

Article



Can Trust Motivate Farmers to Purchase Natural Disaster Insurance? Evidence from Earthquake-Stricken Areas of Sichuan, China

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Abstract: Natural disasters cause great losses of property and life in many areas of China. However, rural residents do not always insure themselves against these losses. Measuring the correlation between trust and farmers' behavior related to the purchasing of natural disaster insurance is of great significance to the implementation of natural disaster insurance pilot programs and insurance systems in China. This article analyzes data from a survey of 327 households in four districts and counties of Sichuan Province, China, that were affected by the Wenchuan and Lushan earthquakes. According to the relevant theories of trust, trust was divided into three dimensions: authority trust, collective trust, and relationship trust. Then a technology acceptance model was built, and PLS-SEM was used to comprehensively analyze the correlation between different dimensions of trust and farmers' insurance purchase behavior. The results show that (1) only relationship trust was directly and significantly positively correlated with insurance purchasing behavior. Although there was no direct significant correlation between authoritative trust or collective trust and buying behavior, relationship trust was found to indirectly affect buying behavior. (2) Younger farmers and those with higher incomes are more likely to buy disaster insurance if they live in a disaster-threat zone, have experienced disasters, and are risk averse. We then discuss the correlations between farmers' trust and natural disaster insurance purchasing in areas threatened by earthquake disasters. This provides a policy inspiration for the promotion of disaster insurance and the construction of insurance systems in China.

Keywords: trust; natural disaster insurance; PLS-SEM; technology acceptance model; correlation judgment

1. Introduction

Natural disasters refer to events in which abnormal changes in nature exceed the tolerance that humans can bear [1,2], resulting in human casualties, property losses, social instability, resource destruction, and other phenomena or a series of injuries to human society and economy, mainly including geophysical disasters (such as earthquakes and volcanoes) and climate-induced disasters (such as floods, storms, and landslides) [3–6]. China is a large mountainous country in which hilly areas account for 70% of the total land area and host about 45% of the population [7–14]. Influenced by geology and geomorphology, mountainous areas have been prone to natural disasters since ancient times [15,16]. Their disasters are characterized by chain reactions and mass occurrences [17–21]. This makes China one of the countries with the worst natural disaster regions in the world [22–24]. Sichuan Province is one of the most famous earthquake disaster regions in the world and suffers great losses from earthquakes [25,26]. Some 204 earthquakes of magnitude \geq 5 occurred



Citation: Bao, X.; Zhang, F.; Deng, X.; Xu, D. Can Trust Motivate Farmers to Purchase Natural Disaster Insurance? Evidence from Earthquake-Stricken Areas of Sichuan, China. *Agriculture* 2021, *11*, 783. https://doi.org/ 10.3390/agriculture11080783

Academic Editor: Terence J. Centner

Received: 28 July 2021 Accepted: 15 August 2021 Published: 17 August 2021

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Copyright: © 2021 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (https:// creativecommons.org/licenses/by/ 4.0/). in China from 2004 to 2019, causing 561,800 casualties and direct economic losses of RMB 1.14 trillion [27]. Among them, the Wenchuan earthquake of 12 May 2008 and the Lushan earthquake of 20 April 2013 were magnitude \geq 7 and caused about 450,000 casualties and more than RMB 900 billion in direct economic losses. For residents of some areas, natural disasters are inevitable. They cause huge losses that far exceed the residents' ability to bear [28–31]. As early as 1991, some scholars put forward theories related to behavioral insurance and risk aversion, and now these theories have been used maturely [32]. In this context, natural disaster insurance came into being [33,34]. At present, natural disaster insurance refers to the institutional arrangement of risk diversification and economic compensation in the form of insurance by a government or other public organizations [35,36]. It uses the insurance mechanism to mitigate the huge property losses and serious casualties caused by natural disasters, such as earthquakes, hurricanes, tsunamis, and floods [37]. Although natural disaster insurance has been implemented in China for several years, some studies have found that the proportion of farmers purchasing natural disaster insurance is low [38]. Is this because local governments do not promote insurance sufficiently? Is it that local residents do not trust insurance schemes to protect people and property? This is an anomaly well worth studying. Improving the insurance purchasing intentions and behaviors of residents of natural disaster areas, especially disaster areas, has become a difficult problem in academic and political circles.

The main research question is: why do only a small proportion of people at risk of natural disasters purchase disaster insurance? Some scholars have analyzed this phenomenon by considering the roles of governmental/societal assistance and insurance, finding that the former has a "crowding-out effect" on residents' insurance purchasing [39,40]. The reason for the above phenomenon is precisely that the government often participates in disaster relief; residents expect to receive its benefits. Hence, they may confuse insurance liability with social responsibility, which reduces their motivation to purchase disaster insurance. The willingness, behavior, and influencing factors of purchasing natural disaster insurance have always been a focus of academic research [41–43]. Existing studies have mostly considered residents' personal characteristics, their families' socioeconomic characteristics, and government charity risk and have analyzed their correlations with insurance purchasing. For example, Dumm et al. [44] found that residents with a better understanding of the characteristics of natural disasters feel a more urgent need for insurance, and the occurrence of a disaster will greatly enhance residents' demand for insurance [44,45]. Zhu [46] found that residents' background cognition of earthquake risk was correlated with their insurance purchasing behavior. In fact, this behavior of residents or farmers buying natural disaster insurance essentially involves a consumer purchasing a commodity, and factors such as consumer income, recognition of goods, and trust in goods may all affect consumers' final purchase behavior [47]. However, few scholars have studied disaster insurance purchasing behavior and its influencing factors from this perspective. This is because, in traditional transactions, consumers can identify the quality of goods by what they see, touch, and feel when they use them. However, insurance products are purchased in advance in an environment involving distrust factors and high perceived risk [48]. Therefore, when purchasing such goods, consumers will pay attention to the factor of trust. Essentially, trust is a type of psychological expectation involved in interpersonal communication [49]. It can be divided into public trust and interpersonal trust [50]. Among them, governmental trust and collective trust are types of public trust which are established on the basis of law, politics, and other factors [51]. Government trust includes residents' psychological expectations and belief that the government will support their interests, while collective trust involves residents' expectations, dependence, and attributions related to local groups [52]. Generally speaking, the higher is the credibility of the local government, the stronger is its appeal and the more active residents are in participating in public policies [53]. Correspondingly, interpersonal trust is based on the relationships between people [54,55].

Although some scholars have realized the importance of trust in insurance purchasing, there are relatively few empirical studies on the relationship between trust and insurance in general. In the few that exist, there are some deficiencies. On the one hand, although some scholars have focused on the correlation between trust and insurance purchasing, most have considered new agricultural insurance and general commercial insurance rather than natural disaster insurance. For example, Huo et al. [49] found that under the influence of a "trust-cooperation" mechanism, trust had a significant positive influence on farmers' New Rural Social Pension Insurance (NRSP) purchasing behavior. Ding et al. found that only social trust level affected rural residents' purchasing of NRSP [55]. In fact, disaster insurance, NRSP, and general commercial insurance have some differences. Disasters are characterized by low frequency and high consequence [56]. Hence, the role of trust in purchasing such insurance may be different from that in regular insurance. On the other hand, in these limited studies, scholars have mostly explored the trust-insurance purchasing correlation from the perspective of trust objects (such as the government, experts, media, family, and neighbors) and a single trust dimension [49,57]. These two common research perspectives usually influence each other, resulting in overlapping that may lead to one-sided empirical research results. In addition, scholars mostly use conventional models, such as logit, OLS, and probit to study insurance purchasing behavior and its influences [58–60]. Although these methods have their merits, problems such as multiple influencing factors, complex research types, and multiple linear correlations in practical research increase the difficulty of analysis.

To sum up, existing studies have the following deficiencies: First, generally speaking, there are few empirical studies focusing on the relationship between trust and residents' insurance purchasing. Second, the ones that do have considered new agricultural insurance and general commercial insurance, and none have involved natural disaster insurance. Third, in these limited empirical studies, the research perspective has mostly been from the trust object or single trust dimension, and the conclusions may be biased. Fourth, logit, OLS, and probit models are the most used research methods and have difficulty in analyzing the interactions among multiple variables. Based on this, on the basis of the technology acceptance model (TAM), this paper divides trust into three dimensions: authority trust, collective trust, and relationship trust. We build a theoretical analysis framework for the factors of trust and natural disaster insurance purchasing behavior. Based on survey data from 327 households in the regions of the Wenchuan and Lushan earthquakes of Sichuan Province, China, the PLS-SEM method was used to explore the correlation between trust in different dimensions and the purchase of natural disaster insurance by farmers. The results provide a reference for the formulation and improvement of a natural disaster insurance policy in disaster-threatened areas based on theory and empirical evidence.

2. Materials and Methods

2.1. Research Area

Sichuan Province is located in southwestern China, and 97.46% of the area comprises hills, mountains, and plateaus. In addition to earthquake disasters, it has landslides, debris flows, and other secondary disasters. From 2005 to 2018, 144 earthquakes and 18,518 geological disasters, such as landslides and mudslides, occurred in Sichuan, causing 1390 casualties and a direct economic loss of RMB 8 billion [14]. Among them, the Wenchuan earthquake on 12 May 2008 (magnitude 8 on the Richter scale) and the Lushan earthquake on 20 April 2013 (magnitude 7) caused huge casualties and economic losses to local residents. Considering the non-negligible impact of earthquake disasters in a multi-disaster-threatened environment, this paper selected mountainous areas stricken by the Wenchuan and Lushan earthquakes as the study areas.

2.2. Data Sources

The data used in this paper came mainly from a questionnaire survey conducted by the research group in the worst-hit areas of the Wenchuan and Lushan earthquakes in August

2019. The research examined the sustainable livelihoods of farmers, disaster risk perceptions, disaster avoidance behavior responses, and the construction of village resilience disaster prevention systems [61–63]. To ensure the representativeness of the survey, stratified equal probability random sampling was adopted to determine the survey samples.

In selecting sample districts (Figure 1), there were two main considerations: First, the four sample districts and counties should be from the worst-hit areas of the Wenchuan and Lushan earthquakes (these two major earthquakes each involved two districts and counties). Second, there is a significant difference in the economic development levels of the two sample counties involved in each major earthquake. Based on the above considerations, Beichuan County and Pengzhou City were selected as sample counties from 10 counties in the worst-hit areas of the Wenchuan earthquake. Baoxing County and Lushan County were selected from six counties in the worst-hit areas of the Lushan earthquake. After selecting the sample districts and counties, according to their differences in economic development level, the distances from the center of the districts to the counties, and the situation of severe disasters (especially the numbers of threatened people), two sample towns were randomly selected from each sample district and county—a total of eight towns. The third consideration was the selection of sample villages. After the determination of the sample towns, the villages in each were divided into two categories according to the number of threatened people, differences in economic development level, and the distance from the township center. Then, 1 village from each category was randomly selected as the sample village to obtain 16 villages. Finally, the sample farmers were determined. After the sample villages were determined, the frontline team members obtained lists of resident farmers from the village cadres and the following methods to determine the sample farmers. According to the total number of households in the village, the number of households threatened by secondary geological disasters, such as landslides and mudslides, and the level of economic development of the households, 20-23 households were selected from each sample village through a random number table. The sample households were ultimately 327, accounting for landslides and mudslides and other secondary geological disasters threatening 28.56% of households. Since the sample farmers we surveyed were generated through random number tables, and China's rural areas have relatively high homogeneity, our sample was still very representative of the sample villages (at least covering different levels of economic development: good, medium, and poor farmers, including farmers of varying degrees threatened by geological disasters). Since there were 13 people in the research team (including 1 team leader), our preliminary estimate was that the sample size was 24 households in a village. However, it was limited by actual conditions (limited funds, scattered rural households in mountainous areas, and the relatively high time cost of household surveys), so we only collected 20-23 households in each village, and 327 sample households accounted for 85.15% of the expected target households. At the same time, because the investigators were systematically trained masters and undergraduates, and they were led by the village cadres to enter the farmers' homes to do one-on-one surveys, our questionnaire was 100% efficient.



Figure 1. Location map of sample counties and towns.

2.3. Theoretical Analysis and Research Hypotheses

As mentioned above, trust is a type of psychological expectation involved in interpersonal communication [64]. At the same time, Chinese society is traditionally an "acquaintance society", and trust in this environment often involves low interaction with the outside world. People clearly classify themselves and outsiders based on mutual understanding through the scope of trust, which is specifically manifested as giving decreasing degrees of trust to relatives, acquaintances, and strangers, in that order. Once the category of blood relationship is broken, it is difficult to expand trust at every step [65,66]. Based on this, this paper divides trust into three dimensions: authority trust, collective trust, and relationship trust. It then comprehensively considers the nature of "buying behavior" and the purpose of studying the factors affecting insurance purchasing. Considering that the TAM model is a model of attitude intention behavior, it is often used in combination with other models to study consumers' purchasing behavior [57,67,68]. Therefore, on the basis of the TAM model and in combination with the system of trust dimensions, this paper assumes that the direct influences between the three trust dimensions and farmers' purchasing of natural disaster insurance are as follows:

Hypothesis 1. Authority trust has a direct and positive impact on farmers' natural disaster insurance purchasing behavior.

Hypothesis 2. Authority trust has a direct and positive impact on collective trust.

Hypothesis 3. Authority trust has a direct and positive impact on relationship trust.

Hypothesis 4. Collective trust has a direct and positive impact on relationship trust.

Hypothesis 5. Collective trust has a direct and positive impact on farmers' natural disaster insurance purchasing behavior.

Hypothesis 6. Relationship trust has a direct impact on farmers' natural disaster insurance purchasing behavior.

In terms of the relationships between variables, if X influences Y through variable M, then M is called an intermediary variable and is said to have an intermediary effect [69]. In fact, farmers' own purchasing behavior is mostly influenced by the psychological expectation of trust, which is called ripple effect [70]. However, due to the differences in trust objects and trust degrees, farmers are affected differently. In theory, authority trust and collective trust can indirectly affect farmers' natural disaster insurance purchasing behavior by influencing relationship trust. Therefore, the indirect impact path between trust and farmers' insurance purchasing is assumed as follows:

Hypothesis 7. Authority trust indirectly and positively influences farmers' natural disaster insurance purchasing by affecting collective trust; the action path is composed of the direct influence paths H2 and H5.

Hypothesis 8. Authority trust indirectly and positively influences farmers' natural disaster insurance purchasing by influencing relationship trust; the action path consists of the direct influencing paths H3 and H6.

Hypothesis 9. Authority trust indirectly and positively influences farmers' natural disaster insurance purchasing by affecting collective trust and then relationship trust; the effect path is composed of the direct influencing paths H2, H4, and H6.

Hypothesis 10. Collective trust indirectly and positively influences farmers' purchasing of natural disaster insurance by influencing relationship trust; the effect path is composed of the direct influence paths H4 and H6.



The specific hypothetical paths are shown in Figure 2:

Figure 2. Examining the hypothetical path.

2.4. Variables, Model, and Methods

2.4.1. Selection and Definition of Model Variables

The aim of this paper is to reveal the effect of trust on farmers' purchasing of natural disaster insurance. The dependent variable is whether farmers buy natural disaster insurance, and the core independent variable is trust. According to the related theories of trust, this study further divides trust into authority trust, collective trust, and relationship trust. Among them, authority trust is measured by the respondents' and villagers' trust in the local government and the government's trust in disaster judgment, and entries are measured using Likert 5 Scale. Collective trust is measured by the village to convey collective information, and entries are measured using 5-point Likert scale. Relationship trust is measured by the residents' degree of trust in others in the village (neighbors, village cadres, etc.), family members, relatives, and friends in relation to disaster judgment, and entries are measured using 5-point Likert scale. At the same time, to further reveal the heterogeneous effects of trust on farmers' disaster insurance purchasing behavior, indicators representing residents' personal characteristics, risk perception, and risk preference were added as control variables [71–74]. The specific variables, dimensions, entry codes, measure entries, and descriptions are detailed in Table 1.

Variable	Dimensionality	Entry Code	Entry			
Dependent variable	Purchasing behavior	Y	Are residents insured against natural disasters? ^a			
		A1	Do you find the government's assessment of the disaster credible? ^b			
	Authority trust	A2	People in the village have great faith in the government's decisions? ^b			
		A3	In general, your level of trust in government? ^b			
Independent variables		C1	What problem does the village have that everybody can communicate with the village cadre and deal with? ^b			
	Collective trust	C2	The village tells relevant information to the villagers through telephone/broadcast/cadre communication. ^b			
	Relationship trust	R1	Do you find the judgments of others in the village credible? ^b			
		R2	In general, how much trust do you have in your family? ^b			
		R3	In general, how much do you trust your friends and family? ^b			
	Personal	P1	How old are you?			
	characteristics	P2	The per capita annual cash income of your family (USD).			
		S1	Do you think your family lives in a disaster zone? ^a			
Control variables	Risk perception	S2	Overall, how serious do you think are the disasters you have experienced? ^b			
	Diele aus ferrer es	D1	Does your family buy any other insurance besides endowment insurance? ^a			
	Nisk preierence	D2	Do you want to take some precautions for disaster prevention and mitigation? ^a			

Table 1.	Study	variable	setting ar	nd data	description.
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Note: ^a score (0 = no, 1 = yes); ^b 5-point Likert scale, where 1 means strongly disagree and 5 means strongly agree.

2.4.2. The Models

According to the literature review and research hypotheses, farmers' purchasing of natural disaster insurance is a type of purchasing behavior. The TAM model is a kind of attitude intention behavior model that is suitable for studying consumers' purchase behavior and its influences. Therefore, this study intends to adopt a TAM model as the basic model framework to study trust and farmers' disaster insurance purchasing behavior and its influencing factors. Because there is a relatively complex relationship between several dimensions of trust and whether farmers buy natural disaster insurance, PLS-SEM analysis is adopted. This method does not need to assume the probability distributions of the observed variables and errors. It is often used to estimate complex models containing multiple variables and multiple influence paths [75]. Based on this, this study takes a TAM model as the basic model framework and combines it with the PLS-SEM analysis method to systematically explore the correlation between trust and farmers' purchasing of natural disaster insurance. See Figure 3 for the specific model construct.



Figure 3. Model construction.

3. Results

3.1. Model Verification

Henseler pointed out that if a model does not pass the test of reliability and validity, then the results will be meaningless [76]. Therefore, before the specific analysis, the reliability and validity of each dimension of the model comprising the core variables were tested. As can be seen from Table 2, the Cronbach's α values of all the dimensions of the core variables are all >0.6, the composite reliability (CR) values are all >0.8, and the average (AVE) values are all >0.5, indicating that the research-designed entries have good reliability. At the same time, the factor loadings of all the measured entries are >0.7, which indicates that they have good validity. The variance inflation factor (VIF) values of all the dimensions are <3, indicating that there is no serious multicollinearity problem among the core variables. In addition, the SRMR of this paper is 0.088, which is lower than the upper limit of 0.100, indicating that there is no hypothesis error in this study. The values of D_G and D_ULS are 0.166 and 0.351, respectively, both of which are less than the upper limit of the 99% confidence interval, indicating that the model in this study passed the fitness test.

Variable	Dimensionality	Entry Code	Outer Loading	Cronbach's α	CR	AVE	VIF
Independent variable	Authority trust	A1	0.788	0.707			1.417
		A2	0.850		0.832	0.623	
		A3	0.726				
	Collective trust	C1	0.861	0.668	0.857	0.750	2.060
		C2	0.872			0.750	
	Relationship trust	R1	0.710	0.740	0.849		1.885
		R2	0.852			0.654	
		R3	0.855				
Dependent variable		Y	1.000	1.000			

Tal	ble	2.	Valic	lity	test	of	varia	bles
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3.2. Model Results

The output results of the model are shown in Table 3. Six paths are significant; among them, the four paths of direct positive significance are: H2: authority trust \rightarrow collective trust, H3: authority trust \rightarrow relationship trust, H4: collective trust \rightarrow relationship trust, and H6: relationship trust \rightarrow whether to buy natural disaster insurance. The two indirect positive significant paths are: H9: authority trust \rightarrow collective trust \rightarrow relationship trust \rightarrow whether to buy natural disaster insurance, and H10: collective trust \rightarrow relationship trust \rightarrow whether to

buy natural disaster insurance. In addition, H1: authority trust \rightarrow whether to buy natural disaster insurance, H5: collective trust \rightarrow whether to buy natural disaster insurance, H7: authority trust \rightarrow collective trust \rightarrow whether to buy natural disaster insurance, and H8: authority trust \rightarrow relationship trust \rightarrow whether to buy natural disaster insurance are not significant.

Assumed Influence Path	Path Coefficient	T Value	<i>p</i> -Value	Inspection Result
H1: authority trust→whether to buy natural disaster insurance	0.088	1.485	0.138	No
H2: authority trust \rightarrow collective trust	0.527 ***	11.227	0.000	Yes
H3: authority trust \rightarrow relationship trust	0.142 **	2.680	0.007	Yes
H4: collective trust \rightarrow relationship trust	0.601 ***	11.625	0.000	Yes
H5: collective trust→whether to buy natural disaster insurance	0.021	0.304	0.761	No
H6: relationship trust→whether to buy natural disaster insurance	0.191 **	2.828	0.005	Yes
H7: authority trust→collective trust→whether to buy natural disaster insurance	0.012	0.301	0.763	No
H8: authority trust→relationship trust→whether to buy natural disaster insurance are not significant	0.027	1.927	0.154	No
H9: authority trust→collective trust→relationship trust → whether to buy natural disaster insurance	0.061 **	2.583	0.010	Yes
H10: collective trust→relationship trust→whether to buy natural disaster insurance	0.115 **	2.696	0.007	Yes

Table 3. Model results.

Note: ** means *p* < 0.05, and *** means *p* < 0.001.

As can be seen from Table 3, among the direct effects, only relationship trust is positively and significantly correlated with whether farmers buy natural disaster insurance or not, and the path coefficient is 0.191. A possible explanation for this result is that China is traditionally an acquaintance society, and the social behavior of peasant households shows a typical "ripple effect" (Tan et al., 2021). Relatives and friends, as direct contacts, can drive and influence the behavioral decisions of farmers in real time. At the same time, people have a herd mentality. Once their relatives and friends have certain related consumption behaviors, most farmers will be naturally driven to consume similarly if economic conditions permit.

From the perspective of the three significant paths affecting farmers' purchasing behavior, first, the path coefficient of H10 is 0.115, which is lower than that of H6 (0.191). This shows that the collective, as an authoritative and close "hub", not only conveys the policies and instructions of the authoritative government from the upper level downward but also expresses the difficulties and demands of farmers up the bureaucratic hierarchy. In obvious correspondence with the two paths of H2 and H4, although the collective cannot directly affect farmers' natural disaster insurance buying behavior, it can indirectly affect it by influencing their living conditions, by conveying the benefits of natural disaster insurance, and by influencing others in the farmers' network. Second, by comparing the insignificant H7 and H8 and the significant H9 hypotheses, it can be seen that only through the collective "hub" can the authorities indirectly affect the relationship trust of farmers, which will have a significant impact on their disaster insurance purchasing behavior. Note that this process generates a "dielectric"-like loss, which may explain why the path coefficients of H9 are lower than those of H10 and H6, which also correspond to the path coefficients of two notable paths, H2 and H3. Finally, the path coefficients of both H9 and H10 are lower than that of H6. In the absence of knowledge about disaster insurance provided by the government and village collective, farmers generally make decisions based on information provided by relatives and friends. To get the attention

of others or express their feelings, these people often add personal emotions and wills to such information intentionally or unintentionally. In this context, the disaster information obtained by farmers themselves tends to be exaggerated. In addition, Chinese people are very conscious of their own "face" (especially honor and morality) and can be easily influenced by other farmers to buy natural disaster insurance.

It is worth noting that, echoing the significant path H6, among the three paths that significantly affect farmers' disaster insurance purchasing behavior, the direct influence that ultimately determines whether farmers will buy natural disaster insurance is relational trust. This shows that no matter how local governments, other authorities, and village collectives guide and encourage local farmers to buy disaster insurance, policy making may need to focus more on the trust relationships between farmers.

3.3. Heterogeneity Analysis

To further reveal the heterogeneous effects of trust on farmers' disaster insurance purchasing behavior, indicators representing farmers' personal characteristics, risk perceptions, and risk preferences were added as control variables. Group analysis was conducted on the basis of satisfying reliability and validity, and the specific group division and path coefficients of the H6, H9, and H10 significant paths are shown in Figure 4 [77,78]. The specific analysis is as follows.



Figure 4. Heterogeneity analysis results.

In terms of personal characteristics, farmers under the age of 53 years and with an annual per capita income of more than USD 2261 are more willing to buy disaster insurance. One possible explanation is that the younger the farmers are, the more receptive they are to new things and the faster is the spread of new ideas among peers. Conversely, the older people are, the richer is their life experience, and the more indifferent they are to life and death, and the lower is their need for security. At the same time, with the development of the social economy and improvement in farmers' income level, purchasing power is enhanced. After meeting their basic physiological needs, farmers seek a higher level of security needs, that is, a stable and safe living environment, personal safety, and property protection. Such inhabitants must be protected from fear and anxiety in order to lead orderly lives.

In terms of risk perception, people who believe that disasters are serious or very serious and people who live in areas threatened by disasters are more likely to buy disaster insurance. This is because such farmers have strong risk perception and a rapidly increasing

demand for personal safety and property protection, which will significantly improve their own disaster insurance purchasing behavior.

In terms of risk preference, farmers who have not bought other insurance and want to take measures to avoid and mitigate disasters and follow the guidance and trust of authorities (such as the government and village collective) are more inclined to buy disaster insurance. This is because farmers who have already bought other commercial insurance to protect their personal and property safety are reluctant to buy separate disaster insurance, which will increase the expense and burden on their families. In contrast, farmers who have not purchased other insurance are more likely to follow the guidance of authorities (such as the government and the collective), improve their awareness of disaster prevention, and increase their collective trust and authority trust, and thus, are more likely to purchase disaster insurance. Farmers who have made preparations for disaster mitigation are typically risk averse and may be more willing to purchase disaster insurance under the guidance of authorities (such as the government and the collective) than to bear all the risks themselves.

4. Discussion

Through empirical analysis and discussion of the results, this paper draws the following main conclusions:

- 1. Among the three trust variables of authority trust, collective trust, and relational trust considered in this paper, only relational trust had a direct, positive, and significant impact on disaster insurance purchasing behavior. At the same time, although collective trust cannot directly affect purchasing behavior, it can directly and positively affect residents' relational trust and then indirectly affect purchasing behavior, producing a positive and significant correlation with an indirect effect. Authority trust can directly and positively affect residents' collective trust and then indirectly affect rust and then indirectly affect and significant correlation with an indirect effect. Authority trust can directly and positively affect residents' collective trust and then indirectly affect relationship trust and, finally, purchasing behavior, producing a positive and significant correlation.
- 2. From the heterogeneity analysis, it can be seen that the younger is the age, the higher is the per capita annual cash income. Residents of disaster areas who have experienced severe natural disasters and have not purchased other commercial insurance and are risk averse are more likely to take measures to protect their personal and property safety.

Based on the above analysis, several policy implications can be drawn: First, importance should be attached to relational trust. Disaster risk management policies can be taken as a starting point to influence residents by influencing their peers. Second, attention should be paid to the role of the collective "hub", increasing the manpower of the grassroots village collective; improving staff quality, office efficiency, and office quality; and enhancing residents' trust and dependence on the village collective. Third, the credibility of the government and other authorities and residents' affinity for them, so as to establish an honest and reliable image for local residents, enhances their sense of dependence and trust and brings people together.

Combined with the model results and conclusions of this article, this article puts forward the following policy recommendations: First, the Chinese government should vigorously promote policy-based natural disaster insurance and design a set of natural disaster insurance systems that are more suitable for Chinese farmers by referring to the results of current insurance pilots in Yunnan and Sichuan. Second, the Chinese government should design targeted natural disaster insurance types based on field surveys conducted by teams of universities and enterprises, such as Yunnan's earthquake housing insurance. Finally, the government bears a certain percentage of insurance premiums and issues policies to local governments, and village leaders take the lead in vigorously promoting, through government underwriting, collective propaganda and mutual influence of farmers to promote the implementation of natural disaster insurance in disaster areas in China.

Finally, the research limitations of this article include the following aspects: First of all, this article focuses on research on the influence of the element of "trust" on the

purchase of insurance by farmers. Although the control variables in the model involve the personal characteristics, risk perception, and risk preference of local residents, other relevant research studies mentioned in risk communication and property losses, such as specific disaster content, are not involved. Second, due to differences in correlation measurements and influencing factors of different types and variables, future research will deepen the understanding of the correlation between farmers and natural disasters, such as earthquakes, and explore and construct a more scientific and reasonable correlation-type system. Finally, in the future, this research will further increase farmers' trust in social institutions, such as insurance companies and the media, in terms of farmers' trust in the government and other authoritative institutions and grassroots collectives. In this way, a multiangle and multiagent research method is used to test the trust relevance of different subjects and their differences.

Author Contributions: Conceptualization, X.B. and D.X.; methodology, F.Z. and X.D.; software, X.D.; formal analysis, X.B. and F.Z.; investigation, D.X.; writing—original draft preparation, X.B. and D.X.; writing—review and editing, X.B. and D.X.; supervision, D.X.; funding acquisition, D.X. All authors have read and agreed to the published version of the manuscript.

Funding: This research was funded by National Natural Science Foundation of China (41801221), Special Program for Cultivating Excellent Young Talents under the Dual Support Plan of Sichuan Agricultural University, Undergraduate research interest cultivation program in 2021 of Sichuan agricultural university (2021489; 2021488).

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Acknowledgments: We gratefully acknowledge financial support from National Natural Science Foundation of China (41801221), Special Program for Cultivating Excellent Young Talents under the Dual Support Plan of Sichuan Agricultural University, Undergraduate research interest cultivation program in 2021 of Sichuan agricultural university (2021489; 2021488). The authors also extend great gratitude to the anonymous reviewers and editors for their helpful review and critical comments.

Conflicts of Interest: The authors declare that they have no conflicts of interest. This article does not contain any studies with human participants or animals performed by any of the authors. Informed consent was obtained from all the individual participants included in the study.

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