Motor Insurance in Phnom Penh, Cambodia

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Abstract

Cambodian insurance market is still in its early development phase despite refinement is made to fit the current context and market. The aim of this study is to explore motor insurance market in Phnom Penh, Cambodia and to find out differentiation of driver characteristics, vehicle information, and driving behavior between insured and uninsured influenced acquiring motor insurance. To achieve this aim, the sample of 382 vehicle users in Phnom Penh, Cambodia were collected from January to June 2021. The findings indicated that Cambodia motor insurance market is currently small that means there is still more space of motor insurance products in Cambodian market. Motor insurance premium the insurers should offer in the market shall be less than $100 for one-year coverage. To promote motor insurance products, social media is the most preferred channel that the insured rated in the survey and followed by TV spots and paper brochures. The potential prospect customers prefer to buy motor insurance through direct marketing (walk in or contact market staff) followed by financial service provider channels and agents. Logistic regression model suggests that the factors that predict the higher probability of purchasing motor insurance are the driver' age (30 to 40 years and 41 to 50 years comparing to other groups), income between $501 and $1,000, the pick-up truck, the motor's age from 3 to 5 years, and the motor used for non-business purposes.

Keywords: Motor, Insurance, Phnom Penh, Logistic Regression

Any opinions, findings, and conclusions or recommendations expressed in this material are those of the authors, and do not necessarily reflect the views of the authors' organizations

Introduction

Traffic accident is not just one nation concern, but it is worldwide concern. As stated by World Health Organization, traffic accident is one among other major factors causing day to day fatality in all ages (WHO, 2022). The most important grounds of accident mainly caused by human error, motor condition, and ruthless weather and there are about 1.3 million casualties every year as a result of traffic accident. Traffic accident causes both casualty and financial loss.

Insurance is a safety net in which to policy purchasers invest a predetermined amount of money, that is called insurance premium, to the insurance company and the insurers might use these prepaid amount to cover all expenses of its clients who accidentally incurred accident (Insurance Information Institute, 2010). Insurance industry comprised of three main insurance coverage such as property insurance, life insurance and health insurance (Insurance Information Institute, 2010).

Motor insurance laid within the category of property insurance. Usually, insurance price is derived from the process of risk classification that each individual information is grouped among those who share similar characteristics so that a standardized premium price will be set to offer in the market. Motor insurance is a formal agreement between an insurer and a purchaser in which the compensation will be paid to a policy holder in case there is any unforeseen motor accident or other kind of harms. Motor insurance is the best form of financial protection to protect drivers in case there is any unanticipated accident. However, motor insurance does not seem to be very popular in developing country due to economic reason. Despite the fact that of motor insurance is not so popular, it has been observed that this product is increasingly available in the market (Azhar et al., 2022).

For motor insurance, geographical information and characteristics of each driver are the salient indicators to be taken into account (Finger, n.d.). Gusner & Megna (2021) set out thirteen core indicators which have influences on motor insurance such as geography position, gender, marital status, number of year in driving motor, historical record of driving motor, history of insurance claims, loan history, previous insurance cover, motor type, motor usage, annual drive distance, and coverages and deductibles. Martin & Longero (2022) expressed that the insurance premium price is set based on the car model and where it is made. Kellison & Brockett (2003) highlighted that the motorists with higher credit score tend to be offered low premium cost and vice versa. Litman (2011) emphasized that the yearly travelling distance has significant impact on yearly motor accident rate.

In Cambodian, motor insurance market is still small with the motor insurance penetration (premiums as a percentage of GDP) at 0.054% and motor insurance density (per capita premium) at 0.71 USD in 2017. However, motor insurance premium is growing fast with the annual growth rate at 12.1% by increasing from 6.95 million USD in 2012 to 11.33 million USD in 2017 due to the increasing of the number of vehicles in Cambodia (Insurance Association of Cambodia, 2018).

Therefore, it is beneficial to conduct projection model assessing the factors

influencing potential clients to subscribe to motor insurance product so that insurance company could refine its sale strategy and business model to raise its sales revenue.

The aim of this study is to explore the motor insurance market in Phnom Penh, Cambodia and to find out the differentiation of driver characteristic, vehicle information, and driving behavior between insured and uninsured. This research can be used as marketing information for insurance players to plan a marketing strategy and develop motor insurance products. Another contribution of this study is to provide information on current Cambodia's insurance market status and its trend in the future.

Literature review

Al-rawashdeh (2016) studied the behavior of insurance demand behavior based on the data collected from individual and institution in Jordan with a total gathered sample size of 552. The study applied logistic regression model to gauge the necessary indicators which influence the decision whether to buy insurance or not. The independent variables used in the model consist of promoting and advertising activities, insurance price, social safety level, comparative advantages, income level and quality. The result indicates that promoting and advertising activities, social safety level, comparative advantages, and quality have significant influence on the demand of insurance product. Insurance price and income level of each individual do not show any effect on the probable insurance demand since they are not statistically significant at 5% significant level.

However, it has been observed that there are only several studies that focus on motor insurance demand in the market. Awunyo-Vitor (2012) conducted a study to find out the determinant factors contributing in the decision to purchase motor insurance. His study was executed in Ghana in which the data was collected from each individual private vehicle owners who registered their motors with Driver and Vehicle Licensing Authority and a simple random sample of 350 motor owners was selected for interview. He made use of binary logit regression model and motor insurance ownership is the dependent variable. The independent variables used comprised of gender, motor owner age, motor age, annual income, education, purchase motor with loan, motor value, application procedure satisfaction, premium payment satisfaction, and claim procedure satisfaction. He aims to explore the significant indicators in his model that determine the choice whether to buy motor insurances for their vehicles or not. His model execution has informed the significant of income level, motor value, motor age, premium cost and claimed procedure awareness. In addition, he found out that mortgaging motor or purchasing motor by using loan from a financial institution would likely increase the tendency of buying motor insurance for their vehicles.

Dragos & Dragos (2017) studied the determinant indicators of whether to purchase insurance or not among drivers in Cluj County, Romania. They applied simple random sampling to perform a face to face interview using a questionnaire. Nested logit regression model was applied in their study to evaluate the key important factors catalyzing the drivers to buy motor insurance. The decision whether to buy

motor insurance is the dependent variable in their logit regression model. To the independent variables, they used 9 different variables such as risk profile, car price range, total travel distances a year, wage range, ratio of wage over car price range, education level, living in urban area or not, age and gender. The model result reveals that the drivers who are risk takers and the drivers' education level lower than bachelor's degree are likely to increase the likelihood of not buying motor insurance.

Su Hyun An et al., (2021) made use of Health Insurance Cross-sell Prediction dataset given by Kaggle, an open data source site. They employed Two Class Logistic Regression and Two Class Boosted Decision Tree simultaneously so as to compare the two methods and make projection from these two methods. The model indicated that there is a positive sign of the drivers who possessed health insurance are likely to buy motor insurance for their vehicle. Duan et al., (2018) studied a bit distinctly comparing to the mentioned researchers. They are interested to examine the probability of insurance claim by each insured. They made use the data from an insurance company in Chongqing, China in which logistic regression model is used to assess the probability of insurance claim by each insured driver. They took into account motor driver age, motor age, region, burden index, and frequency of past claim as the independent variables in their model. The probability of claiming is the regressor. They intended to prove the necessity of including the variable burden index in the regression model.

Regarding this motor insurance in the United States, there was also a study on the demand of motor insurance product conducted in 2002 making use of the data across different states in the United States from 1982 to 1994 (Khovidhunkit & Weiss, 2002). The researchers used cross-sectional and time series dataset for analyses, so the log-linear regression model with fixed effect is applied to evaluate the demand of motor insurance. The model was executed on seven independent variables which are income per person, invers loss ratio (price), traffic density, proportion of people age 18-24, add-on, no fault, and number of registered motor. The result proved that income per person, traffic density, add-on, and number of registered motor have positive effect on motor insurance demand while proportion of people age 18-24 and invers loss ratio (price) have negative effect on motor insurance demand.

Stith & Hoyt (2012) have emphasized the substantial presence of insurance service provision to market and it is a real matter to all motor drivers, regulation setters and insurers. The researchers imposed immense cost of uninsured motorists' expenses to cover accident; therefore, they are interested in uncovering the reasons which laid behind demand of motor insurance product in underserved areas of California using the data collected from California Department of Insurance and the data collected from US Census Bureau's 2000 census to map for the demographic information. The Ordinary Least Square model (OLS) is applied in their study and the independent variables comprise of urban, percentage of minority population, income per person, percentage of poverty level family, language isolated (do not speak English as first language), percentage of adults at least high school level and Hispanic in each Zip code level. The depend variable is the percentage of insurance possessing in each Zip code.

The result proved that there is less motor insurance demand in the high poverty rate areas but predominantly urban areas of California.

Leiria et al., (2022) studied on the likelihood that the insured tended to cancel insurance from the current insurance company. The researchers made use of the data from the main insurance firms in Portugal with the sample size of 3,500 motor insurance policies. Their main research objective is to explore root causes that could explain why the insured decided to stop buying insurance. Leiria et al., (2022) employed binary logistic regression model to evaluate the pertinent factors which drive insurance drivers away. The result showed that aggressive strategy to acquire clients may lead to the cancel of motor insurance purchase. Furthermore, valued clients, expensive insurance price and recently insurance claimed clients, supplementary liaison and agents are the core factors that drive the insured away; however, the insurance payment medium through direct debit restricting partial repayment minimized the chance of client exit.

To the best of our knowledge, this study shall be the first study on motor insurance demand using logistic regression model in Cambodia. Therefore, this study would be an essential finding for insurance sector in Cambodia as well as a crucial literature for the next generation to use as reference for further study. Therefore, as reviewed on different studies above, binary logistic regression model was selected as the tool to evaluate the probability of purchasing motor insurance in Cambodia market. The independent variables including in the study are gender, age, marital status, highest education level, monthly income, occupation, motor ownership, motor type, motor brand, motor age, motor value, frequency of motor use, purpose of motor use, driving experience, daily driving distance, driving speed, and driving alone.

Research methods

Scope of the study

In this research, data were collected from motor users in Phnom Penh, Cambodia by using a questionnaire to collect data from January to June 2021. This study intends to explore the behind reasons that influence drivers in Phnom Penh, Cambodia whether to purchase motor insurance or not.

Research conceptual framework

The main focus of this study is to find out the determinant which laid behind the decision whether to buy motor insurance or not in Phnom Penh, Cambodia. The indicators to be identified is illustrated in Figure 1.
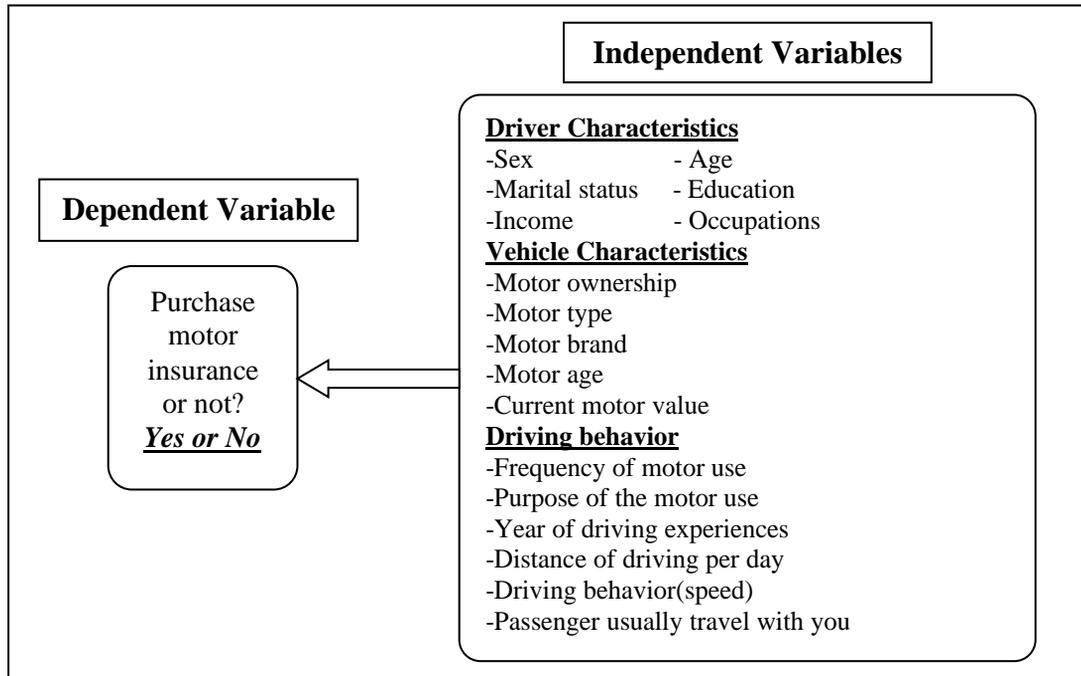
Figure 1 Conceptual framework

Population and sample

Due to the fact that the majority of motor drivers in Cambodia are those who live in Phnom Penh, the targeted respondent sample comprises of motor users in Phnom Penh, Cambodia. The data for the study were collected by using a structure questionnaire which was designed in Google Form and distributed to motor drivers in Phnom Penh. The questionnaire was sent out to motor drivers who are within Telegram Group, WhatsApp Group, Messenger Group and Line Group in which it takes around 10 minutes for them to fill-in the questionnaire and submit it. The data collection took six months from January to June 2021 in which 382 motor users were responded. In this study, the selected sample consists of 116 insured motor users and 266 uninsured motor users.

Data analysis

To meet the aim of this study, descriptive statistics, Chi-Square test, and binary logistic regression were used for data analysis.

Results and discussion

Younger population is the main vehicle drivers who occupy the road and they should be the virtual target for motor insurance products. From all insured vehicle drivers in this survey, some of them are insured only for one purpose; therefore, the cover on Third Party Liability and Own Damage have some more space to grow, too.

To information dissemination, Reputation of the Company, Benefit Coverage and Service Quality are very important information. This information tells the

benefit that the suppliers could use to promote products in marketing campaign through social media, TV Spots and Brochures.

As depicted in the conceptual framework, this research aims to figure out grounds drive the drivers to acquire motor insurance and those indicators are grouped in Driver Characteristics, Driver Behavior and Vehicle Characteristics and Usage.

Driver characteristics

The total sample size of this study is 382 motor drivers who are either insured or uninsured. Among these respondents, only 30.4% of them bought motor insurance for their vehicles.

Driver Characteristics is a composite of gender, age, marital status, education, income, and occupation. Table 1 indicate the chi-square analyses of motor drivers' characteristics cross-tabulating with the term of insured drivers and uninsured drivers. The comparison of Male and Female in the Gender category illustrates that there is no significant difference between the Male and Female cross-tabbed by the insured and uninsured who participated in this study because the P-value > 0.05. To Age, there is a significant difference among Less than 30-year, 30-40-year old, 41-50-year old and More than 50-year old cross-tabbed by the insured and uninsured who participated in this study because the P-value < 0.05. Regarding motor drivers' marital status, Table 1 also indicated that there is a significant difference among single drivers, married drivers, and widow/widower drivers cross-tabbed by the insured and uninsured who participated in this study since the P-value < 0.05. To education level categorized as Lower than Bachelors' Degree, Bachelor's Degree and Higher than Bachelor's Degree, it informed that there is no significant difference among them cross-tabbed by the insured and uninsured who participated in this study as the P-value > 0.05. For income level each motor driver generated, it informed that there is a significant difference among those who earn Less than $500, $501- $1,500, $1,501 – $3,000 and More than $3,000 cross-tabbed by the insured and uninsured who participated in this study because the P-value < 0.05. Similarly, motor drivers' main occupation pointed out that there is a significant difference among those who Run Their Own Business, Work as a Civil Servant, Work as a Laborer and Work as an Officer at a Private Company cross-tabbed by the insured and uninsured who participated in this study since the P-value < 0.05.

Table 1 Chi-Square analysis of driver characteristics

Driver Characteristics	Total (n=382)	Insured (n=116)	Uninsured (n=266)	Chi-Square	P-value
Gender					
Male	47%	43%	48%	0.817	0.366
Female	53%	57%	52%		
Total	100%	100%	100%		
Age					
Less than 30	58%	38%	66%	34.789*	0.000
30 - 40	34%	43%	29%		
41 - 50	5%	10%	2%		
More than 50	4%	9%	2%		
Total	100%	100%	100%		
Marital Status					
Married	42%	59%	35%	19.169*	0.000
Single	58%	41%	65%		
Total	100%	100%	100%		
Education					
Lower than bachelor's degree	4%	5%	4%	0.767	0.682
Bachelor's degree	80%	78%	81%		
Higher than bachelor's degree	16%	17%	15%		
Total	100%	100%	100%		
Income					
Less than $500	34%	12%	43%	38.149*	0.000
$501 - $1,000	37%	53%	30%		
$1,001 - $2,000	20%	21%	20%		
More than $2,000	9%	14%	8%		
Total	100%	100%	100%		
Occupation					
Running your own business	13%	12%	14%	13.466*	0.004
Working as a civil servant	7%	2%	9%		
Working as a laborer	6%	2%	8%		
Working as an officer at a private company	74%	85%	70%		
Total	100%	100%	100%		

Vehicle characteristics and usage

Vehicle characteristics and usage is a composition of motor ownership, motor type, motor brand, motor age, and motor value. Table 2 indicated the chi-square analyses of motor information cross-tabulating with the term of insured drivers and uninsured drivers. The comparison of motor Full-ownership and Mortgaging illustrated that there is a significant difference between the Full-ownership and Mortgaging cross-tabbed by the insured and uninsured who participated in this study since the P-value < 0.05.

Table 2 Chi-Square analysis of vehicle characteristics and usage

Vehicle Characteristics and Usage	Total (n=382)	Insured (n=116)	Uninsured (n = 266)	Chi-Square	P-value
Motor Ownership					
Yes	92%	86%	95%	8.121*	0.004
No	8%	14%	5%		
Total	100%	100%	100%		
Motor Type					
Cars	75%	81%	72%	3.366	0.067
Pick-up trucks	25%	19%	28%		
Total	100%	100%	100%		
Motor Brand					
TOYOTA	70%	76%	68%	44.433*	0.000
FORD	16%	5%	20%		
MAZDA	6%	0%	8%		
OTHERS (HONDA, HYUNDAI, LAND ROVER, KIA, NISSAN)	8%	19%	4%		
Total	100%	100%	100%		
Motor Age					
Less than 3 years	32%	19%	38%	15.902*	0.001
3 – 5 years	29%	31%	29%		
5 – 10 years	18%	21%	17%		
More than 10 years	20%	29%	17%		
Total	100%	100%	100%		
Motor Value					
$5,001 - $15,000	24%	38%	18%	20.963*	0.000
$15,001 – $30,000	71%	55%	78%		
More than $30,000	5%	7%	4%		
Total	100%	100%	100%		

The comparison of Car and Pick-up Truck in the Motor Type category illustrated that there is no significant difference between the Car and Pick-up Truck cross-tabbed by the insured and uninsured who participated in this study as the P-value > 0.05. To Motor Brand, there is a significant difference among TOYOTA, FORD, MAZDA and Other Brand (HONDA, HYUNDAI, Land Rover, KIA, NISSAN, MG3) cross-tabbed by the insured and uninsured who participated in this study since the P-value < 0.05. Age of Motor is also an important indicator to be included in the analyses of this research. Table 2 proved that there is a significant difference among Motor Age which is Less than 3 years, 3 – 5 years, 5 – 10 years and More than 10 years cross-tabbed by the insured and uninsured who participated in this study because the P-value < 0.05.

Regarding Current Value of Motor, Table 2 also indicated that there is a significant difference among motor value which ranges $5,000 - $15,000, $15,001 - $30,000, and More than $30,000 cross-tabbed by the insured and uninsured who participated in this study since the P-value < 0.05.

Driver behavior

Driver behavior consists of motor use frequency, motor usage purposes, driving experience, driving distance, driving speed and driving alone.

Table 3 Chi-Square analysis of driver behavior

Driver Behavior	Total (n = 382)	Insured (n = 382)	Uninsured (n = 116)	Chi-Square (n = 266)	P-value
Motor Use Frequency					
Less often	6%	7%	5%	15.304*	0.002
1 – 2 days per week	12%	21%	8%		
3 – 5 days per week	10%	7%	11%		
Every day or nearly everyday	73%	66%	76%		
Total	100%	100%	100%		
Motor Use Purpose					
Business Use	19%	5%	26%	21.504*	0.000
Other Use	81%	95%	74%		
Total	100%	100%	100%		
Driving Experience					
Less than 1 year	9%	9%	9%	4.899	0.179
From 1 year to 5 years	35%	35%	35%		
From 5 years to 10 years	30%	24%	33%		
More than 10 years	26%	33%	23%		
Total	100%	100%	100%		
Driving Distance per Day					
Less than 30 km per day	69%	64%	71%	2.249	0.325
30 - 50 km per day	24%	26%	23%		
More than 50km a day	8%	10%	7%		
Total	100%	100%	100%		
Driving Speed					
Drive slowly, do not rush	32%	28%	34%	3.975	0.137
Drive at a moderate speed (around 40 Km/h)	64%	66%	63%		
Drive at a quick speed (around 80-100 Km/h)	4%	7%	3%		
Total	100%	100%	100%		
Driving Alone					
Drive alone	63%	48%	69%	15.103*	0.000
Drive with others (colleague(s), family)	37%	52%	31%		
Total	100%	100%	100%		

For motor use frequency, there is a significant difference among the Less Often Use, 1-2 Days Use per Week, 3-5 Days Use per Week, and Every Day or Nearly Every Day Use cross-tabbed by the insured and uninsured who participated in this study since the P-value < 0.05 as illustrated in Table 3. There is also a significant different in motor use for business purpose and motor use for other purposes cross-tabbed by insured and uninsured as it is significant at P-value < 0.05.

To Driving Experience, there is no significant difference among those who are Less than 1 Year of Driving Motor, 1 – 5 Years of Driving Motor, 5 – 10 Years of Driving Motor and More than 10 Years of Driving Motor cross-tabbed by the insured and uninsured who participated in this study since the P-value > 0.05. Referring to the driving distance that each driver drives a day, there is no significant difference among those who drive Less than 30 Km per Day, 30 - 50 Km per Day, 51 - 100 Km per Day, 101 - 200 Km per Day, and More than 200 Km per Day cross-tabbed by the insured and uninsured who participated in this study since the P-value > 0.05. Similarly, there is no significant difference among those who drive slowly, those who drive at a moderate speed (around 40 km/h), and those who drive at a quick speed (around 80 – 100 km/h) cross-tabbed by the insured and uninsured who participated in this study since the P-value > 0.05. However, the term whether the drivers drive alone or with other passengers is statistically significant difference cross-tabbed by the insured and uninsured who participated in this study since the P-value < 0.05.

Binary logistic regression analysis of motor insurance purchase

Non-linear model has been specifically designed for the binary dependent variable which is introduced in many forms, so does Logistic Model. Logistic Model is developed to avoid the flaws of using OLS and it is similar to Probit Model that uses cumulative standard normal distribution function while Logistic Model use cumulative standard logistic distribution function. Table 4 indicated outputs Logistic Regression Model of 17 main indicators over the demand of motor insurance product in Cambodia. Among the 17 indicators in the dependent variables, some of them are categorical variables, so a reference variable in the individual category was assigned. Usually, outputs of Logistic Model are hard to interpret in magnitude change on B or Exp(B), except the direction change. An additional calibration is needed to easily interpret magnitude change affected dependent variable; therefore, Δ Odd Ratio is the subtraction of 1 from Exp(B) and the result could be interpreted as percentage change (increase/decrease).

In previous section, we took in account each factor at a time. This section, we would like to consider all factors simultaneously, so binary logistic regression is applied. The results are as shown in Table 4. Using the significance level of 0.05, among 17 variables, the majority of them are statistically significant to predict the probability to buy motor insurance.

For the Driver Age, the logistic regression indicates that if the driver age is Age 30-40 comparing to the Age Less than 30, the Age 30-40 is likely to increase the odd of buying motor insurance by 375% and it is

statically significant at P-value < 0.05. For Driver Age 41-50 comparing to the Age Less than 30, it is also found that the Driver Age 41-50 is likely to increase the odd of buying a motor insurance by 4,037% and it is statically significant at P-value < 0.05. This result can be implied that the Driver Age 41-50 has the highest probability to buy motor insurance. The second highest probability to buy motor insurance group is Age 30-40. Age Above 50 did not have effect on probability to buy motor insurance. Khovidhunkit & Weiss, (2002) also found that age has a positive effect on insurance demand.

Considering the Education, let the Lower than Bachelor Degree be the reference category. The odds of the drivers with Bachelor Degree comparing to the odds of the Lower than Bachelor Degree decreases by 85% and it is statically significant at P-value < 0.05. Similarly, comparing the drivers with Higher than Bachelor Degree to the drivers with Lower than Bachelor Degree, the odds decreases by 96% and it is statically significant at P-value < 0.05. It implied that the Lower than Bachelor Degree group has the highest probability to buy motor insurance. This result is contrast to the finding of Dragos & Dragos (2017). For Income, |drivers who have income $501-$1,000, is the group that has positive effect in probability to buy motor insurance since odd ratio increased by 788% and it is statically significant at P-value < 0.05. This result is aligned with the finding in the research conducted by Khovidhunkit & Weiss, (2002) and Awunyo-Vitor (2012). Occupation has no influence on the demand of motor insurance since and it is not statically significant at P-value < 0.05.

For Motor Characteristics and Usage, there are 5 variables in this group. The model indicated that full ownership of motor decreased odd of buying motor insurance by 77% and it is statically significant at P-value < 0.05. This means that the driver mortgaging his/her motor with banks or financial institutions are likely to buy insurance for his/her motor and this finding is aligned with the study of Awunyo-Vitor (2012). This could possibly be the compulsory requirement by financial institutions applied to mortgagers. For motor type, driving pick-up truck comparing to driving car increases the odd of buying motor insurance by 3,125% and it is statically significant at P-value < 0.05. However, the driving of Ford brand comparing to Toyota brand decreases the odd of buying motor insurance by 99% and it is statically significant at P-value < 0.05, while all other brands are not different from Toyota brand. In addition, age of motor is also an important indicator to be taken into consideration whether to buy motor insurance. As laid-out in Table 4, only the motor age 3-5 years comparing to the motor age less than 3 years increases the odd of buying motor insurance by 274% and it is statically significant at P-value < 0.05. The motor age 5-10 years and more than 10 years comparing to less than 3 years are not statistically significant difference. Concerning approximate motor value, the motor value $15,001-$30,000 comparing to approximate motor value $5,000-$15,000 decreases the odd of buying motor insurance by 69% and it is statically significant at P-value < 0.05. The approximate motor value of more than $30,000 comparing to motor value $5,000-$15,000 is not statistically significant difference.

Table 4 Binary logistic regression of motor insurance purchase

Variables in the Equation (Variable Y: Y=1 buy, Y=0 not buy)							
	B	S.E.	Wald	df	Sig.	Exp(B)	Δ Odd Ratio
Driver Characteristics							
Gender							
Female	0					1	
Male	-0.379	0.388	0.954	1	0.329	0.685	-32%
Age							
Less than 30	0		16.087	3	0.001	1	
30 – 40	1.559	0.560	7.740	1	0.005	4.753*	375%
41 – 50	3.722	0.952	15.284	1	0.000	41.367*	4037%
More than 50	1.113	0.978	1.297	1	0.255	3.045	204%
Marital status							
Married	0					1	
Single	-0.445	0.451	0.972	1	0.324	0.641	-36%
Education							
Lower than bachelor's degree	0		9.597	2	0.008	1	
Bachelor's degree	-1.927	0.960	4.030	1	0.045	0.146*	-85%
Higher than bachelor's degree	-3.194	1.060	9.079	1	0.003	0.041*	-96%
Income							
Less than $500	0		28.586	3	0.000	1	
$501 - $1000	2.184	0.532	16.856	1	0.000	8.885*	788%
$1001 - $2000	-0.652	0.714	0.834	1	0.361	0.521	-48%
More than $2000	0.748	0.902	0.687	1	0.407	2.112	111%
Occupation							
Working as laborer	0		6.982	3	0.072	1	
Working at private company	0.271	0.895	0.091	1	0.762	1.311	31%
Working as civil servant	-2.087	1.390	2.253	1	0.133	0.124	-88%
Running own business	0.941	0.972	0.938	1	0.333	2.563	156%
Vehicle Characteristics and Usage							
Motor ownership							
Mortgaging	0					1	
Full ownership	-1.483	0.756	3.850	1	0.050	0.227*	-77%
Motor type							
Car	0					1	
Pick-up truck	3.473	0.827	17.653	1	0.000	32.248*	3125%
Motor brand							
Toyota	0		22.037	3	0.000	1	
Mazda	-24.723	6564.875	0.000	1	0.997	0.000	-100%
Ford	-4.360	1.047	17.354	1	0.000	0.013*	-99%
Other	1.118	0.590	3.588	1	0.058	3.059	206%
Motor age							
Less than 3 years	0		6.675	3	0.083	1	
3 - 5 years	1.320	0.519	6.456	1	0.011	3.742*	274%
5 - 10 years	0.928	0.598	2.404	1	0.121	2.529	153%
More than 10 years	1.071	0.615	3.026	1	0.082	2.917	192%
Motor value							
$5000-$15,000	0		7.638	2	0.022	1	
$15,001-$30,000	-1.186	0.435	7.439	1	0.006	0.306*	-69%
More than $30,000	-0.429	1.011	0.180	1	0.671	0.651	-35%

Driver Behavior

Motor use frequency							
Less often	0		8.289	3	0.040	1	
1 - 2 days per week	-1.966	0.951	4.277	1	0.039	0.140*	-86%
3 - 5 days per week	-2.561	1.028	6.208	1	0.013	0.077*	-92%
Everyday	-0.752	0.675	1.244	1	0.265	0.471	-53%
Motor use purpose							
Business	0					1	
Other	2.636	0.721	13.355	1	0.000	13.954*	1295%
Driving experience							
Less than 2 years	0		0.648	3	0.885	1	
From 2 - 5 years	0.183	0.708	0.067	1	0.796	1.201	20%
From 5 - 10 years	-0.121	0.736	0.027	1	0.870	0.886	-11%
More than 10 years	-0.178	0.845	0.044	1	0.833	0.837	-16%
Driving distance per day							
Less than 30km a day	0		5.179	2	0.075	1	
30km - 50km a day	-0.421	0.434	0.942	1	0.332	0.656	-34%
More than 50km a day	-1.653	0.752	4.826	1	0.028	0.192*	-81%
Driving speed							
Drive slowly	0		0.534	2	0.766	1	
Drive around 40 Km/h	0.080	0.447	0.032	1	0.858	1.083	8%
Drive around 80-100 Km/h	0.608	0.842	0.520	1	0.471	1.836	84%
Drive alone							
Drive with others	0					1	
Drive alone	0.219	0.409	0.286	1	0.593	1.245	24%
Constant	-0.379	1.905	0.040	1	0.842	0.685	-32%

Note: -2LL = 269.388, Cox & Snell R Square = 0.407, Nagelkerke R Square = 0.576
Hosmer and Lemeshow Test: Chi-Sq = 18.620, p-value = 0.017

The last group of factors is Driver Behavior which consists of 6 variables, i.e. motor use frequency, motor use purpose, driving experience, driving distance per day, driving speed, and driving alone. Regarding the motor use frequency, the driving frequency 1-2 days a week comparing to driving less often and the driving frequency 3-5 days a week comparing to driving less often decrease the odd of buying motor insurance by 86% and 92% respectively and they are statically significant at P-value < 0.05. The drivers who drive their motor every day comparing to those who drive less often are not statistically significant difference. In addition, the motor use for other purposes comparing to business purpose increases the odd of

buying motor insurance by 1,252% it is statically significant at P-value < 0.05.

Driving distance is statistically significant effect the probability to buy motor insurance. The drivers who drive More than 50km a day comparing to the drivers who drive less than 30km a day decrease the odd of buying motor insurance by 81% it is statically significant at P-value < 0.05. However, number of year in driving, driving speed, and driving alone have no significant effect to the demand of motor insurance product.

Conclusions

Cambodia general insurance market is very small with the insurance penetration

(premiums as the percentage of GDP) at 0.38% and insurance density (per capita premium) at 6.24 USD that means the market still has a lot of space to grow. Simultaneously, motor insurance market in Cambodia is quite tinny with the motor insurance penetration (premiums as a percentage of GDP) at 0.054% and motor insurance density (per capita premium) at 0.71 USD in 2017 because of the lack of public knowledge about insurance benefit.

Drivers' age and earned income are the salient indicators which determined the decision to purchase insurance and this finding is aligned with the finding of Khovidhunkit & Weiss, (2002) and Awunyo-Vitor (2012). This study also found similar result to Awunyo-Vitor (2012) which he emphasized that the mortaging motors are likely to have motor insurance. However, the drivers possessing bachelor degree, possessing higher than bachelor degree, driving Ford, owning motor value between $15,000 and $30,000, driving 1 to 2 days a week, driving 3-5 days a week, and the driving between 51km and 100km a day would inhibit them from buying motor insurance. This implies that these group of drivers are not the targeted market to be focused on motor insurance sales.

Recommendations

Younger population is the main vehicle drivers who occupy the road and they should be the virtual target for motor insurance products. From all insured vehicle drivers in this survey, some of them are insured only for one purpose; therefore, the cover on Third Party Liability and Own Damage should be focused, too.

Motor insurance premium price shall be less than $100 for one policy coverage. Drivers' age from 30-50 years, income generation between $501 and $1,000, driving pick-up truck, motor age 3-5 years, and the motor use for non-business purposes shall be targeted for the future market of motor insurance sales so as to expand the current market saturation.

To information dissemination, Reputation of the Company, Benefit Coverage and Service Quality are very important information. This information implies the benefit that the suppliers could use to promote products in marketing campaign through social media, TV Spots and Brochures.

Implication for further research

The exploration for in-depth understanding of the factors influenced the motor drivers' behavior to decide to purchase motor insurance or not are clearly high-lighted in this paper which are going to be very fruitful inputs for insurance companies and regulator to make use of his finding to assist strategic design as well as policy design. However, this study focused only the demand sided of insurance products, so to have a complete picture of the insurance market, a further study on supply side (insurance companies) and well as regulator would complement this study to have a full over-view of insurance market in Cambodia. In addition, the feasibility study of on-line motor insurance products would also a good supplement study to customize with this advance technology era.

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