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The Impact of Macroeconomic and Organizational Factors on the Profitability of the Insurance Industry within the TVP-FAVAR Approach

•***Mahdi Gholami Zare***: *University of Mazandaran, Mazandaran, Iran.*

Amir Mansour Tehranchian: *University of Mazandaran, Mazandaran, Iran.*

Ahmad Jafari Samimi: *Economics at University of Mazandaran, Mazandaran, Iran.*

ABSTRACT: *The insurance industry, as an intermediary between economic savings and risk transfer, plays a crucial role in the allocation of financial resources and the management of economic surpluses. Therefore, analyzing the profitability of this industry is of great importance. This study aims to investigate the impact of macroeconomic and internal organizational factors on the profitability of the insurance industry from 2011 to 2022 on a quarterly basis, using the TVP-FAVAR model and Python programming for data analysis and modeling the effects of economic variables. The results of this study indicate that economic shocks, such as changes in Gross Domestic Product (GDP), inflation, oil prices, exchange rates, and other macroeconomic variables, have significant impacts on the profitability of the insurance industry. Insurance companies must adopt appropriate risk management strategies to mitigate short-term economic fluctuations and aim for long-term profitability stability by improving internal processes and developing intelligent financial models. Additionally, economic policymakers should adjust macroeconomic conditions in a way that reduces the negative impacts of economic shocks on this industry and fosters greater stability.*

Key words*: Intra-Organizational Factors, Macroeconomic Factors, Profitability, TVP-FAVAR.*
JEL classification: *E44; D24; G22; C32.*

1. Introduction

The insurance industry, alongside the capital market, is considered one of the essential pillars of the global economy in today's world, being sensitive to fluctuations in macroeconomic variables and internal organizational factors. This industry, especially in unstable economic conditions, faces multiple challenges, including fluctuations in interest rates, inflation, exchange rate fluctuations, changes in GDP, and other macroeconomic variables (Kim & Lee, 2023; Iriabije et al., 2022). As a key indicator of economic development, Gross Domestic Product (GDP) remains a principal factor among economists and significantly impacts the profitability of the insurance industry. This is because the overall performance of the economy is directly related to the ability of policyholders to pay premiums and the demand for insurance services (Ashik-E-Elahi et al., 2018). These factors, due to their rapid and unpredictable changes, can have substantial effects on the profitability and performance of insurance companies. In particular, during global or regional economic crises, economic fluctuations can introduce new risks for the insurance industry, potentially negatively affecting the stability and financial resilience of companies. In such conditions, insurance companies must continuously assess and adjust their strategies, finding innovative solutions to cope with economic crises in order to avoid financial breakdowns and improve their performance (Borges & Fernandez, 2022).

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On the other hand, internal variables such as financial structure, risk strategies, asset and liability management, quality of management processes, and organizational approaches also play a critical role in the performance of insurance companies. Recent studies have shown that insurance companies with stronger financial structures and optimized management strategies are better equipped to cope with economic fluctuations and manage risks and crises more effectively. In this context, optimal management of financial resources, particularly investments and asset allocation, can help mitigate the negative effects of economic crises. For example, in times of inflation or exchange rate volatility, insurance companies with a diversified asset mix are likely to have a greater capacity to handle these crises (Alves & Pereira, 2025).

Moreover, risk strategies that are strategically designed by insurance managers can have a significant impact on the performance and profitability of companies. Those that can simulate and predict economic risks more accurately are typically more flexible and capable of making more effective decisions during economic crises. For instance, predicting and managing changes in interest rates or exchange rate fluctuations in a timely manner can prevent sharp fluctuations in profitability and help maintain the financial stability of insurance companies during unpredictable conditions (Mendoza & Torres, 2025).

In practical terms, management approaches and internal processes within insurance organizations directly influence how they deal with crises and economic fluctuations. Efficient, transparent, and adaptable management processes can help insurance companies respond quickly to economic changes during crises and take necessary actions effectively without compromising the quality of their insurance services. This is especially crucial in situations where financial markets undergo sudden and unpredictable shifts (Garcia & Lopez, 2025).

Ultimately, the combination of macroeconomic factors and internal variables in the performance of insurance companies is highly complex and requires precise and up-to-date analyses. Given the rapid changes in the global economy and the increasing risks of economic downturns, it is crucial for insurance companies to use modern analytical and management methods to assess and predict fluctuations. Advanced models like TVP-FAVAR enable analysts to model the complex and dynamic relationships between these variables and assess their long-term and short-term impacts on the profitability and performance of insurance companies. These models can effectively help insurance industry managers develop better strategies to deal with crises and economic changes, ultimately contributing to the stability and long-term growth of the insurance industry (Martinez & Ortega, 2022).

In this context, the use of advanced models like TVP-FAVAR (a factor-augmented vector autoregressive model where its parameters change over time) provides researchers with the ability to analyze the complex and dynamic relationships between macroeconomic and internal organizational variables over time and under different economic conditions. This model can effectively assess the impact of economic fluctuations on the performance of insurance companies and allow analysts to make more accurate predictions about future trends. The TVP-FAVAR model, by considering time-varying changes in variables and economic shocks, can assist researchers in simulating the long-term and short-term effects on the profitability of the insurance industry (Chen & Zhang, 2025).

This paper is organized into five sections. After this introduction, the second section reviews the empirical literature related to the topic. In the third section, the research methodology and estimation models are analyzed. The fourth section presents the findings derived from the estimation of the generalized vector autoregressive model with time-varying parameters (TVP-FAVAR). Finally, in the fifth section, the results and policy recommendations are provided.

2. Empirical Background

Various studies in recent years have explored the impact of macroeconomic variables on the profitability of the insurance industry. In the latest research, Garcia and Lopez (2025) investigated the effects of macroeconomic factors on the profitability of insurance companies in emerging markets. Their findings indicated that interest rates and inflation significantly influence the profitability of insurance firms in these markets. In periods of economic and inflationary volatility, insurance companies face greater challenges in maintaining their profitability. Similarly, Chen and Zhang (2025) examined the impact of economic fluctuations on the performance of insurance companies in Asian countries. They found that exchange rate and interest rate volatility during periods of economic instability negatively affected the profitability of

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insurers. In fact, frequent changes in currency values and interest rates can lead to financial instability for insurance companies and reduce the predictability of their profitability.

Furthermore, Mendoza and Torres (2025) analyzed the relationship between macroeconomic indicators and the profitability of the insurance industry in Latin America. Their study revealed that rising inflation rates and exchange rate fluctuations lead to a decrease in the profitability of insurance companies in this region. These findings clearly suggest that countries with more unstable economies, characterized by high inflation and currency fluctuations, are more prone to lower performance in the insurance sector. In Europe, Ramos and Silva (2025) conducted a similar analysis, examining the effects of inflation and GDP growth on the profitability of the insurance industry. Their results showed that GDP growth and inflation control positively impact the profitability of the industry. This study demonstrated that countries with more stable economies and high economic growth rates tend to have more successful insurance companies, as economic stability allows them to fine-tune their business and financial strategies more effectively.

Alves and Pereira (2025) in Portugal also investigated the effects of economic shocks on the performance of the insurance industry. Their study showed that lower interest rates and economic fluctuations directly affect the reduced profitability of insurance companies in Portugal. In an environment with low interest rates, insurance companies face difficulties in raising capital as they lose returns on their investments. Additionally, economic volatility can increase unexpected risks for companies and decrease the certainty of their profitability forecasts.

On a global scale, earlier research by Alvarez and Vargas (2024) and Zhang and Li (2023) examined the impact of macroeconomic variables such as inflation, exchange rates, and GDP on the performance of insurance companies. These studies revealed that economic fluctuations, such as inflation and exchange rate volatility, have a predominantly negative impact on the profitability of insurance companies. For instance, exchange rate volatility can create challenges in managing risks related to claims payouts or adjusting insurance rates, ultimately reducing profitability.

In the context of domestic studies, Kim and Lee (2023) addressed the role of internal variables such as financial structure and debt in the impact of economic shocks. Their research showed that companies with stronger financial structures are better equipped to cope with economic fluctuations. They are able to maintain liquidity and safeguard their investments during economic crises, whereas companies with weaker financial structures may struggle to withstand these shocks. Similar studies by Hassan and Ali (2023) and Nguyen and Tran (2022) have also been conducted on the effects of economic fluctuations in emerging and developing markets. The findings from these studies indicate that economic volatility continues to affect the profitability of the insurance industry. Specifically, in emerging markets, insurance companies face serious challenges in managing risks and forecasting profitability.

Finally, Martinez and Ortega (2022) and Borges and Fernandez (2022) explored the impact of interest rates and economic fluctuations on the profitability of the insurance industry. These studies pointed to the negative effects of rising exchange rates and inflation on the profitability of insurance companies. These factors can decrease the competitive ability of companies and place additional pressure on their financial processes.

Overall, various studies show that economic volatility—whether related to exchange rates, inflation, or changes in GDP—has a significant impact on the profitability of the insurance industry. This sector requires effective strategies for managing risks and minimizing the negative effects of such fluctuations in order to continue its optimal performance during periods of economic instability.

3. Research Methodology

This study is classified as applied research, and the research methodology is scientific in nature. The theoretical foundations were collected through library-based studies. The time-series data for the variables were considered for the period from 2011 to 2022 on a quarterly basis. The data were obtained from the economic indicators of the Central Bank and the Statistical Center of Iran. The model used in this study is the generalized Vector Autoregression model with time-varying parameters (TVP – FAVAR).

One of the key challenges in traditional models for estimation and forecasting was their inability to provide accurate and reliable predictions over time (Hansen & Li, 2024). These limitations led to the emergence of new models that utilize time-varying parameters. Among these, models based on Markov Chain Monte Carlo (MCMC) methods have gained significant importance due to their ability to manage a large

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number of variables and offer dynamic forecasts. These models allow for the coefficients to change over time, which significantly improves the accuracy and quality of predictions in macroeconomic and financial models (Koop & Korobilis, 2013).

TVP-FAVAR models (Time-Varying Parameter Factor Augmented Vector Autoregression) are considered one of the key advancements in this area. These models have proven particularly useful for analyzing complex, multivariate systems such as financial markets and macroeconomies. They have a strong capacity to estimate and forecast macroeconomic variables in times of economic instability. Recent studies have also demonstrated that TVP-FAVAR models perform better than traditional models in analyzing economic shocks and examining the behavior of macroeconomic variables such as inflation, exchange rates, and economic growth (Baumeister & Hamilton, 2020; Korobilis, 2019).

In these models, instead of assuming constant parameters over time, it is assumed that the parameters can change dynamically, allowing for a more accurate modeling of economic developments and structural changes over time. This capability makes these models more accurate and applicable when dealing with complex data and unstable conditions.

Numerous studies have been conducted using structural models and the TVP method. Subsequently, FAVAR models were used to identify the factors influencing the dependent variable during different time periods, expanding their applicability. The combination of TVP and FAVAR models has proven to be a powerful tool for economic and political analysts. The TVP-FAVAR model used in this study overcomes the limitations of linear models in the presence of structural breaks and cyclical changes in time series, enabling a more precise examination of the relationships between variables (Choi & Chung, 2024).

The general structure of the TVP-FAVAR model is as follows:

$$x_t = \lambda_t^y y_t + \lambda_t^f f_t + u_t \quad (1)$$

$$\begin{bmatrix} y_t \\ f_t \end{bmatrix} = c_t + B_{t,1}\begin{bmatrix} y_{t-1} \\ f_{t-1} \end{bmatrix} + \ldots + B_{t,p}\begin{bmatrix} y_{t-p} \\ f_{t-p} \end{bmatrix} + \varepsilon_t \quad (2)$$

In the above relation λ_t^y the regression coefficients, λ_t^f the coefficient of the factor variable, and f_t the factor variable are present. $(B_{t,1},\ldots,B_{t,p})$ coefficients are from the VAR model, u_t and ε_t the residuals of the model are normally distributed with a mean of zero and a covariance Q_t , V_t .

The coefficients $\lambda_t = ((\lambda_t^f)', (\lambda_t^y)')'$ and VAR coefficients $\beta_t = (c_t', vec(B_{t,1})', \ldots, vec(B_{t,p})')$ are extracted according to a time-varying random step process:

$$\lambda_t = \lambda_{t-1} + \nu_t \quad (3)$$

$$\beta_t = \beta_{t-1} + \eta_t \quad (4)$$

Where $\eta_t \sim N(0, R_t)$ and $\nu_t \sim N(0, W_t)$. All errors in equations 3 and 4 are uncorrelated with each other and over time; therefore, they have the following structure

$$\begin{pmatrix} u_t \\ \varepsilon_t \\ u_t \\ \eta_t \end{pmatrix} = N\left(0, \begin{bmatrix} \nu_t & 0 & 0 & 0 \\ 0 & Q_t & 0 & 0 \\ 0 & 0 & w_t & 0 \\ 0 & 0 & 0 & R_t \end{bmatrix}\right) \quad (5)$$

Relationships 1, 2, 3, and 4 are called the TVP_FAVAR model (Alvarez & Vargas, 2024).

The key variables influencing profitability (ROA) in the insurance industry are presented as follows:

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Table 1. Selected variables affecting the profitability (ROA) of the insurance industry.

Variable	Symbol	Description	Source (forecast)
Profitability	ROA	Return on assets: Profit after tax divided by total assets.	Al-Dalabih, (2023)
Gross Domestic Product	GDP	$GDP = \frac{GDP_t - GDP_{t-1}}{GDP_{t-1}}$	Chen & Jiang, (2023)
Inflation rate	INF	$INF = \frac{INF_t - INF_{t-1}}{INF_{t-1}}$	Harris, & Sanguinetti, (2024)
Tax revenues	TAX	Tax revenue growth rate	Martinez-Vazquez & Vulovic, (2023)
Oil revenues	oil	Growth rate of resources from the sale of oil and petroleum products	Bruno & Sachs, (2023)
Exchange rate	EXR		Salles & Roussel, (2023) Hussain, (2020)
Unemployment rate	UNE		Fernandez & Gomez-Salvador, (2024)
Underwriting	UNR	Ratio of claims paid to net premiums received	Kim & Oh, (2024)
Premium growth	PGR	Premium income growth	Zhang & Lee, (2023)
Financial leverage	LEV	Ratio of total debt (sum of current and non-current liabilities) to equity	Huang & Zhang, (2023)
Capital adequacy ratio	CAR	Ratio of shareholders' equity to total assets	Rajan & Singh, (2024)
Company size	SIZ	Logarithm of total assets	Liu & Wang, (2023)

4. Results of the Study

The following presents the results of the analysis of the impulse response of the model's variables on the performance of the insurance industry, after estimating the TVP_FAVAR model. The impulse response function results in this study vary over time, which differentiates it from previous studies, as it is represented in a three-dimensional format.

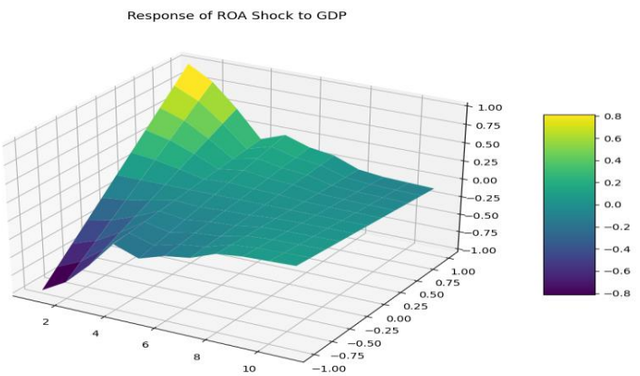


Figure 1. Instantaneous **shock** in GDP on ROA.

Based on Figure 1, the impact of a shock to GDP (economic growth) on profitability (ROA) is demonstrated throughout the entire period under study. If there is a shock in GDP (such as an increase or decrease in economic growth), the graph illustrates when and to what extent ROA changes. In the short term, a sharp decline in profitability may be observed, which could be attributed to a drop in demand for insurance as a result of reduced GDP. However, in the long term, after the economy recovers and growth improves, ROA begins to rise again. Overall, this figure indicates that economic shocks and fluctuations in GDP can directly influence the profitability of the insurance industry. A decline in GDP, particularly in the short term, exerts a significant negative impact on profitability, but as economic conditions recover, profitability gradually improves.

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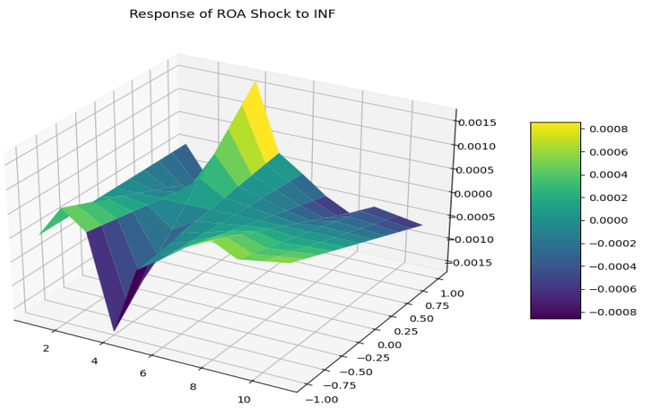


Figure 2. Instantaneous shock in Inflation on ROA.

The impact of inflationary shocks on profitability (ROA) shows an initial decline in the short term due to increased operating costs and reduced customer purchasing power. However, profitability gradually improves in the medium term as insurance companies adjust by raising premiums. In the long term, the effect of inflationary shocks on profitability becomes more volatile, influenced by factors like economic policies and internal efficiency. Overall, the findings emphasize the importance of managing inflation risks and adopting appropriate strategies, while structural reforms and macroeconomic policies may be needed to stabilize profitability in the long term.

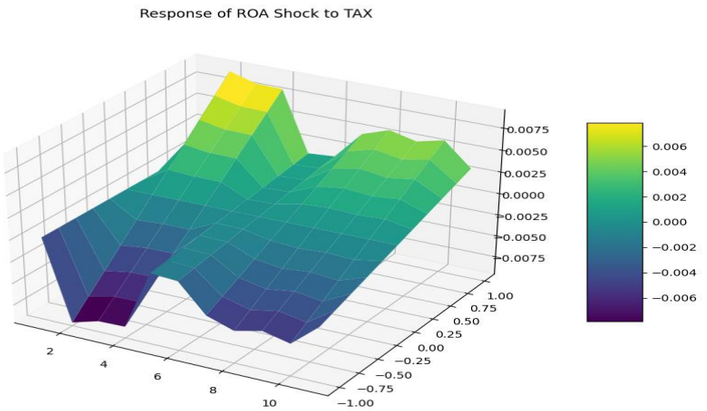


Figure 3. Instantaneous shock in Tax Revenue on ROA.

Figure 3 shows that after a positive tax shock, profitability (ROA) initially increases, as higher tax revenues boost demand for insurance products and services, allowing insurance companies to improve their profitability in the short term. Insurance companies should take advantage of this short-term opportunity to enhance returns and offer innovative programs.

However, in the long term, the positive effects of the tax shock fade and may turn negative. This could lead to reduced demand, decreased investments, and lower asset returns. Insurance companies should focus on improving risk management strategies, diversifying income sources, and shifting assets toward more sustainable investments for long-term stability.

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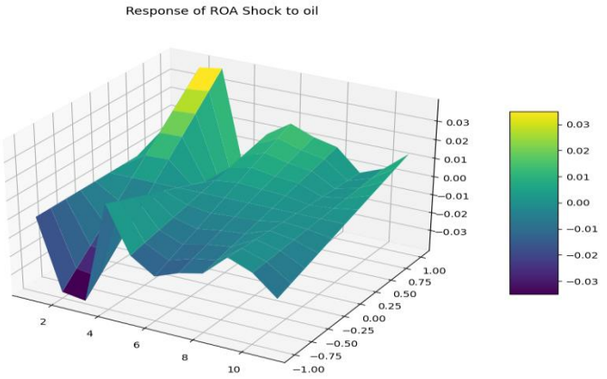


Figure 4. Instantaneous shock in Oil Revenues on ROA

Figure 4 illustrates the impact of oil revenue shocks on insurance companies' profitability (ROA) over time. Initially, oil price shocks have a negative effect on profitability, but over time, the response becomes positive and peaks, indicating that insurance companies adapt better to these shocks. In the long term, the impact becomes negative again, reflecting the lasting adverse effects of oil price fluctuations. The findings suggest that oil price shocks negatively affect profitability in the short term, improve in the medium term, and decline again in the long term. The varying responses highlight the importance of managing oil price risk and developing policies to reduce insurance companies' financial vulnerability.

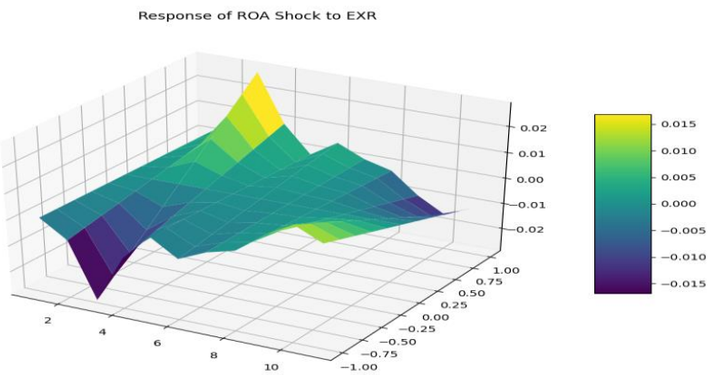


Figure 5. Instantaneous shock in Exchange Rate on ROA.

According to Figure 5, the impact of exchange rate shocks (EXR) on profitability (ROA) is presented for the entire study period. In the early stages, shocks to the exchange rate may have a smaller effect on ROA, but over time, the impact of these shocks can intensify. A rise in the exchange rate (for example, the depreciation of the national currency) may negatively affect the profitability of insurance companies in the short term. However, in the long run, some areas may experience improvement, as reflected in the changes in the curve height. Overall, this Figure shows that fluctuations in the exchange rate, particularly large shocks, can have diverse effects on the profitability of insurance companies. An increase in the exchange rate can lead to a short-term reduction in ROA, but in certain situations, positive effects may emerge in the long run.

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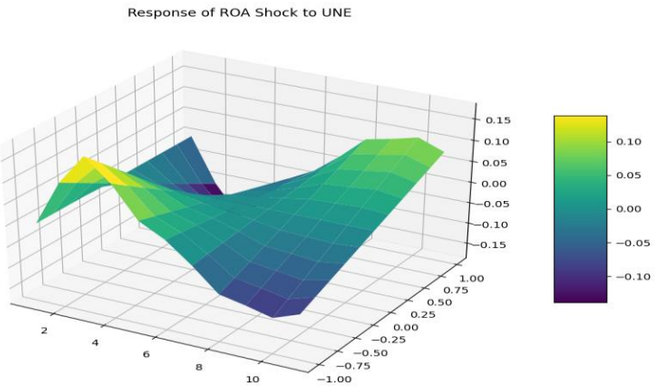


Figure 6. Instantaneous shock in Unemployment Rate Variable on ROA0.

Based on Figure 6, the impact of a shock to the unemployment rate (UNE) on profitability (ROA) is shown over the entire period under consideration. The Figure reveals that a shock to the unemployment rate initially has a negative effect on ROA. In the early periods, an increase in unemployment leads to a decline in asset returns, which could be attributed to several factors: rising unemployment usually causes a decrease in household income and lowers demand for goods and services, which negatively impacts corporate profitability. Furthermore, higher unemployment may lead to reduced production and delayed investments by companies, further harming profitability. The Figure indicates that the initial impact of unemployment on ROA is negative.

However, over time, the negative effects of increased unemployment on ROA gradually diminish, and the Figure shows a steady return to positive values. This trend suggests that, in the long run, companies and markets adjust and recover from the adverse effects of the unemployment shock. As the unemployment rate improves, demand for goods and services picks up again, leading to an improvement in corporate profitability. In the final sections of the Figure, we see that as unemployment decreases and economic conditions improve, asset returns turn positive once again. This pattern indicates that while negative shocks from rising unemployment may have short-term effects, markets eventually reach equilibrium, and profitability improves.

During periods of recession and rising unemployment, insurance companies may face decreased demand and reduced profitability. However, as economic conditions improve and unemployment decreases, new growth and return opportunities emerge. It is suggested that during periods of rising unemployment, insurance companies focus on cost optimization and intelligent asset management to prevent significant profitability declines. Additionally, in the long run, they should capitalize on economic recovery opportunities and make strategic plans for increased investments and sustainable growth.

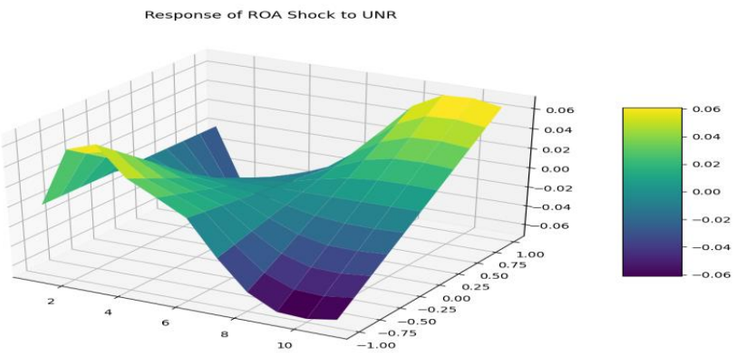


Figure 7. Instantaneous shock in Underwriting Risk Variable on ROA.

Figure 7 illustrates that underwriting risk (UNR) shocks initially decrease profitability (ROA) in the short term. However, the negative effects lessen over time, with a gradual return to positive values. This suggests

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that while underwriting risk reduces profitability in the short run, companies can mitigate these impacts in the long run through better risk management and improved underwriting processes. Insurance firms should focus on managing underwriting risks, investing in technology for better risk assessment, and developing long-term strategies for sustainability and profitability.

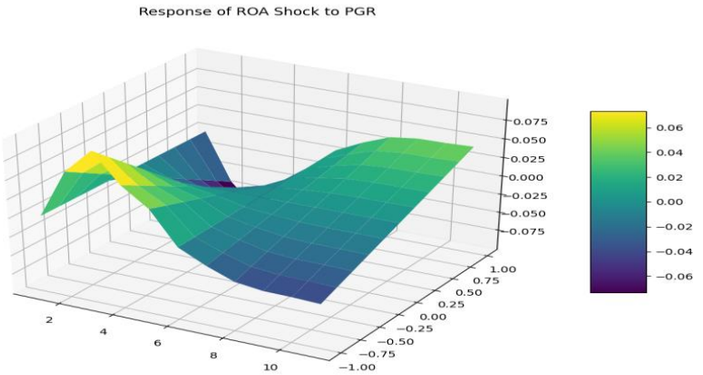


Figure 8. Instantaneous shock in Premium Growth Variable on ROA.

The Figure shows that in the early stages, shocks in premium growth (PGR) positively affect profitability (ROA), likely due to improved cash flow from higher policy sales and premiums. However, over time, the positive impact diminishes as premium growth may lead to higher costs, risks, or reduced efficiency in asset management, causing a decline or stabilization in profitability. Factors like increased operational costs, inefficiencies, higher claim rates, market saturation, or rising competition could contribute to this reduction in asset returns.

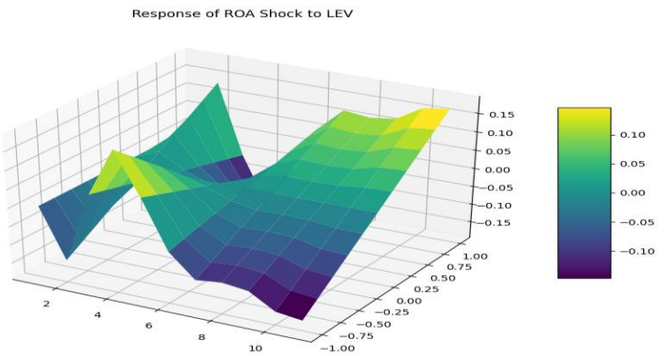


Figure 9. Instantaneous shock in Financial Leverage Variable on ROA.

Based on Figure 8 and 9, the impact of shocks to premium growth and financial leverage (LEV) on profitability (ROA) is shown. In the short term, positive shocks to financial leverage boost profitability, but this effect decreases over time and becomes negative. Initially, higher financial leverage may lead to increased profitability due to new investments and better short-term operations. However, in the long run, the costs associated with higher debt (such as interest payments) reduce profitability. This suggests that insurance companies should balance using debt for short-term performance with maintaining a stable financial structure for long-term profitability.

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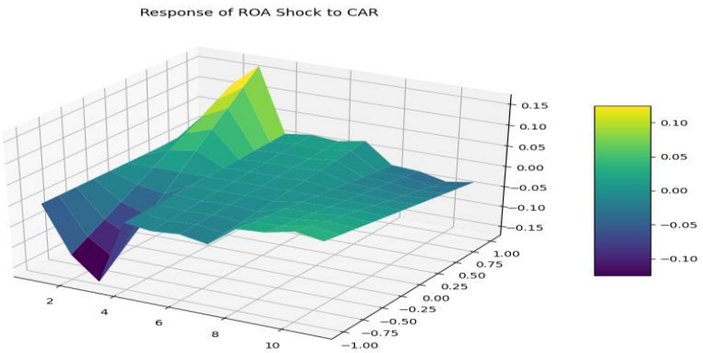


Figure 10. Instantaneous shock in Capital Adequacy Ratio on ROA.

Based on Figure 10, positive shocks to the Capital Adequacy Ratio (CAR) initially improve profitability (ROA) in the short term, as companies with higher CAR can manage risks better. However, over time, the positive effects gradually diminish and may even become negative, possibly due to inefficiencies or increased operational costs. In the short run, higher CAR boosts profitability, but in the long run, it may result in negative outcomes unless managed properly. To maintain long-term profitability, stronger managerial and regulatory policies are needed to ensure efficient use of extra capital.

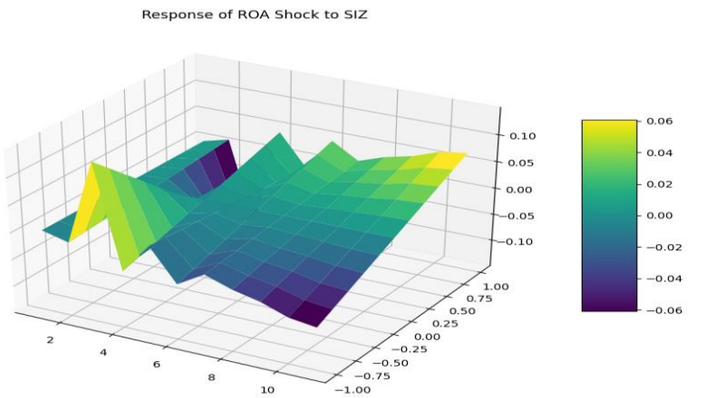


Figure 11: Instantaneous shock in company size on ROA.

Based on Figure 11, the impact of company size (SIZ) on profitability (ROA) shows that, in the short term, growth in company size or economic expansion improves profitability. This is due to increased investment opportunities, efficiency, and better resource utilization, which enhance asset returns. However, in the long term, these positive effects decrease and may even turn negative, possibly due to management complexities, higher costs, and market saturation. Therefore, while insurance companies can benefit from growth in the short term, they must focus on optimizing resources and managing costs in the long term to sustain profitability.

5. Conclusion and Recommendations

In this study, the immediate responses of the insurance industry to various economic shocks were analyzed using the TVP_FAVAR model. The results indicate that economic shocks such as changes in GDP, inflation, tax revenues, oil prices, exchange rates, unemployment, underwriting risk, premium growth, financial leverage, capital adequacy ratios, and company size can have diverse effects on the profitability of the insurance industry (ROA).

Initially, the impact of GDP shocks on the profitability of the insurance industry is notably significant. A decrease in GDP typically leads to a reduction in insurance demand and a drop in profitability. However, improvements in economic conditions and a recovery in GDP can lead to a return of profitability. This

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Corresponding Author: Mahdi Gholami Zare

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highlights the importance for insurance companies to monitor economic conditions and implement flexible policies to prevent severe profitability declines during economic recessions. During downturns, insurance companies should adopt cost-reduction strategies and enhance productivity to mitigate economic fluctuations.

The effects of inflation shocks on the profitability of the insurance industry are also significant. Inflation typically has a negative impact on profitability, as it can lead to higher operational costs and reduce consumers' purchasing power. However, in the long run, insurance companies may respond by adjusting premiums and other pricing policies, which can improve profitability. To counter the negative effects of inflation, insurance companies should actively update their premiums and focus on managing inflationary risks. Policymakers should prioritize boosting economic growth and controlling inflation.

Shocks related to tax revenues also impact profitability. In some cases, an increase in tax revenues may temporarily help profitability by boosting demand for insurance and injecting resources into the economy. However, in the long run, the positive effects of these shocks may diminish and potentially turn negative. In such cases, insurance companies need to design long-term investment strategies that can prevent profitability declines following tax shocks.

Fluctuations in oil prices are another factor influencing the profitability of the insurance industry. Oil price shocks may have a negative short-term impact on profitability, but improvements can be observed in the medium term. In the long run, oil shocks may again have negative consequences, illustrating the complex relationship between oil prices and the insurance industry's performance. Insurance companies must have comprehensive risk management programs and diversified investment portfolios to manage risks related to oil price fluctuations. Additionally, policymakers should pay close attention to the effects of oil prices on other sectors and their implications for insurance demand.

Exchange rate fluctuations also have significant effects on profitability. Volatility in exchange rates may negatively affect profitability in the short term. However, some companies may capitalize on these shocks in the long run, achieving better profitability. Insurance companies should implement strong foreign exchange risk management systems and hedging policies to minimize the effects of exchange rate fluctuations. Furthermore, exchange rate policies should be adaptable, allowing the insurance market to swiftly adjust to new conditions.

Unemployment rates tend to negatively affect insurance profitability. An increase in unemployment typically leads to a reduction in insurance demand and a decline in profitability. Over time, however, these effects diminish, and profitability may improve. During periods of rising unemployment, insurance companies should focus on reducing costs and optimizing their resources to avoid profitability losses. Government policies aimed at reducing unemployment and supporting the labor market can have positive effects on the insurance industry's performance.

Underwriting risk is another factor that significantly affects profitability. An increase in underwriting risk tends to reduce profitability in the short term. Over time, companies can improve their underwriting processes and enhance profitability. To achieve this, insurance companies should carefully manage underwriting risks and avoid unnecessary risk exposures. Additionally, the use of technology for more accurate risk assessments can help improve underwriting processes and profitability.

Shocks related to premium growth have a temporary positive effect on profitability. However, in the long term, increased costs or reduced efficiency may lead to lower returns. In this context, insurance companies should focus on sustainable premium growth and avoid unnecessary competition or temporary rate hikes. Over the long term, optimizing resources and improving operational processes can help maintain profitability.

Financial leverage also plays a significant role in profitability. Positive shocks in financial leverage may have short-term benefits for profitability, but in the long term, an increase in debt can lead to higher financial costs and reduced profitability. Insurance companies must balance their use of debt and maintain a stable financial structure. Proper debt management and reducing dependence on external financial resources can help preserve long-term profitability.

Finally, the effect of company size on profitability is also notable. Larger companies tend to experience improved profitability in the short term. However, in the long run, managerial challenges and additional costs associated with increased company size can lead to reduced profitability. Insurance companies must focus on optimizing managerial processes and reducing operational costs in large companies. Furthermore, long-term diversification of revenue sources and reduction in managerial complexity should be a priority.

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In conclusion, this study demonstrates that various economic shocks can have significant effects on the profitability of the insurance industry. In this regard, insurance companies need to focus on risk management and develop long-term strategies to sustain profitability. Policymakers should also guide macroeconomic conditions in a way that minimizes extreme economic fluctuations and their negative impacts on the insurance industry.

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