

# IBMIRC

The 7<sup>th</sup> International Business Management Research Conference

## Venue

The Faculty of Business Administration,  
Chiang Mai University, Chiang Mai THAILAND

Friday 24<sup>th</sup>, November 2017





The 7<sup>th</sup> International Business Management Research  
Conference

Venue: Faculty of Business Administration, Chiang Mai University,  
Chiang Mai, Thailand

Friday 24<sup>th</sup>, November 2017

Organized by Faculty of Business Administration, Chiang Mai University,  
Chiang Mai, Thailand

## Welcome Message from the Dean

The Faculty of Business Administration, Chiang Mai University proudly welcomes all participants of the 10<sup>th</sup> Business Management Research Conference (BMRC) and the 7<sup>th</sup> International Business Management Research Conference (IBMRC).

Once again academic experts, businesspeople, graduate students and representatives from government agencies and private organizations join us to enrich knowledge and understanding through research exchange as well as building up networks for further academic cooperation. In addition, the forum provides a venue to publish academic papers.

The conference encompasses papers including nine themes which are: 1) Marketing Management 2) Organization Management 3) Financial Management 4) Human Resource Management 5) Accounting Management 6) Information Technology Business Management 7) Brand Management and Marketing Communication 8) Corporate Sustainability 9) Interdisciplinary Business Management oral presentation. This year distinguished guest speaker, Mr. Kreingkrai Kanjanapokin, Founder & Group CEO Index Creative Village Public Company Limited, the leader of ASEAN's one-stop-service creative marketing and world's 7<sup>th</sup> best creative events company (ranked by Special Events Magazine, USA) has kindly accepted our invitation to give a keynote lecture on "Innovation for Sustainable Development: Case Studies from INDEX Creative Village PLC."



(Associate Professor Dr. Siriwut Buranapin)

Dean of Faculty of Business Administration

Chiang Mai University

Chiang Mai, THAILAND

## Message from Editor-in-Chief

Every year, our Conference brings together academicians and researchers in the areas of business management and other related areas in order to disseminate knowledge and exchange the knowledge between academicians, researchers, as well as Master's and Doctorate students who are extending their studies on innovative knowledge.

For year 2017 we are proud to present the publication of the 10<sup>th</sup> and 7<sup>th</sup> volume of BMRC and IBMRC Conference Proceeding which is produced by the Conference Publications Committee of Faculty of Business Administration, Chiang Mai University, Chiang Mai THAILAND.

All BMRC and IBMRC Conference Proceeding articles are subject to a stringent process of review by members of our Editorial Advisory Board. Manuscripts are carefully accepted for possible inclusion in the Proceedings before being considered for final publication.

For the 10<sup>th</sup> BMRC and 7<sup>th</sup> IBMRC in the year 2017, the Faculty of Business Administration at Chiang Mai University proudly organized the events on November 24<sup>th</sup>, 2017. The events brought together around 100 delegates consisting of academic experts, businessmen, graduate students and representatives from both government agencies as well as private organizations. The conference encompasses manuscripts in various topics related to business management for today's context. We would like to express our sincere thanks to our stakeholders and the editorial boards as well as our delegates.

We would like to thank all the contributing authors for providing such a rich variety of outstanding research articles on a broad range of exciting topics.



(Associate Professor Dr. Narumon Kimpakorn)

Editor-in-Chief

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Faculty of Business Administration

Chiang Mai University, Chiang Mai, THAILAND

# The 7<sup>th</sup> International Business Management Research Conference

## Principle & Rationale

The vision of the Faculty of Business Administration at Chiang Mai University is to focus on enhancing the academic knowledge of business management. The Faculty encourages the creation and development of ongoing research to academic scholars and students. This would lead to the expansion of new knowledge in managing a business which can provide a benefit to the profession itself, the local community, and industries nationwide. The Business Administration Conference is one of the methods in disseminating knowledge by the Board of Administration.

Chiang Mai University has heeded to the importance of endorsing the development and propagation of knowledge. The effort is demonstrated in producing a channel to have participants from the private business sector, government institutions, and academic research centers to come together and exchange their experiences and ideas as well as collaborate on upholding the profession of business management. Under the provision of Chiang Mai University, the International Business Management Research Conference has continued on from 2011. The conference has received accolades from the participants of the seminar.

Therefore, it is the aim of the institution to strengthen the academic administration line in providing leadership and knowledge in business management. Moreover, the purpose of creating this forum is to disseminate knowledge in the business management. This is to stimulate a continuation of ideas being exchanged between academics, researchers, and students who are extending their studies on the master's and doctorate in business management and other related fields. The Faculty of Business Administration at Chiang Mai University is proud to hold the seventh annual international conference in "International Business Management Research" which will be held on November 24<sup>th</sup>, 2017.

**The 7<sup>th</sup> International Business Management Research Conference (I-BMRC) are focused on the theme:**

1. Monodisciplinary research include marketing, finance, accounting, human resources, organization management, production management, logistics management, and entrepreneurship. The research presented may be an innovation discovery in related academic disciplines or the application of theory or concept or business management approach to situations or problems, business sector, service industry and the agricultural sector.
2. Interdisciplinary research approach that focuses on integrating knowledge from the monodisciplinary subjects of business management with the other related disciplines to get a new tool or method.
3. Multidisciplinary research is composed of or combining several academic disciplines for Business Management or professional specialization in an approach to topics or problem such as information technology management, real estate management and marketing.

This conference is divided into two sessions (1) Academics and researchers' presentation and (2) consortium for graduate student.

### **The area for submit manuscript**

#### **1) Monodisciplinary**

- Brand Management research
- Marketing management research
- Consumer behavior management research
- Financial management research
- Accounting research
- Organizational management research
- Human resource management research
- Entrepreneurship development research

#### **2) Interdisciplinary**

- Cultural management research
- Tourism management research
  - Logistics management research
  - Innovation management research

- Marine business research
- Environmental management research
- Business administration for development and sustainability research

### **3) Multidisciplinary**

- Information technology management
- Organization management or real estate management projects
- Organizational communication research
- Corporate social responsibility research

### **4) Other related research topics**

## **Types of manuscript**

Types of manuscript divided into two type 1) Academic Paper and 2) Research Paper. People who interested in conference can submit a completed article which will be reviewed and selected by 2/3 experts to decide if the work meets with the conference requirements.

- Paper will publish in proceeding required to submit a full abstract only (English only) the length of the article should not exceed more than 15 pages for oral presentation
- For the delicate who wish to submit work their considering “Best Paper Award”, must select a series of presentations in oral presentation and submit a full completed paper to the conference committee only during the due date.

All articles will be considered by the experts in a confidential manner (double-blind review, which means that both the reviewer and author identities are concealed from the reviewers, and vice versa, throughout the review process.) The committees will be judging the “Best Paper Award” for the articles that are presented at the forum. The work must be in accordance with article quality criteria of the experts and the seen as unique, based on assessment ratings from the experts. Final decisions will be made by the Conference Committee.

Selected articles to be presented at the 10<sup>th</sup> National Business Management Research Conference (BMRC) and the 7<sup>th</sup> International Business Management Research Conference (IBMRC) will have the opportunity to be selected in three academic journals under the Thailand Regional Business Schools Network (TRBS NET): Faculty of Business Administration and Accountancy, Khon Kaen University Faculty of Management and Tourism, Burapha University and Faculty of Management Science, Prince of Songkla University.

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### Agenda 2017: BMRC & IBMRC

The 10<sup>th</sup> Business Management Research Conference

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8.30–9.00 hrs.	Registration ( <i>Upload Power Point file for presentation at registration desk</i> ) (Convention room at 6 <sup>th</sup> Floor BAB #2)
9.00–9.10 hrs.	Opening Ceremony by President of Chiang Mai University or representatives (Convention room at 6 <sup>th</sup> Floor BAB #2)
9.10–10.00 hrs.	Key Note Speaker “ <b>Innovation for Sustainable Development: Case Studies from INDEX Creative Village PLC.</b> ” By Mr. Kreingkrai Kanjanapokin , Founder & Group CEO Index Creative Village Public Company Limited (Convention room at 6 <sup>th</sup> Floor BAB #2)
10.00 – 10.15 hrs.	Lucky draw
10.15 – 10.30 hrs.	Coffee–Break (Convention room at 6 <sup>th</sup> Floor BAB #2)
10.30 –12.00 hrs.	Seminar presentation – Session 1 (divided into 4 rooms) (presentation 15 min. , Q&A 5 min./paper) <ul style="list-style-type: none"><li>- <u>Room 1</u> : BAB 2501 (5<sup>th</sup> Floor)</li><li>- <u>Room 2</u> : BAB 2502 (5<sup>th</sup> Floor)</li><li>- <u>Room 3</u> : BAB 2401 (4<sup>th</sup> Floor)</li><li>- <u>Room 4</u> : BAB 2402 (4<sup>th</sup> Floor)</li></ul>
12.00 –13.00 hrs.	Lunch (Convention room at 6 <sup>th</sup> Floor BAB #2)
13. 00 –14. 20 hrs.	Seminar presentation – Session 2
14. 20–14.40 hrs.	Coffee–Break (Convention room at 6 <sup>th</sup> Floor BAB #2)
14.40–16.00 hrs.	Seminar presentation – Session 3
16.00–16.30 hrs.	Announcement for “ <b>Best Paper Award</b> ” “ <b>Best Research Methodology</b> ” “ <b>Award Best Impact Award</b> ” (Convention room at 6 <sup>th</sup> Floor BAB #2)

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## FACTORS INFLUENCING ON PURCHASE INTENTION OF ORGANIC FOODS IN BANGKOK

*Tran PhanBich Ngoc\* and Nattapan Buavaraporn\*\****ABSTRACT**

Nowadays, the health and environmental problems from foods are the alert situation leading the raising in demand of using clean and safe foods, the remarkable tendency in Food Industry that is keeping increasing consumers in this niche market, especially in Thailand. Therefore, this study's target is to examine the factors that impact on buying organic foods in Bangkok as perceptions of organic foods to persuade consumer choices, moreover, Theory of Planned Behavior is applied in this study, which is the most popular theory in researching on concept of purchase intention that was improved by Ajzen in 1988. To signpost some of main factors that influence on intention through reviewing several prior theories, Attitude towards to Purchase Intention, Subjective Norm, Perceived Behavioral Control which are mentioned as three main factors impacting on people intention to use organic foods. In this research used sub-factors of three main factors as health consciousness, environmental awareness, personal norms, family norms, social norms, perceived affordability and perceived risk on purchase intention of organic food products to explore in more detail. To collect the data of research, a quantitative questionnaire was designed with 45 questions relating to the given factors and given away to over 400 consumers in Bangkok, Thailand and the result has collected 373 acceptable samples. The author examined data by SPSS 20 and AMOS 20 to analysis the figures and check the results of each section to answer the questions and conduct the objectives of this study. The consequence based on data analysis that shows the relationship among factors that are not really similar with the applied theory due to some reasons as selected sample, technology errors and etc. In addition, some recommendations based on marketing side as using more promotion and digital marketing as well as focusing on the hot issue to build good campaign for total quality management among department are given to support and take the advantages of organic food products to develop Thai food industry and raise the demand, awareness as well as sales

**Keywords:** Organic foods, Purchase Intention, Bangkok

**INTRODUCTION**

In recent years, with the massive growth in the demand of clean foods, especially nonchemical foods by the way there are growing in understanding the importance of daily foods for human health among some social groups going along with many news and reports released to show the dangerousness of the clean levels of foods in facts is in alert situation in these decades (Grunert & Juhl, 1995). In the latest study from Basha, Mason, Shamsudin, Hussain, and Salem in 2015, the growing tendency of consumer in health concern is buying Organic

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foods and using healthy products. The “Organic food” has accounted for increasing market shares in global food industry (Basha, Mason, Shamsudin, Hussain, & Salem, 2015). Especially, the target of Thailand in recent decades that they want to be the leader in agriculture, with the developing in organic food's field and Thai government is keeping promoting in researching and developing nonchemical products selling in domestic market as well as global trading. Regarding the data from Globaltrading and GreenNet, these websites have updated the figures of Thai consumption that show the inclination of Thai consumer. In the study of Dias, Schultz, Schuster, Talamini and Révillion in 2015, that has shown the reason why people tend to use organic food products increasingly and the mainly causes from the reputation of the quality and benefits, moreover people are paying more attention on their well-being, health and life standards (Hill & Lynchehaun, 2002). When people try to enhance their life quality, the standards of foods are required higher also. Based on the results of some researches that tried to answer questions whether customer will buy or how much satisfy when people use organic foods; and what are the factors that impact on the customer Purchase Intention, they are influenced by which external reasons or internal reasons?

Nowadays, in the modern research, Theory of Planned Behavior (TPB) is widely applied and proven for regulating the individual intention towards to the behavior, the intention is proposed to explain the factors that influencing behavior (Fielding, McDonald, & Louis, 2008). Regarding intention of buying organic foods, this study shows the factors impacting on the thinking or mindset of customers, the reasons may come from external things like social impacting, environmental problems, or perception of each person about the risks that they can get or the ability to buy the thing they want (Zanoli & Naspetti, 2002). Those are taken in account by TPB that have three mainly well-known causes as Attitude towards to Intention, Subjective Norm and Perceived Behavioral Control. Therefore, this study examines the relationship among three main factors with purchasing intention (PI) of organic food products in Thailand. In Thailand, nowadays they are remaining to be lack of knowledge and awareness in organic food products and the current customer are specific groups and small segmentation (Xie, Wang, Yang, Wang, & Zhang, 2015). This problems coming from the media communication between the producers and sellers, they are still shortage of investing in the images and medias for their products and make people trust in using even though Thai consumer are taking more attention on their health and standard of life right now. To examine the main factors and find out the outcomes of research in-depth, this study will explore the influences and provide the concept of Thai consumer. Relied on some earlier researches, this study has found out some variables and using research method to examine the relationship among variables

The foremost objectives of the study is relied on the topic to determine what the factors affecting on the consumer intention towards the purchase of organic food products.

The listing of comprehensive research objectives of this study:

- To examine the main factors and identify the sub-factors of TPB that influence the buying in term of Organic foods.
- To study the relationships among factors: Attitude, Subjective Norm (SN) and Perceived Behavioral Control (PBC) and purchase intention (PI) towards organic food products.

Another specific purpose is to develop the application of marketing strategies in Thailand's organic food industry.

## LITERATURE REVIEW

In the past, the first theory to examine in Customer 's Intention and Customer Behavior used TRA of Fishbein in 1960s. This theory was innovated to expand the aspect and adapt scale of study to the changing of customer behavior in recent decades by Ajzen and has become the most of applied theory used to explain the behavioral intention of customers – that is called Theory of Planned Behavior (TPB) (Manning, 2009). New theory believes that the individual intention is the psychology action and volitional thinking of that subject about anything and people can plan their own purpose before acting that are able to forecast based on the factors surrounding them and that factors changing the thoughts of that person in this theory (Tarkiainen & Sundqvist, 2005; Thøgersen, 2009 and Bui, 2015). Some former researches have provided the similar results that people are impacted by integrated explicit and implicit perceptions that depend on in the context of each individual perspective. Summary of some studies, the elaboration of TPB normally is assumed three main factors that influence on individual acceptances as Attitude towards to Intention, Subjective Norms and Perceived Behavioral Control (Ajzen, 1991). These elements help individual create concept in the thought and when the chance to make the action happen (Ittersum, 2001).

To develop the theory into many aspects as now, TPB has been changed and examined by some previous studies, as Ajzen and Fishbein in 2005 indicated that the attitude to predict the intention, for example that people who concern to the environment problem tending to use the eco-friendly products (Chen, 2009) or who have interesting in education, they will reach for the product related to eco-products. Thus, to research on intention based on TPB, this paper has to find out the main variables relating to the aspect deserving to examine (Fishbein & Ajzen, 2005). In the modern research, Customer Behavior is changing fast which makes harder to predict the Customer Intention. The research of Ajzen in 1991 specified that the both of motive and ability are impacted on intention. The vital values to predict the intention of human that can help every firms improve their own products or services, the activist can predict the phenomenon (Fielding, McDonald, & Louis, 2008; Thøgersen & O'lander, 2002; Bui, 2005), by the way the most important is taking into account the concepts that effects on the human as external and internal factors because each individual is easy to be influenced (Bamberg, 2003). According to the research of Conner and Sparks, this study has showed the formula to calculate the effect of variables on intention that depends on the weighted of each factors.

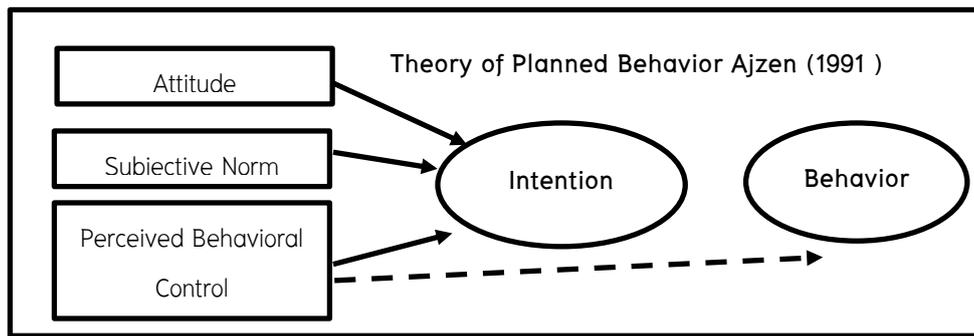


Figure 1. Theory of Planned Behavior Ajzen (1991)

## 1. Theory of Planned Behavior

### 1.1 Attitude

Attitude is normally the first element regarded by some previous studies, in term of psychology perspective, Attitude is defined as the feeling that people have a favorable or unfavorable to the issues in that circumstances, in concept of economic, by the way the attitude is one of function of emerging individual belief or consciousness such as the feeling of consumer to new products or the thought of the following concept can impact on their decision (Ajzen, 2005). Therefore, to understand the meaning of attitude that based on the context and condition (Padel & Foster, 2005) as this research focusing on exploring the relationship between attitude and Intention, and reviewing the customer intention in special aspect as organic foods. There are so many kinds of products examined and relating to this study as fast foods, health services, using e-commerce, dairy products, environmental issues (Gould, 1989). In term of green products, especially organic foods have been researched for long time ago and the upshots are also precious and honorable (Ueasangkomsate & Santiteerakul, 2016). As some of previous studies, the Health Consciousness is the main factors that impact on buying intention of customers, healthy foods as organic products have been taken in account of lifestyle and attitude towards to care of health situation, level of safety. In the research of Essoussi and Zahaf in 2008, that has shown the attitude of consumer on the organic foods affected by the awareness and knowledge concerning to environment. The hypothesis that shows a part of consumers who pay attention on the environment issues as the water pollution, destroyed land and etc. This research is assumed that these reason effecting on Attitude having latent variables represented by two sub-factors that are Health Consciousness and Environmental Awareness (Hair, 2009).

Hypothesis 1: Attitude has positive effect on Purchase Intention.

### 1.2 Subjected Norms (SNs)

People are influenced by ambient elements on the behavior intention, which are confirmed from several studies in the past and current time. Based on TPB, SN is the main second factor that is regarded as the external and internal elements as social pressure, family culture, environmental living which are influence on the individual perception and awareness about circumstance (Fishbein & Ajzen, 2005). To comprehend the meaning of PN, as

regard the study of Schwartz in 1977, PN is an interior and self-determination to perform a behavior (Schwartz, 1977). It is able to understand as feeling stemming from the way people react to a determined event, as regarded by Eide and Toft (2013): "Fear, Trust, Belief, Positive or Negative thinking" are from experience of individual and influence on the purpose towards to behavior of subject. According to Organic foods, from some previous researches, consumer will buy the product if they think that is good and believe in the quality of products from their knowledge and experience (Bertoldo & Castro, 2016). People are influenced of mindset by social pressure, Family norm is the belief relating to the culture, lifestyle of members, family create the environment surrounding individuals. In a family, members have similar actions and feeling in some cases. For example, consumer tend to buy organic foods because their parents like to eat clean foods. Some previous studies that have shown, there is a large amount of people said they want to buy organic foods because their family have arrival babies, patents, vegetarian and. As an external factors that have studied in many field – Social norm, people seem to be influenced by social network as working environment, schools, hospitals, groups, friends, etc (Baker, Donthu, & Kumar, 2016). Consumers will have high trusting level and follow the sharing from others who are their acquaintances. Moreover, they also attracted by the images of well-known and high position people in their community as singers, artists, doctors, teachers. In study of Bonne and Verbeke (2006) has shown that people user observable skills to see what people surrounding them do and then react similar when they meet same situation. In research of Van Doorn and Verhoef in 2011, it has shown that people have trend to buy organic foods because their friends have already used and given good reviews.

**Hypothesis 2: Subjective Norms has positively affects on Purchase Intention.**

### **1.3 Perceived Behavior Control (PBC)**

Individual perception is defined as the capacity of human to act and/or react the purposeful events (Kim & Chung, 2011). Likewise, the perception is impacted by some internal elements as abilities, emotions, skills, knowledge and external factors as finance, occasions, barriers and etc, these objectives can control behavior of each person depending on the context and performances (Ajzen, 1991; Vermeir & Verbeke, 2006). According TPB, there are many psychologists who denoted that people have ability to recognize their resources in exact occasions to approach and intent to act, who are prospective to understand and use the subjective inferences to ask themselves whether they should or should not do. If the belief of individual thinks that is extremely hard to perform, their PBC will be weak. Therefore, the conclusion from most researchers on PBC has been explained that people who have high perception, knows how to control their behavior (Kalafatis, Pollard, East, & Tsogas, 1999; Kihlberg & Risvik, 2006; Kim & Chung, 2011; Tarkiainen & Sundqvist, 2005). Affordability is defined as relating to costs that means the ability in finance to buy or pay for products or services (Mathieu, Sommer, Mitchell, & Barkin, 2016). Some previous studies have regarded as income and the price to investigate this factors. In part of customer intention, perceived affordability is understand that consumers who have awareness about their ability to expend, they will make decision based on how much they can pay for products and how eager to pay the products and compared with other categories (Notani, 1997; Grewal, Monroe, & Krishnan, 1998). Perceived affordability are

displayed as economic variable relating to financial term. In organic food products, price is one of factors make them be different from counterparts, therefore, this research investigated the perception of financial conditions affecting on customer intention whether customers are willing to buy organic foods even though the price is normally higher than normal products. Perceived Risk has researched by many authors in many aspects, as Mitchell (1999) regarded that there are several kinds of risks affecting on human consciousness as social risk, financial risk, functional risk, physical risk and etc. Risks have defined as the loss in feeling when people meet bad circumstances (Dejtanasoonorn & Hanpernchai, 2010). Moreover, Stone and Grønhaug (1993) have mentioned that consumers when making decision to buy any products always has suspect feeling and they concern about what they will get if that products are not goods for themselves. As a consequence, they will care of the images, the standards, the announcements from creditable organization before they decide to buy. With organic products, Williams and Hammitt (2001) used to studying about risks when people intent to buy this products as food safety, natural toxin when producing products or the certificated labels from government (Yeung & Morris, 2001). This research examine how much people trust on the image of products and perceived risk affecting on purchase intention or not, thus this section relating on the marketing field.

**Hypothesis 3: Perceived Behavioral Control positively impacts on Perceived Behavioral Control.**

#### 1.4 Purchase Intention

After reviewing some papers and reports has shown some ideas that attitudes affecting on PBC in some aspects as in the common food, people has the attitude toward to pay money to purchase products that impact on the perceived behaviors (Hansen, Jensen, & Solgaard, 2004), for example when people think that the foods are good for their health, they will create a mindset consciously and then the attitudes which guide the controlling factors and the results of this stage are behaviors as definition from some previous studies, behavior shows the interested action that people got from practicing and experience (De Cannière, De Pelsmacker, & Geuens, 2009). By contrast, if they has bad attitudes to the products that affecting on their life negative, they will control their behaviors to buy those products (Li, Mizerski, Lee & Liu, 2009). Therefore, the concept is created that there is a tight relationship between the attitudes towards to purchase intention and the perception of people in some aspects. Hypotheses of this relationship:

**Hypothesis 4: Attitude positively impacts on Perceived Behavioral Control.**

Intention is usually defined as psychological thinks that people plan to act in right condition. Some psychologist have tried to develop formula to calculate the weighted of factors influencing on human intention towards to act rational behaviors (Gogoi, 2013). There are massive papers researched in many kind of areas to define what is the main elements? As consumer in health care, people in this section rely on healthy elements as that products or services having no bad influence on health or good reputations (Hoppe, Vieira, & Barcellos, 2013). As consumer in e-commerce, the main factors are trust, risk, social norms, demographic, etc and in term of economics, most of authors believe that buying intention can be predicted by studying the internal and external

factors (Suprpto & Wijaya, 2012). Organic food section relate to main section as economic, health and environment, therefore, in order to study intention to buy organic foods, the keywords as healthy foods, eco-friendly is extremely popular worldwide as well as consumers in food industry are preferring to buy products that are good for health going along with protecting environment (Chen, 2010). Spears and Singh (2004) have provided the evidence to understand the term of “intention” as the individual conscious to buy products as relating to subject norms, especially personal norm (Khan, Ramzan, Shoaib, & Mohyuddin, 2015). In Thailand, the current situation that people are growing awareness on the standards of products, they read and care more about the information of origin of foods and the recommendation of healthy organizations to reduce risk when they make purchase foods in diversity origin and sellers as now (Doorn & Verhoef, 2011).

## 2. Conceptual Framework

This study stems from conceptual and model is mainly relied on the conceptual of TPB and mixture with some outcomes of previous researches. Purchase intention on Organic foods in Bangkok are affected by Attitude toward to purchasing (Health consciousness, environmental awareness), Subjective Norm (Personal Norms, Family Norms, Social Norms) and Perceived Behavioral Control (Perceived Affordability, Perceived Risk).

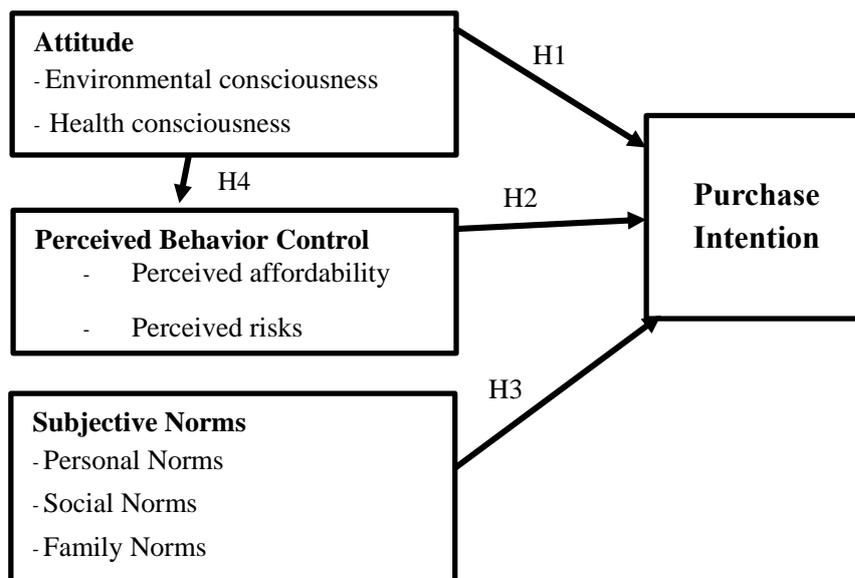


Figure 2. Theory of Planned Behavior Ajzen (1991)

## RESEARCH METHOD AND DATA COLL

### 1. Research Question

The research questions of this study are:

1. What are the key factors impacting on PI organic foods in Bangkok, Thailand?
2. What are the certain relationship of three main variables that are Attitude, SN, and PBC in identifying organic product PI?

This thesis studies the influence of different factors on consumers' spontaneity to buy organic foods or PI of consumer in buying organic foods in Bangkok, Thailand. Otherwise, this study also brings some useful advantages to understand the main intentional psychologies and reasons that influence on the PI of consumers as well as contributing to find the solutions to help Thai food industry and sellers who are selling organic foods that can understand and focus on analyzing those factors to create an effective business plan with marketing strategies to meet the customer satisfaction.

## 2. Data Collection

To investigate the factors that influence on PI of consumers on organic food products, therefore, the plan to do research is combination of actions showing the method to provide essential information to design and get ration answer to our questions and then aim the purpose of research which are answering the research questions and research objectives (Mark, Philip, & Adrian, 2009). Thai people who are tending to use healthy products and paying attention into their health. Therefore, Bangkok is a pilot place selected to research for this study. Based on age structure, this study investigate in people who aged from 20– 60 years old, therefore from the provided report of <http://www.indexmundi.com/> , there is 60.97% of total population. More than 60% of consumers are interesting in organic agriculture production and processing did not allow the use of chemicals (Kongsom & Kongsom, 2016), so the population who interested in organic products is 3.39 million people. After calculating the sample size (1) by the Yamane's formula above, the numbers of sample is 399.952809 persons. Therefore, this study has to obtain to 400 people to collect data.

$$n = \frac{N \cdot k}{1 + N(k-1)} = 399.952809 \quad (1)$$

The questionnaire of this research was designed based on the factors influencing on purchasing intention as attitudes and SN and PBC. The very first part of the questionnaire is about demographic information that is basic data of consumer as age of the consumer, gender, income and number of family members. This paper will focus on consumer aged from 20 years and above. Second section is about the attitude towards to purchasing organic foods. Section three is about SN and then section four is about PBC and the last section is PI on Organic foods in Bangkok. (Eide & Toft, 2013). This study used questionnaire based on five point Likert scales which is a popular method for measuring attitudes (Allen & Seaman, 2007). The continuous question in this research is defined as variable agreement by five features: Strongly Disagree – Disagree – Uncertain – Agree – Strongly Agree the outcome of data will be investigated to explain the relationship between given factors of hypotheses and prove the conceptual of Theory of Planned Behavior applied for this study. The consequence will answer the questions and objectives of this research, therefore, to analyze data, some methods will be chosen, especially in Quantitative Research and to study the relationship and the meaning of figures, this research uses two main software IBM SPSS Software 20 and Amos 20.

## RESULTS

In this research, the questionnaire was designed 45 questions divided into five section in which five questions about demographics were ordinal and nominal scale and the other 40 questions were used in Likert scale, ranged from 1–strongly disagree to 5–strongly agree. The research mainly collected by direct questionnaires around 402 respondents in which there are 29 out of standard, were excluded due to its invalidity. Therefore, this study has 373 responses were used for analyzing process. The items to analysis are given in Appendix: Questionnaire.

### 1. Demographic

There are five questions in this section: age, gender, income, marriage status and awareness of Organic foods. Age, this section is divided into five different ranges; “from 20–30”, “from 31–40”, “from 41–50”, “from 51–60”, and “over 61”. Gender has two options which are “Male” and “Female”. Regarding Income in Thai Baht which are ranged from less than or equal to 20,000 to greater than 61,000. The currency which was conducted to investigate Income is Baht as the official currency in Thailand. In specific, the ranges include; Less than 20000 THB, 21000– 40000 THB, 41000– 60000, more than 61000. About Marriage Status, that has four alternatives as “Single”, “Married”, “Divorced” and “Widowed”. Finally, this research using one question to avoid the wrong target responses that is relating to Awareness about Organic: “Have you know about organic foods before?” with three option as “Never heard”, “Already known”, and “Not that much”. Because there are 29 people ticked into “Never Heard” therefore this research will reject these questionnaires and the result from 373 Thai respondents have participated in this study will be shown in this analysis below. In term of Gender, the outcomes have collected showed male accounts for 42.4% (158 respondents) and female stands for 57.6% (215 respondents). Relating to Ages ,139 respondents (37.3%) belong to the group age between 20 and 30, 142 respondents (38.1%) aged from 31–40, 79 respondents (21.2%) are between 41–50, 9 of them (2.4%) are in the range 51–60 and the rest of 4 respondents (1.1%) belongs to the group age more than 61.

The examined results had showed that the major responses range is between 21,000 and 40,000 chosen by 165 respondents (44.2%), in while there are 79 responses chose under 20000 accounting for 21.2%, 85 respondents (22.8%) are in the range of 41,000–60,000, the rest of 44 respondents (11.8%) exceeds the amount of 60000 Bath per month for their income. The result of collecting data showed that the major percentage of responses is Single (60.3%) and the second one is Marriage Status (37%), Divorced accounted for 2.1% and the rest is Widowed 0.5%. In term of the awareness of Organic Foods, there are 223 responses knowing about organic foods and the rest has known but not much 42%. The result shown Thai consumers who attend in this research being able to deliver right direction and quality results.

### 2. Factors' Results

According to Annunziata and Vecchio (2016), from literature review, to measure Likert–type response items the ordinal scale is the rational method, using this method support the research is able to understand the

emotional action or behaviors to conducts in some psychological fields. In this study, there are 40 questions used Likert questions to rank the emotional insight of responses divided into four main section based on the variables. These are “Purchase Intention”, “Attitude”, “Perceived Behavioral Control” and “Subjective Norms”.

Question from 2.1.1 to 2.1.5 (HC 1 – HC 5) – As the result, almost major people agreed with the questions relating to Health Consciousness.

Using same analyzing way on Environmental Consciousness from 2.2.1 to 2.2.5, except EC1 has biggest “Uncertain” percentage. With the question 2.2.1 “I identify whether the products are environmental friendly when I buy the products.” And other questions have biggest in “Agree” and lowest in “Strongly Disagree”.

Factor “Personal Norm” from question 3.1.1 to 3.1.5 they mostly have high “Agree” selection but we can see that question 3.1.1, 3.1.2 and 3.1.3 which have no one choose disagree in sample 373 responses.

3.1.1 “From what I have learnt, organic foods are creditable than nonorganic foods.”

3.1.2 “I believe that choosing organic food is a right decision.”

3.1.3 “And I bought organic food because I think organic food is better than normal food.”

These results showed that the response having knowledge about Organic Foods by themselves and they have their own intention to buy organic.

Another factor of Subjective Norms is “Family Norm”, the results were similar with other factors that are highest in “Agree” and Lowest in “Strongly Disagree”. But one thing that we should care that question FN1 (3.2.1) had the most people choosing as 27 responses.

3.2.1 I normally only buy organic food for my family.

About the factors Social Norms, we can focus on the question SN2 which has highest “Strongly Disagree”

3.3.2 I will buy organic foods if my teacher saying that good for me.

From the results of Subjective Norm, these had shown the percentage of the Likert scales of studied factors and they assist us to understand that responses have interested in Organic Foods from their Norms and Inner Thinking.

Perceived Behavioral Control designed question from 4.1.1–4.2.5 with two sub–factors that are Perceived Affordability and Perceived Risks. The results of the survey. With the highest percentage in “Agree “and lowest in “Strongly Disagree”, both PA and PR have the similar the weighted of percentage. Moreover, analyzing in detail, we can focus on these questions having no one picking “Strongly disagree” and high “Disagree” which are 4.2.1, 4.2.2, 4.2.3

4.2.1 I always buy food products from supermarket because it is less risk.

4.2.2 I am aware of the impacts of hazards to my health.

4.2.3 I am concerned about origin when I buy organic food products.

These results show that responses having some insight about their concerns before they make decision to buy some things. In term of Organic Foods, risks, health, origin and etc. have directly or indirectly impact on Customer’s Purchase Intention.

Question from 5.1.1 to 5.1.5 (PI 1 – PI 5) – There are many of respondents agreed with the statements that show the relationship of each independent variable with dependent variable in 5 question to measure the relationship. To be more detail, the total numbers of such agreements were shown based on SPSS software:

**Table 1.** Reliability

	Corrected Item–Total Correlation	N items
Health Consciousness	.793	5
Environment Consciousness	.732	4
Personal Norm	.773	4
Family Norm	.763	5
Social Norm	.820	3
Perceived Affordability	.784	4
Perceived Risk	.796	3
Purchase Intention	.734	5

To measure the Reliability and Validity, this paper used the following standards and the acceptable starting point for Cronbach alpha value (Bonett & Wright, 2015). This step is also called EFA – Exploratory Factor Analysis to find out the good factors to investigate.

$$[0.6 \leq \alpha < 0.7] \text{ plus } [0.7 \leq \alpha < 0.9]$$

Which depicted a good reliability coefficient as suggested by Peterson (1994). The inception of Cronbach alpha value was given as the list below, after running the data via using SPSS, this standard range will be used to conduct the sub-factors and the items that had not achieved the standard will be deducted or ignored when compared Cronbach's  $\alpha$  value with the threshold below, for this study the minimum is 0.70 Streiner, D. L. (2003).

The data shown that each items in the research had correspondences and for the whole meaning of the questionnaire (Field, 2006). Using the "Corrected Item– Total Correlation" data to eliminate the items that has negative effect on whole variable and a suggested reliable extent for questionnaire using Linkert with 5 points that must be at  $\leq 0.4$  therefore after this step, we could deduct the items with low correlations. This research has 40 items and 6 items removed out of the rest of research. Therefore, using Cronbach's  $\alpha$  value can help author avoid the bad influences of incorrect items to do analysis and the exported data shown that the higher the value for corrected– item– to– total value, the higher the Cronbach's alpha value that mean the higher relationship between variables in questionnaire.

To ensure the validity of variable, using "correlation analysis" how strong two variables have relationship. In this research, using the indicator – "Pearson's correlation coefficient" to conduct the influence between two

main variables. In the information from other previous studies these showed that the value is under 0.8 or 0.9 and Sig < 0.05 these show the validity is ensured. All the values were under 0.8 which indicated that two sets of concept are not highly related. In other words, these concepts measured differently.

The first regression was to test the relationship between five factors and attitude. Five factors including health consciousness, consumer knowledge, environmental concern, personal norms and subjective norms were considered as independent variables while attitude was the dependent variable (Holtzman & Vezzu, 2011). The second regression aimed to investigate the relationship between attitude and purchase intention in which attitude is independent variable and purchase intention is dependent variable. Referring to the significance value, star (\*) showed the level of significance. One star indicates the significance value is lower than 0.05 (\*p<0.05) and two stars indicates significance value is lower than 0.01 (\*\*p<0.01) (Hochberg & Benjamini, 1990). “The lower its value is, the higher the significance level is”:

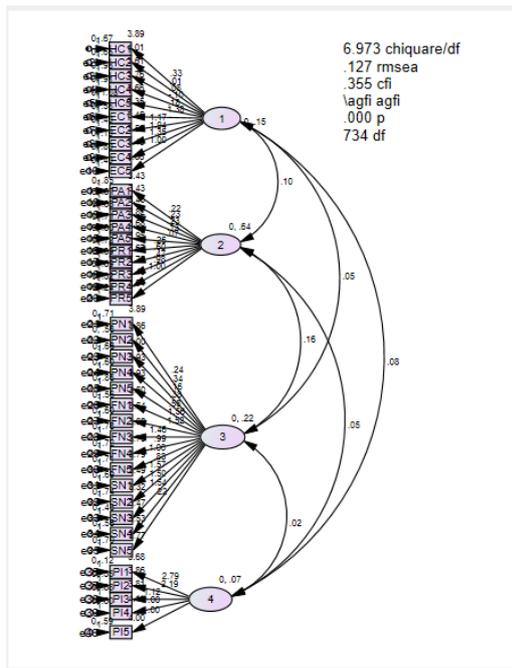
- HC → PI, sig > 0.05, they do not have strong relationship between two variables.
- SN → PI, sig > 0.05, they do not have strong relationship between two variables.

Other variables has p-value <0.05 therefore they have relationship to each other:

### 3. Model-fit testing

In this research, the quantitative method, experimental correlation survey and cross-sectional design are used to collect data to investigate the factors that impact on Dependent Variable – Purchase Intention. 373 responses had finished survey directly from random picking in Bangkok. To conduct the results and work on the objectives of research in depth, Statistical Package for Social Sciences Software (SPSS) and Structural Equation Modeling (SEM) are used and the process is testing the factors' relationship, the null hypotheses, analyzing factors via using Confirmatory factor analysis (CFA) method and model fit from SEM (Byrne, 2001). One main research question and null hypothesis as well as five sub-questions for each factors and null sub-factors were tested in this study (Stover,1995).

The latent variables were applied by CFA to conduct the relationship and the affects on model in the first step of SEM. Beside using data of SPSS, another software – AMOS 20 was used to analyze some indicates as well as the reliability of conceptual model fit via using CFA (Savalei & Bentler, 2010). Because the results of the initial model that unacceptable with some indicates which are lower than standards therefore the next step would be used CFA as an important part of SEM to adjust and find out the factors that should be deduct while analyzing Model by some recommendation of former research. As regard, CFA was used to quantitatively calculate and develop estimable variables that specified a series of associations, suggesting how to measure the value of the latent construct.



After adjust the outcomes of CFA process, the measurement model was shown as observed model in SEM that gives the indicators of each main variable beside that the reliability and relationship of variables. This analysis tries to specify as to which variables load onto which factors (Moshagen, 2012). For the estimated regression weight, to show the correlation of factors, these number must be range from 0.4 or higher (Hair et al., 2009), the factors that could not reach the standard which were deduct. To be more detail, this research used “Standardized Regression Weights” and “Modification Indices” to modify and reject the factors based on the given information from the research of Khine in 2013. About the value P to test the relationship between the main variable that means “Estimated probability of getting a sample value this

far from zero if the population value is zero” (Efron & Tibshirani, 1993).

**Figure 3.** CFA testing

This figure shown the result of model with whole items that used for collecting data. ( $\chi^2/df = 6.98$ , CFI = 0.355, AGFI = n/a, RMSEA = 0.127) These data totally under standards of acceptable model therefore this research need to modify the variables and factors by using Modifying Indices and Standardized Regression Weights to adjust and make decision to keep or remove factors and make covariance between some factors then got the new figures below. ( $\chi^2/df = 2.561$ , , CFI = 0.901, AGFI = 0.859, RMSEA = 0.065)

These are date achieved the standards of acceptable model. Transfer the CFA into SEM in AMOS, use the results while testing CFA re-make the framework based on given model in former part to investigate the acceptable of designed framework. As the table below that shows the effect between Perceived Behavior Control and Subjective Norm that are unacceptable with P-value over than standards  $>0.05$ . Therefore, we will reject Hypotheses 2 and 3. Moreover, based on the outcome of table below, we can see the influences of H1 and H4 that are acceptable and another impact that we can see while testing the studied model that Subjective Norm has relationship with Perceived Behavior Control. This outcome will help create a new suggested design for Framework based on Purchase Intention of Organic Food in Bangkok.

Table 2. CFA RGW

			Estimate
EC5	<---	Att	.521
EC4	<---	Att	.502
EC3	<---	Att	.902
EC2	<---	Att	.534
EC1	<---	Att	.531
PR5	<---	PBC1	.866
PR4	<---	PBC1	.819
PR3	<---	PBC1	.387
PR2	<---	PBC1	.587
FN5	<---	SubN	.454
FN4	<---	SubN	.391
FN3	<---	SubN	.534
FN2	<---	SubN	.538
FN1	<---	SubN	.579
SN1	<---	SubN	.349
SN2	<---	SubN	.678
SN3	<---	SubN	.830
SN4	<---	SubN	.803
PI5	<---	Pul	.281
PI4	<---	Pul	.305
PI3	<---	Pul	.209
PI2	<---	Pul	.668
PI1	<---	Pul	.957

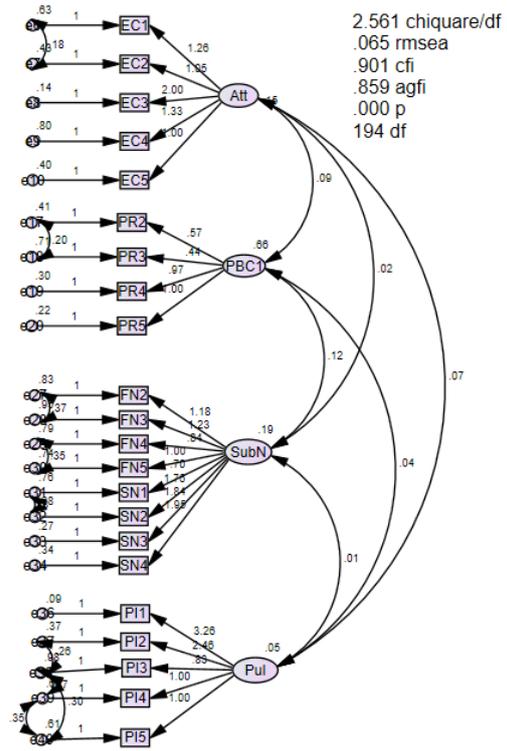


Figure 4. CFA modification

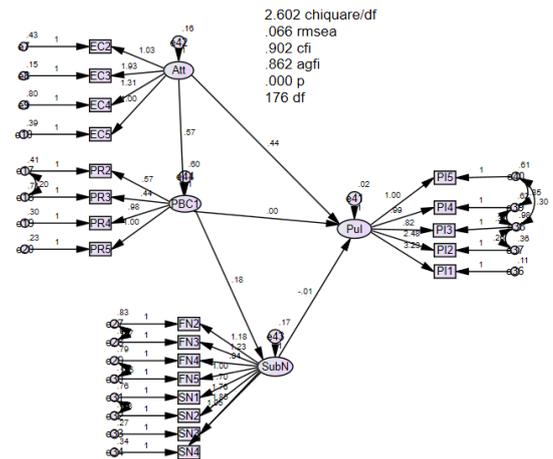


Figure 5. Model Fit

## DISCUSSION AND CONCLUSION

### 1. Discussion

Based on the title, research questions as well as objectives of this study, after getting the results from Data Analysis, this results' purposes are deeply discussing the outcomes which have relation to the other former researches and especially the main theory applied for conducting the purchase intention (TPB).

For the first part, Demographics section has shown the data and basic insight of response that we can improve for future study, with five question in while four question relating to personal data and one question about awareness of Organic Foods that had shown Thai Consumers having about Organic Foods. Moving to other section relating to the theory, the results of Thai consumer's attitude towards to purchase organic foods, with two main factors represent as Health Consciousness and Environment Consciousness, each factor has five designed question to evaluate, after using Model Fit and some insight data from Descriptive and Linear Regression. Finally the main factor Attitude towards to buy Organic foods has relationship to Purchase Intention. But the factor "Health Consciousness" that was removed out of model because that had negative influences on general model. After the hypothesis (H1) is accepted, the meaning explained that Thai people who are more concerns about the environment and they are willing to buy foods that are good for their environment. On the other hand, this research showed that the more Thai consumer are conscious of environment, the more positive attitude they have towards organic food. Moreover, there are several previous research which showed that people tend to care of life environment and try to protect them as more as possible as in research of Vermeir and Verbeke in 2006 or from Chen in 2007. The data has shown the sub-factor of H1 is Health Consciousness had not impact on Purchase Intention. It explained that Thai consumer do not care of Health Consciousness and it could not become a factor influencing on their Purchase Intention towards to buy Organic Foods.

To conclude the result of Subjective norm, there are two sub-factors that accepted as Family Norm and Social Norm. By contrast, Personal Norm is rejected. Family and Social factors that affecting on Thai consumer positively, which were explained that Thai people, who tend to follow the traditional culture and lifestyle from their family as well as they prefer to buy Organic foods for their Family (Maloney, Lee, Jackson, & Miller-Spillman, 2014). This factor is linked to family- attitude and beliefs of an individual in acting or behaving in systematic way based on their knowledge and observed action. Moreover. Thai Consumer has strongly agree that they will tend to buy Organic Foods based on the recommendation from people they know as Doctor, Famous people, Co-worker or Friends. That show Thai consumer has mass media intention that they are easy to be influenced by other people. Regard the rejected hypothesis, Personal Norm represented for self-norm action as the knowledge that they learn by themselves, their independent attitude. In this research that show Thai Consumer having not high influence based on Personal Norm to make decision to buy Organic Foods.

Moreover, Perceived Affordability is not the factor that impact on Purchase Intention, this is explained that the perception of finance has no affect or that Thai consumer has no much knowledge in the cost that they have to pay to buy organic Foods. But based on the data that shown Perceived Affordability is rejected in this research.

Hence, the result has been received from fact data that are not same with the theory and some former research, the reason may come from subjective reasons as the way to pick sample and language barrier while collecting data as well as objective reason as the time is not enough to read in depth and understand new technological tools.

The objectives of this study that investigates the main factors affecting on Purchase intention of Organic foods, the conducted places is Bangkok. As the results of Data analysis, the relationship of some factors that are not same as the former researches. In this study, using the latent variables: Attitude, Subjective Norms and Perceived Behavioral Control with independent variables : Health Consciousness, Environment Awareness, Personal Norm, Family Norm, Social Norm, Perceived Affordability, Perceived Risk and one dependent variable is Purchase intention . The results has shown in table below:

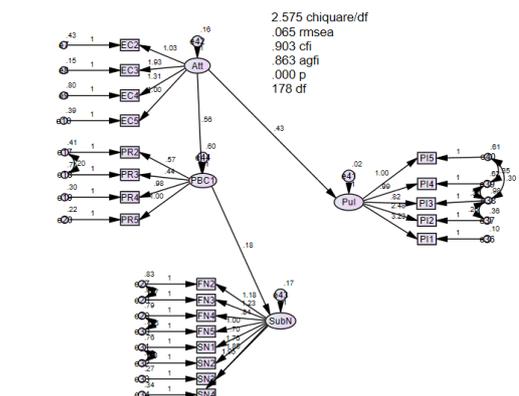
**Table 3.** The result of Hypotheses

HYPOTHESES	RESULT
HYPOTHESIS 1: ATTITUDE HAS POSITIVE EFFECT ON PURCHASE INTENTION.	Accepted
HYPOTHESIS 2: SUBJECTIVE NORMS HAS POSITIVELY AFFECTS ON PURCHASE INTENTION.	Rejected
HYPOTHESIS 3: PERCEIVED BEHAVIORAL CONTROL POSITIVELY EFFECTS ON PURCHASE INTENTION	Rejected
HYPOTHESIS 4: ATTITUDE POSITIVELY IMPACTS ON PERCEIVED BEHAVIORAL CONTROL.	Accepted

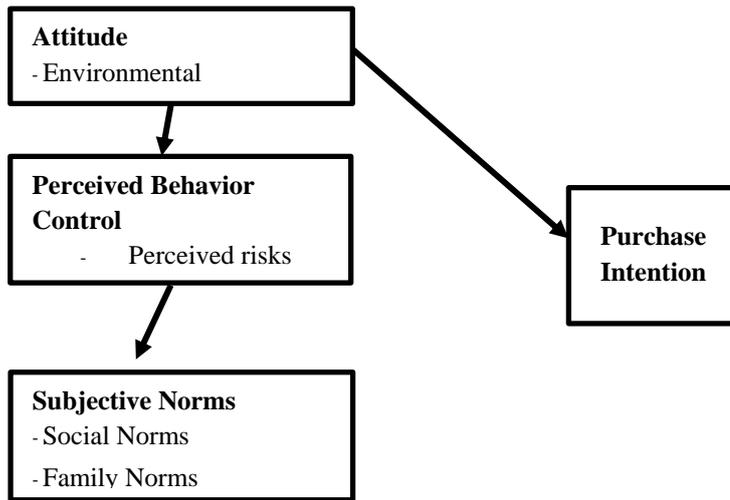
Based on the analysis using AMOS 20, Model fit from this study has shown the suggestion conceptual framework that relating to the data collected based on the 373 residents in Bangkok.

**Table 4** The result of Hypotheses checking in AMOS

			Estimate	S.E.	C.R.	P
PBC1	<--->	Att	.562	.130	4.334	***
Pu1	<--->	Att	.435	.093	4.652	***
SubN	<--->	PBC1	.181	.038	4.785	***



**Figure 6.** Final Model Fit



**Figure 7.** Conceptual Framework after Model Fit

By answering three research questions, this paper has contributed to the previous research in the field of organic food. According to the introduction, there are not many studies have been made about consumer attitude towards organic food in Thai. Therefore, this paper has certainly contributed to the research area of organic food in Thai.

Moreover on this research, based on some results of some steps and methods to investigate the model as well as model. There are some differences from the initial model based on literature review. There are four factors that affect on Consumer Intention towards to buy Organic foods. They are named as environmental consciousness, Perceived Risk and Family norm and Social norm. Furthermore, after SEM process, there is a relationship between Perceived Behavioral Control and Subjective Norm. Some former research have shown that the Health Consciousness influencing on Purchase Intention but this research that shown different result, the reason that might come from the characteristics of responses. Therefore, to conduct the similar study, author must use another kind of sampling with larger number and range of age.

## 2. Conclusion and Recommendations

As regards the objectives of this study, to give more benefit to whoever wants to do any business or research on Organic Foods. First of all, "Finding out" the fears of customers and what make they be willing to buy organic foods, it may be from Environment consciousness, Family lifestyle, from recommendation of "social people". With Thai consumer's Behavior, there are the high impact on purchase intention from Well-known people, teachers, doctors, friends, etc... and the outstanding characteristic that is focusing on solving the fear that make Thai people scaring to buy Organic Foods.

While working on this research, some limits and troubles occurred. First of all, the results of collecting data impacts on the data and figures the relationship and the targets of study. When the study was collected in Bangkok, the sample focus on Thai consumers, there was a language barrier to access to the Thai consumers and make them feel free to do questionnaire trustily. Moreover, when adopting the research design, the chosen random

sampling and snowball sampling which has some limits because the sample was not wide and diversity. Finally, in the analysis step when results export from SPSS analysis, the percentage and results had shown some questions which could not work well with chosen sample and author needs to reject them out of the research. Therefore, four questions in four sections to measure the variable of Environmental Consciousness, Social Norm, Personal Norm and Perceived Risks. As consequence, the rest of question had impact on the research. Based on this research, the further research must have more time to build the research design and questionnaire more carefully. As the benefit of this research, that could be used for some organizations, farmers or people who wanting to work in Organic Industry in the future, especially in Thailand.

Moreover, some insights of this study can help other researchers using for build the knowledge in customer behavior of Bangkok's consumers. Because some results of factors influencing on purchase intention that conducted via many sub-factors. Additionally, the outstanding results of this results that has shown the relationship between attitudes toward to buy organic foods and purchase intention could be examined by qualitative method. In this research, the demographic is not the main factors investigated. The future researches should expand the impacts of these factors as Age, Income, Gender, Marriage Status.etc. For the effect of consumer attitude, the research can do in other countries or cites with other way to pick up sample size, and that will be better if they can reach for larger number of respondents.

Finally, the further researches should do in qualitative to get the reason why the Subjective norms and Perceived Behavioral Control are rejected.

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## ADOPTION AND USE OF CONTEMPORARY MANAGEMENT ACCOUNTING PRACTICES IN THAILAND

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### ABSTRACT

The paper explores current state of contemporary management accounting practices (MAPs) in Thailand and investigates characteristics of firms which adopt and use contemporary MAPs. Mail questionnaires were sent to CFOs of firms listed on the Stock Exchange of Thailand (SET) and Market for Alternative Investment (MAI). Results from the survey reveal that average adoption rate of contemporary MAPs is higher than prior study. High perceived environmental uncertainty firms place a great emphasis on benchmarking, advanced operations techniques and contemporary performance measurement, while high decentralized firms place an emphasis on strategic cost management techniques. Mixed strategy firms and archetypal differentiation firms place a greater emphasis on contemporary MAPs than archetypal cost leadership firms. Mixed strategy firms and archetypal differentiation firms place a similar focus on benchmarking and strategic cost management techniques. Unexpectedly, mixed strategy firms place a greater emphasis on advanced operations techniques and contemporary performance measurement than archetypal differentiation firms.

**Key words:** Management Accounting Practices, Contemporary Management Accounting Practices, Firm Characteristics, Mixed Strategy

### INTRODUCTION

During the past few decades, a wide range of innovative management accounting practices (MAPs) has been developed in response to changes in business environment and technologies. Over time, these contemporary management accounting practices (CMAPs) have become widely adopted although traditional management accounting practices (TMAPs) still remain emphasized (Chenhall & Langfield-Smith, 1998a; Guilding, Cravens & Tayles, 2000; Nimtrakoon & Tayles, 2015). From a diffusion of innovation perspective, explanations for firms to adopt innovative MAPs include efficient-choice, forced selection, and fad and fashion (Malmi, 2001). Malmi (2001) suggests that earliest adopters usually perceive economic benefits from the adoption, while firms which adopt the practice at the take-off stage are often driven by fad and fashion. Later on, the influence of fashion will fade, and explanations for firms which later adopt and use such practice are efficient choice and mimetic.

With an increasing popularity of innovative MAPs, many scholars have studied factors which influence the adoption and use of a particular CMAP. Activity-based costing and balanced scorecard are among the

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CMAPs which receive a great interest (e.g. Ax & Bjørnenak, 2005; Bjørnenak, 1997; Chongruksut & Brooks, 2005; Malmi, 2001). These studies have shed light on determinants of the adoption of a particular CMAP. However, MAP and management control practices operate as a package; some are complementary while some can act as substitute (Malmi & Brown, 2008). Studying a specific MAP in isolation can potentially lead to a model underspecification, therefore, influencing conclusions we draw if the use and effect of the new MAP is related to the functioning of other existing MAPs (Chenhall, 2003; Malmi & Brown, 2008). Therefore, to extend existing literature, this paper examines the adoption and use of a more comprehensive range of CMAPs, including benchmarking, advanced operations techniques, contemporary performance measurement and strategic cost management. The paper explores the current state of adoption and use of CMAPs in firms listed on the Stock Exchange of Thailand (SET) and Market for Alternative Investment (MAI) with an aim to understand characteristics of firms which adopt and use CMAPs.

Relatively little is understood about MAPs of companies in emerging economies (Hopper et al, 2009). For Thailand in particular, Phadoongsitthi (2005) and Nimtrakoon & Tayles, (2010, 2015) are among very few studies which explore the adoption of a wide range of MAPs, traditional and contemporary. However, Phadoongsitthi (2005) examines effect of national culture (Hofstede, 2001) on adoption rate of MAPs in Thai, Indian and Australian manufacturing companies. Characteristics of firms which may have an impact on MAPs adoption are left unexamined. As for Nimtrakoon & Tayles (2010, 2015), a relationship between a wider range of contingency factors, including strategy, and perceived benefits of MAPs are explored. Nevertheless, Nimtrakoon & Tayles (2010, 2015) neither directly investigate MAP usage nor explicitly consider MAP adoption in mixed strategy firms. With an increasing number of firms pursuing multiple strategic priorities (Chenhall & Langfield-Smith, 1998b; Dekker, Groot, & Schoute, 2013; Lillis & van Veen-Dirks, 2008; Shutibhinyo & Wongkeaw, 2017), understanding how mixed strategy firms use MAPs to manage potentially conflicting strategic priorities is important. To extend Phadoongsitthi (2005) and Nimtrakoon & Tayles (2010, 2015), this paper investigates effect of firm characteristics (i.e., perceived environmental uncertainty, decentralization and strategy) on the use of CMAPs. Unlike Phadoongsitthi (2005) and Nimtrakoon & Tayles (2010, 2015), this paper examines not only the adoption of CMAPs but also a degree of CMAP usage.

The remainder of the paper is structured as follows. Prior literature is reviewed and hypotheses are developed in Section 2. Section 3 and 4 present the research methodology and empirical findings. Conclusions, limitations and future research are discussed in the last section.

## LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Contingency theory proposes that “there is no universally appropriate accounting system which applies equally to all organisations in all circumstances.” (Otley, 1980, p.413). Firm characteristics are potential determinants of the MAP usage (see Chenhall, 2003 for a review). This study focuses on firm characteristics, covering exogenous factor (Perceived environmental uncertainty), endogenous factor (Decentralization) and strategic priorities (Strategy), which are seen to impact the use of MAPs, as follows:

## ESTIMATING HUMAN RESOURCE ABUNDANCE IN THAILAND: WHETHER LABOR SHORTAGE MATTERS?

*Yuzuru Utsunomiya, Ph. D.\**

### ABSTRACT

The purpose of this study is to estimate the abundance of human resource. Human resource abundance can be defined as the number of employees and potentially eligible people's population. To estimate the abundance, we employed hierarchical state-space model, a method of stochastic inference in combination with hierarchical Bayesian framework. The target of this study are factory workers belonging to foreign manufacturers' factories and period is from 1967 to 2012.

We obtained three results. First, the 1987 shock have the most influence on human resource abundance. Also, the number of factories and its natural rate of increase have been affected. Second, human resource abundance has grown approximately 14.6 times throughout the period. Third, the gap between the number of employees and human resource abundance come to become less than 0, especially after the end of 1990s'.

We concluded that labor shortage is not a serious issue as prior researches have expected in the long term even if the factories would face labor shortage during a couple of decades. Moreover, in the long term, retaining the human resource is a vital issue.

**Key words:** Human resource abundance; Thailand; State space model;

### INTRODUCTION

#### **Purpose and background**

The purpose of this study is to estimate human resource abundance in Thailand. Particularly, we aim to estimate abundance of human resource (HRA), clarify factors affecting the HRA, and consider HRM policy in terms of HRA.

Currently, in many countries, issues regarding labor shortage are reported (Agapiou, 1995; Price, and McCaffer, 1995; Bennett and McGuinness, 2009; Bosworth, 2003; Bosworth and Dutton, 1990; Bryant and Jaworski, 2011; Cappelli, 2015; Carnevale 2005; Evans, 1991; Haskel and Martin, 2001; Haughton, 1990; Jones and Goss, 1990; Neumark, Johnson, and Mejia, 2013; Smith, 2009; Veneri, 1999). All the researchers concluded that the shortage would affect human resource management practice such as recruitment training, and wage structure. Then, what does "Human resource (HR)" mean?

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The concept, human resource, has been used in many disciplines since the 1930s' (Zimmermann, 1933). He defined "resource" as a function what a material achieves through human effort and stated that human resources as a type of management resource. The definition illustrates the functional side of human resource and the resource can be regarded as in the same position as natural materials.

Resource-based view of management transformed the perspective to human resource. Resource-based view is a school of management studies that emphasizes the importance of management resources including human resource for sustainable competitive advantage (Acedo, Barroso, and Galan, 2006; Colbert, 2004; Lavie, 2006; Oliver, 1997; Wernerfelt, 1984). Based on this view, a company can accomplish a dominant position in a market when the company has competent management resources such as human resource. Reflecting the view, HR researchers have applied and invented strategic human resource management, a view emphasizing contribution of human resource toward business activity (Autier, and Picq, 2005; Barney, 2001; Boxall, 1996; Coff, 1997; Holtbrugge, Friedmann, and Puck, 2010; Lee, Phan, and Chan 2005; Manroop, Singh, and Ezzedeen, 2014; Mueller 1996; Muger, 2005).

Apart from the deepened controversy of human resource's position, definition of human resource does not appear to change. HR refers to the employees (Wright, 1994; Wright, 2001). We may regard human resource abundance as the number of employees. Different from expectation, however, it would be challenging for us to estimate the HR abundance. Visible number of employees may contain errors because of miscount, seasonal change, and other reasons. When many workers leave a factory, and move to another frequently, it is challenging for the company / industry to sum up the abundance. Even if workers would not be hired, it is doubtful to regard them as unemployed workers, not human resources. Such workers have eligibility and may potentially contribute to the company / industry. Second, the proposition does not understand the characteristics of resource. Any resources such as coal, iron ore, and fish have their potential stocks as well as visible abundance. We should consider that there are some potential stocks also in human resource. Considering such data structure, human resource should be regarded as a different concept from the number of employees or population. The concept, human resource abundance, should be referred not only to the number of employees but also other peripheral and invisible people eligible to work.

## OBJECT AND METHOD

### Object

We focus on workers belonging to foreign manufacturers expanding to Thailand.

A case of Thailand demonstrates a typical situation of labor shortage. According to a report by International Labour Office, 116,000 demand surpluses in labor has occurred A report by Siam Commercial Bank says that the shortage posed shortfall 23% of the total numbers of workers needed Due to demographic transition, poor investment toward instruments / apparatus, introducing cheap labors from peripheral country, and academic-oriented education, time-spending recruit, Thailand appears facing labor shortage. SCB report

suggests three solutions; revamp hiring procedure, improve labor productivity by investment, and enhance workers' retention.

We estimated the abundance by industry; Agriculture and Agricultural Products, Mining, Ceramics, and Basis Metals, Light Industry, Metal Products, Machinery and Transport Equipment, Electric Industry and Electrical Appliance, Chemicals, Papers and Plastics, and Service and Public Utilities. The classification of industry follows the International Standard Industrial Classification of All Economic Activities, Rev. 4 by the United Nations.

We conduct 3-step purification, a three-layered process of data editing and cleaning to obtain data. Information regarding the number of employees is essential to estimate HRA.

To obtain the number, normally we use labor survey by statistics office of government. Using official labor statistics of countries, labor economists have implemented estimation of the number of employees (Campoliety, Gefang, and Koop, 2014; Clark, T. E., 1998; Samson, 1991). In Thailand, National Statistical Office monthly publishes results of "*Labor Force Survey*", which has started to be undertaken since 1963, and we can check their contents via Internet partly. To figure out whole picture of labor force in Thailand, the statistics should be appropriate. It, however, is challenging to consider microscopic measures such as industry, province, and company by using the public labor statistics. To consider the microscopic measures while considering error structure discussed above, we are supposed to make a suitable dataset by our own. To build a dataset instead of the official statistics, we have implemented the following procedure. First, we checked the list of companies expanding to Thailand using "*BOI Promoted Companies Directory 2014-2015*". The directory contains information such as name of expanding company and URL. Considering its published year, covered period is expected to be 2013 or earlier and we set 2012 as a final targeting year. Most of expanding companies tend to apply promotions provided by BOI and the directory appears to cover most of expanding companies. It, however, does not contain factory location, number of employees, capital amount, and other essential information. To compensate for the lack of information, second, we refer to another source, "*Factory Directory of Thailand 2014/2015*". Combining the two directories, we checked factory location, number of employees, capital amount, and year of establishment. Finally, to make sure the existence and correctness of the companies' information, we checked the companies' website.

Figure 1 demonstrates the annual number of employees by industry.

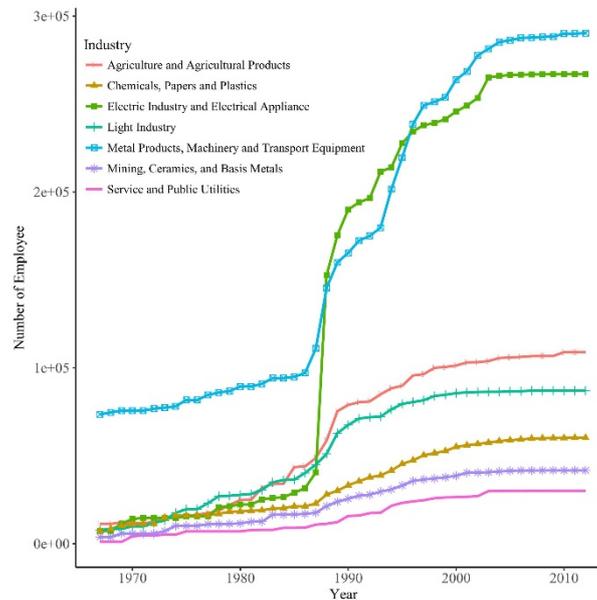


Figure 1. Annual number of employees by industry, Thailand (1967–2012)

### Procedure

To estimate the human resource abundance, we employ hierarchical state space model, a combination of Bayesian stochastic inference and state space method.

Many predictors may have their original distributions and errors structures. Such difference may affect result of analysis. It might be challenging to compute the results within a reasonable period if we would employ traditional statistical analysis method like regression and generalized linear mixed model (GLMM). Because of multiple integration, we could not compute entire error structure of model with the methods above. Moreover, HRA appears to change over time. By definition, HRA is a value composed of the number of employees and time-series movement. Although we are not able to observe HRA directly, HRA appears to move as the employees' number.

Using the conventional methods, we might be able to analyze such data and model. For example, when we would apply ARIMA model, we would be supposed to transform the data using Box-Cox transformation or eliminate trend component. Such transformation and elimination may bring about difficulties to obtain clear implication from analysis. Bayesian dynamic linear model might treat such data. The method can treat the invisible mechanism. It, however, suppose relatively stronger distribution than that of other methods suppose.

The state space model can overcome the methodological obstacles while combining hierarchical Bayesian inference. State-space model is a methodology of stochastic inference (Casals, et al., 2016; Zucchini, MacDonald, and Langrock, 2016). Originally the methodology was developed to predict the condition of chemical reaction process. In the process, we can assure some reaction process would occur inside the apparatus, even though we cannot observe the reaction directly. To estimate such invisible process, the model has been

developed. Based on the model, observable phenomena are determined by state space, where invisible mechanisms affecting the phenomena works. When we state the mechanism in the state space, we are able to understand and draw invisible mechanism affecting observable phenomena. For details of the state space model, refer to Commandeur and Koompan (2007). The state space model has a particular affinity to the Bayesian framework. Bayesian framework is an analytical methodology for stochastic inference. Its characteristic is quite simple: Combine Bayesian theorem with computer-based sampler such as Markov Chain Monte Carlo (MCMC, Kyry and Schaub, 2011; Kruschke, 2014). Based on the combination, we are able to avoid so-called multi integration problem and build a complex model with various error distribution. Regarding the details of concept, procedure, and merit of the Bayesian framework, refer to Gelman and Hill (2006). As a result, the framework proves that we can build and compute a complex statistical model within a feasible computation period.

Our state space model can be stated using the following equations:

$$\begin{aligned}
 Y_{i,j} &\sim \text{Normal}(h_{i,j}, s_y) \\
 h_{i,j} &\sim \text{Cauchy}(h_{i,j-1} + r_{i,j} + \beta_{1i,j}, s_h + \beta_{2i,j}N_{i,j}, s_h) \\
 r_{i,k} &\sim \text{Normal}(r_{i,j-1} + r_{i,j-2} + r_{i,j-3}, s_r) \\
 \beta_{1,i,j} &\sim \text{Normal}(\beta_{1,i,j-1} + \beta_{1,i,j-2} + \beta_{1,i,j-3}, s_{\beta 1}) \\
 \beta_{2,i,j} &\sim \text{Normal}(\beta_{2,i,j-1} + \beta_{2,i,j-2} + \beta_{2,i,j-3}, s_{\beta 2}) \\
 s_y, s_h, s_r, s_{\beta 1}, s_{\beta 2} &\sim \text{student\_t}(4, 0, 100)
 \end{aligned}$$

Where:

$Y_{i,j}$ : The number of employee in year  $i$  and industry  $j$

$h_{i,j}$ : Human resource abundance in year  $i$  and industry  $j$

$N_{i,k}$ : The number of factory in year  $i$  and industry  $j$

$r_{i,k}$ : Natural increase rate of human resource abundance in year  $i$  and industry  $j$

$\beta_{1,i,j}$ : Impact of 1987 shock in year  $i$  and industry  $j$

$\beta_{2,i,j}$ : Impact of the number of factory in year  $i$  and industry  $j$

$s_y, s_h, s_r, s_{\beta 1}, s_{\beta 2}$ : Variance of each predictors

We suppose that  $N$  of Employee ( $Y$ ) is a sampled observation obtained from HRA ( $h$ ) randomly and  $Y$  distributed along Normal distribution,  $\text{Normal}(H_{i,j}, s_y)$ . HRA ( $h$ ) is determined by  $h$  in previous three years, the number of factory ( $M$ ), irregular fluctuation ( $r$ ), and 1987 shock. The shock refers that some events affecting the number of employees might occurred around 1987. In fact, around 1987, some couples of golden events have occurred; motorization, reasonable promotion policy, and transformation of socioeconomic environment. For society and economy of Thailand, the year should be a banner year. From 1960s', automobile production volume has increased steadily. In 1960, the amount was 500 and the amount increased to approximately 100,000 units in 1985. After 1986, the volume has doubled year by year until 1997.

Favorable combination promotion policy by government has also worked for the rapid growth. from 1983, the government assessed to procure 45% of parts from Thailand local suppliers. The decision lasted until 1990 and expanding automobile assemblers were forced to follow the decision. Fortunately, abundant land and location helped the assemblers to establish new factories (Siriprachai, 2012).

Devaluation of Japanese Yen have fostered foreign manufacturers' expansion. In 1985, to adjust twin deficit of US, the Plaza Accord has concluded among France, Germany, Japan, United Kingdom, and United States. As soon as the conclusion, Japanese Yen has hiked sharply. Exchange rate of Japanese yen and US Dollar extraordinarily decreased from 238.4JPY/USD in 1985 to 168.52JPY/USD in 1986. The strong yen resulted in wage increase for Japanese workers and manufacturers operating inside of Japan could not but expand their factories to overseas to seek cheaper labor.

As a result of the banners, production volume of Automobile in Thailand has increased dramatically. The amount increased from 31,000 in 1975 to 110,000 in 1985 (Kohpaiboon, 2006). To cope with the rapid increase, HRA might be hired. These banners have occurred around 1985. To make use of the banners, foreign manufacturers might spend a couple of years to establish subsidiaries, build factories, set up apparatus, and hire and train worker.

Moreover, we add some other values into our model. The  $h$  distributes along Normal distribution,  $Normal(H_{i,j}, s_h)$ . The natural increase rate ( $r$ ), impact of the number of factory, and impact of 1987 shock has third order trends, since we expected a company may spend two or three years to implement feasible study, building a factory, and test working.

To compute distribution of  $h, r, \beta_1, \beta_2, s_y, s_h, sr, s\beta_1, s\beta_2$  in the model by MCMC method, we used a statistical analysis environment R (Ver. 3.4.0) and STAN (Ver. 2.1). To confirm the independence of the posterior probability on initial values, we executed four independent iterations. We obtained estimates from 100,000 iterations after a burn-in of 100,000 iterations, thinning at intervals of 10. To evaluate goodness of convergence, we employed Rhat number (Gelman, 2014).

## RESULTS

### Increase rate of human resource volume and other impacts

Throughout industries, the increase rates ( $r$ ) is similar. Figure 2 demonstrates annual trends of  $r$  by industry. The figure implies that the increase rates settles between 7 and 8 among the industry. With 81% likelihood, the rates become less than 20. This fact means that human resource abundance in entire industries grows up in the same pace annually. In the first and last year, because of characteristics of MCMC sampling, the rate become higher even though the  $r$  is inside of coefficient intervals. Other rates, impact of 1987 shock and the number of factory, show similar trends as  $r$ .

Among the predictors, impact of 1987 shock is remarkably strong (Fig. 3). The impact transitions approximately 650. If such shock would be occurred, human resource abundance would increase approximately 650. Comparing the 1987 shock, impact of the number of factory is modest (Fig. 4). When a factory would be added, 14 human resource abundances would be recruited. These facts also show that at least 650 HR abundance is added annually.

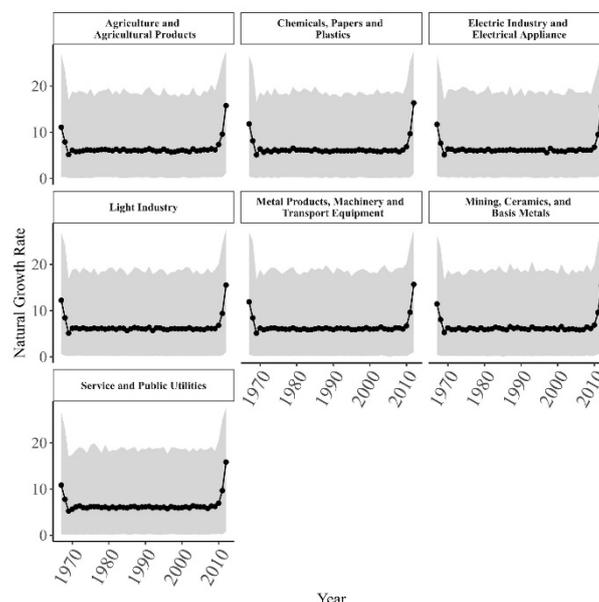
### Human resource abundance

Figure 5 demonstrates trend of annual estimated HR abundance. We understand that HR abundance experienced monotonic increase annually through the years. Especially before and after 1987, something might happen as we stated into our estimated model, since the curves showing abundance curves raise up keenly. It is surprising that the HR abundance is similar other than the machine products, machinery and transport equipment industry. For example, the estimated abundance of Agriculture industry is 11,387 in 1967; one of Chemical is 3,784; one of Electricity is 7,809; one of Light industry is 7,313; one is Mining is 7,310; one of Service is 1,076. The numbers' dispersion is not so large. Also, in the machine products, machinery and transport equipment industry, the HR abundance is 73,551 in 1967, which is seven times more than that of other industries.

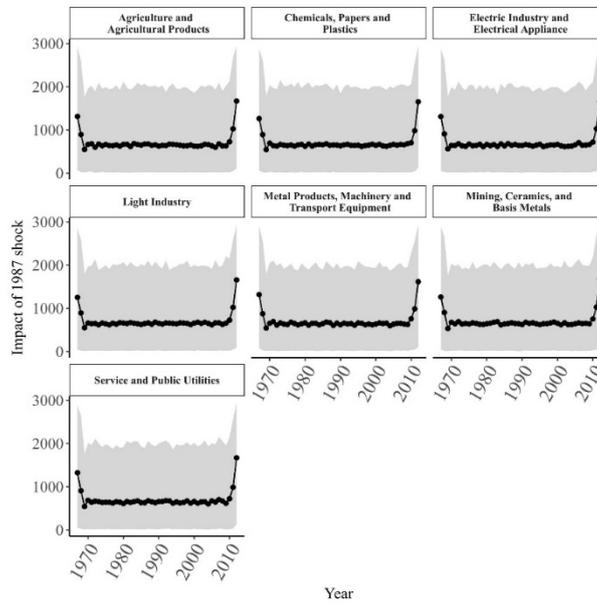
### Gaps between real number and estimated number

Computing the gaps between real number of manufacturing employees and the HR abundance, we are able to consider allowance of human resource abundance by industry. If the gap would be more than 0, we can regard such situation as overuse, which factories belonging to the industry would hire workers more than HR abundance. If the gap would be less than 0, we do it as underuse, which ones belonging to the industry would hire workers less than HR abundance.

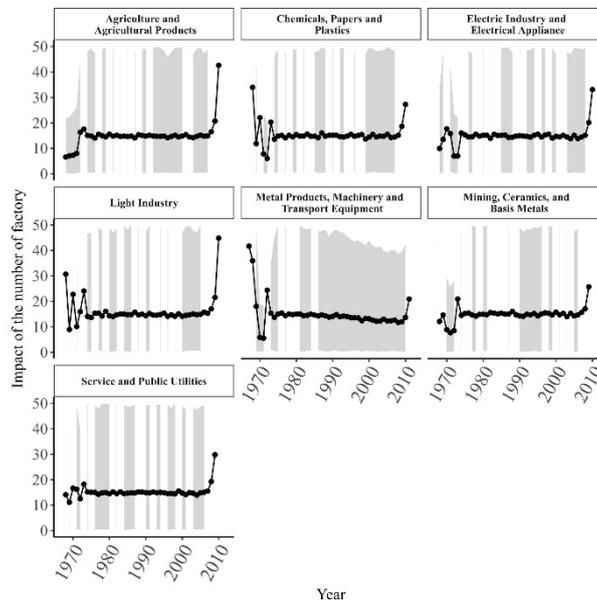
Figure 6 shows annual trend of gaps by industry. We can classify the 7 industries by pattern of gap; type A and type B. Type A refers to a pattern showing monotonic decrease. Chemicals, Mining, and Service industry belong to this group. In the industry, HR abundance tend to start decreasing earlier than other industries belonging to type B. For example, in Chemical industry, the gap started decreasing from the midst of 1970. Type B refers to one showing convex-upward pattern. Agriculture, Electricity, Light industry, and Machinery belong to this group. In the industry, gaps of belonging industries reach their peaks between the midst of 1980s and the end of 1990s. After the end of 1990's, as type A, the gaps are on the decrease. Combining the results regarding the patterns, all the industries reach declining mode, namely, Thai manufacturers have started saving human resource abundance since then.



**Figure 2** Annual natural increase rate of human resource abundance by industry (Unit: person), 1967–2012. Points in each year and industry denote posterior mean of parameters. Grey areas denote 95% credible intervals.



**Figure 3** Annual impact of 1987 shock by industry, 1967–2012. Points in each year and industry denote posterior mean of parameters. Grey areas denote 95% credible intervals.



**Figure 4** Annual impact of the number of factory by industry, 1967–2012. Points in each year and industry denote posterior mean of parameters. Grey areas denote 95% credible intervals.

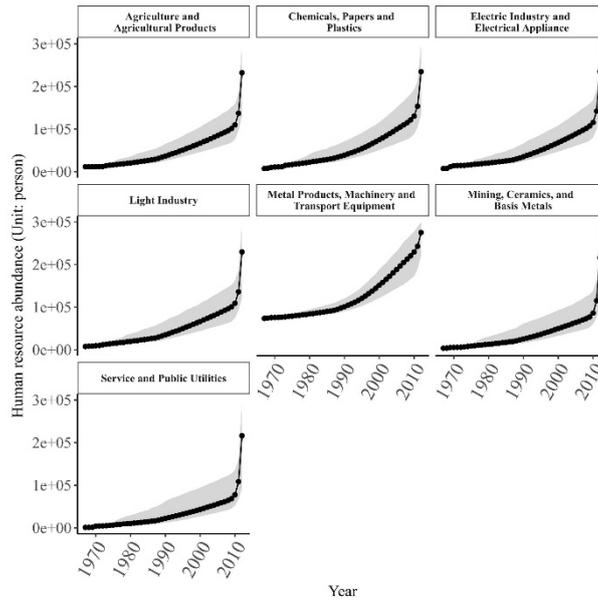


Figure 5 Annual human resource abundance by industry, 1967–2012. Points in each year and industry denote posterior mean of parameters. Grey areas denote 95% credible intervals.

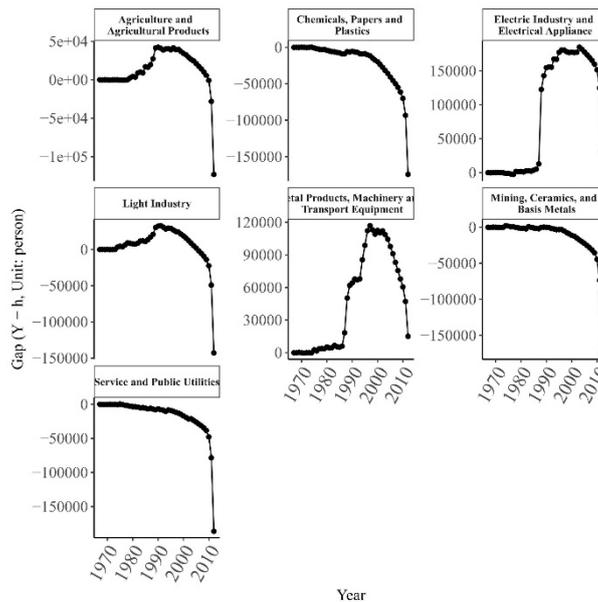


Figure 6 Annual gaps between the number of employees and human resource abundance ( $Y - h$ , Unit: persons) 1967–2012. Points in each year and industry denote posterior mean of parameters. Grey areas denote 95% credible intervals.

## DISCUSSION

### Discussion

The purpose of this study is to estimate human resource abundance in Thailand. Human resource abundance refers to population of employees and possibly eligible people to work. Using state–space model, we

estimate human resource abundance while considering impact of 1987 shock and the number of factory, and natural increase rate.

We obtained the following results. First, the number of enterprise has contributed to HRA increase most. Impact of 1987 shock and increase rate of HR have contributed next to the number. Second, human resource abundance has experienced monotonic increase for several decades. In 1967, total abundance is estimated 112,232. Since then, the abundance has been increased dramatically until now and the abundance has reached 1,639,150 in total. The abundance has increased approximately 14.6 times spending for 50 years.

Finally, in the long term, gaps in entire industries becomes lower and lower. In type-A industries, since 1980s', the gap has become less than 0. In type-B industries, within a couple of decades, the gap will become less than 0. These facts mean that within decades, among the industries, the gap will become less than 0. In other words, manufactures may not hire workers as expected because of some reasons.

### Conclusion

We conclude that developing human resource use rather than labor shortage matters. Currently, other than automobile assembly and electronic instruments, the HRA is expected to be balanced. The HRA will be overused approximately until 2040s'. In the long term, however, among all the targeting industries, the HRA will be expected to greater than demand, particularly from 2040s' and labor shortage will be resolved.

Improving training is essential not only for developing more productive workplace but also for enhancing retention. When a factory will introduce more capital-intensive apparatus to cope with the contemporary labor shortage, workers in charge of the apparatus will require workers to keep up newer technology and newer operating skills.

Expectation to switch education system that meet practical purposes is questionable. In principle, it is a manufacturer who is responsible for workers' training. Such training costs should be covered by an economic agent who will make use of fruits, not by taxpayers in general. Moreover, after a couple of decades, unpredictable technological transition might be occurred, and the education system should be rearranged. We may not be able to obtain the fruits as expected.

Our conclusion may help foreign companies' decision making. When a company think about expansion to a certain country, according to some theories such as lifecycle theory and eclectic paradigm, availability to procure human resource is a vital factor. Using the conclusion, they are able to find out the HRA as another criterion. The HRA can be computed not only using the official data but also individual / first-starter companies' number of employees while considering original predictors.

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INVESTIGATING EFFECTS OF CUSTOMER PERCEIVED VALUE AND CUSTOMER  
SATISFACTION ON INTENTION TO ADOPT MOBILE PAYMENT SERVICE  
IN THE EASTERN OF CHINA

*Xiaohong Yang\** *Nattapan Buavaraporn, Ph.D.\*\**

## ABSTRACT

Customer perceived value and customer satisfaction are two important factors in marketing context and attract attention both academic and practical. This study aimed at assessing the relationship between customer perceived value, customer satisfaction and behavior intention in mobile payment service of developing country such as China. Online questionnaire was distributed to respondents who used mobile payment service by Questionnaire Star, QQ, Alipay and Wechat payment website. 376 valid questionnaires from mobile users in China were collected from Shanghai, Hangzhou and Guangzhou. Descriptive analysis and Structure Equation Model (SEM) were applied to study the relationship of all variables in the study. The results of this study showed that customer perceived value directly affect customer satisfaction and indirectly affect customer behavior intention through customer satisfaction in the mobile payment service of China.

**Key words:** Customer perceived value; customer satisfaction; behavioral intention; mobile payment; China.

## INTRODUCTION

Nowadays, with the development of wireless communication technologies, mobile phone became more and more normal and important in our life. Many practitioners and researchers have studied the emergence of mobile commerce (m-commerce) due to its potential impact on business and industry (Chu & Pan, 2008). As one of the critical drivers for successful mobile commerce, mobile payment will continue to facilitate secure electronic commercial transaction between organizations or individuals.

In recent decades, a large number of researchers have studied mobile payment and made a great achievements (Dahlberg et al., 2008; Chen, 2008). Even though there are a number of studies on mobile payment adoption so far, mobile payment is still a quite new context since 2000s and it is developing rapidly and widely in whole world.

In China, mobile payment study started late and previous researches on the reason why Chinese mobile phone users are willing to use mobile payment has not come to a convincing conclusion. On the other hand, there are few empirical studies focusing on factors influencing the adoption of mobile payment from users'

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point of view in China. Furthermore, how the factors affect the adoption of mobile payment is not well explored. Western scholars have done a lot of research about technology acceptance, which present reference value for the adoption and development of information technology industry, however, the relevant research about mobile payment in China is much less and is still a new thing. Whether the conclusion drawn from western scholars is suitable for China market needs to be tested. Hence, mobile payment adoption is very important to study.

According to a report from iResearch China, China's third-party mobile payments GMV (gross merchandise volume) could grow from 6.0 trillion yuan in 2014 to 18.3 trillion yuan in 2018, which is a healthy compound annual growth rate of 32%. However, although the mobile payment has been developed in China, the development of the mobile payment business in China has not yet reached the expected level.

In addition, from the previous literature review, China has a largest potential mobile payment market in the world, the mobile payment technology has been achieved, and users' intention is the key matter which hindered the development of mobile payment Luo et al.(2010). Customer perceived value and satisfaction are the most important driver of loyalty, and have a strong predictive power to the intention. Customer perceived value and customer satisfaction have been studied in many field, but mobile payment service as a new service , there is few study had assessed the concepts in mobile payment service (Zhu, 2011). Hence, it is necessary to assess the effects of customer perceived value and customer satisfaction on intention to adopt mobile payment in China.

This objective of this study are (1) To assess the relationship between customer perceived value and customer satisfaction of mobile payment service in China, (2) To assess the relationship between customer satisfaction and intention to adopt mobile payment service in China, (3) To assess the relationship between customer perceived value and intention to adopt mobile payment service in China.

## LITERATURE REVIEW

Generalized mobile payment is one kind of service refers to the user using mobile facility to finish payment on the consumption of goods and service. However, various researchers and institutions have defined it from different perspectives. For example, China's scholar defines that mobile payment is a transaction activity which is through the communication way such as short message service, wireless application protocol by means of mobile communication facilities such as mobile phone, PDA and laptop (Chen et al., 2006). In this paper, a broader definition of Wang & Chou (2012) is adopted, which specifies that mobile payment is "a form of payment where the user uses a mobile device to realize information exchange and complete fund transfer from the payer to the payee for the purpose of payment by way of accessing communication networks or using short-range communication technologies". Mobile payment can be used in a variety of payment scenarios such as payment for digital content t (e.g. ring tones, logos, news, music, or games), concert or flight tickets, parking fees, and bus, tram, train and taxi fares and so on (Dahlberg et al., 2006).

Woodruff (1997) proposed that "customer perceived value is a customer's perceived performance for an evaluation of those product attributes, attribute performances and consequences arising from use that

TRACEABILITY COSTS AND BENEFITS IN FOOD SUPPLY CHAIN:  
A CASE STUDY IN SERANG CITY, INDONESIA

*Kiki Khoifin\* and Suthep Nimsai\**

**ABSTRACT**

The food demand is highly increased every year. Beside, consumers require a higher safety and transparency at the whole of food supply chain (Asioli, Boecker & Canavari, 2014). Over the last decade, food safety has been significantly concerned by public and industry (Chrysochoidis, Karagiannaki, Pramatarı & Kehagia, 2009). Beyond as a merely food safety, traceability can be defined and deliver several benefits such as regulation, supply chain management, marketing, etc. (Asioli, Boecker & Canavari, 2014). Likewise, as an investment-worthy (Chrysochoidis, Karagiannaki, Pramatarı & Kehagia, 2009), it is worth-mentioning that traceability is part of the food business system and thus has to be unified with logistic processes and good manufacturing/agriculture practice. Traceability Costs (TC) and Traceability Benefits (TB) are influenced by firm resources and objectives as summarized as Firm Characteristics (FC) associated to traceability system implementation (Golan et al. 2003). This research used sample of 30 food industries in Serang city, Indonesia, and analyzed through path analysis by using SmartPLS 3. The result of this research shown that perceiving the traceability both cost and benefits were experienced by cracker and bread factory was relied on the traceability level implemented, although without imposition by the government. Further, the biggest amount of the traceability costs both implementation and maintenance was respectively in terms of material and label/packaging. It makes sense, when these kinds of costs are tangible. In respect to specific benefits, food processors extremely paid attention into market share and customer response. It probably caused by management information within manufacturing processes at the level input (breadth) rather than upward or backward tracing, or even the smallest unit per batch/lot, would therefore exhaustively comprehend the market and customer response. With limit knowledge and experience in traceability system, this particular size of industries are relatively overestimated on market share and customer response, also, a tremendous costly at the material/labeling.

**Key words:** Food supply chain, firm characteristics, traceability levels, traceability costs, traceability benefits

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## INTRODUCTION

The food demand is highly increased every year. Beside, consumers require a higher safety and transparency at the whole of food supply chain (Asioli, Boecker & Canavari, 2014). Over the last decade, food safety has been significantly concerned by public and industry (Chrysochoidis, Karagiannaki, Pramataris & Kehagia, 2009). Therefore, such systems had been implemented to underpin achieving this goal. One of its systems is well-known as traceability. Traceability aspects have been recognized as a critical instrument for assuring food safety and quality (Dabbene, Gay & Tortia, 2013). Traceability is ability to trace the history, application or location of that which is under consideration (Narsimhalu, Potdar & Kaur, 2015). Since 2005, traceability system had been mandatory initiative for European food processors under EGFL (European General Food Law) No 178/2002 or in the US (Bioterrorism Act PL107-188). Beyond as a merely food safety, traceability can deliver several benefits such as regulation, supply chain management, marketing, etc. (Asioli, Boecker & Canavari, 2014). Likewise, as an investment-worthy (Chrysochoidis, Karagiannaki, Pramataris & Kehagia, 2009), it is worth-mentioning that traceability is part of the food business system and thus has to be unified with logistic processes and good manufacturing practices. Though, in the business realm, decision-makers may not exhaustively comprehend the associated costs and/or benefits of traceability (Sparling, Henson, Dessurreault & Herath, 2006). The study of traceability system of Indonesian food industry is still limited and deal with barriers in the implementation (Syahrudin & Kalchschmidt, 2011).

The implementing traceability costs are relatively easy to define, although, difficult to measure (Sparling, Henson, Dessurreault & Herath, 2006). Traceability, in particular costs such as equipment and software, changes in processes, training and on-going operating costs (Sparling & Sterling, 2004). However, costs of traceability depend on the characteristics of its firm such as regulatory environment, technology adopted, firm size, firm strategy and culture, characteristics of products and production processes, number of information to be saved, structure and complexity of the supply chain (Food Standard Agency, 2002). While, traceability benefits are also hard to be measured. As such, in the food supply chain adoption of traceability had seemingly been weak (Verdenius, 2006 in Asioli, Boecker & Canavari, 2014). Nonetheless, few studies had addressed the measurement of costs and benefits of improved traceability (Asioli, Boecker & Canavari, 2011).

Karlsen, Dreyer, Olsen & Elvevoll, (2012) argued that it had been little attention in the literature reviews about analysis of the relationships between Firm Characteristics (FC), the Traceability Level (TL) and costs and benefits of traceability. This study will therefore examine whether or not the effect of FC on Traceability Costs (TC) and Traceability Benefits (TB) through Traceability levels (TL) which described as three dimensions such as precision, breadth, and depth (Golan et al. 2004) by empirical analysis. Although, traceability is an essential catalyst of future system in food supply chain. There has been little research in respect to traceability implementation experienced in Serang city, Indonesia. Also, paucity of research reflected the specific traceability both costs and benefits had been fundamental issue for either academics or practitioners.

## LITERATURE REVIEW

### 1. Firm Characteristics

The firms implement voluntary law in force or even into the statutory of the traceability system, going beyond the law requirements (Canavari, Centonza & Spadoni, 2006). Traceability system might rise up added-value as far as it goes beyond statutory norms (Canavari, Centonza & Spadoni, 2006). Thus, this study will focus on whether or no imposition of implementing traceability by the government (GI). Firm's traceability goals and its sources, such as adopted quality management systems (QMS) or firm size (FS) may effect on the balance of TC and TB (Asioli, Boecker & Canavari, 2010). Moreover, to adopt the traceability system might be motivated by complying with government regulations (Asioli, Boecker & Canavari, 2010). Mora & Menozzi (2005) believed that when firms already have a QMS in place (e.g. ISO 9001:200) the cost of traceability will increased. Either TC or TB was depended on firm size (Mejia et al., 2010). Firm size can be measured with total asset, total sales or revenue (Graves & Waddock, 1994). Each firm has different characteristic in nature of the products including harvest and packing location, diversity of supplier (DS), the raw materials are sourced (INPUT), and the stage of the product sold (DESTINATION). Therefore, TC may also vary depending on firm characteristics (Food Standard Agency, 2002), and relationship between partners; capacity of managing transaction (Manos & Manikas, 2010).

### 2. Traceability Levels

The firms expect efficiently implement and maintain the traceability system will perceive benefits over than costs (Golan et al., 2004). TL could be categorized into three levels, such as, breadth, precision, and depth. Breadth which intends to the level of attribute tracked and traced (Narsimhalu, Potdar, & Kaur, 2015), and refers to what information is recorded for an individual input batch (Asioli, Boecker & Canavari, 2014). Traceability practices consist of data collection through the food chain (Mejia et al., 2010), thus, its cost would be increase when operations are more complicated (Asioli, Boecker & Canavari, 2010). The complexity of food processing operations is referred to the way in which traceability records are stored by firm which practically unique, therefore, varying decisions with respect to the size of batches that are produced and food recall (Food Safety Agency, 2002). Depth is how far back or forward the system tracks the relevant information (Golan et al. 2004). Thereof, to effectively run this matter, co-ordination forms, their complexity and the firm willingness to build long run relationships with other members of the chain, highly affect the opportunities to collect and manage information (Canavari, Centonza & Spadoni, 2006). Shared information may distinct from strategic to tactical in nature, and from information concern on logistics activities to general market and customer information (Mentzer, J. T., Min, & S., Zacharia, Z, G. 2000). Executing "Depth" simply could be seen in the recall process, in the case of small enterprises with shorter food supply chain, recall process is deficient costly and more effective (Donnely et al., 2012). Precision is degree of assurance to pinpoint a particular movement of good, a smaller unit analysis (such as individual cow or crate) will allow greater precision (Golan at al. 2003). Precision ordinarily defines as the smallest units that company can trace at the level input and output (Asioli, Boecker &

Canavari, 2014). It pointed that precision as more directly related with cost, because of the larger interference of precision requirements with the flow of operation (Asioli, Boecker & Canavari, 2014).

### 3. Traceability Costs and Benefits

Determining costs and benefits of improved traceability through an empirical analysis is only a few studies. Those are also grossly lacking of empirical evidence and quantitative evaluation (Verbeke, 2001). As such, in fact, traceability benefits are actually hard to grasp (Verdenius, 2006 in Asioli, Boecker & Canavari, 2010) due to strategic meaning (Roth & Doluschitz, 2007). According to Bennet (2010), traceability provides four potential benefits for business, including; Meeting regulatory requirement, recall and risk management: perception related to reduced risks; process improvements (efficiency and quality: improved customer service/response time), and supply chain operation. In particular traceability costs both implementation and maintenance may have four categories such as time and effort (of workforce, administration and management), equipment, training, external consultant, materials, and certification and audit (Asioli, Boecker & Canavari, 2014; Bosona & Gebresenbet, 2013; Chrysochoidis et al. 2009; Meuwissen, Velthuis, Hogeveen & Huirne, 2003; Mora & Menozzi, 2003).

### 4. Conceptual Framework

As literature reviews stated above, TC and TB were influenced by FC associated to TL (Golan et al. 2003) which is described as precision, breadth, and depth (Golan et al. 2004). Therefore, this study proposed hypothesis consist of:

**H1** = Firm Characteristic (FC) will effect on Traceability Costs (TC)

**H2** = Firm Characteristic (FC) will effect on Traceability Benefits (TB)

**H3** = Firm Characteristic (FC) will effect on Traceability Costs (TC) through Traceability Levels (TL)

**H4** = Firm Characteristic (FC) will effect on Traceability Benefits (TB) through Traceability Levels (TL)

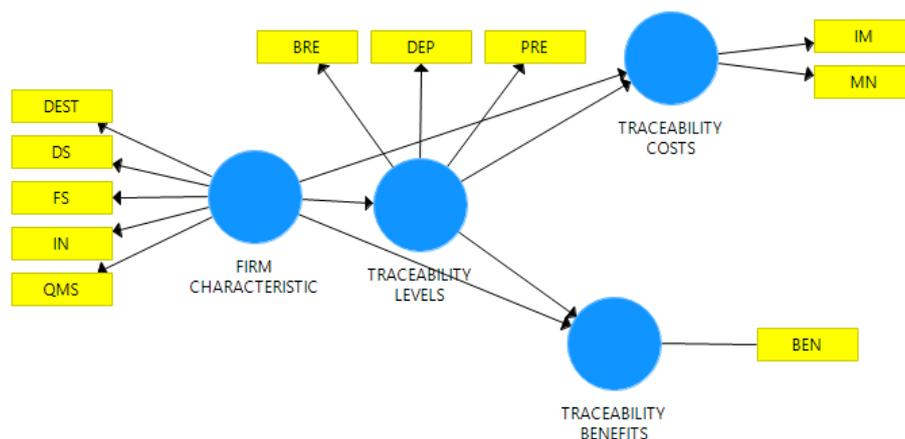


Fig. 1 Conceptual framework\*

\* DEST (Destination), DS (Diversity of Suppliers), FS (Firm Size), IN (Input), BRE (Breadth), DEP (Depth), PRE (Precision), IM (Implementation), MN (Maintenance), and BEN (Benefits)

## METHODOLOGY

## 1. Instrument Measurement

Table 1. Instrument Measurement

Variable	Explanation	Measurement Scale	Value Scale
<b>Firm Characteristic:</b>			
Firm Size (FS)	Annual revenue categories (1: 0 – ≤ \$22,300, 2: > \$22,300 – ≤ \$186,000, 3: > \$186,000 – ≤ \$3,700,000)	Rating scale	Min score: 1 Max score: 3
Input (IN)	Total number of different raw material types that are used in operation: wild, farm, and both. (Each reported raw material type adds a value of 1 to the score)	Ordinal scale	Min score: 1 Max score: 3
Diversity of Supplier (DS)	Total number of different regions from which raw materials are sourced: Serang city, Banten province, Java island, other island, Asean, Asia, EU/USA, other. (Each reported sourcing region adds a value of 1 to the score)	Ordinal scale	Min score: 1 Max score: 8
Destination (DEST)	Total number of different regions to which output is sold: Serang city, Banten province, Java island, other island, Asean, Asia, EU/USA, other. (Each reported destination region adds a value of 1 to the score)	Ordinal scale	Min score: 1 Max score: 8
Quality Management System (QMS)	Total number of food quality or safety assurance/management standard to which the firm is certified: Standard Nasional Indonesia/Indonesian National Standard, ISO 9001:2000 Quality Management System, ISO 22000:2005 Food Safety Management System, HACCP, MSC, ISO 14001 Environmental, IFS–International Food Standard, Others. (Each reported certification adds a value of 1 to the score)	Ordinal scale	Min score: 1 Max score: 8
Government Imposition (GI)	Whether or no imposition from the government in implementing traceability. Does	Ordinal scale	No: 0 Yes: 1

	a government (international, national, regional, provincial, or municipality) or a government agency impose the implementation of traceability system? (No: 0, Yes:1)		
<b>Traceability Level:</b>			
Breadth (BRE)	Total number of information recorded for an individual input batch: supplier details, data an hour of product arrival, date of harvest, location (area) of harvest/farming, water quality classification, method of production, scientific name of the species, common name of the species, quantity, quality grading, others. (Each reported information recorded adds a value of 1 to the score)	Ordinal scale	Min score: 1 Max score: 11
Depth (DEP)	Ability to trace the input beyond the direct suppliers and buyer on a regular basis. The legal requirement is to be able to trace a product to the direct supplier of an input and direct buyer of an output. Are you able to trace your inputs beyond the direct suppliers and your outputs beyond direct buyers? (No: 0, Yes: 1)	Ordinal scale	No: 0 Yes: 1
Precision (PRE)	Ability to trace the smallest unit at the level input and output. Can you trace the smallest unit at the level input and output? (No:0, Yes:1)	Ordinal scale	No: 0 Yes: 1
<b>Traceability Cost:</b>			
Implementation (IM)	Overall implementation cost (1: Very low cost to 4: Very high cost)	Ordinal scale (Likert-scale)	Min score: 1 Max score: 4
Maintenance (MN)	Overall maintenance cost (1: Very low cost to 4: Very high cost)	Ordinal scale (Likert-scale)	Min score: 1 Max score: 4
<b>Traceability Benefit:</b>			
Overall Benefit (BEN)	Overall benefit (1: No benefit at all to 4: Great benefit)	Ordinal scale (Likert-scale)	Min score: 1 Max score: 4

**Source:** Adapted Asioli, Boecker & Canavari, (2014); Golan et al., (2004); Bulut & Lawrence, (2008); Mora & Menozi, (2005); Mejia et al. (2010); McEntire et al. (2010) in Bosona & Gebresent, (2013); Golan et al., (2004); Sparling, Henson, Dessureault & Herath, (2006)

In particular traceability costs and benefits. The survey also included a section set equal to 100 units to prop the result interpretation. How these 100 units delivered across the five categories of specific implementation costs, specific maintenance costs, and four categories of the traceability benefits.

## 2. Population and Sample

Population of this study is food industries in Serang city. There were 75 food industries which had labor more than 10 (Badan Pusat Statistik Provinsi Banten, 2015). Purposive sampling was used in this research. The difficulty in collecting data had been occurred. The respondents thought that information of FC and traceability system was confidential, then, inconvenience to share. Finally, there were 30 companies accepted to answer the questionnaire. Those were cracker and bread factories.



**Fig. 2.** Bread & Cracker factory in Serang city, Indonesia

**Source:** Own observed-picture

## 3. Data Analytical Approach

This research used PLS-path analysis method by using SmartPLS 3. The study regarding traceability costs and benefits are still few and insufficiently grounded. Therefore, for initial development and assessment phase of theory building, using PLS is advantageous (Julien & Ramangalahy, 2003). In addition, as a robust reason, PLS-Path analysis used due to this study proposed the model that had exogenous variable (Firm Characteristics) connecting line with arrow (path) at three endogenous variables (Traceability Levels, Traceability Costs and Benefits) with reflective indicators which aims to examine the effect both direct and indirect. This research obtained 30 complete data. As such, in respect to sample size, this study was hence appropriately used PLS-Path analysis (sample size less than 100 can be used for PLS) (Chumney, F. L. 2013; Wold, 1985 in Ghozali, 2006). Chin & Newsted, (1999) proved that with only 20 data they could use properly PLS SEM. Indicators with categorical scale, ordinal, interval, and ratio can be applied at the same model (Ghozali, 2006).

## 4. Data Analysis and Empirical Result

### 4.1 Outer Model

Convergent validity of the measurement model with the relative model of the indicator is measured by the correlation between the score item/component score and the construct score. The reflective size is high if it correlates more than 0.70 with the constructs. Reliability test was used by cronbach's alpha and composite

reliability test  $\geq 0.7$  (Henseler, Pauline & Ray, 2015; Ghozali, 2006). Whereas, the validity test had used Fornell–Larcker criterion (Ghozali, 2006).

#### 4.2 Inner Model

The structural model is evaluated by using R – square for the dependent construct and t–test and the significance of the structural path coefficients parameter (CP). Testing was conducted by using resampling and bootstrapping. The influence between variables is considered significant at the 5% level if the T–statistic value is greater than T–table 1.96 (Ghozali, 2006).

## RESULTS AND DISCUSSION

### 1. General Description of Research Object

A total of valid 30 complete responses were collected. An overview of the descriptive of research object is described in Table 2 below. The information include: Annual revenue, the age of the company, total number of suppliers, total number labor, selling ways, customers types, information types, and both traceability in specific costs and benefits.

**Table 2.** General Description of Research Object

Item	Percentage	Item	Percentage
<b>Annual revenue*:</b>		<b>The age of company:</b>	
0 – $\leq$ \$22,300	73%	1–5	7%
\$22,300 – $\leq$ \$186,000	27%	>5	93%
<b>Number of suppliers:</b>		<b>Number of labor:</b>	
1 Supplier	37%	1–4	3%
2 Suppliers	27%	5–19	47%
3 Suppliers	20%	20–99	43%
4 Suppliers	10%	>99	7%
5 Suppliers	7%		
Item	Percentage		
<b>Selling ways:</b>			
Sold under the company’s brand name to the final consumer	67%		
Sold under licensing agreement for another brand name	14%		
Sold to buyer without any direct brand name involvement in contract	19%		
<b>Customer types:</b>			
Wholesale market	16%		
Wholesaler	25%		

Local food shop	33%
Food service chain	1%
Restaurant	8%
Institution	5%
Other	12%

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**Information types:**

Supplier's detail	40%
Data and hour of product arrival	27%
Quantity	30%
Quality grading	3%

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**Traceability specific implementation costs:**

At purchase new equipment and software	17%
Certification, audit and external consultants	11%
Production line, supervisory staff and managerial/administrative time	22%
Training course	10%
Material (e.g. labels)	40%

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**Traceability specific maintenance costs:**

Upgrades and service contracts	9%
Repeat audit/certification	1%
For specific challenges upgrade hygiene, labeling legislation	21%
On-going training for new staff	22%
Label/Packaging	47%

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**Traceability specific benefits**

Meeting current and anticipated future regulatory requirements	9%
Reducing customer complaints, recalls, risk of product liability	34%
Increasing market share or accessing new markets or customers response or obtain a price premium	47%
Improving supply chain management (inventory, logistics, communication with suppliers and customers)	10%

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\*Indonesian law No. 20 in year of 2008 "Micro, Small, and Medium Enterprises" article 6

2. Descriptive Statistics

Table 3. Descriptive Statistic

Variable	Mean	Standard Deviation
<b>Firm Characteristic:</b>		
Firm Size (FS)	1	0.442
Input (IN)	1	0.400
Diversity of Supplier (DS)	2	1.230
Destination (DEST)	1	0.249
Quality Management System (QMS)	0.5	0.500
Government Imposition (GI)	0.0	0.000
<b>Traceability Level:</b>		
Breadth (BRE)	1	1.183
Depth (DEP)	1	0.806
Precision (PRE)	0.6	0.482
<b>Traceability Cost:</b>		
Implementation (IM)	2	0.496
Maintenance (MN)	2	0.396
<b>Traceability Benefit:</b>		
Overall Benefits (BEN)	3	0.516

Source: Data running SmartPLS

3. Outer Model

3.1 Measurement evaluation (outer) model

The correlation among indicator and its construct will be shown in the following figure.

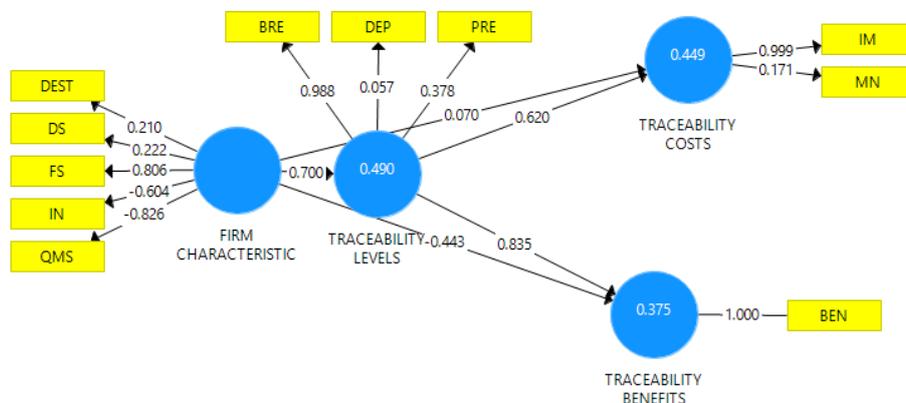


Fig. 2. Full Path Model

Source: Data running SmartPLS

Based on the outer loading above, Indicators which meet loading  $> 0.70$  are FS (0.806), BRE (0.988), IM (0.999), and BEN (1.000). Therefore, indicators  $< 0.70$  are IN (-0.604), DS (0.222), DEST (0.210), QMS (0.826), DEP (0.057), PRE (0.378), and MN (0.171), thus will be dropped-out from the model.

### 3.2 Validity test

This following table represents correlations between other construct in the model. It is clear that all constructs have met the requirement of discriminant validity.

**Table 4.** Fornell–Lacker Criterium

	Firm Characteristic	Traceability Benefit	Traceability Cost	Traceability Level
Firm Characteristic	1.000			
Traceability Benefit	0.146	1.000		
Traceability Cost	0.325	0.521	1.000	
Traceability Level	0.637	0.491	0.682	1.000

**Source:** Data running SmartPLS

### 3.3 Reliability Test

Reliability test had been conducted by using cronbachs alpha or composite reliability test  $\geq 0.7$ .

**Table 5.** Cronbachs Alpha and Composite Reliability

	Cronbachs alpha	Composite reliability
Firm Characteristic	1.000	1.000
Traceability Level	1.000	1.000
Traceability Cost	1.000	1.000
Traceability Benefit	1.000	1.000

**Source:** Data running SmartPLS

Cronbach Alpha provides an estimate for the reliability based on the interrelationship of the measuring item, while composite reliability takes into account that indicators have different loadings (Henseler, Ringle & Sinkovics, 2009). It is reasonable, that all construct reached 1.000 for both cronbachs alpha and composite reliability due to each construct had only one indicator.

### 3.4 Inner Model

The value of R-square will be shown in the table below.

**Table 6.** R-square

	R square
Traceability Level	0.406
Traceability Cost	0.486
Traceability Benefit	0.288

**Source:** Data running SmartPLS

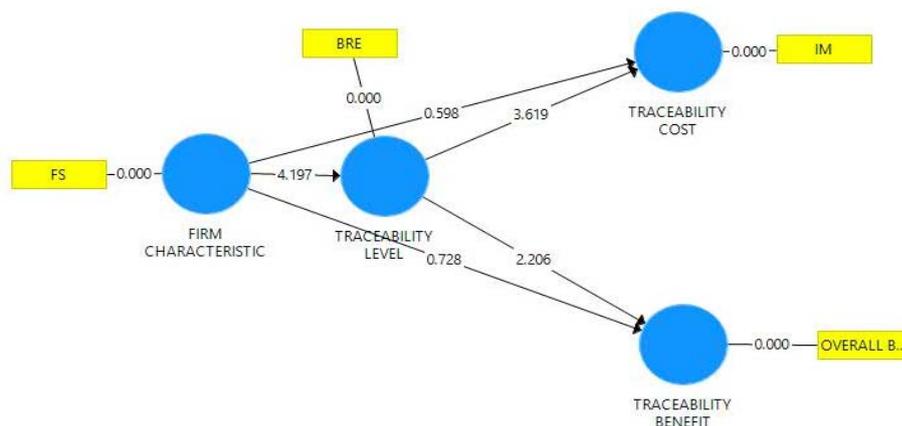
The effect of FC on TL gives R-square value 0.406. It can be interpreted that TL can be explained by FC in the amount of 40.6%, while 59.4% is explained by other variable which is not involved in this study. But, it is surprisingly that 48.6% FC can explain TC. The last, TB can be explained by FC in the amount of 28.8%.

### 3.4.1 Hypothesis Test

**Tabel 7.** Path Coefficients

	Original sample (o)	Sample mean (m)	Standard error (sterr)	T statistics
Firm Characteristic → Traceability Cost	-0.185	-0.130	0.310	0.598
Firm Characteristic → Traceability Benefit	-0.281	-0.204	0.386	0.728
Firm Characteristic → Traceability Level	0.637	0.641	0.152	4.197
Traceability Level → Traceability Costs	0.800	0.756	0.221	3.619
Traceability Level → Traceability Benefits	0.670	0.595	0.304	2.206

**Source:** Data running SmartPLS



**Fig. 3** Path model bootstrapping result

**Source:** Data running SmartPLS

In the following hypothesis analysis will discuss in specific indicator which met significant of each construct such as, Firm Characteristics (Firm Size= FS, Traceability Level (Breadth= BRE), Traceability Costs (Implementation=IM), and Traceability Benefits (Overall Benefits=BEN)

#### H1 = Firm Characteristic (FC) will effect on Traceability Costs (TC)

As a result, FC has no direct effect on TC with CP -0.185 and t-statistics 0.598 (t table significant 5%) lower than t-table 1.96. Therefore, H1 is rejected. FC were not been found to significantly link to TC (Asioli, Boecker & Canavari, 2010). Moreover, it is noteworthy that FC were found to be only weakly linked with costs, this observation may caution any trial to develop design for traceability solution that are intended to be applied in a “One size fits all” manner (Asioli, Boecker & Canavari, 2014), because of resources setting, objectives,

customer or market requirements, operational set-up, and technologies calls for customized traceability solutions. Leading to FS, seemingly, cost disadvantage experienced by these small companies when compared with medium and large size (Kelepouris et al., 2007; Kher et al., 2010 in Bosona & Gebresenbet, 2013). The limitations might include lack of information about the traceability systems and lack of enough knowledge to implement it (Kher et al., 2010; Manos & Manikas, 2010 in Bosona & Gebresenbet, 2013), or further measurement issue specially in implementation costs of traceability.

### **H2 = Firm Characteristic (FC) will effect on Traceability Benefits (TB)**

The CP of  $FC \rightarrow TB$  is  $-0.281$  with t-statistics as  $0.728$  (t table significant 5% = 1.96), t-statistics value lower than t table 1.96. Thus, there is no effect between  $FC \rightarrow TB$ . It is concluded that **H2** is rejected. This result propped the prior research, Asioli, Boecker & Canavari (2011) confirmed that FC are not extremely correlated with any specific benefit due to measurement issue in term of benefits in particular. Many benefits are difficult to assess (Asioli, Boecker & Canavari, 2014). The respondents deemed that TB will be perceived when traceability system has been well-integrated, indeed, not through direct effect. At the first step in developing traceability-oriented management policies, evaluation of the traceability benefits is necessary (Dabbene, Gay, & Tortia, 2013).

### **H3 = Firm Characteristic (FC) will effect on Traceability Cost (TC) through Traceability Level (TL)**

Based on the CP value of direct  $FC \rightarrow TC$  is  $-0.185$ .  $FC \rightarrow TL$  at  $0.637$  with (t-statistics  $4.197 > t$  table 1.96), and  $TL \rightarrow TC$  is  $0.800$  with (t-statistics  $3.619 > t$  table 1.96). While, the CP value of indirect effect  $FC \rightarrow TL \rightarrow TC$  is  $0.637 \times (0.800) = 0.510$ . Therefore, FC is better indirectly affected on TC due to the CP value of indirect effect is bigger than direct effect. As a result, thus **H3** is accepted. Breadth was found to increase both cost categories significantly (Asioli, Boecker & Canavari, 2014). Breadth is at significant level, the absolute costs were perceived to increase with firm size (Asioli, Boecker & Canavari, 2010). The result of Golan, et al (2003) can be exerted as a robust research finding. They found that breadth vary depending on the attributes of interest and each firm's traceability costs and benefits. It concluded that firms' incentives for implementing tracking and tracing technologies are straightforward to assess costs. This proved that Traceability capacity varies greatly among operators depending on the business activity, stage in the supply chain and applicable legislation (ECR Europe, 2004 cited in Asioli, Boecker & Canavari, 2014). As an investment, capital and resource intense, traceability involves reviewing and changing established processes, training of workers and staff and implementation technology and other equipment and expertise (Bosona & Gebresenbet, 2013). When operations are more complicated, the cost of data collection and data management increases (Asioli, Boecker & Canavari, 2010). The costs of "materials" is associated to using pallets, boxes, labels (Stuller & Rickard, 2008 in Asioli, Boecker & Canavari, 2010) etc. required to conduct physical handling of traceability. Traceability has brought about an increase in the costs of raw materials and greater flow information to be managed (Mora & Menozzi, 2005).

**H4 = Firm Characteristic (FC) will effect on Traceability Benefits (TB) through Traceability Level (TL)**

The value of CP between FC → TB is -0.281. FC → TL at 0.637 with (t-statistics 4.197 > t table 1.96), and TL → TB is 0.670 with (t-statistics 2.206 > t table 1.96). While, the CP value of indirect effect and the value of indirect effect FC → TL → TB is  $0.637 \times (0.670) = 0.427$ . As such, it can be concluded that FC can be better indirectly effect on TB due to the CP value of indirect effect is bigger than direct effect. It thus believed that **H4** is accepted. Either TC or TB was depended on firm size (Meija et al., 2010). This result shown that traceability practices consist of data collection through the food chain (Meija et al., 2010), also, information management which is included either in logistics or strategic issues (Canavari, Centonza & Spadoni, 2006). The matching of buyer's purchasing needs happens through the market and the choice of the product is made from time to time (Canavari, Centonza & Spadoni, 2006). TB in particular increasing market share or accessing new markets had been overly optimistic on the benefits side (Asioli, Boecker & Canavari, 2014), also, product differentiation based on credence attributes, such as organic and through increasing consumer trust (Meuwissen et al., 2003) by joint effort of partners to design and provide a product (Bosona & Gebresenbet, 2013). Further, customer relationships improved when availability of accurate real-time information about production and stocks provided (Asioli, Boecker & Canavari, 2010). As Bosona & Gebresenbet, (2013) confirmed that contemporary food supply chain should adequately provide information that consumers and other members need to know such as variety of food attributes, country of origin, and so on, then would increase consumer confidence in food to make good choice. Thus, should be generated important logistics elements such as packaging, labeling, as well as application of data capturing and transferring techniques (Bosona & Gebresenbet, 2013). Companies enjoyed non-quantifiable advantage consists of reduction in internal defects, reduction in external defects, and strategic advantage. Traceability has not only improved the overall quality of the product, but has also led to enhancement of the company image, and has guaranteed an increase in turnover and market share (Mora & Menozzi, 2005). Manos & Manikas (2010) indicated that, in the case of small enterprises, an efficient paper-based traceability system could enable to effectively trace product. This indicates that there is no need of introducing expensive and complicated traceability systems (for small producers).

**CONCLUSIONS AND RECOMMENDATIONS****1. Conclusion**

Perceiving the TC and TB were experienced by food processors represented by cracker and bread factory in Serang city was relied on the traceability level implemented, although without imposition by the government. It was accounted for 73% of the respondents had annual revenue below \$22,300. At this revenue, food processors could only implement breadth (TL), indeed, paper-based. The information which recorded at the level input were supplier detail, data and hour product arrival, quantity, and very less quality grading. Further, the biggest amount of the traceability costs was in terms of material and label/packaging. It makes sense, when these kinds of costs were tangible. In respect to specific benefit, food processors extremely paid attention into

market share and customer response. It probably caused by management information within manufacturing processes at the level input (breadth), rather than upward or backward tracing, or even the smallest unit per batch/lot, would therefore exhaustively comprehend the market and customer response which almost accounted for 47% observed. Sum up, with limit knowledge and experience in traceability system, this particular size of industries are relatively overestimated on market share and customer response, also, a tremendous costly at the material/labeling. Manos & Manikas (2010) indicated that, in the case of small enterprises, an efficient paper-based traceability system could enable to effectively trace product.

## 2. Recommendation

This research is beneficial either academic or practitioner due to describing the comprehensive picture the traceability system in food supply chain in Serang city, Indonesia. However, it is still far from the perfect. For the future research, it is expected to meet big sample size. Data for assessing the representativeness of the study was conducted in small size industries, it is reasonable to assume that it is biased towards larger firms. In particular literature review, it is needed to look for many researches relating to traceability costs and benefits. The last, it is strikingly viewed through an observation that Indonesian government should design the traceability system to guide food processors conducting the traceability by soft infrastructure (regulation) or even hard infrastructure (workshop).

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