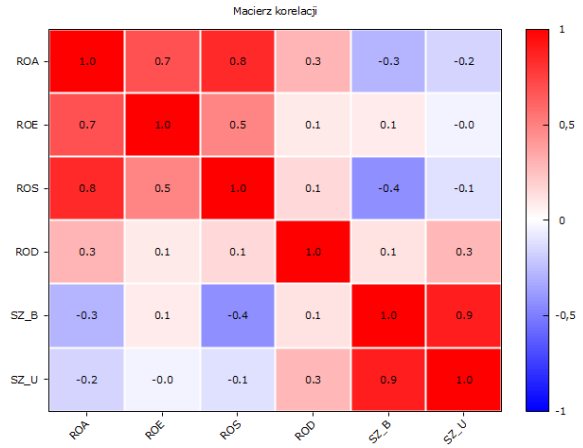
Source: Own analysis using the Gretl package based on reports published on the website of the www.knf.gov.pl supervisory authority http://www.knf.gov.pl/ and data from the Orbis BvD Info database.

FIGURE 2.: CORRELATION MATRIX FOR THE ANALYZED VARIABLES FOR THE PERIOD 2020-2021



Source: Own analysis using the Gretl package based on reports published on the website of the www.knf.gov.pl supervisory authority http://www.knf.gov.pl/ and data from the Orbis BvD Info database.

FIGURE 3.: CORRELATION MATRIX FOR THE ANALYZED VARIABLES FOR THE PERIOD 2022-2023



Source: Own analysis using the Gretl package based on reports published on the website of the www.knf.gov.pl supervisory authority http://www.knf.gov.pl/ and data from the Orbis BvD Info database.

With regard to the correlation between profitability and loss ratios, it could be expected that they would be at an average

negative level – higher profitability would then be associated with a lower loss ratio. However, the results obtained only partially confirm these assumptions – the negative correlation was particularly related to the relationship between the loss ratio on own and profitability. From this perspective, it can be concluded that among the analysed insurers, a higher loss ratio on deductible had a negative impact on the financial results achieved. On the other hand, the link between the profitability of investments and loss ratios was not negative in each period of the analysis. This may indicate an increased intensity of investment activity of insurance companies to provide themselves with funds for the payment of compensation. It may also be the result of a general trend on the market, as the level of the loss ratio is not clearly related to investment activity. However, this phenomenon requires an in-depth analysis beyond the scope of this article.

From the perspective of this study, apart from the analysis of descriptive statistics and correlations, it is also worth verifying the hypotheses about the lack of significant differences between the average values of individual financial indices of insurers. The results of the t-test for dependent samples, selected in this respect, are presented in Table 4.Table 4.: Results of the Mean Differentiation Test

Variable	Years	Test statistics	Value p
ROA	2018-2019 vs 2020-2021	0,8540	0,3962
	2020-2021 vs 2022-2023	-1,3587	0,1789
	2018-2019 vs 2022-2023	-0,6152	0,5406
ROE	2018-2019 vs 2020-2021	0,2565	0,7984
	2020-2021 vs 2022-2023	-0,2590	0,7965
	2018-2019 vs 2022-2023	-0,0427	0,9661
ROS	2018-2019 vs 2020-2021	-0,9747	0,3333
	2020-2021 vs 2022-2023	-2,2320	0,0292
	2018-2019 vs 2022-2023	-1,4965	0,1396
ROD	2018-2019 vs 2020-2021	2,6211	0,0109
	2020-2021 vs 2022-2023	8,7258	0,0000
	2018-2019 vs 2022-2023	6,2018	0,0000
SZ_B	2018-2019 vs 2020-2021	-2,0538	0,0440
	2020-2021 vs 2022-2023	-1,1467	0,2558
	2018-2019 vs 2022-2023	-0,9491	0,3463
SZ_U	2018-2019 vs 2020-2021	-1,5878	0,1172
	2020-2021 vs 2022-2023	1,6518	0,1035
	2018-2019 vs 2022-2023	-0,0861	0,9317

Source: Own analysis using the Gretl package based on reports published on the website of the www.knf.gov.pl supervisory authority http://www.knf.gov.pl/ and data from the Orbis BvD Info database.
Values relevant to $p<0.05$ are bolded (assuming a two-sided critical area).The results obtained in the case of most variables indicated that there was no significant differentiation of average values between the years 2019-2020, 2020-2021 and 2019-2021. Only 5 pairs constructed in this way out of 18 analyzed were characterized by statistical significance for $p<0.05$. These were: return on deposits (all 3 pairs), net return on sales (2020-2021 vs 2022-2023) and gross loss ratio (2018-2019 vs 2020-2021). On the basis of these results, it is only possible to clearly indicate a significant difference in the average values of return on investments in individual sub-periods 2018-2023 and the gross loss ratio, where the average value for the period 2018-2019 differed significantly from the values for subsequent sub-periods. In the case of the other financial indices analysed, it cannot be clearly concluded that there is a significant difference between the pre-pandemic period, the period of the COVID-19 pandemic and the years after its end. In general, the results do not confirm the significant impact of the COVID-19 pandemic on the financial situation (assessed from the perspective of profitability and loss ratio) of Polish insurers in Section II.

V. CONCLUSIONS

Profitability and loss ratios are key measures in assessing the financial condition of insurance companies. The services of such entities are widely used by both enterprises and households, transferring risk, which emphasizes the importance of insurers in the economy. Hence, the financial analysis of insurance companies seems to be an important area of interest for all types of analysts.

The COVID-19 pandemic has definitely affected the economic situation of insurers, but such an impact was observed to a different extent for individual countries. In the case of Polish insurance companies, K. Puławska pointed to the lack of a significant impact of the pandemic on the condition of such entities – this conclusion was also empirically confirmed in this study.

Based on the descriptive statistics for the analyzed indicators, it can be concluded that most of the insurers of section II in the period 2018-2023 made profits. Loss ratios remained on average at a safe level, referring to the ranges postulated in the literature on the subject. On the other hand, most of the indices surveyed were characterized by significant volatility.

On the basis of the analysis of correlations between individual groups of ratios (profitability and loss ratio), an average negative relationship between the loss ratio on equity and the return on assets, equity or net sales was identified. However, these correlations were usually not strong or found to be statistically insignificant. In general, the results of the empirical study do not confirm the hypothesis that the pandemic situation has a significant impact on the profitability and loss ratio of insurance companies (on the example of Polish insurers in section II). Of all the variables analyzed, only the profitability of deposits was characterized by a significant variation in average values between individual years 2018-2023. For the other variables, either the results were not sufficient to reject the hypothesis that there were no significant differences between the means, or the results were inconclusive.

It seems that the lack of significant differentiation with respect to loss ratios can be explained by the lack of universality of insurance against extraordinary events, such as the COVID-19 pandemic. As a result, insurers were not overburdened with damages and benefits to be paid after the outbreak of the pandemic. There was also no phenomenon of customers withdrawing from insurance and terminating contracts, which would translate into a sharp change in the level of profitability. Significant differences in averages were identified only for the profitability of deposits, for which the average decreased during the pandemic period, while increasing significantly in 2022-2023. This is probably related first to the slowdown of the entire economy during the pandemic, and then to the general recovery after the pandemic. On the other hand, the average values of the other profitability indices of the analyzed insurance companies did not differ significantly from year to year, which was influenced by, m.in other things, the relative stability of the loss ratio. On the other hand, the economic situation in Poland, including relatively high inflation, also had a significant impact in this context.

VI. REFERENCES

Babuna P. et al.. *The Impact of COVID-19 on the Insurance Industry*, International Journal of Envoronmental Research and Public Health, 17, 5766, 2020

Berry-Stölzle T., M. Esson, *Capital issuances and premium growth in the property–liability insurance industry: evidence from the financial crisis and COVID-19 recession*, The Geneva Papers on Risk and Insurance – Issues and Practice, 2023

Dressler Z., *Przedmiot, cel i metody badawcze zagadnienia rentowności przedsiębiorstw w Polsce* [w:] Rentowność przedsiębiorstw w Polsce pod red. Z. Dresslera, Wydawnictwo Uniwersytetu Ekonomicznego w Krakowie, Kraków, 2014

Farooq U. et al, *The impact of COVID-19 pandemic on abnormal returns of insurance firms: a cross-country evidence*, Applied Economics, 53, 31, 2021

Jończyk B., Ogrodnik H., Szewieczek D., Wieczorek M., Znaniecka K., *Analiza finansowa zakładu ubezpieczeń*, Wydawnictwo Akademii Ekonomicznej w Katowicach, Katowice, 2006

Puławska K., *Financial Stability of European Insurance Companies during the COVID-19 Pandemic*, Journal of Risk and Financial Management, 14, 266, 2021

Wanat – Połeć E., (red.), Bijak W., Kwiatkowski R., Smętek M., *Metodologia analizy finansowej zakładów ubezpieczeń,* Departament Analiz Systemu Ubezpieczeniowego PUNU, Warszawa, 2001

Wang Y*., How Does COVID-19 Affect China's Insurance Market?*, 56, 10,2020

www.knf.gov.pl