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*Total 5 pages exclude the references*

## **Intervention to alleviate impacts of rice price variability on Thai farmers**

### **I. Motivations**

Agricultural production labour force in Thailand is still the biggest labour participation industry, which has average number 42.5% ,during the wet season from year 2001 - 2005, of total labour force (Labor Force Survey, National Statistical Office, Thailand). One of top ten export products from Thailand is rice (TradeMap), international agricultural market becomes more integrated, thus, world rice price must have some transmitted impact on the local price. According to Wiboonpongse, Chaovanapoonphol and Battese (2012), their research paper showed that, price transmission seemed stronger when the world price declined, and the backward price transmission impact was slightly higher than forward linkage. In the year 2008, there was a spike increasing in world rice price, which driven the world price from about 300 USD per metric ton to almost 600 USD per metric ton (IMF). Not too long, then world price were pushed down again due to influx of supply from emerging countries such as Vietnam and India.

The world commodity market is become more and more integrated, the idea of Law of One Price (LOP) which is about the global market become perfectly integrated, at that point, every countries should have the same price level for the same quality of commodity. Therefore, the international price transmission of commodity should be fully transmit. Ghoshray's literature (2011) is testing on various main commodities price such as beef, rice, coffee and sugar, by testing the international price transmission on various groups and testing across various countries. However, only using the correlation coefficient in the early researches to conclude for existing of price transmission had been criticism. This led to regression-based approaches which was introduced by Engle and Granger (1974) by using standard linear regression, formal tests for cointegration.

Thailand is effected with the international price transmission of rice. Therefore, some policy intervention is needed to alleviate the impacts of rice price variability-

ty on Thai farmers. The policy makers had been debating over the period of time about letting the domestic price to reflex the world price, some supported the idea of protected local price to remain high, in order to distribute more income to the poor farmers. However, the opposite scholars side showed the results, that the protected price benefit only the big commercial farmers, not the poor one (Trairatvorakul, 1984).

Twisted the price level could cause the dead weight loss to the society, what Thailand needed is not the high domestic price, because this makes us to lose price competitiveness to other countries, we need some price stabiliser tools, just to alleviate the impact of price declining during the bad year. Thus, *agricultural product price insurance* would be proposed as the policy intervention.

## **II. Description of policy intervention**

The idea of agricultural product price insurance is based on the concept of accident insurance, one who would like to minimise the loss due to uncertainty, in this case is price variability, is suggested to buy the insurance to get the subsidise of indemnity from the insurance company, which would occur when the rice price is dropped. As the price drops, the total income of farmers tend to be declined, thus with the indemnity, the loss due to price drop would be less severed. As we had seen from the past, that when the farmers faced high drop of rice price, the income could not cover the production cost, thus some of them had to borrow money from the money lender with dramatically high interest rate.

Ultimate goal of the policy is to alleviate the impact of price drop on farmers, and the indemnity could be accumulated as the small fund to invest in the production cost for the next season.

This project can be more sustainability, if the insurance company can operate in many countries because sometime systematic risk, i.e. natural disasters, can be exposed to the whole country.

## **III. Research question and hypothesis**

Short Term

- What might be the pattern and determinants of insurance uptake?

Medium Term

- Does agricultural product price insurance could alleviate the impact of world price decrease? Suggested measurement tools; in term of consumption smoothing, funding accumulation or less amount of money borrowing for those who join the insurance program?

Long term

- How could the insurance program be sustainability?

#### IV. Research design and methodology

There is more likely that people who are near the poverty trap, would willing to buy the insurance in order to smoothing their assets. To see the pattern and determinants of insurance uptake, one way is conducted the survey, by educated them about the agricultural product insurance and demonstrate the stimulated situation through the game playing. There is a probability that characteristics of Thai farmers are different from others and lead to different elasticity pattern, further research is needed. However, price elasticities of premium payment should be vary between assets endowments.

In medium term measuring the impact of this program in alleviating the result of world price decreases and transmits to local price, ideally, pure Randomised Control Experiment (RCE) could be the case,

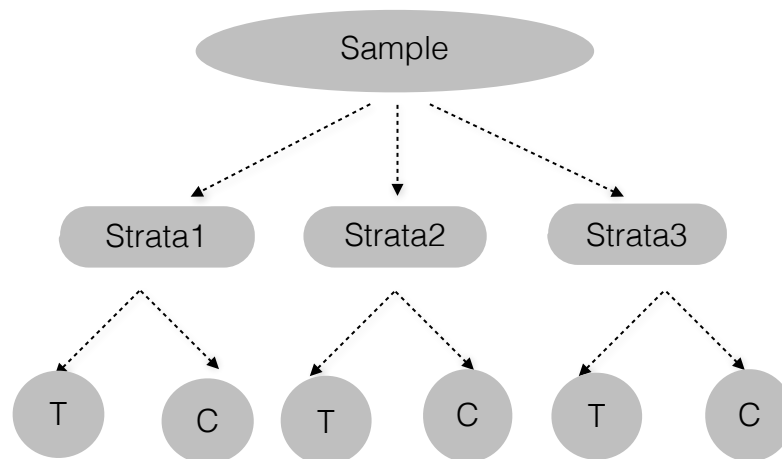
$$Y_i = \alpha + \beta ins_i + \varepsilon_i$$

Whereas:  $Y_i$  = income of household i  
 $ins$  = insurance obtain (obtain =1, not obtain = 0)  
 $\beta$  = impact of insurance program

by measuring income differences between those who obtain the program and those who does not. Without unbiased result, income differences can be measured in term of  $\beta$ . However, we cannot force who to buy insurance, thus, we must create some instrument  $Z_i$  to solve for this, such as discount coupon with different discount rate and also randomly assign, and/or educational game to demonstrate the idea of insurance and risk minimisation by using game, this game designs to launch with only half of the sample group.

$$y_i = \alpha + \beta \widehat{ins}_i + X_i \delta + \varepsilon_i \text{ with } ins_i = a + bZ_i + X_i c + e_i$$

Therefore, we can solve for self selection in 2SLS by create two Zi by randomising encouragement to buy the agricultural product insurance. Secondary result of how to conducted the randomising of this research is followed from the paper by Chantarat and Mude 2012, in the case Designing Index-Based Livestock Insurance for Managing Asset Risk in Northern Kenya.



The process of Randomised Control Experiment should be followed as the suggested diagram above. Firstly, we randomly selected the sample to run the pilot program, in order the find the expected outcome of the program and observe the behaviour of target group. Second, we use Stratification to grouping the same sample with their characteristics, in this case would be asset endowment, according to the Poverty Trap, if the multiple equilibria pattern occurred, those who are in different endowment point would react toward risk management program differently. Lastly, we will randomly assign the randomising encouragement to solve for self selection issue, as mention above, the consideration level will be in group, one is treatment and other is control.

The expected result from the program can be measured as following;

$$Expected\ Outcome = E(Y_i/T) - E(Y_i/C)$$

Whereas:  $E(Y_i/T)$  = Expected outcome of Treatment group  
 $E(Y_i/C)$  = Expected outcome of Control group

For long term, the main concern is sustainability, how could the program be sustained, since systematic risk could cost loss to the insurance company, the suggestion would be risk pulling by diversified this program in various countries, in both developed and developing. From the book name, Government Support to Agricultural Insurance; Challenges and Options for Developing Countries by Majul and J.Stutley, this show the premium payment for agricultural insurance from various countries, and the results showed that 86.5 percentage of global agricultural premiums were paid by high income countries.

## **V. Expected outcome**

The goal of this Agricultural Product Insurance program is to alleviate the decreasing in world agricultural product price transmission, therefore, the insurance would insure the indemnity to payback during the downturn. The expected outcome is helping the poor to getting out of the poverty trap, from the poverty trap multiple equilibria theory, the poor could be trapped or fall into the trap due to price shock, with the insurance program, the shock impact can be minimised.

## **VI. Potential challenge**

However, there are some potential challenges that we need to think through, and carefully when launch the program.

### **i) Accessibility to water conflict with premium charge**

With difference degree of accessibility to water or irrigation system, the premium charge should also be different. Those who expose to more risk such as farming in the landscape far from water resource, tend to be poor farmers and trapped in the poverty, i.e. our main target group, however, this is the group that suppose to pay higher premium. In order to encouraging them to buy the insurance, the premium charge should not be too expensive that they cannot effort one.

Suggestion for this conflict should be charging the premium according to the number of cropping per year. Higher number of cropping per year, higher chance that the world price of agricultural can drop, therefore these high income farmers should pay more premium for more frequent cropping per year, regardless of accessibility to water.

**References:**

Adeyinka, A, Krishnamurti, C, Maraseni, T & Chantarat, S. 2013, 'Viability of Weather Index Insurance in Managing Drought Risk in Australia' Actuaries Institute Actuaries Summit, 20-21 May 2013.

Chantarat, S, Pannangpetch, K, Puttanapong, N, Rakwatin, P, & Tanompongphandh, T 2013, 'Index-Based Risk Financing and Development of Natural Disaster Insurance in Developing Asian Countries', *ERIA Discussion Paper* 2013-09.

Cole, S, Gine, X, Tobacman, J, Topalova, P, Townsend & Vickery, J. 2010, 'Barriers to Household Risk Management: Evidence from India', *Policy Research Working Paper 5504*, The World Bank.

Granger, C. W. J.; Newbold, P. 1974. "Spurious regressions in econometrics". *Journal of Econometrics* 2 (2): 111–120.

Ghoshray, Atanu, 2011. "Underlying Trends and International Price Transmission of Agricultural Commodities," ADB Economics Working Paper Series 257, Asian Development Bank.

Mahul, O, Stutley CJ. 2010, Government Support to Agricultural Insurance: Challenges and options for developing countries. *The World Bank*. Washington, D.C.

Siam Intelligence Unit (2009). "TDRI's comments on the market distortion and reduction of competition of the rice mortgage program". Available at <http://www.siamintelligence.com/tdri-to-criticise-rices-pawn-policy/>. Retrieved on 10 April 2014. (in Thai)

Trairatvorakul, P. 1984. 'The effects on income distribution and nutrition of alternative rice price policies in Thailand' *International Food Policy Research Institute* (Washington, D.C.)

Vincent, SH & Glauber, JW. 2012, 'Agricultural Insurance in Developed Countries: Where Have We Been and Where Are We Going?' *Applied Economic Perspectives and Policy* (2012) volume 34, number 3, pp. 363–390.

Wenner, M & Arias, D. N.A, 'Agricultural Insurance in Latin America: Where Are We?' Asian Knowledge Centre for Mutual Insurance (ASKMI).

Wiboonpongse, A., Chaovanapoonphol, Y., & Battese, G. E. Inefficiency in Agricultural Markets: Asymmetric Rice Price Transmission in Thailand. *AEE Working Paper*, 2/2555. Retrieved April 20, 2014