The impacts of the food traceability system and consumer involvement on consumers' purchase intentions toward fast foods

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ABSTRACT

This study aims to ascertain whether or not the Food Traceability System (FTS) can decrease an individual's perceived uncertainty and strengthen his/her purchase intention regarding fast foods. A website-based questionnaire study was conducted in Taiwan and a total of 435 valid subjects collected. The empirical results of structural equation modeling (SEM) analysis indicate that when a fast food store adopts FTS then consumers' perceived uncertainty can be reduced because both their perceived information asymmetry and fears of seller opportunism are also reduced, which in turn strengthen their purchase intentions regarding fast foods. In addition, with FTS, not only are both consumers' perceived product diagnosticity and informativeness are increased but consumers' trust in the farmer's records kept for this system is also increased, which in turn mitigate both consumers' perceived information asymmetry and fears of seller opportunism. Finally, the higher the degree of involvement an individual has and the more FTS mitigates his/her perceived uncertainty, the higher his/her purchase intention regarding fast foods than otherwise. Based on the findings from this study, attempts are made to provide some suggestions to the public health sector and the fast food marketers to promote FTS.

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1. Introduction

With the advancement of information technology, the Food Traceability System (FTS) has been introduced in many countries to reduce the uncertainties originating in the food purchasing process by providing information about the whole process from farm to table in terms of quality and safety (Choe, Park, Chung, & Moon, 2009). Such a system has the ability to trace and follow a food, feed, food-producing animal, or substance through all stages of production and distribution. Though FTS itself cannot preclude the possibility of food safety crises, it can help a business discover the crux of a food safety problem promptly and lessen the harmful consequences later by investigation and recalling (Karlsen, Sorensen, Foras, & Olsen, 2011; Regattieri, Gamberi, & Manzini, 2007; Ruiz-Garcia, Steinberger, & Rothmund, 2010; Saltini & Akkerman, 2011) to mitigate or avoid the damage to the market, potential illnesses, or even loss of life (Liao, Chang, & Chang, 2011). In addition, FTS can be used to distinguish the credence attributes from average products (Golan, Krissoff, & Kuchler, 2004) such as organic, non-genetically modified, or point-of-origin foods to

charge a price premium (Liao et al., 2011). According to Hobbs (2004), to remedy information asymmetry of food safety and food quality is the main incentive to the implementation of FTS.

In recent years, a series of food scares occurring in Taiwan have cast doubt on Taiwan's food safety and decreased trust in the food supply system (Chen, 2008). The Taiwanese government introduced the Taiwan Agriculture and Food Traceability (TAFT) program in 2004 (Liao et al., 2011) and enacted legislation for this program in 2007, thereby incorporating CAS (Certified Agricultural Standards) and GAP (Good Agriculture Practice) into TAP (Traceable Agriculture Product) as the new marks of official verification. The TAFT program provides a channel for the producers and sellers who want to certify the places of origin for their agro-products. A record of the food traceability may help producers to deal with food crises and to assign personal responsibilities. Moreover, such a system increases the efficiency of a producer's business, considerably reducing management costs and promoting the quality of products. Those producers and sellers who comply with the rules and participate in the TAFT program can thus win their competitive advantages. After a change in government in 2008, the food traceability policy was altered; the system was optional rather than mandatory, though CAS and GAP were still valid. The policy shift that the government brought not only interrupted the ongoing food traceability operation but also confused most consumers in Taiwan.

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Personal involvement refers to the degree of the perceived significance, interest, relevance induced by the stimulus, which is evoked by the product, service, product type, brand, purchasing decision, advertisement, and so on (Beharrell & Dennison, 1995; Juhl & Poulsen, 2000; Mitchell, 1979; Zaichkowsky, 1985). In recent years, more and more consumers believe that foods contribute directly to their health (Mollet & Rowland, 2002) and healthiness becomes one of the frequently mentioned motivations behind food choices (Lappalainen, Kearney, & Gibney, 1998; Steptoe, Pollard, & Wardle, 1995). Thus, the function of consumer involvement in food choice is a topic worth further investigation.

Consumers' acceptance of the concept of FTS and a better understanding of its impact on consumers' intentions to purchase foods will have a strong effect on the popularity of this system. Previous studies (e.g., Dalvit, De Marchi, & Cassandro, 2007; Gellynck, Verbeke, & Vermeire, 2006; Karlsen et al., 2011) focus on the topic of how FTS can be applied to main food categories such as meat, fish, and oil while some even explore the effect of such a system on consumers' purchase intentions (Loureiro & Umberger, 2007). Choe et al. (2009) found that Korean consumers were willing not only to purchase greater quantities of, but also to pay more for, food covered by the traceability system, indicating that the mitigated uncertainty brought about by the traceability system plays a key role in price premiums and purchase intentions.

Because of the convenience provided and the taste of fast food offered, many people carve for such food and treat it as a favorite meal. For some people, it is hard to resist the temptation from fast food meals, though fully aware of the harm they can do to human health. Oily and rich in sodium, they may lead to obesity and high cholesterol, resulting in diabetes, strokes, and heart attacks. Recently, some fast food franchises in Taiwan were confronted with a series of food safety issues regarding the food ingredients. For example, in early July of 2009, consumer protection officials in Taiwan announced that high levels of arsenic were found in the frying oil used at McDonald's and Domino's restaurants (Taipei Times, 2009), causing perspective consumers to hang back though no casualties have been reported since the crisis erupted. How to clear up people's uncertainty has become a cause for concern. Given the health risks related to the repeated use of arsenic-contaminated oil in cooking, Taiwan's Department of Health (DOH) made more frequent inspection of edible oil used by fast food restaurants as well as by night market vendors to ride out the crisis (Taiwan News, 2009). In addition, for fear of 'mad cow' disease, Taiwan's government vetoed the resumption of the import of American beef in 2010, causing trade tensions between the US and Taiwan. To allay consumers' concerns about food safety, some fast food stores began to emphasize that their beefs were imported from Australia.

Will FTS be a good approach to mitigating consumers' uncertainty so as to strengthen their purchase intentions to consume fast foods? Based on Choe et al.'s (2009) research model, this study aims to explore whether or not FTS can decrease an individual's perceived uncertainty, thereby leading to the formation of his/her purchase intention to consume fast foods in Taiwan. In addition, it is believed that if an individual's degree of involvement in the fast foods is higher than the other's then he/she may show more concern about whether or not the ingredients of his/her fast food cuisine are traceable to ensure food quality and safety. Therefore, it is of significance to investigate whether or not consumers with varying degrees of involvement will show variations in the relationship between perceived uncertainty and purchase intention to consume fast foods offered by stores adopting FTS. Based on the findings from this study, attempts are made to provide some suggestions to the fast food marketers to improve their performance in meeting the consumer's need for safe and quality foods and to the policy makers in the public health sector to help them formulate more effective communication strategies.

2. Research framework and hypotheses development

The impacts of the antecedents, such as perceived information asymmetry and fears of seller opportunism, on consumers' perceived uncertainty in adopting FTS by the fast food stores are examined. Moreover, the moderating role of consumer involvement in the relationship between his/her perceived uncertainty and purchase intention is also investigated. The research framework of this study is depicted in Fig. 1.

2.1. The impact of perceived uncertainty on purchase intention

The underlying psychological assumption driving the linkage between intentions and behavior is that most human behavior is under volitional control (Ryan, 1970). Fishbein and Ajzen (1975, p. 288) have defined intention as a "a person's location on a subjective probability dimension involving a relation between himself and some action." In other words, behavioral intention reflects a person's decision to perform a behavior. Intentions are the single best predictor of planned behavior and they are also an unbiased predictor of action (Bagozzi, Baumgartner, & Yi, 1989).

Whenever there is incomplete information in buyers or sellers (mostly buyers), there emerges uncertainty in buyers' mind before making purchase decisions (Singh & Sirdeshmukh, 2000), and such uncertainty may lead to their subjective possibility of going to suffer a loss (Chiles & McMackin, 1996). Perceived uncertainty refers to the degree to which the outcome of a transaction cannot be accurately predicted by buyers because of many uncertain factors
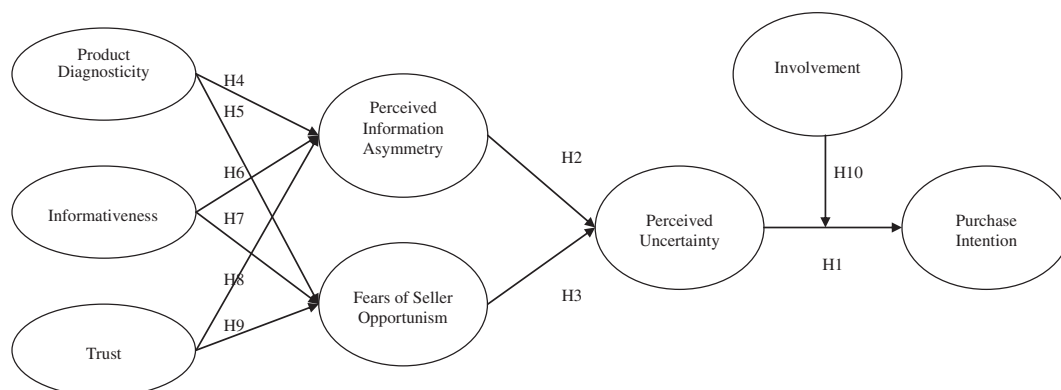

Fig. 1. A research framework of consumer's purchase intention of fast foods with food traceability system.

from sellers and the product itself lurking in the transaction process (Pavlou & Fygenson, 2006; Pavlou, Liang, & Xue, 2007). The perception of risk that arises from uncertainty may negatively influence consumer purchase intention (Jarvenpaa, Tractinsky, & Vitale, 2000). Both the seller's attribute (Pavlou et al., 2007) and the product quality (Erdem, Zhao, & Valenzuela, 2004; Pavlou et al., 2007) are the main aspects of the uncertainty. Consumers will try to gather information to decrease the uncertainty existing in the purchase decision making (Kim & Benbasat, 2003), because only when people have acquired certain information will they realize this behavior intention (Fishbein & Ajzen, 1975).

FTS could be used as a helpful and useful mechanism to protect consumers' rights by providing more transparent information to ensure food safety and quality. According to the results from Choe et al.'s empirical study (2009), FTS indeed could mitigate uncertainty and could strengthen consumers' purchase intention. There are many ingredients contained in the fast foods. It is believed that given the application of FTS, an individual's perceived uncertainty will be decreased and his/her purchase intention regarding fast foods will be increased. Therefore, the following hypothesis is proposed.

H1 If an individual has a lower degree of perceived uncertainty given the application of FTS, then he or she will be more likely to have more purchase intention regarding fast food.

2.2. Information asymmetry and fears of seller opportunism

Information asymmetry exists when there is a difference between the amounts of information available to sellers and buyers in the market transaction (Choe et al., 2009). Whenever information asymmetry comes into being, not only do the transaction costs of downstream firms and buyers rise (Hobbs, 2004), but the seller's opportunistic behaviors also increase (Choe et al., 2009). According to Pache (2007), opportunism occurs when information disclosed is incomplete or falsify or both, and is especially characterized by confusing behaviors intended to mislead, disguise, or obfuscate real information. A seller's opportunistic behaviors include false quality claims, mislabeling, contract default, characteristic misrepresentation, failure to acknowledge product assurance, etc. (Mishra, Heide, & Cort, 1998). Some sellers choose to emphasize the advantages but hide the disadvantages of their products to maximize their profits (Choe et al., 2009; Mishra et al., 1998; Nayyar, 1990; Singh & Sirdeshmukh, 2000). The main purpose of seller opportunism is to serve self-interest (Choe et al., 2009; Pavlou et al., 2007; Singh & Sirdeshmukh, 2000).

Rational people will do information searching as hard as they can before a purchase decision-making so as to close the information asymmetry gap and avoid the harm from a seller's opportunistic behaviors. On the other hand, some sellers with good reputation would like to provide their consumers with more reliable and accurate information regarding their products voluntarily to reduce the perceived information asymmetry in the consumer's mind (Mishra et al., 1998) and to convince their consumers engaged in their purchase decision-making (Pavlou et al., 2007). The application of FTS to the ingredients of fast food meals could provide the detailed record of the information gathered by the food supply chain such as the dates, categories of chemical usage, gathering, handling process, and so forth. In Taiwan, consumers can make use of the trade code to trace product information at http://taft.coa.gov.tw/welcome.asp?mp=8&role=C&mpap=A. By means of providing transparent information, the information asymmetry relative to food safety and quality could be redressed (Hobbs, 2004).

Choe et al.'s empirical study (2009) showed that FTS could indeed mitigate uncertainty by reducing consumers' perceived information asymmetry and by allaying fears of seller opportunism. Therefore, if the ingredients for the fast foods could be better explained given the application of FTS, an individual's perceived information asymmetry and fears of seller opportunism will be decreased and his/her perceived uncertainty about fast foods will also be reduced. Therefore, the following hypotheses are proposed.

H2 If an individual has a lower degree of information asymmetry given the application of FTS, then he or she will be more likely to have less perceived uncertainty about fast foods.
H3 If an individual has a lower degree of fears of seller opportunism given the application of FTS, then he or she will be more likely to have less perceived uncertainty about fast foods.

2.3. The antecedents mitigating perceived uncertainty

2.3.1. Product diagnosticity

Product diagnosticity refers to the degree to which an individual believes that some particular shopping experiences are helpful for him or her to evaluate products (Jiang & Benbasat, 2005; Kempf & Smith, 1998). Whenever information asymmetry happens, there is the possibility of mislabeling or cheating. So, a trustworthy third-party inspector could play the role of product diagnosticity. This means that the higher the degree of product diagnosticity consumers perceive, the more information on product attributes the consumer will have. As a result, information asymmetry can be diminished and fears of seller opportunism allayed, an effect that will help consumers to make purchase decisions (Jiang & Benbasat, 2004).

Perceived diagnosticity relates to the degree to which such a traceability system is believed by consumers to render assistance in evaluating products (Choe et al., 2009). When there is no suitable inspection system, consumers may be less likely to terminate the behaviors of opportunism from service providers in the trade (Singh & Sirdeshmukh, 2000). Choe et al.'s empirical study (2009) found that with FTS the impact of product diagnosticity on an individual's fears of seller opportunism is non-significant but its effect on an individual's perceived information asymmetry is indeed significant. In Taiwan, producers participating in FTS are required to record their production information on the Internet accurately and the authorities concerned, the Council of Agriculture, Executive Yuan, will take the responsibility for verifying the information recorded in the hope that the gap of perceived information asymmetry between consumers and service providers can be further filled. The more information on product attributes consumers can obtain, the more product diagnosticity they can have (Jiang & Benbasat, 2004). Therefore, the following hypotheses are proposed.

H4 Given the application of FTS, an individual with a higher degree of product diagnosticity will be more likely to have less perceived information asymmetry of fast food.
H5 Given the application of FTS, an individual with a higher degree of product diagnosticity will be more likely to have less fears of seller opportunism toward fast food.

2.3.2. Informativeness

Due to limited availability of information, consumers may have difficulty in making purchase decisions, resulting in failures to carry out market transactions (Caswell & Mojduszka, 1996; Teisl & Roe, 1998). Informativeness refers to the degree to which the traceability system can offer helpful information to consumers (Choe

et al., 2009). In view of a series of food safety incidents, consumers begin to care about the related information of what they eat. FTS requires the participants to record information about the production and distribution processes systematically so that consumers can track the supply chain operation in the future (Zhang, Chai, Yang, & Weng, 2011). The information required includes the cultivating process, origin, usage of chemicals, inputs, and other product description (Choe et al., 2009; Hall, 2010; Liao et al., 2011). The well-informed public can be sure that the gap of perceived information asymmetry between consumers and providers of goods and services can be closed. Both perceived information asymmetry and fears of opportunism can be mitigated out of informativeness obtained from FTS (Choe et al., 2009; Pavlou et al., 2007). Therefore, the hypotheses are proposed as follows.

H6 Given the application of FTS, an individual with a higher degree of informativeness will be more likely to have less information asymmetry of fast food.
H7 Given the application of FTS, an individual with a higher degree of informativeness will be more likely to have less fears of seller opportunism toward fast food.

2.3.3. Trust

Trust is defined as the buyer's personal intention to accept the vulnerability, and to believe that the seller will not behave in an opportunistic way (Pavlou & Gefen, 2004; Rousseau, Sitkin, Burt, & Camerer, 1998). Whenever there is uncertainty between buyers and sellers, trust keeps the transaction process continuing. Whenever consumers are wondering whether or not sellers would engage in opportunistic behaviors, trust can lower buyers' risk perception (Ganesan, 1994; Pavlou & Fygenson, 2006). According to Knight and Warland (2005), there is an inverse relationship between product risks and trust. Ganesan (1994) and Pavlou and Fygenson (2006) also suggested that trust can lower consumers' risk perception that sellers might act opportunistically. Trust is an influential factor in transactions, reducing information asymmetry and the fear of seller opportunism (Pavlou et al., 2007; Singh & Sirdeshmukh, 2000).

The relationship between consumer trust and food product safety have aroused broad attention worldwide (Grunert, 2005; Rohr, Luddecke, Drusch, Muller, & Alvensleben, 2005; Verbeke, 2005). Trust refers to the degree to which consumers are willing to believe that the information farmers disclose for the food traceability is trustworthy. There is a verifying institution to be responsible for inspecting diverse products to ensure the accuracy of the information in FTS. Now the Taiwanese government is making efforts to build up public trust in FTS, hoping that the gap in perceived information asymmetry between consumers and providers of goods and services can be further filled. Both perceived information asymmetry and fears of opportunism can be diminished by trust obtained from FTS (Choe et al., 2009; Pavlou et al., 2007). Therefore, the following hypotheses are proposed.

H8 Given the application of FTS, an individual with a higher degree of trust will be more likely to have less perceived information asymmetry of fast food.
H9 Given the application of FTS, an individual with a higher degree of trust will be more likely to have less fears of seller opportunism toward fast food.

2.4. Consumer involvement

Consumer involvement refers to the level of perceived personal importance, interest, or relevance evoked by a stimulus or stimuli (e.g., products, services, product categories, brands, purchase decisions, or advertisements), which are linked by the consumer to enduring or situation-specific goals (Beharrell & Dennison, 1995; Juhl & Poulsen, 2000; Mitchell, 1979; Zaichkowsky, 1985). According to Soloman (2007), high involvement leads to extensive problem-solving. When an individual engages in extensive problem-solving, he or she will search actively for information and process it carefully. Most food purchase decision-making is regarded as a low-involvement case due to routine consumption. However, once people perceive that a wrong choice would get into a significant risk and health problem, then they would treat food purchase decision-making as a high-involvement case (Verbeke & Vackier, 2004). Verbeke and Vackier (2004) argued that a high-involvement individual will actively gather related information voluntarily. Since the level of involvement with foods varies from one individual to another, some researchers have taken this construct into consideration for foods purchase decision-making (Verbeke & Vackier, 2004). Zaichkowsky (1985) argued that the relationship from perceived uncertainty to purchase intention is moderated by purchase involvement. Therefore, the following hypothesis is proposed.

H10 Given the application of FTS, an individual with a higher degree of involvement will enhance the negative relationship between his/her perceived uncertainty and purchase intentions toward fast food.

3. Methodology

3.1. Data collection

This study posted the research questionnaire on the questionnaire collection website mySurvey http://www.mysurvey.tw/ in March 2012, because most fast food consumers are students and teenagers and are also Internet surfers. There were 435 valid surveys returned after excluding 22 incomplete responses. Of the 435 subjects, 206 were male and 229 were female. Most of the subjects were in the age bracket of 20–29 (83.9 percent) and 70.6 percent were students.

3.2. Measurement

The questionnaire was prefaced with a brief description of the term 'FTS' used in this study. The measurement scales and the indicators adopted in this study, which were originally developed by Pavlou et al. (2007), were later validated by Choe et al. (2009). The measurement statements were measured on a seven-point Likert scale (1 = strongly disagree, 7 = strongly agree). Consumer involvement measurement scale was adapted from Zaichkowsky (1994) to measure the personal perceived relevance, interest, and significance about buying agro-products through FTS.

4. Data analysis results and discussion

Before the path effects of the structural framework can be examined, confirmatory factors analysis (CFA) should first be conducted (Anderson & Gerbing, 1988). The typical measurement model assessment process is gone through to check unidimensionality, reliability, and validity of the multiple item measures. Then the chi-square difference test proposed by Singh (1995) is carried out to ascertain whether or not consumers with different degrees of involvement will show variation in the relationship between perceived uncertainty and purchase intention given FTS in the fast food store industry.

Table 1
Standardized loadings of indicators and convergent validity.

Construct	Indicator	Cronbach's α	Standardized loadings	Convergent validity (t-value)
Product diagnosticity	PD1	0.73	0.82	19.33
	PD2		0.78	18.00
	PD3		0.51	10.58
Informativeness	INF1	0.77	0.82	18.08
	INF2		0.76	16.55
Trust	TRU1	0.82	0.76	16.71
	TRU2		0.81	19.43
	TRU3		0.86	20.45
Perceived information asymmetry	PIA1	0.83	0.85	20.09
	PIA2		0.84	19.72
Fear of seller opportunism	FSO1	0.86	0.76	16.53
	FSO2		0.78	17.26
	FSO3		0.77	16.99
Perceived uncertainty	PU1	0.80	0.86	20.21
	PU2		0.77	17.61
Purchase intention	INT1	0.90	0.78	18.91
	INT2		0.89	22.86
	INT3		0.92	24.06

4.1. Measurement model analysis

The results of confirmatory factors analysis reveal that a chi-squared/d.f. ratio of 1.96 (219.3607/112) is close to 2, implying that there is a good fit (Marsh & Hau, 1996). The root mean squared error approximation (RMSEA) = 0.05 and root mean square residual (RMR) = 0.05; both are within the acceptable level. The goodness-of-fit index (GFI) = 0.95, the adjusted goodness-of-fit index (AGFI) = 0.92, the comparative-fit index (CFI) = 0.98, Non-normed Index (NNI) = 0.97, and the normed-fit index (NFI) = 0.95. According to Marcoulides and Schumacker's (1996) standards of model fitting, the results of the CFA indicate a satisfactory fit for the measurement model.

Reliability can reflect the internal consistency of the indicators measuring a given construct. As shown in Table 1, the reliabilities of the scales in the measurement model are confirmed with the co-efficient alpha values higher than the recommended level of 0.7 (Nunnally, 1979). The t-value of factor loading is commonly used to establish convergent validity. According to Anderson and Gerbing (1988), when t-value is greater than 1.96 ($\alpha = 0.05$), convergent validity is achieved. Table 1 reveals that all t-values are greater than 1.96. Therefore, the indicator variables of this study have good convergent validity.

Chi-square difference test can be applied to evaluate the discriminant validity of two constructs by calculating the difference of the chi-square statistics for the constrained and unconstrained measurement models (Anderson & Gerbing, 1988). If the chi-square difference of the two constructs (with 1 d.f.) is significant, the two constructs are viewed as distinct (but correlated) factors. All chi-square difference statistics for every two constructs are statistically significant; therefore, the discriminant validity among the constructs studied is achieved in this study.

4.2. Structural model analysis

The raw data of the survey variables retained from the CFA were used as database for the structural model analysis after the adequacy of the measurement model was confirmed. The results of structural model analysis reveal that a chi-squared/d.f. ratio of 2.26 (272.9534/121) is less than 5; thus, the model fits reasonably well (Marsh & Hau, 1996). The RMSEA = 0.05 and RMR = 0.07; both are within the acceptable level. The GFI = 0.94, the AGFI = 0.91, the CFI = 0.97, NNI = 0.96, and the NFI = 0.94. According to Marcoulides and Schumacker's (1996) standards of model fitting, the results of this structural model indicate a satisfactory fit.

The standardized path coefficients of the proposed research model are reported in Fig. 2 above each arrow, indicating the effect of one variable in predicting another. The path from an individual's perceived uncertainty to his/her purchase intention ($b_{H1} = -0.60$, $t = -10.67$) of applying FTS is statistically significant in the expected direction, showing that H1 is supported in this case. In addition, the paths from an individual's perceived information asymmetry ($b_{H2} = 0.49$, $t = 8.75$) and fears of seller opportunism ($b_{H3} = 0.47$, $t = 7.94$) to his/her perceived uncertainty of applying FTS in the fast food store are statistically significant. As expected, the directions of the paths bear positive signs. Thus, both H2 and H3 are supported.

The proposed Hypotheses 4 through 9 are to examine the antecedents of a consumer's perceived uncertainty of applying FTS in the fast food store by using the constructs of perceived information asymmetry and fears of seller opportunism. The results shown in Fig. 2 indicate that the paths from an individual's perceived product diagnosticity to his/her perceived information asymmetry ($b_{H4} = -0.38$, $t = -3.65$) and fears of seller opportunism ($b_{H5} = -0.26$, $t = -2.38$) of applying FTS in the fast food store are statistically significant. As expected, the directions of paths bear negative signs. Thus, both H4 and H5 are supported. In addition, the path from an individual's informativeness to his/her perceived information asymmetry ($b_{H6} = -0.26$, $t = -2.83$) of applying FTS in the fast food store is statistically significant in the expected direction, indicating that H6 is supported in this case. Thus, the information provided by FTS indeed reduces the information asymmetry phenomenon. However, the path from an individual's
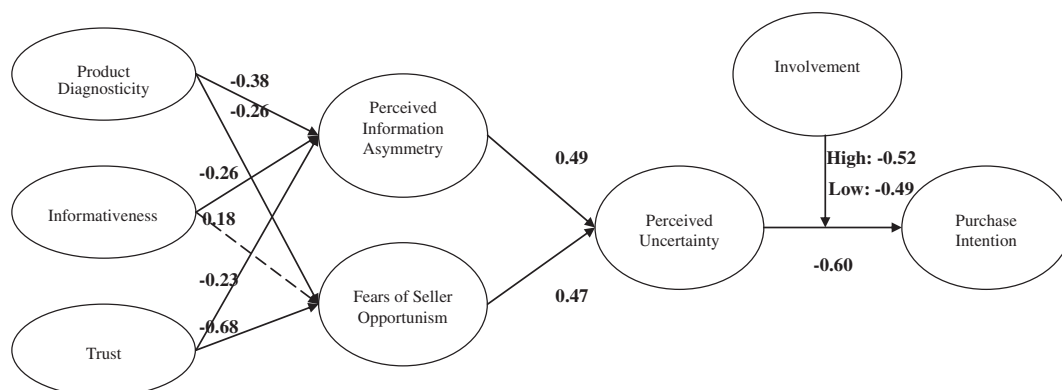

Fig. 2. Estimates of the research framework of consumer's purchase intention of fast foods with food traceability system.

informativeness to his/her fears of seller opportunism ($b_{H7} = 0.18$, $t = 1.84$) of applying FTS in the fast food store is not statistically significant here, reflecting that H7 is not supported in this case. This non-significant path coefficient result is consistent with Choe et al.'s (2009) study. One possible reason is that even if consumers can acquire abundant information through FTS, they are still afraid that the sellers would act in an opportunistic way to cheat them. Moreover, the paths from an individual's trust in farmers' records in FTS to his/her perceived information asymmetry ($b_{H8} = -0.23$, $t = -3.76$) and fears of seller opportunism ($b_{H9} = -0.68$, $t = -8.56$) of applying FTS are statistically significant in the expected direction, showing that both H8 and H9 are supported in this case.

4.3. The moderating effect of consumer involvement

The sample was divided into two groups on the basis of the median of the consumer involvement construct. According to the analytical strategy proposed by Singh (1995), the chi-square statistics for the "unconstrained" and "constrained" models are, respectively, 431.87 (d.f. = 242) and 434.79 (d.f. = 243). The difference is 2.71 with 1 degree of freedom. Though the difference seems not very large, it is indeed statistically significant at the 10% level, indicating that there exists a moderating effect. The path coefficient regarding the relationship between an individual's perceived uncertainty and intentions to purchase fast foods in the high involvement group is -0.52, as against -0.49 in the low involvement group (See Fig. 2). For those who are more concerned about what they eat in their fast food meals, if the fast food store adopts FTS, then their perceived uncertainty will be reduced, which in turn will strengthen their purchase intentions. On the contrary, for those who care less about what they eat in their fast food meals, even if the fast food store adopts FTS, their perceived uncertainty will be reduced and purchase intentions increase marginally.

5. Conclusions

The results of this empirical study conducted in Taiwan reveal that the proposed research model adequately validates the data. In agreement with Choe et al.'s (2009) study, the analysis of the empirical data collected from Taiwan reveals that when a fast food store adopts FTS then consumers' perceived uncertainty can be reduced because both their perceived information asymmetry and fears of seller opportunism are also reduced, thereby strengthening their purchase intentions. In addition, when a fast food store adopts FTS then not only are consumers' perceived product diagnosticity and informativeness enhanced but their trust in farmers' records kept for this system is also increased, resulting in further mitigation of both consumers' perceived information asymmetry and fears of seller opportunism. Finally, in case a fast store has adopted FTS, the higher the degree of involvement an individual has and the more FTS mitigates his/her perceived uncertainty, the higher his/her purchase intention regarding fast foods than otherwise.

FTS records all relevant information about how food is produced, processed, and delivered. Such a system allows all participants in the food supply chain, including the final consumers, to extract detailed information on food products from the database via the Internet 'from the farm to the table'. That is to say, consumers could have a better understanding of the food they eat as well as more certainty in terms of the quality and the safety of their food. However, the success of FTS requires the efforts of and cooperation between the government and the industrial sector. The expensive verification expenses, the complex verification procedure, and the difficulties for older farmers to record information through the Internet are considered to be some obstacles to

promoting FTS in Taiwan. Numerous farmers even regard such a system as a low-value one for them to join because of limited extra profits.

The empirical results and findings from this study could provide the marketers in the fast food industry with some marketing implications and managerial suggestions to formulate effective marketing communication strategies. Since product diagnosticity, informativeness, and trust are the antecedents to determine consumers' perceived information asymmetry and fears of seller opportunism, it is suggested that the Taiwanese government should develop an FTS that includes all the detailed and relevant information the consumers need to help product diagnosticity. Besides, all the information should be recorded honestly to win consumers' trust, which is essential to the success of such a system. Therefore, the main tasks for the authorities concerned are to make efforts to simply the verification procedure to cut the expenses involved, to encourage the farmers in the food supply chain to participate in this FTS, and to educate them on how to execute this system in a more effective and efficient way. In addition, the fast food industry should put premium on the safety and quality of its products and should enhance FTS as one way to ensure the safety and quality of the ingredients for the fast food meals it serves for the public. On the other hand, the marketers who adopt this system could procure the strategy edge. FTS can be a two-edge sword: it plays a leading role in food safety and an active role in food product differentiation. Indeed, when a fast food store could provide its meal service with the aid of FTS, consumers can obtain more detailed and relevant information about how good and safe the ingredients of their foods are; such useful and helpful information increases their product diagnosticity and informativeness, helping to decrease their perceived information asymmetry and/or fears of seller opportunism. Moreover, if FTS itself is trustworthy, then the phenomenon of consumer's perceived information asymmetry and fears of seller opportunism could be also decreased. Finally, an individual's degree of involvement indeed plays a moderator role in intensifying the negative relationship between his/her perceived uncertainty about the safety and quality of fast foods and purchase intention. Therefore, if people could concern more about the supply chain of the ingredients in the fast food chain store, then FTS can fulfill its public health function well. It is suggested that the authorities concerned and the marketer should encourage consumers to accept FTS to enforce and protect consumer's rights.

It is worthwhile noticing that the most common systems used for food traceability are the barcode and radio frequency identification (RFID) systems. The barcode system is a product identification system that includes digital or alpha digital sequences. The RFID system is automatic identification system that uses radio waves and includes a reader and a microchip. A projected web-based tracing system using the RFID code to identify the single and specific food product could improve business transaction–food or otherwise–by increasing the information transparency for the consumer (Papetti et al., 2012). The RFID-enabled traceability system is characterized by gaining real-time and accurate data acquisition and transmission, and the high efficiency of information tracking and tracing across the final consumer and the different food chain actors before or after purchasing (Feng, Fu, Wang, Xu, & Zhang, 2013; Papetti et al., 2012). Although the implementation cost in the current form is still high, it is estimated that the RFID code adopted to identify the single and specific food product is to be a future trend. For example, U.S., Canada, and Japan have developed an RFID-enabled traceability system for the cattle to promote and protect animal health and food safety.

To the best of our knowledge, this study is among the first attempt to gain analytical insight into fast foods purchase intentions with consumer involvement as a moderator in the context

of FTS in the fast food industry. The findings from this empirical study should be helpful to both the authorities concerned and the marketers in the fast food industry in performing and promoting FTS. The main limitation of this study is that though the behavioral intention models have received robust support in numerous behavioral domains (Ajzen, 2001), caution must be kept in mind that actual behavior is not always equally well predicted by consumers' stated behavioral intentions (Belk, 1985). It is suggested that future researchers further investigate consumers' actual purchase behavior under FTS by observing and/or interviewing.

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