ROLE OF TELEMATICS IN MOTOR INSURANCE: A WAY FORWARD

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ABSTRACT

Telematics or Usage Based Insurance (UBI) is one of the fastest growing concepts in the motor insurance segment. In India, traditional risk rating methods are still used, which are not capable of analysing the risk accurately and telematics can help to solve this issue. India is far behind other countries, which use telematics. This paper seeks to study the Role of Telematics in Motor Insurance and the perception of customers towards it. Further, the way forward for this technology is also discussed. For this research, the benefits and shortcomings of telematics have been analysed. Also, a survey was conducted and respondent's opinion as to the installation/ usage of telematics device was asked. A Logistic Regression test was then done to complete our analysis. The findings present that most of the people in India are willing to have telematics devices installed if their privacy concerns are taken care of.

Keywords: Motor Insurance, Telematics, UBI, India, Traditional Risk Rating.

INTRODUCTION

Motor Insurance

Motor Insurance, also known as car insurance, auto insurance or vehicle insurance; is the insurance for cars, trucks, motorcycles etc. It provides financial protection against physical damage or injury due to accidents, pollution etc. and protects against liabilities arising from such incidents. Motor insurance is mandatory in India. In India, motor insurance is given based on the type of the vehicle owned for which insurance is taken. The types of vehicles can be:

1. Private Car
2. Two-Wheeler
3. Commercial Vehicle

Current Status of Motor Insurance Business

India's motor insurance market is most likely to contract by more than a quarter this year due to the lockdown restrictions and economic uncertainty brought on by the COVID-19 pandemic. According to the Insurance Regulatory and Development Authority of India (IRDAI), motor insurance premiums registered growth of 1% in June 2020, as compared to the previous year. Global Data said that this growth could be because of the higher share of renewal premiums.

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Premiums Underwritten in India

Table 1 MOTOR INSURANCE PREMIUMS	
Year	**Premium Underwritten (in Crore)**
2018-2019	64,522.35
2019-2020	68,951.07

Source: IRDAI.

Table 1 shows the premium income for Motor Insurance Business in India for the financial year 2019 and financial year 2020. In the financial year 2019 the premium underwritten was INR 64522.35 Crore and it increased by INR 4,428.72 Crore, in the year 2020 to INR 68,951.07 Crore.

Table 2 GROWTH FROM THE PREVIOUS YEARS	
Year	Growth from the Previous Years (%)
2018-2019	8.91
2019-2020	6.86

Source: IRDAI.

The Growth rate for Motor Insurance Business in India is depicted in the table 2. We can see that the motor insurance business showed a growth rate of 8.91% in the Financial Year 2019, from the previous Financial Year 2018. But the Financial year 2020, shows a growth rate of 6.86%, from its previous year.

Need for Telematics

Telematics refers to the use of telecommunications with information and communication technology, which includes information transporting, wireless communication, and global navigation satellite (GNS). It is used most importantly for the purpose of making a person's life, work, and business easier.

Currently, Motor Insurance policies in India are priced traditionally, which is unjust for some policyholders based on attributes such as the make and model of the vehicle, its capacity, the geographical use etc. But there can be many other aspects other than this that can be considered for pricing. For example, people who use their vehicles for lesser duration or lesser distances are subject to lesser risks and vice-versa. But all these people end up paying the same premium for a particular model of the vehicle. Other parameters should also be considered in the risk assessment such as maintenance of the vehicle, how frequently it is driven, the distance it is driven for, the road quality, the driving habits of the driver and so on. Consideration of these factors will help in more accurate risk assessment and a better mechanism for pricing. All this has led to a change in the paradigm of traditional insurance policies by offering new Usage-Based Insurance (UBI) policies. UBI is based data such as mileage, speed, location, time, total duration of trip, etc. which can be recovered from telematics devices. UBI products are still new in some markets, and insurance companies will have to put a lot of effort to increase the adoption of UBI.

Advantages of Telematics

1. Telematics gives the people greater control over their insurance premiums as drivers are rated based directly on their individual driving behaviours. So, the people can easily get discounts by improving their

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driving habits. Driving carefully, reducing-mileage, and avoiding rush hours are some effective methods to gain a lower premium.

2. It helps to increase in a driver's safety awareness and helps in promotion of safer driving behaviours as a survey conducted by the Insurance Research Council (IRC) reported that most of the people made changes in their driving behaviours after the telematics device was installed in their vehicle.
3. People tend to drive less aggressively under the monitor of telematics devices which reduces the fuel consumption expense. Hard breaking, speeding, and rapid acceleration could increase fuel consumption by about 40%
4. Telematics can help in faster claim settlement process for consumers because the data collected by the telematics devices helps them to assign responsibility for crashes and better estimate the extent of crash damage.

Review of Literature

Navneet (2020), in an article published by The Economic Times, titled 'Driving habits could determine your motor insurance premium' said that once telematics comes into effect, motor insurance premium can be customised. So, people will not have to a pay premium based on the cars make and model rather it will be based on your driving habits. The better/lesser you drive the lesser premium you will have to pay. Siniša Husnjaka, et al. (2014) in a study titled 'Telematics System in Usage Based Motor Insurance', found that current billing models are not customised for the end users. Important parameters like driving behaviour, mileage, and types of roads are not considered for the premium calculation. Sam & Michelle (2019) Canaan's report titled, 'Overcoming speed bumps on the road to telematics', a research report by Deloitte Centre for Financial Services, stated that, as individual telematics programs mature, insurers will leverage the data they are gathering to price risks much more accurately. Then, safe drivers will be benefitted from UBI by earning lower rates, while others will end up paying more. Yuanjing Yao (2017), in his research titled 'Evolution of Insurance: A Telematics-Based Personal Auto Insurance Study', found out that The Telematics Insurance, despite some minor disadvantages, offers a fairer way to pay their premiums and an accurate way for insurers to calculate their expected costs. Also, telematics insurance will become the dominant way of pricing personal auto insurance soon. Jean-Philippe Boucher, Steven Côté and Montserrat Guillen, (2017) In their research paper, 'Exposure as Duration and Distance in Telematics Motor Insurance Using Generalized Additive Models' propose to use a rating system that simultaneously considers exposure time and distance travelled in the premium calculation, as risk exposure is directly dependent on both. William Vickrey (1968) was the first to discuss mileage-based insurance premium. He identified several flaws in the motor insurance market at that time, as common insurance policies hardly reflected any exposure in terms of mileage. Mercedes Ayuso, Montserrat Guillen & Jens Perch Nielsen, (2018), in their research titled, 'Improving automobile insurance ratemaking using telematics: incorporating mileage and driver behaviour data', show how data collected from a GPS device can be used for insurance ratemaking. Then risk exposure will be determined by distance travelled by the driver, driver habits, number of accidents and in turn the cost of insurance cover. Martin Eling, Mirko Kraft, 2020, in a research study titled, 'The impact of telematics on the insurability of risks' analyse the use of telematics in insurance and implications of the new technology on loss frequency and severity, legal restrictions and ethical consequences of the use of telematics in the insurance field. Cornel Coca Constantinescu, Ion Stancu, Iulian Panait, (2018) in their research titled, 'Impact study of telematics auto insurance' found that vehicle insurance contracts with telematic insurance policies are the focus of insurance companies and these types of auto insurance contract terms can provide, upto 25% savings on an average for careful drivers. Bhumika Narwani; Yash Muchhala; Jatin Nawani; Renuka Pawar, 2020, in their research paper titled, 'Categorizing Driving Patterns based on Telematics Data Using Supervised and

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Unsupervised Learning', used a combination of telematics data and insurance claim history to create a method where the categorization of driving patterns would always cover the entire spectrum of driving quality which This ensures equal penalty and reward when aggregated on the entire customer base. Their technique makes use of both supervised and unsupervised Machine Learning algorithms to calculate an adaptive driving score for each motor vehicle over some time. This score is indicative of how good a motor vehicle is driven. Manoj Pareek, Manoj Kumar Pandey, Pratik Priyadarshi, 2020 in their research paper titled. 'Emerging technologies enabling the digital transformation of motor insurance in India', found that data is very critical to decision-making and using technologies like telematics, machine learning & artificial intelligence, and insurers can draw better inferences from data to make decisions with an element of speed and efficiency. Ranjan Kumar, 2019 in his research Titled 'Insurance Telematics: Risk Assessment of Connected Vehicles' created a scoring system for those rating variables which have made underwriting much more complex. With this model his aim is to create a model which will help actuaries to calculate the risk exposure of every vehicle.

Objectives

1. To study the role of telematics in Motor Insurance.
2. To study the Perception of the consumers towards Telematics.
3. To study the benefits of telematics in Motor insurance.
4. To study the challenges faced in implementing telematics.

Research Methodology

This section provides an insight on the specific procedures or techniques which were used to conduct the research and to analyse the results. This section is further divided into 5 sections namely, Research Design, Hypothesis, Sample design, Data Sources and Data Collection tool.

Research Design

A Descriptive Research was conducted because it describes the characteristics of the phenomenon that is being studied. It describes the research subject which might be a population, situation, and phenomenon.

Hypothesis

H_1: Telematics has an impact in reducing risky driving behaviour.

H_2: Telematics will help in reducing insurance premiums significantly.

H_3: Telematics will help to reduce accidents significantly.

H_4: Telematics can help reduce the risk of theft.

H_5: Telematics can help the vehicle to be located and recovered in case of theft.

Sample Design

Sampling Method: Convenience Sampling

Sampling Unit: Individual person.

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Sample Size: 200 respondents

Data Sources

Primary Data: The primary data for the study was collected by a survey using a structured questionnaire and was shared using Google forms to the 500 individuals, out of which 200 responded.

Secondary data: The secondary data was collected from company websites, lounge books, Journals, referrals, internet browsing.

Data Collection Tool

A questionnaire will be designed to collect the data to keep in view the objective of the study. The Questionnaire contains closed ended questions for the convenience of respondents and to develop a clear understanding.

RESULTS AND DISCUSSION

In this section, the results and findings of this research are analysed and discussed. From the Primary research conducted, we found out that People are aware about the benefits of having telematics installed. Most of the respondents Agreed to the entire advantages telematics offer, such as Checking the Risky Driving Behaviour (64.5%), Reduction in the Number of Accidents (56.5%), Protection of the vehicle from Theft (62%) and Relocation in case of Theft (57.5%). But at the same time the respondents were sceptical if the telematics technology can help in Reduction of Premiums (45.5% Agreed, 29% Neutral, 26% Disagreed). This might because for some people the premium tends to gain a loading rather than a discount, due to their driving behaviour. At the same time people also Agreed to certain disadvantages which telematics devices hold. Such as Increase in the Cost of Vehicle (57%), and Breach of Privacy (51.5%). The last question that the respondents were asked was if they would consider using a telematic device after analysing all the Merits and Demerits of the same. A logistic regression test was conducted to predict the odds of a person considering installing a telematics device or not. This was a dichotomous variable with only two possible answers- Yes or No.

The test results are shown in the Table 3 below.

Table 3
CASE PROCESSING SUMMARY

		Predicted		
		No	**Yes**	**Percentage**
Observed	No	0	77	
	Yes	0	123	100
	Overall Percentage			61.5

The Table 5 describes our baseline model –that does not include any of the explanatory (Independent) variables. The predictions of this baseline model are made on whichever category occurred most often in our dataset. In our analysis, the research model always guesses yes because more participants chose to consider installing telematic device in their motor vehicle, (123 compared to 77 who said no).

It tells us that this approach to making a prediction is correct 61.5% of the time. Given the base rates of the two decision options (123/200 = 61.5% decided to consider installing telematic devices) and no other information, the best strategy is to predict, for every case, that

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the respondent will consider installing a telematics device in their motor vehicle. Using that strategy, we would be correct 61.5% of the time in Table 4.

Table 4
VARIABLES IN EQUATION

	B	S.E.	Wald	Df	Sig	Exp(B)
Constant	.468	0.145	10.389	1	0.001	1.597

Here, we see that the intercept-only model is ln(odds) =0.468. If we exponentiate both sides of this expression we find that our predicted odds [Exp(B)] = 1.597. That is, the predicted odd of deciding whether to install a telematic device is 1.597. Since 123 of our subjects decided to install the telematic device and 77 decided not to install the telematic device according to our research, our observed odds are 123/77=1.597. The model with just the constant is a statistically significant predictor of the outcome as ($p < 0.05$). However, this will be accurate only 61.5% of the time. Here, the Significance level is <0.05 so we reject the null hypothesis, at 95% level of significance.SE standard error in Table 5.

Table 5
OMNIBUS TEST OF MODEL COEFFICIENTS

		Chi-square	**Df**	**Sig.**
Step 1	Step	5.630	1	0.018
	Block	5.630	1	0.018
	Model	5.630	1	0.018
Step 2	Step	7.489	1	0.006
	Block	13.120	2	0.001
	Model	13.120	2	0.001

The Omnibus Tests of Model Coefficients is used to check that the new model (with explanatory variables included) is an improvement over the baseline model. It uses chi-square tests to see if there is a significant difference between the baseline model and the new model. We can see here that the new model is explaining more of the variance in the outcome and is an improvement. Here the chi-square is highly significant (chi-square=5.630, df=1, p<.05) so our new model is significantly better. The Sig. values are $p < .05$, which indicates the accuracy of the model improves when we add our explanatory variables.
So, we reject the null hypothesis at 95% significance level in Table 6.

Table 6
HOSMER LEMESHOW TEST

Step	**Chi-square**	**Df**	**Sig.**
1	4.659	2	.097

The Hosmer-Lemeshow statistic indicates a poor fit if the significance value is less than 0.05. Here, the model adequately fits the data. The Hosmer & Lemeshow test of the goodness of fit suggests the model is a good fit to the data as p=0.097 (>.05). However, the chi-squared statistic on which it is based is dependent on sample size so the value can get changed with a change in the size of the sample.

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Suggestions

This section mentions certain suggestions which this study has to make. The idea of these suggestions is to provide a beneficial guide that will not only resolve certain issues but also result in a beneficial outcome.

1. To make more people aware about the telematics technology and, give them a clear picture about the advantages and the disadvantages it has to offer.
2. The insurance companies should take strict steps to prevent misuse of data due to hijacking or otherwise, because that would put many people's privacy at stake and put them at a huge risk.

CONCLUSION

Today, Telematics is a word which has a lot of Buzz in context of Motor Insurance. It provides a more scientific methodology for pricing, and certain other advantages for the insured, insurer, and the society. It enables insurance companies to use technology not only to assess risks in a better way but also offer an efficient claims service. One major problem facing the telematic industry today is that all the telematics devices available have some or the other shortcomings which the insurance companies along with various software companies must overcome. Only then the policyholders and the insurers will be fully benefited from this technology. The insurance company must make use of strict rules and firewalls for the customers to trust them. In conclusion, it can be said that the benefits of telematics outweigh its shortcomings. Once all the shortcomings are taken care of, telematics can prove to be beneficial for the Indian market. This will be an upcoming trend in the future, and looking at the benefits it has to offer, most of the people would want to purchase a motor vehicle with a telematic device installed in it. The Way Forward for Telematics in Motor Insurance business has a lot of Scope.

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