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FARMERS' WILLINGNESS TO PAY FOR BREEDING SOW INSURANCE: EVIDENCE FROM CHINA'S HUBEI PROVINCE

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THESIS

A thesis submitted in partial fulfillment of the requirements for the degree of Master of Science in Agricultural Economics in the College of Agriculture, Food and Environment at the University of Kentucky

By

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ABSTRACT OF THESIS

FARMERS' WILLINGNESS TO PAY FOR BREEDING SOW INSURANCE: EVIDENCE FROM CHINA'S HUBEI PROVINCE

China is the world's largest pork producer and consumer, and Hubei Province is one of the top pork production provinces in China. Since problems and risks have led to large-scale reduction of pork production and farmers' income, Chinese government offers various policy measures to help farmers. Breeding sow insurance is considered as one of the most effective measures started in 2007. To better understand farmer's need for breeding sow insurance and make proper policy insights, our research is the first empirical study in Hubei Province and one of the pioneer studies investigate farmer's willingness to pay(WTP) for breeding sow insurance premium and preferred coverage level. Survey questionnaires were distributed to breeding sow farmers in 5 townships from Shayang County, Hubei Province. Based on random utility theory, we use tobit model to examine the factors that affect farmer's WTP and preferred coverage level. The results showed that famers' average WTP for premium was ¥14.4 and average preferred coverage level was ¥1191, both exceeded current values. Farmers' trust towards insurance companies, household income, and knowledge about breeding sow insurance significantly affect their WTP and preferred coverage level.

KEYWORDS: Breeding sow insurance, willingness to pay, premium, preferred coverage level, tobit model

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Chapter 1: Introduction

1.1 Introduction of Study

China has the largest population and 2nd largest economy in the world. And the Chinese government always emphasizes the development of agriculture because it has to feed the 1.3 billion people with limited land and resources. Due to the fact that pork is the primary meat source of Chinese people with the most production and consumption among the world, pork industry is extremely important from many aspects for Chinese society. Although Chinese pork industry is booming since 1978's "Reform and Opening", problems and risks never cease. The most significant ones such as pork price fluctuation, rising cost of feeding stuffs, pig epidemics and natural disasters led to large-scale reduction of pork production and farmers' income recent years alone.

To help deal with these problems and risks, Chinese government offers various subsidies, tax breaks, market interventions and policy insurances (such as hog insurance and breeding sow insurance), etc. Rising attentions are paid to policy insurances recent years, up to June 2009, a total of 153 million heads had been insured and payment was made to over 7 million heads/times (China Insurance Regulatory Commission 2009).

Given the fact that the hog and breeding sow insurances are new to China's hog industry(since 2007) and the high subsidies to the premiums from the government, government officials, insurers, as well as academic researchers are willing to know more in-depth insights from current famers' perception and participation. This study offers some insights by explaining factors affecting farmers' willingness to pay (WTP) for premium and preferred coverage level of breeding sow insurance.

1.2 Definition of Related Concepts

1.2.1 The Definition of Agricultural Insurance and Sow Insurance

Agricultural insurance is one of the financial tools used to manage the various risks that may arise in agricultural production. It operates by transferring the risks associated with farming to a third party via payment of a premium that reflects the true long-term cost of the insurer assuming those risks. In other words, the insurance agency is able to pool the risks by accepting appropriate premiums from a large number of clients (FAO 2007).

Sow insurance in China is a government subsidized policy insurance product used to cover the loss during raising and production of breeding sows. The loss may come from natural disasters, pig epidemics and other unpredictable accidents during production.

1.2.2 Definitions in Hog Production

Breeding Sow: Female pig that has farrowed at least once. Farmers raise sows to generate profits by selling their piglets.

Fatten Pig: a domesticated pig, especially one over 120 pounds (54 kg) and reared for slaughter.

Hog: Live pigs, including male and female pigs.

Piglet: An unweaned pig that weighing an average of 10-20 pounds, usually less than 8 weeks old.

1.3 Research Questions and Objective of Study

Breeding sow insurance as an important measure to reduce the risks in China's hog production for farmers has been implemented since 2007. Significant changes and challenges arise in the hog market, but the policies about the insurance haven't been changed. Besides, research and studies on breeding sow insurance are very rare.

This study is based on information collected from two surveys of all 535 farmers' households who raised breeding sows in random selected 5 townships from Shayang County, Hubei Province, China. To our knowledge, this study will be the first empirical study about sow insurance in Hubei Province.

The main objective of this thesis is to identify Hubei farmers' WTP for premium and preferred coverage level of breeding sow insurance as well as their determinants under the situations that the government allows changes in premium to coverage ratio or not, and then make implications for farmers, policy makers and insurance companies to improve breeding sow insurance market.

1.4 Thesis Structure

The structure of the thesis is as follows: Chapter 2 presents background information for this study; Chapter 3 reviews related literatures on agricultural insurances studies; Chapter 4 introduces the research methodology used to identify the farmers' preferences on premium and coverage as well as the empirical model to be use in analyzing the data; chapter 5 explains the survey design and data collection; Chapter 6 presents the empirical results; Chapter 7 concludes the results and makes implications.

Chapter 2: Background

2.1 Background of Pork Industry in China

2.1.1 The Importance of China's Pork Industry

China's pork industry has significant impact on global pork market. First, China is the world's largest pork producer and consumer. According to FAO database, about 471 million pigs were raised in China in 2012, which was almost half of world's total pig stocks. (FAO 2014) While total domestic pork consumption in China was 52.7 million tons, also accounts for nearly half of world's total consumption of 105 million tons. United States is the second largest pork producer and consumer in the world, but we can see that china's pork production and consumption were both 5 times more than those in the US in 2009 (Figure 2.1 and 2.2).

Figure 2.1: Pork Production: US vs China, 1979 - 2013

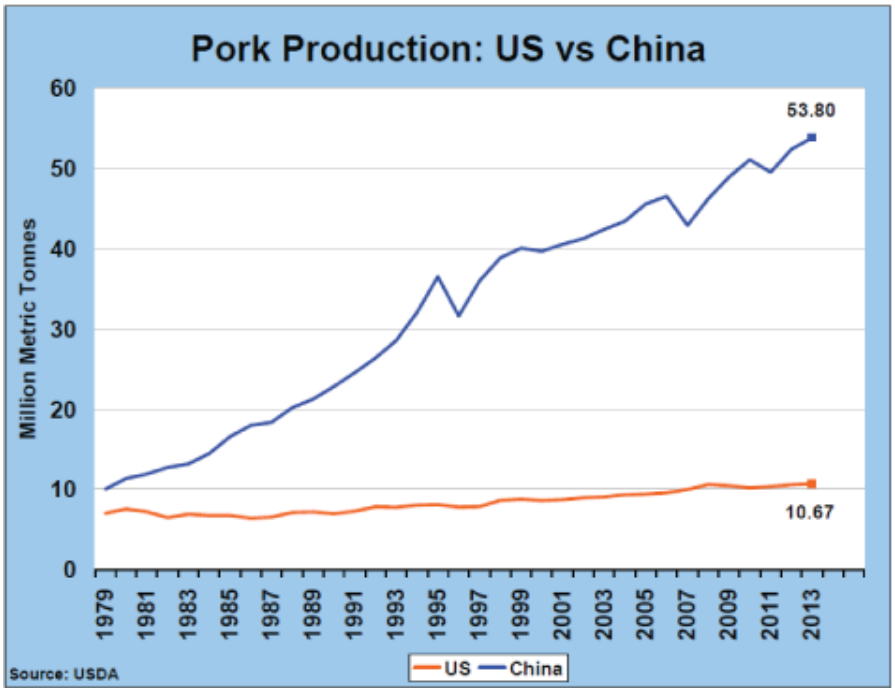
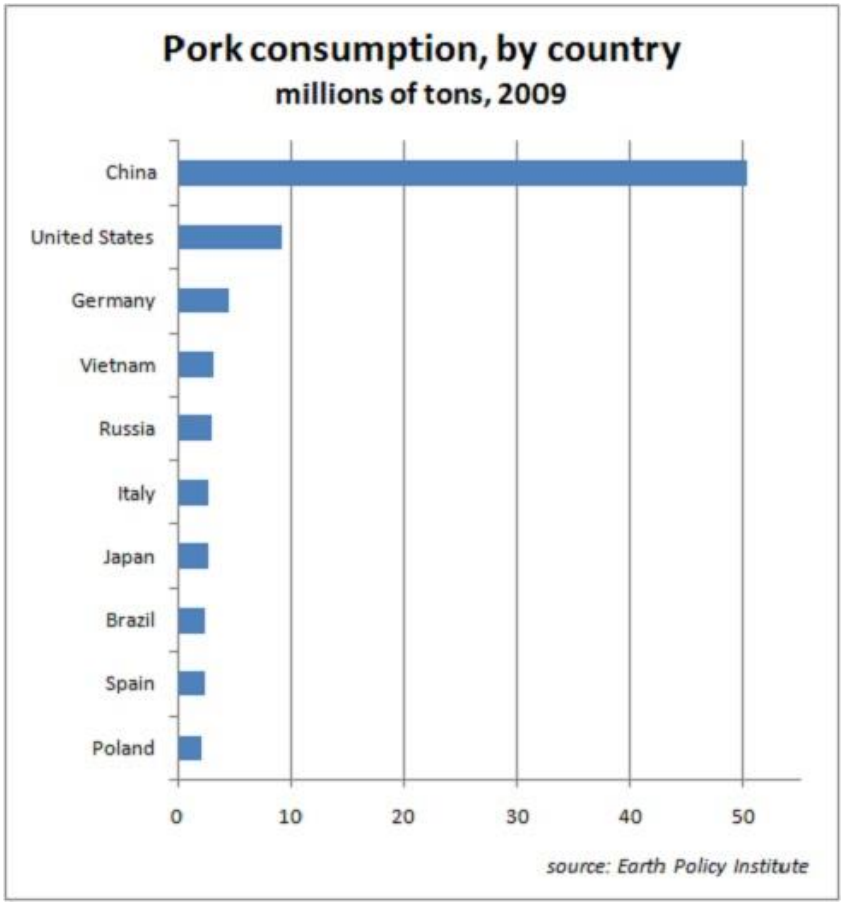


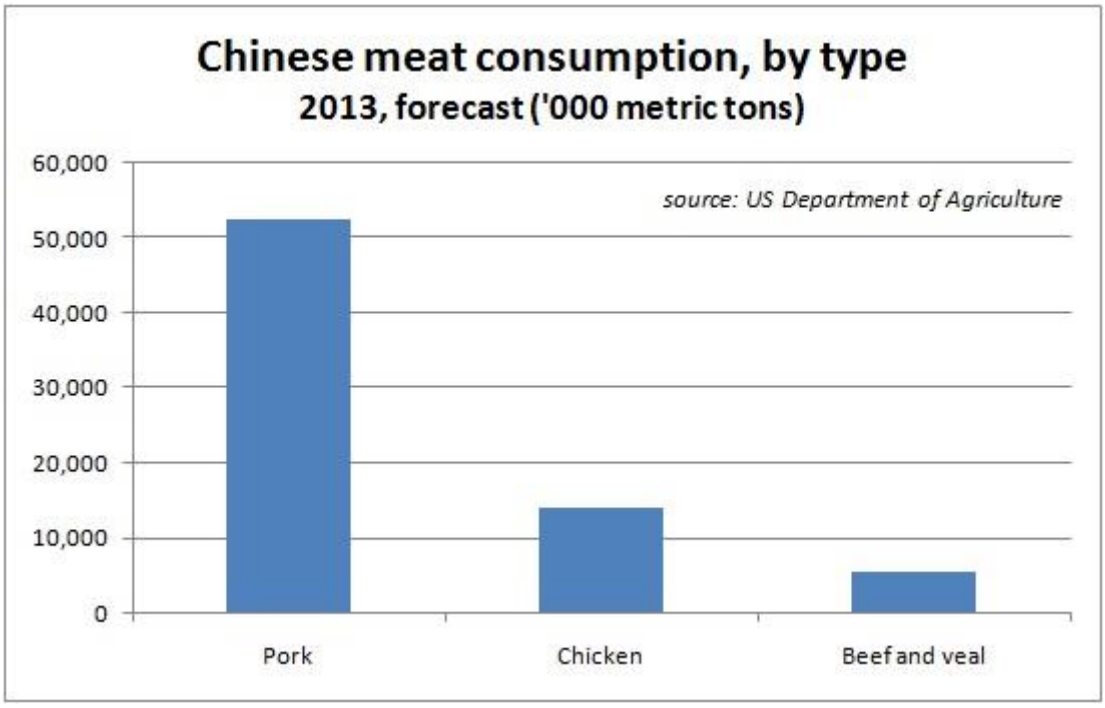
Figure 2.2: Top Pork Consumption Countries in 2009



Second, China ranked the 3rd world largest pork importer in 2012, which imported over 7.3 million tons compared with the world's total pork import of 69.2 million tons. (USDA 2014) And it is also the 3rd largest pork importer from the U.S following Japan and Mexico in 2012.

Third, pork is the main meat source in Chinese diet. The annual per capita meat consumption in China consists of 36.8 Kg pig meat, 12.6 Kg poultry meat and 4.8 Kg, while Americans consume 30.1 Kg, 49 Kg and 39.8 Kg respectively in 2012 (FAO 2014). Figure 2.3 shows the forecasted Chinese meat consumption of three main meat sources- pork, chicken and beef.

Figure 2.3: Chinese Meat Consumption by Type, Forecast 2013



2.1.2 Current Facts and Trends of China's Pork Industry

In 2011, the share of pork consumption in Chinese meat consumption had fallen to 65% from 80% in 1985. Although there are fluctuations in pork price, the average pork price in recent years almost doubled than that ten years ago. Rabobank predicted that the pork consumption volumes would have a relatively small annual growth rate at 1-2% (Rabobank 2012). Studies have found that lower income groups and the rural populace contribute the most to Chinese pork consumption growth.

In Chinese hog production industry, backyard farms, specialized households and commercial farms are the three types of operations that conduct pork production. In general, backyard farms usually raise less than 50 hogs at one time, specialized farms raise 50 to 3,000 hogs and commercial farms raise more than 3,000 hogs in inventory (Rabobank 2012)

Chinese government builds a pork price alert system to monitor hog-to-corn price ratio changes in the market. And the ratio of six is considered to be a break-even level for pig farmers and sharp fluctuations of the ratio would be an alert of unstable pork supply and farmers income. Actions might take place whenever the ratio reach over nine or fall below six. To reduce the ratio, government would release more pork into the market, while to increase the ratio, government would buy more pork to support price.

In supportive of the system, Chinese government also established a national pork reserve since 2007. This is administrated by the Ministry of Commerce, and implemented by provincial level and municipal level governments. It contains both live pigs and frozen pork. The cycle of rotating live pigs is four months, and six month for frozen pork. Strict regulations were enforced to keep the reserve fresh, active and effective. There is no accurate amount of reserved pigs and frozen pork, but in the regulation, reserved amount should meet the Chinese pork consumption need of a week, which is about a million tons.

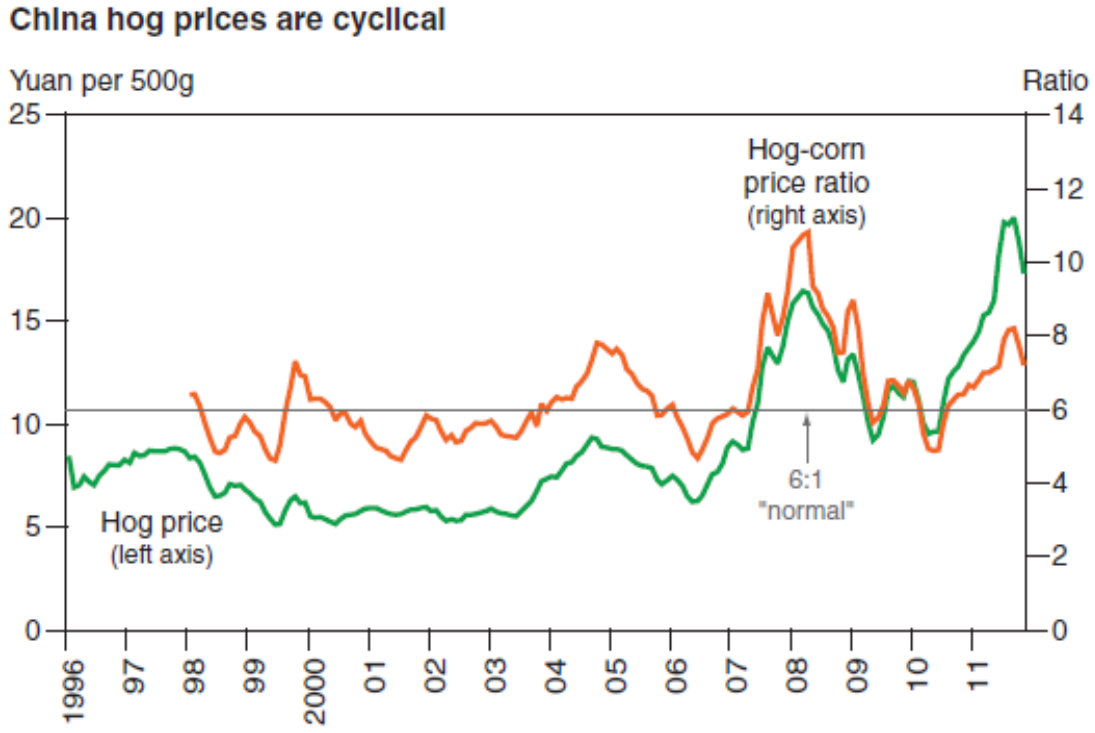
2.1.3 Risks and the Impacts on China's Pork Industry

Livestock farming is a high-cost and high-risk industry with its nature of diversity, volatility, vulnerability to natural disasters and epidemics. Affected by the fluctuation of pork price, periodical outbreak of swine epidemics, rising of production costs, lack of adoption of science and technology and lack of intensive production system, China's pork industry is posed to high-risk.

The fluctuations in prices and production in Chinese pork industry were observed by Chinese scholars and analysts, and identified as 3- to 4-year cycles during 1996-2009 (Han and Qin, 2007; Liu and Wang, 2009; Nie et al., 2009). Sharp increases in pork price in 2007 and 2011(Figure 2.4) not only encouraged farmers to raise more hogs and also attracted more

investments to pork industry, which led to large hog inventory and dramatic price drops in subsequent years. And it contributed to China's high inflation rate at both years.

Figure 2.4: Cyclical Patterns in China's Hog Price and Hog-Corn Price Ratio



Note: Hog-corn price ratio is a measure of profitability in hog production. Cycles are delineated based on Nie et al., 2009.

Source: USDA, Economic Research Service using data from China National Bureau of Statistics and China Ministry of Agriculture.

Common hog epidemics in China are blue ear disease, foot-and-mouth disease, classical swine fever, pneumonia, streptococcus suis, circovirus, parasites, and erysipelas, etc. These diseases outbreak periodically often and regionally, and they are hard to predict and measure. In 2007, the huge wave of blue ear disease outbreak reduced the supply of feeder pigs significantly, which led to the output reduction of finishing pigs and high price in 2007.

2.2 Background of Breeding Sow Subsidy and Insurance in China

Given the fact of significant drop in hog inventory and sharp increase in hog price in 2007, Chinese government started offering breeding sow subsidy for farmers with the amount of ¥50 in 2007, and then increased to ¥100 since 2008. But breeding sow subsidy is not effective in practical, and it also increase financial burdens to the government while limiting the role that private capital plays to diverse risks.

As an important alternative approach to promote hog industry and reduce the risks in production, the government offered breeding sow insurance to hog farmers in August, 2007. The premium is fixed at ¥60, while farmers only have to pay ¥12 as ¥36 is paid by provincial and local government and ¥12 is paid by central government; the coverage is ¥1000 per head and the insurance period is one year. In 2011, the total subsidy amount dispensed for the breeding sow insurance scheme was about ¥1.4 billion (Xie 2012).

The average cost of a breeding sow was ¥1100-¥1200 in Shayang County 2012(various by varieties and regions), plus the raising costs of feedstuffs, labor and veterinary- which was about ¥4800 per year, so current coverage level of ¥1000 could only cover about 1/6 of total input on a breeding sow.

Pig farmers are “strongly encouraged” by government to participate in breeding sow insurance, which is referred as “mobilized by government officials” later in the text. And farmers are required to buy insurance for all the qualified breeding sows they raise (definition of qualified breeding sows varies by different insurance companies and regions).

2.3 Current Challenges of Breeding Sow Insurance

Before the government's subsidy and mobilization on breeding sow insurance, both farmers and insurance companies had low interest in participating insurance programs on breeding sow. Due to the high risks in pork production industry and high costs in claim investigation and settlement, insurance companies had to charge a high amount of premium on breeding sow insurance which discouraged farmers from participating. As a result of law of large numbers, insurance companies would have less incentive to participate in this market as well. But since 2007, breeding sow insurance is growing rapidly and has high participation rate in most of the country. However, challenges exist with the development.

Since most of the hog farmers in China are not well educated and not well informed about breeding sow insurance policies, they may not understand the meaning of insurance, which is diverting risks. Some farmers choose not to raise breeding sows with care and adopt other risk management measures in production because they believe that they could get ¥1000 indemnity at the cost of ¥12 when accident happens to a breeding sow. Moral hazard arises as a big problem to the insurance companies since those farmers are having higher risks now and they would choose to cheat the insurance company in order to get indemnities. In addition, current coverage level of ¥1000 discourages farmers' from participation because it is insufficient compared to the total input on a breeding sow.

The process of claim settlement involves many government agencies, so that it is complicated and time-consuming. This not only increases the cost of insurance companies but also discourages farmers' from participation. And in some regions, heavy subsidies on breeding sow insurance premium increase the financial burden of local government.

2.4 Background of Research Location

Our study aimed at the farmers' WTP for breeding sow insurance in Shayang County, Jingmen City, Hubei Province, China. Figure 2.5 shows the location of Shayang County in China.

Figure 2.5: Shayang County in China

Hubei Province is one of the largest hog production provinces in China (Table 2.1), accounted for 6% of China's total hog output in 2011.

Table 2.1: Top 10 Hog Slaughtered Provinces in China from 2009 - 2011

Province	Hog Slaughtered in 2011 (Million Heads)	Hog Slaughtered in 2010 (Million Heads)	Hog Slaughtered in 2009 (Million Heads)
Sichuan	70.03	71.78	69.15
Hunan	55.76	57.24	55.09
Henan	53.61	53.91	51.44
Shandong	42.34	43.01	41.56
Hubei	38.71	38.27	37.35
Guangdong	36.64	37.32	36.01
Hebei	32.36	32.23	33.33
Guangxi	31.95	32.30	31.20
Yunnan	29.65	29.62	28.25
Jiangxi	28.85	28.47	27.14

Shayang County is one of the key hog production counties in Hubei, which produced 0.92 million heads per year in 2013(Shayang Food and Animal Husbandry Bureau, 2013). The number of hog slaughtered continued growing in the past ten years, with the annual growth rate of 11.7% since 2003. Besides that, Shayang County had won awards for its large hog output from the Central Government since 2008. In addition to that, Shayang County was one of the first pilot experiment sites of breeding sow insurance in China in 2007. The number of insured breeding sows, premiums of breeding sow insurance collected from farmers, government subsidies on breeding sow insurance and indemnities paid by insurance companies in Shayang county from 2007-2010 were listed in Table 2.2 (He, 2011).

Table 2.2: Breeding Sow Insurance Data in Shayang County from 2007 - 2010

Year	Number of Insured Breeding Sow(Head)	Premiums Collected from Farmers(¥)	Government Subsidies on Premium(¥)	Indemnities Paid(¥)
2007	19,031	228,372	913,488	627,000
2008	22,468	269,616	1,078,464	682,000
2009	34,278	411,336	1,645,344	1,063,000
2010	22,849	274,188	1,096,752	1,401,000

Chapter 3: Related Literatures

Since breeding sow insurance is a specific agricultural insurance product, it is necessary to examine studies on other agricultural insurances especially livestock insurances to achieve comparable and important insights.

By summarizing the pilot experiments of agriculture insurance since 1982, Tuo et al. (2003) brought up six contradictions which were the main causes of market failure during experiment period and offered two types of policy agricultural insurance systems leaded by government to solve the problems. Wang et al. (2011) "used results from an investigation and field survey conducted since 2007 in Hunan Province to analyze the performance and effects of this agricultural trial and summarize the experience and lessons learned, followed by recommendations on how to ensure the smooth operation and sustainable development of agricultural insurance."

Factors that affect farmers' participation in agricultural insurance were investigated in various studies. Zhang et al. (2005) conducted survey in Shanxi and Jiangxi provinces of 655 farmers to find out those low income farmers were more unlikely to participate in agricultural insurance, but the increase in household income would lead to an increase in participation to manage risks in production. Ning et al. (2005) studied the cotton farmers' participation in cotton insurance in Manas Valley, Xinjiang Uygur Autonomous Region. The results from a binomial Probit model indicated that variation in cotton yield, specialization degree of the cotton producers and total cotton land acreage were significantly positive factors, while farmer's experience in farming had negative impact.

Chen et al. (2007) analyzed data from 100 farmers in Wuhan and Xingshan in Hubei province and found that years of education, farmland acreage, farming experience and household income to have positive impact on participation.

Sun (2008) investigated 431 farmers' households in Huai'an, Jiangsu Province on WTP for agricultural insurance. Through combined bidding game and payment cards CVM for WTP question, Tobit model was used to find out that trust in government and have purchased crop insurance before would positively affect WTP, while farmers who had had loss due to natural disaster but didn't get indemnity would pay less. Chen et al. (2008) also applied CVM approach to obtain WTP data of 265 tobacco farmers in Xingshan County, Hubei Province. Piecewise-constant exponential model was adopted to figure out factors that significantly affect WTP for tobacco insurance were average loss due to natural disasters, perception of importance of tobacco insurance, age and household annual net income.

Sun et al. (2009) applied "the dichotomous choice with open-ended followed up CVM to household survey data on WTP collected for cotton insurance in Xinjiang province, corn insurance in Heilongjiang province and rice and wheat insurances in Jiangsu province to identify the factors influencing farmers' WTP for crop insurance programs. The empirical results showed that the yield variation，frequency of losses caused by natural disasters, household income and its share in insured crop, trust on government's policy and farmers' knowledge of crop insurance significantly affect farmers' WTP for crop insurance."

Wan (2009)'s research indicated that farmers' WTP for livestock insurance was relatively high, could reach up to 70% of insurance premium. Age, years of education, livestock farm scale and risk level would negatively affect WTP, while net income and percentage income from livestock had positive impact.

Zeng et al. (2009) investigated 127 cow farmers in Jingyang County, Shaanxi Province by using payment cards CVM for WTP question on cow insurance, 2007. Logit model was then applied to the data to determine the factors that affect farmers' WTP for cow insurance.

Knowledge about subsidy, years of education, experience in cow production, age and reasonable premiums are found to have significant impact.

Before 2007, when the implementation of breeding sow insurance and hog insurance were allowed by Chinese Central Government's official policies, studies on both insurance topics are very rare. After that, more and more reports and studies started to appear in these fields. But until now, related researches on both areas are still scarce.

Gao (2010), Wu et al. (2010), and Wang et al. (2010) investigated the emerging problems with the development of breeding sow insurance since 2007 in country level, while Su et al. (2013), Cai et al. (2010) and Fang et al. (2012) focused on specific regions, they offered a series of suggestions on current policy and insurance system, as well as incentives for the participation of farmers and insurance companies from theoretical perspective.

On the empirical research side, Zhang (2010)'s study was based on randomly selected survey data from 154 hog farmers in 6 villages within Yanglin District of Shaanxi Province, China. After analyzing data using Logistic model, hog raising scale, knowledge about insurance policies and degree of trust towards insurance companies were found positively affecting farmers' willingness to participate in hog insurance while the amount of government loss subsidies had negative impact.

Hu and Yang (2011) surveyed 101 hog farmers in 3 suburban areas of Beijing, 78 of them are medium to large scale producers (more than 100 hogs raised). They first used logit model to found that farmers' participation of hog insurance was positively affected by hog raising scale, percentage household income from hog production and knowledge about insurance policies. Then they investigated farmers' WTP for premium of hog insurance and the factors that affected WTP by adopting Tobit model when the coverage level was hypothetically raised from ¥700 to ¥1,000 with 50% of the premium subsidized by the government. From their

results we can see that the average WTP for premium was ¥14.6 per head, and the hog raising scale, percentage household income from hog production, knowledge about insurance policies and degree of trust towards insurance companies would positively affect famers' WTP.

Dong and Wang (2010) investigated factors that would affect farmers' WTP for breeding sow insurance based on 320 breeding sow farmers in Jiajiang county, Sichuan Province. Contingent valuation method (CVM) double-bounded model was used for observing farmers' WTP intervals of insurance premium, and then Ordered-Logit model was adopted for empirical analysis. The perceived importance of breeding sow insurance, household annual net income, hog raising scale, professional degree in hog production, years of education and purchased other commercial insurance products all have positive impact, while received government loss subsidy would lead to decrease in WTP for premium.

Xi and Zou (2012)'s research first estimated farmers' WTP and Willingness to Accept (WTA) values for breeding sow insurance. A total number of 409 farmers' household within 3 key hog producing counties in Sichuan Province was investigated by a survey combining open-ended and payment cards CVM on WTP and WTA questions. Results showed that the average WTP for premium is ¥19.97 and WTA for coverage is ¥1812, while 95.5% of farmers had their WTP for premium greater than or equal to current amount of ¥12, 86.6% of farmers had their WTA for coverage greater than current amount of ¥1000. After a series of correlation analyses, they found that gender, age, household size, household income, income from hog raising, income from non-livestock raising, WTA for coverage had positive impact on WTP for premium, while suffered from livestock loss had negative impact. And only gender, income from hog raising and overall impact of risks had significantly would significantly affect farmers' WTA for coverage.

In summary, most agricultural insurance research and studies were focused on crop insurances rather than livestock insurances. Besides, most empirical studies on livestock

insurance investigated farmers' participation intention for the insurance rather than farmers' WTP for premium and preferred coverage level. And some studies had relatively small sample size as less than 200. Most studies found that householder's gender, education level, household income, knowledge about agricultural insurance and trust level towards insurance companies had significant impacts on farmers' WTP and participation for agricultural insurance.

Chapter 4: Research Methodology

4.1 Theoretical Foundation

Based on expected utility theorem and an approach proposed by Stiglitz (1976) in analyzing demand for insurance contracts, farmer's preferences for income in two states of nature can be described by a function,

(1) $$V(p, W_1, W_2) = (1-p)U(W_1) + pU(W_2)$$

where W_1 denotes his income if there is no accident, W_2 his income if an accident occurs, U( ) represents the utility of money income and p the probability of an accident.

We assume $\alpha = (\alpha_1, \alpha_2)$ represents breeding sow insurance contract, where α_1 is the premium, α_2 is the amount that insurance indemnity subtract premium, then the value of the insurance contract is,

(2) $$V(p, \alpha) = V(p, W - \alpha_1, W - d + \alpha_2) = (1-p)U(W - \alpha_1) + pU(W - d + \alpha_2)$$

Since a farmer always has the option of not buying breeding sow insurance, an individual farmer will purchase the insurance contract α only if $V(p, \alpha) \geq V(p, 0) = V(p, W, W - d) = (1-p)U(W) + pU(W - d)$, where W is the initial income and d is the income loss due to an accident. Then, we can derive the relationship between farmers' WTP and insurance premium as

(3) $$when\ \alpha_1 \leq WTP, V(p, \alpha) \geq V(p, 0);$$
$$when\ \alpha_1 > WTP, V(p, \alpha) < V(p, 0).$$

which means, a farmer will choose to buy the insurance to get higher utility when the premium is less than or equal to his WTP.

Similarly, for the farmer's preferred coverage level

(4) $$when\ \alpha_1 + \alpha_2 \geq preferred\ coverage\ level,$$
$$V(p, W - \alpha_1, W - d + \alpha_2) \geq V(p, W, W - d);$$

$$when\ \alpha_1 + \alpha_2 < preferred\ coverage\ level,$$
$$V(p, W - \alpha_1, W - d + \alpha_2) < V(p, W, W - d).$$

Suggested by the random utility theory, given farmer *i*'s characteristic vector X_{iq} and income Y_i, the utility of not purchasing breeding sow insurance, represented by V_{i0}, can be written as

(5) $$V_{i0} = \alpha_{i0} + \alpha_q X_{iq} + \alpha_Y Y_i + e_i$$

Where α_0 is a constant; α_q and α_Y are unknown coefficients; and e_i is the stochastic portion of the utility. Assuming a random variable WTP_i represents farmer *i*'s WTP for premium, the utility of purchasing breeding sow insurance V_{i1} is

(6) $$V_{i1} = \alpha'_{i0} + \alpha'_q X_{iq} + \alpha_Y (Y_i - WTP_i) + e_i$$

Following Haab and McConnell, the coefficient α_Y is maintained the same is these two states to ensure no "money illusion." Respondent *i* would be willing to pay WTP_i if the utility of purchasing breeding sow insurance or not is exactly equal, $V_{i0} = V_{i1}$. So we can obtain the expression for WTP_i

(7) $$WTP_i = \beta X_i + e_i$$

where βX is the difference between the deterministic part of utilities in (5) and (6) excluding Y_i. Assume that a latent variable WTP^* indicates the true WTP by individual farmer *i*,

(8) $$WTP_i^* = \beta X_i' + u_i \; and \; WTP^*|x \sim Normal(\beta X', \sigma^2)$$

where $\sigma^2 = Var(WTP^*|x)$ is assumed not to depend on x, and u_i is a mean zero constant variance error term.

Previous literatures applied contingent valuation method (CVM) to study farmers' WTP for agricultural insurance (Chen at el. 2008; Sun 2008; Sun and Zhong, 2009; Zeng at el. 2009). "CVM is a stated preference approach, as the "valuation" estimate obtained from preference information given that the respondent is said to be "contingent" on the details of the "constructed market" for the good put forth in the survey (Carson, Richard T. and W. Michael Hanemann 2005)." It is widely adopted in analyzing environmental goods. Since agricultural policy insurance shares something in common with environmental goods- they are not bought and sold in the marketplace, we could use CVM to obtain WTP for breeding sow insurance. Inspired by the previous literatures, we combined both payment card method and open-ended question in investigating farmers' WTP for premium and preferred level of coverage. First, we provided a table listing pre-calculated premium/ coverage combinations with increasing or decreasing ratios and let farmers choose the most satisfied combination (Table 4.1 and Table 4.2). Second, if farmers couldn't find the ideal combination as provide, they were asked to report their own ideal combinations of premium/ coverage in the open-ended question, following the payment card table. Previous studies analyzed the factors that affecting WTP for premium and preferred coverage level separately, but we jointly consider the effects of each other associated with other factors.

One survey questionnaire only contains either one of the two tables. Survey questionnaires with table 4.1 were denoted as Version A, while questionnaires with table 4.2 were denoted as Version B. Both Version A and B were randomly distributed to the breeding sow farmers. Since current breeding sow insurance policy fixed premium/coverage combination as ¥12/¥1000 = 0.012, we allowed some variations in terms of different ratios around 0.012. In order not to confuse respondents, we designed ratios in table 4.1 as increasing, and ratios in table 4.2 as decreasing, despite of some fixed ratios =0.012 in between.

Table 4.1: Payment Card Table for Version A: Increasing Premium/Coverage Ratio

Premium	Coverage	Premium/Coverage Ratio
6.75	500	0.0135
7.2	600	0.012
9.1	700	0.013
9.6	800	0.012
11.25	900	0.0125
12	1,000	0.012
13.365	1,100	0.01215
14.4	1,200	0.012
15.99	1,300	0.0123
16.8	1,400	0.012
18.675	1,500	0.01245
19.2	1,600	0.012
21.42	1,700	0.0126
21.6	1,800	0.012
24.225	1,900	0.01275

Table 4.2: Payment Card Table for Version B: Decreasing Premium/Coverage Ratio

Premium	Coverage	Premium/Coverage Ratio
5.55	500	0.0111
7.2	600	0.012
7.98	700	0.0114
9.6	800	0.012
10.53	900	0.0117
12	1,000	0.012
13.079	1,100	0.01189
14.4	1,200	0.012
15.314	1,300	0.01178
16.8	1,400	0.012
17.505	1,500	0.01167
19.2	1,600	0.012
19.652	1,700	0.01156
21.6	1,800	0.012
21.755	1,900	0.01145

4.2 Econometric Model

Since the values of dependent variable (WTP) in this study are all positive values, the Ordinary Least Square method (William H. Greene, 2007) will not yield consistent estimates. A widely used approach, the Tobit model (Tobin, 1958) was developed to alleviate the problems caused by OLS.

The general form of Tobit Model: (when lower limit is censored to zero)

(9) $y_i = X_i^T \beta + \varepsilon_i \qquad if\ RHS > 0$

(10) $y_i = 0 \qquad if\ RHS \leq 0$

where y_i is the observed value of dependent variable, X_i is a vector of explanatory variables, β is a vector of unknown coefficients to be estimated (Tobit coefficients), and the error terms ε_i is a vector of independent and identically distributed normal random variables assumed to have mean zero and constant variance, σ^2.

Unconditional marginal effects of Tobit model can be calculated by

(11) $$\frac{\partial E(Y)}{\partial X} = \Phi(\frac{X\beta}{\sigma})$$

And conditional marginal effects of Tobit model can be calculated by

(12) $$\frac{\partial E(Y^*)}{\partial X} = \beta(1 - \frac{X\beta}{\sigma} * \frac{\phi\left(\frac{X\beta}{\sigma}\right)}{\Phi\left(\frac{X\beta}{\sigma}\right)} - \frac{\phi\left(\frac{X\beta}{\sigma}\right)}{\Phi\left(\frac{X\beta}{\sigma}\right)} * \frac{\phi\left(\frac{X\beta}{\sigma}\right)}{\Phi\left(\frac{X\beta}{\sigma}\right)})$$

Chapter 5: Survey Design and Data

The purpose of this chapter is to explain in details how the survey was designed and the data was collected. The first section presents how the survey questionnaire was designed and the key questions we examined. The next section explains how the data was collected. The final section describes the data collected from the survey by descriptive statistics.

5.1 Survey Design

A survey questionnaire was developed to investigate the farmers' WTP for breeding sow insurance in Shayang County, Hubei Province, China. Based on the discussions among focus group participants, who were researchers, breeding sow farmers, government officials, and hog insurance experts, main questions were identified to address the research goal of this study. Prior to the final in-person investigation, a pilot survey was conducted among 20 breeding sow farmers randomly drawn from Shayang County in August, 2012 to better wording and confirming the necessary contents.

The survey questionnaire was divided into five parts. The first part asked the respondents their household demographic and socioeconomic characteristics. This part also included several questions related to their agricultural operations such as composition of farm income and the hog raised and died in recent three years. The second part investigated the sources of risks in agricultural operations, along with the corresponding risk management actions taken by farmers. The third part contained questions regarding to the farmer's perception and purchasing behaviors on agricultural insurances whether the respondents had purchased agricultural insurances or not. The fourth part examined farmers' ideal premium and coverage combination and the best purchase channels for breeding sow insurance. In the last part, farmers' trusts in their neighbors, insurance companies and local government, as well as their risk preferences were investigated.

In order to reach our research goal, the questionnaire was designed to two versions: Version A and Version B. Both Version A and Version B were consisted of five identical sections except for Question 24 in section 4.

Question 24 investigated the farmers' ideal premium and coverage combination for breeding sow insurance by choosing one from a given table. Questionnaires with Table 5 were defined as version A while questionnaires with Table 6 were Version B.

Table 5.1: Question 24 in Survey version A

6.7/500	7.2/600	9.1/700	9.6/800	11.2/900
12/1000	13.4/1100	14.4/1200	16/1300	16.8/1400
18.7/1500	19.2/1600	21.4/1700	21.6/1800	24.2/1900

Table 5.2: Question 24 in Survey version B

5.5/500	7.2/600	8/700	9.6/800	10.5/900
12/1000	13.1/1100	14.4/1200	15.3/1300	16.8/1400
17.5/1500	19.2/1600	19.7/1700	21.6/1800	21.8/1900

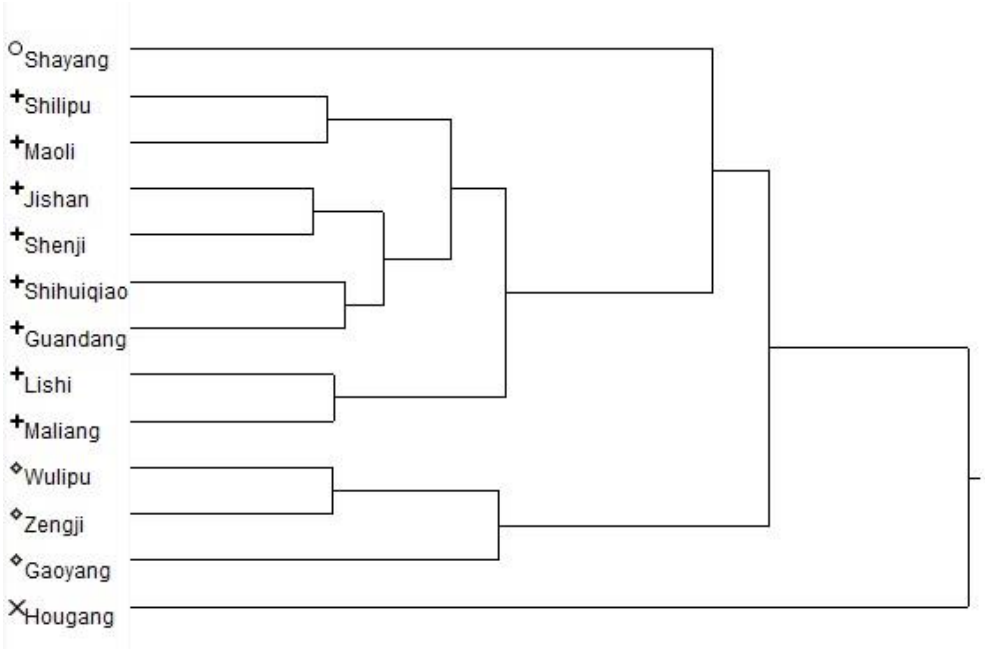
Besides, the page numbers of Version A were located bottom left while bottom right in Version B in order to identify them more efficiently for data entry.

5.2 Data Collection

5.2.1 Survey Location and Sampling Method

Survey was conducted in Shayang County, Hubei Province, China. There were a total of 13 townships in Shayang County. Samples of the survey were chosen through a mixed sampling scheme. A clustered sampling method was used. Based on 10 criteria, a cluster analysis generated 4 clusters (Figure 5.1).

Figure 5.1: Thirteen Townships Clustering Results



The 10 criteria were: gross output value of industry and agriculture, number of agricultural households, size of agricultural population, number of individuals working in non-ag related fields away from home, annual hog production, annual breeding sow, heads insured breeding sow, size of arable land, rural per capita net income and agricultural output value per capita. Initially, one township was randomly chosen within each cluster and the four selected townships were: Shayang, Maoli, Gaoyang and Hougang. Since 8 townships out of 13 were clustered into one group, we investigated an additional township- Lishi to enlarge our sample size. Table 5.3 displays the characteristics of the all townships based on the 10 selection criteria of the cluster. It's clear that compared to the county-wide average; the five townships represented a variety of conditions.

Table 5.3: Characteristics of All Townships in Shayang County Based on the Cluster Selection Criteria (2011)

Township	Gross Output Value of Industry and Agriculture (¥ 10,000)	Number of Agricultural Households	Size of Agricultural Population	Number of Individuals Working in Non-Ag Related Fields away from Home	Annual Hog Production (Head)	Annual Breeding Sow (Head)	Heads Insured Breeding Sow(Head)	Size of Arable Land (Mu)	Rural per Capita Net Income (¥)	Agricultural Output Value per Capita (¥)
Shayang	41,609	3,668	12,998	3,294	27,959	1,411	1,194	17,148	6,848	12,828
Wulipu	185,710	10,643	40,440	9,640	106,979	2,260	2,210	97,528	7,968	15,611
Shilipu	94,123	8,916	30,497	7,496	61,276	2,644	1,187	67,579	7,889	21,647
Jishan	178,533	7,423	26,298	6,364	45,898	2,054	835	43,025	8,146	14,379
Shihuiqiao	156,491	9,677	38,754	9,226	54,725	2,796	2,795	83,867	8,286	15,420
Hougang	536,837	17,793	66,098	12,652	110,904	4,785	520	131,180	8,600	20,639
Maoli	95,492	8,864	37,009	11,400	42,187	2,403	782	56,754	8,224	19,462
Guandang	375,420	9,352	35,272	8,306	45,082	2,300	1,262	75,974	8,080	14,533
Lishi	99,352	10,211	38,175	9,454	55,906	3,227	1,725	56,778	7,560	10,486
Maliang	106,151	9,815	36,707	9,092	49,817	1,089	569	46,444	7,800	9,227
Gaoyang	74,608	12,344	42,425	7,144	69,255	5,284	4,393	90,289	7,930	13,023
Shenji	116,628	8,222	35,910	5,244	47,484	2,018	1,677	86,765	8,090	14,380
Zengji	118,787	10,086	40,358	9,258	114,676	3,852	2,736	109,519	7,398	18,578
Five townships Average	169,580	10,576	39,341	8,789	61,242	3,422	1,723	70,430	7,832	15,288
Shayang county Average	167,672	9,770	36,995	8,352	64,011	2,779	1,683	74,065	7,909	15,401

5.2.2 Survey Implementation

First in-person survey was implemented during Oct. 14th to Oct. 26th, 2012 in Shayang, Maoli, Gaoyang and Hougang townships, while the second in-person survey in Lishi Township was implemented during Dec. 8th to Dec 12th .

The survey was conducted by a group of government officials and livestock specialists from Lishi Township with the assistance of local government officials and livestock specialists from Shayang, Maoli, Gaoyang and Hougang townships. All members in the survey team were well-informed with survey questionnaires and trained to use uniformed language during survey in order to reduce bias prior to the actually survey. Since all the surveyors were from local community, they were able to well communicate and get the more exact response among the farmers' households.

During the survey, both version A and version B questionnaires were randomly distributed to farmers. All farmers' households who raised breeding sows within the targeted 5 townships were investigated so that the response rate was 100%. Table 5.4 shows the total number of surveys gathered from the 5 townships during the two in-person surveys.

Table 5.4: Distribution of All Responses

Township	**Survey**
Shayang	67
Maoli	59
Gaoyang	165
Hougang	90
Lishi	154
Total	535

5.3 Data Description

Table 5.5 shows the variable definitions and variable descriptive statistics for all observations. The average WTP for breeding sow insurance premium is ¥14.41, while the average coverage is ¥1191.16. The average breeding sow farmers' household size is 4 people, and 90% of the householders who filled out the survey are male. The average age of our respondents is 48.7 years old, while the years of education is 8.3 years. On average, our respondents' per capita household income is about ¥10100. The average number of breeding sows raised in 2012 is 11.3 heads per household, while the number of breeding sows insured in 2011 is 9.4 heads per household. Among all 535 famers' household, 99% of them had heard of breeding sow insurance, 90% were mobilized by officials to purchase sow insurance, 90% knew purchasing time of sow insurance, 99% knew government subsidy in premium, 82% knew highest possible payment level, 90% purchased insurance based on own decision, 98% purchased sow insurance in 2011, 6% didn't trust insurance companies, 14% held neutral attitude towards insurance companies, 79% trusted insurance companies, 40% whose ideal coverage was greater than 1000. And the average likelihood of receiving payment for a claimed loss from insurance companies was 85.76% from the farmers' perspective. And 13% of total respondents lived in Shayang township, 11% lived in Maoli township, 31% lived in Gaoyang township, 17% lived in Hougang township and 29% lived in Lishi township.

Table 5.5: Variable Descriptive Statistics for All Observations and Variable Definition

Variable	Mean	Std. Dev.	Definition
Premium	14.42	4.48	continuous variable, ideal sow insurance premium farmer would like to pay
Coverage	1191.16	358.72	continuous variable, ideal sow insurance coverage farmer would like to receive
Hh_size	3.94	1.11	continuous variable, household size
Male	0.90	0.30	dummy variable, householder's gender, male = 1, female = 0
Age	48.68	8.59	continuous variable, householder's age
Y_edu	8.31	2.63	continuous variable, householder's years of education
Cap_inc	10.10	6.31	continuous variable, per capita household income/1000
Sow_rai_12	11.28	27.00	continuous variable, number of breeding sows raised in 2012
Ins_num_2011	9.37	16.64	continuous variable, number of breeding sows insured in 2011
Know_sow	0.99	0.12	dummy variable, heard of sow insurance = 1, never heard of sow insurance = 0
If_mob	0.90	0.31	dummy variable, mobilized by officials to purchase sow insurance = 1, else = 0
Know_when	0.90	0.30	dummy variable, knew purchasing time of sow insurance = 1, else = 0
Know_sub	0.99	0.11	dummy variable, knew government subsidy in premium = 1, else = 0
Gua_lev	0.82	0.38	dummy variable, knew highest possible payment level = 1, else = 0
Pur_dec	0.90	0.30	dummy variable, purchased insurance based on own decision = 1, else = 0
Tru_com_no	0.06	0.24	dummy variable, do not trust insurance companies = 1, else = 0
Tru_com_neutral	0.14	0.35	dummy variable, neutral attitude towards insurance companies = 1, else = 0
Tru_com_yes	0.79	0.40	dummy variable, trust insurance companies = 1, else = 0
Cla_pro	85.76	20.93	continuous variable, likelihood of receiving payment for a claimed loss (out of 100)
If_bou_2011	0.98	0.14	dummy variable, purchased sow insurance in 2011 = 1, didn't purchase = 0
Shayang	0.13	0.33	dummy variable, residents of Shayang township = 1, else = 0
Maoli	0.11	0.31	dummy variable, residents of Maoli township = 1, else= 0
Gaoyang	0.31	0.46	dummy variable, residents of Gaoyang township = 1, else = 0
Hougang	0.17	0.37	dummy variable, residents of Hougang township = 1, else = 0
Lishi	0.29	0.45	dummy variable, residents of Lishi township = 1, else = 0
Ratio	1.21	0.04	continuous variable, farmer's ideal (premium/coverage)*100
M_cov	0.40	0.49	dummy variable, ideal coverage greater than 1000 = 1, less than or equal to 1000 = 0
N=535			

Table 5.6 shows the variable descriptive statistics for 331 observations with Premium/Coverage = 0.012 and 133 observations with Premium/Coverage≠0.012.

Table 5.6: Variable Descriptive Statistics for Obs. with Premium/Coverage = 0.012 and ≠ 0.012

Variable	Ratio=0.012 Mean	Std. Dev.	Ratio≠0.012 Mean	Std. Dev.
Premium	12.46	1.74	19.28	6.33
Coverage	1038.67	145.07	1570.68	514.31
Hh_Size	3.90	1.07	3.92	1.08
Male	0.89	0.32	0.92	0.28
Age	49.10	8.43	46.49	8.75
Y_Edu	8.16	2.70	8.74	2.42
Cap_Inc	9.21	4.61	12.14	8.98
Sow_Rai_12	8.65	12.33	19.32	48.81
Ins_Num_2011	8.08	14.11	14.82	23.76
Know_Sow	0.99	0.08	0.99	0.09
If_Mob	0.94	0.24	0.77	0.42
Know_When	0.97	0.18	0.87	0.34
Know_Sub	0.99	0.08	0.97	0.17
Gua_Lev	0.88	0.32	0.80	0.40
Pur_Dec	0.88	0.33	0.92	0.28
Tru_Com_No	0.07	0.25	0.07	0.25
Tru_Com_Neutral	0.16	0.36	0.16	0.37
Tru_Com_Yes	0.77	0.42	0.77	0.42
Cla_Pro	82.60	22.20	86.69	19.99
If_Bou_2011	0.99	0.11	0.95	0.21
Shayang	0.11	0.31	0.22	0.41
Maoli	0.09	0.28	0.14	0.34
Gaoyang	0.28	0.45	0.41	0.49
Hougang	0.15	0.36	0.23	0.42
Lishi	0.37	0.48	0.01	0.09
Ratio	0.012	0.00	1.23	0.07
M_cov			0.83	0.37
	N=331		N=133	

Chapter 6: Empirical Results

Both OLS and Tobit estimations were examined for comparison. Estimation results of the Tobit model are presented in chapter. The estimated values of σ are highly significant at 1% significance level among all eight Tobit estimation models, which suggest highly significant inverse Mills ratios (IMR) among the Tobit models so that the Tobit models are preferred to the OLS models.

6.1 Results of Farmers' WTP for Premium

6.1.1 Premium as Dependent Variable, Include Coverage as Independent Variable (Model 1)

Motivation

To investigate farmers' WTP for breeding sow insurance premium as well as its determinants, we set premium as dependent variable and include coverage as an independent variable in order to reduce missing variable bias and control the effect of coverage on premium to build model 1.

Results

We can see from the results in Table 6.1 that coverage, male, per capita household income and living in Maoli and Gaoyang townships have significantly positive impact on farmers' WTP for premium, while farmers who purchased breeding sow insurance in 2011 and held neutral trust level towards insurance companies tend to pay less for premium.

According to the marginal effect, on average, each 100 increase in coverage would lead to about ¥1.24 increase in premium. Male farmers tend to pay ¥0.25 more in premium than female farmers on average. Farmers who lived in Maoli and Gaoyang would like to pay ¥0.39

and ¥0.18 more on premium than those who lived in Shayang Township on average, respectively. Compared to the farmers who trusted insurance companies, farmers who held neutral attitude towards insurance companies tend to pay ¥0.29 less on premium on average. And also farmers who bought breeding sow insurance in 2011 would pay ¥0.26 less than those who didn't buy in 2011, on average. At last, although per capital household income has statistically significant positive effect on premium, but its marginal effect is too small to have economic significance.

Discussions

Possible explanations for the results above could be as follows: Famers had the perception that "the more you pay, the more you get paid", so they were expecting an increase in premium as the coverage went up. And generally speaking, male farmers had higher chance to get more education and information about farming and policies than female farmers in the countryside, so they were likely to value insurance more and pay more. In addition, during the field survey, some farmers who had purchased breeding sow insurance in previous years had complaints regarding to insurance companies, such as insurance companies paid insufficient or refused to pay indemnities and couldn't settle claims in time, etc. These complaints reflected farmers' adverse attitude and distrust in insurance companies. So that farmers who had bought insurance in 2011 and held neutral attitude towards insurance companies demonstrated less WTP for the premium. At last, the significant differences in WTP for premium among Maoli, Gaoyang and Shayang townships revealed the existed differences in difference townships. Although our study had captured some various situations specific to the regions, there could be more factors that also contributed to the differences among farmers' WTP for premium with regard to where they live.

Table 6.1: Estimation Results of Tobit Model with Conditional Marginal Effects for Model 1

Variable	Coefficient	Std. Err.	Conditional Marginal Effect
Constant	0.20056	0.410052	
Coverage	0.012378***	6.615E-05	0.012378
Hh_size	-0.006356	0.020382	-0.006356
Male	0.25439***	0.071436	0.25439
Age	-0.000665	0.002777	-0.000665
Y_edu	-4.292E-05	0.009526	-4.292E-05
Cap_inc	0.007451*	0.004118	0.007451
Sow_rai_12	-0.000328	0.001185	-0.000328
Ins_num_2011	-0.000463	0.001934	-0.000463
Know_sow	0.049353	0.168934	0.049353
If_mob	-0.125171	0.080903	-0.125171
Know_when	-0.002314	0.085235	-0.002314
Know_sub	-0.269609	0.211524	-0.269609
Gua_lev	-0.093613	0.064295	-0.093613
Pur_dec	-0.055394	0.081354	-0.055394
Tru_com_no	-0.128514	0.091635	-0.128514
Tru_com_neutral	-0.290906***	0.066428	-0.290906
Cla_pro	-0.001533	0.001145	-0.001533
If_bou_2011	-0.264077*	0.160621	-0.264077
Maoli	0.394278***	0.10237	0.394278
Gaoyang	0.185116**	0.082202	0.185116
Hougang	0.031386	0.08511	0.031386
Lishi	0.091071	0.078616	0.091071
Sigma	0.46879***	0.014336	
LL	-353.81		

*, **, and *** indicate significant at the 10%, 5%, and 1% significance levels respectively.

6.1.2 Premium as Dependent Variable, Using Observations with Ratio=0.012(Model 2)

Motivation

In model 1 we examined farmers' WTP for premium while allowing them to choose their ideal premium/coverage combination. In model 2, we examine farmers' WTP for premium while assuming that the government has a specific non-market, internal pricing mechanism which fixes the premium/coverage ratio (P/C ratio) equal to current ratio of 0.012. This could be possible because current P/C ratio may be an equilibrium point after balancing costs and benefits among government, insurance companies and farmers so that it could not be changed.

Results

Table 6.2 shows the Tobit estimation results of farmers' WTP for premium of breeding sow insurance for the farmers who considered current premium/coverage ratio (P/C ratio = ¥12/¥1000 =0.012) the ideal ratio.

We can see that per capita household income, mobilized by officials to purchase sow insurance, knew government subsidy in premium, and neutral trust level towards insurance companies have significantly positive impact on farmers' WTP for premium, while farmers who knew highest possible payment level, purchased insurance based on their own decision, didn't trust insurance companies and were not living in Shayang township tend to pay less for premium.

Unlike the economic insignificance in Model 1, when per capital household income goes up by ¥1000, WTP for premium will add ¥0.086 on average. Farmers who were mobilized by officials to purchase sow insurance were willing to pay ¥0.93 more than who were not mobilized, on average. Similarly, farmers who knew government subsidy in premium would like to pay ¥3.8 more than those who didn't, on average. Interestingly, farmers who held

neutral attitude towards insurance companies tend to pay ¥0.53 more than those who trusted insurance companies; while farmers who didn't trust insurance companies tend to pay ¥0.80 less than those who trusted, on average. Farmers who made insurance purchasing decisions themselves (instead of being mobilized by officials involved) were willing to pay ¥0.62 less, on average. In addition, farmers who knew the highest possible payment level (which was ¥1000) would like to pay ¥0.56 less than those who didn't, on average. Finally, residents in Maoli, Gaoyang, Hougang and Lishi would be willing to pay ¥1.55, ¥1.76, ¥1.50 and ¥2.22 less than those who lived in Shayang township, respectively.

Discussions

First, farmers' households with higher per capita income would like to pay more on premium because they were more likely to be able to afford it. Second, since the farmers who were mobilized by government officials and the ones who knew government subsidy in premium had more positive information about breeding sow insurance, they were willing to pay more for the insurance. Third, farmers' distrust in insurance companies would result in less WTP for premium. Compared to the result in Model 1 where the impact of farmers' neutral trust level towards insurance companies is negative, in Model 2 we discover positive impact. So the impact of neutral trust level is ambiguous. Fourth, knowing the fact that current coverage of ¥1000 could only cover about 1/6 of total input on a breeding sow, farmers might be discouraged from purchasing breeding sow insurance and willing to pay less for premium. At last, similar to the results in Model 1, the differences specific to regions affected the WTP for premium as well.

Remember in this analysis, P/C ratio = ¥12/¥1000 =0.012, so farmers' preferred coverage level is a linear combination of premium, which equals to premium/0.012. Based on that, we could observe the same impacts of the factors on the preferred coverage level as of those on the premium in model 2.

Since we use a subsample with only observations whose P/C ratio equal to 0.012, this may cause bias in our results.

Table 6.2: Estimation Results of Tobit Model with Conditional Marginal Effects for Model 2

Variable	Coefficient	Std. Err.	Conditional Marginal Effect
Constant	9.811571***	2.209777	
Hh_size	0.029863	0.08744	0.029863
Male	0.159022	0.27467	0.159022
Age	-0.010383	0.011248	-0.010383
Y_edu	0.003283	0.036507	0.003283
Cap_inc	0.085974***	0.022574	0.085974
Sow_rai_12	-0.007169	0.010817	-0.007169
Ins_num_2011	0.007637	0.009617	0.007637
Know_sow	0.176381	1.059759	0.176381
If_mob	0.932328**	0.377484	0.932328
Know_when	0.34142	0.501073	0.34142
Know_sub	3.804401***	1.289008	3.804401
Gua_lev	-0.562935*	0.348528	-0.562935
Pur_dec	-0.621976**	0.321891	-0.621976
Tru_com_no	-0.798572**	0.373007	-0.798572
Tru_com_neutral	0.528761**	0.265897	0.528761
Cla_pro	-0.004513	0.004718	-0.004513
If_bou_2011	0.000117	0.89377	0.000117
Maoli	-1.549011***	0.454655	-1.549011
Gaoyang	-1.760408***	0.373077	-1.760408
Hougang	-1.505034***	0.386598	-1.505034
Lishi	-2.22444***	0.362657	-2.22444
Sigma	1.475139***	0.057334	
LL	-598.34		

*, **, and *** indicate significant at the 10%, 5%, and 1% significance levels respectively.

6.2 Results of Farmers' Preferred Coverage Level

Coverage as Dependent Variable, Include Premium as Independent Variable (Model 3)

Motivation

To investigate farmers' preferred coverage level for breeding sow insurance as well as its determinants, we set coverage as dependent variable and include premium as an independent variable in order to reduce missing variable bias and control the effect of premium on coverage to build model 3.

Results

Table 6.3 shows the tobit estimation results of farmers' preferred coverage level of breeding sow insurance while we include premium as an independent variable to control the effect of premium. We can see that premium, neutral trust level towards insurance companies, and purchased sow insurance in 2011 have significantly positive impact on farmers' preferred coverage level, while per capita household income, male, living in Maoli, Gaoyang and Lishi have significantly negative impact.

According to the marginal effect, on average, ¥1 increase in premium would lead to about ¥79.6 increase in coverage. Compared to the farmers who trusted insurance companies, farmers who held neutral attitude towards insurance companies tend to have ¥23.6 more coverage, on average. And also farmers who bought breeding sow insurance in 2011 would like to have ¥22.4 more than those who didn't buy in 2011, on average. However, unlike the positive effect on premium, male farmers tend to have ¥19.9 less on coverage than female farmers on average. Per capital household income goes up by ¥1000, farmers' preferred coverage level would go down by ¥0.59, on avaerage. At last, farmers who lived in Maoli ,Gaoyang and Lishi would like to have ¥37, ¥16.9 and ¥11.7 less on coverage than those who lived in Shayang Township on average, respectively.

Discussions

Since famers had the perception that “the more you pay, the more you get paid”, they would expect an increase in coverage as they pay more premium. Farmers who held neutral trust attitude towards insurance companies would like to have more coverage compared to farmers who trusted insurance companies. Since farmers who bought breeding sow insurance in 2011 would have more knowledge about the insurance, they would have discovered that the coverage was not enough to cover losses, so they were willing to get more coverage. Male farmers tend to prefer less coverage than female farmers because they were generally more educated and experienced to have better control on risks in production. With the increase in household income, farmers may have other income sources other than hog production, or they could have various investments to spread risk, moreover, change in coverage would not be a significant influence on their income. Finally the differences specific to regions affected the preferred coverage level as well.

Table 6.3: Estimation Results of Tobit Model with Conditional Marginal Effects for Model 3

Variable	Coefficient	Std. Err.	Conditional Marginal Effect
Constant	12.823038	32.878290	
Premium	79.571688***	0.425124	79.571688
Hh_size	0.858893	1.633900	0.858893
Male	-19.943487***	5.730487	-19.943487
Age	0.017459	0.222678	-0.017459
Y_edu	0.022893	0.763731	0.022893
Cap_inc	-0.586425*	0.330179	-0.586425
Sow_rai_12	0.065085	0.094954	0.065085
Ins_num_2011	0.033390	0.155091	0.03339
Know_sow	-4.691521	13.544158	-4.691521
If_mob	6.090504	6.495605	6.090504
Know_when	-2.705755	6.832839	-2.705755
Know_sub	17.170772	16.968796	17.170772
Gua_lev	7.072381	5.156082	7.072381
Pur_dec	5.569543	6.521119	5.569543
Tru_com_no	11.014005	7.345053	11.014005
Tru_com_neutral	23.562372***	5.324005	23.562372
Cla_pro	0.127999	0.091756	0.127999
If_bou_2011	22.416400*	12.874202	22.4164
Maoli	-36.978494***	8.165554	-36.978494
Gaoyang	-16.881141***	6.581474	-16.881141
Hougang	-5.665485	6.820271	-5.665485
Lishi	-11.746363*	6.290542	-11.746363
Sigma	37.586194***	1.149052	
LL	-2699		

*, **, and *** indicate significant at the 10%, 5%, and 1% significance levels respectively.

6.3 Results of Farmers' Preference for the Ratio between Premium and Coverage

Premium/Coverage Ratio as Dependent Variable, Using All Observations (Model 4)

Motivation

In model 1and model 3, we examined the factors which would affect premium or coverage separately, while in Model 4, we investigate the factors that would affect them jointly. To achieve this goal, we use P/C ratio as dependent variable.

Results

Table 6.4 shows the Tobit estimation results of model 4. We can see that male, ideal coverage was greater than ¥1000, residents in Maoli and Gaoyang township would like to receive higher P/C ratio, while mobilized by officials to purchase sow insurance and held neutral trust level towards insurance companies would lead to smaller P/C ratio.

To better interpret the results, let's set the coverage at ¥1000 to see the monetary changes to premium when explaining the marginal effects of each significant factor. Male farmers would like to pay ¥0.14 more for premium than female farmers on average. Farmers whose ideal coverage levels were greater than ¥1000 would like to pay ¥0.11 more for premium on average. Residents in Maoli and Gaoyang were willing to pay ¥0.40 and ¥0.11 more than the residents in Shayang township. Farmers who were mobilized by government officials and held neutral attitude towards insurance companies tend to pay ¥0.12 and ¥0.18 less for the premium. In the other words, every ¥1000 change in coverage would lead to corresponding changes in WTP for premium for each factor stated above.

Although these marginal effects seem to be small compared to previous models, but when we consider them jointly and multiply by the total number of breeding sows in Hubei Province, which was 38.71 million in 2011, their impacts are still sizable.

Table 6.4: Estimation Results of Tobit Model with Conditional Marginal Effects for Model 4

Variable	Coefficient	Std. Err.	Conditional Marginal Effect
Constant	1.243424***	0.028821	
Hh_size	-0.00113	0.001468	-0.00113
Male	0.014106***	0.005151	0.014106
Age	-7.455E-05	0.0002	-7.455E-05
Y_edu	-0.000187	0.000688	-0.000187
Cap_inc	0.000286	0.000297	0.000286
Sow_rai_12	-1.596E-05	8.514E-05	-1.596E-05
Ins_num_2011	-9.429E-05	0.00014	-9.429E-05
Know_sow	0.010273	0.012319	0.010273
If_mob	-0.011708**	0.005719	-0.011708
Know_when	0.008485	0.006275	0.008485
Know_sub	-0.020973	0.015199	-0.020973
Gua_lev	-0.004157	0.004814	-0.004157
Pur_dec	-0.00666	0.005857	-0.00666
Tru_com_no	-0.006234	0.006626	-0.006234
Tru_com_neutral	-0.018085***	0.004788	-0.018085
Cla_pro	-9.928E-05	8.27E-05	-9.928E-05
If_bou_2011	-0.018367	0.011585	-0.018367
M_cov	0.011292***	0.003713	0.040208
Maoli	0.040208***	0.00737	0.01117
Gaoyang	0.01117*	0.006006	-7.357E-05
Hougang	-7.357E-05	0.006234	0.003343
Lishi	0.003343	0.005806	-0.00113
Sigma	0.033801***	0.001034	
LL	1053		

*, **, and *** indicate significant at the 10%, 5%, and 1% significance levels respectively.

Chapter 7: Conclusions and Implications

7.1 Conclusions

China is the largest pork producer and consumer in the world and pork is the No.1 meat source of Chinese people, so the stability of Chinese pork industry is extremely important not only for international pork market, but also for Chinese people's daily lives. Facing numerous challenges and risks in China's pork industry, government policies and subsidies on breeding sow insurance as well as hog insurance were mobilized to alleviate these problems since 2007. Although more and more attentions were paid to both insurances recent years, impediments to further growth such as ineffectiveness for farmers, financial burden for government and low-profit for insurance companies occurred and still were unsolved.

Studies on farmers' demand for breeding sow insurances are scarce. Our study is one of the pioneer studies using empirical research methods to investigate the factors that may affect farmers' WTP for breeding sow insurance premium and preferred level of coverage. This study was based on date collected from two randomly distributed versions of survey questionnaires towards 535 breeding sow farmers in Shayang County, Hubei Province, China. Both questionnaires have all identical questions except for the two different WTP question tables. The WTP question was designed by combining CVM open-ended question and payment card method. In payment card table, premium and coverage were offered as 15 pre-calculated combinations of Premium/Coverage ratios equal to 0.012(which is current P/C ratio) or greater than 0.012 in Version A; and P/C ratios equal to 0.012 or less than 0.012-Version B.

Data descriptive statistics showed that farmer's average WTP for breeding sow insurance premium was ¥14.4 and average preferred coverage level was ¥1191, both of them exceeded current premium of ¥12 and coverage of ¥1000.

Empirical results showed that, coverage, gender, household per capita income, trust level towards insurance companies, bought breeding sow insurance in 2011 and location variables had significant effects on farmers' WTP for premium. Similarly, premium, gender, household per capita income, trust level towards insurance companies, bought breeding sow insurance in 2011 and location variables had significant effects on farmer's preferred coverage level.

Then we examined factors that affect WTP for premium and preferred coverage level while government enforces a fixed P/C ratio of 0.012. Results were found that household per capita income, mobilized by officials to purchase sow insurance, knew government subsidy in premium, trust level towards insurance companies, knew highest possible payment level, purchased insurance based on their own decision, didn't trust insurance companies and location variables are significant for both WTP and preferred coverage level.

After the separate analyses for premium and coverage, P/C ratio was used as dependent variable to incorporate the joint effect of premium and coverage. Gender, ideal coverage greater than ¥1000, location variable, mobilized by officials to purchase sow insurance, trust level towards insurance companies were found to have significant effects on P/C ratio.

7.2 Implications

Our study examined farmers' reactions to breeding sow insurance through a series of analyses on farmers' WTP for premium and preferred coverage level. It is easily to find out that farmers' average WTP for premium and average preferred coverage level both exceeded current insurance policy. Insurance companies could increase premium and coverage by a certain amount to benefit from farmers' higher WTP. Other than that, insurance companies should pay more attention to build trust between farmers to further increase the demand and WTP for breeding sow insurance.

Government could also benefit from the results by understanding farmers' behavior towards breeding sow insurance. Government may consider adjusting the amount of subsidies on premium and continuing to mobilize farmers participate in breeding sow insurance.

Hubei is one of the biggest hog production provinces in China, surrounded by top three largest hog production provinces of Sichuan, Hunan and Henan. So our township level research findings could provide useful instructions and insights for future studies in the other areas. In addition, this study offers empirical analysis on breeding sow insurance from farmers' side, which can also be comparable to researches on other agricultural insurances.

Breeding sow insurance is a policy insurance heavily subsidized by government to help farmers diverse risks in hog production and stabilize pork prices in China. But in the U.S., government provides price support system rather than policy insurance. Future studies could compare these different strategies and policies across countries.

Pork price fluctuates frequently and follows by some kind of cyclical patterns. That would directly affect hog production and hog farmers' income. However, premium and coverage of breeding sow insurance were fixed since 2007 no matter how market price changed. That brings trouble to both farmers and insurance companies. If coverage was much more than breeding sow price on the market, moral hazards could occur; while farmers' demand for breeding sow insurance could be discouraged if breeding sow price was much more than the coverage.

Appendix: Questionnaire

Survey Copy (Version A)

2012 Survey of Producers' Participation in Breeding Sow Insurance

This survey aims to understand the development of breeding sow insurance in order to provide policy guidance. This survey has six pages, and needs 20 to 40 minutes to finish. Please answer as truthful as you can. We appreciate your support very much!

Town: ☐ ShaYang ☐ MaoLi ☐ GaoYang ☐ HouGang ☐ Lishi

Village: _____

Group: _____

Householder's Name: _____

Name on Breeding Sow Insurance: _____

Contact Information: _____

Survey Time: 2012- _____- _____

_____h_____m to _____h_____m

Surveyor:_____

Part 1 Basic Household Background

Table 1: Householder Personal Information

Gender	Age	Years of Education	Years in Farming	Occupation(Note)	Chinese Communist Party(CCP) Member (Y/N)	Migrant Workers (Y/N)	Participants of Agricultural Technical Training (Y/N)
M F		( )Year	( )Year		Y N	Y N	Y N

Note: Occupation 1 Village Official 2 Specialized Household in Animal Raising or Crop Growing
3 Private Entrepreneur 4 Enterprise manager 5 Workers 6 Farmers 7 Individual Transportation
8 Craftsmen 10 Individual Service 11 Individual Business 12 Others

Table 2: Family Basic Information

Household Size	Total Number of People in Farming	Number of Full-Time Farmers	Number of Members Work Out of Town	The Ratio of Agriculture in Total Household Income	CCP Member in Household	Village Official in Household	Participant of Agricultural Technical Training in Household
				( )%	Y N	Y N	Y N

Table 3: Family Members Education Level

Education Level	Preschool Children	Illiterate	Elementary School	Middle School	High School	Vocational School	College and Above
Number of People							

Table 4: Basic Agriculture Background

Total Area of Farmland and Forest Land	The Main Raising Livestock and Scale(Heads)	Participation of Agricultural Cooperatives or Professional Associations	Signed Production Contract With Companies	The Mortality of Livestock is Higher than 30% Caused by Diseases	Crop Lost more than 30% because of Weather
( )Acre		Yes No	Yes No	Yes No	Yes No

Table 5: Proportion of Profit of Agricultural Production to Total Agricultural Income

Production Project		The Ratio of Total Agricultural Income(Check)					
		Less than 20%	21%-35%	36%-50%	51%-65%	66%-80%	More than 80%
Planting	Staple Crop(Rice/Wheat/Corn/ sorghum/Millet/Other cereals/ Potato and beans)						
	Cash Crops:1.Oil Plant (Peanut/ Rapeseed /Sesame)；2.Sugar(Sugar Cane/Beet); 3.Fruit, Vegetable; 4.Flowers, Nursery stock etc.						
Breeding	Poultry, Livestock and Silkworm etc.						
	Aquaculture Product (Fish/Shrimp/Crab/Frog/Shellfish etc.)						
Others	Edible Mushrooms/Chinese Medical Plant/Tea/Economic Forest						

1. Estimated income from all agricultural production ( ) CNY/year.

A:Less than 10000 B:10000-20000 C:20000-30000 D:30000-40000 E:40000-50000 F:50000-60000 G:60000-70000 H:70000-80000 I:80000-90000 J:More than 90000

2. The estimated total household income____CNY/year.

3. The number of pigs raised and dead in recent three years:(If didn't raise pigs in recent three years，please check here□)

Table 6: The Number of Pigs Raised and Dead in Recent Three Years

Category	Breeding Sow	Fatten Pig	Piglet
2010 Numbers Raised (Head)			
2011 Numbers Raised (Head)			
2012 Numbers Raised (Head)			
2010 Numbers Dead (Head)			
2011 Numbers Dead (Head)			
Estimated 2012 Numbers Dead (Head)			

Part 2 Source of Agricultural Risk, Risk Management Strategy and Acknowledgement

4. Risk Factors of Agricultural Business? Influence Level? Fill out the Table 7.

Table 7: Risk Factors and Their Impact to Business

Risk Factors(Check All That Apply)	Very High	High	Medium	Low	None
A .Quality of Seedlings/ Breeding Stocks					
B. Loss of Production Caused by Weather					
C. Planting/Breeding Technical Problems					
D. No Effective Sales Channel					
E. Price Change of Agricultural Products					
F. Price Change of Agricultural Production Materials					
G. No Reliable Marketing Information Resource					
H. Quality Problem of Agricultural Production Materials					
I. Policy Instability(Specify_____)					
J. Quality Problems of Preserving and Processing Technology					
K. Others(Note_____)					
Overall Impact Caused by above Factors					

5. The impacts of the above factors, ranked in descending orders, are ___, ___, and ___.
6. What precaution methods have you used? What are the effects? Please fill out the following table.

Table 8: The Precaution Methods and Effects

Methods(Check All That Apply)	Very High	High	Medium	Low	None
A: Purchase Agricultural Insurance (Ex: Rice insurance, etc.)					
B:Diversification of Production					
C:Obtain More Market Information					
D:Improve Self Technical and Management Skill					
E:Participate in Professional Cooperatives or Associations					
F:Sign Sales Contract with Companies					
G:Apply New Varieties / Technology					
H:Self (or cooperate with others) investment in infrastructure construction					
I:Others(Specify_____)					

7. The impacts of the above factors, ranked in descending orders, are ___, ___, and ___.

Part 3 Agricultural Insurance Purchase Intentions

(A) The understanding of agricultural insurance

8. Do you know Agricultural Insurance?
   A. Never heard of B. Heard of but don't know much C. Very familiar

9. How did you know the Agricultural Insurance? (Check All That Apply)
   A. Family or Friends B. Government Mobilization C. Advertisement of Agricultural Insurance Company D. Cooperatives or Associations
   E. Large Household Specialized in Animal Raising or Crop Growing F. TV
   G. Newspaper and Magazine H. Internet I. Others (Please Specify ____)

10. Have you ever purchased Agricultural Insurance (e.g. Rice, Breeding Sow Insurance, etc.)?
    A. Never B. Purchased before, not now (Specify the reason of not purchasing now_____)
    C. Always purchase D. Others (Please Specify_____)

11. Do you know whether you can purchase breeding sow insurance or not?
    ☐ Yes (If yes, fill out the following table)
    ☐ No (If no, skip the following table and jump to (B))

Table 9: Information about Purchasing Breeding Sow Insurance

A. From whom do you know to purchase breeding sow insurance?(Check All That Apply)	☐ Insurance company advertisement ☐ Village meeting ☐ TV, Newspaper etc. ☐ Technicians from animal husbandry office ☐ Epidemic Prevention Coordinator ☐ Village official home visit ☐ Other villagers ☐ Others
B. Have village officials mobilized you to purchase breeding sow insurance?	☐ Y ☐ N
C. Do you know when you can purchase breeding sow insurance?	☐ Y ☐ N
D. Do you know the coverage level of breeding sow insurance?	☐ Y ☐ N
E. How much is the highest coverage of each breeding sow this year?	( )CNY (Fill 999 if don't know)
F. Before you purchase, who will you consult with?	☐ Village Official ☐ Relatives and Friends ☐ Most Villagers ☐ Yourself

(B) If you have <u>never</u> purchased agricultural insurance, please fill out the following table; if have purchased, please skip to(C)

12. The reasons you have never purchased Agricultural Insurance (Check all that apply)

☐ 1 Too expensive ☐ 2 Do not trust the insurance company
☐ 3 Coverage amount is too small ☐ 4 Not enough government subsidy
☐ 5 Unfair claims ☐ 6 Do not like the sale promotion method
☐ 7 Do not know about agricultural insurance
☐ 8 Complicated settlement of claim
☐ 9 Coverage range is limited ☐ 10 Undertake the risk by oneself
☐ 11 Insurance purchases for all breeding sows
☐ 12 Nobody buys agricultural insurance in my village
☐ 13 Insurance period is too short ☐ 14 Others (Please specify____)

13. Do you think agricultural insurance is effective? A. Extremely effective
B. Very Effective C. Effective D. Little E. Not at all F. Don't know

14. Would you be willing to purchase agricultural insurance? A. Extremely Likely
B. Very Likely C. Likely D. Less Likely E. Unlikely F. Don't know

15. If the government offers proper subsidies for purchasing agricultural insurance, what category and how likely will you make purchase?

Table 10: Farmers' Willingness of Purchasing Different Agricultural Insurance Products with Proper Subsidies

Insurance Product(Check all that apply)	Extremely Likely	Very Likely	Likely	Less Likely	Unlikely	Don't Know
Hog Insurance						
Breeding Sow Insurance						
Others 1 ( )						
Others 2 ( )						

Note: If you are not interested in either product offered, please specify your desired agricultural insurance products in "Others 1" and "Others 2".

16. If you have 100 CNY to purchase agricultural insurance in a year, how would you allocate this 100 CNY to the following insurance products?

Table 11: Farmers' Allocation of Insurance Purchase out of 100 CNY

Insurance Products	Allocated Fund(CNY)
Retirement Insurance	
Health Insurance	
Life Insurance	
Property Insurance	
Agricultural Insurance	
Other Insurance(Specify_____)	
Total Amount	The sum of the above should be equal to 100

17. What is/are the best way to purchase agricultural insurance (Check all that apply)?

☐ 1 Insurance Company ☐ 2 Government

☐ 3 Agricultural Cooperatives/ Associations ☐ 4 Local Villagers Group

☐ 5 Purchase with seeds/ breeding stocks

☐ 6 Purchase with Production Materials such as fertilizers, pesticides

☐ 7 Others (Specify_____)

(C) If you have purchased agricultural insurance，please fill out the following table，if not，please jump to Part 4

18. Did you purchase breeding sow insurance in 2011?

☐ Yes (If yes，please fill out the following table)

☐ No (If not，please jump to question 19)

Table 12: Breeding Sow Insurance Purchases and Claims

Purchase Times	Purchase Date (Month of year)	Number of Insured Breeding Sows (Head)	Date of Settling Claims (Month)	Number of Breeding Sows in Claims (Head)	Date of Receiving Insurance Indemnity (Month) (If not remember, fill in 99; if haven't received, fill in 66)	Received Insurance Indemnity (CNY)	Time Spent in Settling Claims (Day)	Cost of Settling Claims (CNY) (Including commuting cost, commissions etc.)
1								
2								
3								

19. The reason of purchasing agricultural insurance(Check all that apply)

☐ 1 Family/Friends' Recommendation ☐ 2 Trust Insurance Salesperson

☐ 3 Government Subsidies if Purchasing ☐ 4 Government Mobilizations

☐ 5 Meet Household Agricultural Production Needs

☐ 6 Receiving Government Preferential Policies if Purchasing

☐ 7 Others (Please Specify_____)

20. Do you think the government should provide subsidies for purchasing agricultural insurance? A. Agree B. Indifferent C. Disagree D. Don't know

21. If you have 100 CNY to purchase agricultural insurance in a year, how would you allocate this 100 CNY to the following insurance products?

Table 13: Farmers' Allocation of Insurance Purchase out of 100 CNY

Insurance Products	Allocated Fund(CNY)
Retirement Insurance	
Health Insurance	
Life Insurance	
Property Insurance	
Agricultural Insurance	
Other Insurance(Specify_____)	
Total Amount	The sum of the above should be equal to 100

22. What is/are the best way to purchase agricultural insurance (Check all that apply)?
    - ☐ 1 Insurance Company
    - ☐ 2 Government
    - ☐ 3 Agricultural Cooperatives/ Associations
    - ☐ 4 Local Villagers Group
    - ☐ 5 Purchase with seeds/ breeding stocks
    - ☐ 6 Purchase with Production Materials such as fertilizers, pesticides
    - ☐ 7 Others (Specify_____)

Part 4 Information about Breeding Sow Insurance

23. No matter whether you have purchased agricultural insurance, which is/are the best way to purchase breeding sow insurance (Check all that apply)?
    - ☐ 1 Individual Purchase for Single Household
    - ☐ 2 Combined Purchases for a Group of Households
    - ☐ 3 Purchase Insurance as Whole Village
    - ☐ 4 Purchase Insurance via Cooperatives
    - ☐ 5 Purchase Insurance via Leading Enterprises
    - ☐ 6 Others (Please Specify_____)

24. Please select the ideal Premium and Coverage Combination for one breeding sow (For example"12/1000" indicates that if you pay 12 CNY as premium per head, you will get up to 1000 indemnity when you encounter an insurable loss.)

Table 14: The Premium and Coverage Combination of Breeding Sow Insurance (per head)

6.7/500	7.2/600	9.1/700	9.6/800	11.2/900
12/1000	13.4/1100	14.4/1200	16/1300	16.8/1400
18.7/1500	19.2/1600	21.4/1700	21.6/1800	24.2/1900

25. If there is no ideal Premium/Coverage combination for you, please specify the ideal combination_____/_____CNY.

Part 5 Level of Trust and Risk Preference

26. How much do you trust other people besides your family and friends?
☐Always ☐Most of the time ☐Half of the time ☐Sometimes ☐Never

27. For questions below，use 1-5 to rate how much you agree or disagree with each statement, 1 indicates complete disagreement, 5 indicates complete agreement.

Table 15: Household Trust Level

A. Trust the insurance company's commitment	1 Completely Disagree	2 Disagree	3 Neither	4 Agree	5 Completely Agree
B. I could trust my neighbor to bring 1000 CNY to my family from me	1 Completely Disagree	2 Disagree	3 Neither	4 Agree	5 Completely Agree
C. If I am not at home, I believe that my neighbor would help me feed my pigs	1 Completely Disagree	2 Disagree	3 Neither	4 Agree	5 Completely Agree

28. If you paid the premium and then the breeding sow died within the coverage period, what is the possibility you think the insurance company will repay you within a year? (Check the closest answer)
☐100% ☐90% ☐80% ☐70% ☐60% ☐50% or less than 50%

29. If you have an investment and you may get one of the five returns, which one would you prefer?
(A) 100% 1000 of CNY
(B) 50% possibility of 900 CNY, 50% possibility of 1600 CNY
(C) 50% possibility of 800 CNY, 50% possibility of 2000 CNY
(D) 50% possibility of 400 CNY, 50% possibility of 3000 CNY
(E) 50% possibility of 0 CNY, 50% possibility of 4000 CNY

30. How much do you trust the local government?
A. Very Much B. Trust C. Don't Trust D. Don't know

31. Your suggestions about agricultural insurance products, coverage, premium, subsidy, mobilization, claim settlement etc., _____
_____

At last, thanks very much for your support!

Question 24 of Version B

32. Please select the ideal Premium and Coverage Combination for one breeding sow (For example"12/1000" indicates that if you pay 12 CNY as premium per head, you will get up to 1000 indemnity when you encounter an insurable loss.)

Table 14: The Premium and Coverage Combination of Breeding Sow Insurance (per head)

5.5/500	7.2/600	8/700	9.6/800	10.5/900
12/1000	13.1/1100	14.4/1200	15.3/1300	16.8/1400
17.5/1500	19.2/1600	19.7/1700	21.6/1800	21.8/1900

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Vita

Wei Wan

PLACE OF BIRTH

Jingmen, Hubei, China

EDUCATION

M.S.	Agricultural Economics, (Expected May 2014) University of Kentucky, Lexington, KY
Graduate Certificate	Applied Statistics, (May 2012) University of Kentucky, Lexington, KY
B.A. (Double Degree)	Business Administration, (August 2008) China Agricultural University (CAU), Beijing, China
B.A.	Agronomy, (August, 2008) China Agricultural University, Beijing, China

RESEARCH EXPERIENCE

05/2012- 05/2014	Research on farmers' WTP for breeding sow insurance in Hubei Province, China
03/2011- 02/2012	Research on seafood marketing in Kentucky, *Conference Paper:* first author, *"At-Home Seafood Consumption in Kentucky",* SAEA Annual Meeting, 2012
06/2007- 05/2008	Research on Nitrogen balance and spatial variability in farmland of Tong Zhou District in Beijing, National Key Lab of Farming System (CAU)

PROFESSIONAL EXPERIENCE

08/2011- 08/2012	Research Assistant, Department of Agricultural Economics, University of Kentucky
Summer 2007	Investigator, CAU, China Investigated grain direct subsidy policy in Beijing for Beijing Agro-Tech Extension Center and ecological health of cropping system in North China Plain for Department of Agronomy, CAU