










“Pre- and post-effect of COVID-19 on the insurance industry: A study based on Romanian companies”

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| AUTHORS | Anamaria-Geanina Macovei  Olha Popelo   Artur Zhavoronok   Robert Dankiewicz  Cristina Gabriela Cosmulese  Liubov Popova  |
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Olha Popelo, Artur Zhavoronok,
Robert Dankiewicz, Cristina Gabriela
Cosmulese, Liubov Popova, 2024

Anamaria-Geanina Macovei, Ph.D.,
Lecturer, Department of Accounting,
Audit and Finance, Stefan cel Mare
University, Romania.

Olha Popelo, D.Sc., Professor,
Department of Management and
Administration, Chernihiv Polytechnic
National University, Ukraine.

Artur Zhavoronok, Ph.D., Associate
Professor, Department of Finance and
Credit, Yuriy Fedkovych Chernivtsi
National University, Ukraine.
(Corresponding author)

Robert Dankiewicz, Ph.D., Associate
Professor, Department of Finance,
Banking and Accountancy, Rzeszow
University of Technology, Poland.

Cristina Gabriela Cosmulese, Ph.D.,
Assistant Professor, Department of
Accounting, Audit and Finance, Stefan
cel Mare University, Romania.

Liubov Popova, Ph.D., Associate
Professor, Department of Finance and
Credit, Yuriy Fedkovych Chernivtsi
National University, Ukraine.



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Anamaria-Geanina Macovei (Romania), Olha Popelo (Ukraine),
Artur Zhavoronok (Ukraine), Robert Dankiewicz (Poland),
Cristina Gabriela Cosmulese (Romania), Liubov Popova (Ukraine)

PRE- AND POST-EFFECT OF COVID-19 ON THE INSURANCE INDUSTRY: A STUDY BASED ON ROMANIAN COMPANIES

Abstract

The COVID-19 pandemic has had a detrimental effect on the global economy, including the insurance industry. It has forced financial markets to confront a new risk directly related to the virus's rapid spread. Therefore, the paper aims to determine possible risks or opportunities that insurance companies may encounter, considering both pre- and post-pandemic phases. For this purpose, financial data of 110 Romanian insurance companies for 2016–2022 were analyzed. The topfirme platform was used in the data collection process. Subsequently, based on statistical analysis methods, an econometric model was developed to evaluate the turnover for insurance companies in Romania. When developing the model equation, establishing dependent and independent variables based on the Altman model or the Z-model of bankruptcy prediction was considered. Thus, the findings indicate that employees are the primary factor in these businesses' proper operation and increased profitability. It is emphasized that turnover directly depends on these variables since the number of employees is a variable around which incomes and expenses fluctuate. Turnover is affected positively or negatively depending on employee productivity and workload, which can lead to increased revenues and decreased costs, or vice versa. Accordingly, an insurance company's HR department should resolve issues that crop up during the shift to telemedicine, enhance workers' digital skills, provide them with moral and psychological support, and foster stable working relationships. It should also implement strategies to sustain and raise employee engagement levels, fortify control measures, and alter internal communications.

Keywords

insurance companies, services, COVID-19, econometric model, Altman model, stock market

JEL Classification

G22, G23, G28, G29, G32

INTRODUCTION

The business environment is changing, health and safety regulations are becoming more complex, and the economic consequences of the pandemic are being felt on investment portfolios. In some cases, this can lead to losses for insurance companies. During the healthcare crisis pandemic, insurance companies faced many risks. One is an increase in pandemic-related claims, including event cancellations, work interruption claims, and health insurance claims. The volume and severity of these requirements create a financial burden on insurance companies in Romania. In addition, low interest rates and volatile financial markets make it difficult for insurers to generate sufficient investment income, and uncertainty related to the pandemic makes it difficult for insurers to accurately assess and underwrite risks.

Insurance companies in Romania also face reputational risks if responses to policyholders' claims are deemed inadequate or if they are unable to offer coverage for pandemic-related risks. In the post-effect

of Covid-19, it is extremely important for insurers to maintain customer confidence and take care of policyholders' needs in uncertain times. However, insurance companies' operations, capital requirements, and risk management strategies have been affected by new regulations enacted in response to the pandemic. Therefore, in order to maintain financial stability in the post-Covid period and continue to offer reliable insurance coverage, insurance companies must actively manage these risks. This will facilitate the introduction of reasonable risk management procedures, close monitoring of investment portfolios, and modification of underwriting procedures in accordance with market changes.

1. LITERATURE REVIEW

The COVID-19 pandemic and its side effects currently pose significant worldwide risks, which have impacted powerful financial institutions like insurance companies (Danylyshyn, 2020; Mukarker, 2023). In this regard, risk insurers confront a number of difficulties in meeting their contractual commitments to clients while also making sure owners receive the required financial performance and return on their investment (Grofcikova & Izakova, 2021; Abramova et al., 2024; Tayeh et al., 2023). Restrictions imposed by the governments of individual countries, related not only to movement but also to limiting the possibility of conducting business, have put some entities, including insurers, in a difficult situation (Dankiewicz et al., 2021).

Insurance claims have significantly increased as a result of the COVID-19 pandemic. The property and casualty insurance industry is anticipated to see a rise in claims as a result of business disruption and cancellation events, according to Swiss Re Institute (2020). It is anticipated that the life insurance industry will see a rise in claims as a result of deaths linked to COVID-19. Due to the need for many to postpone or cancel their travel plans, the pandemic has also resulted in a decline in the market for some insurance products, including travel insurance. In addition, the stock market has been volatile, affecting investment income for insurance companies (Jerry, 2021). In addition to all of these weaknesses mentioned, the pandemic has also led to increased demand for certain insurance products, such as health and life insurance (Han & Mun, 2023; Richter & Wilson, 2020; Shkarlet et al., 2019). The pandemic stressed the importance of adequate insurance protection, leading to increased awareness and interest in insurance products.

Chummun and Nleya (2023) examined in a recent study the role that human resources play in an insurance company's ability to operate and survive. Employees play a critical role in decision-making, teamwork, communication, creativity, and innovation, all of which substantially impact how well insurance companies perform (Judeh, 2023).

Babuna et al. (2020) focus on the risks associated with the pandemic, namely those arising from various health insurance claims and complaints. Alshammari and Altarturi (2021) analyze the new rules introduced in response to the pandemic that regulate the work of insurance companies and outline the features of developing risk management strategies.

Santos (2022) studies the impact of IFRS 17 on insurance companies during the pandemic period. His analyses suggest that the greatest impact in terms of insurance contracts relates to long-term ones. As the company operates mainly on short-term contracts of up to 12 months, it does not expect a significant impact on its operations. According to a study (Owais & Dahiyat, 2020) on the preparedness of Jordanian insurance companies to implement International Financial Reporting Standards (IFRS 17) and the difficulties in doing so, insurance companies are not very capable of defining the scope of IFRS 17, analyzing the effects of applying IFRS 17 to financial reports, or creating new internal monitoring techniques to implement IFRS 17. The data challenge is the largest obstacle to applying IFRS 17.

Employees who are knowledgeable, devoted, and driven contribute innovative ideas to strategic decision-making (Chummun & Mathithibane, 2020; Shkolnyk et al., 2022; Tulchynska et al., 2024; Lesníková et al., 2022). The caliber of personnel from different departments determines the pro-

duction of new ideas. According to Thompson (2020), inventive personnel can serve as both a competitive advantage and an organizational asset. Therefore, creativity serves as the foundation for innovation when workers convert their own ideas into offerings of goods or services.

Employee turnover is a phenomenon that should be considered because it negatively affects a company's performance by changing its functions due to the departure of skilled and knowledgeable workers. The expansion of insurance companies may already be threatened because there is currently no minimum degree of education or experience needed to work in the insurance sector (Al Mamun & Hasan, 2017). For an organization to be stable and competitive, leaders must work to lower employee turnover.

Traditionally, insurers have financed their business by accepting payments from their first clients and employing sophisticated money management techniques that take regulatory capital adequacy requirements and risk-return models into consideration. But when creating the ideal capital structure, insurance companies-like any other business in any sector-need to take into account all available funding options, including conventional third-party loans. Financial sponsors are searching more and more for regulated insurance assets. Typically, they use a leveraged investment approach. Financial sponsors have typically concentrated on more easily regulated insurance brokerage firms; however, a number of recent acquisitions of regulated insurance indicate that regulators and sponsors are likely getting more acquainted with one another and the creative debt capital structures utilized to fund these deals (Mathews, 2020).

Even in the midst of the pandemic, this equated to standard client interactions in the insurance industry. In this context, Gopalakrishnan et al. (2022) investigated the relationship of individual factors of COVID-19 with variations in loan and bond financing, based on analytical data of firms in 61 countries. According to their research, the trend in debt financing during COVID-19 is linked to the suitability of certain industries for remote work; that is, companies in more physically demanding industries are less likely to use

debt financing. Their analysis also shows that, in comparison to companies that are more likely to use remote work, businesses have a comparatively higher cost of financing during the pandemic.

The study's purpose is to identify possible risks or opportunities that insurance companies may face in the near future, taking into account both the pre- and post-pandemic phases.

The following hypotheses were formulated:

H1: In the context of the COVID-19 pandemic's disruption, allowing employees to participate in decision-making can give insurance companies a greater competitive edge and lower employee turnover.

H2: The performance of insurance companies in a challenging credit environment brought on by the COVID-19 pandemic is heavily influenced by the role of actual factors and managerial motivations underlying debt financing.

2. METHODS

In order to carry out the analysis, data were collected from 110 insurance companies via the topfirm website (Bankar, 2023). Following the application of the inclusion-exclusion criteria, i.e. the going concern criterion, only 98 companies remained to be analyzed. The field covered is insurance, NACE code 6511 – Life insurance activities, NACE 6512 – Other insurance activities (except life insurance), NACE 6530 – Pension funding activities (except public social security), NACE 6619 – Activities auxiliary to financial intermediation, except insurance and pension funding activities, NACE 6622 – Activities of insurance agents and brokers, NACE 6629 – Other activities auxiliary to insurance and pension funding.

Six indicators were selected for analysis, which will be the dependent and independent variables of the regression model. The indicators analyzed are: turnover, average number of employees, total revenues, total expenses, receivables and payables. These indicators have been selected in order to observe the evolution and the influence they have on the performance of the company; in this sense, turnover was chosen as the dependent variable.

The following model was used to test the research hypotheses::

$$T_i = \alpha + \beta_1 \cdot AE_i + \beta_2 \cdot R_i + \beta_3 \cdot E_i + \beta_4 \cdot AR_i + \beta_5 \cdot D_i + \varepsilon, \quad (1)$$

where: T_i – turnover indices, the dependent variable of the model; AE_i – average number of employee indices; R_i – revenue indices; E_i , AR_i – account receivable indices; D_i – debts indices – are the independent variable; β_0 , β_1 , β_2 , β_3 , β_4 , and β_5 – are the parameters of the regression model; ε – is the random error variable, which quantifies the influence of randomly acting factors.

3. RESULTS

Using the data processing results, it was possible to create an econometric model and determine the regularity between the variables of turnover, average number of employees, income, expenses, claims, and debts (Table 1).

Table 1 shows that there is a significant relationship between claims, revenues, and the average number of employees. From an economic perspective, this correlation can be interpreted as a direct relationship between average employee count and receivables because the employees cannot contrib-

ute to the company's receivables production without competent workers.

When it comes to insurance companies, fewer insurance contracts are signed by staff members who deliver subpar services, which impacts the volume of claims the business makes. The second high-impact correlation between revenues and expenses shows the firm's position, profit, or loss, depending on the circumstances. These two fundamental indicators are relevant for any economic entity.

IBM SPSS Statistics 26 software was used for data analysis and regression model validation. The developed model analyzes the correlation dependence between the turnover and the independent variable. To ensure relevant results, a descriptive analysis of the variables presented in Table 2 was first carried out, and SPSS 26 statistical software was used to estimate the results.

Table 3 shows that the correlation coefficient for the analyzed model is 0.999. This indicates a strong correlation between the variables of the model: turnover, average number of employees, income, expenses, receivables, and payables, since its value is greater than 0.750. The coefficient of determination R^2 , which has a value of 0.997, is used to interpret the model.

Table 1. Correlation matrix values in RON

Source: Own processing in SPSS 26.

| Correlations | | | | | | | |
|---------------------|------------|-----------------|-----------|------------|-------------|---------|-----------------|
| Pearson Correlation | Turnover_i | AveragenoEmpl_i | Revenue_i | Expenses_i | AReivable_i | Debts_i | Sig. (1-tailed) |
| Turnover_i | 1.000 | .523 | .999 | .920 | .594 | .480 | .000 |
| AveragenoEmpl_i | .523 | 1.000 | .511 | .687 | .222 | .322 | .000 |
| Revenue_i | .999 | .511 | 1.000 | .916 | .597 | .480 | .000 |
| Expenses_i | .920 | .687 | .916 | 1.000 | .468 | .458 | .000 |
| AReivable_i | .594 | .222 | .597 | .468 | 1.000 | .937 | .000 |
| Debt_i | .480 | .322 | .480 | .458 | .937 | 1.000 | .000 |

Table 2. Descriptive statistics

Source: Own processing in SPSS 26.

| Pearson Correlation | Mean | Std. Deviation | N |
|---------------------|----------------|-----------------|-----|
| Turnover_i | 2,825,010.18 | 6,004,054.428 | 490 |
| AveragenoEmpl_i | 103,075,945.77 | 111,658,361.595 | 490 |
| Revenue_i | 105,258,043.87 | 115,751,897.880 | 490 |
| Expenses_i | 14,300,641.32 | 17,969,628.724 | 490 |
| AReivables_i | 39,401,002.48 | 50,229,171.509 | 490 |
| Debts_i | 252,211.83 | 1,072,423.007 | 490 |

Table 3. Model summary

Source: Own processing in SPSS 26.

| Model | R | R ² | Adjusted R ² | Std. Error of the Estimate | Durbin-Watson |
|-------|-------------------|----------------|-------------------------|----------------------------|---------------|
| 1 | .999 ^a | .997 | .997 | .05153528 | 1.917 |

Note: ^a Predictors: (Constant), AveragenoEmpl_i, Revenue_i, Expenses_i, AReceivables_i, Debts_i; Dependent Variable: Turnover_i (RON).

Table 4. ANOVA

Source: Own processing in SPSS 26.

| Model | Sum of Squares | Df | Mean Square | F | Sig. |
|--------------|----------------|-----|-------------|-----------|------|
| 1 Regression | 487.715 | 5 | 97.543 | 36727.079 | .000 |
| 1 Residual | 1.285 | 484 | .003 | – | – |
| 1 Total | 489.000 | 489 | – | – | – |

Also, the determination ratio value shows that 99.7% of the change in turnover is explained by the change in the variables average number of employees, income, expenses, receivables, and payables. In Table 3, the Durbin-Watson coefficient is determined with a value of 1.917.

The Fisher coefficient value is $F = 36727.079$. From the ANOVA table, the Sig. value for the F-test is less than 0.05, i.e. the constructed model explains the dependence between the analyzed variables by a multiple linear relationship, which is considered significant.

The ANOVA table (Table 4) provides information that aids in model testing.

The parameters of the multiple linear regression model are determined in Table 5.

From the ANOVA table (Table 4), the components of variation are shown in the second column otherwise:

The estimated equation is:

$$T_i = 1.415 \cdot 10^{-7} + 0.016 \cdot AE_i + 0.959 \cdot R_i + 0.029 \cdot E_i + 0.031 \cdot AR_i - 0.029 \cdot D_i. \quad (2)$$

- Regression Sum of Squares represents the estimated explained variance and has a value of 487.715;
- Residual Sum of Squares represents the estimated residual variance and has a value of 1.285;
- Total Sum of Squares is the estimated total variance that has a value of 489,000.

The econometric interpretation of the obtained model demonstrates the impact of the change in turnover on the exact factors of influence, namely:

- It was found that if the average number of employees increases by 1% and the other variables remain constant, then the turnover increases on average by 0.016%, which means that the value of human resources, creates an added value materialized also by the increase

Table 5. Model coefficients

Source: Own processing in SPSS 26.

| Model | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|------------------------------|-----------------------------|------------|---------------------------|--------|-------|
| | B | Std. Error | Beta | | |
| 1 (Constant) | 1.415E-17 | .002 | – | .000 | 1.000 |
| 1 AveragenoEmpl _i | .016 | .004 | .016 | 4.527 | .000 |
| 1 Revenue _i | .959 | .010 | .959 | 91.700 | .000 |
| 1 Expenses _i | .029 | .010 | .029 | 2.967 | .003 |
| 1 AReceivables _i | .031 | .012 | .031 | 2.571 | .010 |
| 1 Debts _i | -.029 | .011 | -.029 | -2.677 | .008 |

Note: Dependent Variable: Turnover_i (RON).

in turnover. In other words, the increase in the number of employees denotes an increase in the volume of work, leading to the development of the activity carried out; it can be seen that the two factors are related to the two variables with which they are correlated, namely turnover and average number of employees.

- In addition, following the developed model, it was established that if revenues increase by 1% and other variables remain unchanged, turnover decreases by an average of 0.959%. This aspect is related to the fact that in the case of insurance contracts, income from these contracts is divided into three categories: income from direct insurance (related to operating income within other economic entities), income for the creation of reserves, and income under reinsurance contracts. The model shows a strange fact for this ratio, but in the case of insurance companies, this behavior is somewhat unusual since a large part of the total income is directed to create reserves before the end of the contract, to be able to cover certain claims that may arise over time, thus the turnover decreases, since the mentioned incomes are not included in the incomes that make up the turnover.
- Also, this model found that if costs increase by 1% and other variables remain constant, turnover decreases by an average of 0.029%. From an economic point of view, this ratio is also maintained for insurance companies as for other economic entities. Expenses are an important indicator affecting the performance of firms. That is why, even in the case of insurance companies, if expenses increase, turnover decreases. The category of expenses incurred by an insurance company includes amounts paid for: “claims, personnel expenses, the performance of legal or contractual obligations, expenses relating to reinsurance commissions, etc.”, so if these types of expenses increase, turnover is affected, as its value decreases (as these expenses are part of the expenses that are part of the operating expenses category).
- Another important finding according to the model is that if receivables increase by 1% and the other variables remain constant, then turnover decreases on average by 0.031%. This is again atypical for economic companies, but in the model developed it was found that the situation is specific to insurance companies by recording revenues in advance. When insurance companies record an advance income, it represents a receivable that the company will have to collect, so the more such advance income is recorded, the more the company’s turnover is negatively affected as it decreases, since this income will have to be incorporated into the creation of reserves to cover possible claims by policyholders.
- It was determined that if debt increases by 1% and the other variables remain constant, turnover decreases on average by 0.029%. From an economic point of view, this statement holds for all economic entities, in this case, insurance companies. If a company borrows, the debt ratio increases, and turnover decreases. This is also true for insurance companies, according to the model developed.

Table 6 shows that the smallest residual value is -0.59144300, and the highest value is 0.61291951.

Figure 1 shows a histogram, which is characterized by a normal distribution, with a slight shift to the right.

Table 6. Residual statistics

Source: Own processing in SPSS 26.

| Indicator | Minimum | Maximum | Mean | Std. Deviation | N |
|----------------------|------------|------------|-----------|----------------|-----|
| Predicted Value | -.2016393 | 16.3936501 | .0000000 | .99868477 | 490 |
| Residual | -.59144300 | .61291951 | .00000000 | .05127113 | 490 |
| Std. Predicted Value | -.202 | 16.415 | .000 | 1.000 | 490 |
| Std. Residual | -11.476 | 11.893 | .000 | .995 | 490 |

Note: Dependent Variable: Turnover_i.

Source: Own processing in SPSS 26.

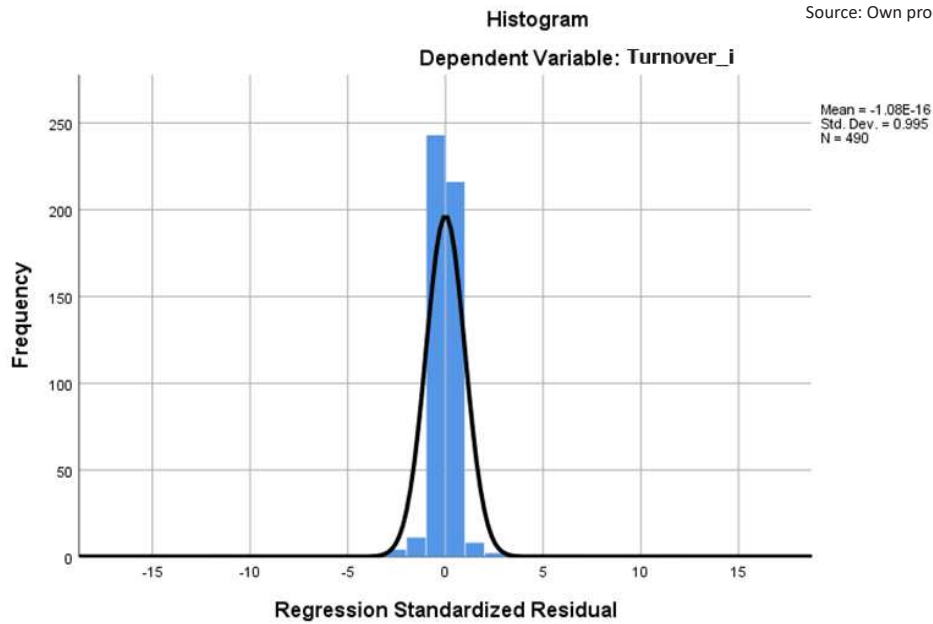


Figure 1. Histogram of errors

Based on the analysis of the error histogram, one can state there is a normal distribution between -4 and 4, with a slight shift to the right. This means that the data selected for analysis is correct, the histogram illustrates a Gaus' bell.

The P-P Plot has shifts from the specific theoretical distribution representing Henry's right.

The P-P Plot Diagram (Figure 2) shows that, compared to the theoretical distribution, the distribution of points has a slight shift to the right. But given that there is a common point on the axis, we can claim that the turnover data are correct. The input data have been ordered in ascending order, thus obtaining a diagram with an ordered distribution.

Source: Own processing in SPSS 26.

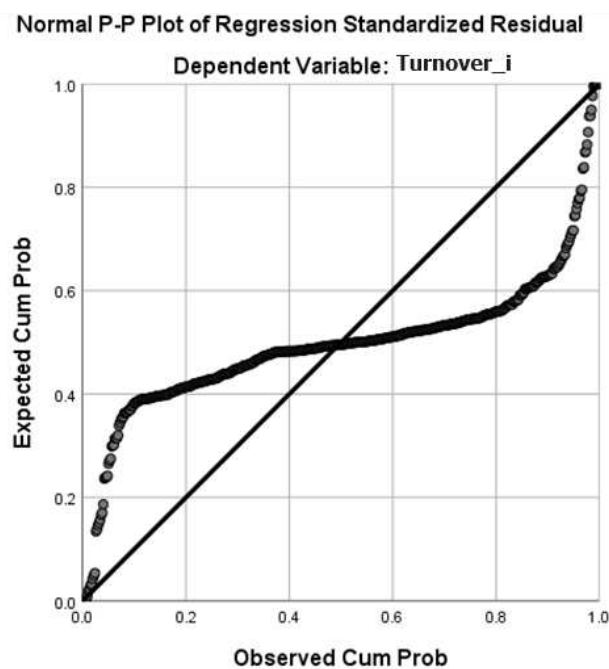


Figure 2. P-P Plot Diagram

The analysis of the obtained model shows that the average number of employees, income, and expenses significantly influence turnover. In another sense, these variables directly influence turnover, since the number of employees is the variable around which revenue and expenditure oscillate. Turnover is affected positively or negatively depending on the performance and workload of employees, which can lead to an increase in revenue and a decrease in expenditure, or vice versa, as turnover is always dependent on these variables, i.e., the generation of added value by human resources (training, skills, abilities).

4. DISCUSSION

The results of the study show that, in contrast to other earlier studies (Burca & Batrinca, 2014), which hold that insurance leverage, company size, gross written premium growth, underwriting risk, risk retention rate, and solvency margin are the factors that determine financial performance in the Romanian insurance market, human resources have the greatest impact on an insurance company's performance. Additionally, a risk factor that greatly complicates management in general and HR management in particular is the unpredictable action of the authorities regarding the introduction, cancellation, and changing conditions of anti-epidemic restrictions, i.e., the uncertainty surrounding the operating conditions of companies in the near future (Makar et al., 2021; Shkolnyk et al., 2021).

This paper presents an equation based on Altman's (1993) bankruptcy model for insurance companies in Romania, based on related studies. The objective is to examine how turnover and other factors pertaining to these businesses' circumstances within this industry are related and how these factors affect the likelihood that these entities will file for bankruptcy.

Supporting the research results of Nematollahi et al. (2024), it is appropriate to pay attention to the importance of studying the impact of digital human resource management practices and digital transformation on the strength of the

management system of insurance companies. The digital transformation and digital management have a significant positive impact on the strength of the management system of insurance companies (Riadi et al., 2023; Pakhnenko et al., 2021).

Considering the results of the scientific paper by Goyal and Gulati (2024) as relevant, it is appropriate to note the analyzed relationship between the quality of financial reporting and the management of an insurance company with the hypothesis that reliable management procedures exercise better control over the opportunistic behavior of managers. As a result of the study, the authors present empirical support for theories of dependence on resources and agencies in the insurance sector.

Also of practical importance are materials presented in the article by Soriano-Gonzalez et al. (2024), in which it is proven that insurance companies generate large amounts of data that involve transaction policies, risk assessment, and customer interactions. The authors developed and analyzed approaches based on traditional binary classification models and proved that forecasting the effectiveness of potential new customers will help reduce operating costs and improve the management of insurance companies.

An interesting analysis is the impact of the insurance sector's development on economic growth (Tasdemir & Alsu, 2024; Abu Daqar et al., 2021). In this framework, based on the analysis of data from the G-20 countries, scientists noted the insurance sector's positive impact on the development of the economy.

Sharing the opinion and research results of Arianty et al. (2023), it is appropriate to note that investments in the insurance industry reach 50% of the main insurance fund. The authors have explored that the government and regulatory bodies play a significant role in supporting the insurance industry by providing convenience in various aspects, such as government incentives and relaxations to promote the development of the insurance industry.

CONCLUSION

The study's purpose is to identify possible risks or opportunities that insurance companies may face in the near future, taking into account both the pre- and post-pandemic phases.

As a result of the analysis, the negative impact of the COVID-19 pandemic on the global economy, including the insurance industry, was established. It has been proven that Romania's insurance industry was significantly affected by the pandemic. Based on the statistical analysis methods, an econometric model was developed to estimate the turnover of insurance companies in Romania, within which the influence of dependent and independent variables was analyzed based on the Altman model or the Z model of bankruptcy prediction. It has been established that employees are the main factor in the proper operation of these enterprises and increased profitability.

It should be noted that the average number of employees, as well as income and expenses, have the most significant impact on turnover. On the other hand, turnover directly depends on these variables, since the number of employees is the variable around which income and expenses fluctuate. Turnover is affected positively or negatively depending on the productivity and workload of employees, which can lead to increased revenues and reduced costs, or vice versa, since turnover always depends on these variables, that is, the creation of added value by human resources (training, skills, abilities).

AUTHOR CONTRIBUTIONS

Conceptualization: Anamaria-Geanina Macovei, Olha Popelo, Artur Zhavoronok, Robert Dankiewicz, Cristina Gabriela Cosmulese, Liubov Popova.

Data curation: Anamaria-Geanina Macovei, Olha Popelo, Cristina Gabriela Cosmulese, Artur Zhavoronok.

Formal analysis: Anamaria-Geanina Macovei, Robert Dankiewicz, Cristina Gabriela Cosmulese, Liubov Popova.

Investigation: Anamaria-Geanina Macovei, Olha Popelo, Artur Zhavoronok, Cristina Gabriela Cosmulese.

Methodology: Anamaria-Geanina Macovei, Olha Popelo, Artur Zhavoronok, Cristina Gabriela Cosmulese, Robert Dankiewicz, Liubov Popova.

Project administration: Artur Zhavoronok.

Resources: Anamaria-Geanina Macovei, Robert Dankiewicz, Cristina Gabriela Cosmulese, Liubov Popova.

Supervision: Anamaria-Geanina Macovei, Olha Popelo, Artur Zhavoronok, Cristina Gabriela Cosmulese.

Validation: Anamaria-Geanina Macovei, Robert Dankiewicz, Cristina Gabriela Cosmulese, Liubov Popova.

Visualization: Anamaria-Geanina Macovei, Olha Popelo, Artur Zhavoronok, Robert Dankiewicz, Cristina Gabriela Cosmulese, Liubov Popova.

Writing – original draft: Anamaria-Geanina Macovei, Olha Popelo, Artur Zhavoronok, Robert Dankiewicz, Cristina Gabriela Cosmulese, Liubov Popova.

Writing – review & editing: Anamaria-Geanina Macovei, Olha Popelo, Artur Zhavoronok, Robert Dankiewicz, Cristina Gabriela Cosmulese, Liubov Popova.

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