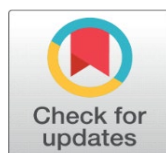
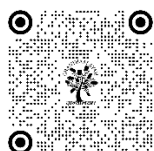


IMPACT OF FUNDING IN INSURTECH ON PREMIUM PERFORMANCE OF INSURANCE BUSINESS

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ABSTRACT

New technologies such as Blockchain, Internet of Things, Chatbots, Telematics, and Artificial Intelligence are driving innovation in the insurance industry. Insurance innovation has a substantial impact on economic and industry success. This paper explores the effects of InsurTech on the logicity of insurance sector and presents many perspectives on the topic. Examining the benefits that accrue for the insurer and the consumer, this article tries to explain the basics and significance of new technology in the insurance market. Hypotheses are used to check the performance of certain factors related to insurance. Secondary sources were used to collect data. The overall performance of InsurTech has been analyzed with the help of IBM SPSS Statistics Software. Regression analysis as it presents a comprehensive analysis of how InsurTech innovations contribute to better risk management, more accurate underwriting, and enhanced customer engagement. Through case studies and empirical data, the research highlights the positive correlation between InsurTech adoption and premium growth, demonstrating that technological advancements not only drive competitive edge but also give greater profitability and ability to sustain in the insurance sector. The findings underscore the transformative potential of InsurTech in reshaping traditional insurance practices and fixing new standards for industry performance.

Keywords: Insurance technology, claim automation, Telematics, Cyber Security, Usage based Insurance

1. INTRODUCTION

Technological advancements, especially in the insurance sector, are transforming financial administration. Insurance technology, or "InsurTech," is transforming financial governance globally, notably in the insurance sector. (1) Traditional methodologies are being challenged by innovative and creative advancements. Over the next decade, traditional insurance practices are expected to rapidly change. Clients and industry partners will benefit from code-based innovations such as Blockchain and Artificial Intelligence, which prioritize safety and security. Adopting new financial processes helps avoid and mitigate fraud. (2) New technologies have improved efficiency in the insurance industry and reduced the need to visit branches and consult with experts. The latest developments in the insurance market are expected to have significant benefits for consumers and users. Health and accident insurance claims increased dramatically in the immediate aftermath of the outbreak. However, travel and auto insurance rates have decreased significantly. It's time to evaluate the level of client cooperation. Insurance firms leverage pandemics to attract and keep

customers. (3) Research indicates that implementing technologies such as AI, Blockchain, Chatbots, Telematics, and IoT can mitigate the plague's negative influence on the financial industry, particularly in insurance. Technological breakthroughs are driving significant changes in the insurance market. InsurTech improves efficiency and effectiveness in the insurance sector. InsurTech provides insurers with new opportunities to gain a competitive edge. Leveraging technology may assist insurers in smooth operations, enhancing customer acquaintance, developing new products, and improving risk assessment and pricing models. (4) This research helps insurance companies optimize their strategies to stay competitive. InsurTech technologies give insurers access to comprehensive data, enabling accurate underwriting and risk assessment. Using advanced analytics and AI can assist insurers identify risks, manage claims and determine fair premiums. This study assists insurers in evaluating their underwriting methods and ensuring fair pricing for policyholders. Insur-Tech helps insurers to provide personalized, digitally-driven services that suit client needs. Insur-Tech solutions automate and streamline insurance procedures, leading to increased efficiency and lower costs. Insurance technologies encompass automated claims processing, digital insurance issuing, fraud detection algorithms, and more. Insur-Tech advancements may provide new regulatory issues for the insurance business. This study assists insurers in navigating regulatory requirements and leveraging technological improvements to assure compliance.

Previous studies examined the progress of electronic insurance services and highlighted key concerns of the industry. (5) Blockchain, Artificial Intelligence (AI), chatbots, telematics, and the Internet of Things (IoT) are modern developments in insurance governance. These technologies have a notable impact on the evolution of the insurance sector. (6) This study examines the challenges of incorporating technology developments in the overall insurance industry, using secondary data. The major purpose of this study is to understand how insurance technologies impact the sector's performance. This research benefits the insurance business by promoting innovation, improving underwriting and pricing methods, improving customer experience, reducing costs, managing risks, and assuring regulatory compliance. A joint analysis may be more useful if the initial research focused on both life and non-life insurance. Leveraging InsurTech effectively may help insurers adapt to changing consumer demands and expectations, positioning them for success in a dynamic market.

2. RELATED WORK

Digitalization, combining analog and digital settings, improves client involvement, data availability, and corporate operations [7]. Over the past decade, insurance technology has driven digital transformation. New technologies affecting the insurance sector include Blockchain, Telematics, IoT, smartphones, and AI. Automation has significantly impacted the insurance industry's value chain [8]. The primary changes are new business models, better customer relationships, improved distribution methods and improved product development.[9] Existing studies has demonstrated that digitization can significantly boost the efficiency of insurance networks. [10]. Researchers identified seven development trends that digitize the insurance, banking and financial services industry [11]. Trends include IoT, mobile banking, insurance, Blockchain, ATMs, AI, and machine learning logic. [12] Technological advancements in the insurance sector have affected the obligation's purpose, claim resolution, and value generation [13]. Fin-tech and Insur-Tech have greatly influenced monetary policy management, especially in the banking industry [14]. Nonprofits leverage Blockchain, AI, IoT, individuals, government agencies, and other organizations to improve information trustworthiness (15). Blockchain, AI, and IoT technology can establish confidence in transactions, facilitating global transfers of money, commodities, and sensitive information. [16] Researchers have explored Blockchain, AI, and IoT technologies to gain a better ability to understand their operation related to Insurrance[17]. Bitcoin's application in several businesses has put questions about its technological potential [18]. New concepts and knowledge are transforming our economy and society, and the insurance market will follow suit. Modern firms, similar to newly founded innovative corporations, seek attractive protection arrangements. Participants often give substantially to organizations with dependable and adaptive suppliers. When considering backup plans for client applications, it's possible that they become direct rivals, restricting net income [19]. The insurance sector contributes major part in the country's finances and economic development [20]. There are multiple issues in this business, including decreased accreditation, insufficient promotion and branding, an absence of business ethics, inadequate IT support, ineffective officials, low ROI, failure to be forthcoming and truthful, a decreases in recognition, and a loss of control [21]. Digitalization enabled new work designs, technical innovation, and the replacement of outdated procedures. Modifications may lead to more durable and sensible movements [22, 23].

3. RESEARCH GAP

Today's clientele grew up in a fast-paced society where everything can be searched, purchased, and downloaded in seconds. Computers hold the key to the solution. The insurance market faces challenges compared to other financial organizations. More research is needed to determine the current level of digital adoption in the global insurance sector.

Hence, the problem of this study is that, "What is the status of technology adoption in the insurance sector at global level and impact on premium performance?"

4. RESEARCH OBJECTIVES

The major aims of this study are mentioned here

1. To investigate the correlation between global funding in InsurTech and the premium performance of insurance corporations
2. To present the current scenario of the firm's premium performance.
3. To provide suggestions to enhance the firm's performance by leveraging new insurance technologies.

5. PROPOSED METHODOLOGY

This study was conducted using secondary data. Data for "Premium Volume in the World" and "Funding in InsurTech" were gathered from the IRDAI annual report and Gallagher Re's Global InsurTech Report, respectively.

Data from the 2014-2015 to 2022-2023 financial years is being used for this study. The chosen research methodology or analytical strategy may have required a different analysis owing to design or restrictions. Life insurance and non-life insurance is difficult to analyze due to limited data available. Categorization of data into different categories may be inconsistent or unreliable, which may result in findings. Statistical tools are used to probing the observed variables. The quantitative data is being evaluated using IBM SPSS statistics software. The adjusted R-squared measures the brightness of the independent variable. F statistics calculate the chances of achieving a high F-score if the null assumption is true. The *t* test assesses the statistical significance (sig.) of the coefficients. Additionally, the ANOVA test is used to know whether the regression model adequately explains the mutability of the dependent variable.

A statistical method known as regression analysis may simulate the correlation between a dependent variable and independent variables. On the basis of data gathered, it attempts to estimate, examine and analyze the relationship between the variables. A linear connection between the dependent variable and one independent variable is presumed in a simple linear regression model. The following equation represents a simple linear regression model:

$$Y = \beta_0 + \beta_1 X + \epsilon$$

Where, Y represents dependent variable (premium performance) X represents independent variable (investment in InsurTech) β_0 represents y-intercept, which is the value of Y when X is 0 β_1 represents slope of the line, indicating the change in Y for a unit change in X ϵ represents error term, which captures the unexplained or random variation in the dependent variable. In this investigation, simple regression model helps to forecast the value of Y (premium performance) based on a given value of X (investment in Insurtech) or helps to understand the relationship between X and Y by examining the estimated coefficients and their statistical significance. "Premium performance" of insurance business depends on independent factor "Funding in InsurTech" (Fig. 1).

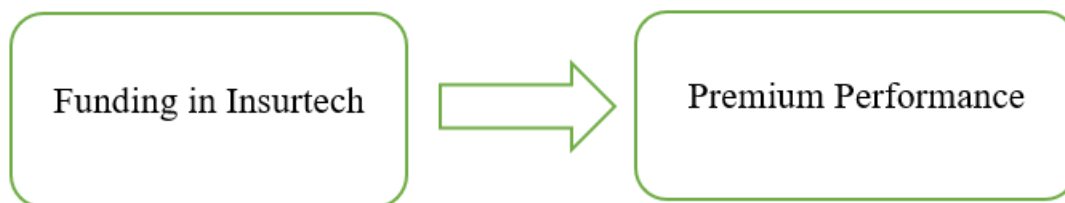


Fig. 1 Conceptual framework

Table 1: Funding in InsurTech and premium volume in world by year

Financial Year	Funding in InsurTech (\$ Millions)	Total Premium Volume in world (\$ Billions)
2022-23	4510	6782.23
2021-22	7997.28	6860.60
2020-21	15799.41	6287.04
2019-20	7107.99	6292.60
2018-19	6347.73	5193.23
2017-18	4166.58	4891.69
2016-17	2274.4	4732.19
2015-16	1741.98	4553.79
2014-15	2721.08	4778.25

Source: IRDAI Annual Report and Gallagher Re's Global InsurTech Report [24, 25]

6. DATA ANALYSIS AND DISCUSSION

Table 2: Correlation coefficient

R	R Square	Adjusted R Square	R Square Change	Sig. F Change
.606 ^a	.368	.277	.368	.084

a: Dependent Variable- Premium

Source: Author Compilation.

This table presents the Correlation coefficients for a model where the dependent variable is Premium Volume, and the independent variable is funding in InsurTech. Here's an analysis of the key components:

R: The magnitude and inclination of a linear correlation between the predictor variable(s) and the dependent variable are represented by the correlation coefficient denoted as (R). The coefficient in this instance is 0.606, There is a moderate positive linear association between the independent and dependent variables. (Tables 1, 2, 3, 4).

- R-square: The coefficient of determination (R^2) shows the proportion of variance in the dependent variable (DV) that is predictable from the independent variable(s). An R^2 value of 0.368 signifies that the independent variable (Funding in InsurTech) account for 36.8% of the variation in the dependent variable (Premium Volume). This means that the model explains 36.8% of the data's variation, while the remaining 63.2% is attributed to other factors, random noise, or variables not included in the model
- Adjusted R-square adjusts for the sample size and the number of predictors, providing a more accurate estimate of the model's explanatory power. With an adjusted R-square of 0.277, it indicates that, after accounting for the number of predictors in the model, about 27.7% of the variation in the dependent variable (Premium Volume) is justified or explained by the independent variable (Funding in InsurTech).
- R-square change: This summary shows the difference in R-square between the old and new models, if any. The R-square change in this instance is 0.368, it means that after introducing one or more additional independent (Funding in InsurTech) variables into the regression model, **36.8%** more of the variance in the dependent variable (Premium Volume) is explained by these new variables
- Sig. F change: The p value for the F statistic is shown in this summary. Since the p value in this instance is of 0.084 **is greater than 0.05**, meaning the additional variables **do not provide a statistically significant improvement** to the model at the 5% significance level.

Table 3: Regression analysis

Model	Model	Standardized Coefficient Beta	t	Significance	95.0% confidence interval for B	
					Lower Bound	Upper Bound
1	(Constant)		10.302	<.001	3715.417	5929.014
	Funding in InsurTech	.132	2.017	.084	-.023	.288

Source: Author Compilation.

This table presents the regression coefficients for a model where the dependent variable is Premium Volume, and the independent variable is funding in InsurTech. Here's an analysis of the key components:

Unstandardized Coefficients (B):

- **Constant (4822.216):** This is the intercept of the regression equation. It means that when Funding in InsurTech is 0, the expected Premium Volume is 4822.216 units. The constant reflects the base level of the Premium Volume when no additional funding is considered.
- **Funding In InsurTech (0.1325):** When each additional unit increases in Funding in InsurTech, the Premium Volume is expected to increase by 0.1325 units, holding all else constant.

Standardized Coefficients (Beta):

- **Beta for Funding in InsurTech = 0.132:** This shows the strength and direction of the relationship between Funding in InsurTech and Premium Volume in standardized units. A beta of 0.132 implies that for every 1% movement, funding in the InsurTech sector would be expected to move only by **0.132%**. This is a very low correlation between Funding and Premium.

t-statistic and Significance (t and Sig.):

- **t = 2.017, Sig. = 0.084:** The t-value assesses whether the coefficient for Funding in InsurTech is significantly different from 0. A p-value (Sig.) of 0.084 exceeds the typical significance threshold of 0.05, indicating that the relationship between Funding in InsurTech and Premium Volume is not statistically significant at the 5% level, though it is close. This implies that while a positive relationship exists, the evidence is not sufficient to definitively establish statistical significance.

Confidence Interval (95.0% CI for B):

- The **confidence interval for the B coefficient of Funding in InsurTech** ranges from **-0.023 to 0.288**. Since this range includes 0, it reinforces the earlier finding that the effect of Funding In InsurTech is not statistically significant at the 5% level. A positive effect cannot be conclusively established.

Table 4 Analysis of ANOVA

Model		Sum of Squares	df	Mean Square	F	Significance
1	Regression	2619891.117	1	2619891.117	4.068	.084 ^b
	Residual	4508605.758	7	644086.537		
	Total	7128496.875	8			

b. Predictors: (Constant), Funding in InsurTech

Source: Author Compilation.

The provided table represents an **ANOVA (Analysis of Variance)** output for a regression model where the dependent variable is **Premium Volume** and the predictor (independent variable) is **Funding in InsurTech**.

Here's an analysis of the key components:

Sum of Squares (SS):

- Regression SS (2619891.117): This value indicates the portion of the variation in the dependent variable (Premium Volume) that can be applied to the independent variable (InsurTech funding). A higher Regression SS demonstrates that the predictor explains more of the variance in the dependent variable.
- Residual SS (4508605.758): This represents the portion of the variation in Premium Volume that remains unexplained by the model, essentially the error or residual variance.
- Total SS (7128496.875): This is the total variability in the dependent variable (Premium Volume) and is computed as the sum of the Regression SS and Residual SS. It provides a measure of the overall variation in the dependent variable.

Degrees of Freedom (df):

- The degree of freedom (df) indicates the various number of values available to estimate a parameter or test a hypothesis. For the regression model, the degree of freedom is 1, corresponding to the number of predictor (Funding) in the model. For the residual, the degree of freedom is 7, computed as the total sample size minus the number of predictors. The total degree of freedom is 8, which reflects the total sample size minus 1 and includes both the regression and residual components.

Mean Square (MS):

- **Mean Square for Regression (2619891.117):** This is calculated by dividing the Regression SS by its corresponding degrees of freedom ($df = 1$). It represents the average amount of variance explained by the predictor.
- **Mean Square for Residual (644086.537):** This is calculated by dividing the Residual SS by its degrees of freedom ($df = 7$). It represents the average amount of unexplained variance (error).

F-statistic (4.068):

F: The proportion of the residuals of the mean square regression to the mean square residual is called as the F statistic. It evaluates if the regression model significantly outperforms the variability left unaccounted for in explaining the dependent variable. The F statistic in this instance is 4.068, This statistic tests whether the model, as a whole, explains a significant portion of the variance in the dependent variable (Premium Volume).

Significance (Sig.) = 0.084:

- The **p-value** or **Significance (Sig.)** associated with the F-statistic is 0.084, which is slightly above the typical threshold of 0.05. This means that the regression model, including InsurTech funding as the predictor, **is not statistically significant** at the 5% significance level.
- While the p-value is greater than 0.05, it's relatively close, suggesting that there can a moderate relationship between InsurTech funding and Premium Volume, but it is not strong enough to be considered statistically significant in this dataset.

7. FINDINGS

The major findings of this investigation are that this research highlighted the significant role of technology in attracting new clients, retaining existing ones, and ultimately increasing premium volume. Indeed, technology has become an invaluable tool in modern business operations, especially within the insurance industry. Value of R^2 of 0.368 shows that this model has some predictive power but also have notable scope for improvement and **R-squared change** of 0.368 shows that the additional variables in your model have a strong and meaningful impact on improving its predictive power. Additionally, **Significance F change of 0.084** suggests that while the added variables contribute to the model, The improvement is not statistically significant at the conventional 0.05 level. Nonetheless, it is sufficiently close to merit additional investigation or refinement. while **InsurTech funding** seems to have some relationship with **Premium Volume**, the ANOVA outcome advocates that it is **non- statistically significant** which means that this model may need forward refinement or additional predictors to better explain the variance in Premium Volume. The outcome makes clear that while some InsurTech companies demonstrate robust growth potential, others face challenges related to operational scalability and maintaining adequate capital reserves.

Technological advancements, such as online platforms, targeted digital marketing strategies, personalized communication through various channels, and efficient customer relationship management (CRM) systems, contribute a crucial role in attracting prospective clients and maintaining relationships with existing ones. By increasing these tools effectively, insurance companies can have a seamless and engaging experience for clients, building trust and fostering long-term relationships. For instance, implementing AI-powered Chatbots to address client queries promptly or utilizing data analytics to tailor insurance offerings to individual client needs can significantly enhance the overall client experience. These efforts not only gain attention of new clients but also foster loyalty and retention among the existing clientele

8. CONCLUSION

Conclusion For InsurTech to improve, grow their product lines, and gain the upper hand, IoT, AI, and Blockchain technologies are essential. The confidence of clients who have utilized several of these tools will increase. It must digitize the services provided by insurance companies to guarantee the quick provision of insurance services. Customers require access to a platform that makes using all services, from screening to claims, straightforward [26]. The insurance sector may also profit from selecting the best premium rate by applying the necessary technology to evaluate the risk connected to each insured property. The study's findings demonstrate how crucial insurance technology is to the industry. The model summary reveals that the regression model with independent variable (Funding) explains a significant percentage of the variance in the dependent variable (Premium). The model's R^2 of 0.368 shows that the model sustains predictive power but also leaves substantial room for improvement. The change statistics show that **R-squared change** of 0.368 suggests that the additional variables in your model have a strong and meaningful impact on improving its predictive power. As per the ANOVA table, **InsurTech funding** have some relationship with **Premium Volume**. ANOVA results suggests **statistically not significant**, which means that this model may need forward improvement, refinement or additional predictors to better explain the variance in Premium Volume. The sum of squares and mean squares give information about the explained and unexplained variability. Overall, conducting a study on the impact of InsurTech on the excellent performance of the insurance business is necessary to adapt to the changing landscape, gain a competitive advantage, improve underwriting practices, meet customer expectations, enhance operational efficiency, and address regulatory challenges. By understanding and leveraging InsurTech effectively, insurers can optimize their exceptional performance and thrive in the evolving industry.

CONFLICT OF INTERESTS

None

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None

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