"Contribution of the non-life insurance sector to the economic growth of Nepal: Analysis from the EGLS approach"

AUTHORS	Yadav Mani Upadhyaya (iD) Khom Raj Kharel (iD) Narayan Prasad Aryal (iD) Basu Dev Lamichhane (iD)

NUMBER OF REFERENCES	NUMBER OF FIGURES	NUMBER OF TABLES
35	0	4

BUSINESS PERSPECTIVES

Yadav Mani Upadhyaya (Nepal), Khom Raj Kharel (Nepal), Narayan Prasad Aryal (Nepal), Basu Dev Lamichhane (Nepal)

CONTRIBUTION OF THE NON-LIFE INSURANCE SECTOR TO THE ECONOMIC GROWTH OF NEPAL: ANALYSIS FROM THE EGLS APPROACH

Abstract

Nepal's non-life insurance sector holds immense potential to drive economic growth and boost the nation towards a secure financial future. Embracing this potential is a goal and a pivotal catalyst for substantial change. The study aims to determine how the non-life insurance sector can drive economic growth in Nepal. The methodology of this study uses quantitative analysis of financial data from 2013 to 2022 from 20 non-life insurance companies in Nepal and econometric modeling to assess the sector's impact on economic growth. Using Panel EGLS (Estimated Generalized Least Squares) regression analysis, the findings show that with one-unit increments in total investment, total premium, and total tax paid, GDP is expected to change by approximately 591.52, −920.54 and 8,470.65 units, respectively. In contrast, the coefficient for total profit is −910.3477 and is not statistically significant. The study's main conclusion implies that the insurance sector contributes to the country's economic growth by investing in productive activities and paying taxes to the government. Still, it also imposes a cost on the economy by charging high premiums to the insured. The profitability of the insurance sector does not affect the GDP, which indicates that the insurance sector is competitive and efficient or that other factors determine the GDP besides the insurance sector. This study contributes to a deeper understanding of the non-life insurance sector's role in Nepal's economic development and informs evidence-based policy decisions.

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Yadav Mani Upadhyaya, Dr., Assistant Professor of Economics, Tribhuvan University, Nepal.

Khom Raj Kharel, Dr., Associate Professor of Economics, Tribhuvan University, Nepal. (Corresponding author)

Narayan Prasad Aryal, Assistant Professor of Management, Tribhuvan University, Nepal.

Basu Dev Lamichhane, Master's Degree in Management/Assistant Professor in Management, Faculty of Management, Department of Management, Tribhuvan University, Nepal.

Keywords	non-life insurance, economic growth, financial data, investment, premium, tax paid, profit, panel EGLS
JEL Classification	G22, O40, O16

INTRODUCTION

Non-life insurance companies play a vital role by collecting premiums from policyholders, creating a steady source of funds for investments and profit. They act as financial intermediaries, directing these resources into various sectors of the economy, fostering growth and overall economic development. Additionally, the taxes generated by this sector contribute to government revenue, supporting public infrastructure, education, and healthcare, thereby advancing economic progress.

The non-life insurance sector's growth creates various job opportunities in sales, underwriting, claims processing, and administration. This positively affects household income, spending habits, and the overall economy. Adapting to market changes, this sector has the potential to boost economic growth further. It fosters consumer confidence and financial stability, promoting increased economic participation and benefiting various sectors, ultimately enhancing the overall economic environment.

This study can assist in mitigating risk and fostering risk awareness, thereby contributing to financial stability. However, further research is necessary to fully comprehend the scope of this impact. The research highlighted in the text emphasizes the importance of further investigation into the influence of insurance on economic growth in developing countries. The existing studies have shown that insurance can play a significant role in driving economic growth in developed countries. However, further studies are required to fully comprehend its impact on economic growth in developing nations.

1. LITERATURE REVIEW AND HYPOTHESES

In the midst of these insights, Arena (2008) passionately emphasizes the insurance industry's immense value as a global economic asset. By fulfilling a multifaceted role, the insurance sector becomes a catalyst for promoting and sustaining economic growth on a global scale (Safitri, 2019). At the heart of these scholarly contributions, Ege and Saraç (2011) emphasize the critical role of insurance in promoting financial inclusion in developing nations. Fida et al. (2020) argue that insurance can help reduce poverty and inequality by providing a safety net for people who suffer losses, such as those caused by natural disasters or accidents. Iyodo et al. (2020) also show how non-life insurance can contribute to economic growth in the ASEAN and MENA regions.

Nestled within the domain of economic inquiry, Rao and Srinivasulu (2013) argue that these studies provide evidence that well-established non-life insurance sectors can play a positive role in promoting economic growth. Mohammed et al. (2023) further studied how non-life insurance can help reduce risk, mobilize savings, and promote risk awareness. At the heart of these insightful perspectives, Haiss and Sümegi (2008) passionately call for more comprehensive policymaking within the insurance sector. Jain (2013) illuminates its potential to enhance financial stability and foster sustainable economic growth.

The study by Trinh et al. (2016) highlights the significant factors that impact non-life insurance expenditure in different countries. These factors include economic freedom, income levels, bank development, urbanization, cultural influences, and legal systems. Nestled within the mosaic of insights, Kondrat et al. (2019) delve into the investment activities of life and non-life insurance companies during the period of 2001–2016, re-

vealing a general ineffectiveness in these activities. Lee et al. (2021) studied various perspectives, each a brushstroke on the canvas of insurance research, to collectively enrich our understanding of the insurance industry's multifaceted nature and its intricate effects on financial stability and innovation.

The findings of Basu and Aithal (2022) pointed to unsatisfactory performance among private non-life insurers in India concerning financial indicators during the period under examination. Siddik et al. (2022) further enrich this narrative by emphasizing the detrimental impact of financial insolvency on the profitability of non-life insurance companies. These studies, each a distinct thread in the fabric of understanding, collectively shed light on the financial challenges and vulnerabilities faced by non-life insurers in diverse contexts (Dash et al., 2018).

Muthulakshmi and Muthumoni (2023) examined the key financial aspects of the non-life insurance sector in China and the ASEAN-5 nations. They also explored the relationship between insurance activities and economic development from 1980 to 2014. Kugler and Ofoghi (2005) shed light on the economic impact of non-life insurance. They think claims and net premiums drive public-sector non-life insurance profitability. Pradhan et al. (2016) suggested that economic freedom may hamper non-life insurance development. They conclude that insurance activities boost the economy.

As per navigating the labyrinth of research, Balcilar et al. (2018) use dynamic panel GMM techniques to expand the stage to ASEAN countries. Beck and Webb's (2003) study revealed the complex link between insurance, economic development, and the financial system. Insurance and economic development have a positive feedback loop; however, this may vary by nation. Kharel (2019) highlighted the insurance sector's enormous effect on Nepal's economic growth in several ways, whereas

a strong result establishes the insurance business as a major economic contributor. Guochen and Wei (2012) argue that its many tasks orchestrate economic growth, promote financial inclusiveness, and support sustainable development.

This study explains the insurance sector's many contributions to economic prosperity. Khanal (2020) shows that insurance firms effectively gather dispersed money and orchestrate the financial symphony in the complex dance of finance and insurance. Nejad and Kermani (2012) studied how smart investments maintain financial stability while orchestrating society's remarkable economic progress. This informative piece illuminates finance-insurance interactions. Ghimire (2020) highlighted insurance industry issues under regulation.

Pradhan et al. (2015) studied how regulatory issues have long shaped the industry's stability and growth. This fascinating look at the insurance sector's regulatory landscape reveals its complex issues. In the field of management, Hamal (2020) emphasizes risk management in insurance. This clarion cry helps the industry expand sustainably and achieve its objectives. In this orchestration, insurance firms excel at risk management to create a symphony of value for their stakeholders. In this harmonious tale, policyholder financial security and sustainable prosperity combine perfectly.

Insurance penetration and economic development are resonant chords in economic dynamics (Khadka, 2020). This harmonic finding shows that nations with increasing insurance penetration have a powerful economic boom. The virtuoso execution of this connection highlights insurance's capacity to enhance economic development, improving our knowledge of finance and wealth. Sah and Magar (2021) proposed leverage and long-term investments in finance. Their findings show Nepalese insurance firms how to boost returns on equity and reduce volatility.

This composition strengthens financial stability and paints a window of financial prosperity for Nepalese insurers, but caution is advised to ensure long-term sustainability and effective financial performance in the insurance sector (Jaishi & Poudel, 2021). Pradhan and Dahal (2021) de-

pict company strategy and progress vividly. Their study highlights the advantages of scale and business size. Strategic growth and management guide profitability and shareholder value in this tableau. They create a key masterpiece of corporate achievement, encapsulating strategic progress in the company.

Marwa and Zhanje (2015) have provided theoretical frameworks that can be studied to gain insight into the relationship between the non-life insurance sector and Nepal's economy. They assert that the advancement of financial development, including the expansion of the insurance sector, can stimulate economic growth. This is because insurance plays a crucial role in mobilizing savings, optimizing capital allocation, and mitigating risk, all of which are essential for fostering economic growth.

Regarding developing countries, Barsby (1968) argued that countries such as Nepal can benefit from the experience of early-developing countries by adopting more advanced financial institutions, such as the insurance sector. This is because the insurance sector can accelerate the development of other financial markets and institutions, which can help promote economic growth. Shi et al. (2022) argued that the insurance sector can help improve the productivity of firms and industries in an economy. This is because insurance can help reduce the uncertainty faced by firms, which can lead them to invest more and innovate more, which can in turn lead to higher productivity and economic growth.

Furthermore, numerous empirical studies have demonstrated a strong correlation between the non-life insurance sector and economic growth, complementing the existing theoretical frameworks. As an illustration, Upadhyaya et al. (2023) discovered a correlation between a 1% rise in non-life insurance penetration (the ratio of non-life insurance premiums to GDP) and a 0.08% increase in GDP growth.

The research gap identified in the text highlights the importance of further research on the impact of insurance on financial stability. This study can assist in mitigating risk and fostering risk awareness, thereby contributing to financial stability.

Further research is necessary to fully comprehend the scope of this impact. This research highlighted in the text emphasizes the importance of further investigation into the influence of insurance on economic growth in developing countries. The existing studies have shown that insurance can play a significant role in driving economic growth in developed countries. However, further studies are required to fully comprehend its impact on economic growth in developing nations.

Here are some specific hypotheses that can be tested:

H1: *Increased insurance penetration has no significant impact on higher economic growth rates in developing countries. Specifically, as the percentage of the population covered by insurance policies rises, there has not found the equal effect on GDP growth.*

H2: *In developing countries, the enhancement of financial stability and economic growth via insurance does not depend on particular mechanisms like risk pooling. This process does not diffuse financial risks among a wider populace, thus failing to foster investment and entrepreneurial activities, consequently hindering economic expansion.*

H3: *The challenges facing the development of the insurance sector in developing countries, including regulatory barriers, lack of infrastructure, and low levels of financial literacy, negatively impact economic growth. Specifically, overcoming these challenges through targeted interventions will not lead to improved economic performance and stability in these nations.*

2. RESEARCH METHODOLOGY

The methodology covers the different steps outlined:

a) **Data Collection:** Secondary data have been collected from the Office of the Insurance Authority Nepal for analysis, and it has been sourced from reports, financial statements, official records, and academic literature. Prior

to their merger, there were a total of 20 non-life insurance companies operating in Nepal as presented in the Table 1.

Table 1. Non-life insurance companies in Nepal

Source: Nepal Insurance Authority, 2023.

S. N	Nonlife Insurance Companies in Nepal	Date of Establishment
1	Nepal Insurance Company Limited	24 Sept, 1947
2	Oriental Insurance Company Limited	15 Sept, 1967
3	National Insurance Company Limited	7 Jan, 1988
4	Himalayan General Insurance Company Limited	21 July, 1993
5	United Insurance Company Limited	1 Dec, 1993
6	Premier Insurance Company Limited	21 April, 1994
7	Everest Insurance Company Limited	31 May, 1994
8	Sagarmatha Insurance Company Limited	26 June, 1996
9	Neco Insurance Company Limited	30 May, 1996
10	Prabhu Insurance Company Limited	19 July, 1996
11	IME General Insurance Company Limited	23 Jan, 2001
12	Prudential Insurance Company Limited	3 May, 2002
13	Shikhar Insurance Company Limited	18 Oct, 2004
14	Siddharth Insurance Company Limited	5 April, 2006
15	NLG Insurance Company Limited	9 Oct, 2005
16	Lumbini General Insurance Company Limited	15 July, 2005
17	Rashtriya Beema Company Limited	29 June, 2013
18	Ajod Insurance Company Limited	12 June, 2018
19	General Insurance Company Limited	12 June, 2018
20	Sanima General Insurance Company Limited	12 June, 2018

b) **Quantitative Analysis:** A comprehensive analysis has been conducted on the financial data of twenty non-life insurance companies in Nepal. The objective of this analysis is to assess their premium income, investment portfolio, profitability, tax contributions, and the influence on the country's GDP. Panel data analysis has been utilized to investigate the relationship between the total premium to GDP ratio and various economic indicators, including premium income, investment portfolio, profitability, and tax contributions.

c) **Econometric Modeling:** Econometric modeling has been employed to quantify the sector's direct and indirect impact on economic growth. A macroeconomic model has been constructed to simulate the potential effects on GDP growth, premium collection, profitability, tax, and investment.

$$GDP = \alpha + \beta 1 \, TOPM + \beta 2 \, TOINV$$
$$+ \beta 3 \, TOPF + \beta 4 \, TOTXP + \varepsilon, \qquad (1)$$

where *GDP* is the gross domestic product, *TOMP* is the total premium paid, *TOINV* is the total investment, *TOPF* is the total profit, *TOTXP* is the total tax paid, α is the intercept term, $\beta 1$, $\beta 2$, $\beta 3$, and $\beta 4$ are the slope coefficients, and ε is the error term. The study tests the hypothesis that total investment has a positive and statistically significant effect on *GDP*. To do this, we would estimate the econometric model and then test the null hypothesis that $\beta 2 = 0$. If the p-value of the test is less than the significance level, then we would reject the null hypothesis and conclude that total investment has a positive and statistically significant effect on *GDP*.

d) **Policy and Regulatory Assessment:** A thorough examination of the current policies and regulations impacting the non-life insurance sector has been carried out. This assessment has provided valuable insights into the obstacles and potential areas for development, allowing for the creation of impactful policy suggestions.

e) **Expert Consultations:** Consultations with insurance industry experts, economists, policymakers, and academics have provided a well-rounded perspective on the sector's role in the economy. Feedback from these consultations has been integrated into the analysis and recommendations.

f) **Scenario Analysis:** Different scenarios, such as variations in premium income, investment patterns, and GDP contribution strategies, have been modeled to assess their potential impact on economic growth. Sensitivity analysis has been employed to understand the magnitude of change under different assumptions.

g) **Policy Recommendations:** Drawing from the quantitative findings, along with international best practices, a set of actionable policy recommendations has been formulated. These recommendations have been designed to harness the sector's potential for driving economic growth, enhancing financial stability, and promoting risk management.

h) **Validation and Review:** The methodology and findings have undergone validation and review by experts in the field to ensure rigor and accuracy in the analysis.

By employing this multifaceted methodology, the study aims to provide a comprehensive understanding of the non-life insurance sector's contribution to Nepal's economy and its potential to drive economic growth.

3. RESULTS AND DISCUSSION

The results of this analysis reveal several key findings regarding the relationship between non-life insurance and economic growth in Nepal.

Table 2. Lagrange multiplier tests for random effects

Source: Results from data analysis.

Test Hypothesis			
Presence of Random Effect	**Cross-section**	**Time**	**Both**
Breusch-Pagan	28.441	179.444	207.886
	(0.000)	(0.000)	(0.000)

The null hypothesis of these tests assumes the absence of any random effects, while the alternative hypothesis suggests the presence of random effects. According to Table 2, the p-values for all three tests are 0.000. This indicates that the null hypothesis can be confidently rejected at a significance level of 0.01%. This suggests that there are random effects in the model and that the fixed effects model is inappropriate. The results of the Lagrange multiplier tests indicate the presence of random effects in the model. Based on the analysis, the fixed effects model is not suitable for the situation at hand, suggesting that a random effects model would be more appropriate.

Table 3. Correlated random effects – Hausman test

Source: Results from data analysis.

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	97.904	4	0.000

Table 3 depicts the outcomes of the Hausman test for correlated random effects. The null hypothesis of the Hausman test is that the random effects model is the same as the fixed effects model. The

Table 4. Panel EGLS

Variable	Coefficient	Std. error	t-Statistic	Prob.
TOINV	591.519	64.269	9.204	0.000
TOPM	−920.542	213.233	−4.317	0.000
TOPF	−910.348	572.003	−1.592	0.114
TOTXP	8470.650	1548.442	5.470	0.000
C	2.33E+12	7.50E+10	31.118	0.000
Effects Specification			S.D.	Rho
Cross-section random			7.53E+10	0.027
Idiosyncratic random			4.51E+11	0.973
Weighted statistics				
Root MSE	5.78E+11	R-squared		0.539
Mean dependent variable	2.86E+12	Adjusted R-squared		0.525
S.D. dependent variable	8.58E+11	S.E. of regression		5.88E+11
Sum squared residual	4.64E+25	F-statistic		39.138
Durbin-Watson stat	0.395349	Prob. (F-statistic)		0.000

alternative hypothesis suggests that the random effects model is more efficient than the fixed effects model. The table shows that the chi-squared statistic for the Hausman test is 97.904, with 4 degrees of freedom. The p-value for the test is 0.000, which is less than the 0.01% significance level. This means that we can reject the null hypothesis and conclude that the random effects model is more efficient than the fixed effects model. In other words, the random effects model is the better model to use for this data.

Table 4 shows the results of a panel *EGLS* cross-section random effects regression analysis. The dependent variable is *GDP*, and the independent variables are total investment, total premium, total profit, and total tax paid. The coefficient of total investment is positive and statistically significant, indicating that an increase in total investment is associated with an increase in *GDP*.

The coefficient is 591.519, indicating that for a one-unit increase in *TOINV*, *GDP* is expected to increase by approximately 591.52 units. The coefficient of total premium is negative and statistically significant, indicating that an increase in total premium is associated with a decrease in *GDP*. The coefficient is −920.542, suggesting that for a one-unit increase in *TOPM, GDP* is expected to decrease by approximately 920.54 units.

The coefficient of total tax paid is positive and statistically significant, indicating that an increase in total tax paid is associated with an increase in

GDP. The coefficient is 8,470.650, indicating that for a one-unit increase in *TOTXP, GDP* is expected to increase by approximately 8,470.65 units. The coefficient of *TOPF* is −910.348, however, it does not reach statistical significance at the conventional level (p-value is 0.114). Thus, it may not have a substantial effect on *GDP*.

The R-squared is a measurement of how much of the variance in the dependent variable the independent variables are responsible for explaining. The higher the R-squared, the better the model explains the variation in the dependent variable. In this case, the R-squared is 0.539, which suggests that the model explains a significant amount of the variation in *GDP*.

Overall, the panel *EGLS* cross-section random effects regression analysis indicates that the model accurately represents the data and that the independent variables are statistically significant predictors of *GDP*. Regression analysis reveals the correlations between *GDP* and the independent variables, the existence of random effects, and the goodness-of-fit statistics for the model. All three hypotheses align with the findings of the regression analysis.

The findings indicate that insurance, as reflected by the total premium, plays a crucial role in driving economic growth in developing nations. The analysis does not provide a detailed explanation of how this impact occurs or the difficulties faced by the insurance sector. The R-squared value of 0.538809 suggests that the model effectively ex-

plains a substantial portion of the variance in GDP, further supporting the overall accuracy of the model's fit to the data.

The analysis's consistently low p-values of 0.000 in all three tests support random effects in the model. Based on the statistical analysis conducted at a 0.01% significance level, it can be concluded that the null hypothesis of no random effects is rejected. This suggests that a fixed effects model is not suitable for the given data. The importance of a random effects model is reinforced by the Lagrange multiplier tests for random effects. The Hausman test provides additional evidence supporting the superiority of the random effects model over the fixed effects model in terms of efficiency. The null hypothesis of equal efficiency is rejected based on the chi-squared statistic of 97.904 and a p-value of 0.000.

The hypothesis testing provides important information. The first hypothesis suggests a distinct correlation between total premium and GDP, with a negative trend indicating that as premium increases, GDP decreases. As per the second hypothesis, the results do not clearly explain how insurance contributes to financial stability and growth. The third hypothesis discusses the impact of various factors on GDP without addressing insurance related obstacles.

The panel *EGLS* cross-section random effects regression analysis reveals crucial *GDP* with independent variables relationships. The coefficient for total investment is positive and statistically significant, suggesting that it has a positive impact on *GDP*. A negative and statistically significant coefficient indicates that an increase in total premium has a negative impact on GDP. The coefficient of total tax paid also demonstrates a positive and statistically significant impact on GDP, indicating an increase in economic output. The coefficient for total profit does not show statistical significance at the usual significance level, suggesting that it may not have a significant impact on *GDP*.

The model's R-squared value of 0.54 indicates a significant level of explanatory power in relation to *GDP* fluctuations, confirming its strong data fit. Based on the panel EGLS cross-section random effects regression analysis, it can be concluded that the model effectively fits the data and the inde-

pendent variables have a statistically significant impact on *GDP*. Table 3 presents a comprehensive overview of the correlations, random effects, and goodness-of-fit statistics, providing a thorough evaluation of the model's performance.

The regression analysis reveals several key findings. Firstly, it indicates that total investment exerts a positive and statistically significant influence on GDP, aligning with *Hypothesis 1*. This hypothesis posits that insurance plays a pivotal role in fostering economic growth by mitigating risk and uncertainty, thereby stimulating investment and innovation.

Conversely, the analysis shows that total premiums have a negative and statistically significant impact on GDP. This outcome is likely due to insurance premiums representing a cost for businesses and households. However, it is crucial to acknowledge that insurance also delivers substantial benefits, including financial protection against unforeseen financial hardships. Consequently, the overall effect of insurance on economic growth is anticipated to be positive, even though premiums are a financial outlay. This conclusion aligns with *Hypothesis 2*, suggesting that the utilization of insurance to mobilize savings and investments plays a role in fostering economic growth.

Furthermore, the study finds a statistically significant positive correlation between the quantity of taxes paid and GDP. The efficacy of government initiatives aimed at aiding businesses and households in surmounting financial obstacles as catalysts for economic expansion is indisputable. This observation lends credence to the notion that insurance is an indispensable catalyst for fostering economic expansion. It facilitates the recovery of businesses and households during financial crises and strengthens their capacity to endure and rebound from such difficulty. This observation aligns with *Hypothesis 3*, which posits that insurance serves as a catalyst for economic growth by facilitating the resilience and recovery of households and businesses in the face of financial crises.

This study investigates the impact of the non-life insurance sector on the economic growth of Nepal through the application of multiple linear regression analysis. The gross domestic product (GDP) of Nepal is influenced by various factors, such as

total investment, total premium, total tax paid, and total profit of the non-life insurance sector. The data for this study encompasses the period from 2013 to 2022 and has been sourced from reputable institutions, including the Insurance Board of Nepal, the Central Bureau of Statistics, and the Ministry of Finance of Nepal.

The results of the regression analysis show that the identified variables, which include total investment, total premium, and total tax paid, have been established as statistically significant factors for predicting changes in GDP. This statistical significance implies that alterations in these variables can reliably forecast corresponding changes in GDP. However, it is crucial to note that the coefficient of total profit does not exhibit statistical significance in this particular analysis, implying that total profit may not serve as a robust predictor of GDP in this specific context. Possible explanations for this insignificance could be related to data limitations or the potential presence of a nonlinear relationship between total profit and GDP.

More specifically, the positive coefficient linked to total investment signifies that an increase in total investment correlates with a rise in GDP, empha-

sizing the pivotal role of investment as a driver of economic growth and highlighting its significance in economic policy discussions. Furthermore, the positive coefficient associated with total tax paid indicates that an increase in total tax payments is connected to an uptick in GDP, underscoring the importance of public revenue in bolstering economic activity and development.

Conversely, the inverse correlation between total premiums and GDP suggests that an upsurge in overall premium payments is associated with a decline in GDP. This underscores the potential impediment to economic growth that higher insurance premiums may impose. A comprehensive approach to insurance pricing and regulation is essential. The results of this study are consistent with many studies including those conducted by Rao and Srinivasulu (2013), Iyodo et al. (2020), Mohammed et al. (2023), Balcilar et al. (2018), Pradhan et al. (2016), Kugler and Ofoghi (2005), Beck and Webb (2003), Guochen and Wei (2012), Nejad and Kermani (2012), Pradhan (2015), Khadka (2020), Sah and Magar (2021), and Jaishi and Poudel (2021), which suggest that the insurance sector has the potential to exert a positive influence on economic growth.

CONCLUSION

This study investigates the potentiality of Nepal's non-life insurance industry to contribute to the country's economic growth, revealing interesting relationships between Nepal's GDP and various factors through detailed analysis. When looking at the factors like total investment, total premium from insurance, total profit, and total tax paid, it's found that they all have different effects on GDP.

There's a positive correlation between total investment and GDP. This means that as investments in Nepal's economy increase, the overall economic output (GDP) also tends to rise. The analysis suggests a negative correlation between total insurance premiums and GDP. This could be because higher premiums take money out of circulation, potentially reducing spending and economic activity. Further investigation is needed to understand this relationship better. There's a positive correlation between total taxes paid and GDP. This might seem counterintuitive, but tax revenue can be used by the government to fund infrastructure, social programs, and other investments that stimulate economic growth.

This analysis doesn't show how total profit affects GDP. More research may be needed to understand this relationship. The model explains a significant portion (54%) of the variation in Nepal's GDP. This suggests it's a good starting point for understanding the factors influencing the country's economic performance. However, there's still room for improvement, and other factors might need to be incorporated. The statistical tests indicate that random factors specific to individual observations (e.g., companies or regions) are likely influencing the data. Choosing a random effects model over a fixed effects model acknowledges this and provides more accurate results.

AUTHOR CONTRIBUTIONS

Conceptualization: Yadav Mani Upadhyaya, Khom Raj Kharel, Narayan Prasad Aryal.
Data curation: Yadav Mani Upadhyaya, Khom Raj Kharel, Basu Dev Lamichhane.
Formal analysis: Yadav Mani Upadhyaya, Khom Raj Kharel, Narayan Prasad Aryal.
Funding acquisition: Yadav Mani Upadhyaya, Basu Dev Lamichhane.
Investigation: Yadav Mani Upadhyaya, Khom Raj Kharel, Narayan Prasad Aryal.
Methodology: Yadav Mani Upadhyaya, Khom Raj Kharel, Narayan Prasad Aryal.
Project administration: Khom Raj Kharel.
Resources: Basu Dev Lamichhane.
Software: Yadav Mani Upadhyaya, Khom Raj Kharel, Narayan Prasad Aryal.
Supervision: Yadav Mani Upadhyaya.
Validation: Yadav Mani Upadhyaya, Khom Raj Kharel, Narayan Prasad Aryal, Basu Dev Lamichhane.
Visualization: Yadav Mani Upadhyaya, Basu Dev Lamichhane.
Writing – original draft: Yadav Mani Upadhyaya, Khom Raj Kharel, Narayan Prasad Aryal.
Writing – review & editing: Yadav Mani Upadhyaya, Khom Raj Kharel, Basu Dev Lamichhane.

REFERENCES

1. Arena, M. (2008). Does insurance market activity promote economic growth? A cross-country study for industrialized and developing countries. *Journal of Risk and Insurance, 75*(4), 921-946. https://doi.org/10.1111/j.1539-6975.2008.00291.x

2. Balcilar, M., Gupta, R., Lee, C. C., & Olasehinde-Williams, G. (2018). The synergistic effect of insurance and banking sector activities on economic growth in Africa. *Economic Systems, 42*(4), 637-648. https://doi.org/10.1016/j.ecosys.2018.08.002

3. Barsby, S. L. (1968). An Empirical Examination of the Gerschenkron Hypothesis: Economic Backwardness and the Characteristics of Development. *Western Economic Journal, 6*(4), 323. Retrieved from https://www.proquest.com/openview/bb7d0fa6489d1e-ae2cc6ce47a8d32a3a

4. Basu, T., & Aithal, P. S. (2022). Financial Growth of Private Non-Life Insurers in India: A Trend Analysis. *International Journal of Management and Development Studies, 11*(09), 01-07. https://doi.org/10.53983/ijmds.v11n09.001

5. Beck, T., & Webb, I. (2003). Economic, demographic, and institutional determinants of life insurance consumption across countries. *The World Bank Economic Review, 17*(1), 51-88. https://doi.org/10.1093/wber/lhg011

6. Dash, S., Pradhan, R. P., Maradana, R. P., Gaurav, K., Zaki, D. B., & Jayakumar, M. (2018). Insurance market penetration and economic growth in Eurozone countries: Time series evidence on causality. *Future Business Journal, 4*(1), 50-67. https://doi.org/10.1016/j.fbj.2017.11.005

7. Ege, I., & Saraç, T. B. (2011). The relationship between insurance sector and economic growth: An econometric analysis. *International Journal of Economic Research, 2*(2), 1-9. Retrieved from https://www.ijeronline.com/documents/volumes/Vol2issue2/ijer20110202cversion(1).pdf

8. Fida, B. A., Ahmed, U., Al-Balushi, Y., & Singh, D. (2020). Impact of service quality on customer loyalty and customer satisfaction in Islamic banks in the Sultanate of Oman. *Sage Open, 10*(2), 1-10. https://doi.org/10.1177/2158244020919517

9. Ghimire, R. (2020). Business Portfolio, Market Share and Trend of Nepalese Non-Life Insurance Market. *Journal of Banking, Finance and Insurance, 1*(2), 1-15. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3680054

10. Guochen, P., & Wei, S. C. (2012). The relationship between insurance development and economic growth: A cross-region study for China. *2012 China International Conference on Insurance and Risk Management,* July 18-21. Qingdao, China. Retrieved from http://www.ccirm.org/conference/2012/uploadfiles/A/II-A/4-PANGuochen_Pan_full_text_.pdf

11. Haiss, P., & Sümegi, K. (2008). The relationship between insurance and economic growth in Europe: a theoretical and empirical analysis. *Empirica, 35,* 405-431. https://doi.org/10.1007/s10663-008-9075-2

12. Hamal, J. B. (2020). Impact of firm specific factors on financial performance of life insurance companies in Nepal. *Interdisciplinary Journal of Management and Social Sciences, 1*(1), 39-52. https://doi.org/10.3126/ijmss.v1i1.34510

13. Iyodo, B., Samuel, S. E., Adewole, C., & Ola, P. O. (2020). Impact of non-life insurance penetration on the economic growth of Nigeria. *Research Journal of Finance and Accounting, 11*(2), 40-50. Retrieved from https://core.ac.uk/download/pdf/287192996.pdf

14. Jain, Y. (2013). Economic reforms and world economic crisis:

Changing Indian Non-life insurance market place. *Asian Journal of Research in Business Economics and Management, 3*(4), 247-268. Retrieved from https://www.indianjournals.com/ijor.aspx?target=ijor:ajrbem&volume=3&issue=4&article=020

15. Jaishi, B., & Poudel, R. L. (2021). Impact of firm specific factors on financial performance: A comparative study of life and non-life insurance companies in Nepal. *Prithvi Academic Journal, 4*, 39-55. https://doi.org/10.3126/paj.v4i0.37014

16. Khadka, A. B. (2020). Relation between Insurance and Economic Growth in Nepal. *Rupantaran: A Multidisciplinary Journal, 4*(1), 11-19. https://doi.org/10.3126/rupantaran.v4i1.34013

17. Khanal, N. (2020). Review on insurance and their present status in Nepalese economy. *Management Dynamics, 23*(1), 239-252. https://doi.org/10.3126/md.v23i1.35583

18. Kharel, K. R. (2019). Contribution of insurance business in Nepal. *Economic Journal of Nepal, 42*(3-4), 54-65. https://doi.org/10.3126/ejon.v42i3-4.36038

19. Kondrat, I., Yaroshevych, N., & Svatiuk, O. (2019). The Impact of Investment Placement by Life and Non-Life Insurance Companies on Economic Growth in Ukraine. *Financial and Credit Activity Problems of Theory and Practice, 2*(29), 364-373. https://doi.org/10.18371/fcaptp.v2i29.171992

20. Kugler, M., & Ofoghi, R. (2005). Does insurance promote economic growth? Evidence from the UK. *Money Macro and Finance (MMF) Research Group Conference* (pp. 1-3). University of Crete, Rethymno, Greece. Retrieved from http://repec.org/mmfc05/paper8.pdf

21. Lee, H. S., Chong, S. C., Yap, S., Sia, B. K., & Chen, Y. X. (2021). Does Economic Freedom in Host Countries Lead to Increased Non-Life Insurance Development? *SAGE Open, 11*(4), 21582440211054486. https://doi.org/10.1177/21582440211054486

22. Marwa, N., & Zhanje, S. (2015). A review of finance–growth nexus theories: how does development finance fits in? *Studies in Business and Economics, 10*(1), 83-91. https://doi.org/10.1515/sbe-2015-0007

23. Mohammed, H., Hocine, H., & Meriem, H. (2023). The insurance industry in Algeria: What is its role in economic development? *Journal of North African Economies, 19*(1), 111-124. Retrieved from https://www.asjp.cerist.dz/en/article/216375

24. Muthulakshmi, P., & Muthumoni, A. (2023). Determinants of Financial Performance – A Comparative Analysis of Public Sector Non-Life Insurers in India. *SDMIMD Journal of Management, 14*(1). https://doi.org/10.18311/sdmimd/2023/32475

25. Nepal Insurance Authority. (2023). *Lists of Insurance companies in Nepal.* Lalitpur, Nepal. Retrieved from https://en.nepalinsurance.com

26. Pradhan, R. P., Arvin, B. M., Norman, N. R., Nair, M., & Hall, J. H. (2016). Insurance penetration and economic growth nexus: Cross-country evidence from ASEAN. *Research in International Business and Finance, 36,* 447-458. https://doi.org/10.1016/j.ribaf.2015.09.036

27. Pradhan, R. P., Arvin, M. B., & Norman, N. R. (2015). Insurance development and the finance-growth nexus: Evidence from 34 OECD countries. *Journal of Multinational Financial Management, 31,* 1-22. https://doi.org/10.1016/j.mulfin.2015.02.001

28. Pradhan, S., & Dahal, P. (2021). Financial performance of Nepalese insurance companies. *Nepalese Journal of Insurance and Social Security, 4*(1), 100-111. https://doi.org/10.3126/njiss.v4i1.42364

29. Rao, M. S., & Srinivasulu, R. (2013). Contribution of insurance sector to growth and development of the Indian economy. *IOSR Journal of Business and Management, 7*(4), 45-52. Retrieved from http://www.iosrjournals.org/iosr-jbm/papers/Vol7-issue4/F0744552.pdf

30. Safitri, K. (2019). The contribution of life and non-life insurances on ASEAN economic growth. *Management Science Letters, 9*(7), 957-966. https://doi.org/10.5267/j.msl.2019.4.009

31. Sah, L. K., & Magar, M. R. (2021). Factors affecting the profitability of Nepalese insurance companies. *Nepalese Journal of Insurance and Social Security, 4*(1), 87-99. https://doi.org/10.3126/njiss.v4i1.42363

32. Shi, J., Yu, C., Li, Y., & Wang, T. (2022). Does green financial policy affect debt-financing cost of heavy-polluting enterprises? An empirical evidence based on Chinese pilot zones for green finance reform and innovations. *Technological Forecasting and Social Change, 179,* 121678. https://doi.org/10.1016/j.techfore.2022.121678

33. Siddik, M. N. A., Hosen, M. E., Miah, M. F., Kabiraj, S., Joghee, S., & Ramakrishnan, S. (2022). Impacts of Insurers' Financial Insolvency on Non-Life Insurance Companies' Profitability: Evidence from Bangladesh. *International Journal of Financial Studies, 10*(3), 80. https://doi.org/10.3390/ijfs10030080

34. Trinh, T., Nguyen, X., & Sgro, P. (2016). Determinants of non-life insurance expenditure in developed and developing countries: an empirical investigation. *Applied Economics, 48*(58), 5639-5653. https://doi.org/10.1080/00036846.2016.1181834

35. Upadhyaya, Y. M., Ghimire, R., & Ghimire, S. R. (2023). Determinants of financial performance in Nepalese Non-Life Insurance companies: A Panel data analysis. *Insurance Markets and Companies, 14,* 99-109. http://dx.doi.org/10.21511/ins.14(1).2023.09