

# How does informal institution affect policy performance? : Evidence from discrete choice experiment in Hanoi and Ho Chi Minh city

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## 1. Motivation of research

The study of informal institutions such as culture, norms and religious beliefs is hardly new in the development studies. It was started to be focused in development studies from the 1990s, and at present many researches about economics and culture exist. Especially, research about the relationship between economic growth and culture has been proliferating mainly in African studies.

Institutional research by Landes (1999) and Jean Philippe Platteau (2000) have emphasized the relevance of cultural endowment of societies to their institutional and economic development (Seidler, 2011). Many literatures followed which investigated the connection between culture, institutions and economic performance. Today the consensus is made as how North (2005) insisted; “institutional arrangements are the combination of formal constraints and informal rules”. This argument is derived from his Shared Mental Model; informal institution fostered by culture and/or norms affect each actor’s behavior, which result the different function of formal institution such as law and rule. This argument got enough attention in economics, and as a result, informal institution is said to have a significant role in development studies and/or policy analysis.

Nevertheless, they are not well studied in development studies and policy analysis. It is still the central topic of study in the field of only anthropology and comparative politics (Gretchen et al. 2003). The reason may be the lack of empirical research on the real policy analysis.

North insists that “institutional arrangements are the combination of formal constraints and informal rules”, but his work has not been followed by rigorous analyses under a specific culture. This lack of empirical evidences restricts our full understanding of the interplay between the informal institutions and policy performances.

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Without investigating these, research about cultures in development studies will remain incomplete.

For the above reasons, this paper aims to provide empirical evidences on the effects of informal institutions on the performance of formal institution. With this, we hope to shed more light on the importance of considering informal institutions in development studies.

In this research we will take the Vietnamese safety food certification as an example of the formal institution and examine whether its performance varies according to cultural aspects or informal institutions. Especially I focus on how the performance differs in Hanoi and Ho Chi Minh city by utilizing experimental method.

## **2. Introduction**

### *Informal institution and certification system in information economics*

As income increases, consumers tend to consume high-quality food. Food safety is one of the most important dimensions in food quality, so that safety food with less chemical residuals has become more popular across the world (Xiaohua et al. 2014). Vietnam is no exception. Media, report and former researches suggest that demand for high-quality, especially healthy and safety food has been proliferating (Moustier, 2010).

In the market for safety food, information is delicate issue since consumers are not able to verify the food safety even after consumption (Meike et al. 2012). Safety food must be produced according to safety principle (Lusk et al., 2005). In information economics, product attributes like these are called credence attributes. Unlike search attributes, such as price or/and color, and experience attributes, such as taste, which consumer can evaluate prior and after consumption respectively, credence attributes involve a high level of uncertainty from consumer's perspectives (Meike et al. 2012). Thus, credence attributes create severe asymmetric information problems that may have devastating consequences for the related markets, reducing their trading volume or leading them to total collapse (Olivier et al. 2015), which is well known as "market failure."

In this context, the constitutive element of safety food production is the certification system (Zagata et al. 2012). Approval of conformity of production practices to formal standards transmits an important message to consumer about the quality and nature of products, since they cannot directly check this quality for themselves (Zagata et al. 2012). A huge amount of the recent researches have revealed that certification systems

actually convey information about production attributes and enhance safety attributes which result in the improvement of the food market.

However, most of the research is conducted in developed countries such as USA and/or European countries. While people may differ in consumer attitudes, and the institution underlying markets, the differences between developed countries and developing countries are expected to be much larger.

Whereas substantial support for government labeling of food safety concerns exists in developed markets, there are additional challenges in developing economies, because the formal institutions that would ordinarily carry out such activities may not be well-developed or may not be trustworthy in the eyes of the consumers making them less willing to pay for a governmental label (Ubilava et al. 2009). Thus, it is necessary to be extra cautious when examining consumer preference for safety attribute in developing economies. The research objective may also be different from those of developed economies.

Considering the situation of the formal institution in developing countries, it is appropriate to investigate other factors which convey the information about the safety attribute of products. In the vision of institutional research, informal institution such as culture, norms are as important as formal institution, which interact deeply with formal institution and/or also structure the market. Especially in developing countries, the role of informal institution is expected to be larger comparing to that of developed countries.

### *Safety vegetable and VietGAP in Vietnam*

Since Vietnam Doi moi policy which changed economic system from socialism to market economy, Vietnamese economy has been drastically grown. Along with the economic growth, demand for safety food is proliferating in Vietnam. However, pesticides and chemical use in production process is increasing year by year.

In such a way to enhance the safety, Vietnam government issued decree No.379 that established VietGAP as the main standard and guidelines for production of safe fruit and vegetables in 2008. The aim of VietGAP is to prevent and minimize the risk of hazard which occur during production, harvesting and post-harvest handling of agricultural production (Oleg et al. 2010). However, despite the attested preference for safety products in the public media, it appears that demand for 'safe vegetables' remains modest; consumers cannot purchase the safe foods, consumers are unaware of the availability of safe vegetables or do not know where they are sold (Pham et al., 2010). In addition, Pham (2010) also pointed out that the lack of enforced quality standards and

the absence of guaranteed quality indications on the product, encourages consumer's distrust of the origin of 'safe vegetables. Most importantly, other literatures insist that difficulties of Vietnamese safety food are results of the inadequate or even absent of systematic control even existence of VietGAP. Also according to my background survey in Hanoi from 40 consumers, consumers are not able to judge which vegetables are safe or not. Consumers can not trust the safety attributes even the vegetables, even those have a VietGAP label.

Incidentally, according to the result of background survey in Hanoi, people answered "when I want to purchase safe vegetables, I go to long-familiar vegetable shop" to the question "Where do you purchase safe vegetables?". In contrast, according to E-mail interview for a professor in Ho Chi Minh city said "people go to supermarket to purchase safe vegetables or VietGAP vegetables. Because vegetables in supermarket is more clean and safer than any shopping place".

Here a question arises; how does a consumer judge the safety attribute of vegetables under the VietGAP policy or in other words, what factors does a consumer utilize to judge the safety of vegetables and how and why does it differ between Hanoi and Ho Chi Minh city?

#### *Regionality differences between Mekong Delta and Red River Delta*

Vietnam is divided mainly into 3 regions according to cultural and environmental aspects; North part which has capital city Hanoi, middle part which has old capital city Hoi An, and South part which has the biggest city Ho Chi Minh city. Especially, the regionality in Red River Delta (RRD) area in north part and Mekong Delta (MD) area in South part are often compared according to the environment and historical difference.

In RRD area, the development has started more than 1000 years ago, from 13<sup>th</sup> and 15<sup>th</sup> century, the development rapidly progressed (Chou, 2005). In RRD, the arable land for agricultural use has become scarce from the early stage of development, and people faced a severe land shortage. In order to feed the growing population, farmers in the RRD adopted a very labor-intensive farming system to raise productivity of land without expanding the area. It is said that through this farming practice, in which people had to work very closely with each other, sense of equality became very important norm and the dense social relationship was nourished for the people in the RRD. In his theory of moral economy, Scott (1976) revealed that norm of equality and reciprocity have taken root, relationship between people based on trust norms and/or custom was fostered. In addition, in RRD area, as the proverb says "King's Law doesn't over the fence of village", the communities were not influenced by official law, but ruled by

norm and/or trust. It is so to speak “rule of people”. Hara (2002) named these feature “tightly structured society”.

By contrast, it is not much long since the development has started in MD area. In the past, most of part of MD area was frequently flooded, can't live and/or farm. However, after former colonial nation France built the bank along the Mekong river, development started. For this reason, notion of community is poor or even does not exist, the relation between people were mainly market-based such as transaction of products were fostered. Consequently, people needed to obey largely unified rule to smoothly conduct the transaction of products. It is so to speak “rule of law.” Hara (2002) named these feature “loosely structured society”.

Altogether, RRD area is said to be tightly structured society which implies that relationship between people are based on trust and/or norms and ruled by people. MD area is more loosely structured, and rule of law is more highly regarded.

### **3. Objective, hypothesis and contribution**

Given these backgrounds, we examine how these regional features, in other words, the informal institutions affect the VietGAP certification performance. In order to examine the aforementioned research question, the hypothesis of my research is as follows; the differences of informal institution derived from regionality in RRD and MD affect the consumer's judgement of safety attribute of food, which result different policy performance.

As contribution of this research, we suppose three aspect; discipline, new research idea on certification system, and VietGAP and Vietnamese policy discussion. For discipline, we will discuss how regionality or informal institution affect the policy performance as North and newly institutional economists insist. For certification research, we offer a new idea; how the certification research should include the effect of regionality. At last, for VietGAP certification system, policy function which is not revealed yet will be discussed.

### **4. Survey and data**

To reveal how consumers make purchasing decision of safety vegetable, present studies used qualitative and quantitative method of empirical consumer research. Because little previous knowledge concerning consumer attitudes towards certification labels is available in the literature, the research process began with a qualitative study

and focus group discussions (Meike et al. 2014). We then conducted a quantitative study with consumer choice experiments based on the findings of the initial qualitative study. Every survey was conducted in Hanoi and Ho Chi Minh city.

#### *Qualitative method*

First we conducted focus group discussion and open-ended survey. Five and forty safety vegetable consumers participated respectively. In each survey, two main research questions were asked. First is that how consumers consider the importance of vegetable safety. Second is that how consumers judge the vegetable safety when they purchase vegetable, and how VietGAP certification label contribute for it.

For first question, I asked criteria of purchasing vegetable. The most common answer in both Hanoi and Ho Chi Minh city is safety; 29 of 40 consumers answered safety, and second highest is freshness. In addition, I asked why the safety important. They answered that Vietnamese vegetable is dangerous due to too much chemical usage. These result implies that sever vegetable perceived risk among consumers and demand for safety vegetable.

For second question, I asked the criteria of vegetable safety and how they judge it. They answered that the most important dimension of vegetable safety is less chemical residual. This result is consistent with the former question, consumers are suspicious of vegetable quality and chemical usage. However, more interestingly, consumers in Hanoi answered that judgement of vegetable safety is based on selling place. They only believe vegetable safety if they know the shopkeeper. On the other hand, consumer in Ho Chi Minh city answered the safety judgement is based on the certification and package (better package implies better distribution process).

#### *Quantitative method*

In the quantitative survey, choice experiment and structured interviews were conducted with vegetable consumers in January 2016 under the cooperation of Institute of Vietnamese Studies and Development Science, Vietnam National University, Hanoi. This survey was conducted under research project of Institute of Development economics, Japan External Trade Organization<sup>ii</sup>.

The survey was conducted in Japanese supermarket, AEON in both Hanoi and Ho Chi Minh city; AEON Long Biên and AEON Tân Phú Celadon. The participants were ap-

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<sup>ii</sup> Research project of “*Trade Standards Compliance in Asia: Analysis of Border Rejection Data and Implications for Policy Making*”

proached in front of supermarkets and were screened with age. The participants have to be older than 20 years old. The total sample size is 100 in Hanoi and 101 in Ho Chi Minh city. In order to avoid the selection bias between Hanoi and Ho Chi Minh city, the date and time is fixed on Friday, Saturday and Monday. We chose customers randomly and asked them to fill in the questionnaire written in Vietnamese with supports of enumerator.

### *Choice Experiment*

Choice-based conjoint analysis is a stated preference value revelation technique that is based on allowing consumers to make choices from a set of experimentally designed products defined by a bundle of a product's attributes (Louviere, 2007). In choice experiments, participants are asked to make a choice out of a set of different product alternatives with different attribute levels (Lusk et al. 2004). One advantage of this method is that choice experiments are more similar to a real purchasing situation compared to other methods for analyzing the willingness to pay (WTP) (e.g. contingent valuation, auctions) (Meike,2012). WTP measures can be determined if price is one of the systematically varied attributes (Hensher et al., 2005; Louviere et al., 2000). WTP measures are inferred from participants' choices: the method is thus an indirect method for measuring WTP (Volckner, 2006).

The choice experiments were conducted with tomatoes. Tomatoes were chosen as the experimental vegetable because most of tomatoes consumed in Vietnam are produced domestically and because the price is stable for all year round. Furthermore, tomatoes are bought in Kg unit because a substantial amount of tomatoes are used in daily meal, which makes it easier for consumers to compare the unit price.

A choice set consists of price and other two alternative attribute levels (Table1): price, VietGAP label and familiar store assurance. Price attribute has 4 levels, from 20.000 dong to 44.0000dong. The price is set considering market price in both Hanoi and Ho Chi Minh city. VietGAP attribute has two levels; assured or not assured. The latter two attributes are also included based on our observation in our qualitative survey conducted before the main survey. We found that familiarity of the market and third-party safety assurance are also important factors for consumers when they make a purchase decision. Thus, we assume that safety assurance by VietGAP and this store assurance are considered as product attributes by consumers.

Four different price levels were tested (Table 1) that systematically varied across the labels and store assurance according to an orthogonal fractional factorial design with 32 different choices. The sample was divided into 16 choice sets such that each participant completed all the 16 choice sets. Figure 1 shows one example of choice sets.

### *Structured interview*

Besides the choice experiment, each participant was interviewed with structured questionnaire. This structured questionnaire consisted of 5 parts including socio-demographic characteristics, which are described in Table 2.

First, participants were asked to answer the three knowledge quiz. Each question has four choices and is scaled from 1 to 4 point. The sum of the scores of this part is assumed to represent the participant's knowledge level (see Table 3). Second, participants were shown statement about vegetable risk and benefit of safety vegetable. They choose one choice from strongly agree, somewhat agree, somewhat disagree and strongly disagree against the statements. Each answer is scaled from 1 to 4 points. The sum of the scores of this part is assumed to represent the participant's vegetable risk perception and safety vegetable perception (see Table 4).

Third, data about perception regarding VietGAP and familiar store and its assurance were collected. These measure how much they believe the quality and inspection of each VietGAP and familiar store (see Table 5). At last, participants were asked values regarding consciousness of law and trust. These data were collected in consideration of above mentioned regionality of Mekong delta and red river delta. The results of these are assumed to represent the cultural values of participants (see Table 6).

## **5. Theoretical framework and estimation model**

In order to develop framework for our study, we rely on previous researches about consumer behavior regarding food safety. The assumption of choice experiment is Random Utility Theory (RUT) which assumes that consumers are rational and choosing products to maximize their utility (Mas-colell et al.1995). Following the research by Rose et al. (2014), we rely on Lancaster's theory of quality. Lancaster's theory presents that consumers derive utility not from the good directly but instead from the characteristics that the good possesses (Fralely. 2009). This theory provides an ideal framework for describing demands for quality differentiated products because it deals explicitly with a population of heterogeneous consumers who make mutually exclusive choices from a set of substitutable goods, and offers the possibility to explore how the choice of product-characteristic combinations is influenced by attitudes, social norms, and perceived behavioral control (Giuseppe et al. 2012).

We assume that consumer  $i$  derives utility from a basket of attributes of a tomato. Assuming that his/her utility given one specific product is made up of both observable component  $V_{ij}$  and unobservable component  $\varepsilon_{ij}$ , the utility of consumer  $i$  given by to



mato attribute  $j$  can be expressed as follows:

$$U_{ij} = V_{ij} + \varepsilon_{ij} \quad (1)$$

where  $U_{ij}$  is the indirect utility function for consumer  $i$  by  $j$ th alternative in the choice scenario. In this framework, a consumer chooses a particular type of tomato  $j$  if he/she expects to derive the highest utility over the other alternatives. The probability of selecting a tomato alternative  $j$  is given by:

$$\Pr(j \neq f \forall \in N) = \Pr(\beta_1 X_{j1} + \beta_2 X_{j2} + \dots + \beta_n X_{jn} + \varepsilon_j \geq \beta_1 X_{f1} + \beta_2 X_{f2} + \dots + \beta_n X_{fn} + \varepsilon_f) \quad (2)$$

where  $N$  is the total set of alternative of tomatoes available to consumers.  $X_{jn}$  is the  $n$ th attribute for alternative  $j$  and  $\beta_n$  is a vector of parameters associated with the  $n$ th attribute of the  $j$ th alternative. The underlying assumption is that the random utility ( $U_{ijt}$ ) of consumer  $i$  with the utility of attribute  $j$  in choice set  $t$  has heterogeneous preferences.

Recent literature suggests that every consumer has heterogeneous preference. Therefore, employing a model that allows heterogeneous preference is appropriate (Nicole et al. 2010). Random Parameter Logit (RPL) model is a versatile expansion of a conditional logit model. The key advantages of a mixed logit model are, first, that it allows incorporation of taste heterogeneity with the estimation of random parameters instead of fixed-point parameters (Lim et al. 2012). Second, that the RPL model does not exhibit the restrictive Independence of Irrelevant Alternatives (IIA) assumption (Train, 2003). Thus, the data collected in the quantitative survey is analyzed with (RPL) model.

Three specifications of the RPL model are estimated. The first only includes tomato's choice specific attributes; price, VietGAP and store.

$$V_j = \beta_1 Price + \beta_2 VietGAP + \beta_3 Store + \varepsilon \quad (3)$$

The second specification of the model included individual characteristics regarding vegetable perception and area dummy which takes 1 for Hanoi in interaction with tomato's attributes.

$$V_j = \beta_1 Price + \beta_2 VietGAP + \beta_3 Store + \beta_4 VietGAP \cdot Knowledge + \beta_5 VietGAP \cdot Risk$$

$$\begin{aligned}
& +\beta_6 \text{VietGAP} \cdot \text{Safety} + \beta_7 \text{VietGAP} \cdot \text{VietGAP\_Percep} + \beta_8 \text{VietGAP} \cdot \text{Area} \\
& +\beta_9 \text{Store} \cdot \text{Risk} + \beta_{10} \text{Store} \cdot \text{Safety} + \beta_{11} \text{Store} \cdot \text{Store\_Percep} + \varepsilon
\end{aligned} \tag{4}$$

The third specification of the model adds cultural values variables, consciousness of law and trust in interaction with product attributes to the second model.

$$\begin{aligned}
V_j = & \beta_1 \text{Price} + \beta_2 \text{VietGAP} + \beta_3 \text{Store} + \beta_4 \text{VietGAP} \cdot \text{Knowledge} + \beta_5 \text{VietGAP} \cdot \text{Risk} \\
& +\beta_6 \text{VietGAP} \cdot \text{Safety} + \beta_7 \text{VietGAP} \cdot \text{VietGAP\_Percep} + \beta_8 \text{VietGAP} \cdot \text{Area} \\
& +\beta_9 \text{Store} \cdot \text{Risk} + \beta_{10} \text{Store} \cdot \text{Safety} + \beta_{11} \text{Store} \cdot \text{Store\_Percep} + +\beta_{12} \text{VietGAP} \cdot \text{Law} \\
& +\beta_{13} \text{VietGAP} \cdot \text{Trust} + \beta_{14} \text{Store} \cdot \text{Law} + \beta_{15} \text{Store} \cdot \text{Trust} + \varepsilon
\end{aligned} \tag{5}$$

These estimation models reveal consumer's preference regarding tomato attributes and what consumer's attributes including cultural values affect it. A complete definition of all the variables along with their respective crosses can be obtained from Table 3, 4, 5, and 6.

Parameter estimates from a random utility model are difficult to interpret due to the noncardinal nature of utility (David 2014). Therefore, mean WTP estimates for the RPL model are calculated as the negative ratio of the estimated VietGAP or Store attribute coefficient to the price coefficient. The result from this WTP estimation provides additional WTP comparing tomatoes with or without VietGAP or store assurance.

## 6. Estimation result and findings

### *Hanoi sample and Ho Chi Minh city sample*

Table 7 shows the estimation result of RPL. We have three sample set usage; Hanoi sample, Ho Chi Minh city sample and joint sample (Hanoi sample plus Ho Chi Minh city sample).

For all sample, model 1 is consistent in the result. As former researches suggest, the price has statistically significant negative estimated coefficient and VietGAP has positive estimated coefficient. More interestingly, familiar store assurance has also statistically significant and positive estimated coefficient. This result implies that consumers in Vietnam perceive store familiar to them provide better quality vegetable.

In model 2, the result is slightly different between Hanoi and Ho Chi Minh city. Among the interaction terms with VietGAP variables, only one is statistically significant in Hanoi, while all interactions are statistically significant in Ho Chi Minh city. On the other hand, among the interaction terms with familiar store variables, all of them are statistically significant and positive in Hanoi while only one is in Ho Chi Minh city.

The only statistically significant interaction VietGAP · VietGAP perception in Hanoi and Store · Store perception in Ho Chi Minh. In addition, the coefficients of some interactions (VietGAP · knowledge/safety vegetable perception in Hanoi, and store · vegetable risk perception/safety vegetable perception) are insignificant and negative. This result implies that consumers who trust the quality of VietGAP or familiar store assurance are likely to choose it both in Hanoi and Ho Chi Minh city. However, general consumers who care the quality of vegetable in Hanoi (Ho Chi Minh city) are not likely to choose VietGAP (familiar store assurance).

In model 3, the result remarkably shows the similar regional difference between Hanoi and Ho Chi Minh city as model 2. The additional variables, trust and consciousness of law in interaction with VietGAP and familiar store assurance is statistically significant in all samples. Consciousness of law in interaction with VietGAP has a positive coefficient while in interaction with familiar store assurance has a negative coefficient. This result implies that a consumer who is more conscious of law tends to choose VietGAP certified vegetable, but tends not to choose familiar store vegetable. On the other hand, a consumer who trusts other people tends to choose vegetable with familiar store assurance.

### *Joint Sample*

The result of above mentioned variable is consistent with the result of Hanoi and Ho Chi Minh city sample. However, Joint sample has Area dummy variable additionally. In model 2, the Area dummy in interaction with VietGAP is statistically significant with negative coefficient while in interaction with familiar store assurance is positive. This shows that a consumer in Hanoi is likely to purchase familiar store vegetable but not likely to purchase VietGAP certified vegetable while the purchasing behavior is totally the opposite in Ho Chi Minh city.

The area dummy in model 2 represents various kinds of characteristic of each area including consciousness of law and trust. Thus, in order to examine what these area dummies actually represent, we add those cultural values variables in Model 3, interacted with VietGAP and familiar store dummies. We find that while the interaction terms with the area dummies become insignificant, those interaction terms with VietGAP and familiar store dummies with these cultural variables become significant. By adding the 2 cultural values variables, the effect of those are absorbed from Area dummy, and in model 3, the area dummy interaction with VietGAP and familiar store assurance attributes turned to statistically insignificant. This strongly implies that the different purchasing behavior between Hanoi and Ho Chi Minh city is greatly

caused by its cultural values difference.

### *WTP*

The 95% confidence interval (CI) of WTP was estimated using the parametric bootstrapping technique (PBT) proposed by Krinsky and Robb (1986) using 1,000 draws from a multivariate normal distribution described using the coefficients and variances obtained from the model. This method produces similar results to those obtained by predicting the standard error using the delta method, but it relaxes the assumption that the WTP is asymmetrically distributed (Hole 2007). The estimated mean and 95% CI of WTP for model 1 attributes are shown in Table 8.

As assumed, additional WTP for VietGAP is higher in Ho Chi Minh city and familiar store assurance is higher in Hanoi. Consumers in Hanoi are willing to pay 179% higher for VietGAP tomato while consumers in Ho Chi Minh city is willing to pay 323% higher. On the other hand, consumers in Hanoi are willing to pay 269% higher for familiar store assurance while consumers in Ho Chi Minh city are willing to pay 67%. Joint sample shows that consumers are willing to pay higher for VietGAP (VietGAP=260%, familiar store assurance=171%)

## **7. Implication**

### *VietGAP*

First, this study provides current status of consumer attitude regarding food safety and its purchasing behavior. Food safety is becoming more and more important for vegetable market in Vietnam. Consumers are concerned of chemical usage of vegetable, and demand for safety vegetable is proliferating. Vietnam government established VietGAP as main standard and guideline for safety food production. VietGAP is expected to convey information about safety and nature of product and enhance the safety food purchase. However, qualitative survey revealed that in Hanoi, VietGAP is not perceived as standards for judgement by consumers, consumers perceive well-known and familiar store and its assurance as standards for safety instead.

Also, result of choice experiment supports the result of qualitative survey. Consumers in Hanoi are less willing to pay for VietGAP certified tomato while they are willing to pay more on familiar store assured tomato. Moreover, Consumers in Hanoi are not likely to purchase VietGAP tomato.

This finding may be needed to be considered in VietGAP and other policy regarding food safety. Because the cultural background and market mechanism has large regional

differences due to historical condition, how people perceive safety attribute may differ according to the location. Especially in Hanoi, because people's custom is an important factor, considering such cultural characteristics in policy making is highly important.

Second, this study provides new viewpoint in certification research. The result revealed that certification performance may be affected by cultural aspects, in other words, regionality. As income increases, consumers tend to consume safety food in developing countries such as Vietnam. Considering the lack of formal policy which is expected to convey information about safety to consumers and informal institutions, this viewpoint will be important for policy makers.

At last, this study showed that the so-called informal institution does affect policy performance by analyzing VietGAP certification policy. This strongly suggests that the informal institutions affect the function of formal institution, so that it is needed to be considered in development studies and/or policy analysis. This is consistent with how North and newly institution economics suggest. This study provided evidence to support their idea by experimental research.

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Table 1: Attributes and attribute levels of experimental tomato

Product attribute	Attribute level
1. Price	20.000dong/kg, 28.000dong/kg 36.000dong/kg, 42.000dong/kg
2. VietGAP	Assured, Not assured
3. Familiar shop assurance	Yes, No


Figure 1: A demonstration example of choice sets in choice experiment

13. Which tomato do you want to buy? Or you don't want to buy neither?

Please check your answer.

I want to buy the left tomato   
  I want to buy the right tomato   
  I don't want to buy neither


Price : 42,0000dong/kg



Familiar store you personally know shopkeeper. And also safety assurance from shopkeeper selling place

VietGAP attached

Price : 20,0000dong/kg



store you don't personally know shopkeeper

VietGAP not attached

selling place

Table 2: Summary Statistics of Respondents

Categorical variable	Hanoi (N=100)			Ho Chi Minh city (N=101)			integrate (N=201)			T test
	Freq(%)	Mean	Std. Dev	Freq(%)	Mean	Std. Dev	Freq(%)	Mean	Std. Dev	
<b>Gender</b>		0.33	0.47		0.287	0.452		0.308	0.462	3.341***
1=Male	33			28.71			30.85			
0=Female	67			71.29			69.15			
<b>marriage</b>		0.9	0.3		0.485	0.500		0.692	0.462	38.547***
1=Married	90			48.51			69.15			
0=Not married	10			51.49			30.85			
<b>Child under 11 years old</b>		0.61	0.487		0.218	0.413		0.413	0.492	37.947***
1=Have	61			21.78						
0=Don't have	39			78.22						
<b>Age</b>		37.42	10.367		35.505	13.314		36.458	11.976	6.3224***
<b>Education</b>		3.8	1.697		3.901	1.891		3.851	1.798	-1.73**
0=No education	2			2.97			2.49			
1=Elementary school	4			8.91			6.47			
2=Middle school	18			15.84			16.92			
3=High school	31			19.8			25.37			
4=Training school	5			4.96			4.98			
5=College	13			15.84			14.43			
6=University	27			30.69			28.85			
7=Master course	0			0.99			0.5			
<b>Breadwinner</b>		0.54	0.498		0.455	0.498		0.498	0.500	6.313**
1=Yes	54			45.54			49.75			
0=No	46			54.46			59.25			
<b>Born and grow in this city</b>		0.72	0.449		0.505	0.500		0.612	0.487	17.747***
1=Yes	72			50.5			61.19			
0=No	28			49.5			38.81			
<b>Main vegetable shop</b>		1.76	0.618		1.337	0.634		1.547	0.661	27.925***
1=supermarket	34			75.25			54.73			
2=market	56			15.84			35.82			
3=vegetable shop	10			8.91			9.45			
<b>Main safe vegetable shop</b>		1.88	0.962		1.119	0.451		1.498	0.841	38.878***
1=supermarket	53			93.07			73.13			
2=market	6			1.98			3.98			
3=vegetable shop	41			4.95			22.89			
<b>Familiar vegetable store</b>		0.65	0.477		0.634	0.482		0.642	0.480	0.905
1=Yes	65			63.37			64.18			
0=No	35			36.63			35.82			
<b>Household income</b>		1.64	0.742		1.713	0.813		1.677	0.779	-2.957***
1=less than 16million dong	52			51.49			51.74			
2=15million~20million dong	32			25.74			28.86			
3=more than 21million dong	16			22.77			19.4			
<b>Currently have a job</b>		0.83	0.375		0.802	0.399		0.816	0.388	3.155***
1=Yes	83			80.2			18.41			
0=No	17			19.8			81.59			
<b>Job type</b>		2.65	1.675		2.901	2.047		2.776	1.876	-5.684***
0=No job	17			19.8			18.41			
1=Business man	10			8.91			9.45			
2=Self employee	21			18.81			19.9			
3=Craft making	6			1.98			3.98			
4=Factory	35			29.7			32.34			
5=Government	11			5.94			8.46			
6=Other	0			14.85			7.46			

\*\*\* = significant at 1%, \*\* = significant at 5%, \* = significant at 10%

Table 3: VietGAP knowledge

Questions and alternative	Hanoi			Ho Chi Minh city			Integrate			T test
	Freq(%)	Mean	Std.Dev	Freq(%)	Mean	Std.Dev	Freq(%)	Mean	Std.Dev	
<b>Do you know what VietGAP is?</b>		2.94	0.998		3	0.98		2.975	0.989	-2.366***
4=I completely know it	33			35.64			34.33			
3=I knew it somewhat	42			42.57			42.29			
2=I did'nt know it somethat	11			8.91			9.95			
1=I completely did'nt know it	14			12.87			13.43			
<b>Have ever you buy VietGAP food?</b>		3.15	1.17		3.316	1.116		3.233	1.119	-6.027***
4=Yes	55			67.33			61.19			
3=May be yes	21			12.87			16.92			
3=May be no	8			3.96			5.97			
1=No	16			15.84			15.92			
<b>Did you know that VietGAP food basically mean the non- use of prohibited chemicals and fertilizer for production periods?</b>		3.15	0.909		3.257	0.92		3.203	0.921	-4.158***
4=I completely know it	41			51.49			46.27			
3=I knew it somewhat	42			30.69			36.32			
2=I did'nt know it somethat	8			9.9			8.96			
1=I completely did'nt know it	9			7.92			8.46			
<b>Total score</b>		9.23	2.66		9.623	2.606		9.427	2.642	-5.586***

\*\*\* = significant at 1%, \*\* = significant at 5%, \* = significant at 10%

Table 4: Vegetable risk perception and safety vegetable perception

Questions and alternative	Hanoi			Ho Chi Minh city			Integrate			T test
	Freq(%)	Mean	Std.Dev	Freq(%)	Mean	Std.Dev	Freq(%)	Mean	Std.Dev	
<b>When I'm eating conventional vegetable, I think I'm exposed high risk</b>		3.45	0.92		3.623	0.768		3.537	0.852	-8.495***
4=I completely agree	67			76.24			71.64			
3=I somewhat agree	19			13.86			16.42			
2=I somewhat disagree	6			5.94			5.97			
1=I completely disagree	8			3.96			5.97			
<b>I really care what I eat.</b>		3.68	0.705		3.93	0.29		3.805	0.552	-18.141****
4=I completely agree	78			94.06			86.07			
3=I somewhat agree	1			4.95			10.45			
2=I somewhat disagree	2			0.99			1.49			
1=I completely disagree	4			0			1.99			
<b>I accept the risks of eating no-safety vegetable</b>		3.08	1.074		3.306	0.992		3.194	1.04	-8.443***
4=I completely agree	51			63.37			57.21			
3=I somewhat agree	17			9.9			13.43			
2=I somewhat disagree	21			20.97			20.9			
1=I completely disagree	11			5.94			8.46			
<b>total score</b>		10.21	1.946		10.9	1.324		10.557	1.698	-16***
<b>I can have substantial positive impact on my health by purchasing certain kind of products</b>		2.81	1.205		2.306	1.166		2.557	1.212	15.665***
4=I completely agree	40			18.81			29.35			
3=I somewhat agree	26			31.68			28.86			
2=I somewhat disagree	9			10.89			9.95			
1=I completely disagree	25			38.61			31.84			
<b>I believe safe vegetable is good for my health.</b>		3.71	0.652		2.861	0.508		3.786	0.589	-10.232***
4=I completely agree	80			91.09			85.57			
3=I somewhat agree	13			5.94			9.45			
2=I somewhat disagree	5			0.99			2.99			
1=I completely disagree	2			1.98			1.99			
<b>I believe safe vegetable have higher quality than conventional vegetable</b>		3.81	0.542		2.851	0.533		3.83	0.538	
4=I completely agree	87			91.09			89.05			
3=I somewhat agree	8			4.95			6.74			
2=I somewhat disagree	2			1.98			2.99			
1=I completely disagree	1			1.98			1.49			
<b>Total score</b>		9.32	1.64		10.029	1.619		10.174	0.721	-2.831***

\*\*\* = significant at 1%, \*\* = significant at 5%, \* = significant at 10%

Table 5: Perception regarding VietGAP and familiar store assurance

Questions and alternative	Hanoi			Ho Chi Minh city			Integrate			T test
	Freq(%)	Mean	Std.Dev	Freq(%)	Mean	Std.Dev	Freq(%)	Mean	Std.Dev	
<b>I believe that VietGAP vegetable is safer than conventional vegetable.</b>	54	3.33	0.861		3.851	0.407		3.592	0.721	-29.27***
4=I completely agree	30			87.13			70.65			
3=I somewhat agree	11			10.89			20.4			
2=I somewhat disagree	5			1.98			6.47			
1=I completely disagree							2.49			
<b>I have a great trust in the standards behind the VietGAP.</b>	48	3.21	0.8978		3.871	0.363		2.542	0.759	-36.882***
4=I completely agree	30			88.12			68.16			
3=I somewhat agree	17			10.89			20.4			
2=I somewhat disagree	5			0.99			8.96			
1=I completely disagree							2.49			
<b>I have a great trust in the inspection system behind the VietGAP.</b>		3.13	0.955		3.287	0.836		3.487	0.817	-37.513***
4=I completely agree	47			86.14			66.67			
3=I somewhat agree	25			11.88			18.41			
2=I somewhat disagree	22			1.98			11.94			
1=I completely disagree	6			0			2.99			
<b>Total score</b>		9.69	2.489		11.495	0.792		3.358	0.804	-35.21***
<b>I believe that the vegetable sold at the familiar shop I always go to buy safe vegetable is safer than</b>		3.42	0.802		3.297	0.802		3.358	0.804	6.568***
4=I completely agree	58			47.52			52.74			
3=I somewhat agree	30			38.61			34.33			
2=I somewhat disagree	8			9.9			8.96			
1=I completely disagree	4			3.96			3.98			
<b>I trust the quality of safe food sold at the familiar shop</b>		3.4	0.761		3.158	0.792		3.278	0.786	13.815***
4=I completely agree	53			36.63			44.78			
3=I somewhat agree	38			46.53			42.29			
2=I somewhat disagree	5			12.87			8.96			
1=I completely disagree	4			3.96			3.98			
<b>I trust the quality inspection of the familiar shop I always buy a safe food.</b>		3.46	0.78		3.287	0.836		3.373	0.813	9.188***
4=I completely agree	60			47.52			53.73			
3=I somewhat agree	30			39.6			34.83			
2=I somewhat disagree	6			6.93			6.47			
1=I completely disagree	4			5.94			4.98			
<b>Total score</b>		10.31	2.12		9.732	2.213		10.019	2.132	11.85***

\*\*\* = significant at 1%, \*\* = significant at 5%, \* = significant at 10%:

Table 6: Values regarding consciousness of law and trust

Questions and alternative	Hanoi			Ho Chi Minh city			Integrate			T test
	Freq(%)	Mean	Std.Dev	Freq(%)	Mean	Std.Dev	Freq(%)	Mean	Std.Dev	
<b>To achieve the better life and to smooth business, the most important thing is to follow the law</b>		3.03	1.13		3.851	0.552		3.442	0.981	35.914***
4=I completely agree	51			91.09			71.14			
3=I somewhat agree	16			5.94			10.95			
2=I somewhat disagree	18			0			8.96			
1=I completely disagree	15			2.97			8.96			
<b>In order to have better life and business, making a good law is more important than establishing a good relationship.</b>		2.92	0.986		3.564	0.723		3.243	0.922	28.885***
4=I completely agree	35			66.34			50.75			
3=I somewhat agree	32			27.72			29.85			
2=I somewhat disagree	23			1.98			12.44			
1=I completely disagree	10			3.96			6.97			
<b>The law is most important thing to establish good society.</b>		3.02	1		3.782	0.607		3.402	0.951	-36.559***
4=I completely agree	43			85.15			64.18			
3=I somewhat agree	25			10.89			17.91			
2=I somewhat disagree	23			0.99			11.94			
1=I completely disagree	9			2.97			5.97			
<b>Total score</b>		8.95	2.88		11.207	1.736		10.084	2.633	-36.186***
<b>I can trust people I know personally.</b>		3.48	0.754		3.039	0.9		3.258	0.895	21.941***
4=I completely agree	60			33.66			46.77			
3=I somewhat agree	32			45.54			38.81			
2=I somewhat disagree	4			11.88			7.96			
1=I completely disagree	4			8.91			6.47			
<b>I can live well by trusting people</b>		3.51	0.655		3.099	0.938		3.303	0.836	20.643***
4=I completely agree	58			39.6			48.76			
3=I somewhat agree	37			40.59			38.81			
2=I somewhat disagree	3			9.9			6.47			
1=I completely disagree	2			9.9			5.97			
<b>I can trust the information given by people I know personally</b>		3.48	0.806		3.059	0.899		3.268	0.879	20.805***
4=I completely agree	64			34.65			49.25			
3=I somewhat agree	24			54.54			34.83			
2=I somewhat disagree	8			10.89			9.45			
1=I completely disagree	4			8.91			6.47			
<b>Total score</b>		10.5	1.947		9.207	2.213		9.85	2.182	26.667***

\*\*\* = significant at 1%, \*\* = significant at 5%, \* = significant at 10%

Table7: Random Parameter Logit model estimation with choice specific attributes and interaction

	Hanoi			Ho Chi Minh city			Joint		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
<b>Main effect</b>									
Price	-0.00*** (0.00)	-0.00*** (0.00)	-0.00*** (0.00)	-0.00*** (0.00)	-0.00*** (0.00)	-0.00*** (0.00)	-0.00*** (0.00)	-0.00*** (0.00)	-0.00*** (0.00)
VietGAP	2.60*** (0.33)	1.75*** (1.97)	-3.10** (1.80)	4.30*** (0.45)	4.66** (3.18)	-3.33 (3.36)	3.55*** 0.27	0.64** (-1.64)	2 (1.51)
Familiar store assurance	3.26*** (0.49)	3.14*** (1.95)	-1.52 (1.84)	0.99*** (0.24)	0.73** (2.55)	2.28 (2.94)	2.34*** (-0.25)	4.79*** (-1.57)	-1 (1.52)
<b>Interaction</b>									
VietGAP*VietGAP knowledge		-0.9 (0.10)	0.02 (0.09)		0.02** (0.11)	-0.15** (0.12)		-0.05** (-0.07)	-0.06* (-0.06)
VietGAP*vegetable risk perception		0.26 (0.18)	0.29 (0.15)		0.34*** (0.21)	0.24** (0.20)		0.18 (-0.12)	0 (0.10)
VietGAP*Safety vegetable perception		-0.36 (0.22)	0.09 (0.19)		-0.03** (0.18)	0.02 (0.17)		0 (-0.13)	0 (0.11)
VietGAP*VietGAP perception		0.28*** (0.11)	0.30* (0.13)		0.49*** (0.17)	0.20*** (0.20)		0.33*** (-0.08)	0 (0.10)
VietGAP*Area								-1.34*** (-0.43)	-0.74 (0.36)
VietGAP*Trust			-0.64*** (0.20)			-0.22* (0.12)			-0.36*** (0.10)
VietGAP*consciousness of law			0.54*** (0.12)			0.54*** (0.16)			0.42*** (0.08)
Familiar store*vegetable risk perception		0.36* (0.18)	0.36** (0.16)		-0.20 (0.18)	0.00 (0.16)		0.14 (-0.11)	0.21** (0.10)
Familiar store assurance*Safety vegetable perception		0.43** (0.24)	0.23* (0.19)		-0.07 (0.13)	-0.02 (0.15)		0 (-0.12)	0 (0.11)
Familiar store assurance*Familiar store perception		0.62*** (0.16)	0.22** (0.14)		0.33*** (0.10)	0.18 (0.11)		0.44*** (-0.09)	0.18* (0.09)
Familiar store assurance*Area								2.76*** (-0.45)	1.33 (0.36)
Familiar store assurance*Trust			0.57*** (0.19)			0.19** (0.11)			0.33*** (0.10)
Familiar store assurance*consciousness of law			-0.50*** (0.12)			-0.44*** (0.14)			-0.42*** (0.09)
Log Likelihood	-415.42	-388.08	-359.57	-389.32	-375.25	-357.53	-389.32	-771.63	-732.29
Number of observation		3200			3232			6432	

\*\*\* = significant at 1%, \*\* = significant at 5%, \* = significant at 10%:

Values in parentheses are standard error

Table8: Willingness to pay estimation from RPL model

Attribute	Hanoi		Ho Chi Minh city		Joint	
	Coef.	95%CI	Coef.	95%CI	Coef.	95%CI
VietGAP	35886*** (-6843)	24432, 47340	64748*** (9077)	46956, 82540	52033*** (5348)	41551 62516
Store assurance	53928*** (-8306)	37648, 702078	13503*** (4015)	5633, 21374	34272*** (4597)	25261, 43282

Willingness to pay (WTP) estimates are presented in Vietnam dong/Kg. Confidence intervals were obtained through simulation procedures

\*\*\* = significant at 1%, \*\* = significant at 5%, \* = significant at 10%

Values in parentheses are standard error