

Factors Affecting the Intention to Participate in Disaster Risk Insurance of Households in the North and North Central of Vietnam

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Abstract

The research was conducted with the aim to identify the factors affecting the intention to purchase disaster risk insurance in the North and North Central region of Vietnam. The study used quantitative methods, selected TPB model to conduct research with data collected from 291 subjects, the results showed that the attitude towards disaster risk insurance, subjective norm, perceived behavioral control has a positive influence on the central factor, which is intended. From the results of the analysis, the study gives recommendations for the government and businesses to improve services. Additionally, the research will provide a basis for raising awareness about participating in disaster risk insurance products to proactively protect lives, livelihoods, infrastructure, and homes from the impacts of natural disasters.

Keywords: natural disaster insurance, disaster risk insurance, purchase intention.

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1. Introduction

Vietnam is a rapidly developing country that is vulnerable to natural hazards. For quite a long time, Vietnam has been perceived as one of the countries generally helpless against the effect of climate change and its related phenomena, including natural disasters. The nation has a long coastline of 3,200 km combined with profoundly thought populaces and financial resources situated at waterway deltas and other low-lying regions, presenting these regions to different disasters like sea-level rise, storm, hurricanes, and flooding (Bangalore, Smith, & Veldkamp, 2019). Given the country's grouping of the populace and monetary resources in uncovered regions, Vietnam has been positioned among the five nations generally impacted by environmental change: a 1m ascent in the ocean level would to some extent immerse 11% of the populace and 7% of agricultural land (World Bank, and GFDRR, 2011) (GFDRR, 2015). Moreover, 70% of Vietnam's population lives in coastal areas and low-lying deltas (GFDRR, 2015). 357 dead or missing (291 fatalities, 66 missing people) and 876 injured. 511,172 submerged houses, 3,429 collapsed houses, 333,084 damaged houses/ roofs blown away (IFRC, 2020). These storms and floods that happened in a row are considered the most terrible disaster which hit Central Vietnam in the past 100 years (IFRC, 2020).

The foregoing reality necessitates a method to assist in reducing the harm caused by disaster risks in order to quickly restore people's lives following natural disasters. Although Disaster Risk Insurance is considered a possible disaster risk management tool (Law on Natural Disaster Prevention and Control, 2013), it is still a new product in the Vietnamese market from the standpoint of independent insurance. Several prior scientific research had revealed that the Disaster Risk Insurance product is already available in the Vietnamese market, but only as an extension of Agricultural Insurance or Property Insurance (Dao, 2018) (Hoang, Phan, & Phan, 2014)

Even so, the effectiveness of pilot programs is not really. Agricultural insurance products have been deployed in Vietnam since 1982. However, after eighteen years of pilot implementation, agricultural insurance has not attracted much participation from farmers. According to a report from the Ministry of Finance (2009), only about 1% of the total crop area, 0.24% of the buffalo-cows, 0.1% of the pig, and 0.04% of poultry were insured. And at the conference to review the pilot implementation in the period 2011-2013, the Ministry of Finance estimated that only 3% of households are subject to agriculture insurance. Only 85\$ of poor households participate in agriculture insurance, despite being supported by the Government with a 100% premium (Pham Thi Dinh, 2013).

International institutions such as the Asian Development Bank (ADB), the Green Climate Fund (GCF), and the United Nations Development Programme (UNDP) have recently suggested programs to assist Vietnam in developing disaster risk insurance. If developed in time, this will be a fantastic opportunity for both the Vietnamese government and insurance companies to build efficient disaster risk reduction solutions.

As an outcome, the goal of this article is to identify "Factors affecting the intention to participate disaster risk insurance in the North and North Central of Vietnam" in order to develop a picture of disaster risk insurance needs, identify the shortfalls, difficulties, and benefits of this type of insurance in the Vietnamese market.

2. Literature Review

2.1. Theories on behavioral intentions, and behaviors of consumers

Theory of Reasoned Action (TRA): The theory of reasoned action was proposed in 1975 by Martin Fishbein and Icek Ajzen. The model maintains that consumption intention is the best predictor of consumption behavior. According to the TRA, the intention to perform a certain behavior precedes the actual behavior. The TRA model determined that behavioral intention is by two main factors: their attitude toward the specific behavior and the subjective norms.

Theory of Planned Behaviour (TPB): The Theory of Planned Behavior was developed by Ajzen in 1991, is an extension of the Theory of Reasoned Action (Ajzen & Fishbein, 1975). The TPB states that behavior is not always voluntary and cannot be completely controlled. According to the TPB, the intention to engage in a behavior and perceived behavioral control determine that behavior. Within the TPB model, intentions are determined by three factors: Attitude, Subjective Norms, and Perceived Behavioral Control.

2.2. Empirical researches on intention to purchase disaster risk insurance

In foreign countries, numerous studies have been conducted to clarify the people's intention to prepare for disaster risks and the intention to buy disaster risk insurance.

To predict the intention of households about preparedness for earthquakes in Malaysia, Zaremohzzabieh et al (2021) use the theory of planned behavior (TPB) in its original form and an extended model including community participation and community-agency trust. The research shows that attitude, subjective norms, community participation, and community-agency trust were important predictors of behavioral intention to engage the household in earthquake preparedness and these factors have a positive effect on behavior. The factor perceived behavioral control in both models has no significant effect on the intent to prepare.

Chummun and Mathithhibane (2021) also determine that the factor perceived behavioral control did not affect the intention to buy weather index insurance of farmers in South Africa. In their study, only two factors attitude and subjective norms affect purchase intention.

Based on the fixed-effects model, Browne (2000) points out that Income, Price, and Awareness are the three factors that influence the decision to buy flood insurance of Americans. However, his research has been around since the 2000s, so up to now, there have been many changes in factors.

In Romania, Ciumas and Coca (2015) conducted a study to determine the main factors affecting people's decision to buy disaster insurance by using the OLS regression method. In their research, there are five main factors influencing the decision to buy natural disaster insurance including political, psychological, social, economic, and risk awareness, in which, psychological and social factors have a great impact. Wang et al (2012) also use the regression model to analyze survey data from both individual and regional scales and conclude that the decision to participate in disaster home insurance depends on insurance experience and disaster experience.

Yang et al. (2019) demonstrate the influence of risk awareness on people's willingness to pay (WTP) disaster risk insurance. In their study, risk awareness is divided into five factors include probability factor; controlled factor; fear factor; experiential factor, and the unspecified factor. Based on the PLS-SEM model, the study shows that except for the fear factor that has no effect on willingness to pay, four remaining factors have a significant influence.

In Vietnam, so far, there has not been a separate disaster risk insurance, so very few studies have been conducted, most of which are on agricultural insurance. Therefore, the research team based on similarity and referenced most of the studies on intention to buy agricultural insurance in Vietnam.

Hoang et al. (2014) research on households that participate in training programs on production techniques, households that easily mobilize family labor resources, households that are able to sell finished rice at high prices often have the tendency to participate in rice crop insurance. However, households with higher rice yields or larger rice-growing areas are less motivated to participate in insurance.

Based on the TPB model, Phan Anh Tuan (2020) identified the factors attitude, subjective norms, behavior control, communication, government's fee assistance policies, participation procedures that affect the intention to participate in rice insurance of farmers in the Red River Delta, Vietnam. In which, it is noteworthy that the factor of Government fee support and participation procedures has not been paid attention to in studies on the intention to participate in agricultural insurance in general and rice insurance in particular in Vietnam and in particular. In the world. However, the study has some limitations such as only surveying in two Red River Delta provinces, Nam Dinh and Thai Binh, the generalizability of the study is therefore not high, possibly in other provinces. Others will have their own characteristics affecting the intention to participate in rice insurance of farmers. Although the study has a test to assess the difference in intention to participate between two groups of farmer households by gender, the study has only shown the impact of independent variables on the dependent variable but has not been carried out. appear under the control of the demographic variable.

Nguyen et al.(2021) research on risk management and insurance needs of shrimp farming households in Ben Tre and Tra Vinh provinces In Vietnam, the factors affecting willingness to pay for insurance are income,

chemical costs, production costs, whether farmers provide dead shrimp to the laboratory for testing, participation in farmer training, information on agricultural insurance, and whether farmers have a place to dispose of the sludge. The study also shows that farmers are willing to pay \$0.15 per kilogram of shrimp per year for insurance.

From previous studies, it is shown that most of the works only mention agricultural insurance, if any, only presented in the form of articles, summaries of practical experiences, and related disaster risk insurance issues such as risk management, policies, subjects of application, forms of insurance, summarizing the experience.

Very few research projects use the TPB model to conduct research on intention to participate in DRI or even agricultural insurance. Research shows that these factors are always indicated in people's intention to participate in insurance and they are: Attitude, Subjective Norms, Perceived behavioral control. But the problem is that the factors indicated have not been related to DRI. Furthermore, these factors need to be tested in Vietnam and the North and North Central provinces, as well as for disaster risk insurance. This reveals a big gap for the research topic. In addition to the three initial factors, the study adds the factor of awareness of disaster risk.

There are few studies on the factors affecting the intention to buy disaster risk insurance and no research has been done in Vietnam. Therefore, this study focuses on clarifying the influencing factors and the extent of their influence on the intention to buy disaster insurance in the North and North Central regions of Vietnam.

3. Methodology

The research is done according to a process consisting of five main stages: research topic and theoretical review; collect documents; data collection; preliminary research; analyze the data and finally present the research results as well as the recommendations and suggestions of our team. During the data analysis process, we used statistical methods and SPSS software to run the data. The research team combined the survey method, descriptive statistical analysis method, and quantitative research method to clarify research objectives and research gaps. In which, the survey method is used to collect primary data for the research.

About the descriptive statistical method, we used frequency statistics to evaluate the structure of each variable in the demographic characteristics (gender, age, occupation, income, education level) and average statistics to assess the general opinion of the survey subjects for the 5-level Likert quantitative questions.

About quantitative research, Cronbach's Alpha analysis method is used to evaluate the reliability of four factors and their respective control variables; exploratory factor analysis (EFA) helps to analyze the interrelationships between variables, and the multivariable regression analysis method helps to estimate the most accurate correlation and the influence of factors on the intention to buy disaster risk insurance.

3.1. Questionnaire

This study used survey questionnaires, both direct and indirect questionnaires with statistical analysis. The study sample is those who have not, have been, and are using disaster risk insurance. The research team has collected 312 questionnaires with 300 direct and 12 online questionnaires. When we gave the definition of disaster insurance and asked the respondents whether they understood the concept, 20 people did not understand it. The remaining 292 valid votes were put to use.

3.2. Research Model

Based on the literature review, the study applies the Theory of Reasoned Action (TRA) model of Ajzen and Fishbein (1975) and the Theory of Planned Behaviour (TPB) of Ajzen (1991) as the basis to analyze factors influencing the purchase intention of consumers. The team found 4 factors that influence the intention to buy disaster risk insurance in the North and the North Central of Vietnam included: Attitude towards risk and disaster risk insurance, Subjective norms, Perceived behavioral control, and Awareness of disaster risk.

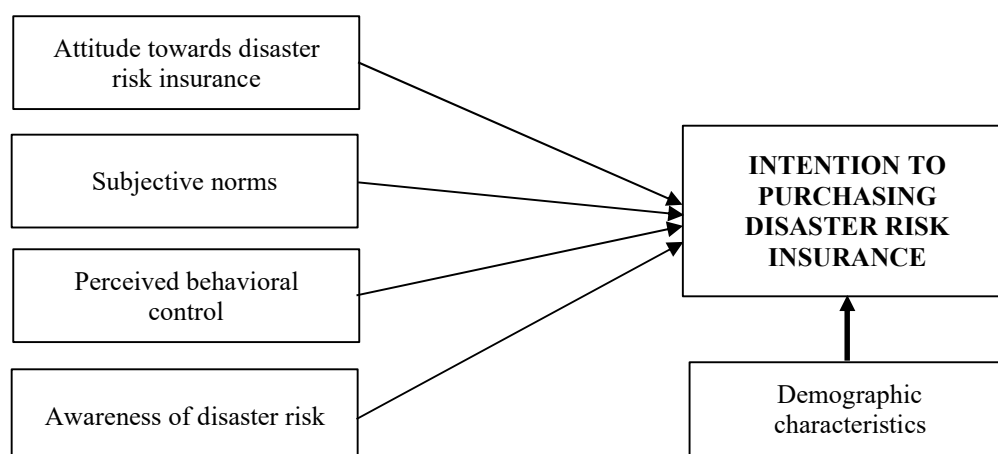


Figure 1. Proposed Model of the Research “Factors affecting the intention to participate disaster risk insurance in the North and North Central of Vietnam”

3.3. Research Hypothesis

○ Attitude towards disaster risk insurance

According to Ajzen(1991), favorable attitudes are formed by the association of behaviors with desirable consequences and vice versa. Therefore, the more favorable attitudes toward a behavior, the stronger individual’s intention to perform that behavior. This has been confirmed by Weedige et al (2019) and Zaremohzzabieh et al (2021) in the research about personal insurance and earthquake disaster risk insurance. In the context of Vietnam’s insurance industry, Phan Anh Tuan (2020), Bui Huy Nam (2019), and Ho Thuy Tien et al (2020) found that attitudes do have a significant impact on household’s intention to purchase non-life insurance, specifically rice insurance and voluntary social insurance.

H1: Attitude towards disaster risk insurance has a positive impact on the intention to participate.

○ Subjective Norms

According to Fishbein & Ajezen (1975), subjective norms are defined as an individual's perception, with important references that the behavior should or should not be performed. Subjective norms can be measured across the involved people of consumers, determined by normative beliefs for behavioral expectations and personal motivations to perform appropriately those expectations.

Vietnam is a country with a collectivist culture that is different from the individualist culture in some Western countries, a collectivist culture is where individual freedom can be restricted and individuals are encouraged to integrate with the community (Hofstede, 2012). Therefore, Vietnamese consumers' psychology is easily affected by "herd mentality", because they have not yet fully grasped accurate information (Vu Huy Thong, 2010), so they often observe the behavior of relevant people. Thus, the tendency to apply for insurance will be influenced by others.

H2: Subjective Norms have a positive impact on the intention to participate.

○ Perceived Behavioural Control

According to Ajzen (2002), if other factors are fixed, the stronger perceived control, the stronger individual’s intention to perform that behavior. For that, the study group choose to test the hypothesis:

H3: Perceived Behavioural Control has a positive impact on the intention to participate.

○ Awareness of disaster risk

Dijksterhuis, Smith, Van Baaren, and Wigboldus (2005) stated that consumers’ behavior is also affected by the unconscious process. However, empirically, the consumers’ awareness gives influence for their willingness to buy a product, (Lee & Shin, 2010), their behaviors in purchasing sustainable products (Suki, 2013), and consumers’ responsibility (Buerke, Straatmann, Lin-Hi, & Müller, 2017). Specifically, except for Takao et al. (2004) and Thieken et al. (2007), all the studies examined by Bubeck et al. (2012) show that negative disaster experience is statistically related to higher degrees of preparedness. The authors also argue that effective risk communication can motivate people to step up their efforts to prevent damage, especially those that were never directly affected by a national disaster such as a flood. Moreover, in previous studies, it has been reported that disaster awareness develops positively after disasters. As a result, the hypothesis statement is

H4: Awareness of disaster risk has a positive impact on the intention to participate.

4. Analytical Results and Discussion

4.1. Reliability Analysis

To evaluate the reliability of the scale, Cronbach's Alpha coefficients are used for each factor group and intention group. This test allows the research team to eliminate inappropriate observed variables and check the internal consistency of a group's variables. It is required that each group have the Cronbach's Alpha being greater than 0.60 and each observed variable has the corrected item-total correlation being greater than 0.30.

Table 1. Cronbach's Alpha Analysis

Observed variables	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
1. Awareness of disaster risk: $\alpha = 0.783$				
NT1	11.78	6.871	.594	.731
NT2	10.81	7.733	.621	.716
NT3	11.46	6.684	.640	.704
NT4	10.58	8.693	.529	.762
2. Attitude toward disaster risk insurance: $\alpha = 0.866$				
TD1	13.98	15.375	.649	.848
TD2	14.19	13.926	.752	.822
TD3	14.67	14.207	.653	.847
TD4	14.08	14.891	.700	.836
TD5	14.51	13.423	.702	.836
3. Subjective norms: $\alpha = 0.836$				
CCQ1	9.66	8.544	.683	.785
CCQ2	9.82	8.014	.798	.730
CCQ3	9.14	10.540	.539	.844
CCQ4	10.18	8.586	.662	.796
4. Perceived behavioural control: $\alpha = 0.778$				
KS1	11.61	6.536	.644	.691
KS2	11.66	6.300	.672	.675
KS3	11.43	6.956	.619	.708
KS4	11.74	7.247	.418	.812
5. Intention to purchase disaster risk insurance: $\alpha = 0.818$				
YD1	6.40	6.152	.524	.883
YD2	6.60	4.351	.806	.603
YD3	6.74	4.337	.713	.709

Source: Analysis results of the research

The results show that all groups are reliable with Cronbach's Alpha ranging from 0.778 to 0.866. All observed variables have the item-total correlation exceeding the threshold of 0.30. However, the Cronbach's Alpha of scales 3 and 4 are improved if CCQ3 and KS4 are deleted; consequently, the research team decided to exclude these two variables. In addition, the Cronbach's Alpha of scale 5 is also higher if YD1 is deleted, yet YD1's item-total correlation is significant, specifically $0.524 > 0.30$. Therefore, YD1 is retained to enhance the research's diversity.

4.2. Correlation analysis

Table 2. Correlation analysis

		Correlations				
		YD	NT	TD	CCQ	KS
Pearson Correlation	YD	1.000	.317	.505	.617	.378
	NT	.317	1.000	.363	.345	.380
	TD	.505	.363	1.000	.346	.452
	CCQ	.617	.345	.346	1.000	.175
	KS	.378	.380	.452	.175	1.000
Sig. (1-tailed)	YD	.	.000	.000	.000	.000
	NT	.000	.	.000	.000	.000
	TD	.000	.000	.	.000	.000
	CCQ	.000	.000	.000	.	.001
	KS	.000	.000	.000	.001	.

Source: Analysis results of the research

Through the Pearson correlation coefficient, the research team conducted correlation analysis to examine the relationships between quantitative variables. The correlation coefficients in the table show the positive relationship between the relative variables and the level of reasonableness. The largest correlation coefficient between the independent variables is 0.452 (correlation between Attitude toward Disaster Risk Insurance and Perceived behavioral control), the smallest correlation coefficient between the independent variables is 0.175 (correlation between Perceived behavioral control and Subjective norms). The largest correlation coefficient between the component factors and the dependent variable is 0.617 (correlation between the independent variable Subjective norms and the dependent variable Intention to purchase Disaster Risk insurance) and the smallest correlation coefficient is 0.317 (correlation relationship between the independent variable Awareness of Disaster Risk and the dependent variable Intention to purchase Disaster Risk Insurance).

Sig values between factors are less than 0.05, meaning that there exists a linear correlation between the dependent variable and the independent variable.

4.3. Descriptive statistics

Table 3. Descriptive statistics

Factors	Mean	Std. Deviation
Awareness of disaster risk (NT)	3.7191	.88126
Attitude toward disaster risk insurance (TD)	3.5711	.93203
Subjective Norms (CCQ)	3.0458	1.08216
Perceived Behavior Control (KS)	3.9141	.89735

Source: Analysis results of the research

The mean of these variables ranged from 3,0458 to 3,9141, which shows that the majority of people agree with the statements for these variables. The factor that received the most agreement belonged to Perceived Behavior Control, while the Subjective Norms factor was true in the opposite direction. The other two variables, Awareness of disaster risk and Attitude toward disaster risk insurance also received the relatively high agreement, respectively 3,7191 and Attitude to disaster risk insurance.

4.4. Model Summary

Table 4. Model Summary

Model Summary					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.708 ^a	.502	.495	.75673	1.927

Source: Analysis results of the research

According to the results of the model summary table, with R=0.708, it shows that the model is appropriate. Adjusted R Square of 0.495 shows a significant relationship between the independent variable and the dependent variable, which means independent variables in the model could explain 49.5% of the overall level.

4.5. Analysis Regression

Table 5. Coefficient of the regression model of The Factors influencing Disaster Risk Insurance purchasing intention

		Coefficient						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-.018	.247		-.073	.942		
	NT	-.022	.058	-.018	-.377	.706	.757	1.321
	TD	.292	.057	.256	5.151	.000	.705	1.418
	CCQ	.494	.045	.503	10.921	.000	.823	1.215
	KS	.215	.058	.181	3.731	.000	.741	1.350

Dependent Variable: Intention

Source: Analysis results of the research

Based on the table 5, significant values of three determinants in the model are lower than 0.05, including Attitude toward disaster risk insurance (TD), Subjective norms (CCQ) and Perceived behavioural control (KS) . The result also shows that the Standardized Coefficients of these determinants are also greater than 0. For that these factors are statistically significant and influence the buying interest of the customers. Meanwhile, the significant value of Awareness of disaster risk (NT) equals 0.942 which is higher than 0.05. It means that Awareness of disaster risk (NT) did not have statistical meaning in this model.

The regression model of determinants of the intention to participate in disaster risk insurance in the North and North Central of Vietnam is:

$$Y=0.256*TD + 0.503*CCQ + 0.181*KS (1)$$

Comparing the value of the standardized coefficients in the Beta column shows that: Subjective norms (CCQ) are the most important factor ($\beta= 0.503$ và Sig.=0.000). It means that if the other factors are fixed when the Subjective Norms increase 1 unit, the intention to participate will increase by 0.376 units.

Similarly, the next one is Attitude toward disaster risk insurance (TD) ($\beta = 0.256$ and sig. = 0.000), and the lowest is Perceived behavioural control (KS) ($\beta = 0.181$ and sig. = 0.000).

4.6. The Level of Determinants' Impact

- o Attitude towards disaster risk insurance

Table 6. Descriptive Statistics of Attitude toward disaster risk insurance

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
TD1	291	1.00	5.00	3.88	1.035
TD2	291	1.00	5.00	3.67	1.152
TD3	291	1.00	5.00	3.18	1.222
TD4	291	1.00	5.00	3.78	1.057
TD5	291	1.00	5.00	3.35	1.0289

Source: Analysis results of the research

As discussed above, Attitude toward disaster risk insurance ranks second in the impact on the intention to purchase disaster risk insurance. The mean value of observed variables fluctuated from 3.18 to 3.88, which means they tend to agree with the statement. Specifically, the observed variable TD1 (Participating in disaster risk insurance is necessary) achieves the highest ratings, indicating that households have certain knowledge

about the importance of disaster risk insurance. Meanwhile, the lowest figure belongs to the observed variable TD3 (Participating in disaster risk insurance is economical). This result is totally reasonable as many respondents are from low-or-average-income households and are just able to afford their necessity.

○ **Subjective Norms**

Table 7. Descriptive Statistics of Subjective norms

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
CCQ1	291	1.00	5.00	3.27	1.240
CCQ2	291	1.00	5.00	3.11	1.223
CCQ3	291	1.00	5.00	3.79	.999
CCQ4	291	1.00	5.00	2.76	1.256

Source: Analysis results of the research

Subjective norms is the strongest determinant of the disaster risk insurance purchase intention. The response to this group of observed variables fluctuates at an average level from 2.76 to 3.79, that is, they disagree or agree. The highest-rated observed variable is CCQ3 (The information sources mention the essentials of disaster risk insurance while the lowest one is CCQ4 (I feel social pressure to participate in disaster risk insurance). This result implies that the media reaches the majority of customers, yet not effective enough to induce them to buy the insurance. An explanation for this phenomenon is that disaster risk insurance is voluntary; without insurance, households still get support from the local government for mitigation after disasters.

○ **Perceived Behavioural Control**

Table 8. Descriptive Statistics of Perceived behavioural control

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
KS1	291	1.00	5.00	3.87	1.067
KS2	291	1.00	5.00	3.82	1.094
KS3	291	1.00	5.00	4.05	.993
KS4	291	1.00	5.00	3.74	1.157

Source: Analysis results of the research

Perceived behavioural control is the factor having the lowest impact on the intention to buy disaster risk insurance. This group of observed variables received a positive response with the average result ranging from 3.74 to 4.05. The highest and lowest records are respectively KS3 (I search for information before joining) and KS4 (I have full ability to decide to participate in disaster risk insurance). It can be seen that there is a caution with insurance purchase and hesitation in the decision-making process. This is in line with the previous results of the influence of surrounding opinions.

5. Recommendation

5.1. Recommendation to the Government

The disaster risk insurance is a new type of insurance and is in the early stages of implementation, so the State's intervention is needed in the development of laws and circulars guiding its implementation. In general, the research team gives the following recommendations to the State as follows:

First, raising people's awareness of active risk management by disaster risk insurance. Due to the characteristics of collective community, communication campaigns should involve local influencers and organizations in order to build residents' trust in insurance products and further encourage them to purchase the disaster risk insurance.

Second, building some preferential policies to engage insurance companies and households in the disaster risk insurance market. The policy that reduces premiums for households has been proved to be effective in motivating households to participate in agriculture insurance (Phan, 2020). Besides, since there are few insurance companies providing disaster risk insurance, policies such as tax reduction and financial support for

coverage of catastrophes should be developed.

Third, building a disaster risk information system and enforcing relevant regulations and guidelines. This is the fundamental infrastructure for risk modeling and index insurance development. The data should be made accessible to everyone to ensure integrity.

Fourth, establishing a disaster risk insurance fund. In the long run, this is an effective mechanism to reduce the government's burden and share risk among insurance firms. Vietnam has recently participated in the Southeast Asia Disaster Risk Insurance Facility (SEADRIF), which is the basis for creating a domestic fund in the future.

5.2. Recommendation to Insurance Companies

According to the study, the disaster risk insurance market has strong potential for growth in the future. Therefore, it is urgent for insurance businesses to catch up with the trend and create their own competitive advantages in the market. The research team suggests the following recommendations for insurance companies:

First, selecting the suitable form of disaster risk insurance and designing appropriate products. Most Vietnamese disaster risk insurances are traditional insurances, which is not the optimal form for disaster risk. Thus, insurance companies should invest in researching index insurance and launching it to the market. Besides, firms should also diversify the products to match the local's needs.

Second, implementing innovative marketing strategies and expanding the distribution network. Insurance companies can associate with local organizations in product promotions to raise the public's interest. In addition, it is crucial to develop insurance distribution channels and ensure their quality through internal training.

Third, improving the procedures related to disaster risk insurance. The procedures should be systematic and transparent in order to build positive beliefs in the community.

6. Conclusion and Limitation

Based on the research, we give results on the impact of factors on the intention to participate in Disaster Risk Insurance of people in the North and North Central regions of Vietnam. In this article, we provide information and definition of Disaster Risk Insurance as well as theories related to consumer purchase intention such as the Theory of Reasoned Action (TRA) and the Theory of Planned Behavior (TPB). After that, we examine the impact of factors on consumers' intention to buy this type of insurance based on 291 survey questionnaires. We eventually offer recommendations to increase the percentage of people participating in this type of insurance.

Through the results of data analysis, we found that the factor "Awareness of disaster risk" had no impact on consumers' intention to buy disaster insurance. Three factors "Attitude towards disaster risk insurance", "Subjective Norms" and "Perceived behavioral control" have a positive influence on the intention of purchasing disaster risk insurance. In which, the factor "Subjective Norms" has the strongest impact, followed by "Attitude towards disaster risk insurance" and finally "Perceived behavioral control". Some recommendations to the government and insurance firms are given in accordance with these results.

Despite bringing positive contributions from the analyzed results, the study "Factors affecting the intention to participate in disaster risk insurance in the North and North Central of Vietnam" still has limitations. Firstly, during the research, time and resources are limited. The research was conducted during the Covid-19 outbreak, making data collection difficult. During the survey, because of the online voting method, it is difficult to control the number of qualified votes, who received the votes, leading to the results of many spam votes. Secondly, the number of survey votes collected is too small, not enough to cover the general intentions of all people. Thirdly, the difference in age, education, and income of voters in the survey might affect the research results. From these limitations, the team hopes to continue the research on a larger scale to get comprehensive studies, to provide practical solutions for the government and insurance businesses.

References

- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179-211.
- Ajzen, I., & Fishbein, M. (1975). *Belief, Attitude, Intention, and Behavior: An Introduction to Theory and Research*. Addison-Wesley Publishing Company.
- Ajzen, I., & Fishbein, M. (1980). *Understanding Attitudes and Predicting Social Behavior*. Englewood Cliffs, New Jersey: Prentice-Hall.
- Bangalore, M., Smith, A., & Veldkamp, T. (2019). Exposure to Floods, Climate Change, and Poverty in Vietnam. *Economics of Disasters and Climate Change*, 3, 77-99.
- Browne, M. J., & Hoyt, R. E. (2000). The Demand for Flood Insurance: Empirical Evidence. *Journal of Risk and Uncertainty*, 20, 291-306.
- Ciomas, C., & Coca, R. A. (2015). An Analysis Of The Factors Influencing The Demand For Catastrophe Insurance. *Journal of Public Administration, Finance and Law, Alexandru Ioan Cuza University, Faculty of*

- Economics and Business Administration*, 69-78.
- GFDRR. (2015). *Country Profile - Vietnam*.
- Hoang, T. H., Phan, D. K., & Phan, T. A. (2014). Factors affecting decision to participate in rice insurance in Dong Thap. *90*(2).
- Nguyen, K. A., Nguyen, T. A., Bui, C. T., Jolly, C., & Nguelifack, B. M. (n.d.). Shrimp farmers risk management and demand for insurance in Ben Tre and Tra Vinh Provinces in Vietnam. *Aquaculture Reports*, 19.
- Phan, A. T. (2020). *Research on factors affecting farmers' intention to participate in rice insurance in the Red River Delta*. [Doctoral dissertation, National Economics University]. Graduate School of National Economic University. <http://sdh.neu.edu.vn/xem-tai-lieu/>.
- Wang, M., Liao, C., Yang, S., Zhao, W., Liu, M., & Shi, P. (2012). Are people willing to buy natural disaster insurance in China? Risk Awareness, Insurance Acceptance, and Willingness to Pay. *Risk Analysis*, 32(10), 1717-1740.
- Weedige, S. S., Ouyang, H., Gao, Y., & Liu, Y. (2019). Decision Making in Personal Insurance: Impact of Insurance Literacy. *Sustainability*, 11(23), 6795.
- World Bank, and GFDRR. (2011). *Vulnerability, Risk Reduction, and Adaptation to Climate Change – Vietnam*.
- Zaremohzzabieh, Z., Samah, A. A., Roslan, S., Shaffril, H. A., D'Silva, J. L., Kamarudin, S., et al. (2021). Household preparedness for future earthquake disaster risk using an extended theory of planned behavior. *International Journal of Disaster Risk Reduction*, 65.