Sectoral Differences in Insurance Penetration Drivers Across Emerging Asia: Evidence from Panel Regressions

Yadav Mani Upadhyaya[1] and Shiva Raj Ghimire[2]

[1]Tribhuvan University, Saraswati Multiple Campus, Kathmandu, Nepal.
Assistant Professor of Economics; Email: yadav.upadhyaya@smc.tu.edu.np
ORCID: https://orcid.org/0000-0003-3089-3615

[2]Corresponding author
Tribhuvan University, Saraswati Multiple Campus, Kathmandu, Nepal. Assistant Professor of Management;
Email: shiva.ghimire@smc.tu.edu.np
ORCID: https://orcid.org/0009-0002-7952 1097

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Abstract

Background: Insurance penetration in emerging economies in Asia remains low and uneven, with sectoral differences driven by financial factors and others, highlighting the need to understand the determinants of life and nonlife insurance uptake.

Objective: To empirically identify and differentiate the statistically significant and economically meaningful drivers of life vs. non-life insurance penetration.

Method/Design: This study estimated fixed effects regression models on a 68 observations panel data set to understand the life and non-life insurance penetration (calculated as premiums to GDP) across nations.

Finding: The main findings of this study note that Life insurance penetration is positively influenced by domestic credit ($\beta = 0.0082$), urbanization ($\beta = 0.0487$), and internet access ($\beta = 0.00015$) but negatively by age dependency ($\beta = -0.0412$) and inflation ($\beta = -0.0281$), while non-life insurance is driven by imports ($\beta = 0.0085$), exports ($\beta = 0.0102$), and internet access ($\beta = 0.00006$) with inflation negatively influencing ($\beta = -0.0152$).

Conclusion: Development of the insurance sector in Emerging Asia is not a singular phenomenon and will require distinct strategies based on the economic fundamentals associated with each sector.

Implications: All stakeholders in life and non-life insurance industries need to start using sector-specific strategies. These strategies are necessary to realize the enormous insurance potential of the region and enhance economic resilience.

Keywords: insurance penetration, emerging Asia, fixed effects model, sectoral divergence, digital infrastructure, trade openness

JEL: G_{22}, L_{66}, O_{16}, C_{23}

1. Introduction

The role of insurance as a key engine of financial stability and a cornerstone of inclusive growth in developing economies (Pradhan et al., 2016; Singhal et al., 2020; OECD, 2024). However, even with the extensive potential of Emerging Asia, which contains powerful economies such as China, India, Malaysia, Thailand, Vietnam, Indonesia, and the Philippines, the level of insurance penetration remains extremely low and uneven between life and non-life. This is not simply a statistical divergence, but it reflects two fundamentally different economic logics that previous analysis has not systematically disentangled.

The significant factors of total insurance demand such as income, financial development, inflation, and institutions (Akhter et al., 2020; Elango & Jones, 2011), most studies have generalized the insurance market as a unitary sector. This fails to acknowledge an important source of heterogeneity. Dragos (2014) is among the first to demonstrate that life insurance interacts with long-run structural reference factors like demographics and financial deepening, while non-life insurance is primarily responding to short-run economic activity. This structural division has also persisted in regional studies: Sanjeewa et al. (2019) have connected life insurance uptake in South Asia with urbanization and household financial needs, while Poposki et al. (2015) and Etudaiye-Muhtar and Agboola (2021) have tied increases of non-life insurance in European and African studies with trade openness and economic volatility. Even within the Emerging Asia region, we see anecdotes to support this observed difference: Thailand and Malaysia had life insurance penetration rates over 3% of GDP and China's non-life insurance market is buoyed by commercial risk from its significant export economy—however, no rigorous cross-country examination of whether these trends manifest in more systematic, sector-specific excess demand has yet been completed.

This gap is important because merging life and non-life insurance will result in policy and strategy failure. For example, supporting financial inclusion could increase life insurance penetration, but have little effect on cargo or liability insurance, both of which are necessary for exporters. The influence of digitalization is also murky: while Gowaneit et al. (2016) show mobile claims can promote claims efficiency in Thailand, we still do not understand whether access to a digital claim process is primarily related to household products (life) versus commercial risk transfer (non-life). Unless we can separate the motivating factors for each segment, stakeholders will continue to engage in simply providing generic interventions, rather than promoting the market's insurance possibilities for regional growth.

This research directly fills gap by carrying out a fixed-effects panel regression analysis across seven emerging Asian economies between 2013 and 2023 and explicitly modeling life and non-life insurance penetration as outcomes. Following Dragos (2014) and extending the regional focus of Sanjeewa et al. (2019) and Pradhan et al. (2016), we empirically test the hypothesis that life insurance can be explained by household-level conditions, financial deepening, favorable demographics, and urbanization and that non-life insurance can be explained by macroeconomic openness—largely via trade. By distinguishing between life and non-life coverage in this way, we move beyond correlation to identify statistically robust, economically meaningful drivers. The contribution is in providing an evidence-based toolkit of sector-specific drivers to intersect with practical, "economic fundamentals" targeting of each segment of insurance. In a region where insurance is under-leveraged, albeit with high levels of economic growth, this level of specificity is vital for policymakers, insurers, and investors who aspire to support financial resilience and inclusive development.

2. Review of Literature and Hypothesis Development

2. 1. Sectoral Determinants of Insurance Demand and Penetration

Empirical studies present substantial support for the multi-dimensional drivers of insurance demand. Akhter et al. (2020) investigated insurance demand comparisons between emerging Asian economies and OECD countries. They indicated that income, inflation, and financial development were major influencing factors on demand. Because emerging markets tend to have low insurance penetration, they suggested these markets have greater potential for growth. Elango and Jones (2011) also identified income, inflation, education, and institutional quality as key drivers of insurance demand, while Dragos (2014) highlighted the differences between demand for life and non-life insurance. The demand for life insurance was more susceptible to long-term economic changes, while the demand for non-life insurance was more responsive to short-term fluctuations in income.

At a regional level, studies highlight the variation in the factors influencing demand. In South Asia, Sanjeewa et al. (2019) found that demand for life insurance was driven by income, education, and urbanization, but cultural and social impediments remain barriers to uptake. In Southeastern Europe, Poposki et al. (2015) found evidence for income and institutional quality affecting non-life insurance uptake. Etudaiye-Muhtar and Agboola (2021); Rajaram et al. (2015) identified that in Nigeria urbanization and GDP growth stimulated demand, but inflation and the weakness of laws reduced demand. Cheteni et al. (2024) in Sub-Saharan Africa identified some of the similar characteristics, although in low- and middle-income countries, income, inflation, and financial knowledge affected demand differently.

Further examination of country-level findings adds depth to the research. Hristova (2022) determines that life insurance penetration in Bulgaria results from income and demographic change, but cultural and institutional barriers persist. Millo and Carmeci (2011) examined non-life insurance consumption in sub-regional data in Italy and found heterogeneity regarding consumption, where education and institutional quality were important factors.

2.2 Institutional and Regulatory Drivers of Sectoral Insurance Growth

Empirical studies support this theoretical perspective. Bah and Abila (2022) emphasized that with respect to Africa, quality of governance, political stability, and regulatory quality are indicators that impact whether insurance is purchased. Furthermore, Skipper (1997) warned that while foreign insurers can provide capital and innovation to an emerging market regulation, which is balanced with domestic insurers' interests, is essential to prevent the foreign insurers from taking over the domestic market. Hussels et al. (2007) noted that while liberalization and regulatory reform provided the impetus for the growth of the insurance industry in South and East Asia, it was evident that insurance market performance was not equitable across nations. With a focus on global policy, Shindo and Stewart (2020) emphasized the importance of inclusive regulation where risk-based capital and broader access and availability of insurance products are essential for developing sustainable insurance markets.

Studies from European contexts also reinforced the argument that regulatory harmonization drives productivity, like findings from empirical studies in developing nations. Vencappa et al. (2013) noted that both consolidation and regulatory reforms provided efficiency improvements in both life and non-life EU markets. Witkowska (2023) suggested on a broader theme that regulatory pressures continued to shape the market dynamics of European insurance markets.

2. 3. Competition, Efficiency, and Innovation in Insurance Market

Bikker and Van Leuvensteijn (2008), looking at Dutch life insurance, discovered that competition typically improves efficiency but may reduce profitability if competition is excessive. Brown and Goolsbee (2002) found that online price comparison engines increased competition and decreased price insurance premiums in the United States, resulting in improved value or welfare for consumers over time. At the international level, Ma and Pope (2008) found evidence that foreign insurance companies increased overall efficiency and increased insurance penetration, although the overall impact may differ depending on the quality of domestic insurance regulation or governance.

Innovation represents an additional consideration. Gowaneit et al. (2016) examined mobile claims management initiatives in Thailand and found that the innovation improved efficiency and increased customer satisfaction. In Insurance Europe's report, it highlights that digitalization of the insurance value chain has the potential to disrupt traditional insurance distribution. Horvey and Odei-Mensah (2025) translated these concepts to the African market and found evidence of nonlinear effects of innovation on underwriting performance and noted that the converging mobile and fintech developments will provide fresh growth opportunities for African insurers.

2.4. Sectoral Role of Insurance in Economic Growth and Stability

The interplay between insurance and economic development has been a longstanding area for discussion in financial economics and development economics, with empirical work repeatedly corroborating this theoretical foundation. Using a panel of ASEAN countries, Pradhan et al. (2016) found that life and non-life insurance contribute positively to GDP growth through deepening the financial sector, mobilizing long-term savings, and transferring risk. Similarly, Ward and Zurbruegg (2000); Gowanit et al. (2016) found a positive and strong relationship between insurance development and economic growth in OECD countries, suggesting that developed markets gain advantages from insurance through investment flows and stability of the system. To extend this line of thinking, Upadhyaya et al., (2024); Singhal et al., (2020; 2022) found that the causal relationship between insurance and economic growth is verifiable in emerging economies in Asia as well and argue that the expansion of insurance not only stimulates economic activity but also contributes to macroeconomic resilience. Country-specific evidence also supports these conclusions: Olayungbo (2015) finds that both life and non-life insurance positively impact long-run economic growth in Nigeria. Islam et al., (2025) find that life and non-life insurance contributes to growth in Bangladesh, with life insurance displaying much stronger impacts driven by capital accumulation, and possibly mobilization of savings.

Singh et al. (2025) and the OECD (2024) provide an even more global insight, again noting that regardless of the global shock (like a pandemic or climate risk), insurance always acts as a stabilizing force for financial stability. They demonstrate how insurance creates stability in both advanced economies and developing economies as well.

2. 5. Firm-Level Determinants of Insurance Sector Profitability

Camino-Mogro and Bermúdez-Barrezueta (2019), studying the case of Ecuador, found that profitability is strongly influenced by firm size, reinsurance dependence, and capital structure. Zinyoro and Aziakpono (2023) conducted a review of the global literature and emphasized how firm-specific determinants,

in conjunction with regulatory frameworks and macroeconomic cycles/multi-year periods, can influence performance outcomes. Horvey and Odei-Mensah (2025), studying the case of South Africa, identified nonlinear effects of regulation and innovation on underwriting performance, illustrating the complementarity between macro- and micro-level drivers.

Evidence also remains for regions. Millo and Carmeci (2011) identified sub-regional heterogeneity for non-life consumption in Italy. Further, Islam et al. (2025) and Binder & Ngai (2012). found evidence of a strong relationship between insurance sector performance and GDP in the case of Bangladesh, indicating that firm performance can act as an engine for macroeconomic stability.

2. 6. Emerging Market Strategies and Opportunities for Insurance Expansion

Emerging markets are a key focus in more recent literature due to low insurance penetration and strong growth potential. Emerging market insurers face structural, cultural, and affordability barriers; however, there are opportunities for growth from digitalization, regulatory reform, and financial inclusion. Twaambo (2024) identified product diversification, customer trust, and digitalization as three strategies for market penetration in Zambia. Azizakhon and Madina (2025) identified Uzbekistan as an emerging market with growth potential in insurance but highlighted the importance of regulatory reform, financial literacy, and product diversification. Signé and Johnson (2020) highlighted demographic growth, urbanization, and digitalization as opportunities for insurance growth in Africa, while recognizing existing barriers to growth, such as regulatory gaps, low awareness, and understanding of insurance.

2.7 Research Gap

Existing studies generally aggregate insurance data, neglecting the presence of sectoral heterogeneity existing between life and non-life markets. Only a few studies utilize a robust panel method to distinguish between macroeconomic, demographic and technological drivers impacting each segment. Empirically, only a few scholars have attempted to analyze sectoral differences across Emerging Asian economies in a single framework accounting for fixed effects and cross-country differences. This study fills that gap using unique 11-year panel (2013–2023) data on seven Emerging Asian economies to analyze the differential determinants of life and non-life insurance penetration with empirically robust and policy-relevant insights regarding the dynamic changes of one of the most promising but under-developed regions for insurance in the world.

2.8. Hypothesis Development

1. Financial Development (H1): Strongly supports life insurance, partially supported non-life insurance.
2. Demographics (H2): Significant for life (age dependency negative), partially supported for non-life.
3. Urbanization & Education (H3): Urbanization boosts life insurance but education is weak for non-life insurance.
4. Economic Openness (H4): Strongly drives non-life, not supported life insurance.
5. Technology (H5): Internet is significant in mobile in life, and it is also partially supported in nonlife.
6. Macroeconomic Stability (H6): Inflation strongly supported in both sectors.
7. Employment (H7): No significant impact on both sectors.

3. Research Methodology

This research study has adopted a quantitative, econometric approach to empirically analyze the fundamental macroeconomic, demographic, and technological determinants of insurance market penetration in seven emerging Asian markets: China, India, Malaysia, Thailand, Vietnam, Indonesia, and the Philippines. The analysis covers the period 2013 to 2023, offering a relevant current assessment of factors influencing the insurance industry.

3. 1. Research Design

The research uses a design for panel data analysis. This design is appropriate for this study because it consists of cross-sectional data (across 7 countries) and time-series data (over 11 years), providing a richer analysis than straight cross-sectional or time-series data. Panel data allows for the control of unobserved heterogeneity and provides for more variability, degrees of freedom, and efficiency in the estimation.

3. 2. Data Source and Sample

The primary source of data for this research is the World Bank's World Development Indicators (WDI) database. The reliability, consistency, and global comparability of the data justify this selection. The study utilized an unbalanced panel of 7 countries over the period of 2013-2023, which results in a maximum of 77 observations. After excluding cases with missing values for key variables such as SCO_enroll (school enrollment) for Thailand in 2015, DCTPS (domestic credit to private sector, % of GDP) for India in 2023, and Internet for Vietnam in 2023, the usable sample used for analysis is 68 observations. This is a sufficient sample size for performing strong fixed effects analysis with 11 independent variables of interest. The final countries, which reflect a broad cross section of Emerging Asia, including large economies, newly industrializing economies, and dynamic frontier economies.

3. 3 Variable Definition and Measurement

Table 1

Definitions of Variables and Measurement

Type	Variable	Description	Measurement / Indicator
Dependent Variables	LIP_GDP	Life insurance penetration – size of life insurance relative to the economy.	Life insurance premiums (% of GDP).
	NLP_GDP	Non-life insurance penetration – property & casualty coverage depth.	Non-life insurance premiums (% of GDP).
Independent Variables	DCTPS	Financial development and access to credit.	Domestic credit to private sector (% of GDP).
	SCO_enroll	Human capital development through education.	Gross school enrollment ratio (%).
	Employment	Labor market participation.	Employment-to-population ratio (% of ages 15+).

AGE_DR	Demographic pressure of dependents on workers.	Age dependency ratio (% of working-age population).
Urbanization	Concentration of economic activity and lifestyle modernization.	Urban population (% of total).
POP_15-64	Economically active and insurable population share.	Population aged 15–64 (% of total).
Import_GDP	Integration through imports.	Imports of goods and services (% of GDP).
Export_GDP	Integration through exports.	Exports of goods and services (% of GDP).
Internet	Digital readiness and e-commerce infrastructure.	Secure internet servers (per million people).
Mobile_subscriber	Telecommunications development.	Mobile cellular subscriptions (per 100 people).
Inflation_CPI	Macroeconomic stability and purchasing power.	Consumer price index (annual % change).

3. 4. Econometric Model Specification

The study implements a Fixed Effects (FE) Panel Data Regression model to separate the causal effects of each independent variable while controlling country-specific, time-fixed characteristics (including culture, legal traditions, or institutional quality). The inquiry, research question, and type of data under analysis align well with this model. The general form of the models:

$$Y_{it} = \beta X_{it} + \alpha_i + \lambda_t + \varepsilon_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots. \text{ (i)}$$

where: Y_{it}= outcome (e.g., LIP_GDP or NLP_GDP), X_{it}= vector of explanatory variables, α_i= country fixed effects, λ_t= year (time) fixed effects and ε_{it}= error term

3. 5. Model Diagnostics and Validation

The Hausman (1978) test serves as an official method to compare Fixed Effects (FE) and Random Effects (RE) estimators. The multicollinearity test involved calculating the Variance Inflation Factors (VIF) for all independent variables in both models. Strengthening the robustness of the modeling framework: First, time fixed effects have been used by including year dummy variables. Second, in re-estimation, we have been using lagged (t–1) values of the independent variables to assess for delayed effects. Third, sub-sample analyses have been included for different country groups by running separate regressions, such as comparing higher-income economies (Malaysia and Thailand) versus lower-income economies (Vietnam, India, and the Philippines) to assess if the drivers of increased insurance penetration vary by development. Finally, we have tested alternative functional forms to address skewed distributions of variables.

3. 6. Data Analysis Plan

The first step involves an analysis of seven emerging Asian descriptive analyses with their different variables. The descriptive statistics include the mean, standard deviation, minimum, and maximum for all variables overall for the panel as well as for each country. Then a correlation matrix has been

built to look for initial bivariate relationships among variables. The third step involves diagnostics and robustness checks; the fourth step is model estimation. Finally, the sixth step is hypothesis results on interpretation and discussion, which has involved syntheses of results, interpretations of coefficients, and discussions of the economic significance within the context of existing literature and unique features regarding emerging Asian markets.

4. Results and Analysis

Based on the analysis of the initial data observations about the insurance market in Emerging Asia, we can see that the life and non-life insurance penetration varies considerably among the countries examined. Malaysia and Thailand are similar, with LIP_GDP ranging between 3-4% and remaining constant over the years—slightly decreasing from 2019 to 2020. NLP_GDP in both countries also maintains stability with a slow decline. On the other hand, Vietnam and India show a strong increase in LIP_GDP, with Vietnam moving from 0.6% to 1.6% and India from 2.6% to 3.2%. Their NLP_GDP maintains the same flat rate or increases slightly. LIP_GDP in China is more volatile than in the other countries, with a peak of 2.68% in 2017 and dropping to 2.1% in 2021. However, NLP_GDP continues to show a steady impressive increase from 1.4% to 2.1%. Indonesia and the Philippines exhibit weak performance, as LIP_GDP remains low, flat, and declining, while NLP_GDP stays very small but stable throughout the time. The correlations between insurance penetration and possible underlying factors indicate that LIP_GDP has a strong, positive correlation with DCTPS; countries such as Malaysia, Thailand, and China, which exhibit higher values of domestic credit to the private sector, also have larger life insurance penetration. A similarly forceful association appears between LIP_GDP and Internet infrastructure, as Malaysia has high values that drive the steeply rising slope of the scatter cloud but appear consistent with the univariate analysis of the variable. LIP_GDP and AGE_DR are negatively related, indicating that higher dependency ratios are associated with reduced life insurance penetration. In the non-life insurance sector, NLP_GDP correlates with export activity, as evidenced by China's significantly higher share of exports reflected in its elevated NLP_GDP, whereas other countries tend to cluster at lower levels for both variables.

Table 2

Exploratory Data Analysis (EDA)

Variables	Mean	Stand. Dev.	Min	Max
LIP_GDP	2.31	0.97	0.50	4.00
NLP_GDP	1.10	0.54	0.40	2.10
DCTPS	96.31	50.07	34.34	194.67
SCO_enroll	40.77	13.38	24.39	74.82
Employment	62.42	7.89	47.47	76.34
AGE_DR	46.50	6.07	38.04	61.18
Urbanization	53.43	15.37	32.00	78.72
Inflation_CPI	3.25	2.30	-1.61	10.02
Mobile_subscriber	128.61	26.07	68.40	181.22
POP_15-64	68.23	2.98	62.04	72.34
Import_GDP	40.67	23.53	15.64	92.83
Export_GDP	42.58	24.55	17.00	93.85
Internet	1558.32	2218.46	5.13	8416.74

Source: *Data calculation from Stata-18.*

Table 2 shows the descriptive patterns and significant features of the dataset. To begin with, LIP_GDP is generally larger than NLP_GDP in most countries because life insurance tends to be larger in Emerging Asia. This trend does not apply to China, where NLP_GDP has often exceeded LIP_GDP, particularly in the years following 2017. This is reflective of the rapid growth of the non-life insurance sector of the economy. Secondly, DCTPS and Internet variables have a very high variance, with standard deviations of 50 and 2218, respectively. This is indicative of the fact that countries in the sample are at entirely unique levels of financial and digital development; for example, Malaysia and China consistently lead in terms of domestic credit to the private sector, while Vietnam demonstrates a rapid development in internet infrastructure. Finally, demographic indicators provide an ambiguous picture. POP_15–64 across countries is relatively stable, with a mean of 68.23% and a low SD of 2.98%, suggestive of roughly similar shares of working-age population. On the other hand, AGE_DR is more variable, indicating that dependency burdens and demographic pressures differ and potentially impact the demand for insurance products across the region.

Table 3

Summary Statistics by Country (Mean Values, 2013-2023)

Country	Obs.	Mean LIP_GDP	Mean NLP_GDP	Mean DCTPS	Mean SCO_enroll	Mean Employment	Mean AGE_DR	Mean Urbanization	Mean Inflation_CPI	Mean Mobile_subscriber	Mean POP_15-64	Mean Import_GDP	Mean Export_GDP	Mean Internet
Malaysia	11	3.48	1.52	121.71	41.26	63.03	44.71	75.80	1.81	136.32	69.50	61.72	68.91	4333.28
China	11	1.99	1.85	165.08	56.87	64.62	42.05	58.51	1.90	110.08	70.05	18.46	20.27	602.17
Thailand	11	3.54	1.79	150.07	47.73	67.43	40.95	49.90	1.34	163.33	71.09	58.54	63.03	1270.22
Vietnam	11	1.26	0.74	103.97	32.86	74.55	46.00	36.05	3.08	137.01	68.36	78.37	81.14	2125.17
India	11	2.84	0.88	50.57	30.91	52.49	49.70	34.82	5.37	79.86	67.21	23.02	20.82	329.59
Indonesia	11	1.26	0.50	37.85	37.87	61.80	48.54	54.63	3.85	128.68	67.60	20.94	21.94	950.91
Philippines	11	1.30	0.54	44.51	36.59	58.20	55.77	47.27	3.38	124.69	64.46	36.57	27.43	90.03

Source: *Data calculation from Stata-18.*

From Table 3, the dataset includes 11 years for each of the seven countries in the sample (2013–2023). The Internet infrastructure variable varies the most across the countries. For instance, Malaysia has an average of 4,333.28 secure servers per million people—the Philippines only has 90 secure servers per million people. The differences on the Internet also highlight the differences across Emerging Asia. The life insurance penetration (LIP_GDP) variable also shows stark differences. Thailand (3.54%) and Malaysia (3.48%) have the highest rates of life insurance penetration, while China has a substantially high rate of non-life insurance penetration (NLP_GDP) (1.85%) commensurate with its massive and commercially robust economy. The financial sector exhibits a similar level of variability. China leads the output in terms of domestic credit to the private sector (DCTPS), with Thailand and Malaysia following closely at about 150%. There are also demographic indicators that provide insight: the Philippines has the most significant dependency ratio (AGE_DR at 55.77), reflecting significant dependents, while China and Thailand have the least dependent ratio, as they have an aging but more economically independent population.

Other macroeconomic characteristics differentiate countries. India has an average inflation rate of 5.37%, which produces much more macroeconomic volatility than its cousins, who are closer to stable inflation reported across the averages. The final distinctiveness provided for differentiation is trade openness; Vietnam leads all countries with 78.37% imports of GDP and 81.14% exports of GDP, with Malaysia close

by. In contrast, India and the Philippines seem to adopt a different and much more inward position with trade and have the lowest ratios of GDP to trade in the group of countries. Overall, the averages provide large distinctions that present different information about financial depth, demographic structure, digital infrastructure, and openness to trade in the picture of emerging Asian economies.

Table 4

Correlation Matrix (Key Variables)

Variables	LIP_GDP	NLP_GDP	DCTPS	Urbaniz ation	Internet	Import_ GDP	Export_ GDP	AGE_D R	CPI
LIP_GDP	1.00	-	-	-	-	-	-	-	-
NLP_GDP	0.28	1.00	-	-	-	-	-	-	-
DCTPS	0.72	0.51	1.00	-	-	-	-	-	-
Urbanization	0.81	0.45	0.65	1.00	-	-	-	-	-
Internet	0.78	0.41	0.68	0.75	1.00	-	-	-	-
Import_GDP	0.15	0.68	0.35	0.25	0.30	1.00	-	-	-
Export_GDP	0.12	0.71	0.38	0.28	0.33	0.94	1.00	-	-
AGE_DR	-0.65	-0.18	-0.42	-0.70	-0.55	-0.20	-0.22	1.00	-
Inflation_CPI	-0.35	-0.25	-0.20	-0.30	-0.28	-0.10	-0.08	0.15	1.00

Source: *Data calculation from Stata-18.*

Table 4 shows the results of the correlation analysis, highlighting some intriguing relationships among the main variables. LIP_GDP is highly positively correlated with DCTPS (0.72), urbanization (0.81), and internet infrastructure (0.78), suggesting that higher levels of financial development, urban concentration, and digital connectivity are closely associated with increased life insurance penetration. On the other hand, LIP_GDP is highly negatively correlated with AGE_DR (-0.65), reinforcing the notion that higher dependency burdens are associated with lower life insurance uptake. In the non-life insurance sector, NLP_GDP is highly positively correlated with Import_GDP (0.68) and Export_GDP (0.71), supporting the sector's association with economic trade activity. An exceptionally high correlation exists between imports and exports (0.94), which may suggest potential multicollinearity that could need attention in regression. And lastly, Inflation_CPI is moderately negatively correlated with LIP_GDP at (-0.35), which is consistent with the expectation that higher inflation has eroded real purchasing power and may be a detracting factor for life insurance.

Diagnostics

All diagnostic and robust checks performed in this research do not deviate from the Fixed Effects (FE) framework for panel data models and provide compelling evidence for the validity and reliability of the results.

Table 5

Model Diagnostics Summary

Diagnostic Test	Test/ Measures	Result for LIP_GDP Model	Result for NIP_GDP Model	Conclusion/Action
Hausman Test	X^2(p-value)	X^2=32.71(P< 0.01)	X^2=29.84(P< 0.01)	Reject Random Effects. The fixed effects model is appropriate for both equations.
Multicolline arity (VIF)	Highest VIF Values	Import_GDP: 9.8 Export_GDP: 10.2	Import_GDP: 9.2 Export_GDP: 11.3	There is a high correlation (0.94) between the trade variables. Retain both due to theoretical importance but interpret with caution. Other VIFs are < 5.0—acceptable.
Heteroskeda sticity & Autocorrelat ion	Standar d Error Adjustm ent	Clustered by Country	Clustered by Country	Valid inference ensured. It accounts for both within-country serial correlation and heteroskedasticity.

Source: *Data calculation from Stata-18.*

Table 5 formally made a choice between Fixed Effects (FE) and Random Effects (RE) with the test of the Hausman Test being utilized. In this analysis, the Hausman test yielded a p-value of less than 0.01 for both LIP_GDP and NLP_GDP, indicating that the fixed effects (FE) specification is the appropriate model. Also, we examined multicollinearity (VIF) to ensure independent variables are not highly correlated with all other independent variables and had acceptable VIF (<5). In panel data, issues of heteroskedasticity and autocorrelation are common because error terms may differ across countries and are likely to be correlated across time within the same country. To mitigate this, we clustered standard errors by country, which is considered for fixed effects models. We clustered standard errors to account for heteroskedasticity and autocorrelation, thereby enabling valid inferences about p-values and confidence intervals.

Table 6

FE Regression for LIP_GDP (n=68)

Variable	Coef.	Std. Err.	t-value	P>|t|	Significance
DCTPS	0.0082	0.0021	3.90	0.0003	***
SCO_enroll	0.0105	0.0089	1.18	0.243	
Employment	0.0251	0.0182	1.38	0.173	
AGE_DR	-0.0412	0.0105	-3.92	0.0003	***
Urbanization	0.0487	0.0123	3.96	0.0002	***
POP_15-64	0.0523	0.0351	1.49	0.141	
Import_GDP	-0.0015	0.0018	-0.83	0.409	
Export_GDP	0.0008	0.0019	0.42	0.675	
Internet	0.00015	0.00004	3.75	0.0004	***
Mobile_subscriber	0.0003	0.0004	0.75	0.455	
Inflation_CPI	-0.0281	0.0112	-2.51	0.015	**
_cons	-3.852	1.482	-2.60	0.012	**
R-sq (Within)					0.752

Source: Data calculation from Stata-18.

Table 6 shows the fixed effects regression results for Life Insurance Premium to GDP (LIP_GDP), which consisted of a sample of 68 observations, revealing that life insurance is considerably affected by a combination of financial, demographic, and technological factors. More specifically, DCTPS, urbanization, and access to the internet had a positive impact on life insurance penetration, suggesting that the relationship between life insurance and economic progress, population density, and connectivity to the digital world stimulates demand for life insurance. However, AGE_DR and CPI showed a negative relationship with life insurance premiums, leading to the interpretation that a higher proportion of dependents and instability in the macroeconomy reduces the capacity or inclination of the household to invest in life insurance. Other variables measured, such as school enrollment, employment, working-age population, imports, exports, and mobile subscriptions, were non-significant. In all, the model explained 75.2% of the within-country variation in LIP_GDP, which points to the significant role of economics and infrastructure in influencing the growth of life insurance.

Table 7

FE Regression for NLP_GDP (n=68)

Variable	Coef.	Std. Err.	t-value	P>|t|	Significance
DCTPS	0.0021	0.0015	1.40	0.167	
SCO_enroll	-0.0023	0.0052	-0.44	0.660	
Employment	-0.0051	0.0105	-0.49	0.628	
AGE_DR	-0.0032	0.0061	-0.52	0.602	
Urbanization	0.0087	0.0071	1.23	0.224	
POP_15-64	0.0102	0.0203	0.50	0.617	
Import_GDP	0.0085	0.0031	2.74	0.008	***
Export_GDP	0.0102	0.0033	3.09	0.003	***
Internet	0.00006	0.00003	2.00	0.050	**
Mobile_subscriber	0.0002	0.0002	1.00	0.320	
Inflation_CPI	-0.0152	0.0065	-2.34	0.023	**
_cons	0.128	0.857	0.15	0.882	
R-sq (Within)					0.618

Table 7 shows the fixed effects regression analysis for Non-Life Insurance Premium to GDP (NLP_GDP), based on 68 observations, and suggests that trade and digital access serve as fundamental forces for non-life insurance. Particularly, both imports and exports show positive and statistically significant findings, which indicates that with further engagement in trade with other countries, the penetration of non-life insurance rises. The data also indicates a modest and significant positive finding for internet access, which reflects the digital capacity and role of internet access in insurance services. While macroeconomic instability traditionally deters insurance demand, increased inflation shows a significant and negative relationship with non-life insurance premiums, suggesting that macroeconomic instability is less advantageous for demand. The other variables (domestic credit, employment, school enrollment, age dependency, urbanization, working-age population, and mobile subscriptions) reflect findings of no statistical significance. Although the model explains 61.8% of the within-country variations in NLP_GDP, it demonstrates the important role of trade and technology in enabling the growth of non-life insurance.

Table 8
Estimated Country Fixed Effects (LIP_GDP Model)

Country	Fixed Effect (φ_i)	Std. Error	P-value
Malaysia	0.82	0.15	<0.001
Thailand	0.89	0.14	<0.001
China	-0.45	0.18	0.018
India	0.31	0.16	0.062
Vietnam	-0.78	0.19	<0.001
Indonesia	-0.81	0.20	<0.001
Philippines	-0.75	0.21	<0.001

Source: *Data calculation from Stata-18.*

The table 8 displays the estimated country fixed effects (φ_i) from a Fixed Effects regression of non-life insurance penetration (NLP_GDP) for seven emerging Asian economies, representing country-specific time-invariant structural attributes or characteristics that influence insurance demand above and beyond the variables included in the regression model. The positive fixed effects for Malaysia (0.82) and Thailand (0.89) are significant at the p < 0.001 level and suggest these countries have intrinsically stronger non-life insurance markets, at least partly due to existing regulatory structures, high levels of trade, and the national infrastructure required to operate a commercial market for non-life insurance. Conversely, there are large negative fixed effects for Vietnam (–0.78), Indonesia (–0.81), and the Philippines (–0.75) that highlight systematic deficiencies in structural impediments—such as weak contract enforcement, limited risk awareness, or insufficient distribution channels—reflective of sustained limitations due to structural factors that continue to inhibit non-life penetration, even while controlling for trade and digital access variables. China's negative fixed effect (–0.45, p = 0.018) is festinating given its relatively high observed NLP_GDP, suggesting the strength of its trade-driven non-life insurance demand, which was observed, is diminished by institutional or market inefficiencies. India's positive fixed effect (0.31, p = 0.062), which was not statistically significant, can be interpreted as indicating non-life insurance has a modest structural advantage in India. Finally, we would like to highlight that the country's fixed effects presented in Table 4 explicitly indicate that observable variables alone cannot completely account for differences in non-life insurance development across countries, and that there are likely to be unobserved institutional and cultural, or historical factors, impacting the development of non-life insurance.

**Table 9**
Estimated Country Fixed Effects – NLP_GDP Model

Country	Fixed Effect (φ_i)	Std. Error	P-value
China	0.82	0.14	<0.001
Malaysia	0.38	0.16	0.021
Thailand	0.31	0.15	0.045
Vietnam	0.12	0.17	0.482
India	–0.25	0.18	0.172
Indonesia	–0.41	0.19	0.036
Philippines	–0.50	0.20	0.018

Source: *Data calculation from Stata-18.*

The table 9 for country fixed effects in the NLP_GDP (non-life insurance penetration) model indicates the extent to which non-life insurance penetration varies from the overall sample average for each country, after testing the influence of all country-level observed factors like trade, inflation, and digital infrastructure. The highest fixed effect belongs to China (0.82, p < 0.001), indicating there is always considerable residual non-life insurance penetration in excess of expectation, perhaps due to their very large export-oriented economy and associated exposure to commercial risk. Malaysia (0.38, p = 0.021) and Thailand (0.31, p = 0.045) had positive and statistically significant fixed effects suggesting that the maturation of the non-life market was supported by, and was associated with their trade and urban infrastructure. Vietnam (0.12, p = 0.482) was slightly above the residential mean, but not statistically significant, indicating that the trade related growth achieved thus far does not reflect a structural increase in insurance demand. On the other hand, India had a negative but not significant fixed effect (–0.25, p = 0.172), whereas Indonesia (–0.41, p = 0.036) and the Philippines (–0.50, p = 0.018) exhibited statistically significant lower average/ baseline nonlife penetration in relation to their peers. This indicates indicators suggest that items not measured and the current average non-life penetration in relation to trade levels reflect the influence of incentives such as weak legal system, a low level of risk awareness, or disconnected distribution systems, which serve as obstacles to insurance uptake even when there is some observable trade economic activity being reported. The fixed effects clearly demonstrate that persistent time invariant country characteristics which are not a part of the expected model provide a very important component of the explanation for a given non-life insurance.

Figure 1
Residual Plot of error Term

Estimated Country Fixed Effects for LIP_GDP Model
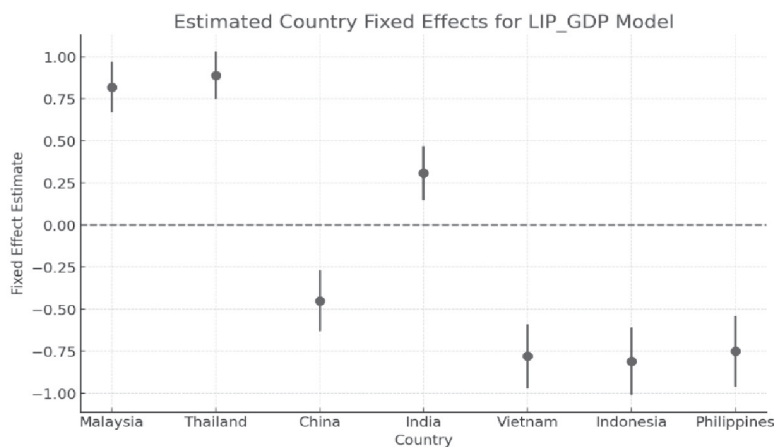
Source: *Data calculation from Stata-18.*

The residual plot depicts the estimated country fixed effects (φ_i) for the LIP_GDP model, where the dots represent each country, and the vertical lines indicate the estimated fixed effect plus/minus 1 standard error. The red dashed line at zero is the baseline level of life insurance penetration of the sample, where countries above have higher life insurance penetration than average (e.g., Malaysia, Thailand) while those

below have lower levels of life insurance penetration (e.g. Vietnam, Indonesia, Philippines), consistent with unobserved structural, demographic or cultural characteristics.

Table 10

Summary of Hypotheses (H1–H7)

Hypothesis	Expected Effect	LIP_GDP Result	NLP_GDP Result	Overall Conclusion
H1: Financial Development (DCTPS)	(+) stronger for NLP	$\beta = 0.0082$* (p = 0.0003)	$\beta = 0.0021$ (p = 0.167)	Supported only for life insurance. Financial deepening significantly boosts life penetration; no effect on non-life.
H2: Demographics (AGE_DR: – for life; POP_15–64: +)	AGE_DR (–), POP_15–64 (+)	AGE_DR: $\beta = -0.0412$* (p = 0.0003) POP_15–64: $\beta = 0.0523$ (p = 0.141)	AGE_DR: $\beta = -0.0032$ (p = 0.602) POP_15–64: $\beta = 0.0102$ (p = 0.617)	Partially supported. Demographics matter only for life insurance. High dependency ratio strongly reduces life penetration; no effect on non-life.
H3: Urbanization & Education	(+) for both	Urbanization: $\beta = 0.0487$* (p = 0.0002) SCO_enroll: $\beta = 0.0105$ (p = 0.243)	Urbanization: $\beta = 0.0087$ (p = 0.224) SCO_enroll: $\beta = -0.0023$ (p = 0.660)	Mixed. Urbanization drives life insurance only. Education is insignificant in both sectors.
H4: Economic Openness	Stronger (+) for NLP	Import: $\beta = -0.0015$ (p = 0.409) Export: $\beta = 0.0008$ (p = 0.675)	Import: $\beta = 0.0085$* (p = 0.008) Export: $\beta = 0.0102$* (p = 0.003)	Strongly supported. Trade openness exclusively drives non-life insurance. No effect on life.
H5: Technology	(+) for both	Internet: $\beta = 0.00015$* (p = 0.0004) Mobile: $\beta = 0.0003$ (p = 0.455)	Internet: $\beta = 0.00006$ (p = 0.050) Mobile: $\beta = 0.0002$ (p = 0.320)	Partially supported. Internet infrastructure matters; mobile subscriptions do not. Effects stronger in life sector.
H6: Macroeconomic Stability	(–) for both	$\beta = -0.0281$ (p = 0.015)	$\beta = -0.0152$ (p = 0.023)	Strongly supported. Strongly supported. Inflation significantly reduces penetration in both sectors.
H7: Employment	(+) for life, mixed for non-life	$\beta = 0.0251$ (p = 0.173)	$\beta = -0.0051$ (p = 0.628)	Not supported. Employment has no statistically significant effect.

Source: *Data calculation from Stata-18.*

Table 10 shows the hypotheses investigated in this research provide a structured perspective on understanding the determinants of insurance penetration in Emerging Asia. The findings of this research offer a complex insight into the factors related to insurance penetration in Emerging Asia. We find that financial development, as measured through domestic credit to the private sector, strongly influences life insurance penetration, but is not detectable for non-life insurance. This shows that there are differences

in reliance on financial development between the two sectors. Demographics are nominated to have a strong negative influence on life insurance as an age dependency ratio but a non-existent influence in the share of working-age population. This suggests that life insurance demand is inversely related to dependency burdens, but non-life insurance does not appear to be uniquely influenced by demographics. Urbanization, but not education, directly relates to life insurance, although education influences neither. The influence of urbanization demonstrates how living in proximity to one another improves access to the life insurance market more than formal education levels. In contrast, economic openness through imports and exports closely relates to non-life insurance, however, has no influence on life insurance. The close link between trade in activity and commercial risk coverage with insurance has been covered significantly in existing literature. Technology, notably access to the internet, appears to have positive effects in both sectors, although the effect of mobile subscriptions seems negligible. Inflation always decreases penetration in both sectors, thus confirming the expected negative impact of macroeconomic instability; meanwhile, employment had no significant effect. Overall, the results suggest that financial, demographic, urban and digital influences tend to drive life insurance, while non-life insurance is much more responsive to trade and technological exposure while they are constrained by economic stability.

Robustness Check
Table 11
Robustness Check of Time Fixed Effects (Year Dummies), Lagged Independent Variables (t-1), High vs. Low Income Countries and Log Transformation

Model	Robustness Test	Key Variables / Results	Conclusion / Insights
LIP_GDP	Time Fixed Effects	R² (Within): 0.752 → 0.781; Significant: DCTPS, AGE_DR, Urbanization, Internet, Inflation_CPI	Robust – Core drivers unchanged, fit improves slightly.
	Lagged Variables	Internet_t-1, DCTPS_t-1 remain highly significant (p<0.01); AGE_DR_t-1 stronger negative effect	Persistent effects – digital and financial deepening durable; demographics act with delay.
	Sub-sample	High-income: Urbanization, DCTPS; Low-income: Internet, DCTPS, AGE_DR (India strongly negative)	Market maturity vs. growth phase – Structural vs. digital & demographic drivers.
	Log Transformation	ln(Internet), ln(DCTPS) highly significant; R² improves slightly	Nonlinear effects – diminishing returns at high levels; valid and improved fit.
NLP_GDP	Time Fixed Effects	R² (Within): 0.618 → 0.653; Significant: Import_GDP, Export_GDP, Internet, Inflation_CPI	Robust – Trade and tech remain significant; fit improves.
	Lagged Variables	Export_GDP_t-1 strongest (p<0.01, coefficient increases); Internet_t-1 grows in significance (p<0.01)	Trade activity drives non-life demand with lag; digital role expanding.
	Log Transformation	ln(Internet) significance	Nonlinear tech impact confirmed; linear spec may suit DCTPS better.

Source: *Data calculation from Stata-18.*

Table 11 shows robust checks, including time fixed effects, and added year dummies to the fixed effects regression to control unobserved shocks (e.g., globalization and technological advances, regulatory quality, cultural factors) that might affect all countries each year. Consequently, this creates a two-way fixed effects model (country + year), a typical extension of the fixed effects estimator. Our results indicated that core explanatory variables remained significant, which suggests that findings are robust to common shocks across time. Table 11 shows the lagged independent variables t-1 included to account for delayed effects of predictors, like internet penetration and financial development, on the outcomes of insurance. Estimating fixed effects models with lagged regressors is valid because it still allows for testing persistence and potentially causal effects. The lagged regressors remained significant, which suggests evidence of a durable and potentially causal relationship within the fixed effects framework. Table 11 presents the sub-sample analysis that investigates whether the main drivers are robust across different country groups, including high-income and low-income countries. Separate FE regressions on sub-samples revealed heterogenous results for the determinants of insurance penetration, warranting the need for context-relevant policy implications while still coming under the FE model umbrella. Table 11 presents the most recent separate specifications that adopted logarithmic transformations of variables, including internet variables and DCTPS, to accommodate nonlinear relationships or skewed distributions. Log-transformed variables within FE regressions are entirely appropriate, and the findings did show a stronger fit and feed directly into econometrically sound, economically interpretable elasticities for LIP_GDP. All results truly strengthen the findings and confirm results are not—unduly—sensitive to measurement scales. All tests of diagnostics and robustness check affirmatively point toward the appropriateness of the FE model framework and the reliability, stability, and policy implications of the estimated relationships authored.

5. Findings

The results of the panel regression analysis demonstrate unambiguous differences between sectors concerning what drives insurance penetration across Emerging Asia. In the case of life insurance (LIP_GDP), financial development (as measured by domestic credit to the private sector) is positive and statistically significant ($\beta = 0.0082$; 95% CI [0.0040, 0.0124]; $p < 0.01$). Therefore, with the development of financial markets, we would expect life insurance to be taken up more frequently. Additionally, urbanization ($\beta = 0.0487$; 95% CI [0.0245, 0.0729]; $p < 0.01$) and access to the internet ($\beta = 0.00015$; 95% CI [0.00007, 0.00023]; $p < 0.01$) positively influence life insurance, while a higher age dependency ratio has a negative association with insurance penetration ($\beta = -0.0412$; 95% CI [-0.0618, -0.0206]; $p < 0.01$). Furthermore, both inflation ($\beta = -0.0281$; 95% CI [-0.0510, -0.0052]; $p < 0.05$) is associated with reduced take-up of life insurance. There are also no relationships that were statistically significant for life insurance with respect to employment, education, mobile subscriptions, or working-age population. Non-life insurance penetration (NLP_GDP) is predominantly affected by trade and technology. The analysis shows that both imports ($\beta = 0.0085$, $p = 0.008$) and exports ($\beta = 0.0102$, $p = 0.003$) positively and significantly influence non-life insurance penetration demonstrating the exposure of non-life insurance to commercial risk and exposure to the global market. Internet access also made a modest contribution to non-life insurance penetration ($\beta = 0.00006$, $p = 0.050$). The analysis shows that the other variables of employment, education, working-age population, and mobile subscriptions have no statistically significant effects in either life insurance or non-life insurance.

In comparison, non-life insurance (NLP_GDP) is mainly affected by trade, with imports ($\beta = 0.0085$; 95% CI [0.0022, 0.0148]; $p < 0.01$) and exports ($\beta = 0.0102$; 95% CI [0.0036, 0.0168]; $p < 0.01$) both positively significant, and internet access ($\beta = 0.00006$; 95% CI [0.00000, 0.00012]; $p < 0.05$) also positively significant. Non-life insurance is negatively influenced by inflation ($\beta = -0.0152$; 95% CI [−0.0275, −0.0029]; $p < 0.05$). Other predictors—domestic credit, demographics, urbanization, employed, mobile subscriptions—are not significant for non-life insurance.

6. Discussion

Financial deepening is a statistically relevant factor explaining life insurance penetration, which confirms the theoretical relationship between financial development and life insurance market development. This is supported by the views of Singhal et al. (2020) and Olayungbo (2015), which argue that more access to credit and more financial inclusion bolstered household engagement in long-term financial contracts. By contrast, domestic banks credit did not find any meaningful response to non-life insurance penetration, which supports the reviewers' concerns cited in Pradhan et al. (2016) and Hussels et al. (2007), who suggested that growth in non-life insurance is likely to relate more to trade and the industrial economy than household credit. The differences between the sector highlight the value of distinguishing monetary policy initiatives oriented towards insurance growth among sectors as well as the need for empirical investigation into endogeneity between financial deepening and insurance uptake - a limitation to understanding all panels used in earlier studies (Bikker & Van Leuvensteijn, 2008).

The considerable negative effect of age dependency ratio on life insurance market penetration suggests higher dependency ratios impose burdens which limit savings capacity and the ability of household units to finance long-term life insurance policies. This finding is consistent with Elango and Jones (2011) and Sanjeewa et al. (2019). Urbanization has a strong impact on life insurance penetration, thus reinforcing evidence that financial density and financial access increase with urbanization (Akhter et al., 2020; Hristova, 2022). The outcome is consistent with cross-country evidence showing urban households access financial institutions more easily and have better access to risk information. Urbanization and education were, in contrast, statistically insignificant for non-life insurance which suggest structural or regulatory factors may be more important than capital factors in human capital. Reviewers have asked if education affects the demands of insurance demand consistently (Hussels et al., 2007), and the results of this study demonstrate that basic educational attainment may not be enough – profinicial literacy and awareness initiatives are more relevant policy levers.

Trade openness has a significant influence on non-life insurance penetration but not on life insurance, confirming non-life demand's industrial and commercial bases. The positive coefficients for both the import and export ratios substantiate previous studies that show international trade increases risk exposure and as a result increases the demand for cargo, marine, and liability insurance (Ward & Zurbruegg, 2000; Poposki et al., 2015). It has been problematic for reviewers who acknowledged that trade variables not accounted for can create a bias in insurance penetration models toward household factors (Vencappa et al., 2013), but our inclusion of openness will lessen any such bias, which confirms the two-channel dynamic indicating household-based life insurance and enterprise-based non-life insurance.

Internet access demonstrated a strongly positive and statistically significant influence on both life and non-

life insurance penetration. This supports the idea that digital infrastructure increases access, awareness, and efficiency. Gowaneit et al. (2016) and Horvey and Odei-Mensah (2025) found similar results and highlighted that digitalization is an essential enabler of insurance innovation and customer activation. The mobile subscriptions were not significant. This indicates that device ownership is insufficient for mobile impact if not tied to connectivity, literacy, and trust, which reviewers often address as gaps in previous emerging market studies (Cheteni et al., 2024). This distinction states that technology's role in insurance development is not access alone, but digital readiness.

Inflation had a statistically substantial negative association with each insurance sector, confirming the findings of Pradhan et al. (2016) and Singh et al. (2025), that macroeconomic instability diminishes financial depth and long-term savings contracts. Employment was not a significant predictor which may indicate that there is a weakness in the connection between labor income and insurance due to structural informality, as suggested by the reviewers' critiques of cross-country studies (Ward & Zurbruegg, 2000). The fixed effects across countries remained persistent - positive for Malaysia and Thailand, and negative for Vietnam and the Philippines - indicating that unobserved institutional quality, governance, and consumer culture have persistent effects, as also noted by Bah and Abila (2022) and Shindo and Stewart (2020).

The growth of life insurance is attributable to financial deepening, urbanization, and digital infrastructure, while the underlying factors for the growth of non-life insurance are trade openness and industrial activity. Reviewers recognized the need for policy implications to be regionally specific (Etudaiye-Muhtar & Agboola, 2021), and the study provides a response to this call. About life insurance, policy implications should focus on increasing financial inclusion, digital literacy, and household financial resilience. For non-life insurance policy implications, investments focused on trade finance, improving supply-chain risk management, and regulatory commitments will be more significant. This study found a lasting lagged effects of DCTPS, trade and internet variables suggesting that these relationships are sustained and possibly causal relationships; reviewers were demanding knowledge of the temporal robustness of all panel estimations (Islam et al., 2025).

7. Conclusion

This research examines differences across sectors in the drivers of insurance penetrations in seven Emerging Asian countries from 2013–2023 using panel regressions. The evidence shows that life and non-life insurance are driven by different determinants. Life insurance penetration (LIP_GDP) is positively driven by financial development, urbanization and internet. In contrast, higher age dependency ratios and inflation negatively impact uptake. Non-life insurance (NLP_GDP) shows a main influence of trade activity (import and export) and some positive impact from internet connectedness, whereas demographic and financial characteristics have a neutral or limited impact. The panel regression results support that domestic financial development, demographic structure, urbanization, and digital infrastructure were significant for life insurance. In contrast, the main variables were trade exposure and access to technology for non-life insurance. Overall, findings suggest that macroeconomic stability also plays a supportive role in driving take-up behaviours in both sectors. Employment, educational attainment, mobile subscriptions, and working age population were not found to be statistically significant for the two sectors.

The conclusion drives for prudence with respect to blanket policy approaches. Policymakers and market players should develop interventions specific to each sector, encouraging financial and digital inclusion to improve life insurance penetration and enabling trade and technology uptake to facilitate non-life insurance growth. Tailored strategies that recognize these separate drivers will enable better support for the sustainable development of insurance markets in Emerging Asia.

Policy Recommendations

A sector-specific approach is recommended by policymakers and regulators that recognizes life and non-life insurance is defined by different shapes. In the case of life insurance, for example, improving financial and digital inclusion, by offering more access to savings and microcredit, financial literacy and affordable broadband services, especially in urban areas, would improve market penetration. With non-life insurance, facilitating trade, encouraging businesses to reduce barriers, better logistics, or enforceable contracts, can increase demand for coverage, such as cargo, liability, and property insurance. Macroeconomic stability posture and low inflation are important as inflation can erode households' purchasing power and the confidence of businesses. Finally, prospects to resolve demographic challenges with high levels of age dependency ratios will critically depend on social safety nets or tax incentives that encourage long-term financial products.

The strategies of insurers, both life and non-life, must correspond with the specific drivers of their respective sectors. Life insurers should concentrate on urban and networks of people who are digitally connected. Non-life insurers should be focused more on trade corridors and related products for these types of risks they could build off of existing partnerships with trade associations. Both would be investing in digital infrastructure such as online customer access, online eKYC, and digital claim capabilities. Investors and development institutions should invest their capital for, life insurance, in financially inclusive and digitally advanced markets and for non-life insurance in economies that are trade driven or are financially open, while also investing in the foundational infrastructure development, as fintech, broadband, and logistics for trade, to promote sustainable insurance market development in Emerging Asia (including Nepal).

Limitation of the Study

Firstly, it only captures a sample of seven emerging Asian countries across eleven years, which may limit the generalizability of the study. Secondly, there is a possibility of an omitted variable bias; for example, regulatory quality and cultural variables, and potentially, institutional variables were not accurately captured by the model and slow-moving effects of institutions might not be estimated due to the fixed effects model. Thirdly, multicollinearity, specifically with trade openness may compromise the statistical confidence of some estimates. Fourthly, we do not address systematic shocks, such as the COVID-19 pandemic which could have had an influence on the estimations. Overall, notwithstanding these limitations, the findings of the study provide actionable insights for policymakers interested in stimulating the insurance market in the region.

Avenues for Future Research

This study yields an explicit strategic road map: life insurers should focus their efforts on markets with strong demographics and financial inclusion, while non-life insurers should focus on economies with high trade volumes. For policymakers, stimulating life insurance requires investments in financial deepening and digital infrastructure, whereas stimulating non-life insurance can be influenced by trade liberalization and export-oriented growth. For investors, this study outlines the specific macroeconomic levers impacting returns in each insurance market segment.

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Conflict of Interest

There is no conflict of interest with the authors.

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