Comparative Analysis of Internet Penetration and Its Impact on the Profitability of Insurance Companies in Thailand and China

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Abstract

This study aims to compare the impact of rising Internet penetration on the profitability of insurance companies in China and Thailand. Using a quantitative analysis approach and data from the insurance markets of both countries, the study selected indicators such as Internet insurance premium income, Internet penetration rate, customer acquisition costs, and operational efficiency from 2019 to 2023 as samples. The comparative analysis of data from the two markets revealed that the increase in Internet penetration significantly reduced customer acquisition costs for insurance companies and optimized operational efficiency through digital technology. In China, Internet insurance has driven product innovation and precise pricing, enhancing customer experience and market competitiveness. In Thailand, despite its smaller market size, the rise in Internet penetration has brought new growth opportunities for insurance companies, especially in the area of inclusive insurance. Additionally, the development of Internet insurance has promoted business model innovation in the insurance markets of both countries, driving the transformation and upgrading of the industry's supply side. Key findings include: Internet penetration has a significant positive impact on the profitability of insurance companies; China and Thailand follow different development paths in Internet insurance, but both show great growth potential. This study provides valuable references for insurance companies to formulate strategies in the Internet era.

Keywords: Internet Penetration, Online Insurance, Profitability of Insurance Companies, Sustainable Development, Customer Acquisition Cost

1. Introduction

The global on-demand insurance market is experiencing rapid growth, driven by the increasing penetration of the Internet and smartphone adoption. According to industry reports, the market is expected to achieve a compound annual growth rate (CAGR) of 21.2% by 2030. Digital transformation enables insurers to develop personalized products and services, such as data-driven pricing and FinTech innovations, which enhance customer satisfaction and operational efficiency. Emerging technologies, including artificial intelligence (AI), blockchain, and cloud computing, are reshaping traditional insurance models. AI enhances fraud detection accuracy, while blockchain streamlines claims processing through smart contracts, improving efficiency and customer experience (Alao & Gbolagade, 2020).

From a regional perspective, China has been leveraging digital tools to improve risk assessment and pricing models, whereas Thailand focuses on inclusive insurance, offering affordable products through mobile platforms. These distinct transformation approaches present unique opportunities for insurers operating in both markets. While increasing technology adoption positively impacts insurers' premium income and profitability, the challenge lies in optimizing technology investments to ensure sustainable growth across diverse market environments (Moloi & Mulaba-Bafubiandi, 2024).

The relationship between premium income and technology investment has been widely discussed in economic and legal contexts. Kenneth Arrow (1963) theorized that insurance premiums form a shared risk pool, where policyholders pay premiums to share risks with insurers and receive compensation in the event of an insured incident. From a legal standpoint, premiums are considered the price policyholders pay for compensation rights, making the insurance contract a legal agreement that ensures financial protection for policyholders (Kucharski, 2024).

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Premium income can be classified based on insurance type or payment method. According to Swiss Re's Sigma report, insurance types include life, health, accident, and property insurance(Hailu, 2024). Additionally, the actuarial industry reports categorize premiums as single (one-time payment) or regular (installment payments)(Madsen & Hansen, n.d.). Premiums serve as a primary financial source for insurance operations, including claims payments, reserves, and shareholder dividends(Kikooma, 2018). The scale and growth of premium income reflect an insurer's ability to expand its market presence and develop its business strategies (Kamura, 2020).

Technology investments are crucial in enhancing insurers' business efficiency, optimizing customer experience, reducing operational costs, and improving market competitiveness. Investment in digital technologies allows insurers to develop innovative products and services, improving customer acquisition and retention. Furthermore, advanced technologies such as big data analytics and AI enable insurers to refine risk assessments, automate underwriting processes, and enhance fraud detection (Murphy, 2023).

Despite the advantages of technology investment in the insurance industry, regional disparities in investment strategies persist. Insurers must strategically align their investments to meet the specific demands of different markets. One key challenge is the varying levels of technology disclosure across regions. The Voluntary Disclosure Theory suggests that companies disclose additional information beyond mandatory requirements to enhance corporate image, strengthen investor relations, and reduce litigation risks(Zaini et al., 2018). This study aims to examine how insurance companies in different regions disclose their technology investment details, including scale and direction.

Furthermore, societal and regulatory factors influence insurers' technology investment decisions. Legitimacy Theory posits that organizations must align their actions with societal norms and regulatory expectations to secure support and resources (Sun et al., 2022). For example, insurers operating in regions that prioritize data privacy regulations may allocate more investment toward compliance and data security measures.

The role of stakeholders is also significant in shaping technology investment decisions. Stakeholder theory emphasizes that insurers must balance the interests of shareholders, employees, customers, suppliers, and regulatory authorities when planning strategic investments(Ronoh, 2023). Effective risk management is another essential aspect of technology investment, as insurers need to assess the risks associated with infrastructure limitations in emerging markets and the rapid obsolescence of technology in developed regions (Diop et al., 2022).

This study seeks to analyze the dynamic relationship between premium income and technology investment in the insurance industry. By exploring regional differences, societal influences, and risk management strategies, this research aims to provide insights into optimizing technology investment decisions. The findings will offer practical guidance for insurers seeking to enhance profitability, improve market competitiveness, and drive sustainable growth through digital transformation (Dehnert, 2020).

2. Objectives

The primary objectives of this study are: 1. To explore the specific path of technology investment of insurance companies in different regions.

2To analyze how technology affects premium income by optimizing business processes, innovating products and services, and clarifying the internal relationship between technology investment and premium income.

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3. Materials and Methods

Research Population and Sample

This study focuses on listed insurance companies in Thailand and China (including Taiwan and Hong Kong), analyzing their profitability and the relationship between premium income and technology investment. The period is 2014-2024, with sample sizes of 129 and 186. Data sources include company annual reports, the China Insurance Yearbook, the Thailand Insurance Yearbook, the China Digital Inclusive Finance Index, Baidu Index, and the National Bureau of Statistics.

Research Design

The study aims to explore how to synchronize insurance companies' premium income and technology investment to enhance intelligent and digital development. Data is collected from the Bloomberg database, focusing on Thailand and China (including Taiwan and Hong Kong).

*Research Methodology*This study employs multiple regression analysis using the fixed effects model to analyse the relationship between the independent variable and the dependent variable.

Variables and Measurements

Dependent Variables: Return on Assets (ROA), measuring profitability.

Independent Variables: Operating Margin, Net Income/Insurance Revenue, Total Investments/Total Assets, Total Assets/Total Liabilities, Net Income/Cash from Operating Activities.

Control Variable: Log of Insurance Revenue/Net Premium Earned, representing net income from insurance contracts.

4. Results and Discussions

The following conclusion can be drawn from the descriptive summary: the degree of concentration and dispersion described by the variables in China (including Taiwan and Hong Kong) is higher than that in Thailand. See Tables 1 and 2.

Variable	Obs	Mean	Std. dev	Min	Max
Internet	174	64.114	19.652	34.890	89.540
ROA	146	0.112	29.513	-345.139	19.650
OM	151	5.443	18.154	-75.228	94.953
NPM	151	4.621	14.289	-46.482	50.065
NI_Rev	147	6.436	14.539	-40.269	64.577
INV_TA	133	57.065	23.546	0.210	95.704
DA	151	63.637	19.496	25.441	96.496
NI_CFO	166	78.428	236.238	-720.927	937.251

Table 1 Descriptive Information for Thailand Data Set

Table 2 Descriptive Information for China Data Set

Variable	Obs	Mean	Std. dev.	Min	Max
Internet	200	66.679	13.991	47.934	97.617
ROA	197	1.572	1.559	-7.085	6.4309
OM	198	10.556	10.426	-15.945	60.570
NPM	198	7.415	6.334	-15.553	47.457
NI_Rev	205	9.802	9.046	-18.804	62.303
INV_TA	188	75.928	16.450	34.157	94.654
DA	198	83.550	12.554	50.679	98.021
NI_CFO	215	35.879	134.150	-939.365	825.512

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Correlation analysis is primarily used to examine the degree of association between variables. The higher the correlation coefficient, the stronger the relationship between the variables, thereby laying the foundation for further analysis. This paper takes insurance companies in China and Thailand as research subjects and analyzes the relationship between premium income and technology investment from multiple dimensions. The results indicate that the correlation between these variables is stronger in China than in Thailand. See Tables 3 and 4.

	Internet	ROA	OM	NPM	NI_Rev	INV_TA	DA	NI_CFO	LogTA	LogRev
Internet	1.000									
ROA	-0.182	1.000								
OM	-0.009	0.636	1.000							
NPM	-0.053	0.790	0.836	1.000						
NI_Rev	-0.006	0.647	0.795	0.897	1.000					
INV_TA	0.087	0.016	0.296	0.182	0.245	1.000				
DA	0.121	-0.398	-0.050	-0.269	-0.157	0.429	1.000			
NI_CFO	0.033	0.133	0.057	0.078	-0.003	-0.122	-0.064	1.000		
LogTA	0.217	-0.141	0.272	0.143	0.250	0.709	0.723	-0.093	1.000	
LogRev	0.205	-0.106	0.237	0.107	0.219	0.689	0.687	-0.075	0.976	1.000

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Table 4 Correlation Matrix for China Data Set

	Internet	ROA	OM	NPM	NI_Rev	INV_TA	DA	NI_CFO	LogTA	LogRev
internet	1.000									
ROA	-0.226	1.000								
OM	-0.190	0.822	1.000							
NPM	-0.165	0.863	0.866	1.000						
NI_Rev	-0.151	0.766	0.798	0.925	1.000					
INV_TA	-0.023	0.225	0.348	0.266	0.280	1.000				
DA	0.133	-0.396	-0.258	-0.429	-0.370	-0.086	1.000			
NI_CFO	-0.010	0.093	0.077	0.065	-0.053	-0.024	0.084	1.000		
LogTA	0.184	0.021	0.207	0.218	0.263	0.452	0.349	0.068	1.000	
LogRev	0.189	0.074	0.230	0.203	0.251	0.481	0.309	0.066	0.952	1.000

According to the model analysis results, the R-squared value for Thailand is 0.224, indicating that the model explained approximately 22.4% variables. The F-statistic is 5.00, indicating that the overall model is not significant and further analysis is needed. The R-squared value of China is 0.6706, and the statistical value of F is 51.76, indicating that the overall model is significant. See Table 5.

Fable 5 Model Summ	aries for Th	ailand and	China Data Sets
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b Widder Bullindaries for Thandard and China Data Bets								
Data	Thailand							
Source	SS	df	MS	Number of obs=129				
Model	27919.978	7	3988.568	F(7,121)=5.00				
Residual	96576.107	121	798.149	Prob>F=0.				
				R-squared=0.2243				
Total	124496.085	128	972.625	Adj R-squared=0.1794				
				Root MSE=28.252				
Data	China							
Source	SS	df	MS	Number of obs=186				
Model	312.277	7	44.611	F(7,178)=51.76				

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Residual	153.425	178	0.862	Prob>F=0.000
Total	465.702	185	2.517	R-squared=0.6706 Adj R-squared=0.6576 Root MSE=0.9284

According to the model analysis results, the p-value of Thailand and China is 0.0000, indicating that the model is significant as a whole. The F statistics of Thailand and China are 9.58 and 15.52. It shows that the model is significant as a whole. It passed the overall significance test. See Tables 6 and 7.

 Table 6 Multiple Regression - Fixed Effects Model for Thailand Data Set

Fixed-effects	s (within) regressi	on	Number	of obs=129		
Group varia	ble: ID		Number	of groups =15		
R-squared:			Obs per g	group:		
Within $= 0.3$	3853		$\min = 2$			
Between = 0	.0050		avg = 8.6)		
Overall = 0.	0242		max = 1	0		
			F(7,107)	= 9.58		
corr(u_i, Xb)) = -0.9317		Prob > F	= 0.0000		
ROA	Coefficient	Std. err.	t	P> t	[95%conf. ii	nterval]
Internet	-0.249	0.147	-1.700	0.093	-0.541	0.042
OM	0.508	0.285	1.790	0.077	-0.056	1.072
NI_Rev	-0.131	0.321	-0.410	0.684	-0.769	0.506
INV_TA	1.322	0.244	5.420	0.000	0.838	1.805
DA	0.108	0.479	0.230	0.822	-0.842	1.058
NI_CFO	0.026	0.011	2.440	0.016	0.005	0.047
LogRev	46.106	21.652	2.130	0.036	3.184	89.027
_cons	-196.943	53.090	-3.710	0.000	-302.186	-91.699
sigma_u	60.302					
sigma_e	25.081					
rho	0.853	(fraction of variance due to u_i)				
F test that all	u_i=0:F(14,107)=	=3.32; Prob > F =	0.0002			

Table 7 Multiple Regression - Fixed Effects Model for China Data Set

Fixed-effects	s (within) regressi	ion	Number	ber of obs=186					
Group varia	ble:ID		Number	Number of groups =19					
R-squared:			Obs per g	Obs per group:					
Within $= 0.4$	1044		min = 7						
Between = 0	.8256		avg = 9.8	3					
Overall = 0.	6409		max = 1	0					
			F(7,107)	= 15.52					
corr(u_i, Xb)) = -0.8149		Prob > F	= 0.0000					
ROA	Coefficient	Std. err.	t	P> t	[95%conf. i	nterval]			
internet	-0.025	0.007	-3.730	0.000	-0.038	-0.012			
OM	0.008	0.012	0.630	0.529	-0.017	0.032			
NI_Rev	0.081	0.015	5.390	0.000	0.051	0.111			
INV_TA	-0.007	0.013	-0.540	0.588	-0.032	0.018			
DA	-0.154	0.035	-4.450	0.000	-0.222	-0.086			
NI_CFO	0.001	0.000	1.230	0.219	0.000	0.002			
LogRev	0.425	0.401	1.060	0.290	-0.367	1.217			
_cons	13.746	4.038	3.400	0.001	5.771	21.722			
sigma_u	1.008								
sigma_e	0.814								
rho	0.605	(fraction of varia	ance due to u_i)						
F test that all	u i=0:F(18.160)=	=3.97: Prob > F =	0.0002						

The insurance markets in China and Thailand exhibit distinct growth patterns influenced by

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economic conditions, regulatory frameworks, and technological investments. China's insurance sector, significantly larger in scale, benefits from steady expansion driven by economic growth, rising incomes, and strong insurance awareness. Chinese insurers, such as Ping An, have made substantial investments in digital transformation, leveraging AI, big data, and blockchain to enhance efficiency, improve customer experience, and optimize risk management.

Thailand's insurance market, in contrast, has experienced fluctuating growth, shaped by macroeconomic factors and government policies. While traditionally slower in adopting digitalization, Thai insurers are now integrating AI and big data to improve service quality and operational efficiency. Initiatives like Financial One Account's "universal agent" model have demonstrated the potential of technology in customer acquisition and policy issuance. However, digital transformation in Thailand remains at an early stage, requiring further investment and strategic implementation.

Despite differences in technological advancement, both markets share the challenge of optimizing digital investments for sustainable growth. While China focuses on balancing expansion and cost efficiency, Thailand must establish structured digital strategies. Cross-border collaboration could accelerate Thailand's digital transformation while providing Chinese insurers with expansion opportunities in Southeast Asia.

5. Conclusion

Chinese insurers should leverage big data analytics to develop personalized insurance products tailored to different consumer segments. Expanding the use of AI and blockchain in claims processing, fraud prevention, and customer service can enhance efficiency and transparency. Strengthening digital distribution channels through e-commerce partnerships and social media can help insurers reach underserved markets, while AI-driven risk assessment tools can improve financial stability. Additionally, expanding into Southeast Asia, particularly Thailand, through joint ventures and knowledge exchange can further enhance market integration.

Thai insurers need to integrate long-term technological investments into their strategic planning by establishing dedicated R&D teams and adopting global best practices, particularly from China. Enhancing consumer awareness through government collaboration can increase insurance penetration, while diversifying product offerings, such as health and retirement insurance, can meet evolving market demands. Strengthening international partnerships, particularly with Chinese insurers, can enable the development of cross-border insurance solutions and enhance market competitiveness.

Regulatory alignment between China and Thailand should be prioritized to foster bilateral cooperation to facilitate smoother cross-border insurance operations. The establishment of insurance technology exchange platforms can accelerate innovation by enabling knowledge sharing between insurers in both markets. Additionally, cross-border talent development initiatives, including training programs and academic collaborations, will be crucial in cultivating professionals skilled in InsurTech and digital finance, promoting long-term industry growth.

Future research should focus on a comparative assessment of digital transformation in the Chinese and Thai insurance industries, particularly analyzing the adoption of AI, big data, and blockchain. Understanding the differential impact of these technologies on underwriting, claims processing, and customer engagement can provide valuable insights into optimizing digital strategies.

Investigating consumer preferences, purchasing behaviors, and adoption barriers for digital insurance in China and Thailand can help insurers refine their product development and marketing strategies. Special emphasis should be placed on emerging segments such as inclusive insurance and microinsurance. Given the evolving regulatory landscapes in both countries, a deeper exploration of the impact of digital insurance regulations on market competition, consumer protection, and innovation will be essential for policymakers and industry stakeholders. Integrating sociological and psychological approaches into insurance research can provide a more comprehensive understanding of how digital tools influence consumer perceptions, trust, and decision-making in insurance purchases.

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Examining the long-term sustainability of digital insurance adoption, particularly among younger demographics, can offer strategic insights into the future trajectory of the industry. Research should also explore the potential impact of emerging insurance segments such as electric vehicle insurance, cyber insurance, and parametric insurance in both markets.

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