An Empirical Study of Consumers' Risk Perceptions and Risk Reduction Strategies Affecting Their Willingness to Pay for Organic Products

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Abstract

An Empirical Study of Consumers' Risk Perceptions and Risk Reduction Strategies Affecting Their Willingness to Pay for Organic Products

by

Wannapol Suphaskuldamrong

This study focuses on the purchasing behaviour of organic product purchasers in relation to their risk perceptions, risk reduction strategies and willingness to pay (WTP) premium prices for organic products. Over the past three decades, the demand for organic products produced without conventional pesticides, chemical fertilisers, bioengineering or ionising radiation has risen steadily, as have their prices. Despite the common belief that organic products are better for people's health than conventional products, most consumers have difficulty in differentiating between organic and conventional products. Scepticism about the virtues of organic products, especially because they are sold at premium prices, increases consumers' risk perceptions, which, in turn, affect their attitudes and purchasing decisions. Consumers' risk perceptions and their risk reduction strategies are considered important in food product marketing. These factors influence consumers' behaviour and impact their WTP premium prices for food products. However, to date, there are no integrated studies of consumers' perceptions of risk and their risk reduction strategies, including their WTP premium prices for organic products. This study investigates Thailand consumers' purchasing behaviour in the context of their risk perceptions, risk reduction strategies and their WTP premium prices for organic products.

This is the first study to investigate the relationships between consumers' risk perceptions, risk reduction strategies and their WTP premium prices for organic products in Thailand. This study explores the relationships between seven latent factors. In addition, this study estimates the mean WTP premium prices for four organic products: organic lettuce, jasmine rice, orange juice and coffee.

This study uses a questionnaire to collect data from 1,512 shoppers at 13 grocery stores in Bangkok, Thailand. The single-bounded contingent valuation method, exploratory factor analysis (EFA), confirmatory factor analysis (CFA) and structural equation modelling (SEM) are applied to analyse the survey data.

The estimated WTP a premium price results show that the surveyed respondents are willing to pay a premium price of 26.11 per cent higher for organic lettuce, 24.40 per cent higher for organic jasmine rice, higher 24.12 per cent for organic orange juice and 26.40 per cent higher for organic coffee than the conventional counterparts. The respondents are willing to pay higher prices for organic products if they perceive higher risks, such as worry about being accepted by their family and friends (social risk), fear of being cheated from false organic products (psychological risk), or concern about wasting their time to search for organic products (time risk). They reduce these risks by searching for more information about organic products and their handling processes, selecting trusted certificates and choosing well-known brands when purchasing organic products. However, if the respondents have difficulty using these risk reduction strategies, they are not willing to pay higher prices for organic products. In addition, respondents with healthy lifestyles prefer cooking at home and have high expectations about safety and healthy foods and are more likely to exhibit levels of risk perception (such as social, psychological and time risk) when purchasing organic products.

Keywords: Organic products, willingness to pay, risk perceptions, risk reduction strategies, structural equation modelling

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Abbreviations

ACT	Organic Agriculture Certification Thailand
AMOS	Analysis of Moment Structures
AVE	Average Variance Extracted
BSE	Bovine Spongiform Encephalopathy (mad cow disease)
BtS	Bartlett's Test of Sphericity
CFA	Confirmatory Factor Analysis
CFI	Comparative Fit Index
CVM	Contingent Valuation Method
Df	Degrees of Freedom
CR	Construct Reliability
EBM	Engel-Blackwell-Miniard Model
EFA	Exploratory Factor Analysis
EPC	Expected Parameter Change Statistics
FiBL	Research Institute of Organic Agriculture
GFI	Goodness of Fit Index
GMOs	Genetically Modified Organisms
IFOAM	International Federation of Organic Agriculture Movements
KMO	Kaiser-Mayer-Olkin
MI	Modification Index
PCA	Principal Component Analysis
PDO	Protected Designation of Origin
RMSEA	Root Mean Square Error of Approximation
SEM	Structural Equation Modelling
SRMR	Standardised Root Mean Residual
SPSS	Statistical Package for the Social Sciences
VCJD	Variant Creutzfeldt-Jakob disease
WTP	Willingness to Pay

Chapter 1

Introduction

This study investigates the factors that influence consumers' willingness to pay (WTP) premium prices for organic products, including organic product purchasers' risk perceptions, risk reduction strategies and purchasing behaviour. This study makes a significant original contribution to the literature by confirming that the WTP premium prices for organic products is driven by consumers' risk perceptions and risk reduction strategies. Many studies investigate consumer behaviour in relation to organic product purchase, including consumers' WTP premium prices for organic products. However, no study has investigated consumers' WTP premium prices for organic products in relation to consumers' risk perceptions and risk reduction strategies.

This chapter provides the context of the thesis and outlines the research problems and objectives. The first section briefly summarises the organic product market and sheds light on consumer behaviour in relation to organic product purchases, including consumers' WTP premium prices. Section 2 describes organic product markets in Thailand and highlights consumers' purchasing behaviour in relation to their risk perceptions and risk reduction strategies. Section 3 presents the problem statements and the research gaps that this study aims to fill. The last section presents the research objectives, the contributions of the research and the research outline.

1.1 Introduction

The demand for organic products has grown globally by 10 to 30 per cent annually over the last decade (FAO, 2019b; Voon, Sing, & Agrawal, 2011). In 2017, the Research Institute of Organic Agriculture (FiBL) and the International Federation of Organic Agriculture Movements (IFOAM) reported that the global market for organic food and drink had reached 97 billion US dollars (Willer & Lernoud, 2019). This demand has increased approximately six-fold since 1999 (see Figure 1.1).

This growth has occurred in both developed and developing countries. For example, in Europe, the sales of organic food and drink products reached 37 billion US dollars in 2017, with an annual market growth rate of 12 per cent (Willer & Lernoud, 2019). In the US, the market for these products increased by over 10 per cent in 2017 (Willer & Lernoud, 2019). In developing countries such as those in Asia, the demand for organic products grew by 10 to 20 per cent each year from

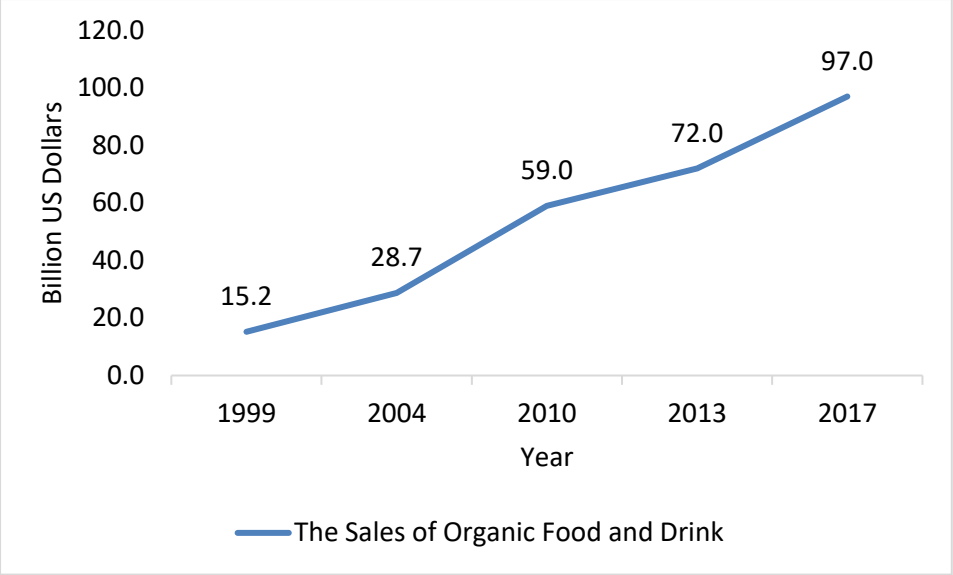

Figure 1.1 The growth of the global market for organic food and drink from 1999 to 2017 (Willer & Lernoud, 2019)

2001 to 2018 (FAO, 2019b). The demand for organic products in Thailand exhibits similar trends to those in the rest of the world (Nuttavuthisit & Thøgersen, 2019; Roitner-Schobesberger, Darnhofer, Somsook, & Vogl, 2008; Sangkumchaliang & Huang, 2012).

The organic product supply has also grown globally. The share of organic farmland compared with conventional farmland indicates the supply. The share of global organic farmland increased from 0.3 per cent in 1999 to 1.4 per cent in 2017 (see Figure 1.2). However, the increase in organic farmland globally is not as fast as the increase in the demand for organic products (Willer & Lernoud, 2019). In sum, the global supply of organic products is limited, which, in turn, causes high prices (Nuttavuthisit & Thøgersen, 2019; Willer & Lernoud, 2019).

Consumers' behaviour with regard to organic products is interesting and has been studied globally. There is ample research on the impact of consumers' characteristics on attitudes toward organic products. For example, Hughner et al. (2007) investigated the characteristics of organic consumers over 20 years from 1985 to 2005. They conclude that most organic consumers are women who live with family members and/or children. They also conclude that younger consumers tend to have more positive attitudes toward organic products. They believe that organic products are healthier, tastier and more environmentally friendly. Xie et al. (2015) found that organic product purchasers in China tend to have a higher education level of education and greater disposable income. These "organic product consumers" tend to live in families with children and are often older than consumers who do not buy organic products. The main reasons for purchasing and consuming organic products are the greater health and safety benefits assumed for these products.

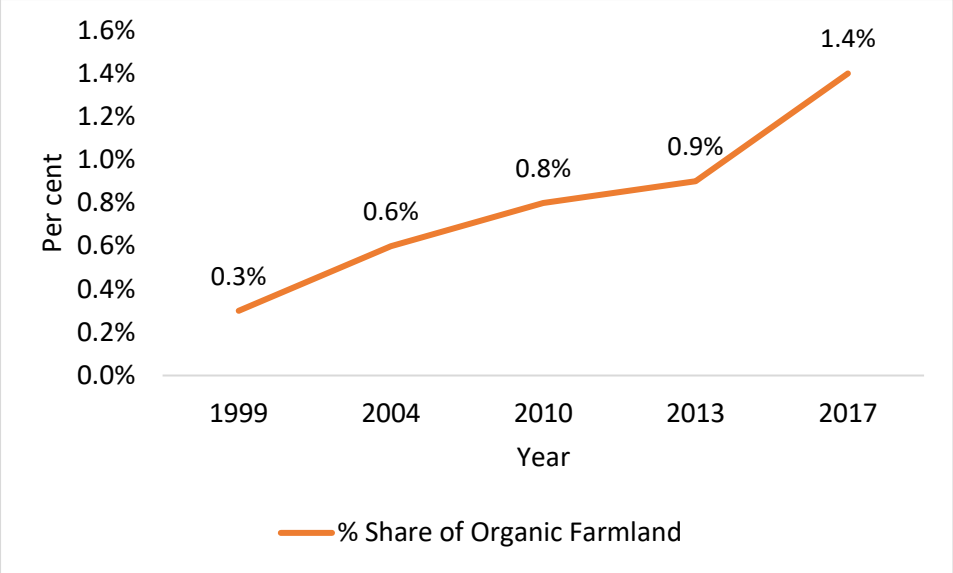

Figure 1.2 The growth in the global organic agricultural land's share 1999-2017 (Willer & Lernoud, 2019)

Changes in consumer lifestyles and concerns about health mean that consumers demand healthier, safer food (Nuttavuthisit & Thogersen, 2015; Sriwaranun, 2011). It is accepted by many that organic products are good for health because they are free from chemicals and are produced in environmentally friendly ways (Roitner-Schobesberger et al., 2008; Sangkumchaliang & Huang, 2012; Voon et al., 2011; Willer & Lernoud, 2019). Consumers' reasons for purchasing organic products in many countries are similar. European, the US and Asia consumers choose organic products because of the assumed health and perceived environmental benefits (Aertsens et al., 2011; Sangkumchaliang & Huang, 2012; Sriwaranun, 2011; Voon et al., 2011). Most consumers believe that organic products are of higher nutritional quality and are safer for consumption than conventional products (Aertsens et al., 2011; Paul & Rana, 2012; Pelletier et al., 2013).

Purchasing behaviour and WTP premium prices for organic products have been extensively studied. For example, Onozaka, Bunch, and Larson (2006) studied consumers' WTP premium prices for organic products in the U.S. The authors find that consumers who regularly buy organic products are willing to pay higher prices because they believe that these products are better for their health and the environment. Occasional organic product buyers are also willing to pay higher prices for organic products; they are concerned only about their health not about the environment.

One significant factor affecting consumers' WTP premium prices for organic products is the logo used in different countries. Janssen and Hamm (2012) studied consumers' WTP premium prices for organic products in six European countries: The Czech Republic, Denmark, Germany, Italy, Switzerland and the United Kingdom. The authors show that consumers' WTP a premium price for

organic products is significantly different when tested against organic logos. Consumers were willing to pay higher prices for organic products that had well-known organic logos. For example, in Switzerland, the Bio Suisse logo yields the highest WTP premium price for organic products (Janssen & Hamm, 2012). In the Czech Republic and Denmark, consumers are willing to pay most for products that feature government logos (Janssen & Hamm, 2012). The EU logos appear to exert the highest influence on consumers' WTP premium price for organic products in Italy (Janssen & Hamm, 2012). In Germany, the highest WTP premium price value is associated with the Farmers' Association Demeter and the government provided logos (Janssen & Hamm, 2012). In the UK, the Soil Association logos and the certification body "Organic Farmers & Growers" are associated with the highest WTP premium price for organic products (Janssen & Hamm, 2012). Consumers trust these logos and certification because they reflect strict organic production processes.

Most studies on organic product purchases were conducted in Europe and the US. These countries are huge potential markets for organic products. There are also more developed organic markets. There is a lack of research on organic product purchasing behaviour in developing countries. Little is known about consumers' perceptions of organic labelling and factors that affect the WTP premium prices for organic products in Asia (Roitner-Schobesberger et al., 2008). Sriwaranun (2011) was the first to investigate the WTP premium prices for organic products in Thailand. The author found that consumers were willing to pay 51 to 88 per cent more for organic products (than conventional products). Voon et al. (2011) studied the factors that influenced consumers' WTP premium prices for organic products in Malaysia and find that consumers' attitudes positively affect their WTP premium prices for organic products. Consumers realise that the higher prices they pay for organic products is for the greater benefits and attributes of organic products. The authors suggest that, to increase the consumption of organic products, marketers should focus on consumer attitudes. Although the size of organic product market in the region has been steadily expanding, especially in Thailand, Singapore, Malaysia, Vietnam and Indonesia, few studies have focused on organic product consumers' behaviour and their perceptions of organic products.

Theoretically, consumers' behaviours are influenced by many internal and external factors. Knowledge, attitudes, motivation, consumer resources, personality, lifestyle, and demographics are some of the internal factors that influence their behaviour. Culture, social class, personal influence and family influence are external factors that affect consumer behaviour (Blackwell, Miniard, & Engel, 2001). Consumer behaviour changes in response to changes in internal and external environments. For example, consumers changed their purchasing behaviour following recent incidences of wide-scale food poisoning and food contamination. Examples include chemical

contamination of vegetables, bird flu outbreaks, which have affected purchases of chicken, and bovine spongiform encephalopathy (BSE; "mad cow disease") in beef. These scandals added to consumers' concerns about food safety. For example, consumers in Thailand have become increasingly concerned about chemical residues in their food after traces of chemicals and pesticides used in agriculture appeared in the food chain (Roitner-Schobesberger et al., 2008). Beef consumption in Spain rapidly declined from 2000 to 2001 when scientists found a link between BSE and Variant Creutzfeldt-Jakob disease (VCJD) in humans in Europe (Angulo & Gil, 2007). With the emergence of the bird flu in 2010, consumers in the UK became increasingly concerned about the safety of poultry (Yeung, Yee, & Morris, 2010); UK consumers looked for safer foods to avoid bird flu contamination in poultry. The issue of global warming has increased consumers' concerns about the environment. European consumers worry about the use of chemicals and pesticides in agriculture that causes environmental deterioration, soil degradation, water pollution, greenhouse gas emissions and biodiversity loss (Brzezina, Kopainsky, & Mathijs, 2016). Consumers, especially in developed countries, purchase organic products that are free from chemicals and pesticides because they want to save the environment and have good health (Rana & Paul, 2017). These concerns have led to changes in consumers' behaviour.

Consumers everywhere appear to want to buy and consume food that they believe is healthy, safe and environmentally friendly. Thus, changes in consumer consumption behaviour are influence by food scandals. For example, after the BSE outbreak, many consumers in Europe wanted to buy certified beef (Angulo & Gil, 2007). Likewise, as a result the bird flu outbreak, consumers were willing to pay higher prices for well-known poultry brands (Yeung et al., 2010). Studies have also found that consumers prefer to buy organic vegetables to avoid chemical contamination (Roitner-Schobesberger et al., 2008; Sangkumchaliang & Huang, 2012). For example, Roitner-Schobesberger et al. (2008) reveal that consumers in Bangkok, Thailand, are willing to pay higher prices for organic vegetables that are seen as safer foods. Sriwaranun (2011) reports that Thai consumers are willing to pay 88 per cent more for organic Chinese kale than for conventional products. Sangkumchaliang and Huang (2012) show that consumers in northern Thailand specifically buy organic vegetables to avoid pesticide residues.

1.2 Organic products market in Thailand

In developing countries, including Thailand, organic products command a small market share compared with conventional products. These markets are categorised as niche markets and the organic products they provide are sold at high prices (Willer & Lernoud, 2019). Consumers who purchase organic products in developing countries always pay higher prices for them (Voon et al.,

2011). Studies on the WTP premium prices for organic products have been conducted in some Asia countries such as Singapore, Malaysia, Thailand and Vietnam (Voon et al., 2011). The findings show consumers in those countries are willing to pay more for organic than for conventional products (Sriwaranun, 2011; Voon et al., 2011).

As a result of the green revolution, Thailand's organic market has grown since 1980, with organic farming practices in Thailand initiated then (Wiboonpongse & Sriboonchitta, 2004). In 2017, the sales of organic products in Thailand had reached 15.6 million USD (FAO, 2019a). Thailand's market for organic products grew by seven per cent in 2018 up to 16.6 million USD (FAO, 2019b). At the end of 2018, the total value of organic food sold in Thailand was 17.7 million USD and is still increasing (FAO, 2019b). Most organic products in Thailand are sold in supermarkets, natural health stores and hypermarkets (Roitner-Schobesberger et al., 2008). The top five organic product categories sold in Thailand are vegetables, grains, drinks, seasonings and snacks (Panyakul, 2016). The most popular organic products that Thai consumers purchase are lettuce, Chinese kale (vegetables), jasmine rice (grains), orange juice and coffee (drinks) (Panyakul, 2016).

In Thailand, the organic product market is in its infancy; the market share of organic products, at approximately two per cent, is small compared with conventional products (Panyakul, 2016). Most Thai consumers still buy conventional products for three main reasons. First, conventional products are more readily available with many more product varieties than organic products (Roitner-Schobesberger et al., 2008; Sriwaranun, 2011). Second, the price of conventional products is lower than that of organic products (Sangkumchaliang & Huang, 2012). Finally, consumers do not see any difference between conventional products and organic products (Nuttavuthisit & Thogersen, 2015; Roitner-Schobesberger et al., 2008). Although the majority of Thai consumers do not buy organic products, those who do are willing to pay higher prices. Sriwaranun (2011) reported that consumers were willing to pay more for organic foods over conventional foods, such as Chinese kale, jasmine rice and pork, at 88 per cent, 51 per cent and 51 per cent, respectively.

Thailand is Asia's third largest food exporter and is in the top ten largest food exporters in the world (World Trade Organization, 2019). The food products, produced throughout the country, include both conventional and organic products. However, most food products produced in the country are conventional; therefore, consumers in Thailand have far more choice with conventional products than with organics (Wiboonpongse & Sriboonchitta, 2004). Thus, organic products produced in the country do not offer a great variety compared with conventional products (Roitner-Schobesberger et al., 2008). Most organic products produced in Thailand are exported to other countries, with 78 per cent exported and the remaining 22 per cent sold in the domestic market (Panyakul, 2016).

The most significant barriers to purchasing organic products for the majority of Thai consumers are high prices and lack of confidence in the authenticity of the products (Nuttavuthisit & Thogersen, 2015; Roitner-Schobesberger et al., 2008). Consumers are sceptical of organic product claims and most could not explain what these are in any detail or describe what defines organic products (Nuttavuthisit & Thogersen, 2015; Sangkumchaliang & Huang, 2012). Consumers thus have difficulty in differentiating between organic and conventional products sold in domestic markets. This makes the consumers less confident and more sceptical about the authenticity and benefits of organic products when having to buy them at higher prices (Roitner-Schobesberger et al., 2008). Sangkumchaliang and Huang (2012) investigated 390 consumers in Chiangmai in northern Thailand. They reveal that 76 per cent of those who do not buy organic products believe that they are the same as conventional products in terms of hygiene and safety. They also thought that organic products offered nothing special compared with conventional products. Sriwaranun (2011) reveals that consumers in Thailand are willing to pay a premium price for organic products if they have had good experiences in purchasing organic products. According to Sriwaranun, health, food safety, ethical and environmental considerations mostly influence organic product purchase in Thailand (Sriwaranun, 2011). Consumers who are more likely to purchase organic products and are willing to pay a premium price for organic products mostly reside in the city (Sriwaranun, 2011). However, consumers who frequently dine out or consume take-away food are less likely to purchase organic products (Sriwaranun, 2011). In sum, the most significant barriers for purchasing organic products in Thailand are high price, limited availability, and a lack of information about organic products (Sriwaranun, 2011).

Many certification tools are used in Thailand to document product quality and safety to increase consumers' confidence. However, when there are too many certificates, consumers become confused (Nuttavuthisit & Thogersen, 2015; Roitner-Schobesberger et al., 2008; Sangkumchaliang & Huang, 2012). Most consumers cannot differentiate between the different types of certification. Research in Thailand revealed that one of the most important barriers to buying organic products is the confusion consumers experience because of the many different certification programmes used in organic product marketing (Roitner-Schobesberger et al., 2008). Though 92 per cent of Thai consumers have heard the term "organic products", only 6.5 per cent of consumers outside Bangkok can correctly answer the question of what constitutes an organic product. Consumers in the greater Bangkok area have a higher rate, with 10.9 per cent of them answering the question correctly (Greennet, 2015). Misunderstanding about organic products may stem from the confusion created by the many different certification types used. These include certifications such as pesticide-free production, healthy vegetable and clean vegetable certificates, hydroponics certification, and the Q

logo, which certifies that the foods were not produced using genetically modified organisms (GMOs) (Greennet, 2015).

1.3 Problem statement

Consumers who purchase organic products are the most important party in making organic product markets sustainable. To increase these customers' satisfaction, an in-depth understanding of their purchasing behaviour is important. Understanding the behaviour of organic product purchasers can be useful to set effective marketing strategies to attract new consumers to buy organic products. Likewise, information about the factors that influence consumers' WTP premium prices for organic products will assist marketers to create marketing strategies to develop the organic product markets that will help organic product producers, including farmers, to manage their production processes effectively. These factors can also be used for promotion purposes to attract non-organic product purchasers to purchase organic products. The non-organic product purchasers represent a large potential market for organic products.

Thai consumers are willing to pay higher prices for organic products (Sriwaranun, 2011). However, it is not clear what exactly consumers perceive they are paying for when purchasing organic products. Even though Thai consumers have a lack of understanding of organic products, they still buy them because they believe they are safer than conventional products that are likely to be contaminated with pesticide residues (Nuttavuthisit & Thogersen, 2015). They also want to support local small farmers (Sangkumchaliang & Huang, 2012). Roitner-Schobesberger et al. (2008) indicate that the demand for organic products in Thailand is associated with pesticide use in agriculture; the higher the degree that pesticides used in agriculture, the higher the demand for organic products. Thus, the WTP higher price for organic products may not be influenced by how much consumers understand about organic products but what they know about the use of pesticides.

Consumers may perceive risks when buying organic products at higher prices because they do not understand much about the products that they buy. It is therefore important to investigate the relationships between consumers' risk perceptions and their WTP premium prices for organic products. When consumers buy goods at higher prices and/or buy them despite a lack of information about the products, they may perceive high levels of risk (Solomon, Russell-Bennett, & Previte, 2013). As noted above, in developing countries, consumers do not appear to understand much about organic products (Roitner-Schobesberger et al., 2008). This lack of understanding causes scepticism about the authenticity and benefits of organic products, which is possibly also amplified by their high prices. In such a sceptical situation, consumers are likely to express concern about the

risks resulting from their decision-making. However, little is known about consumers' perceived risks and their risk reduction strategies when purchasing organic products.

In the last decade, research has focused on consumer risk perception and risk reduction strategies in relation to food purchases (Mitchell, 1999; Yeung et al., 2010). These studies have focussed on different kinds of food, with most done in developed countries. There are a few studies that investigate the risk perception of organic products and no studies of that phenomenon have been done in Thailand. Further, the relationship between risk perception, risk reduction strategies and consumers' WTP premium prices for organic products has not been previously studied in Thailand. There has been no study of consumers' risk perception and their risk reduction strategies when buying organic products in Thailand. Sriwaranun's (2011) study of consumers' WTP premium prices for organic products in Thailand showed that Thai consumers are willing to pay higher prices for organic products because they believe that organic products are better for their health and have less of an impact on the environment. However, few scholars interested in organic production have investigated the WTP premium prices for organic products and the relationship between risk perceptions and risk reduction strategies. Currently, there is no integrated study on consumers' WTP premium prices for organic products and the factors influencing their WTP premium prices, the risk perception factors, and risk reduction strategies when purchasing organic products.

Based on consumer behaviour theory, this study investigates Thai consumers' WTP premium prices for organic products, with a specific emphasis on how consumers perceive risk and the way they reduce their perception of the risks when buying organic products. This study aims to fill the research gaps in the organic marketing literature. The study provides insights that may assist organic producers, government agencies, organic product traders, and marketers to produce organic products effectively and the related risk management and marketing strategies to serve the interests of both consumers and producers. The first research gap is the cause and effect of consumers' WTP premium prices for organic products, especially consumers' risk perceptions. The second research gap is concerned with the effect of the risk perception factors and determinants that affect consumers' WTP premium prices for organic products. The third research gap focuses on the risk reduction strategies related to the purchase of organic products. The fourth and final research gap examines the interrelationship among risk perceptions, risk reduction strategies and consumers' WTP premium prices for organic products, a subject that has not been previously investigated.

1.4 Research objectives

1. To develop a model of consumers' WTP premium prices for organic products in Thailand with regard to risk perceptions and risk reduction strategies.

2. To analyse the determinants of risk perceptions affecting consumers purchase of organic products in Thailand.

3. To identify the significant factors in the risk reduction strategies influencing consumers' willingness to purchase organic products in Thailand.

4. To investigate the interrelationships among risk perceptions, risk reduction strategies and consumers' WTP premium prices for organic products.

To answer the research objectives above, this study focuses on the behaviour of organic product purchasers. However, to understand the holistic picture of all group of consumers, the behaviour of non-organic product purchasers has also been explored to get information about their perceptions and their WTP a premium price for organic products.

1.5 Contributions of the research

This is the first study that develops and tests consumers' WTP premium prices for organic products in Thailand. There are limited studies of consumers' WTP premium prices for organic products in relation to consumers' risk perceptions and their risk reduction strategies, not only in Thailand, but also in other developing countries. This is the first investigation of the relationships between risk perception factors, risk reduction strategies and Thai consumers' WTP premium prices for organic products. The study uses structural equation modelling (SEM) to assess consumers' WTP premium prices for organic products. The study's findings will contribute to the organic product marketing literature and will be useful for understanding, from both theoretical and practical perspectives, consumer behaviour and decision-making in relation to organic product purchases. The findings of this study can be used/applied in other countries where the organic market shares Thailand's characteristics and development stage.

This study focuses on two categories of organic product, unprocessed and processed (Roitner-Schobesberger et al., 2008). Four organic products were chosen based on their availability in Thailand. These four organic products are the most popular organic foods in Thailand and are considered representative of both categories of organic products. The chosen unprocessed organic products are organic vegetables and rice, considered the most popular organic products in Thailand

(Sriwaranun, 2011). Organic juice and coffee represent the most popular processed organic products in Thailand (Panyakul, 2016). These four products were selected because they are available in Thailand and are the most frequently purchased items (Panyakul, 2016; Roitner-Schobesberger et al., 2008; Sriwaranun, 2011).

1.6 Outline of the research

This thesis contains six chapters. Chapter 1 presents an overview of organic products, consumer behaviour, the problem statement, the research gaps and the research objectives. Chapter 2 defines organic products and describes consumers' risk perceptions and their risk reduction strategies, followed by a discussion of the consumer decision-making theory and the literature related to consumers' behaviour. The WTP premium prices for organic products, consumers' risk perceptions, their risk reduction strategies, including the conceptual framework, and the hypotheses developed in this study are also discussed. Chapter 3 presents the research methods, data collection and data analysis. The descriptive statistics and empirical data analyses consisting of Exploratory Factor Analysis (EFA), Confirmatory Factor Analysis (CFA) and SEM, are discussed in Chapters 4 and 5, respectively. Chapter 6 concludes the thesis with the contributions, implications, limitations of the study and suggestions for further study.

Chapter 2

Literature Review and Model Development

This chapter reviews the literature on consumer behaviour related to the purchase of organic products. Specifically, the chapter focuses on literature related to the conceptualisation and measurement of consumer risk perceptions, consumers' risk reduction strategies, including the relevant significant factors based on consumer behaviour theory, and findings from previous studies on consumer perceptions of organic product attributes, consumers' attitudes toward organic products, consumers' knowledge of organic products, consumers' lifestyle and consumers' WTP premium prices for organic products. The chapter explores the relationships between these factors. The chapter concludes with a discussion of the study's conceptual research model and the hypothesis development and testing.

2.1 Definitions of organic products, risk perceptions and risk reduction strategies

Organic products - According to the Research Institute of Organic Agriculture (FiBL) and the International Federation of Organic Agriculture Movements (IFOAM), an organic product is a product produced without the use of conventional pesticides, chemical fertilisers, bioengineering, genetically modified organisms (GMOs) or ionising radiation (Willer, Helga, & Lernoud, 2015). Organic products include organic groceries such as organic fruit, vegetables and rice (Liu, 2011). The organic products examined in this study are foods and drinks produced without the use of conventional pesticides, chemical fertilisers, and bioengineering, GMOs or ionising radiation.

Risk perception – this term refers to consumers' beliefs about potential negative consequences associated with goods about which they do not have enough information (Mitchell, 1999; Solomon, Russell-Bennett, & Previte, 2013). The term is used in a variety of contexts, including marketing, finance and food safety. This study uses the marketing definition for three reasons. First, this study not only considers internal factors but also external factors (social and environmental factors) that influence a consumer's purchasing behaviour. Secondly, risk perception is defined from the consumer's perspective. Thirdly, risk perception is related to an individual's judgment and independent decision-making.

Risk reduction strategies are the behaviours that consumers act on to protect themselves from risks (Bruwer, Fong, & Saliba, 2013; Yeung et al., 2010). These behaviours, such as buying well-known

products with trusted brand or certification, searching for information about products or looking for a warranty, are risk reduction strategies that consumers select when purchasing goods (Bruwer et al., 2013; Yeung et al., 2010). Risk reduction strategies can be seen from a consumer's behaviour when buying goods. For instance, consumers selectively buy goods with well-known brand or certificate, shop around, or buy goods based on the recommendations from family or friends (Yeung et al., 2010). Consumers frequently choose risk reduction strategies when purchasing products that could be underperforming (Mitchell, 1999; Mitra, Reiss, & Capella, 1999; Yeung et al., 2010).

2.2 Consumer behaviour theory

Consumer behaviour theory studies how and why consumers make decisions when they purchase or consume products or services. Marketers can identify what factors influence these decisions to develop marketing strategies effectively (Kotler, 2012). There are many factors that influence consumers' purchasing behaviour (Blackwell et al., 2001). For example, psychological factors include attitude, perceptions and beliefs. Personal factors include age, gender, and occupation. Social factors include family, friends, and community. Their decision process when purchasing or consuming products or services (Kotler, 2012) drive consumer behaviour analogous to consumer's actions. Consumers purchasing decision is mostly driven by their budget. However, consumers preferences can change based on a range of factors (Blackwell et al., 2001). The consumer decision-making process was introduced by Dewey (1910) who showed that the consumer purchasing decision process consists of five steps; problem recognition, search for information, including evaluation of alternatives, choice, and outcome (Dewey, 1910). Later, Engel, Kollat and Blackwell (1973) and Block and Roering (1976) adopted Dewey's consumer decision-making process to further explore consumers purchasing behaviour. Block and Roering (1976) suggested that the environmental factors such as income, cultural, family and social are important factors that influence consumer decision-making process. Blackwell, Miniard et al. (2001) included psychological factors that influence consumers' purchasing behaviour and their decision-making in their consumer decision model, known as the Engel-Blackwell-Miniard Model (EBM).

The literature on organic products, with regard to marketing and consumers' purchasing behaviour, is well documented. As prior studies have shown, many factors influence consumer decisions when buying organic products. The EBM is one of the most widely used consumer decision-making models (Bareham, 1995; Rice, 1993; Solomon et al., 2013). It has been used to analyse the purchase of many different products. EBM is a comprehensive model that explains how consumer decision-making is influenced by a variety of internal and external factors (see Figure 2.1) (Bareham, 1995; Solomon et al., 2013). The EBM consumer decision-making model consists of five steps: problem recognition;

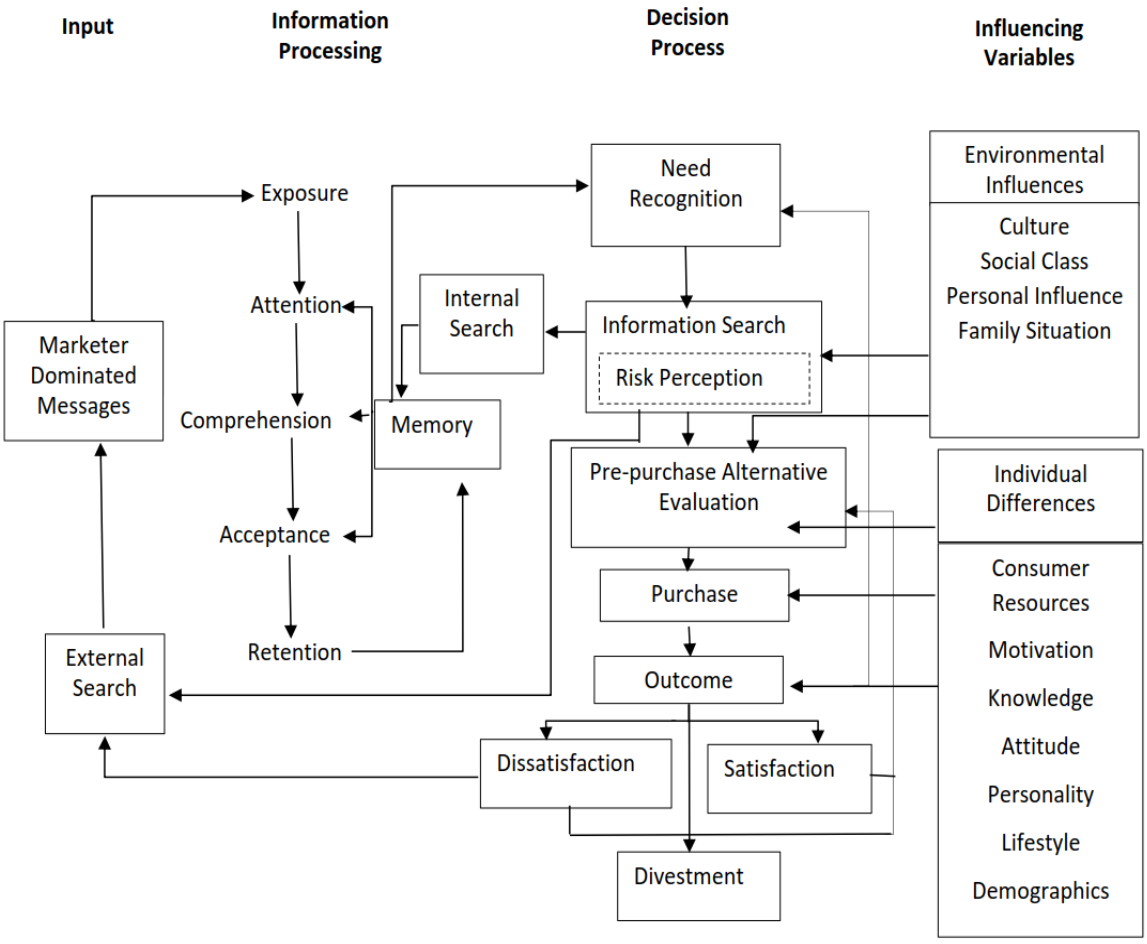

Figure 2.1 The EBM model of consumer decision-making (adapted from Blackwell et al., 2001)

information search; evaluation of alternatives; product choice; and outcome (Bareham, 1995; Solomon et al., 2013). Each step considers numerous factors that influence consumers' decisions (Bareham, 1995; Rice, 1993; Solomon et al., 2013).

In Figure 2.1, risk perception may occur in the information search stage, especially if the product is complex, hard to understand or insufficient information is provided (Mitchell, 1999; Solomon et al., 2013; Yeung & Morris, 2006). Before making a purchase, consumers search for information using both internal and external sources (Bareham, 1995; Solomon et al., 2013). It is widely known that risk perception significantly impacts consumer decision-making when purchasing products that have incomplete information or products seem to be underperforming (Angulo & Gil, 2007; Mitchell, 2001; Solomon et al., 2013; Yeung et al., 2010).

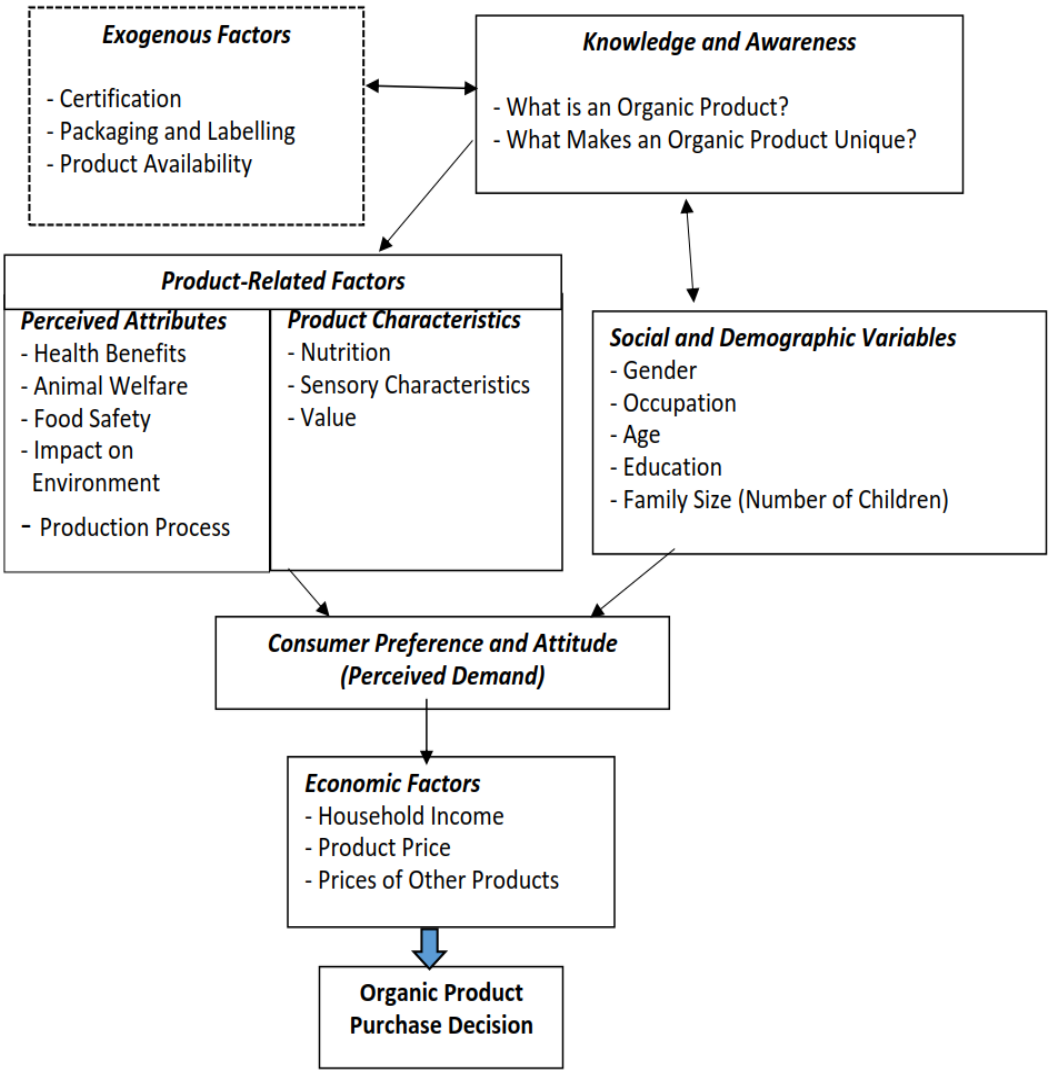

Figure 2.2 Factors affecting organic product consumer attitudes and purchase decisions (Bonti-ankomah & Yiridoe, 2006, p. 18)

The EBM model considers a variety of factors involved when a consumer is making a decision to buy goods. Consumer behaviour on buying organic products can be analysed using the EBM model that considers many processes in consumers' decisions; the model covers a variety of decision conditions and different product categories.

For organic products, Bonti-ankomah and Yiridoe (2006) developed the consumer purchasing decision model based on relevant literature over the previous four decades. Bonti-ankomah and Yiridoe's model includes a framework of variables that influence consumers' decision-making (see Figure 2.2). Consumers' decisions to purchase organic products are based on their knowledge of organic products including the product's characteristics and attributes. Exogenous factors, consumer

preferences and attitudes, including socio-demographic factors, are significant elements that influence consumers to buy organic products.

Based on the literature, many significant factors influencing consumers' purchase of organic products have been identified. These factors include demographics, perceptions about organic products' attributes, attitudes towards organic products, lifestyle and knowledge about organic products including feelings such as trust and scepticism.

2.3 Empirical studies of consumer behaviour in the purchase of organic products

Studies on consumers' purchasing behaviour have focused on the factors that influence consumers' decisions to buy organic products. A literature review of the past 30 years reveals that there are five significant factors that impact consumers' decisions to purchase organic products: demographic factors; perceptions of organic products; attitudes to organic products; knowledge of organic products and processes; and lifestyle. These five factors can be divided into two groups: demographic factors (age, gender, ethnicity) and psychological factors (perceptions, attitudes, knowledge and lifestyle) (Bonti-ankomah & Yiridoe, 2006). Key findings from the literature review of consumer behaviour are presented in the following sections.

2.3.1 Demographic factors influencing consumers' purchase of organic products

In the last decade, researchers investigating organic consumers' behaviour have focused primarily on socio-demographic factors. Several studies have found that demographic characteristics (e.g., age, income, education, and household size), significantly impact consumers' purchases of organic products (Magistris & Gracia, 2007; Nuttavuthisit & Thøgersen, 2019; Paul & Rana, 2012; Thompson, 2014; Xie et al., 2015). Paul and Rana (2012) surveyed 463 respondents in Northern India to investigate organic product consumer behaviour. They find that consumers with higher education levels and are concerned about their health are more likely to purchase organic products. Similarly, consumers with higher education levels tend to buy more organic products because they have higher incomes and are willing to pay the higher price for organic products. Magistris and Gracia (2007) investigated consumers' behaviour when purchasing organic products in Italy. They show that consumers with higher education levels have more knowledge of organic products than consumers with lower education levels (Magistris & Gracia, 2007). Consumers' intentions to purchase depends on organic product knowledge and attitudes (Magistris & Gracia, 2007). Highly educated consumers are more willing to pay for organic products because they have more knowledgeable about organic

products and have positive attitudes toward their health. They also believe that eating/using organic products benefits the environment (Magistris & Gracia, 2007)

However, Thompson's (2014) study shows that US consumers with higher education levels do not have any effect on organic product purchasing behaviour. Thompson finds that, in California and New York, there is no statistical difference in the amount of organic product purchased between highly educated consumers and those with lower education levels. The effect of education level on consumers' purchases of organic products is smaller than the effect of having children in their family (Thompson, 2014). Thompson shows that the probability of buying organic products increases with age and number of children in the household. Parents not only buy organic products for themselves but also for their children because they are concerned about their family members' health (Thompson, 2014). Thompson reveals that parents prepare and give their children organic foods and may buy more organic products as their children grow. The willingness to purchase organic products, is driven by the number of children in the household (Thompson, 2014). In the US, the market share of organic products for children is larger than the share of all organic products in the country (Thompson, 2014). Davies, Titterington and Cochrane (1995) interviewed 2,185 Irish consumers. They show that organic consumers were mostly female with positive attitudes to organic products, and lived with children. Boobalan and Nachimuthu (2020) interviewed 714 people in India and 656 in the US. They show that organic product consumers were mostly women living with their children. They believe that organic products are good for their health. These demographic traits are similar in the United Kingdom and Germany (Goetzke, Nitzko, & Spiller, 2014; Zander & Hamm, 2010). Xie et al. (2015) investigated consumers in China. They show that consumers who with higher education levels and greater disposable income are more likely to be organic product consumers. These organic product consumers also live with their children and are older than non-organic product consumers (Xie et al., 2015).

In contrast, organic product consumers in Thailand are different. Sriwaranun (2011) indicates that Thai consumers who live with children are less likely to purchase and pay higher prices for organic products because these groups have low levels of disposable income. In Thailand, organic product consumers are most likely to be individuals who do not have children; they are frequently elderly with high household incomes. Sriwaranun concludes that household disposable income is important and relevant to the number of people in the household because households with children are more likely to have lower levels of disposable income and thus low purchasing power. Nuttavuthisit and Thøgersen's (2019) survey of Thai consumers found that the amount of household disposable income is important and largely depends on the family size. Nuttavuthisit and Thøgersen find that

Thai consumers who usually purchase organic products are more likely to be young people with higher education level and larger salaries. They typically have four people in their household.

Many studies show that demographic factors weakly influence consumers' purchase of organic products. For example, Hughner et al. (2007) reviewed the organic product literature published over a 20 year period (1985 to 2005). The authors show that consumers have different understandings of the word ''organic'' and that these different understandings influence consumers' purchases of organic products in different ways (Hughner et al., 2007). Hughner et al. (2007) find that the most significant factor influencing consumers' purchase of organic products is consumers' understanding of organic products. They find that consumers' demographic characteristics do not determine whether they will buy organic products (Hughner et al., 2007). The demographic characteristics of consumers who buy organic products vary. Nuttavuthisit and Thøgersen (2019) and Sriwaranun (2011) agree with Hughner et al.'s (2007) findings. They all conclude that the demographics of consumers who purchase organic products is diverse; they are not a homogenous group. Hughner et al. (2007) concluded that the most significant factor influencing consumers' purchasing organic products is consumers' understanding of organic products.

Xiangxiang's (2014) investigation of consumers in China showed that demographic characteristics have a weak influence on consumers' purchases of organic products. After surveying 675 Chinese respondents who purchased organic products, the author concludes that only income influenced consumers' purchases of organic products. Likewise, Voon, Sing and Agrawal's (2011) study of Malaysian consumers indicated that demographic characteristics do not influence consumers' purchases of organic products. Voon et al. (2011) conclude that perceptions of organic products are most important in influencing consumers' purchase of organic products, especially at higher prices. Krystallis and Chryssohoidis (2005) studied consumers' WTP for organic products in Greece. They show that consumers' intention to purchase, and their WTP for organic products, is influenced more by organic product categories than other factors (Krystallis & Chryssohoidis, 2005). Krystallis and Chryssohoidis conclude that demographic factors do not affect consumers' intentions to purchase nor their WTP for organic products. Krystallis and Chryssohoidis' findings are consistent with Bonti-ankomah and Yiridoe's (2006) study that revealed that demographic factors are less important than psychological factors in the purchase of organic produce.

Hughner et al. (2007), Krystallis and Chryssohoidis (2005) and Voon et al. (2011) suggest that future research on organic product consumer behaviour should focus on psychological factors, such as consumers' motivation and perceptions, to obtain greater consumer insights, a better understanding of consumer motivations, and a knowledge of organic product purchases and consumption

experiences. Such studies would help marketers, sellers and farmers develop marketing strategies and/or manage organic product production more effectively.

2.3.2 Psychological factors influencing consumers' purchase of organic products

It is widely accepted that psychological factors influence consumers' purchases of organic products (Hughner et al., 2007; Krystallis & Chryssohoidis, 2005; Voon et al., 2011). These psychological factors include consumers' perceptions of organic product attributes, consumers' attitudes toward organic products, consumers' knowledge of organic products and consumers' lifestyle (Bonti-ankomah & Yiridoe, 2006). The following sections review the literature on each of these psychological factors.

2.3.2.1 Consumers' perceptions of organic product attributes

Consumers' perceptions of organic product attributes have been recognised as significantly influencing consumer purchases of organic products. Attributes include product characteristics, product quality and product price (Aertsens, Verbeke, Mondelaers, & Van Huylenbroeck, 2009; Janssen & Hamm, 2012; Magistris & Gracia, 2007). Consumers purchase organic products because they do not want to eat food contaminated with pesticide residues, they are concerned about their health and want to eat healthier and/or they want to preserve the environment (Aertsens et al., 2011; Basha et al., 2015; Gan et al., 2014).

Consumers' perceptions of organic food have been explored in many countries. Studies include, Basha et al. (2015) in India, Buder, Feldmann and Hamm (2014) in Germany, Magistris and Gracia (2008) in Italy, Pelletier et al. (2013) in the US, Sakagami (2006) in Japan, Sangkumchaliang and Huang (2012) in Thailand, Voon et al. (2011) in Malaysia and Xiangxiang (2014) in China. For example, Basha et al. (2015) find that significant factors influencing consumers in India to purchase organic products are the quality of the food, the superior taste and the environmentally friendly nature of organic production processes. Xiangxiang's (2014) study in China revealed that consumers purchase organic products because they have higher nutritional levels and greater health benefits than conventional products (they are free from chemicals which means they are safer). Sangkumchaliang and Huang (2012) find that the factors influencing consumers in Thailand to purchase organic products include products that are free from chemical contamination, they taste better and they do not have a negative impact on the environment. Aertsens et al.'s (2011) study investigated consumers' experiences of purchasing organic products in Belgium. The authors show that consumer perceptions (organic products free from pesticide residues, they are better for the environment and they taste better) influence consumers to buy organic products.

One problem associated with organic products is that it is sometimes difficult to identify which products are genuinely organic. This is especially true for vegetables, fruit and other agricultural products (Gracia & De-Magistris, 2015; Janssen & Hamm, 2012). To signal to consumers that their product is organic, many organic producers differentiate their organic products using specific branding, different packaging, certification or even store images to communicate and build consumer trust (Gracia & De-Magistris, 2015; Janssen & Hamm, 2012; Ngobo & Jean, 2012; Sakagami, 2006). Despite consumers' beliefs that organic products are better than conventional products, most consumers could not explain or provide a definition of what an organic product is (Nuttavuthisit & Thogersen, 2015; Roitner-Schobesberger et al., 2008; Sangkumchaliang & Huang, 2012). Nuttavuthisit et al. (2015) report that Thai consumers were confused about terms such as "chemical-free," "safe foods," "green foods" and "organic". These concepts mean similar things in the Thai language. Roitner-Schobesberger et al. (2008) interviewed 848 consumers in Bangkok to find that most could not differentiate between organic products and conventional ones. Moreover, consumers were confused about the different types of certification. Sangkumchaliang and Huang's (2012) study of consumers in Chiangmai, Thailand, showed that most consumers do not understand the word "organic" and cannot see the difference between organic products and conventional products because it is not physically visible.

Consumers display much scepticism when buying organic products because the number of organic certificates in the market confuses them and, thus, are unsure about the authenticity of each certificate (Sangkumchaliang & Huang, 2012; Sriwaranun, 2011; Voon et al., 2011). Even though Thai consumers have limited understanding of organic products, they still buy these products at higher prices (Sriwaranun, 2011; Voon et al., 2011). This means that consumers are not influenced by their understanding but by their perceptions (Voon et al., 2011). Based on the literature, it is implied that consumers purchase organic products based on their perceptions, rather than their understanding (Sriwaranun, 2011). Sangkumchaliang and Huang (2012) support this view. They conclude that Thai consumers buy organic products based on their perceptions because they believe that these products are better for them. Thøgersen, Pedersen and Aschemann-Witzel (2019) came to a similar conclusion. They investigated organic product purchasers in Germany, France, Denmark, China and Thailand. The authors conclude that consumes' perceptions of, and trust in, the quality of organic products are significant factors that influence consumers' purchases of organic products. Having a good experience and being satisfied with past purchases are also important factors that influence consumers' purchase of organic products (Ngobo & Jean, 2012; Sriwaranun, Gan, Lee, & Cohen, 2015).

2.3.2.2 Consumers' attitude towards organic products

Consumers' concerns about their health and increased environmental consciousness have driven demands for safer, healthier food (Rana & Paul, 2017). Consumers have positive attitudes toward organic products and believe that they are healthier and have less impact on the environment (Cheung & To, 2019). Several previous studies have confirmed that consumers' attitudes to organic products play a significant role in influencing their purchases of organic products (Gan et al., 2014; Hwang & Chung, 2019; Nuttavuthisit & Thøgersen, 2019; Sriwaranun, 2011). For example, Gan et al. (2014) examined consumer attitudes toward organic products in China. They show that significant factors influencing consumer purchases of organic products in China include health consciousness, food safety and environmental concerns. Sriwaranun's (2011) study in Thailand revealed that consumers' perceptions of organic product quality, consumers' positive attitudes about the environmental benefits and consumers' lifestyle are significant factors influencing consumer purchases of organic products. Hwang and Chung's (2019) survey of US consumers revealed that consumers' purchasing power has a positive relationship with their attitude toward organic product consumption. The authors conclude that people in the US are willing to pay higher prices for organic products because they have high purchasing power and positive attitudes toward organic products. Nuttavuthisit and Thøgersen's (2019) study of Thai consumers indicated that consumers are willing to purchase organic products at higher prices than conventional products because they have a positive attitude towards organic products and trust in organic farming that is free from chemicals and safer for the environment. Nuttavuthisit and Thøgersen reveal that consumers also have negative attitudes toward organic products because of a lack of organic product availability.

Though the demand for organic products is growing continuously, organic product supply is limited. One of the most significant barriers to organic product market growth is the lack of product (Aertsens et al., 2011; Janssen & Hamm, 2014; Van Doorn & Verhoef, 2015; Xie et al., 2015). Aertsens et al. (2011) surveyed 529 consumers in Belgium and find that consumers' health consciousness and concerns about the environment are significant factors that influence consumers' purchase of organic products, like organic vegetables. However, the authors identify high prices and a lack of availability as significant barriers to purchasing organic products (Aertsens et al., 2011). Similarly, Xie et al.'s (2015) survey and interviews with 406 organic consumers in China revealed that the primary factor influencing organic food purchases is health and safety. Barriers to purchasing organic foods is a lack of knowledge, information and a lack of organic product availability. Doorn and Verhoef's (2015) investigation of organic consumers in the Netherlands found that consumers were willing to pay higher prices for organic products than conventional ones, but the main problem was a lack of organic product availability because of limited organic production.

Janssen and Hamm (2014) reveal that, in Germany, the organic product market has been growing rapidly; currently, Germany is globally the highest growth market for organic products. In Germany, the organic product market share is approximately 15 per cent. However, like many other countries discussed above, Germans also face problems with availability because of limited organic production; many organic products sold in Germany are imported from Asia (Janssen & Hamm, 2014). In contrast, Asia has a high capacity to produce organic products but cannot sell them in domestic markets. For example, in Thailand, Willer and Lernoud's (2019) study reported that Thailand produced organic products with a total value of USD 96.6 million but sold only USD 24 million on the domestic market. The rest was exported to other countries (75 to 80 per cent of total production) (Willer & Lernoud, 2019).

There is a limited number of organic products available. This means that consumers do not have a wide variety of organic products from which to choose. This means that many consumers buy both conventional and organic products at the same time (Buder et al., 2014; Doorn & Verhoef, 2015; Xie et al., 2015). Therefore, separating organic product consumers from non-organic product consumers is difficult. Because of the limited organic product choices, consumers are not able to buy organic products regularly. Furthermore, researchers cannot classify consumers who buy conventional products as non-organic product consumers because they may buy organic products when they are available.

2.3.2.3 Consumers' knowledge of organic products

Bonti-ankomah and Yiridoe (2006) define knowledge about organic products as having an understanding of organic products production processes and the differences between organic and conventional products. Many studies indicate that consumers' knowledge of organic products is a significant factor influencing their purchase because this enables them to have increased confidence when purchasing organic products (Roitner-Schobesberger et al., 2008; Sangkumchaliang & Huang, 2012; Sriwaranun, 2011; Voon et al., 2011). Sriwaranun's (2011) study in Thailand revealed that consumers who have a high level of knowledge about organic products are more likely to purchase organic products. Similarly, Sangkumchaliang and Huang (2012) demonstrate that consumers who purchase organic products regularly have better knowledge about organic products. However, in their study in Malaysia, Voon et al. (2011) argue that knowledge is not a significant factor influencing consumers' purchase of organic products. In contrast, Voon et al. (2011) argue that knowledge is not as important as one's attitude toward organic products. In short, Voon et al. (2011) find that consumers purchase organic products based on their beliefs rather than their understanding of

organic products. The authors conclude that knowledge is not a significant factor influencing consumers' purchase of organic products.

Regarding the characteristics of organic products, consumers cannot see the difference between organic products and conventional products. Information about organic products provided in stores at the point of sale influences consumers' organic product knowledge (Gracia & De-Magistris, 2015). An organic certificate is a marketing tool that has been used to differentiate organic products from other products (Drexler et al., 2018). The use of organic certificates may increase consumers' confidence about purchasing organic products (Thøgersen et al., 2019). However, when there are too many certificates, or they are overused, consumers become confused. For example, Nuttavuthisit and Thogersen (2015) reveal that too many organic product certificates in the markets confuse Thai consumers.

Different levels of awareness and knowledge of organic products impact demand for information about organic products. Consumers want to be sure of the quality of the products they are buying. Shafie and Rennie (2012) reviewed the literature from the past 10 years and found that consumers want more information. They recommend that organic producers and sellers provide consumers with information to ensure they have knowledge about product qualities. Nuttavuthisit and Thøgersen's (2019) survey of 965 consumers, who usually purchase organic products in Thailand, showed that awareness and understanding of organic products are key drivers of consumers' organic purchases. Consumers need clear, reliable information about organic products including information about the country of origin and whether they are imported or domestically produced. The authors conclude that scepticism and a lack of information about organic products are the main barriers to purchasing organic products.

2.3.2.4 Consumer lifestyles

Prior studies have indicated a significant relationship between consumer lifestyle and purchase of organic products (Paul & Rana, 2012; Sriwaranun, 2011; Vanit-Anunchai & Schmidt, 2006; Yadav & Pathak, 2016; Zagata, 2012). For example, Vanit-Anunchai and Schmidt's (2006) study in Thailand found that the 'dining out' lifestyle of Thai consumers affected their purchase decisions. The authors reveal that the country's economic growth has affected Thai consumers' lifestyles, which, in turn, affect their food and grocery purchasing behaviour. Sriwaranun's (2011) investigation of Thai consumers found that consumer lifestyles affect their purchases of organic products. Sriwaranun reveals that Thai consumers who regularly dine out are unlikely to purchase organic products. In short, these consumers do not usually buy groceries or organic products (Sriwaranun, 2011).

Different consumers' lifestyles differently influence consumers' behaviour when buying organic products (Paul & Rana, 2012). Paul and Rana (2012) find that consumers in India who have ecological lifestyles have a positive attitude toward organic products. These consumers purchase and consume organic products with higher satisfaction than conventional products (Paul & Rana, 2012). The authors conclude that health, availability and consumers' education levels positively affect the purchase of organic products by consumers who have ecological lifestyles (Paul & Rana, 2012).

Green lifestyle consumers in Germany pay more attention to organic products and are willing to pay higher prices than general consumers. The main reasons these consumers buy organic products is that they are concerned about their health and the environment (Kriwy & Mecking, 2012). Green consumers in Ireland buy organic food only if they are in a high-income bracket. Significantly, individuals who claim to be most concerned about the environment do not regularly buy organic products (Davies et al., 1995). The authors find that most organic consumers in Ireland are women. Their disposable income level is the primary factor when purchasing organic food rather than the environmental factor. The green lifestyle does not indicate that these consumers will buy organic products because these products represent their lifestyle. This implies that environmentally concerned consumers may not buy organic products because the environmentally friendly processes produce them; they buy organic products for other reasons. For example, green consumers in Germany and the UK buy organic foods regularly because of taste and health (Kriwy & Mecking, 2012). Consumers are also more likely to buy organic foods that have been produced in environmentally friendly ways or with high levels of animal welfare (Baker, Thompson & Huntley, 2004).

2.4 Scepticism towards organic products

Scepticism about the authenticity and benefits of organic products influences consumers' risk perceptions and affects their buying behaviour (Nuttavuthisit & Thøgersen, 2019). In other words, consumers may look for further information or other choices to reduce the risks. Therefore, consumer risk perceptions are a major issue that needs to be identified and researched. Consumers buy and consume what they perceive as 'safe' food; they are willing to pay more to protect their health. Many purchase organic food because they believe that it is safer than conventionally produced food. For example, when the BSE (mad-cow disease), broke out in Europe and, later, bird flu in the UK, consumers were concerned about the potential dangers of eating beef and poultry (Angulo & Gil, 2007; Yeung et al., 2010). As a result, consumers demanded more information about

where their food came from and under what conditions it was produced. In these outbreaks, consumers were willing to pay more to ensure that the food they consumed was safe (Angulo & Gil, 2007; Yeung et al., 2010). This behaviour shows that risk perception and risk reduction strategies affect consumers' WTP premium prices for safer food (Angulo & Gil, 2007; Yeung et al., 2010). Angulo and Gil (2007) and Yeung et al. (2010) indicate that scepticism about food safety, consumer risk perceptions, consumer risk reduction strategies and their WTP premium prices for food products are all interrelated.

Many food scandals related to disease outbreaks, food contamination and food toxicity have shaken consumer confidence. These include the BSE (beef), the H5N1 chicken outbreak, chemical contamination and genetically modified organisms (GMOs). For example, food scandals in China have shaken consumers' confidence in purchasing food products. These incidents include rice contaminated with cadmium, milk powder contaminated with melamine, an industrial chemical (Gan et al., 2014), certified organic ginger contaminated with aldicarb, a pesticide (Liu & Ma, 2016), and strawberries contaminated with "norovirus" (Mäde et al., 2013). These food scandals make consumers less confident about food safety.

Consumers are worried about not only contamination but are also confused about food safety claims and safety certificates. Uncertainty occurs because of a lack of consumer information and/or because of poor product quality. Consumers buy organic products for their safety and presumed health benefits. If organic products do not have clear information, or consumers feel sceptical about the claims these products make, they may question the authenticity of these products and the value in paying more for them (Nuttavuthisit & Thøgersen, 2019). Consumers who have personally experienced food poisoning or have greater concerns about food safety are willing to pay higher prices for organic products. This is considered as one of the risk reduction strategies. Because of food scandals, consumers are worried about food poisoning and contamination. Consumers concerned about their health want safer, healthier food. Consumers realise that organic agricultural products (organic fruit, vegetables and rice) are better for their health because they are free from pesticides and chemical contamination (Nuttavuthisit & Thogersen, 2015; Sangkumchaliang & Huang, 2012; Sriwaranun, 2011).

Consumers in developing countries such as Thailand do not have a good understanding of organic products and the processes used to produce them. This is primarily because of a lack of information about them (Roitner-Schobesberger et al., 2008). Consumers find it difficult to tell the difference between organic and conventional products (Thøgersen et al., 2019). Despite their limited understanding, Thai consumers are willing to pay a higher price for organic produce because they

want safer, healthier products (Nuttavuthisit & Thøgersen, 2019). In Thailand, organic products cost approximately twice as much as conventional ones (Nuttavuthisit & Thogersen, 2015; Sriwaranun, 2011).

However, consumers find it difficult to determine whether the organic products they buy are authentic. In Thailand, there are multiple organic certificates, which means that consumers often feel confused about what they are buying (Nuttavuthisit & Thogersen, 2015; Roitner-Schobesberger et al., 2008; Thøgersen et al., 2019). As a result, consumers are taking a high risk when they purchase costly organic products. The high price, the overwhelming number of certification schemes and a general lack of information about organic product processes increase consumers' perceptions of risk. Thai consumers try to reduce these risks using a variety of strategies. This study is interested in identifying what these strategies are and how they affect consumers' WTP premium prices for organic products.

2.5 Empirical studies on consumers' WTP premium prices for organic products and risk factors

The WTP premium prices for organic products and the reasons why consumers buy these products have been widely investigated. In the last decade, scholars have conducted several studies on the WTP premium prices for organic produce. The primary objective of most of these studies has been to compare organic product prices with conventional products and to estimate the premium price that consumers are willing to pay for organic products. It is widely accepted that consumers are happy to pay a much higher price for organic products than conventional ones (Akaichi, Nayga & Gil, 2012; Gil, Gracia & Sánchez, 2000; Sriwaranun, 2011; Voon et al., 2011).

Studies on the WTP premium prices for organic products have focused on how much consumers are willing to pay for the products. Most of these studies report the premium prices that consumers are willing to pay for organic products compared with the conventional product. A premium price is the difference between the normal price of a product and the price of the product in the same category that consumers pay for the special attribute of the product such as brand name, environmental friendliness or pesticide free (Alan, 2001). Scholars have used a variety of methods including the Contingent Valuation Method (CVM). In many of the studies, choice experiments have been used to estimate the premium prices that consumers are willing to pay for organic products. For example, Sriwaranun's (2011) investigation of Thai consumers' WTP premium prices for organic products using the CVM method showed that Thai consumers were willing to pay 51 to 88 per cent more than for conventional products. Janssen and Hamm's (2014) study of consumers' WTP premium prices for

organic products in six European countries using a choice experiment showed that consumers were willing to pay the highest price for an organic product with a well-known organic logo or certification that consumers trust. Consumers' WTP premium prices for organic products in Janssen and Hamm's study differed depending on the logo and countries under investigation.

2.5.1 Consumers' WTP premium prices for organic products

The WTP premium prices for organic products have been widely investigated. Most studies identify significant factors that influence consumers' WTP a premium price for organic products and estimate the price that consumers are willing to pay for the products. Many studies on WTP premium prices for organic products also examine consumers' expected price and question them about the factors that influence their decision to purchase organic products. Consumers' WTP high prices for organic products indicates that consumers prefer them over conventional products (Krystallis & Chryssohoidis, 2005; Roitner-Schobesberger et al., 2008; Voon et al., 2011). Voon et al.'s (2011) study of Malaysian consumers found that consumers' attitudes to organic products have the greatest impact on their WTP premium prices. Akaichi, Nayga and Gil (2012) find that Spanish consumers are willing to pay a premium price for organic milk because of health consciousness. However, the price they are happy to pay decreases with the number of units purchased. Their study shows that the high price of organic foods, their taste and lack of information about the products affect Spanish consumers' purchases of organic products.

Scholars have investigated consumers' WTP premium prices for organic products in numerous countries, including Spain (Magistris & Gracia, 2007), the Czech Republic, Denmark, Germany, Italy, Switzerland and the UK (Janssen & Hamm, 2012) and China (Yu et al., 2014). The findings show that the average price that consumers are willing to pay for organic products is 40 to 80 per cent higher than for conventional products in these countries. Though previous studies have investigated consumers' estimated WTP premium prices for organic products, most do not examine consumers' actual purchases of organic products. The studies that investigate factors influencing consumers' WTP premium prices for organic products by measuring consumers' actual expenditure on organic products are limited. Voon et al. (2011) suggest that WTP premium prices should include the frequency of purchases, amount of purchase, the premium price paid and their experiences from purchasing organic goods.

The literature shows that consumers' WTP premium prices for organic products is influenced by numerous internal and external factors. Each factor may have direct or indirect effects on consumers' WTP a premium price for organic products. Very few studies examine the impact of

these internal and external factors and the interrelationships among them. This study provides a comprehensive investigation of all these factors to provide greater insights into consumers' WTP premium prices for organic products.

2.5.2 Risk factors (consumers' risk perceptions and risk reduction strategies) influencing consumers' WTP premium prices for organic products

The effects of consumers' risk perceptions on their WTP premium prices for food products have been widely studied (Angulo & Gil, 2007; Yeung et al., 2010). Most studies regarding consumers' risk perceptions have focused on conventional products. They found that consumers' risk perceptions and their risk reduction strategies influence their decision-making and their WTP a premium price for conventional products (Angulo & Gil, 2007; Yeung et al., 2010). For example, Angulo and Gil (2007) investigated consumers' beef purchases. Yeung et al. (2010) investigated consumers' poultry purchases in the UK. Both these studies reveal that consumers' risk perceptions and risk reduction strategies influence their WTP premium prices for these products. Though few studies examine consumers' WTP premium prices for organic products, there is a notable lack of research on the impact of consumers' risk perceptions and risk reduction strategies on their WTP premium prices for organic products.

The EBM model reveals that consumers' risk perceptions determine their purchase behaviour. This is especially true where consumers lack information about the products or are sceptical about the authenticity of the organic products they want to purchase. There seems to be a lack of studies on the impact of risk perceptions and risk reduction strategy factors on consumers' WTP premium prices for organic products. To fill these gaps, this study develops a WTP premium price model for organic products that investigates both internal and external factors using the EBM theory. The causes and effects of consumers' risk perceptions and risk reduction strategies are investigated in relation to the WTP premium prices for organic products. All psychological factors are analysed together in a single model (see Figure 2.3).

In terms of the EBM theory, a lack of useful information about the products that consumers want to buy influences their risk perceptions (Bareham, 1995; Mitchell, 1999; Solomon et al., 2013). During the information search stage, before consumers buy or consume organic products, they are unsure whether the organic products they purchase are safe and/or genuine organic products (Anisimova & Sultan, 2014; Gracia & De-Magistris, 2015; Midmore & Jansen, 2003; Roitner-Schobesberger et al., 2008). In the information search, the important point is confidence in the organic products. If consumers trust in organic products and have adequate information, they will buy them without hesitation and are more likely to pay a higher price. Consumers' confidence in organic products has

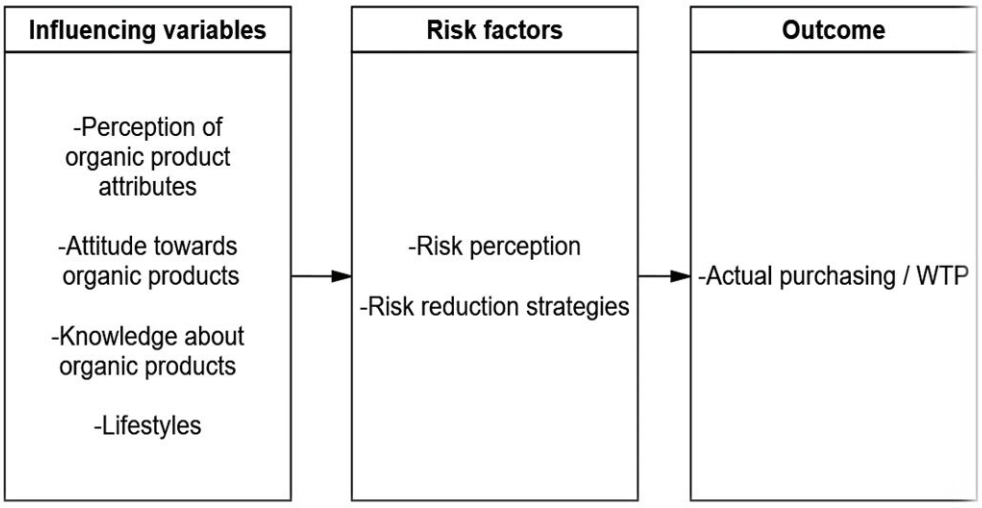

Figure 2.3 Risk factors influencing the WTP for organic products (developed from EBM theory (Blackwell et al., 2001))

been confirmed in Gracia and De-Magistris's (2015) study in European countries. The authors find that European consumers are hesitant about buying products that claim to be produced by organic processes unless they are given more information. The best way to communicate this information is to use a logo as a communication tool to inform target customers that the product is organic. For example, the communication tools and logos used in European countries, such as the Protected Designation of Origin (PDO) indicator, the nutritional fact panel, and the European organic logo, are most trusted logos that help raise consumers' confidence when buying and consuming organic products (Gracia & De-Magistris, 2015). Similarly, Janssen and Hamm's (2012) study on the trustworthiness of organic foods found that consumers in six European countries (the Czech Republic, Denmark, Germany, Italy, Switzerland and the United Kingdom) do not trust the claims of organic foods. However, they find that when producers use well-known organic certificates, consumers were willing to pay a considerably higher price. Using less familiar certification programmes showed no significant benefit.

Communication via certification seems to increase consumers' trust and convince them that the organic products are authentic (Thøgersen et al., 2019). However, if organic products have too many certificates, consumers become confused and apprehensive about the authenticity of organic products (Nuttavuthisit & Thøgersen, 2019). For example, in Thailand, one main reason why consumers do not buy organic products is that they do not trust in, or are suspicious about, organic products, even if they are certified (Nuttavuthisit & Thogersen, 2015). Many consumers are still confused because there are too many certificates that are difficult to understand or do not show what they stand for (Roitner-Schobesberger et al., 2008). To build the consumers' trust in organic

products, producers, policymakers and marketers should build product trust by using appropriate communication tools. Using organic certificates as a communication tool is not adequate to make consumers confident about the certificates. Therefore, using other tools such as product brands, store brands, product information, and friend and family recommendations to make consumers more confident in organic products would be helpful. These tools require further study to determine which tool(s) is(are) effective and can make consumers confident and WTP a higher price for organic products.

2.6 Consumers' risk perception studies on food products

Many studies have investigated risk perceptions and risk-reducing strategies in relation to food safety. For example, Leikas, Lindeman, Roininen, and Lähteenmäki's (2007) study in Finland found that consumers who want to avoid food poisoning have higher risk perceptions. In contrast, consumers who have knowledge and information about food poisoning are less likely to have a high-risk perception. Consumers' risk perceptions also differ in terms of the different types of food (Leikas et al., 2007). The authors also find that consumers' risk perceptions about food are related to their individual personalities. Consumers who are scared of food poisoning buy food based on their feelings; these consumers use avoidance strategies. If consumers have a high avoidance motivation, they have a high-risk perception. In contrast, consumers who believe in the benefits of food buy food based on their cognitive appraisal; these consumers have approach motivation. If consumers have high approach motivation, they have lower risk perception because they believe that the benefits of food are greater than the perceived risk of food poisoning (Leikas et al., 2007).

Previous marketing studies have found that risk is an important factor influencing consumers' behaviour especially when making decisions to buy food. For example, Yeung and Morris' (2001) study showed that consumers' risk perceptions are most significant in influencing consumer behaviour when buying food. Likewise, Lagerkvist et al.'s (2013) study found that risk perception is the most important factor influencing consumers' behaviour when purchasing fresh vegetables in Kenya. Lagerkvist et al. (2013) also conclude that a lack of product information or lack of confidence in farmers increases consumers' risk perceptions of fresh vegetables. In short, the risk that consumers perceive usually occurs in food products that do not have good information or are likely to be of inferior quality (Mitchell, 1999; Solomon et al., 2013).

2.6.1 Measuring consumers' risk perceptions

Researchers can investigate the relationships between observed and latent variables by using measurement models (Byrne, 2010). For example, researchers could consider latent variable with

single or multiple indicators and investigate whether the latent variable is a hierarchical construct (Kline, 2015). Mitchell's (1999) and Yeung and Morris' (2001) findings confirm that consumers' risk perceptions are hierarchical consisting of two levels: primary and sub-dimension. In the measurement model, sub-dimensions are considered first order factors and the primary dimensions are considered second order factors (Kline, 2015). The consumer risk perception construct consists of six sub-dimensions: psychological risk, physical risk, financial risk, social risk, functional risk and time risk (Mitchell, 1999; Yeung & Morris, 2001). This measurement model has been used in several food studies. For example, Bruwer et al. (2013) investigated consumers' perceptions of risk and risk reduction strategies using the six risk perceptions to study wine purchases in Australia. They find that financial, social and psychological risks are the most significant risk perceptions when purchasing wine. The findings also show that two groups of consumers, low perceived risk and high perceived risk consumers, are concerned with financial risk when buying wine. These two consumer groups are affected differently by perceptions of social and physical risk. Consumers with high-risk perceptions are influenced more by social and physical risk than consumers with low-risk perceptions. For risk reduction strategies, the authors find that wine consumers' primary strategy was to search for additional information; this was true for both groups (low and high perceptions of risk) (Bruwer et al., 2013).

Yeung and Yee (2002) studied food safety in the UK using a measurement model of consumers' risk perception to investigate consumers' purchase of chicken meat. The authors find that physical, psychological, financial, time and functional risks are significant risks when purchasing chicken meat and other foods relevant to those risks.

Mitchell (1999) reviewed 30 years of perception studies. He showed that consumers' risk perceptions significantly influence their consumption behaviour and decisions about buying and consuming foods. Yeung and Morris' (2001) review of literature from 1988 related to risk perceptions find that risk perception is the most important factor for consumers when buying food. This is because consumers are concerned about health and safety when purchasing or consuming food; they want to purchase trusted food. The risk perceptions are influenced by psychological factors rather than physical factors, which appeared on the foods (Yeung & Morris, 2001).

2.6.2 Sub-dimensions of consumer risk perceptions

Bauer first introduced the concept of consumer risk perceptions in 1960 (Mitchell, 1999). At the time of publication, Bauer called for further studies to investigate the concept. Over 50 years later, the concept of consumer risk perception has been widely studied, particularly in relation to consumer

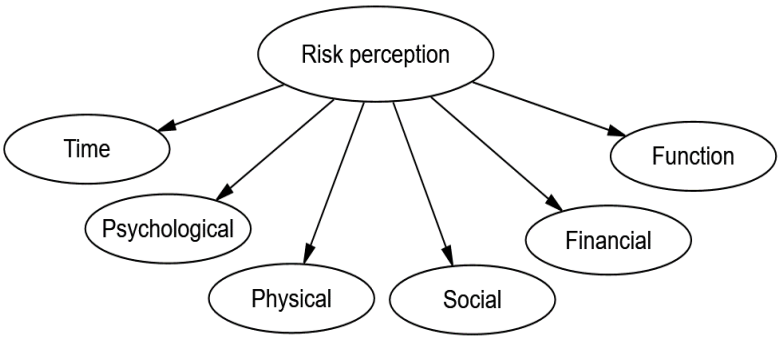

Figure 2.4 A hierarchical construct of consumers' risk perceptions (adapted from Mitchell (1999); Yeung and Morris (2001))

food purchasing behaviour. Mitchell's (1999) review of the literature from the previous 30 years showed that consumer risk perception is a hierarchical construct. Yeung and Morris (2001) maintain that there are six sub-dimensions for measuring consumers' risk perception variables: psychological, physical, social, financial, function and time (see Figure 2.4). Each consumer risk perception sub-dimension is explained below.

2.6.2.1 Psychological risk

As discussed above, consumer risk perceptions have been conceptualised as a hierarchical construct with the primary dimension of consumer risk perception divided into six sub-dimensions. One sub-dimension is psychological risk (Greatorex & Mitchell, 1994). Ueltschy, Krampf, and Yannopoulos (2004) define psychological risk as a consumer's dissatisfaction or disappointment with a poor or underperforming product. Consumers may perceive high levels of psychological risk when purchasing food products that they do not have enough information about, especially food products sold at higher prices (Leikas et al., 2007). Psychological risk is one of the most important sub-dimensions of consumer risk perceptions. It plays an important role in food marketing (Mitchell, 2001). Lagerkvist et al. (2013) agree that consumer risk perceptions are hierarchical. Their investigation of vegetable sales in Nairobi showed that consumers do not trust farmers or vegetable sellers (Lagerkvist et al., 2013). Beneke, Greene, Lok, and Mallett (2012) examined South African consumers' purchases of a variety of premium 'branded' grocery items. They argue that psychological risk was not a significant sub-dimension of consumer risk perceptions. They conclude that psychological risk did not significantly influence consumers' risk perceptions when purchasing premium grocery items (Beneke et al., 2012).

2.6.2.2 Physical risk

For conventional products, such as vegetables or fruit, physical risk refers to consumer concerns about the quality of the product (products that have a poor appearance, taste or nutrition) (Beneke et al., 2012). The appearance of organic products is one of the product qualities that consumers expect. Consumers expect organic produce to look better than conventional products (Nuttavuthisit & Thogersen, 2015). Sangkumchaliang and Huang's (2012) study on organic products in Thailand reported that consumers believed that organic products have a better appearance than conventional products. Nuttavuthisit and Thogersen's findings show that consumers who have higher perceptions of physical risks (concerns about poor appearance and the taste of organic products) significantly affect consumers risk perceptions when purchasing organic products. Likewise, Beneke et al. (2012) reveal that consumers have high levels of physical risk because they fear that costly organic vegetables may not have more nutrition than cheaper conventional vegetables. In short, these studies show that physical risk perception affects consumers' risk perceptions when purchasing organic products.

2.6.2.3 Financial risk

Financial risk refers to the loss of a consumer's investment; this occurs when consumers make a wrong decision and purchase inferior goods at a higher price (Beneke et al., 2012). Yeung and Morris (2006) contend that consumers' concerns about wasting their money has a significant impact on their risk perceptions. For example, Yeung and Yee's (2002) study of poultry purchases in the UK found that consumers took a high financial risk when they purchased chicken during the outbreak of bird flu because the meat might be contaminated and thus consumers would have to dispose of it. Yeung and Yee conclude that financial risk has a significant impact on consumers' risk perceptions. Bruwer et al. (2013), who investigated wine consumers' purchasing behaviour in Australia, support the argument that financial risk is the most significant variable in terms of its impact on consumers' risk perceptions. These studies have shown that financial risk perceptions affect consumers' risk perceptions.

2.6.2.4 Social risk

Mitchell (1999) defines social risk as consumers' concerns about their relationships with family, friends or other people who may be adversely affected by their choices. Beneke et al. (2012) confirm that social risk is an important element of consumers' risk perceptions because it considered a consumer's decision influenced by the society. For example, Nuttavuthisit and Thogersen's (2015) investigation of Thai consumers' purchase of organic products showed that consumers' level of

perceived social risk affects their risk perceptions. Nuttavuthisit and Thogersen conclude that Thai consumers not only buy organic products because of their personal preferences but also because of social pressure from their family and friends. Consumers often seek advice from their family, friends or others when purchasing organic products (Nuttavuthisit & Thogersen, 2015). Voon et al.'s (2011) study of Malaysian consumers' purchasing behaviour found that social risks impact consumers' risk perceptions when purchasing organic products. Voon et al. indicate that consumers are most likely to ask their family, friends or other people whom they respect, for advice when purchasing organic products. In short, the literature review reveals that social risk perceptions impact consumers' risk perceptions when purchasing organic products.

2.6.2.5 Functional risk

Functional risk refers to the risk that comes from purchasing a product that may not meet a consumer's expectations (Yeung & Morris, 2001). Consumers who purchase organic products do so because they believe these products are free from agricultural chemicals (Sangkumchaliang & Huang, 2012). Yeung and Morris (2001) find that functional risk significantly influences consumer risk perceptions. Beneke et al.'s (2012) study found that if consumers have high levels of functional risk (they are uncertain about the quality of the products they are thinking about purchasing), this impacts their risk perceptions. Beneke et al. (2012) also indicate that product complexity (a product is difficult to understand) increases the functional risk. As noted earlier, many studies have shown that consumers purchase organic products because they want to reduce the risks associated with chemical contamination and to save the environment (see Nuttavuthisit & Thogersen, 2015; Sangkumchaliang & Huang, 2012; Sriwaranun, 2011; Voon et al., 2011). Previous studies have shown that functional risk perceptions impact consumers' risk perceptions when purchasing food and organic products.

2.6.2.6 Time risk

Time risk is defined as the amount of time required to purchase a product or the lost time/ convenience associated with unsatisfactory products or services (Mitchell, 2001). Time risk has a significant impact on consumer risk perceptions when purchasing food (Ness et al., 2010). For example, Roitner-Schobesberger et al. (2008) and Sriwaranun (2011) surveyed organic product purchasers in Thailand and find that consumers perceive time risks when purchasing organic products because it takes time to find organic products at markets. The authors conclude that perceived time risk has a significant impact on consumers' risk perceptions when purchasing organic products (Roitner-Schobesberger et al., 2008; Sriwaranun, 2011). Sriwaranun indicates that Thai consumers were willing to pay a higher price for organic products purchased from supermarkets or

health food stores because of the convenience of buying from these stores; consumers did not have to spend a lot of time finding the items. As the findings from these previous studies suggest, time risk impacts consumers' risk perceptions.

2.6.3 The relationship between consumers' perceptions of organic product attributes and consumers' risk perceptions

Several food product studies have identified a positive relationship between consumers' perceptions of product attributes and consumers' risk perceptions (Angulo & Gil, 2007; Johnson & Bruwer, 2004; Zhang, Yang, Cheng, & Luqman, 2020). Zhang et al. (2020) investigated the relationship between consumers' perceptions of chicken meat product attributes and consumers' risk perceptions, and reveal that consumers' perceptions of product attributes positively influence their risk perceptions. Similar results were found in other studies (e.g., Angulo & Gil's (2007) study on beef products; Johnson & Bruwer's (2004) investigation of wine consumers). The theory that underlines the EBM model also indicates that individual influences, such as a consumer's perceptions of a product's attributes, affect their decision to purchase the product, especially where there is a lack of product information and high prices (Blackwell et al., 2001).

Although there is a lack of study about consumers' risk perceptions in relation to organic products, some studies consider the relationship between consumers' perceptions of organic product attributes and consumer risk perceptions when purchasing organic products. For example, Sriwaranun (2011) examined the relationship between consumers' perceptions of organic product attributes and consumers' intentions to purchase organic products, including their WTP premium prices for organic products. The author finds that consumers' perceptions of organic product attributes positively influence their intention to purchase organic products. Sriwaranun's results are consistent with studies on conventional products (see Angulo & Gil, 2007; Johnson & Bruwer, 2004; Yeung & Yee, 2003) which found that consumers' risk perceptions have a relationship with consumers' perceptions of product attributes when making a decision to purchase conventional products. Thøgersen et al.'s (2019) investigation of Thai consumers demonstrates that consumers' perceptions of organic product attributes, such as scepticism about organic product certificates, positively impacts consumers' risk perceptions when purchasing organic products. In short, the findings in previous studies indicate that consumers' perceptions of organic product attributes positively influence their risk perceptions when purchasing organic products.

2.6.4 The relationship between consumers' attitudes to organic products and consumers' risk perceptions

Organic product marketing literature shows that consumers' attitudes toward organic products positively influence consumers' risk perceptions when purchasing organic products. Food marketing theory also indicates that there is a relationship between consumers' attitudes toward food products and their risk perceptions (Mitchell, 1999). Sangkumchaliang and Huang's (2012) investigation of Thai consumers' purchasing behaviour demonstrates that consumers who have high levels of concern about pesticide residues are more likely to purchase organic products than consumers who have lower levels of concern. Sangkumchaliang and Huang (2012) conclude that consumers who want to reduce their risk of pesticide contamination purchase organic instead of conventional products. This behaviour indicates that high risk perceptions drive consumers' decisions to purchase organic products. Sangkumchaliang and Huang's (2012) study clearly indicates the existence of a relationship between consumers' attitudes toward organic products and their risk perceptions, because both of these variables impact consumers' intentions to purchase organic products. Mitprasat, Horakul and Umam (2019) maintain that consumers who want safe food exhibit high-risk levels when purchasing grocery items. Mitprasat et al. (2019) show that consumers who purchase healthy, safe foods have high levels of perceived risk and attempt to reduce their risk by purchasing certified organic products. The authors find that these consumers exhibit positive attitudes and high confidence when purchasing certified organic products. Mitprasat et al.'s study also indicates that there is a positive relationship between consumers' attitudes toward organic products and consumers' risk perceptions. Molinillo, Vidal-Branco and Japutra (2020) show that Spanish and Brazilian consumers who are health conscious exhibit higher risk when purchasing organic products. Molinillo et al.'s research shows that consumers' attitudes toward organic products positively influence their risk perceptions. Molinillo et al. (2020) conclude that consumers' attitudes toward organic products are most important in influencing consumer risk perceptions; they positively influence consumers' WTP a premium price for organic products and consumers' purchase frequency.

2.6.5 The relationship between consumers' knowledge of organic products and consumers' risk perceptions

Previous studies on organic products show that there is a relationship between consumers' knowledge of organic products and consumers' risk perceptions (Nuttavuthisit & Thogersen, 2015; Roitner-Schobesberger et al., 2008; Sangkumchaliang & Huang, 2012). Roitner-Schobesberger et al. (2008) investigated consumers' knowledge of organic products and consumers' behaviour when purchasing organic products in Thailand. Roitner-Schobesberger et al. (2008) find that consumers

who purchase organic products regularly have an extensive knowledge of organic products and have low risk perceptions about chemical contamination of fruit and vegetables. The authors establish a negative relationship between consumers' knowledge of organic products and consumers' risk perceptions when purchasing organic products. Similarly, Sangkumchaliang and Huang's (2012) investigation of consumer behaviour in Thailand found a negative relationship between consumers' knowledge of organic products and consumers' risk perceptions in terms of consumer purchasing behaviour. The authors find that consumers who purchase organic products have high levels of knowledge on organic products and have low risk perceptions about product quality and food safety. Nuttavuthisit and Thogersen (2015), who focused on Thailand, find that consumers who have high levels of knowledge about organic products also have low levels of perceived risk about the authenticity of the organic products they purchase. However, Nuttavuthisit and Thogersen (2015) reveal that about half of the consumers who have low levels of knowledge on organic products are concerned that the products they purchase are not organic. Nuttavuthisit and Thøgersen's (2019) study also showed that the demand for information about organic products depends on the price that consumers are willing to pay and their level of risk perception. The higher the price, the higher their perception of risk and the greater the consumers' demand for information (Nuttavuthisit & Thøgersen, 2019). Briefly, evidence from previous studies indicates that consumers' knowledge of organic products has a negative relationship with consumers' risk perceptions when purchasing organic products.

2.6.6 The relationship between consumers' lifestyle and consumers' risk perceptions

Previous research has reported that consumers' lifestyles play an important role in the purchase of organic products (Sriwaranun, 2011; Vanit-Anunchai & Schmidt, 2006). Vanit-Anunchai and Schmidt (2006) suggest that Thai consumers' lifestyles have changed from preparing food themselves to buying takeaway food. They believe that this is a result of urbanisation and economic growth. These changes to the Thai lifestyle have a significant influence on the purchase of organic products (Vanit-Anunchai & Schmidt, 2006). Sriwaranun (2011) maintains that differences in consumers' lifestyles lead to differences in consumer behaviour when purchasing organic products. Sriwaranun indicates that consumers who prefer to eat out are unlikely to purchase organic products whereas those who prefer to cook at home are more likely to purchase organic products. The author also finds that Thai consumers have high levels of risk perception when purchasing organic products from unfamiliar shops or stores. Pícha and Navrátil's (2019) study revealed that Czech consumers who live a healthy lifestyle, have strict diets or are vegetarian and have high levels of concern about the chemical contamination of the vegetables and fruit they purchase. Pícha and Navrátil (2019) suggest that

healthy lifestyles positively impact consumers' risk perceptions when purchasing organic products. Evidence from previous studies on organic products indicates that consumer lifestyles positively influence consumer risk perceptions when purchasing organic products.

2.6.7 The relationship between consumers' WTP premium prices for organic products and consumers' risk perceptions

Though there is a lack of studies about risk perceptions and WTP premium prices for organic products there are numerous studies on risk perception and WTP premium prices for conventional products. Many studies in food marketing have found that consumer risk perceptions have a significant impact on their purchasing behaviour when buying food (Angulo & Gil, 2007; Gracia & De-Magistris, 2015; Henson, 1996; Mitchell, 1999). For example, Henson (1996) studied UK consumers' risk perceptions and WTP premium prices for eggs and chicken. The study investigated the effect of risk perceptions on consumers' decision-making when buying eggs and chicken products. Henson (1996) finds that UK consumers' risk perceptions significantly influence their WTP premium prices for safe food. He concludes that the greater the risk perception level of consumers, the higher the price they will pay for safe food products.

Premium prices differ for different products. Interestingly, WTP a premium price is related more to consumers' level of risk perceptions than to the actual food or its attributes (Henson, 1996). Angulo and Gil (2007) surveyed beef consumers in Spain and discovered that risk perception has a significant impact on consumers' purchase decisions. The authors find that consumers who have high risk perceptions are more likely to pay higher prices for beef. Mitchell (1999) contends that risk perceptions are formed by many factors. These factors significantly impact consumers' behaviour and influence their purchasing decisions for all products.

Angulo and Gil's (2007) investigation of beef purchases in Spain used six types of risk perception to investigate the relationship between risk perceptions and WTP premium prices for certified beef products. Angulo and Gil show that consumers' risk perceptions directly, positively influence consumers' WTP a premium price for beef products in Spain (see Figure 2.5). The authors confirm that consumers with high levels of perceived risk are more likely to pay a high price for beef than consumers with low levels of perceived risk. Consumers' risk perceptions are related to consumers' experiences of purchasing and consuming beef.

The effect of risk perceptions on the purchase and consumption of food products is similar to that for food safety. A high risk perception factor negatively influences food consumption, but positively

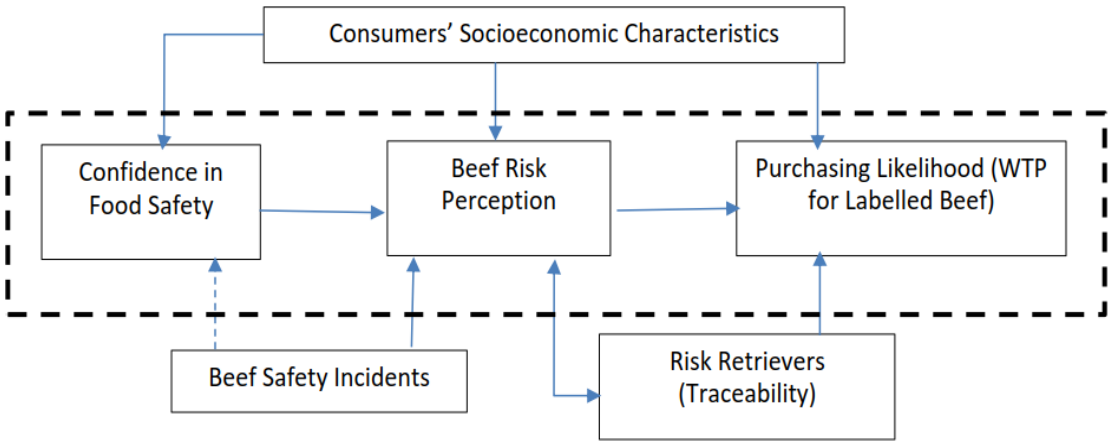

Figure 2.5 A model of consumers' WTP for labelled beef relating to food safety and perceived risk (Angulo & Gil, 2007, p. 1109)

influences WTP premium prices (in short, consumers are happy to pay higher prices) (Angulo & Gil, 2007).

2.7 Studies on consumers' risk reduction strategies for food

There is a notable lack of studies on consumers' risk reduction strategies focusing on organic products; the studies that exist focus primarily on conventional products. Risk reduction strategies differ depending on the type of food (Henson, 1996; Mitchell, 1993). For example, poultry consumers in the UK use product brand and information as their primary risk reduction strategies (Yeung et al., 2010). Consumers prefer to buy well-known brands that are perceived to be of a higher quality. Despite having to pay more for well-known poultry brands, consumers feel safer and more confident purchasing them. Bruwer et al. (2013) investigated wine consumers in the UK and found that information seeking is the most important risk reduction strategy. Consumers perceived high financial, social and psychological risk, especially when purchasing wine at high prices (Bruwer et al., 2013). Henson (1996) investigated UK consumers' risk reduction strategies for eggs and poultry. Henson shows that consumers with higher incomes are willing to pay higher prices to reduce their risk. This differs from consumers with higher education levels who were not willing to pay more to reduce their risk. The finding indicates that consumers with higher education levels could obtain more information about food poisoning and food contamination. In short, they were less concerned about the possibility of food poisoning and contamination. In this case, consumers' education level negatively influenced their risk perceptions (Henson, 1996).

2.7.1 Measuring consumers' risk reduction strategies

Yeung and Yee (2003) contend that consumer risk reduction strategies are a hierarchical construct with two levels: primary and sub-dimensions. The consumer risk reduction strategy construct has five sub-dimensions: information, process, price, certificate and brand (Yeung & Yee, 2003). This measurement model has been used in several food studies. For example, Yeung and Yee (2003) use the model to measure consumers' risk reduction strategies for poultry purchases in the UK. They find that consumers use certificates, information and brand to reduce their risk (Yeung & Yee, 2003). Bruwer et al. (2013) investigated consumers' risk reduction strategies when purchasing wine in Australia. The authors find that consumers use information seeking as their risk reduction strategy.

2.7.2 The sub-dimensions of consumer risk reductions

Bauer (1967) proposed that consumers' risk perceptions could induce consumers' risk reduction strategies when purchasing food products. Roselius (1971) reveals that consumers develop different strategies to reduce their perceived risk. Greatorex and Mitchell (1994) contend that there are five sub-dimensions in consumer risk reduction strategies. Similarly, Yeung et al. (2010) reveal there are five sub-dimensions in consumer risk reduction strategies when purchasing food: searching for information, investigating storage processes, price comparison, only purchasing certified products, or trusted brand (see Figure 2.6).

2.7.2.1 Information

Information is the most important factor in persuading consumers to purchase organic products (Gan et al., 2014; Nuttavuthisit & Thogersen, 2015; Sangkumchaliang & Huang, 2012; Sriwaranun, 2011). Research over the last three decades has confirmed that the main barrier to organic product market growth is a lack of information about organic products. In short, the best way to encourage consumers to purchase products that are more organic is provide them with more information (Gracia & De-Magistris, 2015; Janssen & Hamm, 2014; Sangkumchaliang & Huang, 2012).

The literature shows consumers are also concerned about the source of the information. For example, Gan et al. (2014) investigated purchases of organic products in China and find that consumers searched for further information on the internet and that additional information encouraged them to purchase organic products. The authors conclude that consumers who regularly purchase organic products are more likely to search for further product information. Sangkumchaliang and Huang's (2012) investigation in Thailand found that consumers ask their family and friends for advice about organic products. Sriwaranun (2011) finds that a lack of information about organic products is the main reason why Thai consumers do not purchase organic products.

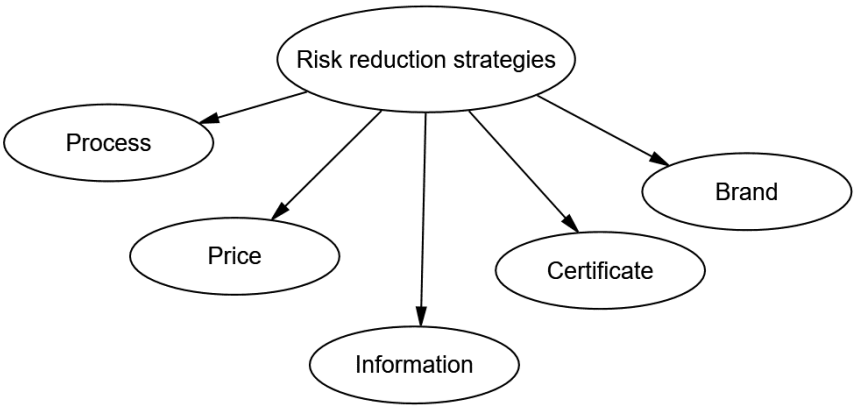

Figure 2.6 A hierarchical construct of consumer risk reduction strategies (developed from Yeung et al. (2010))

These findings indicate that stores that sell organic produce need to provide consumers with more information to increase their sales (Sriwaranun, 2011). Previous studies confirm that information seeking has a positive relationship with consumers risk reduction strategies when purchasing food.

2.7.2.2 Process

Consumers are concerned about organic handling processes (Sriwaranun, 2011). Roitner-Schobesberger et al. (2008) note that consumers want to know how organic products have been processed, transported and stored. If consumers are given more information about organic production, including transport and storage, they are more likely to purchase the products (Roitner-Schobesberger et al., 2008). Nuttavuthisit and Thogersen (2015) maintain that Thai consumers prefer organic products to be stored separately from conventional products. Nuttavuthisit and Thogersen suggest that when stores provide information about organic transport and storage, consumers will have greater confidence in the products and thus will purchase more. Schreinemachers et al.'s (2012) study had similar findings; they argue that consumers are more likely to purchase organic products with higher levels of confidence if they know about the organic production and storage. Evidence from previous studies indicates that processes impact consumers' risk reduction strategies.

2.7.2.3 Price

Price is one factor that consumers consider when purchasing organic products. Prior studies indicate that the higher cost of organic products impacts market growth (Sangkumchaliang & Huang, 2012; Sriwaranun, 2011; Voon et al., 2011). Sriwaranun (2011) finds that Thai consumers would purchase

products that are more organic if the price was reduced. Similarly, Sangkumchaliang and Huang (2012) show that consumers actively look for lower prices (they compare prices at different stores) when purchasing organic products. Price reduction is an important risk reduction strategy (Sangkumchaliang & Huang, 2012; Sriwaranun, 2011). In contrast, Yeung et al. (2010) find that price reductions do not influence consumers to purchase healthy food products. Yeung et al. (2010) contend that higher prices give consumers more confidence when purchasing food products, especially during periods of food safety concerns, such as when bird flu outbreaks occur or when there are food contamination concerns. Yeung et al. (2010) concluded that the price increase is also a risk reduction strategy to purchase safer food products. In short, though the findings on price are mixed, the literature suggests that increases or decreases in price impact consumer risk reduction strategies.

2.7.2.4 Certificates

Organic certificates increase consumers' confidence about organic production and quality attributes; they provide added value for organic products (Tsakiridou, Mattas, & Mpletsa, 2009). The certificates can be official or legal labels on organic products. Certificates may be national or international or associated with private organisations (Sakagami, 2006). Janssen and Hamm's (2012) study demonstrated that the use of organic product certificates involved using well-known organic certificates that consumers trust regardless of whether they are national, international or private. Previous studies show that consumers react to certificates differently in different countries (Sakagami, 2006; Sriwaranun et al., 2015). For example, Sakagami's (2006) study found that Japanese consumers had more trust in organic product certificates from non-profit organisations than national certificates even though the others were legally certified in Japan. Sriwaranun et al. (2015) show that Thai consumers feel more confident when purchasing organic products with certificates produced by the Thai government. The authors conclude that Thai consumers prefer Thai organic product certificates over international certificates. In brief, previous studies confirm that organic product certificates impact consumers' risk reduction strategies when purchasing organic products.

2.7.2.5 Brand

Brand is defined as a name, term, sign, symbol, or a combination of these, including product attributes, intended to identify and differentiate a product from others in the same category (Kotler, 2012). Previous studies note that brand plays an important role in reducing consumers' risks when purchasing both organic and conventional products at high prices (Nuttavuthisit & Thogersen, 2015; Sriwaranun, 2011; Yeung et al., 2010). Consumers who are reluctant to pay a premium price may be

willing to pay more for particular brands of organic products (Sriwaranun, 2011). Sriwaranun reveals that Thai consumers feel high levels of confidence and are willing to pay high prices for organic products with the Thai royal project's brand. Nuttavuthisit and Thogersen (2015) find that Thai consumers prefer to purchase organic products from the same store because they trust the store's brand. Yeung et al. (2010) show that brand is a significant risk reduction strategy that consumers in the UK choose when purchasing poultry products. The authors find that UK consumers purchase well-known poultry brands to reduce their risk. In sum, previous studies confirm that brand impacts consumers' risk reduction strategies.

2.7.3 The influence of consumers' risk perceptions on consumers' risk reduction strategies

Bauer (1967) contends that consumers are likely to shelter themselves from risk by developing strategies to reduce risks when they perceive that there may be unexpected outcomes. Consumers identify strategies to reduce their risks (Mitchell, 1999; Roitner-Schobesberger et al., 2008; Yeung et al., 2010). After reviewing the food marketing literature of the past three decades, Mitchell (1999) concludes that consumers' risk perceptions positively influence consumers' risk reduction strategies when purchasing food. Yeung et al.'s (2010) investigation of UK consumers' purchases of poultry products indicates that consumers' risk perceptions of the bird flu induced risk-reduction behaviour. The strategies included finding more information, reducing their consumption of poultry, and avoiding poor quality poultry. Yeung et al. (2010) conclude that consumers who perceive high levels of risk use risk reduction strategies. Roitner-Schobesberger et al. (2008) find that Thai consumers have high levels of perceived risk in relation to chemical contamination of vegetables and fruit. To reduce this risk, they purchase organic products. Evidence from previous studies confirms that consumers' risk perceptions positively influence consumers' risk reduction strategies when purchasing food, including organic products.

2.7.4 The influence of consumers' risk reduction strategies on consumers' risk perceptions

There are mixed results in the marketing literature on the nature of the relationship between consumer risk reduction strategies and risk perceptions. For example, Yeung et al.'s (2010) investigation of UK poultry consumers demonstrates that consumers' risk reduction strategies negatively impact their risk perceptions. These risk perceptions also positively influence consumers' intentions to purchase poultry products. In contrast, Angulo and Gil's (2007) study on Spanish beef consumers found that consumers' risk reduction strategies, which are influenced by consumers' risk perceptions, negatively influence consumers' intentions to purchase beef products. Both these

studies lead to the same result: consumers' risk reduction strategies negatively influence consumers' intentions to purchase food products. In other words, if consumers risk reduction strategies increase, the intention to purchase food products decreases.

Based on Yeung et al.'s (2010) findings, we test the relationship between consumers' risk reduction strategies and their risk perceptions. Yeung et al.'s (2010) study is consistent with Sriwaranun's (2011) finding that Thai consumers are more comfortable and purchase products that are more organic if organic products were cheaper or if they trust the organic certificates (these are risk reduction strategies). Sriwaranun's results indicate that consumers' high levels of risk perception could be reduced through certain risk reduction strategies. In short, findings from previous studies indicate that consumers' risk reduction strategies negatively influence consumers' risk perceptions when purchasing organic products. Our study aims to provide greater understanding of consumer purchasing behaviour. Specifically, it will provide further information about consumers' risk reduction strategies and consumers' risk perceptions and the relationship between them.

2.8 Conceptual research model development

This section outlines the conceptual research model used in this study. The conceptual research model for consumers' WTP premium prices for organic products (see Figure 2.7) was developed using a hierarchical structure (suggested by Mitchell, 1999; Yeung & Yee, 2003). It is based on Bonti-ankomah and Yiridoe's (2006) EBM model. The conceptual research model proposes that organic product purchasers evaluate consumer risk perceptions and consumer risk reduction strategies as a hierarchical structure consisting of two levels: a primary dimension and a sub-dimension (Mitchell, 1999; Yeung & Morris, 2001). The primary dimension of consumers' risk perception consists of six sub-dimensions: psychological risk, physical risk, financial risk, social risk, functional risk and time risk (Yeung & Morris, 2001). These six sub-dimensions are combined and reflected in the primary dimension of consumers' risk perceptions. The primary dimension of consumers' risk reduction strategies consists of five sub-dimensions: information, process, price, certificate and brand (Yeung et al., 2010). These five sub-dimensions are combined and reflected in the primary dimension of consumers' risk reduction strategies.

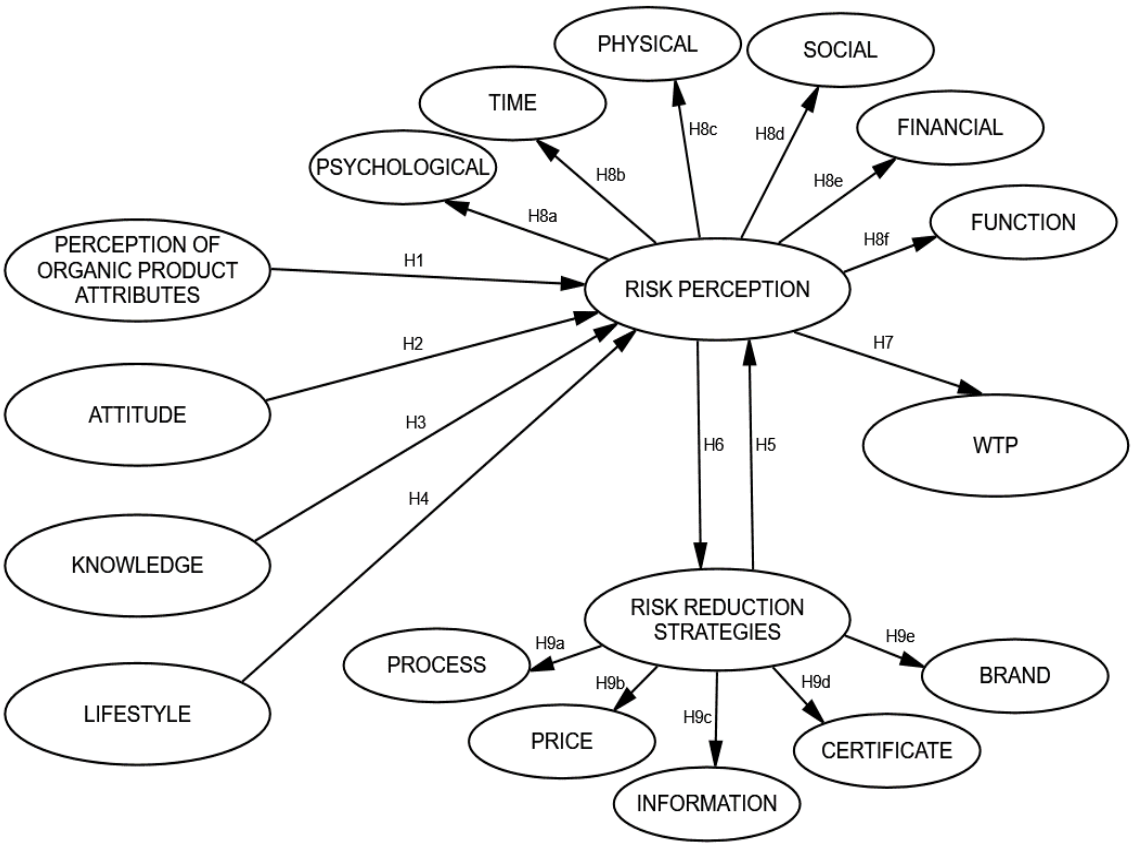

Figure 2.7 The conceptual research model of the study

The conceptual research model investigates the relationships that may exist between consumers' perceptions of organic product attributes, consumers' attitudes toward organic products, consumers' knowledge about organic products, consumers' lifestyles, consumers' risk perceptions, consumers' risk reduction strategies and consumers' WTP premium prices for organic products. In the EBM model, the consumers' risk perception variable is in the information searching stage but the consumers' WTP a premium price for the organic products variable is in the purchasing stage, which comes later in consumer decision-making (Bonti-ankomah & Yiridoe, 2006). In our conceptual research model, the consumers' risk perception variable is between the exogenous variables (consumers' perceptions of organic product attributes, consumers' attitudes toward organic products, consumers' knowledge of organic products, and consumers' lifestyles) and the endogenous variable (consumers' WTP a premium price for organic products). Consumers' perceptions of organic product attributes, consumers' attitude toward organic products, consumers' knowledge of organic products, consumers' lifestyles and consumers' risk reduction strategies are expected to influence consumers' risk perceptions and impact consumers' WTP premium prices for

organic products. Consumers' risk perceptions are expected to influence both consumers' risk reduction strategies and consumers' WTP premium prices for organic products.

2.9 Hypotheses development

The relationships between the variables presented in the conceptual research model (see Figure 2.7) are used for hypotheses testing. The following sections present the hypotheses development to answer the research objectives.

2.9.1 The hypotheses development related to research objective 1

Based on the findings from the literature, this study identifies four factors related to consumer risk perceptions when purchasing organic products. Consumer risk perceptions are expected to have positive relationships with consumers' perception of organic product attributes (Angulo & Gil, 2007; Johnson & Bruwer, 2004; Yeung & Yee, 2003), consumers' attitudes toward organic products (Bauer, 1967; Sangkumchaliang & Huang, 2012; Sriwaranun, 2011) and consumers' lifestyles (Sriwaranun, 2011; Vanit-Anunchai & Schmidt, 2006). However, consumer risk perceptions are expected to have a negative relationship with consumers' knowledge about organic products (Nuttavuthisit & Thogersen, 2015; Roitner-Schobesberger et al., 2008; Sangkumchaliang & Huang, 2012). Therefore, the following relationships are hypothesised:

H1: There is a positive relationship between consumers' perceptions of organic product attributes and their risk perception factors on their WTP premium prices for organic products.

H2: There is a positive relationship between consumers' attitudes to organic products and their risk perception factors on their WTP premium prices for organic products.

H3: There is a negative relationship between consumers' knowledge of organic products and their risk perception factors on their WTP premium prices for organic products.

H4: There is positive relationship between consumers' lifestyle and their risk perception factors on their WTP premium prices for organic products.

2.9.2 The hypotheses related to research objective 2

Consumers evaluate the primary dimension of risk perception by evaluating each sub-dimension of risk perception: physical risk, financial risk, functional risk, psychological risk, social risk and time risk (Mitchell, 1999; Yeung & Morris, 2001). The risk perception sub-dimensions are hypothesised to

have a significant positive relationship with the primary dimension of consumers' risk perceptions. The following relationship is hypothesized:

H8: There is a positive relationship between consumers' perceived psychological risk (H8a), consumers' perceived time risk (H8b), consumers' perceived physical risk (H8c), consumers' perceived social risk (H8d), consumers' perceived financial risk (H8e), consumers' perceived functional risk (H8f) and their risk perceptions related their WTP premium prices for organic products.

2.9.3 The hypotheses related to research objective 3

Yeung et al. (2010) suggest that consumers evaluate the primary dimension of consumers' risk reduction strategies by evaluating each sub-dimension of risk reduction strategies: process, price, information, certification, and brand. Therefore, the sub-dimensions of consumers' risk reduction strategies are hypothesised to have a significant positive relationship with the primary dimension of consumers' risk reduction strategies. The following relationship is hypothesised:

H9: There is a positive relationship between process (H9a), price (H9b), information (H9c), certification (H9d), brand (H9e) and consumers' risk reduction strategies on their risk perceptions when purchasing organic products.

2.9.4 The hypotheses related to research objective 4

Previous studies in food marketing have assessed the relationship between consumers' risk perceptions and consumers' risk reduction strategies when purchasing conventional food (Angulo & Gil, 2007; Bruwer et al., 2013; Yeung et al., 2010). However, an integrated investigation into the interrelationships among consumers' risk perception, consumers' risk reduction strategies and consumers' WTP premium prices for organic products has never been investigated. To investigate the interrelationships among consumers' risk perceptions, consumers' risk reduction strategies and consumers' WTP premium prices for organic products, this study tests the following hypothesis. Consumers' risk reduction strategies are proposed to negatively influence consumers' risk perceptions (Yeung et al., 2010). The following relationship is hypothesized:

H5: There is a negative relationship between consumers' risk reduction strategies and their risk perceptions factors on their WTP premium prices for organic products.

Consumers' risk perceptions positively influence consumers' risk reduction strategies (Mitchell, 1999; Roitner-Schobesberger et al., 2008; Yeung et al., 2010) and consumers' WTP premium prices

for organic products (Angulo & Gil, 2007; Henson, 1996). The following relationships are hypothesised:

H6: Consumers' risk perception factors positively impact their risk reduction strategies when buying organic products.

H7: Consumers' risk perception factors positively impact their WTP premium prices for organic products.

2.10 Chapter summary

The literature review provided in this chapter presents the boundaries of this study that focuses on psychological factors that influence consumers' purchases of organic products. Most previous studies have focused on the factors that influence consumers' purchase of organic products. However, there is a lack of studies about consumers' risk perceptions, risk reduction strategies and consumers' WTP premium prices for organic products. There is no research that investigates the relationships between consumers' risk perceptions, risk reduction strategies and consumers' WTP premium prices for organic products. This study seeks to fill that gap. The literature review reveals that consumers' perceptions of organic product attributes, consumers' attitudes toward organic products, consumers' knowledge about organic products, consumers' lifestyles, consumers' risk perceptions and consumers' risk reduction strategies are important determinants of consumers' WTP premium prices for organic products. There is also a lack of research on consumers' actual purchases of organic products. Most previous studies measured WTP premium prices for organic products using estimated WTP premium prices (the intention to purchase). This study investigates consumers' WTP premium prices for organic products by measuring consumers' actual purchases and their estimated WTP premium prices for organic products (the intention to purchase). This chapter presented the study's conceptual research model and the hypotheses. The next chapter discusses the methodology used in this study.

Chapter 3

Data and Research Methods

Investigating consumers' WTP premium prices for speciality items such as organic products presents researchers with many challenges. Researchers have addressed consumers' attitudes toward organic products for a very long time, but improvements in the way in which they are investigated have not provided comprehensive solutions to the problems. However, modern analytical techniques offer some improvements in the depth of understanding that we might gain from investigating this phenomenon. This chapter describes the ways in which specific research challenges were approached in this study and the mechanisms by which a more detailed understanding was generated. This chapter consists of five sections. Section 3.1 discusses the study's research method, including the research design. Section 3.2 discusses the questionnaire development and pilot test. Section 3.3 provides an overview of the sample selection and data collection. Section 3.4 discusses the empirical methods and Section 3.5 discusses the study's variables and measurement instrumentation development.

3.1 Research methods

This study investigates purchasers of organic products in relation to their buying behaviour and WTP premium prices for these goods, including the emotions and perceptions of the risks of purchasing organic products. These variables are called "latent variables" and cannot be directly observed or measured (Kline, 2015). In this study, consumer risk perceptions, risk reduction strategies, actual purchases and the constructs in the conceptual research model (see Figure 2.7) are investigated using EFA, CFA and the SEM, respectively. The conceptual research model of this study does not focus on investigating those who do not purchase organic products because the variables in the conceptual research model investigate consumers' actual purchases and experiences in purchasing organic products.

Previous studies have investigated consumer purchasing behaviour towards organic products (Onyango, Hallman & Bellows, 2007; Sriwaranun, 2011; Verhoef, 2005). These studies used the logit, probit and ordered probit models. For example, Onyango et al. (2007) used the logit model to investigate consumer purchases of organic foods in the US. Using data from telephone interviews, Onyango et al. (2007) identified significant variables that predict consumers' willingness to purchase organic foods. Sriwaranun (2011) also used the logit model to investigate Thai consumers' purchases of organic products. The author investigated the factors that influence consumers' purchases of

organic products. Verhoef (2005) used both the probit and ordered probit models to investigate Dutch consumers' purchases of organic meat, focusing on the decision to buy and the frequency of purchase. Verhoef estimated two dependent variables using different methods because of the different assumptions required for each method. The author used the probit model to estimate the consumers' decision to purchase organic meat as it a binary variable influenced by psychological variables. In contrast, the frequency of purchasing organic meat is an ordinal dependent variable analysed using the ordered probit model.

However, econometric models have some limitations. First, the estimated coefficients generated by these models can be biased. This is because the models can analyse only observed variables (Hair, Black, Babin, & Anderson, 2010; Kline, 2015). Consumer behaviour is influenced by both observed and latent variables (Blackwell et al., 2001). The logit model requires a strict set of assumptions, such as having a binary dependent variable, independent variables without a multicollinearity problem, and error terms that should be independent (Tabachnick, Fidell & Ullman, 2007). These assumptions are not practical in real-life situations. This is especially so when studying complex consumer behaviour that involves many independent variables that are related to each other, such as attitudes and emotions (Kline, 2011). For example, though Onyango et al.'s (2007) and Sriwaranun's (2011) studies identify significant independent variables that influence consumer behaviour, they cannot explain the relationship between the variables, nor can they compare the significance of each variable. In both studies, the dependent variables are binary based assumptions of the models. Thus, the results are limited to a buy or not buy scenario. In this case, the model can test only whether a consumer is likely to buy a product or not. The model cannot account for multiple outcomes such as buying on a regular basis, buying occasionally or rarely. As a result, these studies cannot address the factors that drive consumer behaviour, nor compare the variables.

Secondly, the logit, probit and ordered probit model have been used to predict consumer behaviour rather than to investigate the interrelationships between behaviours (Tabachnick et al., 2007). These models do not allow the simultaneous testing of multiple hypothetical relationships (Hair, 2010). They cannot examine the causes and effects of consumers' purchasing behaviours that involve multiple hypothetical relationships. Instead, they can analyse only factors in a single relationship at one time (Kline, 2011). For instance, Verhoef's (2005) results from the probit and ordered probit models were derived from variables from different groups of respondents. Thus, the results of each model apply only to the individual group and cannot be generalised. It is not practical to conduct separate analyses for each outcome of interest in consumer behaviour; thus, the results cannot

represent real consumers' decision-making (Solomon et al., 2013). In short, Verhoef's findings do not fully reflect consumers' decision-making involving multiple relationships among the factors.

In the last decade, several studies investigate consumer behaviour using SEM. For example, Voon et al. (2011) used SEM to analyse the factors that influence Malaysian consumers' WTP premium prices for organic products. The results show that attitude and subjective norms positively influence consumers' WTP a premium price, but that affordability has no effect. However, Voon et al. (2011) examined only affective and cognitive components and did not measure consumer emotions. Many studies on organic products have this same limitation; e.g., Honkanen, Verplanken and Olsen (2006) surveyed Norwegian consumers to investigate ethical food choice motivations that influence consumers' attitudes and intentions to purchase organic products, but not consumer emotions. Likewise, Voon et al. (2011) investigated consumer intentions and their actual purchase behaviour. The authors suggest that further studies should explore moderating or mediating factors that affect consumer intentions and actual behaviour. Hughner et al. (2007) find that there is a lack of studies on consumers' emotions and beliefs around organic product quality. Hughner et al. (2007) suggest that further study should focus on consumers' emotions, including trust in organic product quality, that motivate consumers to purchase and consume organic products.

SEM has been widely used to investigate consumers' decision-making and their intention to purchase organic products (Tarka, 2018). For example, Michaelidou and Hassan (2010) studied the factors that influence Scottish consumers' intentions to purchase organic products. The authors surveyed 222 rural consumers and used SEM to analyse the data. The authors investigated consumer attitudes and purchase intentions in relation to organic and free-range products. Consumer attitudes were driven by food safety concerns, ethical lifestyle and price perception (the perception of whether the price was fair). However, the study was based on a small town with a small sample; thus, the findings cannot be generalised. This is one limitation of using survey data (Sekaran, 2003). Furthermore, Michaelidou and Hassan's (2010) study focused only on attitudes and intentions to purchase organic products, which is a narrow view of consumer behaviour. Further study should thus investigate other potential factors to increase our understanding of consumers' purchasing decisions and their behaviour.

Yadav and Pathak (2016) surveyed 220 consumers in India to investigate the constructs that influence consumers' intentions to purchase organic products. The authors used SEM to analyse the constructs in their study. They find that the moral attitude construct significantly influenced consumers' intentions to purchase organic products. Consumers often feel that they are a better person if they purchase organic products; this is referred to as a moral attitude. Consumers also

believe that buying organic products will result in better health outcomes (Yadav & Pathak, 2016). Yadav and Pathak (2016) used SEM to investigate the latent constructs such as attitude and perception towards organic products, which are believed to influence the intention to purchase organic products. However, Yadav and Pathak investigated only consumers' intention to purchase organic products; they did not investigate whether consumers actually purchased organic products. In brief, Michaelidou and Hassan's (2010), Voon et al.'s (2011) and Yadav and Pathak's (2016) studies investigated only the factors that influence consumers' intentions to purchase organic products, not consumers' actual purchases of organic products.

SEM can be used to investigate the cause and effect of consumers purchasing organic products and to test multiple hypotheses simultaneously (Scalco et al., 2017). SEM is appropriate for analysing models with multiple variables with multiple outcomes (Hair et al., 2010). In our study, for several reasons, we use SEM to analyse the relevant constructs. First, the main research objective of this study is to develop and test the WTP premium price model based on Engel, Blackwell, and Miniard's (EBM) theory. SEM is useful, and suitable for model or theory testing. The SEM goodness of fit result shows how well a model fits the sample data. It can also be used to investigate multiple hypotheses. Second, SEM can be used to investigate latent variables that are not directly observable. Our study investigates seven latent variables (risk perceptions, risk reduction strategies, perceptions of organic product attributes, lifestyles, attitudes, knowledge, and WTP premium prices for organic products). Third, these latent variables contain multiple indicators and errors, and the variables are correlated with each other. This means that the variables influencing consumer purchasing behaviours should be analysed simultaneously. Lastly, there are multiple possible outcomes from our model. Our study simultaneously investigates all possible outcomes including the "WTP premium prices for organic products", which consists of the premium price that respondents pay for organic products, the frequency with which respondents buy organic products, respondents' actual expenditure on organic products and respondents' experiences in purchasing organic products.

However, SEM also has limitations. First, though SEM is suitable for model or theory testing, it is not ideal for exploratory studies. Second, SEM can be used only with specific target populations such as individuals who purchase organic products in Bangkok, Thailand. Therefore, our study concentrates on organic product purchasers' behaviour from a theoretical standpoint. To minimise the limitations in using SEM, we survey both organic and non-organic product purchasers to explore and investigate consumers' behaviour and their WTP premium prices for organic products. The results from the survey can be used to obtain additional information from both groups of purchasers and to get a

better understanding of a holistic picture of consumers' behaviour when purchasing organic products.

Research design

The study's aim is to determine the relationships between the seven latent variables that are hypothesised to influence consumers' WTP a premium price for organic products. The study also identifies significant risk reduction strategies and risk perception factors that affect consumers' WTP a premium price for organic products. The study emphasises a cause and effect approach with regard to risk perceptions, risk reduction strategies and WTP premium prices for organic products to develop the theoretical model. EFA, CFA and SEM are used to answer the study's four research objectives.

SEM is the most appropriate analytical method because it can be used to analyse the several viewpoints of our research model. First, SEM can be used to determine the impact of exogenous and endogenous variables on consumers' purchase intentions and their WTP premium prices for organic products. This study specifies a system of relationships among the constructs, rather than a dependent variable and a set of predictors. SEM may have numerous outcomes for the dependent variables - each of which affects the other dependent variables in a more complex system (Kline, 2011). Second, this study investigates psychological variables such as consumers' perceptions, attitudes, knowledge, lifestyle, risk perceptions, risk reduction strategies and WTP a premium price for organic products rather than the observed variables used in previous studies. These psychological variables are latent variables that can be difficult to measure without errors (Byrne, 2010). To solve this problem, we use SEM to measure these latent variables. SEM allows multiple indicators to be associated with a latent variable (Kline, 2015). Factor analysis is applied to reduce the initial set of components and to summarise the observed associations (Awang, 2015a). In doing so, the errors of each individual indicator are corrected to obtain a better measure of the true scores of the latent variables (Arbuckle, 2017). Lastly, SEM allows simultaneous testing of an entire model that consists of multiple hypothetical relationships (Hair et al., 2010). SEM is a robust technique that recognises the variables that influence behaviour that are most likely to operate together rather than sequentially.

EFA and CFA are used to identify the factors and to validate the measurement models (Awang, 2015a; Kline, 2015). First, EFA is applied to identify the factors of the latent variables to partially satisfy research objectives 1, 2 and 3 of this study. Next, a two-step process is used to provide more detailed testing of the research hypotheses. The first step involves performing CFA to validate the

measurement model and to double-check the EFA results applied in response to research objectives 1, 2 and 3. SEM is then used to test the hypotheses for the WTP premium price for organic products model, the relationships between risk perceptions, risk reduction strategies and consumers' WTP a premium price for organic products. We use SEM to empirically answer objectives 1 and 4.

3.2 Questionnaire design

The questionnaire was developed using information from relevant literature on consumer behaviour, including risk perceptions and risk reduction strategies associated with purchasing organic products (Nuttavuthisit & Thogersen, 2015; Sangkumchaliang & Huang, 2012; Sriwaranun, 2011; Voon et al., 2011; Yeung & Morris, 2001; Yeung et al., 2010). The questionnaire was designed to gather information about consumers' lifestyle, knowledge of organic products, perceptions of and attitudes to organic products, including perceived risks, risk reduction strategies, experiences of purchasing organic products and their WTP premium prices for these products. The questionnaire contained both opened-ended and closed-ended questions.

The Likert scale format is suitable for measuring consumers' attitudes in our study (Ryan, 1995). This format is often used in marketing research (Kotler, 2012). A five-point scale is assumed to be less demanding than a seven-point or a nine-point scale, which might be too long for consumers who are in a hurry after shopping. However, using a five-point Likert scale can lead to a central tendency bias in which the respondent tends to choose the mid-point (3 = neutral) to avoid extreme values (Ryan, 1995). This central tendency bias is debatable because the neutral point can either represent a genuine mid-point or indicate that the respondents do not know or prefer not to answer. In contrast, respondents who report feeling neutral or undecided is seen as acceptable (Bradley, 2007). This is better than forcing respondents to answer agree or disagree by providing only even-numbered scales (Bradburn, Wansink & Sudman, 2004).

To minimise the central tendency bias, a "do not know (DK)" or "not applicable (NA)" option can be provided. However, this option allows respondents not to answer a question, which represents a loss of data (Brace, 2004). The greatest concern when using SEM is missing data (Kline, 2015). Using "DK" or "NA" as an answer can lead to a reduction in the number of reliable questionnaires; if the number is too high it can affect the empirical analysis. Hair (2011) indicates that a questionnaire with missing data over 10 per cent is considered unreliable. Based on this argument, a five-point Likert scale excluding the "DK" or "NA" choice was adopted. The questionnaire consists of five sections (see Appendix A2). A brief summary of each questionnaire section follows.

Section 1 of the questionnaire focusses on consumers' profiles and their purchasing behaviours. The questions in this section were adapted from previous studies (Yeung et al., 2010; Sriwaranun, 2011; Voon et al. 2011). At the beginning of the section, respondents were asked where they usually buy their groceries. This question was designed to help consumers recall their purchasing experiences and to provide a context for the questionnaire. The end of the section asks consumers about their lifestyles and knowledge of organic products, including their perceptions and attitudes towards organic products. Five-point Likert scales ranging from 1 (strongly disagree) to 5 (strongly agree) were used to assess consumers' lifestyle, knowledge, perceptions and attitudes towards organic products.

Section 2 asked consumers about their experiences and actual purchases of organic products. The questions in this section were adapted from previous studies (Nuttavuthisit & Thogersen, 2015; Panyakul, 2016; Sangkumchaliang & Huang, 2012; Sriwaranun, 2011; Voon et al., 2011). To obtain details of respondents' actual purchases, we focused on four organic products: organic vegetables, rice, juice and coffee, which are the most popular organic products in Thailand (Panyakul, 2016). This section began with questions about respondents' frequency of purchasing these four organic products. Five options were given: "never purchase", "rarely", "sometimes", "often" and "always". If respondents answered never purchase, the next questions asked consumers the reasons why they did not buy and the factors that would persuade them to purchase organic products. If the respondents had purchased organic products, they were asked to provide more information about their purchases and experience of purchasing the products.

Respondents were asked the amount they had paid for organic products as well as their experience of purchasing such products. Respondents were asked to provide information about the proportion of organic products they purchased (compared with conventional products). Eight rating scales ranging from "never purchase", "1-15%", "16-30%", "31-45%", "46-60%", "61-75%", "76-90%", to "91-100%", were used to indicate the proportion of organic products compared with conventional products. Similarly, eight rating scales ranging from "never purchase", "1-15%", "16-30%", "31-45%", "46-60%", "61-75%", "76-90%" to "91-100%" were used to determine the premium price that the respondents paid for organic products when compared to conventional products. The end of this section asked questions about consumers' experiences of purchasing organic products based on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

Section 3 focused on consumers' risk perceptions and risk reduction strategies when purchasing organic products. This study examines six types of consumer risk: psychological risk, time risk, physical risk, social risk, financial risk and functional risk (Mitchell, 1999; Yeung & Morris, 2001).

Questions regarding these six types of consumer risk were derived from previous studies (Nuttavuthisit & Thogersen, 2015; Roitner-Schobesberger et al., 2008; Sangkumchaliang & Huang, 2012; Sriwaranun, 2011; Yeung & Morris, 2001). The last set of questions in this section asked about consumers' risk reduction strategies when purchasing organic products. Consumer risk reduction strategies include brand, certification, information, price, and process (Yeung et al., 2010). The questions for these five risk reduction strategies were derived from previous studies (Nuttavuthisit & Thogersen, 2015; Roitner-Schobesberger et al., 2008; Sakagami, 2006; Sangkumchaliang & Huang, 2012; Sriwaranun, 2011; Yeung et al., 2010). Five-point Likert scales ranging from 1 (strongly disagree) to 5 (strongly agree) were used for questions about consumers' risk perceptions and their risk reduction strategies.

Section 4 investigated consumers' WTP a premium price for specific organic products: organic lettuce, jasmine rice, orange juice and coffee. This study used both the contingent valuation and single-bounded methods with close-ended questions. The section began with general information about organic products and asked the respondents the highest price that they were willing to pay for organic products. Next, the respondents were asked the highest price that they were willing to pay for organic lettuce, jasmine rice, orange juice and coffee using rating scales with price ranges that started from the lowest possible price. The conventional product price was used as the baseline price for the same organic products in our study. The conventional product prices were obtained from the retail store websites during the questionnaire development period. If the respondents chose the baseline prices as the highest price that they were willing to pay for organic products, this implies that they were not willing to pay more for organic products. Rating scales had a premium price ranging from 80 to 155 Thai baht for organic lettuce and orange juice (80 baht is the conventional product price). The premium price range from 160 to 310 baht was used for organic jasmine rice (160 baht is the conventional product price) and a premium price range of 120 to 270 baht for organic coffee (120 baht is the conventional product price). The maximum price used in our study was high enough to ensure it covers the market price. All price ranges used in the questions were reasonable prices, spread around an average mean WTP premium price based on the pre-test of the questionnaire. The mean WTP premium price from the pre-test of organic lettuce and orange juice was 100 Thai baht (the highest price was 155 Thai baht), organic jasmine rice was 200 Thai baht (the highest price was 310 Thai baht) and organic coffee was 150 Thai baht (the highest price was 270 Thai baht), respectively.

Section 5 captured respondents' demographic information: gender, age, marital status, education level, occupation, income, household structure and number of members in the household. Previous

studies indicate that these factors influence consumer behaviour and WTP premium prices for organic products (Gil et al., 2000; Magistris & Gracia, 2007; Sriwaranun, 2011; Voon et al., 2011).

3.2.1 Questionnaire translation and back translation

The study used a structured questionnaire to collect the data. Following standard practice, the survey questionnaire was prepared, proofed, and tested in English, then translated into Thai and back into English as suggested by Malhotra et al. (2006). A professional translator who is fluent in English translated the questionnaire from English to Thai language. A different professional translator to avoid bias translated the Thai language version back to English. A few minor adjustments to the questionnaire were made because of the translation and back-translation.

3.2.2 Pre-testing the questionnaire

The questionnaire was pre-tested to identify any unclear or difficult-to-answer questions. Pre-testing was conducted to improve content validity and the reliability of the initial version of the questionnaire. A small group of people who appeared to be reasonably similar to the target sample was selected to complete the questionnaire (Cooper & Schindler, 2011; Malhotra et al., 2006).

The pre-test data collection was conducted over 10 days (1 to 10 March, 2018). The pre-test sample includes 30 Thai nationals, 10 of whom were studying or working at Lincoln University. Twenty respondents participated in the pre-test of the survey in Bangkok. All participants were provided with printed copies of the questionnaire; the Bangkok respondents replied by email. Participants were asked to comment on or suggest changes to questions they thought were not clear or were difficult to understand. After the pre-test, a small number of minor adjustments were made to the questionnaire. These changes included editing sentences for clarity and using words that are more appropriate where confusion was noted. The questionnaires were also tested for construct reliability. The results indicated that all constructs were reliable, with Cronbach's alpha scores above the recommended 0.6 threshold (Hair, 2010).

3.3 Sample selection

This study's target population was grocery shoppers residing in Bangkok, the capital and biggest organic product market in Thailand. Bangkok was chosen because most of the target organic products are available there (Nuttavuthisit & Thogersen, 2015; Roitner-Schobesberger et al., 2008; Sriwaranun, 2011). We selected grocery stores, supermarkets and fresh markets in Bangkok. Respondents were selected using the convenience sampling approach. The following sections provide information about the sample size, sample selection and data collection.

3.3.1 Sample size

The specification of an appropriate sample size was driven by the requirements of the analysis methods. As this study uses EFA and SEM, it was necessary to obtain a large sample to ensure the results are reasonably robust (Kline, 2015). The sample size should also be large enough to ensure the power of statistical testing (Hair et al., 2010). In addition, results derived from larger samples have smaller sampling errors than those from smaller samples (Kline, 2011; Mendenhall, Beaver, & Beaver, 2012).

Mendenhall et al. (2012) suggest that a sample of 384 is sufficient for EFA and CFA, no matter how large the population. Mendenhall et al.'s (2012) formula was used to determine an appropriate sample size; in this case, 384. This is the minimum size to minimise error in obtaining accurate results based on the desired confidence and precision levels. In this study, the sample size for the unknown population was calculated because we do not know the proportion of grocery shoppers in Thailand. Mendenhall et al.'s (2012) sample size formula for an unknown population is:

$$n = \frac{z^2 PQ}{e^2} \qquad (3.1)$$

Where:

n is the sample size,

z = the standard score based on an assumed confidence level,

P is the assumed proportion as a decimal,

Q =1-P, and

e = the margin of error (in decimals).

We assume that the confidence level is 95%, z= 1.96 and the margin of error is 5%, i.e., e= 0.05.

In this case, the grocery shoppers' proportion, P is assumed to be 0.5, which results in a Q value of 0.5 since Q=1-P = 0.5. The P value of 0.5 yields the highest possible sample size. Therefore, in this study P is 0.50.

n = (0.5)(1-0.5)(1.96)2/(0.05)2

= 384.16

For EFA, Hair (2010) suggests a sample of 100 or more, with five to ten times as many observations as variables to be analysed, is acceptable. There are 39 variables to be analysed in this study. Therefore, the sample size required for EFA in this study is between 195 and 390.

SEM is a statistical technique that integrates different multivariate techniques into one model fitting framework (Kline, 2015). It is widely accepted that SEM should be conducted with a sample size of no fewer than 200 as a rule of thumb (Kline, 2015). Hair (2010) suggests that for SEM (using Maximum Likelihood Estimation), the sample should be at least 200 observations. However, Tanaka (1993) suggests that the sample should not be larger than 400 with SEM because with a large sample SEM becomes more sensitive and will over-detect differences. As a result, the statistical indices will indicate that the model is a poor fit. In this study, the sample size was estimated as approximately 390 respondents because this number satisfies the EFA and SEM requirements (Hair et al., 2010; Mendenhall et al., 2012; Tanaka, 1993).

Kline (2011) suggests the EFA and CFA should be performed on different samples because the techniques are built on different assumptions of the structure of items (Awang, 2015a). EFA assumes that the items can be loaded to each factor whereas CFA assumes that the items can be loaded on certain factors based on theory (Byrne, 2010). The factor structures identified through EFA may result in a poor fit to the same data when using the CFA (Kline, 2011). Therefore, this study used a total sample size of 780 (390x2). The total sample was randomly divided into two sub-samples: 390 for EFA and 390 for SEM.

To achieve the required number of respondents, the number invited to participate needs to take into account potential response rates lower than 100 per cent compliance. The response rates of previous studies dictate that an increased number of questionnaires is distributed. The response rate of a study on Thai consumers' WTP premium prices for organic products using a survey questionnaire was 71 per cent (Sriwaranun, 2011). Based on Batte, Hooker, Haab, & Beaverson's (2007) study on consumers' WTP premium prices for organic products in the US, the response rate for valid answers was 33 per cent. Based on the average response rate of previous studies, this study administered 1500 (= 780/0.52) questionnaires to consumers at supermarkets, hypermarkets, natural health food stores, and fresh markets (traditional retail markets) in Bangkok (see Table 3.1).

3.3.2 Data collection

The study used convenience sampling. We used this method for several reasons. It was the method of choice because of the practical difficulties in obtaining a comprehensive list of potential participants and more in-depth information about the target population. Convenience sampling is

Table 3.1 The selected Bangkok stores and markets for the survey

Number	Store	Type of Store	Location
1	Tops Supermarket - Central Department Store	Supermarket, located in a shopping mall	Ladprao
2	Tops Supermarket - Central Department Store	Supermarket, located in a shopping mall	Rama 9
3	Home Fresh Mart - The Mall Shopping Centre	Supermarket, located in a shopping mall	Ngam wong wan
4	Home Fresh Mart- The Mall Shopping Centre	Supermarket, located in a shopping mall	Bangkae
5	Golden Place Shop	Natural health food store	Sapan Sung
6	Golden Place Shop	Natural health food store	Rama 9
7	Golden Place Shop	Natural health food store	Silom
8	Tesco-lotus Supermarket- Tesco-lotus Shopping Centre	Hypermarket, located in a shopping complex centre	Rama 2
9	Tesco-lotus Supermarket - Tesco-lotus Shopping Centre	Hypermarket, located in a shopping complex centre	Bangpakok
10	Summakorn Market	Fresh market, traditional retail market	Sukhabhiban 3
11	Saimai Market	Fresh market, traditional retail market	Saimai
12	Bangkapi Market	Fresh market, traditional retail market	Bangkapi
13	Bon Marche Market	Fresh market, traditional retail market	Bangkhen

recognised as an appropriate way to select target samples whenever respondents are available and when other methods present insurmountable problems (Bryman & Bell, 2015). The data were collected from a sample of individuals, irrespective of their gender, occupation, or income. Respondents aged less than 18 years were excluded from the survey because it was thought they might have difficulties interpreting the questions. The questionnaires were completed between 15 March and 30 April 2018. The mall intercept technique was used to approach respondents who purchased grocery products. Three steps were applied to screen the selected respondents. First, respondents had to be grocery shoppers, regardless of their status in their household. Second, respondents were to be interviewed in a store or within a market. Third, all questionnaires were to be completed by the respondents at the store or market. We interviewed grocery shoppers at several stores/areas where organic and non-organic products were sold. The stores or market areas selected for this study include supermarkets, hypermarkets, natural health food stores and fresh markets (traditional retail markets) (see Table 3.1.and Figure 3.1).

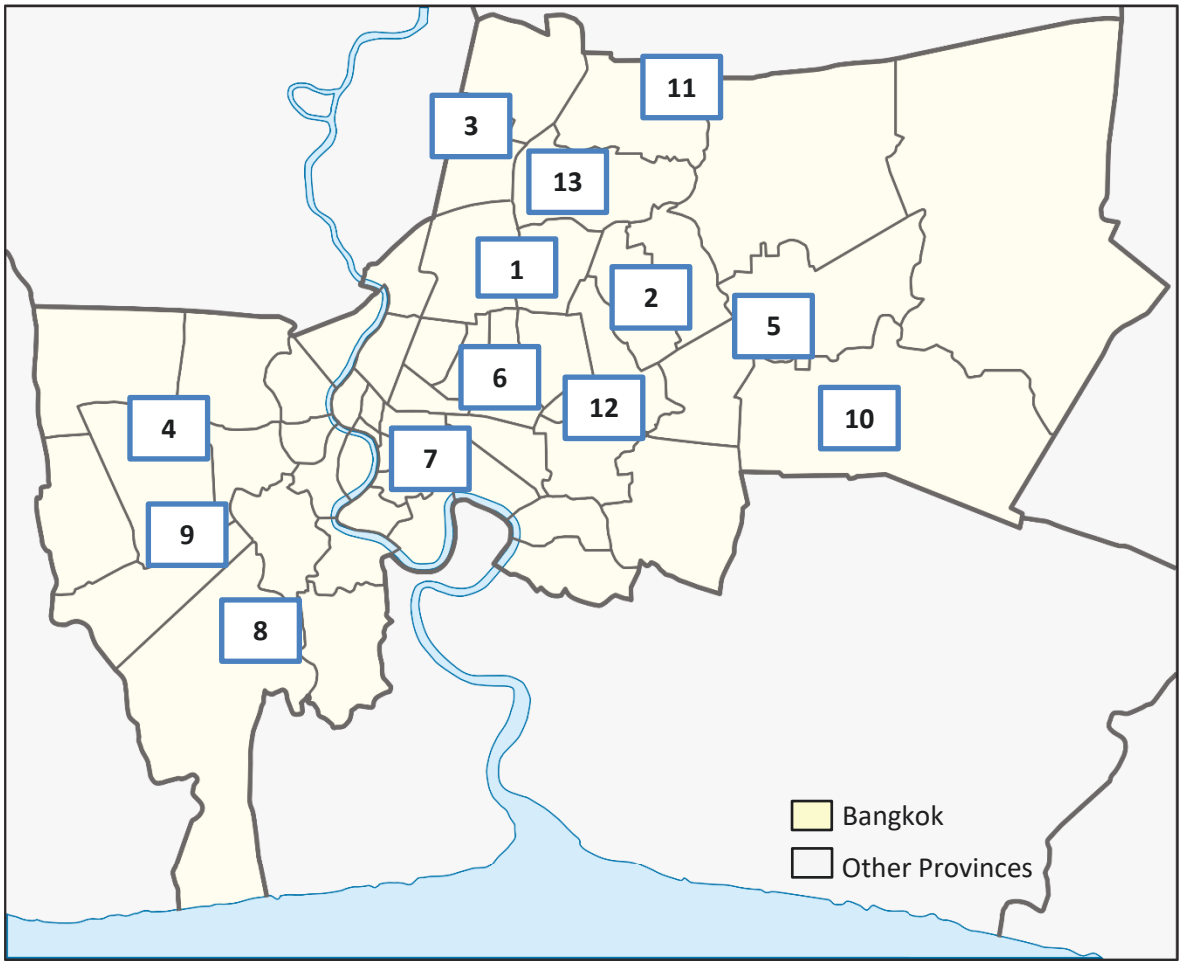

Figure 3.1 The locations of the selected Bangkok grocery stores

3.4 Data analysis

Data analysis began with data screening, remedying missing data, detecting outliers and testing for normality. In this study, two data analysis methods, EFA and SEM, are used to investigate the behaviour of a sample of organic product purchasers. EFA was applied first, followed by SEM, which involved two-steps consisting of CFA and SEM. However, EFA and CFA should use different data sets as suggested by Kline (2015). Therefore, before data analysis could be conducted, the organic product purchasers' sample was randomly divided into two equal sub-samples. First, EFA was used with the first sub-sample to analyse the empirical model specifications. We used the Statistical Package for the Social Sciences (SPSS 24) to conduct EFA. EFA is a standard statistical method used to evaluate empirical models to obtain an appropriate number of factors for further analysis (Kline, 2015). Principal Component Analysis (PCA) was used to extract the significant factors. Factors that had eigenvalues greater than one were retained; factors with eigenvalues less than one were deleted. The EFA results partially satisfied research objectives 2 and 3.

Secondly, after EFA analysis and the significant factor extraction, SEM was applied to the second sub-sample. SEM has two steps, CFA and SEM. Both CFA and SEM were analysed using AMOS 24 software. CFA was used to determine the significant factors and their inter-relationships in the measurement models and to reconfirm the EFA results (Kline, 2015). The CFA results satisfied research objectives 1, 2 and 3. Next, SEM was used to analyse the relationships among the constructs. The SEM results satisfied research objectives 1 and 4. Each data analysis step is discussed further in the following sections.

3.4.1 Exploratory factor analysis (EFA)

EFA is useful for summarising data or gaining a better understanding of latent variable constructs (Hair, 2010; Kline, 2011). The purpose of EFA is to determine meaningful factors from a group of items. Consumer risk perceptions and risk reduction strategies are measured using multiple items. If these items have strong correlations, they should be combined into one factor. EFA was adopted to explore the meaningful factors and to generate the appropriate number of factors for the measurement models.

Several methods were used to determine whether the data set was appropriate to conduct factor analysis. First, the correlation matrix was examined to determine the level of correlation among the variables in the data set. Correlation in the data matrix greater than 0.3 is appropriate and recommended for factor analysis (Pallant, 2013). Next, the Kaiser-Mayer-Olkin (KMO) Measure of Sampling Adequacy was used to determine whether the data set was appropriate for EFA. If the KMO value is higher than 0.6, then EFA is useful (Tabachnick et al., 2007). Bartlett's Test of Sphericity (BtS) was used to examine the overall significant correlation in the data matrix (Hair et al., 2006). In the BtS, a significance level less than 0.05 indicates that there is sufficient correlation among the variables in data set and it is appropriate for factor analysis (Pallant, 2013).

3.4.1.1 Factor extraction in principal component analysis (PCA)

In this study, PCA was used to form a factor. The objective of PCA is to condense information from a number of items into a single factor to minimise the loss of information (Hair et al., 2006). Three criteria must be satisfied: latent root criterion, percentage of variance, and the Scree test criterion (Hair et al., 2006; Hair et al., 2010;). The latent root criterion, which indicates the eigenvalue, was used to determine the number of factors to retain. As Hair (2010) suggests, eigenvalues greater than one determine whether individual factors should be retained. To evaluate whether the extracted factors can explain the amount of total variance, this study used the percentage variance criterion. A total variance of 60 per cent is considered satisfactory in the social sciences (Hair et al., 2006). The

Scree test was used to determine the number of factors to be extracted (compared with the eigenvalue). The Scree test shows the eigenvalue against individual factors, with straight lines connecting the reference points for each. This creates a diagram where the slopes of the points on the plot clearly display the potential contribution of each factor. The point at which the slope of the line approximates the horizontal is interpreted as an indication that subsequent factors are no longer necessary in the analysis (Costello & Osborne, 2005).

3.4.1.2 Factor rotation

The purpose of factor rotation is to simplify and clarify the data structure to obtain more meaningful factor solutions (Costello & Osborne, 2005). There are two types of factor rotations: orthogonal and oblique. Orthogonal rotation assumes that the factor axes are maintained at 90 degrees and produce uncorrelated factors (Costello & Osborne, 2005). Orthogonal rotation consists of three rotations: Varimax, Quartimax and Equamax. Varimax rotation focuses on simplifying the column of the factor matrix (Larose, 2006). Varimax rotation is one of the best methods of orthogonal rotation and is widely used in marketing research (Tabachnick et al., 2007). A factor loading close to +1 or -1 represents a strong correlation between the variables and factors. If it closer to 0, it means that the factors are unlikely to be uncorrelated (Hair et al., 2010; Tabachnick et al., 2007).

Oblique rotation allows factors to be correlated (Costello & Osborne, 2005). Oblique rotation assumes that the factors might be correlated and that the angles of the factor axes are more flexible. Oblique rotations consist of three rotations: Direct-Oblimin, Quartimin, and Promax. Direct-Oblimin rotation is the standard method of oblique rotation (Costello & Osborne, 2005). However, there are no rules of thumb when it comes to choosing Orthogonal or Oblique rotation because they are based on interpretations of the results. Though both methods often provide similar solutions, Oblique rotation output is more complicated than Orthogonal rotation output. This study thus uses Orthogonal (Varimax) rotation because the results are much easier to interpret

3.4.1.3 Interpretation of factors

Factor loadings were used to indicate correlations between variables. The larger the sample size the less factors loadings required. Hair et al., (2010) provides guidelines for factor loadings and the sample sizes (see Table 3.2). In this study, a factor loading higher than 0.30 was considered acceptable because the sample size is higher than 350. A higher factor loading provides higher content validity. In general, factor loadings higher than 0.5 are considered significant factors and the content validity is acceptable.

Table 3.2 Guidelines for identifying significant factor loadings

Factor Loading	Sample Size Needed for Significance
0.30	350
0.35	250
0.40	200
0.45	150
0.50	120
0.55	100
0.60	85
0.65	70

Source: Hair et al., (2010)

3.4.1.4 Unidimensionality analysis

Unidimensional analysis is used to ensure that variables load on one factor. When the variables in the measurement scale are loaded on a single factor, the measurement scale is considered unidimensional (Bernard & Bernard, 2013). Items that load on more than one factor were removed to ensure adequate unidimensionality.

3.4.1.5 Reliability and validity

Reliability measures the degree of internal consistency between variables (Hair, 2010). Internal consistency refers to the correlation among the variables, which is measured by Cronbach's alpha. An instrument is considered reliable if the internal consistency is high (Hair, 2010; Malhotra et al., 2006). A Cronbach's alpha score above 0.6 indicates that the factor has adequate reliability, especially in exploratory studies (Hair, 2010). In this study, only Cronbach alpha scores above 0.6 were accepted.

Validity is the extent to which a set of measures represents the concept of interest (Hair, 2010). This study assessed content validity. Content validity examines the variables correspond with the concepts to be measured (Kline, 2011). Content validity can be assessed using pre-tests with sub-populations (Hair, 2010). In this study, content validity was determined by conducting a pre-test as recommended by Hair (2010).

3.4.2 Confirmatory factor analysis (CFA)

Measurement models are used to investigate the relationships between observed and latent variables (Byrne, 2010). A researcher should investigate the reliability and validity of the observed variables to ensure they perform well as measurement items for the latent variables (Jöreskog & Sörbom, 1996). CFA is used to investigate measurement models and to specify factors that are

measured by the observed variables (Schumacker & Lomax, 2004). Hair (2010) recommends a researcher should conduct CFA before conducting SEM.

In this study, six measurement models were developed and assessed using CFA. We analysed four first order CFA models. The four first order CFA models consist of consumer risk perceptions, risk reduction strategies, five constructs (consumers' perceptions of organic product attributes, attitudes, knowledge, lifestyle and WTP) and seven latent constructs (consumers' perceptions of organic product attributes, attitudes, knowledge, lifestyles, risk perceptions, risk reduction strategies and WTP). Two second order CFA models were analysed consisting of consumer risk perceptions and risk reduction strategies. The purpose of first order CFA is to specify and investigate the latent variables and to test the relationships between the latent and observed variables in the models. Similarly, the second order CFA investigates whether the second order latent variables comprise multiple first order variables that are measured by their measurement items.

3.4.2.1 Reflective versus formative measurement models

There are two types of measurement model: reflective and formative. Both measurement models can be used to measure constructs in SEM (Kline, 2015). Reflective and formative models are based on different assumptions. The reflective measurement model assumes that the latent variable in the model can be explained by observed variables or measurement items (Diamantopoulos & Siguaw, 2006). In other words, the latent variable influences the observed variables or measurement items (Bollen, 1989). In contrast, the formative measurement model assumes that observed variables or measurement items formed the latent variable in the model (Arbuckle, 2013). This study investigates reflective measurement models. Reflective measurement models have been used in marketing research and are appropriate for measuring psychological constructs such as attitudes, perceptions, feelings and emotions (Bollen, 1989; Diamantopoulos & Siguaw, 2006; Kline, 2015).

Validation processes for reflective and formative models also differ. In reflective measurement models, the latent variable is believed to influence measurement items that are highly correlated with each other (Diamantopoulos & Siguaw, 2006). The high correlation of items in a reflective model generates high internal consistency which means that the model's reliability is high (Kline, 2015). Moreover, multicollinearity between items is not an issue in the reflective model because the high internal consistency ensures that the reflective model has high reliability (Diamantopoulos & Siguaw, 2006). In the formative measurement model, measurement items influence the latent variable. Formative model items are not highly correlated with each other (Diamantopoulos & Siguaw, 2006). Internal consistency cannot be used to test a model's reliability in the formative

model (Kline, 2015). It is more difficult to test the validity of the formative model than the reflective model. Multicollinearity is also a major problem with the formative model because it reduces the coefficient stability (Diamantopoulos & Winklhofer, 2001).

Removing items from the reflective and formative models leads to different effects (Diamantopoulos & Siguaw, 2006). Items within the model form the formative model. If the items in the formative model are removed, the latent variable is affected by the removal (Kline, 2015). This contrasts with the reflective model where the latent variable influences items in the model. If one item in the reflective model is removed, the latent variable will not change (Kline, 2015). In short, in the reflective model, the latent variable still influences the rest of items with the same meaning as before (Awang, 2015a). The items or observed variables in the reflective model are represented as effect indicators influenced by the latent variable (Kline, 2015). Items in the reflective model can be removed from, or added to, the model. They do not affect the latent variable because these items affect only indicators in the model (Diamantopoulos & Siguaw, 2006).

3.4.3 Structural equation modelling (SEM)

SEM was used in economic researches in the early 1950s with the aim of examining the causal relationships between variables (Hair, 2006). Since then, several statistics software packages that include SEM have been developed and, as a result, the technique has become increasingly popular. Today, SEM is an advanced multivariate statistical technique commonly used to analyse the interrelationships among variables in a theoretical model (Byrne, 2010). SEM combines factor analysis and multiple regressing techniques; it simultaneously analyses the relationship between observed and latent variables and the relationships among latent variables (Hair, 2010; Kline, 2011). In this study, SEM was chosen to examine the relationships among the latent variables. There are two SEM approaches: one-step and two-step (Hair, 2010). The one step approach involves analysing the measurement and structural model simultaneously and the two-step approach involves developing and estimating the measurement model, followed by SEM (Hair, 2010; Kline, 2011). The literature recommends using the two-step approach, which has been widely used (James, Mulaik, & Brett, 1982). Jöreskog and Sörbom (1996) suggest testing the measurement model first and then assessing the structural relationship. This study therefore applies the two-step approach.

3.4.3.1 Modelling assessment procedures

Modelling of SEM consists of five steps: model specification, model identification, model-fit-indices, modification of the model, and reliability and validity checks. Each step is discussed in greater detail next.

3.4.3.1.1 Model specifications

Model specification refers to the process of developing a model based on a review of theories and relevant literature (Schumacker & Lomax, 2004). In this study, the measurement models and SEM are based on the literature review (see Chapter 2) and the EFA results. In addition, the models used in this study satisfy Byrne's (2010) recommendations:

1. Each measured item is set to 1; all other factors, factor loadings, are freely estimated on a specific factor or fixed to zero.
2. In first order CFA, all variance/co-variance parameters are correlated and freely estimated. In second order CFA, co-variances among the first order factors are fully explained by their regression of the higher order factor.
3. Each measured item error term is uncorrelated.

3.4.3.1.2 Model identification

The purpose of model identification is to consider whether the model has sufficient indicators to derive a unique set for parameter estimation (Diamantopoulos & Siguaw, 2013). In short, does the measurement model have enough latent variable indicators? If it is possible to derive a unique estimate of every model parameter, a model is "identified". If it is not, the model is not identified (Kline, 2015).

There are three model identifications: under-identified, just identified and over-identified (Hair, 2010). If the number of pieces of information (observed variances and co-variances) is less than, equal to, or higher than the number of estimated parameters, a model is under-identified, just identified or over-identified, respectively. An under-identified model does not have enough information to estimate the parameters. In contrast, a just identified and an over-identified model have just enough and more than enough information, respectively, to estimate the parameters in the model (Byrne, 2010).

This study uses the t-rule to determine the model type. The t-rule requires the number of pieces of information (observed variances and co-variances) to be (p[p+1]/2) compared with the total number of parameters in the model (p is the total number of observed variables). It is acceptable if the number of pieces of information (observed variances and co-variances) is equal to or greater than the total number of estimated parameters. If a model does not meet this requirement, then it should be re-specified before further analysis (Kline, 2011). When the t-rule is satisfied, a CFA model is identified (Byrne, 2010).

The degrees of freedom value also indicates the status of model identification. The degrees of freedom are negative for under-identified, zero for just identified and positive for over-identified models (Hair, 2010; Kline, 2011). In brief, the greater the degrees of freedom, the more powerful the test and model estimate (Blunch, 2012). An alternative to the t-rule method is the order condition. The order condition is satisfied if the degrees of freedom for a model are greater than zero (Schumacker & Lomax, 2010). When the order condition is satisfied, a CFA model is considered identified and can be conducted.

3.4.3.1.3 Model fit indices

Model fit indices indicate how well a specified model fits the sample data. Model fit indices consist of normed chi-square (x^2/df), the goodness of fit index (GFI), the comparative fit index (CFI), the root mean square error of approximation (RMSEA) and the standardised root mean residual (SRMR).

Several model fit indices are recommended in the literature. However, researchers should not report all model fit indices since they are often redundant (Hair, 2010). Kline (2015) suggests using three to five model fit indices. This study uses five indices; normed chi-square, GFI, CFI, RMSEA and SRMR (see Table 3.3). The details for each model fit test are discussed next.

Table 3.3 Model fit indices and recommended thresholds

Goodness of Fit Indices	Recommended Thresholds	Note
χ^2/df	Less than 5.0	Less than 5.0 is acceptable
GFI	0.9 or larger	0 indicates a poor fit; 1 indicates a perfect fit
CFI	0.9 or larger	0 indicates a poor fit; 1 indicates a perfect fit
SRMR	0.1 or less	A lower SRMR value indicates a better model fit
RMSEA	0.1 or less	A lower RMSEA value indicates a better model fit

Normed Chi-square

The normed chi-square (χ^2/df) refers to the ratio of chi-square (χ^2) over the degrees of freedom (*df*) for a model (Kline, 2011). Chi-square (χ^2) is used to measure the differences between the observed and the estimated co-variance matrices (Hair et al., 2010; Stevens, 2012). The degrees of freedom (*df*) refer to the amount of information available to estimate the model parameters. A normed Chi-square ratio less than 3.0 indicates a good model fit (Kline, 2011). A normed Chi-square ratio close to 5.0 is still acceptable (Awang, 2015a). However, normed chi-square values higher than 5.0 are considered a poor model fit and indicate that the model needs to be improved (Awang, 2015a).

Goodness-of-fit index (GFI)

The GFI is an absolute fit index that measures the proportion of co-variances in the sample data matrix that is jointly explained by the hypothesised model (Kline, 2015). The GFI estimates how much better the proposed model fits than no model (Kline, 2015). A higher GFI value means a better model fit (Jöreskog & Sörbom, 1996). GFI values range from zero to one. Values over 0.9 indicate a good model fit (Hair et al., 2010; Hooper et al., 2008; Kline, 2011).

Comparative fit index (CFI)

CFI is an incremental fit index that analyses model fit by testing the discrepancy between the data and the proposed model (Kline, 2015). In other words, the CFI measures relative improvements in the fit of the proposed model over a base line model (Hu & Bentler, 1999). CFI values range from zero to one; the higher the CFI value the better the model fit (Hu & Bentler, 1999). A CFI value greater than 0.90 indicates a good model fit (Hair et al., 2010; Schreiber et al., 2006).

Standardised root mean residual (SRMR)

The SRMR test is an absolute measure of fit. The SRMR test determines the standardised difference between the observed correlation and predicted correlations (Kline, 2011). The smaller the SRMR value, the better the model fit. SRMR values less than 0.10 indicate a good model fit (Kline, 2011).

Root mean square error of approximation (RMSEA)

The RMSEA is an index that indicates how well a model fits the data. The RMSEA has been widely used to distinguish good models from poor models, despite the fact that it is considered sensitive to model complexity; i.e., it is sensitive to the total number of parameters in the model (Hu & Bentler, 1999; Jackson, Gillaspy & Purc-Stephenson, 2009). However, the RMSEA is accepted as one of the best measurements for determining how well a model fits the population co-variance matrix. It is considered suitable for evaluating model fit for large samples (Ferdinand, 2002). RMSEA values between 0.08 and 0.1 indicate a moderate fit and values less than 0.08 indicate a good fit (Hair et al., 2010; Kline, 2011; MacCallum, Browne & Sugawara, 1996).

3.4.3.1.4 Model modification

The purpose of model modification is to improve the model fit to the sample data. Models can be improved by identifying and improving misspecification (Byrne, 2010). Generally, model modification involves improving one path or measured item at a time. Scholars should use their judgement and

statistical information when modifying a model to confirm that the modification they use is appropriate and based on theory. Hair (2010) suggests that model modification must be underpinned by theory. Byrne (2010) maintains that if the model has a good fit, there is no further modification. In this study, model modification was conducted only when a poor fit is indicated. This study used model modification based only on theory.

There are two diagnostic measures for performing model modification: modification indices (MI) and standardised residuals (Janssens, De Pelsmacker, Wijnen, & Van Kenhove, 2008). MI provides a decreased value of Chi-square when the fixed parameters are added and freely estimated in the model (Byrne, 2010). A lower MI value indicates a good model fit whereas a higher MI value indicates a poor model fit, i.e., the model needs to be improved (Hair et al., 2010).

In addition, MI are linked to estimated values of freed parameters that are called expected parameter change statistics (EPC) (Schumacker & Lomax, 2010). Advice for applying MI and EPC was taken from several studies (Byrne, 2010; Hair et al., 2010; Jöreskog & Sörbom, 1996; Kline, 2011):

1). If a fixed parameter has a large MI and large EPC, the parameter may be freed especially when there is a substantial support for this in theory.

2). If a fixed parameter has a large MI and a small EPC, the parameter may remain fixed.

3). If a fixed parameter has a small MI and a large EPC, the parameter may be because of sampling variability.

4). If a fixed parameter has small MI and small EPC, the parameter may remain fixed.

A standardised residual is a residual dividing its estimated standard error (Jöreskog & Sörbom, 1996). Large residuals associated with parameters indicate a poor model fit (Byrne, 2010). The critical value of standardised residual is 2.58; a standardised residual higher than the critical value of 2.58 indicates a possible model misfit (Diamantopoulos & Siguaw, 2013).

3.4.3.1.5 Unidimensionality analysis

The unidimensionality of the measurement should meet the threshold required before one assesses construct validity and reliability (Anderson & Gerbing, 1991). Unidimensionality can be determined by the CFI value; a CFI value of 0.9 or above indicates unidimensionality (Byrne, 2010).

3.4.3.1.6 Reliability and construct validity

In CFA, the reliability and construct validity of the measurement instrument are evaluated. In this study, the Construct Reliability (CR) was used to assess the reliability of the measurement instrument. CR was computed using the following equation:

CR formula

$$CR = \frac{(\Sigma\lambda)^2}{(\Sigma\lambda)^2 + (\Sigma(\theta)} \quad (3.2)$$

Where:

CR is the construct reliability;
λ is the indicator loading;
Θ are the indicator error variances; and
Σ is the sum over the indicators of the latent variable.

A CR of 0.6 or higher is acceptable (Awang, 2015a)

In this study, convergent validity and discriminant validity were used to evaluate the construct validity of the measurement instrument.

3.4.3.1.7 Convergent validity

The average variance extracted (AVE) was used to assess convergent validity. The AVE was computed using the following equation:

$$AVE = \frac{\Sigma\lambda^2}{n} \quad (3.3)$$

Where:

AVE is the average variance extracted;
λ is the standardised factor loading;
Σ is the sum over the indicators of the latent variable; and
n is the total number of items.

An AVE of 0.5 or higher is acceptable (Kline, 2015); it indicates the reliability of the measurement model.

3.4.3.1.8 Discriminant validity

Discriminant validity implies that a variable is distinct from other variables (Hair et al., 2010). Discriminant validity can be tested using several approaches. Kline (2015) suggests that discriminant validity is acceptable if the correlation coefficient between different constructs is less than 0.85. Fornell and Larcker (1981) suggest that discriminant validity is satisfied if the square root of the AVE of the constructs is higher than the correlation between the constructs. This study applied both Kline's (2005) and Fornell and Larcker's (1981) approaches to discriminant validity.

3.4.3.2 Structural equation model

Once all measurement models were confirmed, SEM was used to investigate the relationships between the seven latent variables (see Figure 3.2). All variables in the model were measured simultaneously. We investigated the relationships of all seven latent constructs by considering the

regression coefficients between the latent constructs to test the research hypotheses. The structural equation model can be expressed using a general equation (Wang & Wang, 2012):

$$\eta = B\eta + \Gamma\xi + \zeta \qquad (3.4)$$

Where η are endogenous latent variables. The components of ξ are exogenous latent variables. The endogenous latent variables connect exogenous latent variables using a linear equation system with coefficient matrices B (beta), Γ (gamma) and residual vector ς (zeta), where Γ is the effect of the exogenous latent variable on the endogenous latent variables; B is the effect of an endogenous latent variable on other endogenous latent variables; and ς is the regression residual terms.

Figure 3.2 presents the SEM of our study constructs. The regression coefficients are presented in the model. The values of the regression coefficients show the effect of the exogenous construct on the endogenous construct. The SEM (the WTP premium price model) is as follows:

$$WTP = brpwRP + \zeta 1 \qquad (3.5)$$

$$RP = bprPA + barAT + bkrKN + blrLS + brrrpRR + \zeta 2 \qquad (3.6)$$

$$RR = brprrRP + \zeta 3 \qquad (3.7)$$

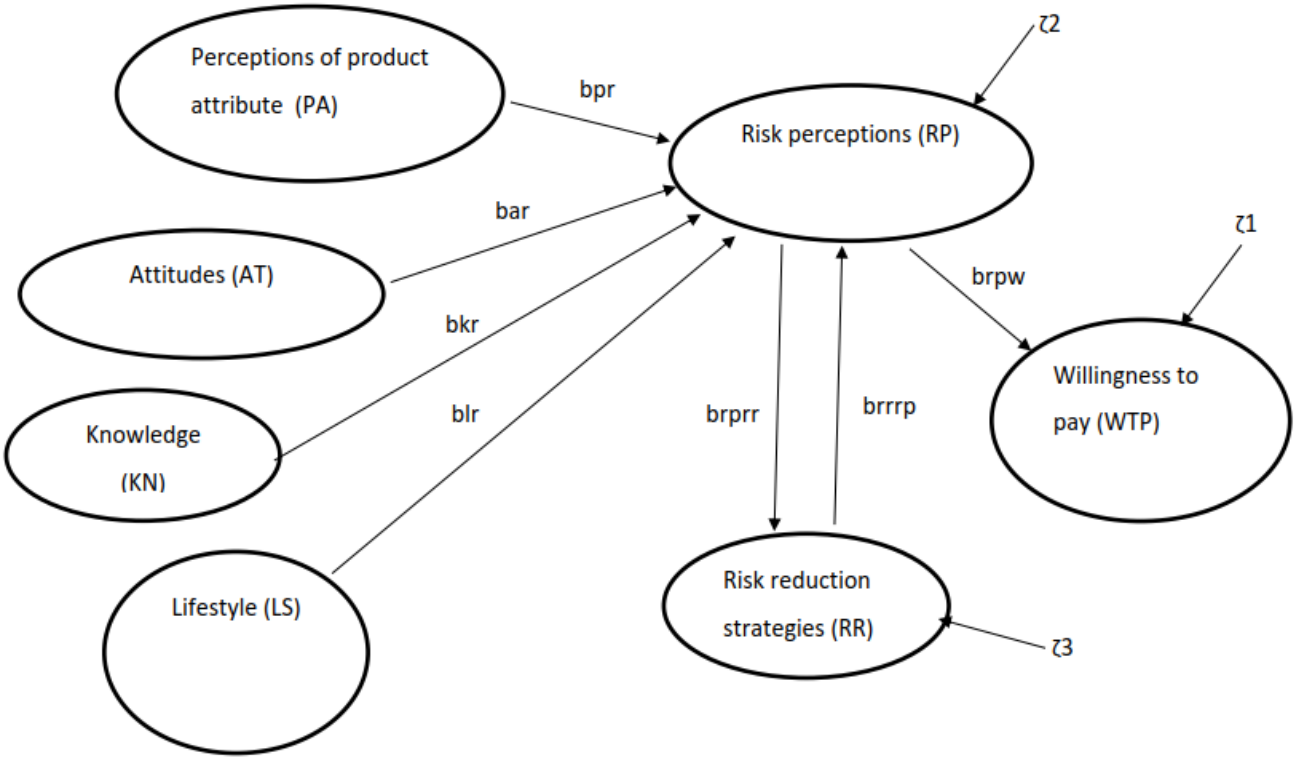

Figure 3.2 The structural equation model

The variable definitions for the SEM in Figure 3.2, including the variables in equations (3.5) to (3.7) are given in Table 3.4. Section 3.5 discusses the items used to measure each variable in the SEM, including the variable and measurement instrumentation development (see Table 3.4).

Table 3.4 Variable definitions for the structural equation model

Variable	Definition	Items used for Measuring
WTP	Willingness to pay (WTP)	W1 - W17 (see section 3.5.1 for details)
RP	Risk perceptions	PSY1- 4, TIME1-3, PHY1- 3, SOC1- 4, FIN1- 4, FUNC1- 4 (see section 3.5.2 for details)
RR	Risk reduction strategies	BRND1- 3, CERT1- 4, INFO1- 3, PRIC1- 4, PROC1- 3 (see section 3.5.3 for details)
PA	Perceptions of organic product attributes	P1-12 (see section 3.5.4 for details)
AT	Attitudes to organic products	A1-9 (see section 3.5.5 for details)
KN	Knowledge	K1-6 (see section 3.5.6 for details)
LS	Lifestyle	L1-11 (see section 3.5.7 for details)
brpw	Regression coefficient between risk perceptions and WTP for organic products	
ζ1	Residual term in equation 3.5	
brrrp	Regression coefficient between risk reduction strategies and risk perceptions	
bpr	Regression coefficient between perceptions of organic product attributes and risk perceptions	
bar	Regression coefficient between attitudes and risk perceptions	
bkr	Regression coefficient between knowledge and risk perceptions	
blr	Regression coefficient between lifestyle and risk perceptions	
ζ2	Residual term in equation 3.6	
brprr	Regression coefficient between risk perceptions and risk reduction strategies	
ζ3	Residual term in equation 3.7	

3.5 The variables and measurement instrumentation development

The latent variables in this study's SEM (see Table 3.4) were measured using observed variables. This study examined seven latent variables: consumers' WTP a premium price for organic products, risk perceptions, risk reduction strategies, perceptions of organic product attributes, attitude towards organic products, knowledge and lifestyle. Summed scales were used to reduce measurement errors and were formed by combining multiple items into a single observed variable (Hair, Bush & Ortinau, 2006). The first five latent variables in the SEM consist of consumers' WTP a premium price for organic products, perceptions towards organic product attributes, attitudes toward organic products, knowledge and lifestyle; the observed variables of these latent variables were formed using the item parcelling technique (see section 5.2.3 for details). For the last two latent variables (consumers' risk perceptions and risk reduction strategies), the observed variables were formed using the data imputation function in AMOS to form the observed variables. These were derived from the results of second order CFA of the latent variables; further details are provided in sections 5.2.1.2 and 5.2.2.2.

Items for the observed variables were developed based on findings in the literature (see Appendix A3). The adoption of questions used in prior studies should increase the reliability and validity of the measurement items. However, this assumes that the literature provides sufficient information and discussion (Cooper & Schindler, 2011) and confirms the assumptions of reliable and valid measures. Items adopted from prior studies are considered appropriate to use in similar studies (Cooper & Schindler, 2011).

Measurements for this study were all quantitative and based on self-reports. These consist of consumers' self-reports on WTP premium prices and actual expenditure on organic products, consumer risk perceptions, consumer risk reduction strategies, consumer perceptions about organic product attributes, consumers' attitudes towards organic products, knowledge, and consumers' lifestyle.

3.5.1 Consumers' WTP premium prices for organic products

This study examined consumers' WTP premium prices for organic products, including their experiences in purchasing organic products. The consumers' WTP a premium price for organic products includes the actual amount of money spent on organic products, the frequency of purchasing these products, the purchase prices and organic product purchasing experiences. This study focused on four organic products (vegetables, rice, juice and coffee). Seventeen items were used to assess consumers' experiences and actual expenditure on organic products (see Table 3.5).

Table 3.5 Items measuring consumers' WTP premium prices for organic product variable in terms of consumers' experiences and actual expenditure on organic products

Variable	Description of Variable	Measurement Scale
W1*	What proportion of your purchases of vegetables are organic?	1= Never purchase, 2= 1-15% compared to the total they spent on conventional vegetables, 3= 16-30%, 4= 31-45%, 5= 45-60%, 6= 61-75%, 7= 76-90%, 8= 91-100%
W2*	What proportion of your purchases of rice are organic?	1= Never purchase, 2= 1-15% compared to the total they spent on conventional rice, 3= 16-30%, 4= 31-45%, 5= 45-60%, 6= 61-75%, 7= 76-90%, 8= 91-100%
W3*	What proportion of your purchases of juice are organic?	1= Never purchase, 2= 1-15% compared to the total they spent on conventional juice, 3= 16-30%, 4= 31-45%, 5= 45-60%, 6= 61-75%, 7= 76-90%, 8= 91-100%
W4*	What proportion of your purchases of coffee are organic?	1= Never purchase, 2= 1-15% compared to the total they spent on conventional coffee, 3= 16-30%, 4= 31-45%, 5= 45-60%, 6= 61-75%, 7= 76-90%, 8= 91-100%
W5	How often you purchase organic vegetables?	1= Never purchase, 2= Once a month, 3 = 2 - 3 Times a month, 4= Once a week, 5= More than once a week
W6	How often you purchase organic rice?	1= Never purchase, 2= Once a month, 3 = 2 - 3 Times a month, 4= Once a week, 5= More than once a week
W7	How often you purchase organic juice?	1= Never purchase, 2= Once a month, 3 = 2 - 3 Times a month, 4= Once a week, 5= More than once a week
W8	How often you purchase organic coffee?	1= Never purchase, 2= Once a month, 3 = 2 - 3 Times a month, 4= Once a week, 5= More than once a week
W9*	How much are you willing to pay for organic vegetables compared to conventional products?	1= Never purchase, 2= pays 1-15% more for organic vegetables than conventional vegetables, 3= 16-30%, 4= 31-45%, 5= 45-60%, 6= 61-75%, 7= 76-90%, 8= 91-100%
W10*	How much are you willing to pay for organic rice compared to conventional products?	1= Never purchase, 2= pays 1-15% more for organic rice than conventional rice, 3= 16-30%, 4= 31-45%, 5= 45-60%, 6= 61-75%, 7= 76-90%, 8= 91-100%
W11*	How much are you willing to pay for organic juice compared to conventional products?	1= Never purchase, 2= pays 1-15% more for organic juice than conventional juice, 3= 16-30%, 4= 31-45%, 5= 45-60%, 6= 61-75%, 7= 76-90%, 8= 91-100%
W12*	How much are you willing to pay for organic coffee compared to conventional products?	1= Never purchase, 2= pays 1-15% higher price for organic coffee than conventional coffee, 3= 16-30%, 4= 31-45%, 5= 45-60%, 6= 61-75%, 7= 76-90%, 8= 91-100%

Note* This question uses 8-point Likert scales to obtain more information from the respondents who had just purchased organic products. We asked the respondents to answer this question at the point of purchase where their memories are still fresh on the amount and price they paid. The 8-point Likert scales are also the most comfortable scales based on the respondents' feedback during the pre-test.

Table 3.5 Items measuring consumers' WTP premium prices for organic products variable in terms of consumers' experience and actual expenditure on organic products (continued)

Variable	Description of Variable	Measurement Scale
W13	The higher price of organic products reflects their higher quality.	1= Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly agree
W14	I will continue to consume organic products regardless of increases in price.	
W15	I buy organic products because the benefits outweigh the costs.	
W16	I would still buy organic products even though non-organic products are cheaper.	
W17	Buying organic products is the right thing to do even if they cost more.	

3.5.2 Consumers' risk perceptions

Consumers' risk perception is a significant factor influencing consumer purchases and the consumption of organic food products (Mitchell, 2001). Yeung and Morris (2001) conclude that consumers' risk perceptions can be classified into six types: psychological risk, time risk, physical risk, social risk, financial risk and functional risk. For example, consumers experience financial risk when purchasing organic products because they must often pay a higher price for organic products than for conventional products. Nuttavuthisit and Thogersen (2015) suggest that if the product is more expensive, consumers consider it a greater financial risk; this is especially true for products that are characterised by invisible attributes. Organic product attributes associated with a higher price are invisible; they are purported to have greater nutritional value, be better for one's health and the environment, and be free from chemicals and GMOs (Willer & Lernoud, 2019). Consumers cannot see these attributes, thus, they may perceive a higher financial risk, than when purchasing conventional products. This study used 22 items to examine respondents' risk perceptions in relation to organic product purchases (see Table 3.6).

3.5.3 Consumers' risk reduction strategies

Consumers develop risk reduction strategies in response to their risk perceptions (Yeung & Yee, 2003). In short, they try to reduce their risks by developing strategies to cope with perceived risk. Many studies consider risk reduction strategies in relation to food purchases, e.g., Angulo and Gil (2007) examine risk reduction strategies in relation to organic beef and Yeung et al. (2010) investigate the same issue for poultry. Yeung et al. (2010) categorise these risk reduction

Table 3.6 Items measuring consumers' risk perceptions when purchasing organic products

Variable	Description of Variable	Measurement Scale
PSY1	I would be embarrassed if I purchased the product at high price but the product has been treated with chemicals.	
PSY2	I fear being cheated when purchasing organic products.	
PSY3	I would lose face if I purchased non-organic products that claimed to be organic.	
PSY4	I waste my money if I buy non-organic products that claimed to be organic.	
TIME1	I do not have time to find organic products.	
TIME2	Limited supply makes buying organic products harder.	
TIME3	I try to buy organic products whenever they are available.	
PHY1	Non-organic products that claim to be organic can harm my health.	
PHY2	Truly organic products taste better than conventional products.	1= Strongly disagree,
PHY3	Truly organic products are more nutritious than conventional one.	2 = Disagree, 3 = Neutral,
SOC1	I am never really certain that the organic products I purchased are really organic	4 = Agree, 5 = Strongly agree
SOC2	I do not easily trust product claims that a product is really organic.	
SOC3	I would be out of fashion if I did not eat organic products.	
SOC4	My family and friends will blame me for not doing the right thing if I do not eat organic products.	
FIN1	I think that organic products are not as safe as they claim to be.	
FIN2	I would save money and buy more if I did not buy organic products.	
FIN3	I think using the words "organic product" is only a marketing strategy to sell at higher prices.	
FIN4	Paying a higher price for organic products is wasteful.	
FUNC1	I worry about pesticide residue when buying food products.	
FUNC2	I am concerned about how organic products are processed.	
FUNC3	I am concerned about the cumulative effects of pesticides in my food.	
FUNC4	I am concerned about food safety even if the product claims to be organic.	

strategies into five groups: brand, certification, information, price, and process (Yeung et al., 2010). This study used 17 items to investigate risk reduction strategies the respondents use when purchasing organic products (see Table 3.7).

Table 3.7 Items measuring consumers' risk reduction strategies when purchasing organic products

Variable	Description of Variables	Measurement Scales
BRND1	I purchase organic products of the same brand regularly.	1= Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly agree
BRND2	I purchase organic products at the same store regularly.	
BRND3	I always choose well-known or popular brands of organic products.	
CERT1	Thai government org. certification is not trustworthy.	
CERT2	I purchase organic products certified by private certification bodies.	
CERT3	I purchase organic products certified by international certification bodies.	
CERT4	I purchase organic products that can be traced back to the farmer.	
INFO1	I read consumer guides regularly.	
INFO2	I store organic products separately from conventional products.	
INFO3	My family and friends provide advice on organic products.	
PRIC1	I do not purchase organic products with price reductions.	
PRIC2	I read in-store product information leaflets regularly.	
PRIC3	I do not shop around to compare organic product prices.	
PRIC4	I inspect organic products before I purchase.	
PROC1	I buy organic product from shops that keep organic products separate from conventional products.	
PROC2	I prefer to buy organic products from shops that buy organic products directly from the farmers that produce them.	
PROC3	I prefer to buy organic products if the price is the same as conventional products.	

3.5.4 Consumers' perceptions of organic product attributes

Over the past three decades, there are numerous studies documenting consumers' perceptions of organic products' attributes (e.g., Bonti-ankomah & Yiridoe, 2006; Sriwaranun, 2011; Voon et al., 2011). In terms of product attributes, consumers' perceptions can be categorised into four groups (Bonti-ankomah & Yiridoe, 2006; Sriwaranun, 2010; Voon et al., 2011). These are perceptions about health benefits, the availability of organic products, quality, and trust in organic products. In this study, 12 questionnaire items were used to assess consumers' perceptions of organic product attribute variables (see Table 3.8).

Table 3.8 Items measuring consumers' perceptions of organic product attributes

Variable	Description of Variables	Measurement Scales
P1	Organic products are safe.	1= Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly agree
P2	Organic products are popular because vegan diets are popular.	
P3	Eating organic products is fashionable.	
P4	Organic products are not easily found in grocery stores.	
P5	In Thailand, there is a small variety of organic products compared with non-organic.	
P6	There are a lot of places to buy organic products.	
P7	Organic products are tastier than non-organic.	
P8	The appearance of organic products (freshness, colour, texture) is better than non-organic.	
P9	Organic product labels are trustworthy.	
P10	I trust that the sellers of organic products are honest about the organic nature of their products.	
P11	I trust international organic certification.	
P12	Thai government certification for organic products is trustworthy.	

3.5.5 Consumers' attitudes towards organic products

Attitude is a psychological concept that is hypothesised to influence an individual's thoughts and actions (Jung, 1971). Attitudes are thus potentially significant factors that can influence consumers' purchasing behaviour, such as WTP premium prices for organic products (Voon et al., 2011). Consumers' attitudes towards organic products can be positive or negative and can be influenced by many social and psychological factors (Bonti-ankomah & Yiridoe, 2006; Voon et al., 2011). For example, attitudes can be affected by a person's religious beliefs, their motivations or a variety of psycho-social influences (Jung, 1971).

Attitudes, such as those relevant to this study, can be measured using direct and indirect measures (Thurstone, 1931). Direct measures may use items with a rating scale or Likert scale, whereas an indirect measure may use pictures or stories to stimulate discussion when interviewing respondents about their attitudes (Osgood, Suci & Tannenbaum, 1957). In this study, we used Likert scales to examine consumers' attitudes towards organic products. Those attitudes can be categorised into three types: health benefits, attitudes towards ethics and the environment, and attitudes towards food safety and prices (Sriwaranun, 2011). Nine items were used to measure consumers' attitudes towards organic products (see Table 3.9).

Table 3.9 Items measuring consumers' attitudes towards organic products

Variable	Description of Variable	Measurement Scale
A1	Organic products are healthier than non-organic.	1= Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly agree
A2	Organic products have more nutrients than non-organic.	
A3	The phrase "organic products" really means nothing artificial.	
A4	Pesticide and herbicide residues on farms have an effect on the environment.	
A5	I buy organic products because I want to support local farmers/producers.	
A6	Organic products are more environmentally friendly.	
A7	Organic products are not more expensive than non-organic.	
A8	Only consumers with higher incomes can afford organic products.	
A9	High price is not a problem if the product is genuinely organic.	

3.5.6 Consumers' knowledge of organic products

Knowledge plays an important role in consumers' purchase and consumption of organic products. Shafie and Rennie's (2012) study shows that understanding and knowledge of organic products influenced consumers' purchases of organic products when sold at high prices. Six items derived from previous studies were used to measure the knowledge of organic products construct (Roitner-Schobesberger et al., 2008; Sriwaranun, 2011) (see Table 3.10).

Table 3.10 Items measuring consumers' knowledge of organic products

Variable	Description of Variable	Measurement Scale
K1	I understand how organic products are produced.	1= Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly agree
K2	I understand how organic products are handled from farms to retailers.	
K3	I understand how organic products are different from conventional products.	
K4	Organic products are free from chemical fertilisers.	
K5	Organic products are free from pesticides.	
K6	Organic products are free from genetically modified organisms (GMOs).	

3.5.7 Consumers' lifestyle

Lifestyle is also a factor that is likely to influence consumers' decisions to purchase organic products. This study divides lifestyle into four categories: green, vegetarian, shopping at malls, and dining out. These were adopted from previous studies (Yeung et al., 2010; Sriwaranun, 2011; Voon et al., 2011). Eleven items were used to measure the consumer lifestyle variable (see Table 3.11).

Table 3.11 Items measuring consumers' lifestyle

Variable	Description of Variables	Measurement Scales
L1	I cook my meals.	
L2	I do not buy takeaway food.	
L3	I do not dine out.	
L4	I exercise regularly.	
L5	I often eat vegetables and fruit.	1= Strongly disagree,
L6	I keep a strict diet.	2 = Disagree,
L7	I usually read/check quality labels before buying food products.	3 = Neutral, 4 = Agree,
L8	I purchase most of my groceries at the same place regularly.	5 = Strongly agree
L9	I prefer to recycle as much of my household waste as possible.	
L10	I use reusable bags when I shop.	
L11	I prefer to buy foods that are environmentally friendly.	

3.6 Chapter summary

This chapter discusses the study's research methods and design, the questionnaire development, data collection and empirical estimation methods. The chapter explains why SEM was chosen as the primary estimation method. The questionnaire design is based on the conceptual framework, underpinned by theory and the literature review. The chapter explains how the questionnaire was developed, including the design, translation and back-translation, and pre-testing. This study used the convenience sampling to collect the data. Data were collected over six weeks at grocery stores and fresh markets in Bangkok, Thailand. This chapter also describes and discusses data analysis methods used to estimate consumers' WTP premium prices for organic products. Finally, the chapter presents the individual variables hypothesised to affect consumers' WTP premium prices for organic products and the instrumentation used for data collection. The next chapter discusses the descriptive statistics and the WTP premium price models' results.

Chapter 4

Descriptive Statistics and the WTP Premium Prices Survey Results

This chapter presents an overview of the data, descriptive statistics of the surveyed respondents and their WTP premium prices for organic products. The chapter provides information on the data collection methods, treatments (missing data, testing for normality and outliers), and descriptive statistics of the respondents' socio-demographic background. The relationships between and within groups of respondents of organic and non-organic product purchasers are statistically examined. The respondents' WTP premium prices for organic products and their actual expenditure on organic products are also investigated. The chapter concludes with a discussion of the average means of expected WTP premium prices for organic products.

4.1 Data mining

Cooper and Schindler (2011) suggest that researchers must clean their data before conducting data analysis. In this study, data mining was carried out to ensure that only valid data were included in the analysis. The study conducted two phases of data mining. First, the data set was double-checked to ensure that all information was correctly recorded. Second, frequency distributions, using SPSS (Software Version 24), were examined to identify any outlying data points.

4.1.1 Missing data

Missing data is an issue, especially for SEM analysis (Kline, 2011). Missing data occurs when respondents skip or are unable to answer one or more questions in the questionnaire. Missing data need to be identified and managed appropriately.

If the missing data are more than 10 per cent in an individual questionnaire, the questionnaire should be excluded from the analysis (Hair et al., 2010). If the missing data are less than 10 per cent it is not an issue (Hair et al., 2010). If the missing data pattern is random, it is also not considered an issue (Kline, 2015). In this study, some questionnaires with missing information of less than 10 per cent were included in the analysis. Kline (2015) suggests that the proper way to handle missing data is to minimise changes in the variable. Hair et al. (2010) recommend that the mean value is the best single value to replace missing data because it is calculated from all valid responses and minimises the effect on the normal distribution of the data. In our study, missing data was substituted using the mean substitution method (Hair, 2010; Kline, 2011).

4.1.2 Deleted questionnaires

Fifty questionnaires were excluded from analysis. Twelve questionnaires were excluded because they were incomplete or had missing data of more than 10 per cent and 24 were removed because the respondents did not appear to engage with the survey. These respondents answered 'somewhat agree' to every Likert scale item. The last question in the questionnaire asked respondents whether they agreed to participate; 14 did not agree to participate and were excluded from the analysis.

4.1.3 Outliers and normality test

An outlier is an unusual or extreme value in the data set (Pallant, 2013). An outlier can be identified using standardised values (z-score). Hair et al. (2010) suggest that if the sample is more than 80, a standardised values (z-score) less than -4 or more than +4 are considered outliers. In this study, only a few outliers were identified. However, Anderson et al. (2012) note that if the outliers have been coded correctly, they can be retained in the data set because they represent elements of the population. Therefore, the identified outliers were retained.

To determine whether the data variables are normally distributed, we calculate the sample's skewness and kurtosis values. Kline (2015) suggests that the absolute values of skewness and kurtosis should not be more than 3.00 and 8.00, respectively. Coefficients for the data set characteristics should be below these values to demonstrate acceptable normality in the data set. The skewness and kurtosis coefficients were 1.54 and 1.99, respectively (see Appendix B1), which indicates that the data are normally distributed.

Before conducting SEM analysis, one must ensure that the data set satisfies the SEM assumption; the data must be normally distributed (Awang, 2015b). The data set (containing organic product purchasers), was randomly divided into two sets. Data set one was analysed using EFA and data set two was analysed using CFA and SEM (see section 3.4). In data set one, the skewness and kurtosis values were 1.70 and 3.76, respectively (see Appendix B1). In data set two, the skewness and kurtosis values were 1.40 and 2.60, respectively (see Appendix B1). Both data sets were considered normally distributed because the skewness and kurtosis values did not exceed 3.00 and 8.00, respectively, the thresholds suggested by Kline (2015).

4.2 Descriptive statistics

Bangkok is the biggest organic product market in Thailand. In Bangkok, most fresh markets, supermarkets and retail chain stores offer organic products. Natural health stores in Bangkok carry more organic products than in other provinces (Panyakul, 2014). Bangkok consumers generally have a good knowledge of organic products (Roitner-Schobesberger et al., 2008). This survey was

conducted in several places in Bangkok. They included supermarkets, grocery stores and fresh markets where both organic and non-organic products are sold.

Convenience sampling was used to collect data from respondents who purchased grocery products. The survey was conducted between 10:00 am and 8:00 pm to ensure that we obtained information from a large range of respondents. Respondents over 18 years were asked to participate in the survey. They were approached after they had finished shopping. It is an advantage to ask respondents about their experience in purchasing grocery items right after they have completed their shopping because their shopping memories are fresh, especially about prices and the cost of their groceries. Convenience sampling was chosen because it is appropriate for collecting information from respondents who are available at a particular time and place and who can provide information via a structured survey questionnaire (Sekaran, 2003). On average, respondents took 20-25 minutes to complete the survey questionnaire. The survey questionnaires were administered over a six-week period from 15 March to 30 April 2018.

4.2.1 Response rate and number of respondents

The questionnaire was administered at several stores in Bangkok. The stores were divided into two groups, modern retail stores and traditional markets, based on Schipmann and Qaim's categories (2011). Modern retail stores consist of supermarkets, natural health stores and hypermarkets. Traditional market refers to fresh markets. The survey questionnaires were conducted during the long weekend holiday (Songkran Day). However, many respondents took the questionnaire with them but did not return it. Therefore, we distributed an additional 10 per cent of the original 1,500 questionnaires in order to obtain the number of questionnaires required for our study. Thus, a total of 1,650 questionnaires were administered to various respondents. Of these, 1,562 were returned. After removing missing cases, unengaged responses and those who refused to participate in the survey, we were left with 1,512 questionnaires. The useable response rate was 91.6 per cent.

The supermarkets (such as Tops Supermarket and Home Fresh Mart) are major grocery stores located in shopping malls. A supermarket offers different kinds of groceries, fresh produce and food products. The natural health store (Golden Place Shop) is a stand-alone store that is smaller than a supermarket. The natural health store offers fresh products, organic products and food products including health products such as vitamins and drugs. A hypermarket (such as Tesco-Lotus Supermarket) is a grocery department located in the Tesco-Lotus superstore that offers a wide range of products. The hypermarket offers fresh products, vegetables, rice, and food products. Traditional markets are called fresh markets (or wet markets). These are local markets where fresh products (such as fresh fruit, vegetables, meats and all kinds of food ingredients) are sold. Products from the

fresh market are cheaper than products from supermarkets, natural health stores and hypermarkets (Schipmann & Qaim, 2011).

Table 4.1 shows the number of respondents based on store location. Over a third of the surveyed respondents (35.4 per cent) completed the questionnaire at supermarkets located in shopping malls (Tops Supermarket - Ladprao, Tops Supermarket - Rama 9, Home Fresh Mart - Ngam Wong Wan and Home Fresh Mart - Bangkae). A further third (34.1 per cent) of the respondents completed the questionnaire at fresh markets (Summakorn Market- Sukhabhiban, Saimai Market- Saimai , Bangkapi Market- Bangkapi and Bon Marche Market- Bangkhen). Sixteen per cent of the respondents completed the questionnaire at natural health stores (Golden Place Shop - Sapan Sung, Golden Place Shop - Rama 9 and Golden Place Shop – Silom). Fourteen per cent of the respondents completed the questionnaire at Hypermarkets located in Tesco Lotus Superstores (Tesco-Lotus Supermarket - Rama 2 and Tesco-Lotus Supermarket - Bangpakok) (see Table 4.1). In summary, nearly two thirds of the respondents (65.8 per cent) completed the questionnaire at modern retail stores (such as supermarkets, natural health stores and hypermarkets) and just over one third (34.4 per cent) at a traditional market (fresh markets).

Table 4.1 The number of surveyed respondents based on store location

Store- Location	Type of Store	Number of Respondents	Percentage
Tops Supermarket - Ladprao	Supermarket	106	7.0
Tops Supermarket - Rama 9	Supermarket	105	6.9
Home Fresh Mart - Ngam Wong Wan	Supermarket	205	13.6
Home Fresh Mart - Bangkae	Supermarket	120	7.9
Golden Place Shop - Sapan Sung	Natural Health Store	64	4.2
Golden Place Shop - Rama 9	Natural Health Store	97	6.4
Golden Place Shop - Silom	Natural Health Store	81	5.4
Tesco-Lotus Supermarket - Rama 2	Hypermarket	92	6.1
Tesco-Lotus Supermarket - Bangpakok	Hypermarket	126	8.3
Summakorn Market - Sukhabhiban 3	Fresh Market	102	6.7
Saimai Market - Saimai	Fresh Market	103	6.8
Bangkapi Market - Bangkapi	Fresh Market	124	8.2
Bon Marche Market- Bangkhen	Fresh Market	187	12.4
Total		1,512	100.0

4.2.2 Surveyed respondents' socio-demographic profiles

Table 4.2 presents the socio-demographic profiles of the surveyed respondents. In this study, organic product purchasers are defined as respondents who had bought organic products at some time in

Table 4.2 Socio-demographic profiles of the surveyed respondents

Variable	Organic Product Purchasers [a] (%) (n= 784)	Non-organic Product Purchasers [a] (%) (n= 728)	Total (%) (n= 1,512)	χ^2 [b]
Gender				*21.869****
Male	27.9	39.3	33.4	
Female	72.1	60.7	66.6	
Age				*53.584****
18-22	7.4	12.0	9.6	
23-27	17.0	21.2	19.0	
28-32	11.0	17.1	14.0	
33-37	11.1	10.2	10.7	
38-42	10.9	11.7	11.3	
43-47	9.7	7.7	8.7	
48-52	7.6	6.0	6.8	
53-57	7.0	5.0	6.0	
58-62	6.6	3.8	5.2	
63-67	5.6	3.6	4.6	
Older than 67	6.1	1.8	4.0	
Status				*28.802****
Single	53.2	63.2	58.0	
Engaged	0.5	1.2	0.9	
Married	35.3	27.5	31.5	
De facto relationship	4.5	5.4	4.9	
Divorced	3.7	1.4	2.6	
Widow	2.7	1.4	2.1	
Other	0.1		0.1	
Education				*11.361***
Primary school	3.1	3.2	3.1	
Secondary school	12.4	14.4	13.4	
Technical or vocational school	11.5	15.4	13.4	
Bachelor's degree	52.4	51.6	52.1	
Master's degree	19.5	14.6	17.1	
Doctorate	1.1	0.8	1.0	
Occupation				*31.865****
Student	9.3	12.4	10.8	
Government officer	9.7	10.9	10.3	
Private company officer	45.0	45.9	45.4	
Self employed	13.0	15.5	14.2	
Farmer	0.5	0.0	0.3	
Housewife	8.4	5.9	7.2	
Labourer	2.3	3.7	3.0	
Retired	10.1	4.4	7.3	
Unemployed	1.3	1.1	1.2	
Other	0.4	0.3	0.3	
Household income				*25.833****
Less than 15,000 baht	11.4	18.0	14.6	
15,000-30,000 baht	28.4	29.5	28.9	
30,001-45,000 baht	13.7	15.8	14.7	
45,001-60,000 baht	11.1	11.0	11.0	
60,001-75,000 baht	7.7	7.3	7.5	
75,001-90,000 baht	5.1	3.3	4.2	
90,001-105,000 baht	5.2	3.4	4.4	

Table 4.2 Socio-demographic profiles of the surveyed respondents (continued)

Variable	Organic Product Purchasers [a] (%) (n= 784)	Non-organic Product Purchasers [a] (%) (n= 728)	Total (%) (n= 1,512)	χ^2 [b]
105,001-120,000 baht	5.2	2.8	4.1	
120,001-135,000 baht	1.9	1.4	1.7	
135,001-150,000 baht	2.0	0.9	1.5	
Over 150,000 baht	8.3	6.7	7.5	
Household characteristics				*9.266^{ns}*
Single adult living alone	17.3	19.1	18.2	
Single adult living with others	24.7	28.7	26.7	
Couple without children	10.1	7.7	8.9	
Couple with a child (or children)	26.5	22.8	24.7	
Single parent with a child (or children)	4.0	4.0	4.0	
Extended family (grandparents or other relatives)	16.6	17.4	17.0	
Other	0.8	0.3	0.5	
The number of people in the household				*1.484^{ns}*
1-2	30.4	28.3	29.4	
3-4	41.8	43.4	42.6	
5-7	22.1	23.4	22.7	
8 and over	5.7	4.9	5.4	
Average [d]	3.78 (2.315)[c]	3.81 (2.169)[c]		-0.245^{ns}

Note: [a] Organic product purchaser refers to respondents who stated that they had bought organic products in 2017. Non-organic product purchaser refers to respondents who indicated that they had not bought organic products in 2017. [b] Chi-square test results. [c] The number in brackets is the standard deviation (SD). [d] Independent samples t-test. *, **, *** indicate significance at 0.1, 0.05 and 0.01 levels, respectively.

the previous year and answered all of the relevant survey questions. Non-organic product purchasers are respondents who had not purchased organic products in the previous year and/or had not answered any of the questions regarding their experience of and expenditure on the purchase of organic products. These respondents were asked to indicate why they did not buy organic products. Of the 1,512 respondents, 784 purchased organic products and 728 did not purchase organic products.

Table 4.2 shows the surveyed respondents' gender. The main purchasers of groceries were female (66.6 per cent). Most organic product purchasers (784 respondents) and non-organic product purchasers (728 respondents) were women (72.1 per cent and 60.7 per cent, respectively). There is a significant difference in gender between organic and non-organic product purchasers. This study shows that women are more likely to be both grocery and organic product purchasers.

The majority of respondents (73.3 per cent) are aged between 18 and 47 years. The survey results show that 57.4 per cent of organic product purchasers were in the 18 to 42 years age groups compared with 72.2 per cent of non-organic product purchasers in the same age groups. Over 42 per cent of organic product purchasers were over 43 years old compared with 27.9 per cent of non-organic product purchasers. The distribution of organic and non-organic product purchasers' ages was significantly different at the 0.01 level. This implies that the organic product purchasers were more likely to be older than non-organic product purchasers.

The survey results show that over half of the respondents were single (58.5 per cent) followed by married (31.5 per cent). For the organic products purchasers, most are single (53.2 per cent) followed by married (35.3 per cent). Nearly two thirds of non-organic product purchasers are single (63.2 per cent) followed by married (27.5 per cent). The marital status of organic and non-organic product purchasers was significantly different at the 0.01 level. Married respondents are more likely to be organic product purchasers, whereas respondents who are single are more likely to be non-organic product purchasers.

The survey results also show that 52.1 per cent of the respondents had graduated with a bachelor degree and 17.1 per cent had a master degree. Just over 13 per cent of the respondents had completed technical or vocational school and secondary school. For organic product purchasers, the results show that 52.4 per cent of the respondents had graduated with a bachelor degree, 19.5 per cent with a master degree, 15.5 per cent with primary and secondary school level and 11.5 per cent with vocational school. For non-organic product purchasers, the results show 51.6 per cent of respondents had graduated with a bachelor degree, 17.6 per cent with primary and secondary school level, 15.4 per cent with vocational school and 14.6 per cent with a master degree. The education level of organic and non-organic product purchasers was significantly different at the 0.05 level. The education level of the organic product purchasers was more likely to be higher than non-organic product purchasers.

The survey results show that nearly half of the respondents worked as private company officers (45.4 per cent), followed by self-employed (14.2 per cent), students (10.8 per cent) and government officers (10.3 per cent). The remaining 19.7 per cent consist of retired individuals, housewives, labourers, unemployed individuals and farmers. For organic products purchasers, nearly half of the respondents worked as private company officers (45.0 per cent), followed by self-employed (13.0 per cent), retired (10.1 per cent), government officers (9.7 per cent), students (9.3 per cent) and housewives (8.4 per cent). For non-organic products purchasers, again nearly half (45.9 per cent) worked as private company officers, followed by self-employed (15.5 per cent), students (12.4 per cent), government officers (10.9 per cent), housewives (5.9 per cent) and retired (4.4 per cent).

There is a significant difference in occupation between organic and non-organic product purchasers at the 0.01 level.

Household income was divided into 11 groups. The largest household income group was between 15,000 and 30,000 baht (28.9 per cent), followed by 30,001 to 45,000 baht (14.7 per cent) and less than 15,000 baht (14.6 per cent). The distribution of the respondents' household income was skewed towards the middle-income levels, between 15,000 and 30,000 Baht (28.9 per cent), and 30,001 and 45,000 Baht (14.7 per cent) (see Table 4.2). Differences in household income between organic and non-organic product purchasers was significant at the 0.01 level. The results indicate that higher household incomes were more likely to be organic product purchasers. For example, 8.3 per cent of organic product purchasers were in the highest household income group (over 150,000 baht), but only 6.7 per cent of non-organic product purchasers were in that household income level.

The results show that most of the respondents are single adults living with others (26.7 per cent), followed by couples with children (24.7 per cent), single adult living alone (18.2 per cent), extended family (17.0 per cent), a couple without children (8.9 per cent), and single parent with a child or children (4.0 per cent). The results indicate that the household characteristics of organic and non-organic product purchasers are similar. There is no significant difference in household characteristics between organic and non-organic product purchasers.

The survey results show that almost half of the respondents (42.6 per cent) had three to four people in their household, 29.4 per cent had one or two people, 22.7 per cent had five to seven people and 5.4 per cent had over seven people in their household. The distribution of the number of people living in the households of organic and non-organic product purchasers were similar. The average number of people living in the organic product purchaser household was 3.78 compared with 3.81 people in the non-organic product purchaser household. Both the Chi-square test and the independent sample t-test show the number of people in the organic and non-organic product purchaser household is not statistically significantly different.

4.3 Grocery purchasing behaviour

To investigate grocery purchasing behaviour, respondents were asked to indicate where they usually shop. In addition, they were also asked to provide information about their diet and health problems. Table 4.3 shows that 22.94 per cent of the respondents purchase groceries at fresh markets, followed by the discount stores (19.12 per cent), grocery departments (18.81 per cent) and supermarkets (17.42 per cent).

Table 4.3 Surveyed respondents' grocery purchasing behaviour

Variable	Organic Product Purchasers (%) (n= 784)	Non-organic Product Purchasers (%) (n= 728)	Total (%) (n= 1,512)	χ^2 [b]
Usual Place of Purchase [a]				
Grocery Department	19.23	18.32	18.81	7.579***
Discount Store	18.07	20.37	19.12	0.213[ns]
Supermarket	18.21	16.49	17.42	11.817***
Healthy Food Store	10.08	5.31	7.90	47.558***
Convenience Store	10.88	12.29	11.52	0.108[ns]
Fresh Market	21.10	25.12	22.94	3.486*
Online Shopping	1.26	1.83	1.52	1.175[ns]
Other(s)	1.17	0.28	0.76	45.482***
Respondents are Vegetarian	7.00	5.90	6.50	0.766[ns]
Respondents have Health Problems	20.40	19.20	19.80	0.329[ns]

Notes: [a] Multiple responses. The percentage is compared with the total number of responses.
[b] Chi-square test results. *, **, *** indicate significance at 0.1, 0.05 and 0.01 levels, respectively.

Organic product purchasers usually purchase their products at the fresh markets (21.10 per cent) followed by the grocery departments (19.23 per cent), supermarkets (18.21 per cent), discount stores (18.07 per cent), convenience stores (10.88 per cent), health food stores (10.08 per cent) and online shopping (1.26 per cent). Organic product purchasers buy groceries least frequently at other places (1.17 per cent), such as the Royal Project Shop, farmers' markets and mobile grocery trucks. Non-organic product purchasers usually purchase groceries at fresh markets (25.12 per cent) followed by discount stores (20.37 per cent), grocery departments (18.32 per cent), supermarkets (16.49 per cent), convenience stores (12.29 per cent), health food stores (5.31 per cent), online shopping (1.83 per cent) and others (0.28 per cent). The differences in the places that organic and non-organic product purchasers frequently purchase their groceries at are significantly different at the 0.01 level. There are significant differences at the 0.1 level in the frequency that organic and non-organic product purchasers visit fresh markets. These results imply that organic product purchasers buy groceries more frequently at grocery departments, supermarkets, health food stores and other places than non-organic product purchasers. Non-organic product purchasers buy groceries more frequently at fresh markets.

The results show that 19.8 per cent of the respondents have health problems. Twenty per cent of the organic product purchasers, and 19.2 per cent of non-organic product purchasers have health problems. Six-and-a-half per cent of respondents indicated that they were vegetarian. Of these, 7.0 per cent are organic products purchasers and 5.9 per cent were non-organic product purchasers. There is no significant difference between organic and non-organic product purchasers regarding both health problems and vegetarian lifestyle.

4.3.1 Surveyed respondents' lifestyle

The respondents were asked about their lifestyle based on their health diet, environmental concerns, and preparing food at home or dining out. The responses regarding the respondents' lifestyle were calculated using mean scores and standard deviations for each statement (see Table 4.4) and the frequency of each response (see Appendix B2). The significant differences between organic and non-organic product purchases are identified and reported.

Table 4.4 shows that most respondents often ate vegetables and fruit, with a mean score of 4.10, usually checked the quality label before buying food products (mean of 3.89) and kept a strict diet (mean of 3.38). The respondents reported frequently using reusable bags when shopping (mean of 3.82), preferring to buy foods that are environmentally friendly (mean of 3.84), exercise regularly (3.69), purchase groceries at the same store (3.60) and recycle their household waste (3.39).

Previous studies in Thailand reported that organic product purchasers prefer to cook at home rather than buy takeaway foods or dine out (Sriwaranun, 2011). Next, the respondents were asked to indicate how often they cook, buy takeaway foods or dine out. The results in Table 4.4 show that the majority of the respondents answered "sometimes" to the following statements "I cook my meals", "I do not buy food take away" and "I do not dine out" with mean scores of 3.35, 2.58 and 2.66, respectively. Therefore, we conclude that the respondents are aware of the importance of having a healthy diet, follow a strict diet and show concern for the environment. The respondents sometimes cook their meals, buy takeaway food and dine out.

The independent sample t-test shows significant differences in lifestyle between organic and non-organic product purchasers. Organic product purchasers' exhibit higher means for reading and checking labels before purchasing products, prefer to recycle waste, use recyclable bags, prefer to buy environmentally friendly food, keep to a strict diet, cook their own meals and do not buy takeaway foods than non-organic product purchasers. The findings are consistent with Sriwaranun's (2011) study that found that organic product purchasers prefer to cook their own meals and did not regularly buy takeaway foods. However, other lifestyle features, such as dining out, exercise and regularly shopping at a particular grocery store, were not significantly different between organic and non-organic product purchasers.

Table 4.4 Surveyed respondents' lifestyles

Statement	Organic Product Purchasers (n= 784)		Non-organic Product Purchasers (n= 728)		Total (n= 1,512)		
	Mean	SD	Mean	SD	Mean	SD	t-value [a]
I cook my meals	3.42	1.184	3.26	1.150	3.35	1.170	2.747***
I do not buy takeaway food	2.64	0.976	2.52	0.947	2.58	0.963	2.283**
I do not dine out	2.64	0.954	2.69	1.021	2.66	0.987	-0.995[ns]
I exercise regularly	3.68	1.054	3.71	0.971	3.69	1.015	-0.706[ns]
I often eat vegetables and fruits	4.20	0.789	4.00	0.846	4.10	0.822	4.577***
I keep a strict diet	3.46	0.961	3.31	0.920	3.38	0.944	3.048***
I usually read/check quality labels before buying food products	3.99	0.855	3.77	0.889	3.89	0.878	4.914***
I purchase most of my groceries at the same place regularly	3.63	0.866	3.57	0.907	3.60	0.886	1.227[ns]
I prefer to recycle as much of my household waste as possible	3.47	1.046	3.30	1.010	3.39	1.032	3.311***
I use reusable bags when I shop	3.88	1.027	3.75	1.025	3.82	1.027	2.461**
I prefer to buy foods that are environmentally friendly	3.94	0.854	3.73	0.871	3.84	0.869	4.708***

Notes: [a] Independent-sample t-test results. *, **, *** indicate significant difference between organic and non-organic product purchasers at 0.1, 0.05, and 0.01 levels, respectively.

4.3.2 Surveyed respondents' knowledge of organic products

This section presents the surveyed respondents' self-reported knowledge and understanding of organic products. Table 4.5 shows the mean scores, standard deviations and the independent sample t-tests of the consumer's knowledge and understanding of organic products. Appendix B3 shows the frequency of these responses. Most respondents (67.7 per cent) reported they knew "how organic products are produced" (mean of 3.8). Similarly, 66.5 per cent of the respondents knew "how organic product are different from conventional products" (mean of 3.79). Over half of the respondents (53.8 per cent) reported that they knew how "organic products are handled from farms to retailers" (3.57).

In terms of understanding of the word "organic products", most respondents (78.7 per cent) reported that they understand that "organic products are free from chemical fertilisers" (mean of 4.2). Most respondents (83.2 per cent) indicated that they knew "organic products are free from pesticides" (4.23) and 67.5 per cent of the respondents reported that they understood "organic products are free from GMOs" (3.89). These mean scores indicate that, overall, most respondents know about organic production and understand what organic products are.

Table 4.5 Surveyed respondents' knowledge of organic products

Statement	Organic Product Purchaser (n= 784)		Non-organic Product Purchaser (n= 728)		Total (n= 1,512)		
	Mean	SD	Mean	SD	Mean	SD	t- value [a]
I understand how organic products are produced	3.90	0.863	3.70	0.858	3.80	0.866	4.517***
I understand how organic products are handled from farms to retailers	3.64	0.909	3.49	0.911	3.57	0.913	3.230***
I understand how organic products are different from conventional products	3.90	0.841	3.67	0.843	3.79	0.849	5.338***
Organic products are free from chemical fertilisers	4.21	0.947	4.01	1.007	4.12	0.981	3.914***
Organic products are free from pesticides	4.36	0.889	4.09	1.026	4.23	0.966	5.433***
Organic products are free from genetically modified organisms (GMOs)	3.99	1.086	3.79	1.056	3.89	1.076	3.649***

Note: [a] Independent-samples t-test results.
*** indicate the significant differences between organic and non-organic product purchasers at 0.01 level.

Organic product purchasers' exhibit higher mean scores for statements regarding their knowledge and understanding of organic products than non-organic product purchasers (see Table 4.5). The t-test shows that the knowledge and understanding of organic products of organic and non-organic product purchasers were significantly different at the 0.01 level. These results indicate that organic product purchasers are more knowledgeable about and have greater understanding of organic products than non-organic product purchasers.

4.3.3 Surveyed respondent's perceptions of organic product attributes

This section presents the surveyed respondents' perceptions of organic product attributes. Table 4.6 shows the mean scores, standard deviations of the respondents' perceptions of organic product attributes, and Appendix B4 shows the frequency of the responses. Over 70 per cent of respondents believe that organic products are safer than conventional products (mean of 4.04) and "organic products are popular because vegan diets are popular" (3.90). Over half of the respondents agreed that the appearance of organic products (freshness, colour, texture) is better than non-organic products (3.64).

Table 4.6 Surveyed respondents' perceptions of organic product attributes

Statement	Organic Product Purchasers (n= 784)		Non-organic Product Purchasers (n= 728)		Total (n= 1,512)		
	Mean	SD	Mean	SD	Mean	SD	t- value [a]
Organic products are safe	4.13	0.779	3.94	0.803	4.04	0.796	4.744***
Organic products are popular because vegan diets are popular	3.96	0.784	3.83	0.813	3.90	0.800	3.221***
Eating organic products is fashionable	3.34	1.012	3.36	0.978	3.35	0.996	-0.352^{ns}
Organic products are not easily found in grocery stores	3.63	1.003	3.67	0.957	3.65	0.981	-0.853^{ns}
In Thailand, there is a small variety of organic products compared with non-organic	3.87	0.969	3.83	0.880	3.85	0.927	0.925^{ns}
There are a lot of places to buy organic products	3.38	1.013	3.25	0.982	3.32	1.000	2.528**
Organic products are tastier than non-organic	3.33	0.944	3.13	0.919	3.24	0.938	4.244***
The appearance of organic products (freshness, colour, texture) is better than non-organic	3.72	0.927	3.56	0.965	3.64	0.949	3.344***
Organic product labels are trustworthy	3.18	1.046	3.04	0.961	3.11	1.008	2.706***
I trust that the sellers of organic products are honest about the organic nature of their products	3.49	0.941	3.43	0.928	3.46	0.935	1.297^{ns}
I trust international organic certification	3.14	0.976	2.95	0.937	3.05	0.962	3.769***
Thai government certification for organic products is trustworthy	3.44	0.858	3.34	0.870	3.39	0.865	2.147**

Notes: [a] Independent samples t-test results
*, **, *** indicate significant differences between organic and non-organic product purchasers at 0.1, 0.05 and 0.01 levels, respectively

However, most respondents believe that there was a lack of organic products in Thai markets. Over 60 per cent of the respondents agreed that "there is a small variety of organic products compared with non-organic products" (mean of 3.85). Nearly 70 per cent of respondents noted that it is difficult to find organic products in grocery stores (3.65). These findings are consistent with previous studies (Roitner-Schobesberger et al., 2008; Sangkumchaliang & Huang, 2012; Sriwaranun, 2011).

Respondents' perceptions about availability, trustworthiness and the quality of organic products were mixed. Regarding the availability of organic products, 36.2 per cent of respondents "agreed" but 32.3 per cent chose "neutral" in response to the statement "there are a lot of places to buy organic products" (mean of 3.32). For the trustworthiness of organic products, 23.6 per cent of the

respondents “agreed”, but 42.1 per cent indicated that they felt “neutral” in response to the statement “organic product labels are trustworthy” (mean of 3.11). Only 21.0 per cent of the respondents agreed with the statement “I trust international organic certification” (mean of 3.05) whereas 46.0 per cent gave a neutral response. Furthermore, 43.5 per cent of the respondents agreed with the statement “Thai government certification for organic products is trustworthy” (mean of 3.39) but 36.2 per cent gave a neutral response. For the statement “I trust that the sellers of organic products are honest about the organic nature of their products” (mean of 3.46), 35.4 per cent of the respondents indicated that they “agreed” and 38.6 per cent indicated “neutral.”

Regarding the quality of organic products, 26.6 per cent of the respondents selected “agree”, but 47.2 per cent reported “neutral” for the statement “organic products are tastier than non-organic products” (mean of 3.24). For the statement, “eating organic products is fashionable” (mean of 3.35), 33.9 per cent of the respondents selected “agree” and 39.0 per cent selected “neutral.”

The results in Table 4.6 show that organic product purchasers exhibit higher mean scores than non-organic product purchasers with regard to organic products’ quality and taste, trust in organic labels and certification. However, organic product purchasers exhibited lower mean scores for two statements: “eating organic products is just a fashion” and “organic products are difficult to find in grocery stores.”

The independent sample t-test shows that the respondents’ perceptions of organic product attributes significantly differ at the 0.01 level for organic and non-organic product purchasers. However, there was no significant difference between organic and non-organic product purchases’ perceptions of three statements: eating organic products is a fashion, organic products are hard to find and have a small variety, and the seller of organic products is trustworthy.

In conclusion, organic product purchasers believe that organic products are safe, healthier, tastier, and popular, of better appearance and have more nutrients than conventional products. Organic product purchasers also trust organic product labelling, international and Thai government certification and believe that they can buy organic products from many places. In contrast, non-organic product purchasers believe that eating organic products is fashionable and that organic products are difficult to find in grocery stores.

4.3.4 Surveyed respondents’ attitudes towards organic products

The mean scores and standard deviations of statements related to health, environment and ethics, including price, were used to investigate the respondents’ attitudes towards organic products. Table 4.7 and Appendix B4 show that most respondents (over 75 per cent) strongly agree with the statements “pesticide and herbicide residues on farms have an effect on the environment” with a

high mean score of 4.15 and “organic products are more environmentally friendly” (mean of 4.07). The results also show that most respondents (approximately 70 per cent) have a positive attitude towards organic products indicated by the statement “organic products really means nothing artificial" (mean of 3.95), and “organic products are healthier than non-organic” (mean of 3.86). Likewise, about half of the respondents indicated that they buy organic products because they want to support local farmers/producers (mean of 3.56), and “organic products have more nutrients than non-organic products” (mean of 3.38). However, the respondents exhibited neutral levels of agreement to statements related to the price of organic products. The mean scores of these statements were close to 3.00 (see Table 4.7). Overall, the results show that respondents exhibited positive attitudes about the health benefits, environmentally friendly nature of organic products and ethics in purchasing organic products. However, the respondents were largely neutral about organic products’ price.

Table 4.7 Surveyed respondents’ perceptions of and attitudes towards organic products

Statement	Organic Product Purchasers (n= 784)		Non-organic Product Purchasers (n= 728)		Total (n= 1,512)		
	Mean	SD	Mean	SD	Mean	SD	t- value [a]
Organic products are healthier than non-organic	4.02	0.804	3.69	0.866	3.86	0.850	7.584***
Organic products have more nutrients than non-organic	3.45	0.981	3.31	0.949	3.38	0.968	2.627***
The phrase “organic products” really means nothing artificial	4.04	0.916	3.84	0.961	3.95	0.943	4.282***
Pesticide and herbicide residues on farms have an effect on the environment	4.28	0.820	4.01	0.941	4.15	0.891	6.038***
I buy organic products because I want to support local farmers/producers	3.61	1.035	3.50	0.983	3.56	1.011	2.161**
Organic products are more environmentally friendly	4.20	0.769	3.93	0.850	4.07	0.820	6.620***
Organic products are not more expensive than non-organic	2.85	1.213	2.97	1.212	2.91	1.214	-1.904*
Only consumers with higher incomes can afford organic products	3.14	1.130	3.23	1.061	3.18	1.098	-1.668*
High price is not a problem if the product is genuinely organic	3.28	1.163	3.07	1.142	3.18	1.157	3.484***

Notes: [a] Independent-samples t-test results *, **, *** indicate significant differences between organic and non-organic product purchasers at 0.1, 0.05 and 0.01 levels, respectively

The independent sample t-test shows that the respondents' attitudes toward organic products differ significantly at the 0.1 level between the two groups (organic and non-organic product purchasers). We conclude that organic product purchasers reveal positive attitudes toward the nutrient and health benefits as well as the environmental impact and ethical nature of organic products. In addition, organic product purchasers purchase organic products to support local farmers. In contrast, non-organic product purchasers display significant negative attitudes, particularly about the high prices of organic products and believe that only people with high incomes can afford to buy organic products.

Table 4.8 shows that 728 of the surveyed respondents (48.1 per cent) claimed that they are non-organic product purchasers having not purchased organic products during the past year.

Table 4.8 Reasons non-organic product purchasers do not purchase organic products

Statement	Non-organic Product Purchasers (%) (n= 728)
Reasons for Not Purchasing Organic Products [a]	
High price	21.8
Poor appearance	1.6
Lack of variety	14.5
Hard to find	19.5
Low quality	2.5
Poor taste	2.9
Not really organic	11.8
Hard to understand	3.9
Prefer conventional products	2.8
Do not trust certification	7.0
Lack of information	10.3
Other	1.5
Attributes that Would Persuade you to Purchase Organic Products [a]	
Lower price	20.4
Increased availability	9.2
Better appearance	7.4
Higher quality	16.3
More package sizes	6.3
Environmentally friendly packaging	9.0
Wider range of products	12.5
Trust in organic certification	9.5
More information	8.1
Other	1.3

Note: [a] Multiple responses.

The main reasons for not buying organic products include the high price of organic products (21.8 per cent), difficult to find (19.5 per cent), a lack of product variety (14.5 per cent) and the belief that the products sold are not organic (11.8 per cent). Other reasons preventing respondents from buying organic products include a lack of information (10.3 per cent), they do not trust the certification (7.0

per cent), questionable authenticity of organic products (3.9 per cent) and preference for conventional products (2.8 per cent) (see Table 4.8).

The factors that persuade respondents to purchase organic products include a lower price (20.4 per cent), higher quality (16.3 per cent) and a wider range of organic products (12.5 per cent) followed by trust in organic certification (9.5 per cent), increased availability (9.2 per cent) and environmentally friendly packaging (9.0 per cent). More package sizes (6.3 per cent) is the least important reason persuading respondents to purchase organic products (see Table 4.8).

4.3.5 Surveyed respondents' risk perceptions towards purchasing organic products

The respondents' risk perceptions were measured based on psychological risk (4 statements), functional risk (4 statements), social risk (4 statements), financial risk (4 statements), physical risk (4 statements) and time risk (3 statements). We asked the respondents about their perceptions of risk when purchasing or thinking about purchasing food products, including organic products. Table 4.9 shows the mean scores and standard deviations of the surveyed respondents' risk perceptions and Appendix B5 shows the frequency of the responses. Table 4.9 shows that all statements displayed mean scores of between 2.41 and 3.95, with an average mean score of 3.30 (standard deviation of 0.999). The results imply that, overall; the respondents were somewhat concerned about the risks when purchasing food and organic products. The results indicate that respondents displayed both low and high-risk awareness when purchasing food and organic products. The findings related to the risks are discussed next.

Table 4.9 shows that the respondents exhibited high risk perception towards "functional risk" with an average mean score of 3.82 (standard deviation of 0.871). Most respondents (approximately 70 per cent) were worried about pesticide residues on food and were concerned about the cumulative effects of pesticides in their food (see Appendix B5), with mean scores of 3.95 and 3.93, respectively (see Table 4.9). Approximately 60 per cent of the respondents were concerned about food safety even if the product is claimed to be organic (mean of 3.7), and they were concerned about how organic products were processed (mean of 3.69). The findings imply that the respondents are most concerned about food safety, regardless of whether the food products they purchase are organic or non-organic. This functional risk is an important part of the respondents' risk perceptions when purchasing food and organic products.

Table 4.9 Surveyed respondents' risk perceptions when purchasing food products including organic products

Statement	Organic Product Purchasers (n= 784)		Non-organic Product Purchasers (n= 728)		Total (n= 1,512)		
	Mean	SD	Mean	SD	Mean	SD	t- value [a]
Psychological risk							
I would be embarrassed if I purchased the product at high price but the product has been treated with chemicals	3.22	1.225	3.29	1.186	3.25	1.206	-1.114[ns]
I fear being cheated when purchasing organic products	3.40	1.107	3.39	1.081	3.40	1.094	0.044[ns]
I would lose face if I purchased non-organic products that claimed to be organic	3.17	1.195	3.32	1.133	3.25	1.168	-2.490**
I waste my money if I buy non-organic products that claimed to be organic	3.43	1.215	3.41	1.135	3.42	1.177	0.358[ns]
Functional risk							
I worry about pesticide residue when buying food products	4.03	0.846	3.86	0.892	3.95	0.872	3.673***
I am concerned about how organic products are processed	3.75	0.844	3.63	0.869	3.69	0.858	2.653***
I am concerned about the cumulative effects of pesticides in my food	4.04	0.830	3.82	0.907	3.93	0.874	4.830***
I am concerned about food safety even if the product claims to be organic	3.68	0.894	3.72	0.863	3.70	0.879	-0.861[ns]
Social risk							
I am never really certain that the organic products I purchased are really organic	3.23	0.981	3.41	0.941	3.31	0.965	-3.522***
I do not easily trust product claims that a product is really organic	3.41	1.005	3.50	0.941	3.45	0.976	-1.799*
I would be out of fashion if I did not eat organic products	2.29	1.066	2.55	1.103	2.41	1.091	-4.630***
My family and friends will blame me for not doing the right thing if I do not eat organic products	2.34	1.065	2.56	1.069	2.45	1.072	-4.005***
Financial risk							
I think that organic products are not as safe as they claim to be	2.88	0.983	2.97	0.955	2.92	0.970	-1.797*
I would save money and buy more if I did not buy organic products	2.97	0.997	3.17	0.973	3.07	0.991	-4.091***
I think using the words "organic product" is only a marketing strategy to sell at higher prices	3.48	1.076	3.57	1.028	3.52	1.054	-1.499[ns]
Paying a higher price for organic products is wasteful	2.61	0.942	2.90	0.943	2.75	0.953	-6.011***

Table 4.9 Surveyed respondents' risk perceptions when purchasing food products including organic products (continued)

Statements	Organic Product Purchasers (n= 784)		Non-organic Product Purchasers (n= 728)		Total (n= 1,512)		
	Mean	SD	Mean	SD	Mean	SD	t- value [a]
Physical risk							
Non-organic products that claim to be organic can harm my health	3.63	1.013	3.48	1.003	3.55	1.011	2.935***
Truly organic products taste better than conventional products	3.21	0.936	3.03	0.862	3.12	0.905	3.832***
Truly organic products are more nutritious than conventional one	3.34	0.956	3.15	0.977	3.25	0.970	3.843***
Time risk							
I do not have time to find organic products	3.20	1.032	3.60	0.923	3.39	1.001	-7.917***
Limited supply makes buying organic products harder	3.32	1.049	3.59	0.879	3.45	0.980	-5.388***
I try to buy organic products whenever they are available	3.57	0.907	3.26	0.905	3.42	0.919	6.664***

Notes: [a] Independent-samples t-test results. *, **, *** indicate significant differences between organic and non-organic product purchasers at 0.1, 0.05 and 0.01 levels, respectively

The results show that the respondents perceived high levels of risk related to "time risk" when purchasing organic products, with a mean score of 3.42 (standard deviation of 0.967). The results in Table 4.9 show that all statements related to time risk displayed mean scores above 3.0 indicating that respondents were more concerned about time risk when purchasing organic products. Approximately 50 per cent of the respondents note that it is time consuming to find organic products, are unhappy about the availability of organic products and believe that buying organic products is a waste of time. They note that the limited supply makes buying organic products more difficult, with a mean score of 3.45. This finding is consistent with Sriwaranun's (2011) and Roitner-Schobesberger et al.'s results (2008). The respondents were also concerned about the time it took to find organic products (mean of 3.39), so they try to buy organic products whenever they are available (mean of 3.42).

"Psychological risk" is the most important risk that respondents were concerned about when purchasing organic products, with a mean of 3.33 (standard deviation of 1.161). All statements regarding psychological risk show mean scores above 3.0 indicating that the respondents have high levels of concern about psychological risk (see Table 4.9). The respondents were concerned about

wasting their money on inauthentic organic products (mean of 3.42). Over 50 per cent of the respondents were concerned about being cheated when purchasing organic products (mean of 3.40) (see Table 4.9 and Appendix B5). Approximately 40 per cent of the respondents were concerned about the potential embarrassment associated with purchasing an expensive product that had been treated with chemicals (mean of 3.25). The respondents were also worried about losing 'face' if they purchased non-organic products that claimed to be organic (mean of 3.25).

The respondents were somewhat concerned about "physical risk" when purchasing organic products, with a mean of 3.31 (standard deviation of 0.962). The result implies that the respondents perceived high levels of physical risk, such as concerns about food safety, nutrition and taste of the organic products they purchased. The results in Table 4.9 show that the respondents were worried about their health and safety when purchasing non-organic products that claim to be organic (mean of 3.55). The respondents were also worried about nutrition (mean of 3.25) and taste (mean of 3.12) of organic products because they believed organic products should be better than conventional products.

In terms of "financial risk", the mean score is 3.07 (standard deviation of 0.992), indicating that respondents are less concerned about financial risk when they purchase organic products. The results in Table 4.9 show that the respondents are somewhat concerned about paying high prices for the word "organic," that it is used only for marketing purposes (mean of 3.52) and that they would save money if they did not buying organic products (mean of 3.07). However, the respondents were not concerned about financial risk in terms of the quality of organic products compared with the price they pay. The respondents disagreed with the statement that paying a higher price for organic products is wasteful (mean of 2.75), and that organic products are not safe and therefore they should not pay high prices for organic products (mean of 2.92)

Respondents are less concerned about "social risk" when purchasing organic products. The respondents perceive low levels of social risk, mean of 2.91 (standard deviation of 1.026). The results in Table 4.9 show that all statements related to social risk have mean scores of between 2.41 and 3.45 indicating that the responses are mixed. The respondents do not trust products that claim to be organic (mean score of 3.45), and are not certain that the organic product they have purchased are organic (mean of 3.31). However, the respondents are less concerned about social acceptance compared with the benefits of consuming organic products. The respondents are not concerned about what their family and friends will think if they do not purchase organic products (mean of 2.45), and are not worried about being judged or seen as 'unfashionable' because they do not consume organic products (mean of 2.41).

Table 4.9 compares the mean scores of all statements related to the respondents' risk perceptions between organic and non-organic product purchasers. The organic product purchasers' exhibit lower mean scores for risk perceptions, especially in relation to "social risk", "financial risk" and "time risk" than non-organic product purchasers. In contrast, the non-organic product purchasers exhibit lower mean scores than organic product purchasers particularly in "functional risk" and "physical risk".

The independent sample t-test shows that there is a significant difference at the 0.01 level between organic and non-organic product purchasers' risk perceptions. We can conclude that organic product purchasers have a lower risk perception towards the authenticity of organic products and are less concerned with wasting time to find organic products, the lack of organic product availability and wasting money to purchase organic products than non-organic product purchasers. In addition, the organic product purchasers are not worried about being unfashionable if they do not eat organic foods. Non-organic product purchasers have lower risk perception than organic product purchasers with regard to pesticide residues in food, missing an opportunity to buy organic products, organic product fraud, and the taste and nutrition of organic products compared with conventional products. However, there are no significant differences between organic and non-organic product purchasers on risk perceptions toward food safety, embarrassment associated with buying fake organic products, and use of the word "organic" as a marketing strategy to sell products at a higher price.

4.3.6 Surveyed respondents' risk reduction strategies when purchasing organic products

In this section, the surveyed respondents were asked about their risk reduction strategies when purchasing organic products. The respondents' risk reduction strategies were measured based on information (3 statements), process (3 statements), certificate (4 statements), brand (3 statements) and price (4 statements) factors. Table 4.10 shows the mean scores, standard deviations and independent sample t-test of the surveyed respondents' risk reduction strategies. Appendix B6 shows the frequency of these responses. The results in Table 4.10 show that all statements displayed a mean score of 3.35 (standard deviation of 0.975). The results indicate that the respondents use these risk reduction strategies when purchasing organic products.

Table 4.10 Surveyed respondents' risk reduction strategies when purchasing organic products

Statement	Organic Product Purchasers (n= 784)		Non-organic Product purchasers (n= 728)		Total (n= 1,512)		
	Mean	SD	Mean	SD	Mean	SD	t- value [a]
Brand							
I purchase organic products of the same brand regularly	3.35	0.980	3.09	0.930	3.22	0.964	5.099***
I purchase organic products at the same store regularly	3.39	1.013	3.13	0.955	3.26	0.994	5.153***
I always choose well-known or popular brands of organic products	3.46	1.019	3.16	0.951	3.32	0.998	6.032***
Process							
I buy organic product from shops that keep organic products separate from conventional products	3.34	0.961	3.27	0.930	3.30	0.947	1.469[ns]
I prefer to buy organic products from shops that buy organic products directly from the farmers that produce them	3.76	0.923	3.55	0.944	3.66	0.939	4.359***
I do not shop around to compare organic product prices	3.12	1.100	3.06	1.068	3.09	1.085	1.116[ns]
Price							
I do not purchase organic products with price reductions	2.75	0.939	2.80	0.978	2.77	0.958	-0.947[ns]
I read in-store product information leaflets regularly [b]	3.62	1.078	3.33	1.071	3.48	1.084	5.222***
I prefer to buy organic products if the price is the same as conventional products	3.76	0.986	3.61	1.026	3.69	1.008	2.806***
I inspect organic products before I purchase [b]	3.72	1.043	3.45	1.081	3.59	1.070	4.925***
Certificate							
Thai government org. certification is not trustworthy	3.04	0.994	3.09	0.950	3.07	0.973	-0.970[ns]
I purchase organic products certified by private certification bodies	3.28	0.865	3.25	0.813	3.26	0.840	0.649[ns]
I purchase organic products certified by international certification bodies	3.58	0.912	3.51	0.884	3.55	0.899	1.502[ns]
I purchase organic products that can be traced back to the farmer	3.78	0.898	3.65	0.879	3.72	0.891	2.746***
Information							
I read consumer guides regularly	3.93	0.891	3.68	0.871	3.81	0.890	5.530***
My family and friends provide advice on organic products	3.12	1.015	3.05	1.000	3.09	1.008	1.405[ns]
I store organic products separately from conventional products	3.03	1.032	3.09	1.005	3.06	1.019	-1.321[ns]

Notes: [a] Independent-samples t-test results, [b] Reversed statements: The negative statements have been reversed from "I do not read in-store product information leaflets regularly" to "I read in-store product information leaflets regularly" and "I do not inspect organic products before I purchase" to "I inspect organic products before I purchase". *, **, *** indicate significant differences between organic and non-organic product purchasers at 0.1, 0.05 and 0.01 levels, respectively.

Respondents strongly agreed with the "certification" risk reduction strategy with the highest mean score of 3.40 (standard deviation of 0.901). All statements' mean scores for certification are above 3.0, which means that the respondents agree with these risk reduction strategies when purchasing organic products (see Table 4.10). Purchasing organic products that can be traced back to the farmer was the highest risk reduction strategy that the respondents agreed with (mean of 3.72). The respondents also agree with purchasing organic products certified by international certification bodies (mean of 3.55), private certification bodies (mean of 3.26) and Thai certification bodies (mean of 3.07).

The respondents agree with the risk reduction strategies such as "price" with a mean score of 3.38 (standard deviation of 1.03). The results indicate that respondents somewhat agree with using a price risk reduction strategy when purchasing organic products. All statements in the "price" strategies displayed mean scores between 2.77 and 3.69 indicating that the respondents agree with some strategies and do not agree with others (see Table 4.10). The results in Appendix B6 show that 57.2 per cent of the respondents agree with purchasing organic products if the price is the same as conventional products (mean of 3.69, see Table 4.10). Respondents prefer to inspect organic products before they purchase them (mean of 3.59). However, respondents disagreed with the risk reduction strategy of avoiding buying organic produce with a price reduction (mean of 2.77). This implies that the respondents are more likely to purchase discounted organic products.

The respondents also agree with risk reduction strategies regarding "process" with a mean score of 3.35 (standard deviation of 0.990). Table 4.10 shows that all statements' mean scores in risk reduction strategies related to "process" were above 3.0, which means that the respondents agreed with all these statements. The results in Appendix B6 show that 56.3 per cent of respondents agreed to buy organic products from shops that purchase organic products directly from farmers (mean of 3.66, see Table 4.10). Respondents agreed with the strategy of buying organic products from shops that keep the products separate from conventional products (mean of 3.30).

Respondents agreed with risk reduction strategies related to "information," with a mean score of 3.32 (standard deviation of 0.972). The results in Appendix B6 show that 66.1 per cent of the respondents agreed that reading consumer guides regularly is the most important risk reduction strategy when purchasing organic products (mean of 3.81, see Table 4.10). The respondents also agreed that obtaining advice from family and friends (mean of 3.09) and keeping organic products separate after purchase (mean of 3.06) to reduce their risk when purchasing organic products.

The respondents also look on "brand" as a risk reduction strategy. The mean score of all statements regarding "brand" is 3.27 (standard deviation of 0.985). The respondents prefer to purchase organic products of well-known brands (mean of 3.32), purchase from the same store (mean score of 3.26)

and purchase the same brand (mean of 3.22). These findings indicate that respondents choose brand as a risk reduction strategy to purchase organic products.

Table 4.10 shows that organic product purchasers exhibit higher means than non-organic product purchasers in most of the risk reduction strategies, especially in "brand", "process", "price" and "information". The independent sample t-test shows differences in most of the risk reduction strategies between organic and non-organic product purchasers are significant at the 0.01 level (see Table 4.10). In conclusion, organic product purchasers are more likely to use the following risk reduction strategies than non-organic product purchasers: purchase well-known brands or purchase from well-known stores; shop from stores where organic products are sourced directly from farmers; read information at the store; buy organic products if the prices are the same as conventional products; inspect organic products before purchasing; choose products that can be traced back to the farmer; and read consumer guides. However, there are no significant differences in the following risk reduction strategies between organic and non-organic product purchasers: buying organic products from shops that keep the products separate from other products; shopping around; purchasing discounted organic products; purchasing organic products with trusted certificates; obtaining advice from family and friends; and storing organic products at home separately from other products.

4.3.7 Organic product purchasers' experience of purchasing organic products

This section discusses organic product purchasers' behaviour when purchasing four organic products: organic vegetables, rice, juice and coffee (see Table 4.11). Table 4.12 shows the organic product purchaser's expenditure on the four organic products and Table 4.13 shows the premium price organic product purchasers paid when purchasing the four organic products.

Table 4.11 Organic product purchasers' frequency of purchasing organic products

Organic Product	Frequency of purchasing organic products (n= 784)				
	Never (%)	Rarely (%) (Once a month)	Sometimes (%) (2-3 times a month)	Often (%) (Once a week)	Always (%) (More than once a week)
1. Vegetables	0.0	14.5	33.9	28.7	22.8
2. Rice	12.1	21.2	27.4	20.2	19.1
3. Juice	12.4	16.3	30.0	27.4	13.9
4. Coffee	52.8	16.7	15.4	7.4	7.7

Table 4.11 shows that 85.5 per cent of organic product purchasers buy organic vegetables at least two or three times a month. Approximately 70 per cent of organic product purchasers buy organic juice at least two or three times a month. About 60 per cent of organic product purchasers buy

organic rice at least two or three times a month. Only 30.5 per cent of organic product purchasers buy organic coffee at least two or three times a month.

Table 4.12 shows organic product purchasers' expenditure on four organic products and their total expenditure on each product. Over 85 per cent of the respondents report that they purchased organic vegetables, rice and juice. However, only 45.9 per cent of the respondents had purchased organic coffee. About half of the respondents spent up to 45 per cent of their expenditure on organic vegetables, rice and juice; they spent the remaining 55 per cent on conventional products. Table 4.12 also shows that 32.2 per cent of the respondents spent up to 45 per cent of their expenditure on organic coffee compared with the total amount spent on non-organic coffee.

Table 4.12 Surveyed respondents' expenditure on four organic products

Organic Products	Percentage of Expenditure on Organic Products (n=784)							
	Never	1-15%	16-30%	31-45%	45-60%	61-75%	76-90%	91-100%
1. Vegetables	1.0	21.8	18.9	16.7	16.2	10.2	8.7	6.5
2. Rice	13.4	23.5	17.3	11.9	11.6	7.9	7.1	7.3
3. Juice	14.0	21.7	18.6	13.0	12.2	8.5	7.0	4.8
4. Coffee	54.1	15.7	10.1	6.4	6.1	2.2	3.2	2.3

Table 4.13 shows the premium price that organic product purchasers paid for the four organic products compared with the normal price of conventional products. For organic vegetables, rice and juice, approximately 24 per cent of the respondents paid 15 per cent more than the price of conventional products. The table result shows 20 per cent of the respondents paid 30 per cent more than conventional product prices. Likewise, approximately 53 per cent of the respondents had never purchased organic coffee. While 15 per cent of respondents who had purchased organic coffee paid 15 per cent more than the price of non-organic coffee.

Table 4.13 The premium price that respondents paid when purchasing organic products

Organic Products	Percentage Premium Price Paid when Purchasing Organic Products (n= 784)							
	Never	1-15%	16-30%	31-45%	45-60%	61-75%	76-90%	91-100%
1. Vegetables	1.1	24.4	23.3	20.2	15.9	6.4	5.1	3.6
2. Rice	13.4	24.0	19.8	18.4	11.6	4.3	5.4	3.2
3. Juice	14.2	24.2	19.3	17.5	12.1	5.7	4.3	2.7
4. Coffee	53.3	15.1	9.7	7.7	7.8	2.7	2.4	1.4

Table 4.14 shows that 61.5 per cent of the organic product purchasers reported that they purchased organic products because of the expected benefits (mean of 3.67), followed by 50.4 per cent of the respondents who reported that they would still purchase organic products even though conventional

Table 4.14 Surveyed respondents' experiences of purchasing organic products

Statement	Mean (n= 784)	SD	Frequency of Response (%)				
			SD	D	N	A	SA
The higher price of organic products reflects their higher quality	3.33	1.016	4.5	16.7	30.2	38.3	10.3
I will continue to consume organic products regardless of increases in price	3.23	0.985	3.7	19.4	36.6	31.1	9.2
I buy organic products because the benefits outweigh the costs	3.67	0.853	1.3	6.8	30.5	46.8	14.7
I would still buy organic products even though non-organic are cheaper	3.49	0.900	2.2	9.1	38.4	38.0	12.4
Buying organic products is the right thing to do even if they cost more	3.35	0.989	3.7	13.8	39.4	30.5	12.6

products are cheaper (mean of 3.49), and 48.6 per cent of the respondents reported that higher prices of organic products mean they are of a higher quality (mean of 3.33). Approximately 40 per cent of respondents reported that they would continue to consume organic products regardless of price increase (mean of 3.23). Overall, the mean score for all statements was 3.41, which implies that respondents agreed with the statements regarding high quality and greater benefits associated with consuming organic products, despite their high cost. We can conclude that organic product purchasers were happy to purchase organic products even at higher prices.

4.4 Surveyed respondents' WTP premium prices for organic products and purchase behaviour

We used open-ended questions to explore respondents' general WTP premium prices for organic products. The single bound method was used to evaluate respondents' WTP premium prices for four specified organic products: lettuce, jasmine rice, orange juice and coffee. We used the single bound method with closed-end questions to minimise the respondents' incorrect answers, skipping questions or not answering questions about their WTP premium prices for four specified organic products. Table 4.15 shows that respondents are willing to pay 40.92 per cent more for organic products. For the four specified organic products, the respondents are willing to pay 26.41 per cent more for organic coffee, followed by organic lettuce (26.09 per cent), jasmine rice (24.40 per cent) and orange juice (24.09 per cent).

Table 4.15 also compares the results for organic and non-organic product purchasers. The results show that organic product purchasers are willing to pay 44.54 per cent more for organic products whereas non-organic product purchasers are willing to pay 37.02 per cent for organic products. For the four specified organic products, organic product purchasers are willing to pay 28.78 per cent more for organic lettuce than conventional lettuce, whereas non-organic product purchasers are willing to pay 23.21 per cent more. Organic product purchasers are willing to pay 26.97 per cent more for organic jasmine rice than for conventional jasmine rice. Non-organic product purchasers are

Table 4.15 Surveyed respondents' WTP premium prices for organic products

Product	Organic Product Purchasers (n= 784)		Non-organic Product Purchasers (n= 728)		Total (n= 1,512)		
	Mean	SD	Mean	SD	Mean	SD	t- value [a]
Organic Products (%)	44.54	29.136	37.02	27.399	40.92	28.552	5.161***
Organic Lettuce (%)	28.78	19.781	23.21	19.944	26.09	20.047	5.449***
Organic Jasmine Rice (%)	26.97	18.835	21.64	18.879	24.40	19.037	5.488***
Organic Orange Juice (%)	25.80	18.566	22.25	19.266	24.09	18.983	3.652***
Organic Coffee (%)	28.35	26.228	24.32	24.881	26.41	25.659	3.055***

Notes: [a] Independent-samples t-test results; *** indicates significant differences between organic and non-organic product purchasers at the 0.01 level.

willing to pay only 21.64 per cent more. Organic product purchasers are willing to pay 25.80 per cent more for organic orange juice than conventional orange juice. Non-organic product purchasers are willing to pay only 22.25 per cent more. The organic product purchasers are willing to pay 28.35 per cent more for organic coffee than conventional coffee. Non-organic product purchasers are willing to pay 24.32 per cent more for organic coffee.

The independent sample t-test shows that the organic product purchasers and non-organic product purchasers' WTP a premium price for four organic products is significantly different at the 0.01 level. Table 4.15 shows organic product purchasers' WTP premium prices for organic lettuce, jasmine rice, orange juice and coffee.

4.4.1 WTP premium prices for four specified organic products

4.4.1.1 Distribution of WTP premium prices

Table 4.16 shows respondents' WTP premium prices for general organic products and four specified organic products. For general organic products, the results show 50.9 per cent of the respondents were willing to pay 30 per cent or less more for organic products. About 25.8 per cent of the respondents were willing to pay between 31 and 60 per cent more for organic products than for conventional products.

Table 4.16 shows the distribution of WTP premium prices for four organic products. Overall, the respondents were willing to pay higher prices for organic coffee followed by organic lettuce, jasmine rice and orange juice. Thirty-six per cent of the respondents were willing to pay between 16 and 30 per cent more for organic coffee than conventional coffee. Similarly, 36.8 per cent of the respondents were willing to pay between 16 and 30 per cent more for organic lettuce and 31.4 and 29.9 per cent of respondents were willing to pay over 31 per cent for organic coffee and organic

lettuce, respectively. However, 37.7 and 37.6 per cent of the respondents were willing to pay 15 per cent or less more for organic jasmine rice and organic orange juice, respectively.

Table 4.16 Surveyed respondents' WTP premium prices for organic products

Percentage of Premium Price (n= 1,512)	Organic Products (%)	Organic Lettuce (%)	Organic Jasmine Rice (%)	Organic Orange Juice (%)	Organic Coffee (%)
15% and less	24.5	33.3	37.7	37.6	32.6
16- 30%	26.4	36.8	34.0	35.8	36.0
31-60%	25.8	24.2	23.6	21.4	20.0
61-90%	17.3	4.4	4.0	4.5	8.6
More than 90%	6.0	1.3	0.7	0.7	2.8

The results in Table 4.16 are similar to previous studies' findings. For example, Sriwaranun (2011) finds that 72.4 per cent of Thai respondents in her study were willing to pay 25 per cent more for organic products. Phillip and Dipeolu (2010) report that most consumers who participated in their study in Nigeria were willing to pay 23 per cent more for organic cucumber. Yu, Gao and Zeng (2014) find that consumers in China were willing to pay 47 per cent more for organic vegetables compared with conventional vegetables. Thus, these studies report similar results in terms of WTP premium prices for organic products. They reveal that respondents were generally willing to pay more for organic products, especially organic vegetables.

Table 4.17 shows the respondents' WTP premium prices for general organic products and four specified organic products. For general organic products, individuals who purchase organic products were willing to pay higher prices than non-organic product purchasers. The results show 26.9 per cent of organic product purchasers were willing to pay between 16 and 30 per cent more for organic products, whereas non-organic product purchasers (28.3 per cent) were willing to pay 15 per cent or less for organic products. Nearly 29 per cent of organic product purchasers were willing to pay 61 per cent more for organic products compared with only 17.7 per cent of non-organic product purchasers who were willing to pay in the same price range for organic products.

For the four specified organic products, organic product purchasers were willing to pay higher prices for organic lettuce, jasmine rice, orange juice and coffee than non-organic product purchasers. Most organic product purchasers were willing to pay between 16 and 30 per cent more for the four specified organic products whereas the majority of non-organic product purchasers were willing to pay 15 per cent or less (see Table 4.17). The findings are consistent with Sriwaranun's (2011) study results that organic product purchasers in Thailand were willing to pay substantially more for organic Chinese kale, jasmine rice and pork than non-organic product purchasers.

Table 4.17 Respondents' WTP premium prices for organic products (organic product purchasers versus non-organic product purchasers)

Percentage of Premium Price	Organic Product Purchasers (n= 784)					Non-organic Product Purchasers (n= 728)				
	Organic Products (%)	Organic Lettuce (%)	Organic Jasmine Rice (%)	Organic Orange Juice (%)	Organic Coffee (%)	Organic Products (%)	Organic Lettuce (%)	Organic Jasmine Rice (%)	Organic Orange Juice (%)	Organic Coffee (%)
15% and less	20.9	26.3	30.7	31.6	29.0	28.3	40.8	45.2	44.0	36.5
16- 30%	26.9	40.3	36.4	39.9	37.0	25.8	33.0	31.5	31.3	35.0
31- 60%	23.5	26.3	27.6	23.2	21.7	28.2	22.0	19.3	19.8	18.1
61- 90%	20.9	5.7	4.5	4.8	8.7	13.6	3.1	3.3	4.1	8.5
Higher than 90%	7.8	1.4	0.8	0.5	3.6	4.1	1.1	0.7	0.8	1.9

Table 4.17 shows that organic product purchasers were willing to pay higher premium prices than non-organic product purchasers for the four specified organic products; approximately 40 per cent of organic product purchasers were willing to pay between 16 and 30 per cent premium prices for the four specified organic products, whereas approximately 40 per cent of non-organic product purchasers were willing to pay 15 per cent or less.

4.4.1.2 Estimated mean WTP

The mean WTP was obtained using the single bound method with closed-ended questions for respondents' purchases of organic lettuce, jasmine rice, orange juice and coffee. Table 4.18 shows the WTP mean score for organic lettuce is 100.89 baht/kg. Compared with the conventional lettuce price, the premium price is 20.89 baht/kg (26.11 per cent higher than for conventional lettuce). The WTP mean for organic jasmine rice is 199.05 baht/5 kgs. Compared with the conventional rice price, the premium price is 39.05 baht/5 kgs (24.40 per cent higher than the conventional jasmine rice). The WTP mean for organic orange juice is 99.29 baht/litre. The premium price is 19.29 baht/litre which is approximately 24.12 per cent higher than for conventional orange juice. The WTP mean for organic coffee is 151.68 baht/250 grams. Compared with the conventional coffee price, the premium price is 31.68 baht/250 grams (26.40 per cent higher than for conventional coffee).

The results confirm that the mean WTP for all four specified organic products for organic and non-organic product purchasers are significantly different. Table 4.18 shows that organic product purchasers are willing to pay 103.04 baht for organic lettuce compared with 98.58 baht by non-organic product purchasers. For organic jasmine rice, organic product purchasers are willing to pay 203.15 baht compared with 194.63 baht by non-organic product purchasers. For organic orange juice, organic product purchasers are willing to pay 100.66 baht compared with 97.82 baht by non-organic product purchasers. The difference in mean WTP between organic and non-organic product

Table 4.18 Respondents' WTP for organic lettuce, jasmine rice, orange juice and coffee

	Lettuce	Jasmine Rice	Orange Juice	Coffee
Mean WTP (baht/unit) [a]	100.89	199.05	99.29	151.68
Mean WTP-Purchase	103.04	203.15	100.66	154.02
Mean WTP-Non-purchase	98.58	194.63	97.82	149.16
Conventional Price [b] (baht/unit)	80	160	80	120
Estimated Premium [c] (baht/unit)	20.89	39.05	19.29	31.68
Purchase	23.04	43.15	20.66	34.02
Non-purchase	18.58	34.63	17.82	29.16
WTP's Difference (Purchase-Non purchase)	4.46	8.52	2.85	4.86
Percentage Premium [d]	26.11	24.40	24.12	26.40
Purchase	28.79	26.97	25.83	28.35
Non-purchase	23.22	21.64	22.27	24.30
% WTP's Difference (Purchase/Non-purchase)	5.57	5.33	3.56	4.05
Percentage Distribution of Premium (N=1,512)				
15% and less	33.3	37.7	37.6	32.6
16-30%	36.8	34.0	35.8	36.0
31-45%	11.0	14.6	10.4	11.3
46-60%	13.2	9.1	11.0	8.7
61-75%	3.3	3.0	3.5	6.9
76- 90%	1.2	1.0	1.0	1.7
Higher than 90%	1.3	0.7	0.7	2.8

Notes: [a] Unit price of organic lettuce is baht/kg, jasmine rice is baht/5 kg pack, orange juice is baht/litre and coffee is baht/250 grams pack; [b] the average price of conventional products at time data were collected; [c] the estimated premium = Mean WTP – conventional price; [d] the percentage premium = (Estimated premium*100)/conventional price.

purchasers for organic orange juice is 2.85 baht/litre. For organic coffee, organic product purchasers are willing to pay 154.02 baht compared with 149.16 baht by non-organic product purchasers. The difference in mean WTP between organic and non-organic product purchasers for organic coffee is 4.86 baht/250 grams. Table 4.18 shows the premium between organic and non-organic product purchasers. Organic lettuce has the highest premium (5.57 per cent or 4.46 baht) between organic and non-organic product purchasers followed by organic jasmine rice (5.33 per cent or 8.52 baht), organic coffee (4.05 per cent or 4.86 baht) and organic orange juice (3.56 per cent or 2.86 baht).

The independent sample t-test shows significant differences at the 0.01 level between the WTP for all four specified organic products between organic and non-organic product purchasers. Table 4.19 shows that organic product purchasers were willing to pay higher prices for organic lettuce, jasmine rice, orange juice and coffee than non-organic product purchasers. This implies that organic product purchasers have positive attitudes towards organic products. They display a healthy, environmentally friendly lifestyle that may influence their WTP for organic products. The finding is consistent with Voon et al.'s (2011) study which found that organic product purchasers have positive attitudes towards organic products that influence their intention to purchase organic products.

Table 4.19 Surveyed respondents' WTP for organic lettuce, jasmine rice, orange juice and coffee

Products	Organic Product Purchasers (n= 784)		Non-organic Product Purchasers (n= 728)		Total (n= 1,512)		
	Mean	SD	Mean	SD	Mean	SD	t- value [a]
Organic Lettuce (baht/Kg.)	103.04	15.816	98.58	15.952	100.89	16.032	5.453***
Organic Jasmine Rice (baht)/5 Kg.)	203.15	30.136	194.63	30.206	199.05	30.459	5.488***
Organic Orange (baht/litre)	100.66	14.845	97.82	15.409	99.29	15.181	3.659***
Organic Coffee (baht/250 Grams)	154.02	31.474	149.16	29.847	151.68	30.787	3.074***

Notes: [a] Independent samples t-test results; *** indicate significant differences between organic and non-organic product purchasers at the 0.01 level.

Similarly, Sriwaranan's (2011) study reports that organic product purchasers' healthy, environmentally friendly lifestyle significantly influences their WTP for organic products. In addition, organic product purchasers were asked about the premium price they paid when purchasing organic vegetables, jasmine rice, orange juice and coffee during the previous year. They were also asked about their estimated WTP premium price for the four specified organic products. The organic product purchaser results illustrate how the actual premium price consumers paid for organic products differed from their estimated WTP premium price for organic products. The factors that influence organic product purchasers to pay the premium price for organic products are discussed in the next chapter.

Table 4.20 shows the organic product purchasers' actual premium prices paid for organic vegetables, jasmine rice and orange juice were higher than their estimated WTP premium prices for the same products; organic coffee differs (the actual premium price paid was lower than the respondents' estimated WTP premium price). The paired sample t-test result shows a significant difference at the 0.01 level between the organic product purchasers' actual premium price paid and their estimated WTP premium price for organic vegetables, jasmine rice and orange juice. We conclude that organic product purchasers' actual premium price paid for organic vegetables, jasmine rice and orange juice was higher than their estimated WTP premium price for organic vegetables, jasmine rice and orange juice.

Table 4.20 Organic product purchasers actual premium price paid versus their estimated WTP premium price for specified organic products

Product	Actual Premium Price Paid [a] (Mean)[a]	SD	Estimated WTP Premium Price (Mean)[b]	SD	N	t-value [c]
Organic Vegetables	2.86	1.633	2.41	1.329	775	6.369***
Organic Rice	2.78	1.666	2.30	1.246	679	6.406***
Organic Juice	2.76	1.632	2.27	1.263	673	6.779***
Organic Coffee	2.70	1.662	2.80	1.663	366	-0.803[ns]

Notes: [a] Mean is calculated using a 7 point Likert scale (1 refers to the actual premium price at 1-15%, 2 = 16- 30%, 3 = 31-45%, 4= 46-60&, 5 = 61-75%, 6 = 76-90% and 7 = 91-100%); [b] Mean of estimated WTP premium price is calculated using a 7 point Likert scale (1 = willing to pay a premium price at 1-15%, 2 = 16- 30%, 3 = 31-45%, 4= 46-60%, 5 = 61-75%, 6 = 76-90% and 7 = 91-100%); [c] Paired-samples t-test results; *** indicates significant differences between the organic product purchasers' actual premium price paid and their estimated WTP premium price at the 0.01 level.

4.5 Chapter summary

This chapter discusses the survey questionnaire and reports the WTP premium price results for organic products. The chapter also provides an overview of the respondents' profiles followed by discussion of the respondents' grocery purchasing behaviour, lifestyle, knowledge, perceptions and attitudes towards organic products, including their risk perceptions and risk reduction strategies they use when purchasing organic products. The chapter also discusses the differences between organic and non-organic product purchasers behaviours based on descriptive statistics, Chi-square, the Independent sample t-test and paired sample t-test.

The chapter also presents results related to the respondents' WTP premium prices for organic products. The results show that the respondents are willing to pay a premium price of 40.92 per cent for organic products. Organic product purchasers were also willing to pay higher price for four specified organic products than non-organic product purchasers. Interestingly, the organic product purchasers actually paid higher premium prices for organic vegetables, jasmine rice and orange juice than their WTP premium prices for the same products. The actual premium prices they paid for the four specific organic products are investigated further in the next chapter as an endogenous variable in the SEM analysis.

Chapter 5

Data Analysis and Results

This chapter discusses the factors that influence consumers' WTP premium prices for organic products. The chapter also reports consumer risk perception and risk reduction strategy factors. More importantly, the chapter discusses the interrelationships among these factors in the research conceptual model to answer the research objectives.

The chapter is organised as follows. Section 5.1 explains the EFA used to investigate the sub-dimensions of the two primary dimensions (consumers' risk perceptions and consumers' risk reduction strategies). Section 5.2 explains the CFA that confirms the relationships between the constructs. It explains the first and second order CFA for consumer risk perceptions and consumer risk reduction strategies. Section 5.2 also presents the CFA results of all the constructs presented in the research conceptual model. Section 5.3 presents the SEM used to determine the relationships among all the constructs.

Data analysis for organic product purchaser's behaviour

We obtained 1,512 respondents (organic and non-organic product purchasers) from our interview, however, we only analysed data from the organic product purchasers (n= 784). We used the EFA, CFA and SEM methods in our data analysis. The organic product purchasers' data were randomly but equally divided into two sets of data based on Kline's (2015) suggestion that the data set for the EFA and CFA should be separated. Data set one ($n_{(1)}$=392) was analysed using EFA to investigate the sub-dimensions of consumer risk perceptions and risk reduction strategies. Data set two ($n_{(2)}$=392) was analysed using CFA and SEM. The details of these analyses are discussed next .

5.1 EFA results for the two primary dimensions

The sections below outline the EFA process and results of consumers' risk perceptions and consumers' risk reduction strategies.

5.1.1 EFA results for consumers' risk perceptions

Twenty-two items were used to measure the six sub-dimensions of consumers' risk perceptions: psychological risk, functional risk, social risk, financial risk, physical risk and time risk. Before conducting EFA, one must check that the data set is appropriate for this method. We conducted several tests on the data set one: the Correlation Matrix, Anti-Image Correlation Matrix, the KMO Measure of Sampling Adequacy and Bartlett's Test of Sphericity.

The Correlation Matrix (see Appendix B7) shows a substantial number of correlations greater than 0.3. These results indicate that factor analysis is appropriate (Pallant, 2013). Most partial correlations were low (Field, 2009; Tabachnick et al., 2007). We conducted the KMO of Sampling Adequacy, followed by Bartlett's Test of Sphericity. The KMO value was 0.750, which is over the cut off level of 0.600 (Tabachnick et al., 2007). This result indicates that the sample in this study is adequate for EFA. The value of Bartlett's Test of Sphericity was statistically significant ($P < 0.05$), indicating that the study sample is suitable for EFA (Hinton, McMurray & Brownlow, 2014; Pallant, 2013) (Table 5.1).

Table 5.1 The KMO and Bartlett's Test of Sphericity of consumers' risk perceptions

KMO Measure of Sampling Adequacy		0.750
Bartlett's Test of Sphericity	Approx. Chi-square	2642.453
	df	231
	Significance	0.000

Next, we analysed the data using EFA. PCA was used to extract the consumer risk perception factors from the measurement items. Consumer risk perceptions were measured using 22 items. The result of the latent root criterion showed that these 22 items should be grouped into six sub-dimensions to measure consumer risk perceptions (see Appendix C1). These six sub-dimensions explain 59.91 per cent of the total variance, which is slightly less than the cut off level of 60 per cent (Arbuckle, 2017; Malhotra et al., 2006).

The Scree Test Criterion suggested six dimensions extracted before the curve became a straight line (see Figure 5.1). These six dimensions have an eigenvalue greater than one which is considered significant. Therefore, the extraction of six dimensions was appropriate for our analysis.

Varimax and Oblimin rotations were used to determine the factor loading patterns; they showed similar patterns, but the Varimax rotation reported higher factor loadings and was easier to interpret than Oblimin. Therefore, Varimax factor rotation was used to obtain the extracted dimensions. It also offered greater content validity (Worthington & Whittaker, 2006). Based on the Varimax rotation, 22 items were grouped into six sub-dimensions. However, from the 22 items, we found that four items (TIME3, PHY1, SOC1 and SOC 2) loaded on more than one factor, including low communalities (lower than 0.4) and low factor loadings. Therefore, these four items were eliminated from the analysis to satisfy the unidimensionality requirements (see Table 5.2) (Bernard & Bernard, 2013).

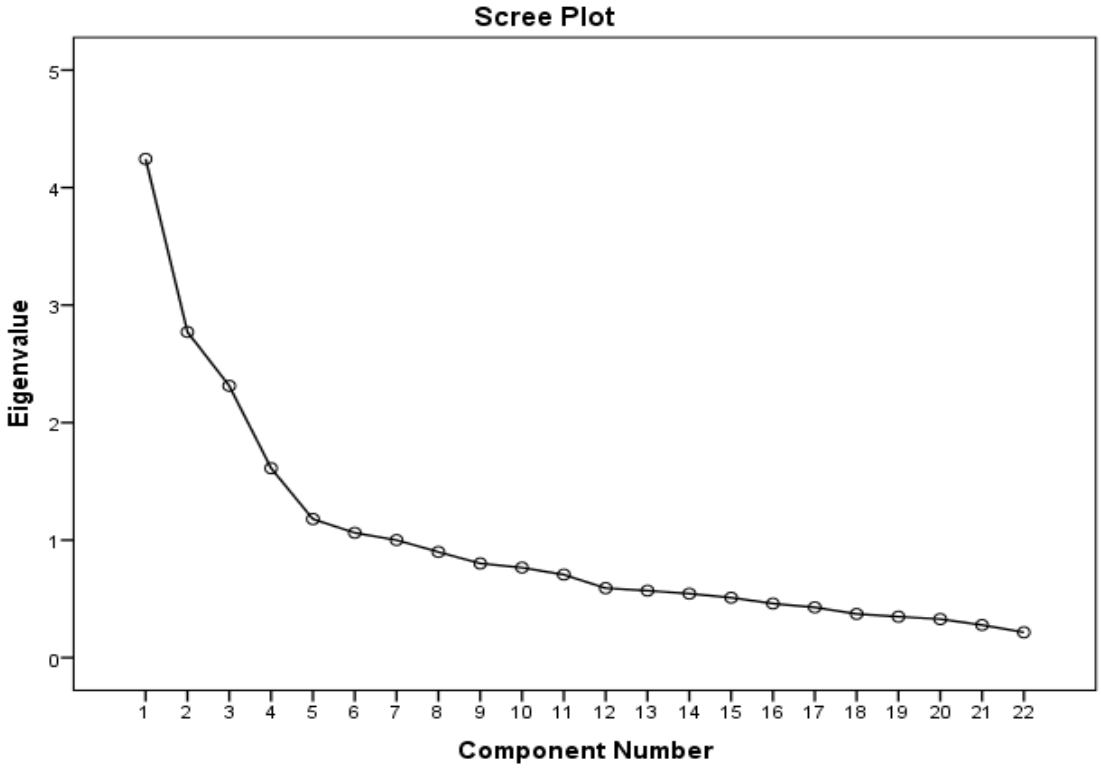

Figure 5.1 Scree plot of consumers' risk perceptions

Table 5.2 Consumer risk perception variables deleted from the analysis

Variable	Statement	Reason for Deletion
TIME3	I try to buy organic products whenever they are available	-Low factor loading -Loaded more than one factor
PHY1	Non-organic products that claim to be organic can harm my health	-Low communalities (<0.4) -Low factor loading -Loaded more than one factor
SOC1	I am never really certain that the organic product I purchased are really organic	-Low factor loading -Loaded more than one factor
SOC2	I do not easily trust product claims that a product is really organic.	-Low factor loading -Loaded more than one factor

Eighteen items were retained and used in the EFA for consumers' risk perceptions. All 18 items indicated adequate unidimensionality since none loaded on more than one factor (see Appendix C1) (Bernard & Bernard, 2013; Hair et al., 2006).

Cronbach's alpha was used to determine the reliability of the constructs. The reliability of constructs is acceptable if Cronbach's alpha is greater than 0.6, especially in exploratory research (Hair, 2010). This study uses the 0.6 cut off level as suggested by Hair (2010). Six factors were extracted. The Cronbach's alpha of each factor is reported in Table 5.3. Four of the six factors had Cronbach's alphas as follows: psychology risk (PSYC) 0.753, functional risk (FUNC) 0.752, social risk (SOC) 0.852 and physical risk (PHY) 0.723. However, two factors (financial risk (FIN) and time risk (TIME)) had Cronbach's alpha of 0.573 and 0.593, respectively, which are slightly lower than 0.6.

Table 5.3 The rotated component matrix for respondents' risk perceptions

Variable	Statement	VARIMAX Rotated Loading					
		F1	F2	F3	F4	F5	F6
	Factor 1: Psychology risk (PSYC)						
PSY3	I would lose face if I purchased non-organic products that claimed to be organic	0.819					
PSY1	I would be embarrassed if I purchased the product at high price but the product has been treated with chemicals	0.726					
PSY2	I fear being cheated when purchasing organic products	0.695					
PSY4	I waste my money if I buy non-organic products that claimed to be organic	0.595					
	Factor 2: Functional risk (FUNC)						
FUNC1	I worry about pesticide residue when buying food products		0.799				
FUNC3	I am concerned about the cumulative effects of pesticides in my food		0.777				
FUNC4	I am concerned about food safety even if the product claims to be organic		0.733				
FUNC2	I am concerned about how organic products are processed		0.665				
	Factor 3: Social risk (SOC)						
SOC3	I would be out of fashion if I did not eat organic products			0.880			
SOC4	My family and friends will blame me for not doing the right thing if I do not eat organic products			0.878			
	Factor 4: Financial risk (FIN)						
FIN1	I think that organic products are not as safe as they claim to be.				0.705		
FIN3	I think using the words "organic product" is only a marketing strategy to sell at higher prices				0.634		
FIN2	I would save money and buy more if I did not buy organic products				0.615		
FIN4	Paying a higher price for organic products is wasteful.				0.583		
	Factor 5: Physical risk (PHY)						
PHY2	Truly organic products taste better than conventional products.					0.873	
PHY3	Truly organic products are more nutritious than conventional one					0.862	
	Factor 6: Time risk (TIME)						
TIME2	Limited supply makes buying organic products harder.						0.787

Variable	Statement	Varimax Rotated Loading					
		F1	F2	F3	F4	F5	F6
TIME1	I do not have time to find organic products.						0.787
	Cronbach's alpha	0.753	0.752	0.852	0.573	0.723	0.593
	Eigenvalue	3.604	2.562	1.778	1.605	1.125	1.060
	Variance explained (%)	20.020	14.235	9.880	8.917	6.250	5.889
	Cumulative variance (%)	20.020	34.255	44.135	53.052	59.302	65.191

Extraction Method: PCA; Rotation Method: Varimax with Kaiser Normalization

Pallant (2013) advises that a lower number of items or shorter Likert scales may make Cronbach's alpha lower than usual and suggest that a Cronbach's alpha less than 0.6 is acceptable. Therefore, the Cronbach alphas of FIN and TIME are acceptable.

In conclusion, the consumer risk perception variable consists of six sub-dimensions. Eighteen items loaded on the six sub-dimensions. The six sub-dimensions of the consumer risk perception variables consist of psychological risk (PSYC) (4 items), functional risk (FUNC) (4 items), social risk (SOC) (2 items), financial risk (FIN) (4 items), physical risk (PHY) (2 items) and time risk (TIME) (2 items). In addition, six factors with eigenvalues greater than one explained 65.19 per cent of the variance, which is higher than the 60 per cent cut off level (Arbuckle, 2017; Malhotra et al., 2006) (see Table 5.3). We conclude that the measurement instrument for consumer risk perceptions used in this study has adequate unidimensionality and reliability.

5.1.2 EFA for consumer risk reduction strategies

The measurement model for consumer risk reduction strategies when purchasing organic products consists of five sub-dimensions. Initially 17 items were proposed to measure the five sub-dimensions of consumer risk reduction strategies: brand, process, price, and certification and information risk reduction strategies. Before conducting EFA for consumer risk reduction strategies, we examined the appropriateness of the data set to be used for analysis. Data set one was tested to ensure its appropriateness for EFA based on the Correlation Matrix, Anti-Image Correlation Matrix, the KMO Measure of Sampling Adequacy and Bartlett's Test of Sphericity.

The Correlation Matrix (see Appendix B8) shows that several variables had correlations greater than 0.3. Further, the Anti-Image Correlation Matrix showed that the majority of the partial correlations were low (Field, 2009; Tabachnick et al., 2007). This indicates that factor analysis is appropriated for this data set (Pallant, 2013). The KMO of Sampling Adequacy and Bartlett's Test of Sphericity were conducted. The KMO value was 0.744, which is above the 0.6 cut off level (Tabachnick, Fidell, & Ullman, 2007) showing that the sample used in this study was adequate for EFA. The value of

Bartlett's Test of Sphericity was statistically significant (P < 0.01), which indicates that the sample in this study was suitable for EFA (Hinton, McMurray, & Brownlow, 2014; Pallant, 2013) (see Table 5.4).

Table 5.4 KMO and Bartlett's Test of Sphericity of consumer risk reduction strategies

KMO Measure of Sampling Adequacy.		0.744
Bartlett's Test of Sphericity	Approx. Chi-Square	1511.437
	df	136
	Significance	0.000

PCA was used to extract the factors of the consumer risk reduction strategies from the measurement items. The primary dimension of consumer risk reduction strategies was measured using 17 items. The result of latent root criterion showed that the 17 items should be grouped into five sub-dimensions (see Appendix C2). Five sub-dimensions with eigenvalues greater than one were extracted. These five sub-dimensions explained 58.02 per cent of the total variance, which is lower than the cut off level of 60 per cent (Arbuckle, 2017; Malhotra, Hall, Shaw, & Oppenheim, 2006).

The Scree Test Criterion showed five dimensions were extracted before the curve became a straight line (see Figure 5.2). Therefore, the extraction of five dimensions was appropriate for our analysis.

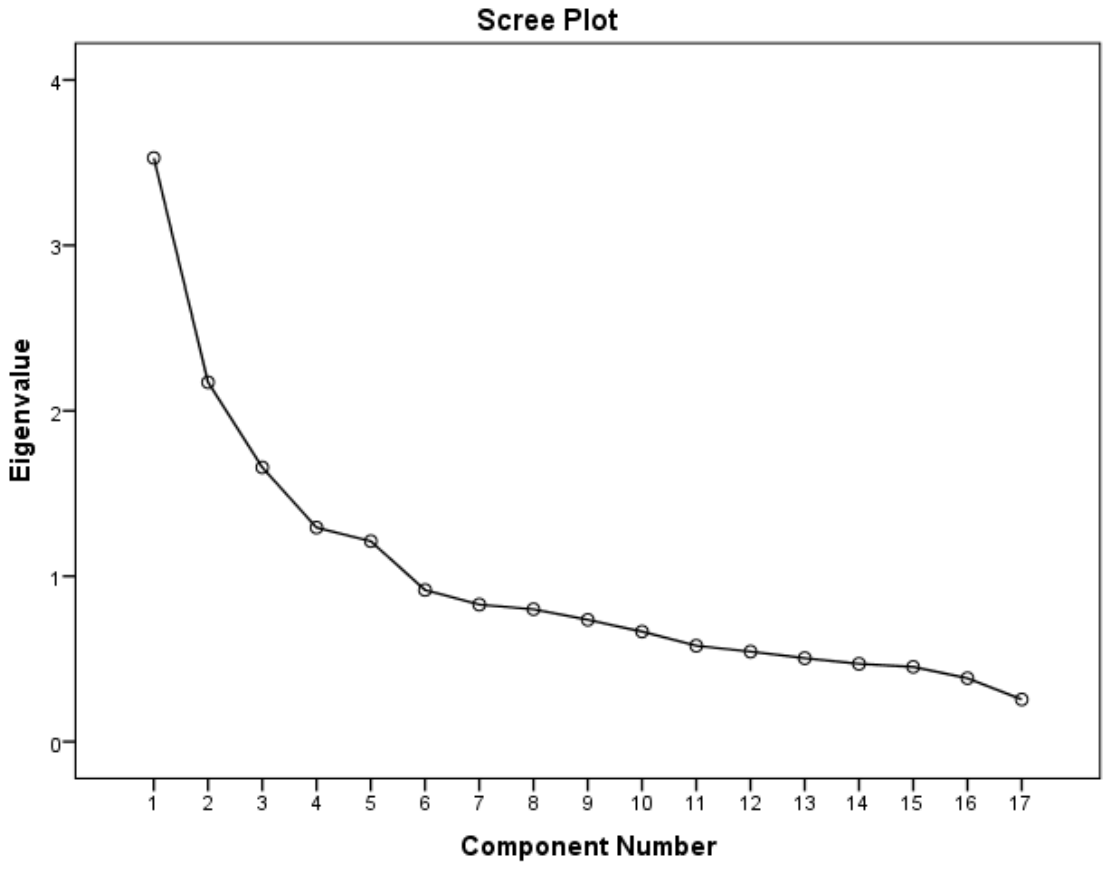

Figure 5.2 Scree plot of consumers' risk reduction strategies

Varimax and Oblimin rotations were examined to establish factor loading patterns. Both rotation matrices showed similar patterns, but the Varimax rotation was easier to interpret than Oblimin. Therefore, Varimax rotation was used to obtain a better result (Worthington & Whittaker, 2006). Based on the Varimax rotation, the 17 items were grouped into five sub-dimensions. However, from the 17 items, two (CERT1 and INFO1) loaded on more than one factor and had low factor loadings. Therefore, these two items were removed from the analysis to satisfy the unidimensionality requirements (see Table 5.5) (Bernard & Bernard, 2013).

Table 5.5 Consumers' risk reduction strategy variables deleted from the analysis

Variables	Statement	Reason for Deletion
CERT1	Thai government org. certification is not trustworthy	-Low factor loading -Loaded on more than one factor
INFO1	I read consumer guides regularly	-Low factor loading -Loaded on more than one factor

In sum, 15 items were retained and used in EFA for consumer risk reduction strategies. All 15 items indicated unidimensionality since none loaded on more than one factor (see Table 5.6) (Bernard & Bernard, 2013; Hair, Bush, et al., 2006).

We measured the Cronbach alpha to determine the reliability of the constructs. The reliability of constructs is acceptable if the Cronbach alpha value is greater than 0.6 (Hair, 2010). Five factors were extracted. The Cronbach's alpha of each factor is reported in Table 5.6. Two extracted factors, Brand (BRND) and Certification (CERT), with Cronbach's alphas of 0.824 and 0.601, respectively, were acceptable as they were within the recommended threshold. The three remaining factors (Process (PROC), Price (PRIC) and Information (INFO)) had Cronbach's alphas of 0.551, 0.546 and 0.477, respectively, which are less than 0.6. Pallant (2013) suggests that a Cronbach's alpha less than 0.6 is acceptable if a factor has a lower number of items or shorter Likert scales. Therefore, the Cronbach's alphas of PROC, PRIC and INFO were considered acceptable for this study.

In conclusion, the consumer risk reduction strategies' primary dimension consists of five sub-dimensions. There were 15 items loaded on those five sub-dimensions. The five sub-dimensions and their variables for consumer risk reduction strategies consist of Brand (BRND) 3 items, Process (PROC) 3 items, Price (PRIC) 4 items, Certification (CERT) 3 items and Information (INFO) 2 items. In addition, five factors with eigenvalues greater than one explain 61.48 per cent of the variance, which is greater than the 60 per cent cut off level (Arbuckle, 2017; Malhotra et al., 2006) (see Table 5.6). We conclude that the measurement instrument for consumer risk reduction strategies used in this study has adequate unidimensionality and reliability.

Table 5.6 Rotated component matrix for respondents' risk reduction strategies

Variable	Statement	VARIMAX Rotated Loading				
		F1	F2	F3	F4	F5
	Factor 1: Brand (BRND)					
BRND2	I purchase organic products at the same store regularly	0.883				
BRND1	I purchase organic products of the same brand regularly	0.858				
BRND3	I always choose well-known or popular brands of organic products	0.724				
	Factor 2: Process (PROC)					
PROC2	I prefer to buy organic products from shops that buy organic products directly from the farmers that produce them		0.719			
PROC1	I buy organic product from shops that keep organic products separate from conventional products		0.699			
PROC3	I do not shop around to compare organic product prices		0.588			
	Factor 3: Price (PRIC)					
PRIC4	I inspect organic products before I purchase			0.768		
PRIC2	I read in-store product information leaflets regularly			0.725		
PRIC1	I do not purchase organic products with price reductions			0.517		
PRIC3	I prefer to buy organic products if the price is the same as conventional products			0.495		
	Factor 4: Certification (CERT)					
CERT3	I purchase organic products certified by international certification bodies				0.713	
CERT2	I purchase organic products certified by private certification bodies				0.700	
CERT4	I purchase organic products that can be traced back to the farmer				0.610	
	Factor 5: Information (INFO)					
INFO3	My family and friends provide advice on organic products					0.783
INFO2	I store organic products separately from conventional products					0.663
	Cronbach's alpha	0.824	0.551	0.546	0.601	0.477
	Eigenvalue	3.335	1.938	1.636	1.218	1.094
	Variance explained (%)	22.230	12.922	10.907	8.121	7.295
	Cumulative variance (%)	22.230	35.153	46.060	54.182	61.476

Extraction Method: PCA; Rotation Method: Varimax with Kaiser Normalization

5.2 Confirmatory factor analysis (CFA)

The purpose of CFA is to determine the relationships between the sub-dimensions of the primary dimensions (consumer risk perceptions and consumer risk reduction strategies) and their measurement models. Data set two ($n_{(2)}$=392) was analysed by using CFA. This process was used to confirm the classification of dimensions extracted from EFA which analysed data set one ($n_{(1)}$=392). CFA consists of two steps: first order CFA and second order CFA. The results of first order and second order CFA for consumer risk perceptions and consumer risk reduction strategies are discussed in next sections.

5.2.1 CFA for consumers' risk perceptions

5.2.1.1 First order CFA model for consumers' risk perceptions

The EFA results in the previous section showed six factors were extracted (six sub-dimensions) and 18 items for measuring consumer risk perceptions. The six sub-dimensions are psychological risk (PSYC) measured by four items, Functional risk (FUNC) measured by four items, Social risk (SOC) measured by two items, Financial risk (FIN) measured by four items, Physical risk (PHY) measured by two items and Time risk (TIME) measured by two items. The first order CFA model for consumer risk perceptions contained 18 observed variables (items) based on the EFA structure. The model was designed to test the relationships between six sub-dimensions and their observed variables (see Figure 5.3). The model included 171 observed variances and co-variances (18[18+1]/2) and 51 estimated parameters (12 regression weights, 15 co-variances and 24 variances).

We used the t-rule suggested by Byrne (2010) (see section 3.4.2.2.2) to determine whether the CFA model was 'identified'. The CFA model is 'identified' if the number of observed variances and co-variances is equal to or greater than the total number of estimated parameters (Byrne, 2010). The first order CFA model for consumer risk perceptions, tested with 120 degrees of freedom (171-51), was considered over identified; there were more observed variances and co-variances than estimated parameters. The first order CFA model for consumer risk perception identification is satisfied based on the t-rule (Byrne, 2010). Therefore, further analysis can be conducted using the CFA model.

The results of the preliminary first order model for consumer risk perceptions indicate that most items had factor loadings above the recommended threshold of 0.60 and were statistically significant at the 0.001 level. However, the factor loading for PSY4 was 0.47 and FUNC2 was 0.40, below the recommended threshold of 0.5 (Bagozzi & Yi, 1988; Hair et al., 2010; Janssens et al., 2008). Some of the model fit indices of the preliminary first order CFA model for consumer risk perceptions, the

Goodness-of-Fit Indices (GFI) and the Comparative Fit Index (CFI), were below the recommended thresholds (see Table 5.7). Therefore, model modifications were required to improve the model fit.

Table 5.7 Goodness of fit results for the first order CFA model for consumers' risk perceptions (the preliminary model)

Goodness of Fit Index	Value
Chi-Square (χ^2)	397.16
Degrees of Freedom (df)	120
Normed Chi-Square (χ^2/df)	3.310
Goodness of Fit Index (GFI)	0.893
Standardised Root Mean Residual (SRMR)	0.073
Comparative Fit Index (CFI)	0.861
Root Mean Square Error of Approximation (RMSEA)	0.077

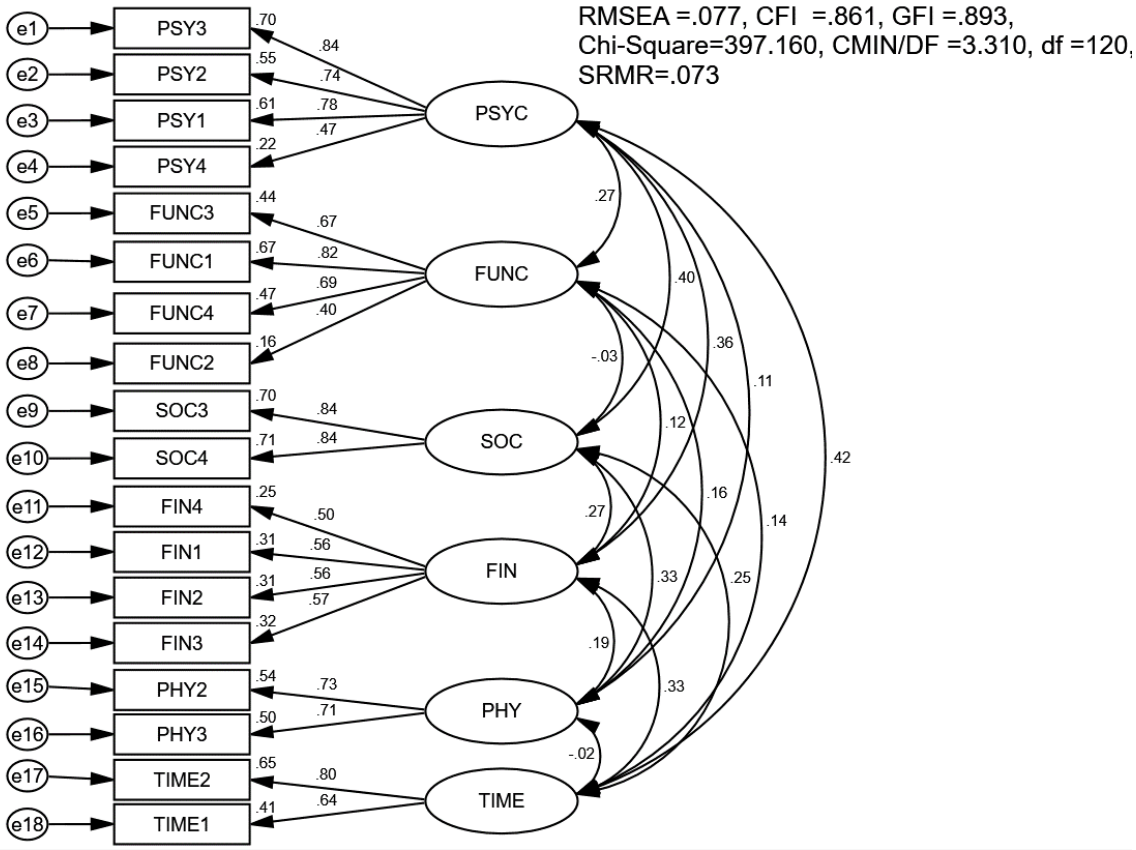

Figure 5.3 The first order CFA model for consumers' risk perceptions (the preliminary model)

Figure 5.3 shows that model fit indices indicate a poor fit, since both the GFI and CFI were below the 0.9 cut off level (Hair, 2010; Kline, 2011). Therefore, the model was modified. First, the factor loadings for all items were examined. If items have factor loadings less than 0.5, the items are considered problematic and should be removed from the analysis (Awang, 2015b). Figure 5.3 shows that PSY4 and FUNC2 with factor loadings lower than 0.5 were removed as they were lower than the recommended threshold. The removal of these items did not change the content or the meaning of

the constructs because this measurement model is a reflective measurement model. In fact, all measurement models in this study are reflective; therefore, the removal of items from the models will not affect the conceptual meaning of the construct.

Secondly, based on the modified indices from AMOS, the MI indicated high values (above 15). This result indicates that there were redundant items in the model. The MI showed high covariances between FIN3 and PSY2 and between PSY1 and TIME2. To resolve these issues, we can either covariance them as "free parameter estimates" or delete one of them from the analysis; the lower factor loading item should be deleted (Awang, 2015a). Therefore, FIN3 and PSY1 were removed from the analysis because they had lower factor loadings than PSY2 and TIME2. Lastly, FIN2 was also removed because it had a low factor loading of 0.5. Thus, five items from consumer risk perceptions were deleted from the model (see Table 5.8)

Table 5.8 Deleted consumers' risk perceptions items

Variable	Statement	Reason for Deletion
PSY4	I waste my money if I buy non-organic products that claim to be organic	-Low factor loading (<0.5)
FUNC2	I am concerned about how organic products are processed	-Low factor loading (<0.5)
FIN3	I think using the words "organic product" is only a marketing strategy to sell at higher prices	-MI (18.392) with PSY2
PSY1	I would be embarrassed if I purchased the product at a high price but the product has been treated with chemicals	-MI (10.358) with TIME2
FIN2	I would save money and buy more if I did not buy organic products	-Low factor loading (<0.5)

Note: MI = modification index for error term correlation

After the five items were removed, 13 measurement items remained in the consumers' risk perceptions model. These 13 items measured sub-dimensions of consumer risk perceptions. Two items measure the PSYC sub-dimension, three items measure the FUNC sub-dimension, two items measure the SOC, two items measure the FIN, two items measure the PHY and two items measure the TIME sub-dimension (see Figure 5.4).

The modified first order measurement model for consumers' risk perceptions contained 13 observed variables. The model included 91 observed variances and co-variances (13[13+1]/2) and 47 estimated parameters (7 regression weights, 15 co-variances and 19 variances). The modified first order CFA model for consumer risk perceptions, tested with 50 degrees of freedom (91-41). The model was examined and considered 'over identified'; there were more observed variances and co-variances than estimated parameters. The modified first order CFA model for consumer risk perceptions

identification satisfies the requirements and thus is considered suitable for further analysis based on Byrne's (2010) t-rule.

The model fit results of the modified first order model for consumers' risk perceptions indicate a good model fit. All model fit indices satisfied the recommended thresholds. Therefore, model modifications were not required. The goodness of fit results indicate a good model fit for the modified first order model for consumer risk perceptions (see Table 5.9).

Table 5.9 Goodness of fit results for the first order CFA model for consumer risk perceptions (modified model)

Goodness of Fit Index	Value
Chi-Square (χ^2)	115.368
Degrees of Freedom (df)	50
Normed Chi-Square (χ^2/df)	2.307
Goodness of Fit Index (GFI)	0.956
Standardised Root Mean Residual (SRMR)	0.044
Comparative Fit Index (CFI)	0.949
Root Mean Square Error of Approximation (RMSEA)	0.058

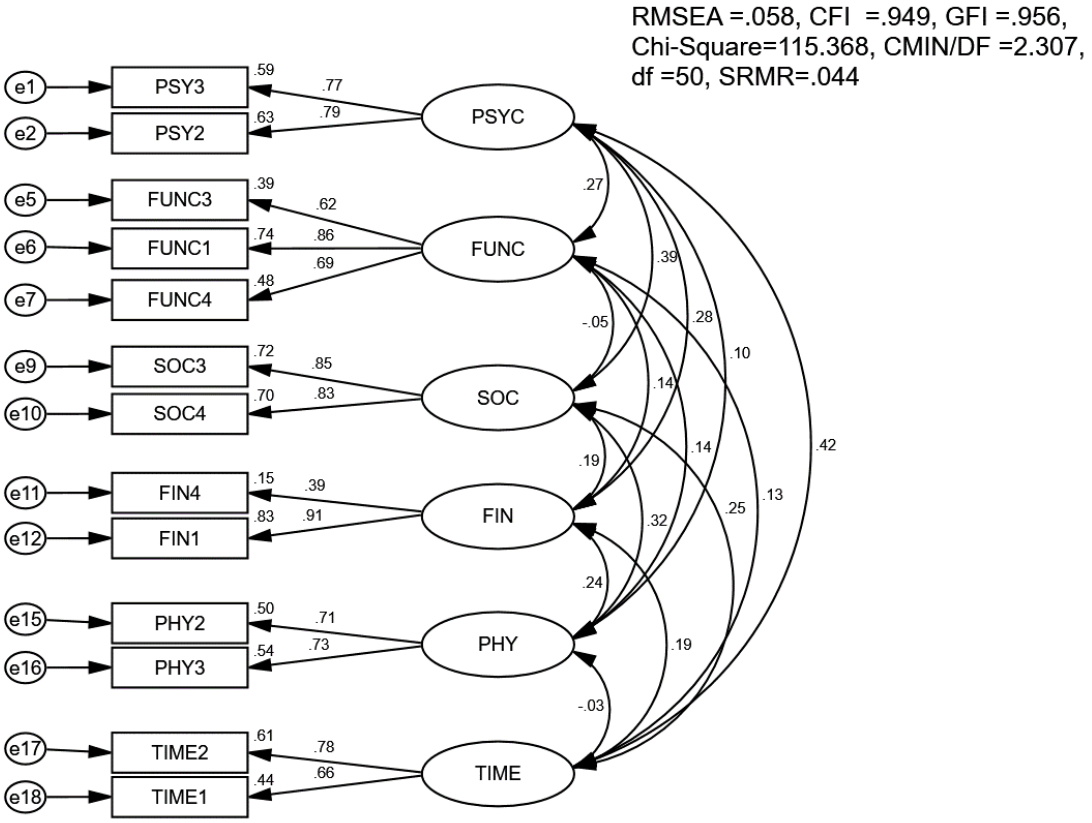

Figure 5.4 First order CFA model for consumers' risk perceptions (modified model)

The standardised solutions and correlations of the first order CFA model for consumers' risk perceptions are summarised in Table 5.10. The estimated factor loadings were statistically significant.

Table 5.10 The standardised solutions and correlations of the first order CFA model for consumers' risk perceptions

Variable	Factor Loading	Correlation
PSY2	0.792***	PSYC <--> FUNC .266
PSY3	0.770 (9.276)***	PSYC <--> SOC .391
FUNC1	0.861 (10.216)***	PSYC <--> FIN .284
FUNC3	0.621***	PSYC <--> PHY .105
SOC4	0.835 (10.073)***	FUNC <--> SOC -.050
SOC3	0.847***	FUNC <--> FIN .137
PHY3	0.732***	FUNC <--> PHY .143
PHY2	0.708 (5.577)***	SOC <--> FIN .188
FIN4	0.385***	SOC <--> PHY .324
TIME1	0.660***	PHY <--> FIN .241
TIME2	0.778 (5.802)***	PSYC <--> TIME .417
FIN1	0.911 (2.678)**	FUNC <--> TIME .128
FUNC4	0.692 (10.442)***	SOC <--> TIME .254
		FIN <--> TIME .189
		PHY <--> TIME -.031

*, **, *** statistically significant at the 0.1, 0.01, and 0.001 level, respectively

The CR and AVE results of the first order CFA model for consumer risk perceptions are summarised in Table 5.11. The CFI was 0.949, above the 0.90 threshold suggested by Byrne (2010). The CFI indicates that the first order CFA model for consumers' risk perceptions had adequate unidimensionality. The CR values ranged from 0.828 to 0.621. They are greater than 0.6, as suggested by Awang (2015). The CR of these constructs shows that the measurement of these six sub-dimensions had adequate reliability. All factor loadings were statistically significant. The factor loadings ranged from 0.620 to 0.91, above the 0.5 threshold suggested by Awang (2015b). This means that they have adequate convergent validity. However, FIN 4 has a factor loading of just 0.385, which is less than the 0.5 threshold.

Table 5.11 CR and AVE results of the first order CFA model for consumers' risk perceptions

Variable	Construct Reliability (CR)	Average Variance Extracted (AVE)
PSYC	0.758	0.610
FUNC	0.772	0.535
SOC	0.828	0.707
FIN	0.621	0.489
PHY	0.683	0.518
TIME	0.683	0.521

However, the FIN4 factor loading was acceptable because the goodness of fit index was satisfactory (Awang, 2015b). The AVE of five of the six sub-dimensions ranged from 0.707 to 0.521, and Kline (2015) above the 0.5 threshold suggested them. However, the AVE value of the FIN construct was 0.489, which is less than the accepted 0.5 threshold. Fornell and Larcker (1981) suggest that if the AVE is less than 0.5 but the CR is higher than 0.6, then the convergent validity is acceptable. Therefore, the convergent validity of FIN is acceptable (Fornell & Larcker, 1981). In sum, the AVE of these constructs indicates that the measures for these six sub-dimensions exhibit adequate convergent validity.

The CFI was 0.949, above the 0.90 threshold suggested by Byrne (2010). The CFI indicates that the first order CFA model for consumers' risk perceptions had adequate unidimensionality. The CR values ranged from 0.828 to 0.621. They are greater than 0.6, as suggested by Awang (2015). The CR of these constructs shows that the measurement of these six sub-dimensions had adequate reliability.

All factor loadings were statistically significant. The factor loadings ranged from 0.620 to 0.91, above the 0.5 threshold suggested by Awang (2015b). This means that they have adequate convergent validity. However, FIN 4 has a factor loading of just 0.385, which is less than the 0.5 threshold. However, the FIN4 factor loading was acceptable because the goodness of fit index was satisfactory (Awang, 2015b). The AVE of five of the six sub-dimensions ranged from 0.707 to 0.521, and Kline (2015) above the 0.5 threshold suggested them. However, the AVE value of the FIN construct was 0.489, which is less than the accepted 0.5 threshold. Fornell and Larcker (1981) suggest that if the AVE is less than 0.5 but the CR is higher than 0.6, then the convergent validity is acceptable. Therefore, the convergent validity of FIN is acceptable (Fornell & Larcker, 1981). In sum, the AVE of these constructs indicates that the measures for these six sub-dimensions exhibit adequate convergent validity.

The correlation coefficient of the six sub-dimensions factors range from -0.050 to 0.417. Kline (2015) below the 0.85 threshold suggests these. These correlation coefficients indicate that the measurement of the six sub-dimensions factors had adequate discriminant validity.

5.2.1.2 Second order CFA for consumers' risk perceptions

The second order CFA model for consumers' risk perceptions was designed to examine whether the RISK_PERCEPTION primary dimension is a hierarchical construct consisting of six sub-dimensions: PSYC, TIME, PHY, SOC, FIN, FUNC (see Figure 5.5). The following hypotheses were tested to confirm the relationships between the six sub-dimensions of consumer risk perceptions: hypothesis (H8a) (there is a positive relationship between consumers' perceived psychological risk and their risk perceptions); hypothesis (H8b) (there is a positive relationship between consumers' perceived time risk and their risk perceptions); hypothesis (H8c) (there is a positive relationship between consumers' perceived physical risk and their risk perceptions); hypothesis (H8d) (there is a positive relationship between consumers' perceived social risk and their risk perceptions); hypothesis (H8e) (there is a positive relationship between consumers' perceived financial risk and their risk perceptions); and hypothesis (H8f) (there is a positive relationship between consumers' perceived functional risk and their risk perceptions).

The model contained 13 observed variables with 91 observed variances and co-variances (13[13+1]/2) and 32 estimated parameters (13 regression weights and 19 variances). The second order CFA model for consumers' risk perceptions, with 59 degrees of freedom (91-32), was over identified; there were more observed variances and co-variances than estimated parameters.

For the second order CFA model, Byrne (2010) suggests that the identification status of the higher order portion of the model should be checked. The result shows that the model was over identified; there were more observed variances and co-variances than estimated parameters. The model of consumers' risk perceptions consisted of six first order factors. The model included 21 pieces of information (6[6+1]/2) and 12 estimated parameters (6 regression weights and 6 residuals) resulting in over identification with nine degrees of freedom (21-12). The second order CFA model identification is acceptable based on Byrne's (2010) t-rule. Therefore, the second order CFA model for consumers' risk perceptions can be estimated further.

The model fit results for the second order CFA model for consumers' risk perceptions show a good fit for the sample data. All model fit indices were satisfied and met the recommended thresholds. The goodness of fit results for the second-order model for consumer risk perceptions are summarised in Table 5.12.

Table 5.12 Goodness of fit results for the second order CFA for consumers' risk perceptions

Goodness of Fit Index	Value
Chi-Square (χ^2)	156.260
Degrees of Freedom (df)	59
Normed Chi-Square (χ^2/df)	2.648
Goodness of Fit Index (GFI)	0.942
Standardised Root Mean Residual (SRMR)	0.063
Comparative Fit Index (CFI)	0.924
Root Mean Square Error of Approximation (RMSEA)	0.065

Table 5.13 shows the standardised solutions for the second order CFA model for consumer risk perceptions. Factor loadings were statistically significant at the 0.001, 0.01 and 0.1 levels.

The results in Table 5.13 show the reliability and validity of the measurements (for the second order CFA for consumer risk perceptions). The factor loading values (β) indicate that the most reliable and strongest indicator of RISK_PERCEPTION was PSYC (β= 0.762), which is statistically significant at the 0.001 level. This result supports hypothesis (H8a) which states that psychological risk has a positive relationship with consumers' risk perceptions. The second most reliable indicator of RISK_PERCEPTION was TIME (β= 0.515), which is also statistically significant at the 0.001 level. This result supports hypothesis (H8b) which states that time risk has a positive relationship with consumers' risk perceptions. The third most significant indicator of RISK_PERCEPTION was SOC (β= 0.503) which is also statistically significant at the 0.001 level. This finding supports hypothesis (H8d) which states that social risk has a positive relationship with consumers' risk perceptions. The fourth most significant indicator of RISK_PERCEPTION was FIN (β= 0.422), which is statistically significant at the 0.1 level. This result supports hypothesis (H8e) which states that financial risk has a positive relationship with consumers' risk perceptions. The fifth most important indicator of RISK_PERCEPTION was FUNC (β= 0.258), which is statistically significant at the 0.01 level. This result supports hypothesis (H8f) which states that functional risk has a positive relationship with consumers' risk perceptions. The last significant indicator of RISK_PERCEPTION was PHY (β= 0.257), which is statistically significant at the 0.1 level. This finding supports hypothesis (H8c) which states that physical risk has a positive relationship with consumers' risk perceptions.

Table 5.13 Standardised solutions for second order CFA model for consumers' risk perceptions

Variable	Factor Loading	R^2
PSYC (Psychology)	0.762***	0.581
FUNC (Functional)	0.258 (3.164)**	0.066
SOC (Social)	0.503 (5.038)***	0.253
FIN (Financial)	0.422 (2.518)*	0.178
PHY (Physical)	0.257 (2.152)*	0.066
TIME (Time)	0.515 (4.272)***	0.265
PSYC3	0.783***	
PSYC2	0.778 (8.788)***	
FUNC1	0.862 (9.921)***	
FUNC3	0.615***	
FUNC4	0.695 (10.373)***	
SOC4	0.774 (7.998)***	
SOC3	0.914***	
PHY3	0.568***	
PHY1	0.913 (2.59)**	
FIN1	0.843 (2.804)**	
FIN4	0.416***	
TIME1	0.668***	
TIME2	0.769 (5.537)***	

*, **, *** statistically significant at the 0.1, 0.01 and 0.001 level respectively

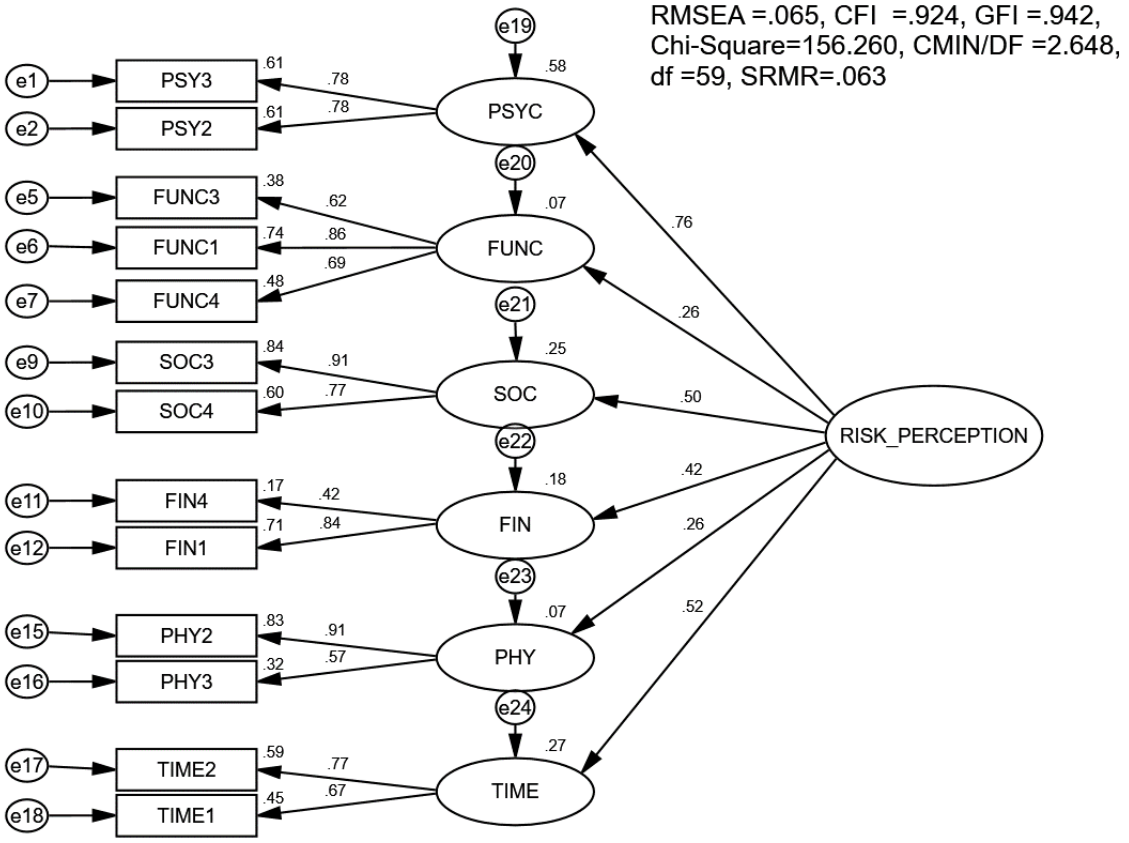

Figure 5.5 Second order CFA model for consumers' risk perceptions

These findings are consistent with Mitchell's (1999) and Yeung and Morris' (2001) studies that confirmed that consumers' risk perception is a hierarchical construct consisting of first and second order levels. Consumers' risk perceptions (second order) consists of six sub-dimensions (the first order): psychological risk, time risk, social risk, functional risk, financial risk and physical risk (Mitchell, 1999; Yeung & Morris, 2001). These results are consistent with Machado Nardi, Teixeira, Ladeira, and de Oliveira Santini's (2020) meta-analysis of food safety and consumers' risk perceptions. Machado Nardi et al. reveal that consumers' risk perceptions are influenced by psychological and social risk, which are driven by scepticism, time and financial risk. These are influenced by information and functional and physical risk, which are caused by food product characteristics. Our findings also confirm that the six sub-dimensions of consumers' risk perceptions of organic products are similar to consumers' risk perceptions for other food products such as poultry (Yeung et al., 2010), beef (Angulo & Gil, 2007), wine (Bruwer et al., 2013). These previous studies confirm that consumers' risk perceptions consist of six sub-dimensions: psychological risk, time risk, social risk, functional risk, financial risk and physical risk.

In addition, the second order latent variable, represented by RISK_PERCEPTION, explained 58.1 per cent of variance for PSYC, 26.5 per cent of variance for TIME, 25.3 per cent of variance for SOC, 17.8 per cent of variance for FIN, 6.6 per cent of variance for FUNC and 6.6 per cent of variance for PHY.

For consumers, psychological risk is the highest concern when purchasing organic products, followed by time, social, financial, functional and physical risk. Consumers' perceptions of psychological risk were over twice as high as time and social risk, over three times higher than financial risk and over eight times higher than functional and physical risk. In other words, if consumers' perceived risk is high when purchasing organic products, they fear being cheated and are concerned about 'losing face' if they purchase non-organic products that claim to be organic (psychological risk). They are also concerned with the limited time to find organic products because the limited supply makes purchasing organic products difficult (time risk). They also worry that they would be out of fashion and would be blamed by their family and friends for not doing the right thing if they do not purchase organic products (social risk). They may think they are wasting money if they purchase organic products at high prices (financial risk). Consumers are concerned about food safety and pesticide residues on the products they buy (functional risk). In addition, the taste and nutritional value may not be what they expect (or perceived) (physical risk).

5.2.2 CFA for risk reduction strategies

5.2.2.1 First order CFA for risk reduction strategies

Based on the EFA results in the previous section, the consumer risk reduction strategies construct consists of five factors (five sub-dimensions) and measured by 15 items. The five sub-dimensions consist of Brand (BRND) measured by three items; Process (PROC) three items; Price (PRIC) four items; Certification (CERT) three items; and Information (INFO) two items. The first order CFA model for consumers' risk reduction strategies contained 15 observed variables. The model was designed to test the relationship between the five sub-dimensions and their observed variables (see Figure 5.6). The model includes 120 observed variances and co-variances (15[15+1]/2) and 40 estimated parameters (10 regression weights, 10 co-variances and 20 variances). The model identification shows that the first order CFA model for consumer risk reduction strategies, tested with 80 degrees of freedom (120-40), was over identified; there were more observed variances and co-variances than estimated parameters. This result indicates that the identification of the preliminary first-order CFA model for consumers risk reduction strategies is satisfied and thus is suitable for further analysis (Byrne, 2010).

The result of the preliminary first-order CFA model for consumer risk reduction strategies indicated that majority of the items had a factor loading above the recommended threshold of 0.60 and statistically significant at the 0.001 level. However, the factor loadings of PRIC3 was just 0.22, PROC3

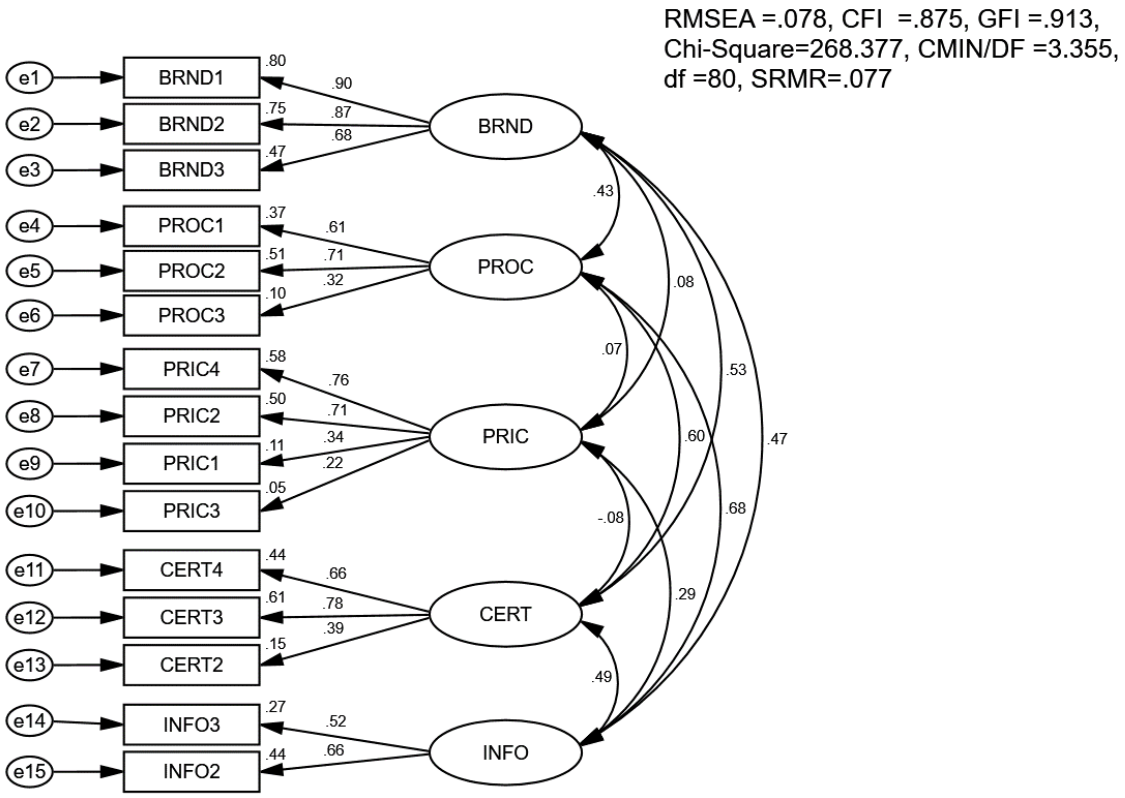

Figure 5.6 First order CFA model for consumers' risk reduction strategies (preliminary model)

was 0.32 and CERT2 was 0.39; in short, they were below the recommended threshold of 0.5 (Bagozzi & Yi, 1988; Hair et al., 2010; Janssens et al., 2008). The model fit index for the preliminary first order model for consumers' risk reduction strategies, the CFI, was below the recommended thresholds (see Table 5.14). Therefore, model was modified to improve the model fit.

Table 5.14 Goodness of fit results of the first-order CFA model for consumer risk reduction strategies (preliminary model)

Goodness of Fit Index	Value
Chi-Square (χ^2)	268.377
Degrees of Freedom (df)	80
Normed Chi-Square (χ^2/df)	3.355
Goodness of Fit Index (GFI)	0.913
Standardised Root Mean Residual (SRMR)	0.077
Comparative Fit Index (CFI)	0.875
Root Mean Square Error of Approximation (RMSEA)	0.078

Figure 5.6 shows the GFI and CFI were below the cut off level of 0.9 (Hair, 2010; Kline, 2011). The factor loadings for all items were examined. If any items with factor loading less than 0.5, they are considered problematic and should be removed from the analysis (Awang, 2015b). The measurement

models in this study are reflective, thus the removal of these items will not affect the conceptual meaning of the latent constructs (Awang, 2015).

However, the removal of low factor loadings should be completed one factor at the time, starting with the lowest factor and ending when the model fit indices are satisfactory (Awang, 2015b). We removed PRIC3 first because it had the lowest factor loading, followed by PROC3. The model fit indices were satisfactory at this point. Therefore, CERT2 was not removed because the model fit indices were achieved.

After two items had been removed, 13 items remained to measure the consumers' risk reduction strategies construct. These 13 items for measuring the sub-dimensions of consumer risk reduction strategies construct include three items for measuring the BRND sub-dimension, two for the PROC sub-dimension, three items for the PRIC, three for the CERT and two for INFO (see Figure 5.7).

The modified first order measurement model for consumer risk reduction strategies contained 13 observed variables. The model included 91 observed variances and co-variances (13[13+1]/2) and 36 estimated parameters (eight regression weights, 10 co-variances and 18 variances). The modified first order CFA model for consumer risk reduction strategies with 55 degrees of freedom (91-36), was over identified; there were more observed variances and co-variances than the estimated parameters. The model identification is satisfied and suitable for further analysis (Byrne, 2010).

The modified first order model for consumers' risk reduction strategies has a good model fit; all model fit indices satisfied the recommended thresholds. Therefore, further modifications were not required. The goodness of fit results for the modified first order model for consumer risk reduction strategies are summarised in Table 5.15.

Table 5.15 Goodness of fit results for the first order CFA model for consumers' risk reduction strategies (modified model)

Goodness of Fit Index	Values
Chi-Square (χ^2)	180.646
Degrees of Freedom (df)	55
Normed Chi-square (χ^2/df)	3.284
Goodness of Fit Index (GFI)	0.934
Standardised Root Mean Residual (SRMR)	0.064
Comparative Fit Index (CFI)	0.911
Root Mean Square Error of Approximation (RMSEA)	0.076

Standardised solutions and correlations of the first-order CFA model for consumer risk reduction strategies are summarised in Table 5.16. All standardised factor loading estimated were statistically significant.

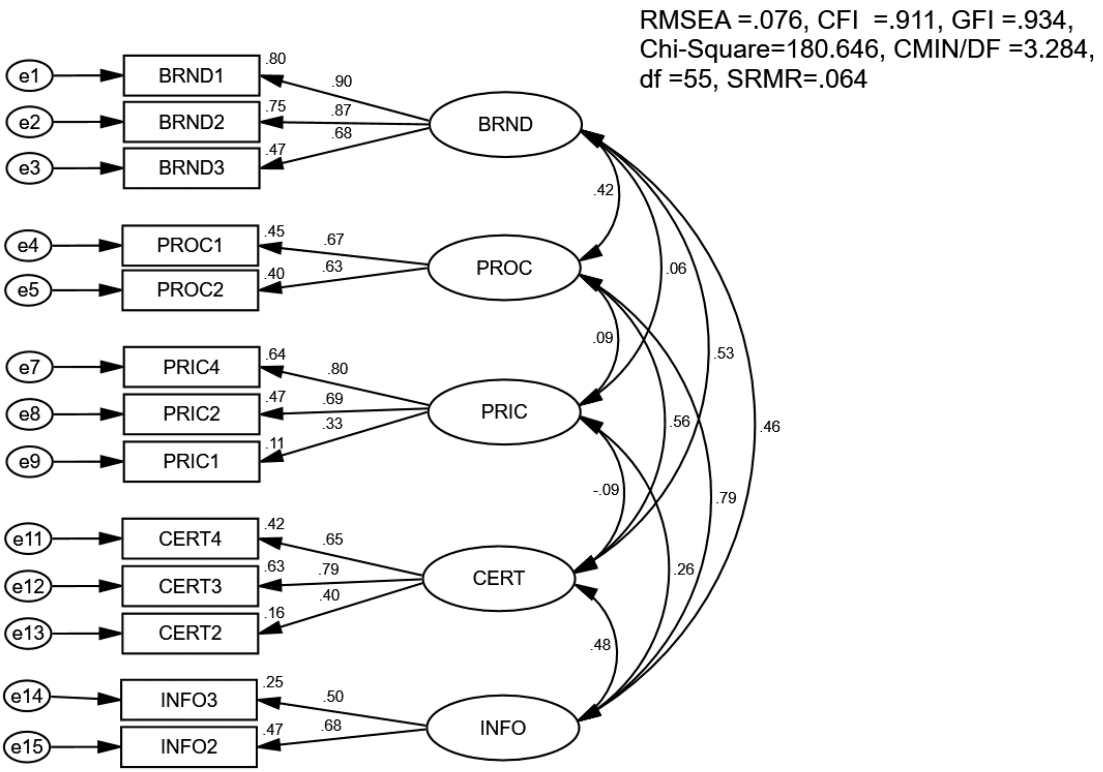

Figure 5.7 First order CFA model for consumer risk reduction strategies (modified model)

Table 5.16 Standardised solutions and correlations of first order CFA model for consumers' risk reduction strategies

Variable	Factor Loading	Correlation
BRND	0.868***	BRND <--> PROC 0.422
BRND	0.895 (19.311)***	BRND <--> PRIC 0.062
PROC	0.634 (8.079)***	BRND <--> CERT 0.526
PROC	0.670***	BRND <--> INFO 0.463
PRIC	0.687 (6.005)***	PROC <--> PRIC 0.091
PRIC	0.799***	PROC <--> CERT 0.564
CERT	0.792 (9.285)***	PROC <--> INFO 0.786
CERT	0.647***	PRIC <--> CERT -0.086
INFO	0.682***	PRIC <--> INFO 0.261
INFO	0.501 (6.789)***	CERT <--> INFO 0.479
BRND	0.682 (14.759)***	
PRIC	0.328 (4.875)***	
CERT	0.398 (6.439)***	

*, **, *** statistically significant at the 0.1, 0.01 and 0.001 level, respectively

Model validity measures

The CR and AVE results of the first order CFA model for consumer risk reduction strategies are summarised in Table 5.17.

Table 5.17 CR and AVE results of the first order CFA model for consumers' risk reduction strategies

Variable	Construct Reliability (CR)	Average Variance Extracted (AVE)
BRND	0.859	0.673
PROC	0.597	0.426
PRIC	0.649	0.406
CERT	0.653	0.401
INFO	0.522	0.358

The CFI was 0.911, above the 0.9 threshold suggested by Byrne (2010), which indicates that the first order CFA model for consumers' risk reduction strategies had adequate unidimensionality. The CR for most of the constructs ranged from 0.859 to 0.649. These figures are greater than 0.6 as suggested by Awang (2015). The CR of PROC is 0.597 and INFO is 0.522, which are slightly lower than the recommended level. However, Awang (2015) suggests that a CR lower than 0.6 can be caused by items that have low factor loadings. However, these items do not have to be deleted if the model fit indices are satisfied. As Awang (2015) notes, a CR lower than 0.6 is acceptable. The CR of these constructs indicates that the measurements for these five sub-dimensions have adequate reliability.

Most standardised factor loadings were statistically significant. The factor loadings, ranging from 0.501 to 0.895, were above the 0.5 threshold recommended by Awang (2015b). They also have adequate convergent validity. However, PRIC had a factor loading of 0.328 and CERT a factor loading of 0.398. These are less than the 0.5 threshold, but these factor loadings are acceptable because the CR of PRIC and CERT were greater than 0.6 and the goodness of fit index was satisfactory (Awang, 2015b). The AVE of all five of the sub-dimensions range from 0.673 to 0.358. The AVE of the BRND construct was 0.673, which is above the 0.5 threshold recommended by Kline (2015). However, the AVE value of the PRIC construct was 0.406 and CERT was 0.401, less than the recommended level (0.5). Fornell and Larcker (1981) suggest that if the AVE is less than 0.5 but the CR is higher than 0.6, the convergent validity is acceptable. Thus, the convergent validity of PRIC and CERT are acceptable. The AVE of PROC and INFO were below the recommendation threshold of 0.5. Fornell and Larcker (1981) suggest that the AVE can be lower than normal if the construct has a small number of items. Awang (2015) suggests that if the AVE of the construct are low because of a small number of items in the construct, the factor loading of each item should be considered. If the factor loading is higher than the 0.5 threshold and the model fit indices are achieved, the convergent validity of the

constructs in the model are acceptable. In this study, the PROC and INFO factor loadings were higher than the 0.5 threshold and the model fit indices were achieved. Therefore, the convergent validity of PROC and INFO are acceptable. In short, the factor loadings, and the CR and AVE constructs indicate that the measurement of the five sub-dimensions had adequate convergent validity.

The correlation coefficients of the five sub-dimensions factors range from -0.086 to 0.786, which are below the 0.85 threshold suggested by Kline (2015). These correlation coefficients indicate that the measures of the five sub-dimensions factors have adequate discriminant validity.

5.2.2.2 Second order CFA for risk reduction strategies

The purpose of the second order CFA for risk reduction strategies is to test whether the RISK_REDUCTION primary dimension is a hierarchical construct consisting of five sub-dimensions: PROC, PRIC, INFO, CERT, and BRND (see Figure 5.8). The hypotheses related to these five sub-dimensions are tested to confirm the relationships between them as follows: hypothesis (H9a) (a positive relationship between process and consumers' risk reduction strategies), hypothesis (H9b) (a positive relationship between price and consumers' risk reduction strategies), hypothesis (H9c) (a positive relationship between information and consumers' risk reduction strategies), hypothesis (H9d) (a positive relationship between certification and consumers' risk reduction strategies), and hypothesis (H9e) (a positive relationship between brand and consumers' risk reduction strategies).

The model consists of 13 observed variables. The model included 91 observed variances and co-variances (13[13+1]/2) and 31 estimated parameters (12 regression weights and 19 variances). The model identification shows that the second order CFA model for consumer risk reduction strategies with 60 degrees of freedom (91-31) was over identified; there were more observed variances and co-variances than estimated parameters.

For a second order CFA model, Byrne (2010) suggests that the identification status of the higher order portion of the model should be checked. The result of the second order model for consumer risk reduction strategies shows that the model was over identified; there were more observed variances and co-variances than estimated parameters. The model of consumers' risk reduction strategies consists of five first order factors. The model includes 15 pieces of information 5([5+1]/2) and 10 estimated parameters (five regression weights and five residuals) resulting in over-identification with five degrees of freedom (15-10). The identification of the second order CFA model for consumers' risk reduction strategies satisfies the requirements suggested by Byrne (2010).

The model fit result of the second order model for consumers' risk reduction strategies indicates a poor fit. The normed Chi square, GFI, and SRMR of the model were acceptable. However, the CFI and the RMSEA did not satisfy the recommended thresholds. Therefore, model modifications were

required to improve the model fit. The MIs from AMOS were used as a guideline to improve the model fit. The goodness of fit results for the second order model for consumers' risk reduction strategies are summarised in Table 5.18.

Table 5.18 Goodness of fit results of the second order CFA model for consumers' risk perceptions (preliminary model)

Goodness of Fit Index	Value
Chi-Square (χ^2)	210.702
Degrees of Freedom (df)	60
Normed Chi-Square (χ^2/df)	3.512
Goodness of Fit Index (GFI)	0.920
Standardised Root Mean Residual (SRMR)	0.074
Comparative Fit Index (CFI)	0.893
Root Mean Square Error of Approximation (RMSEA)	0.080

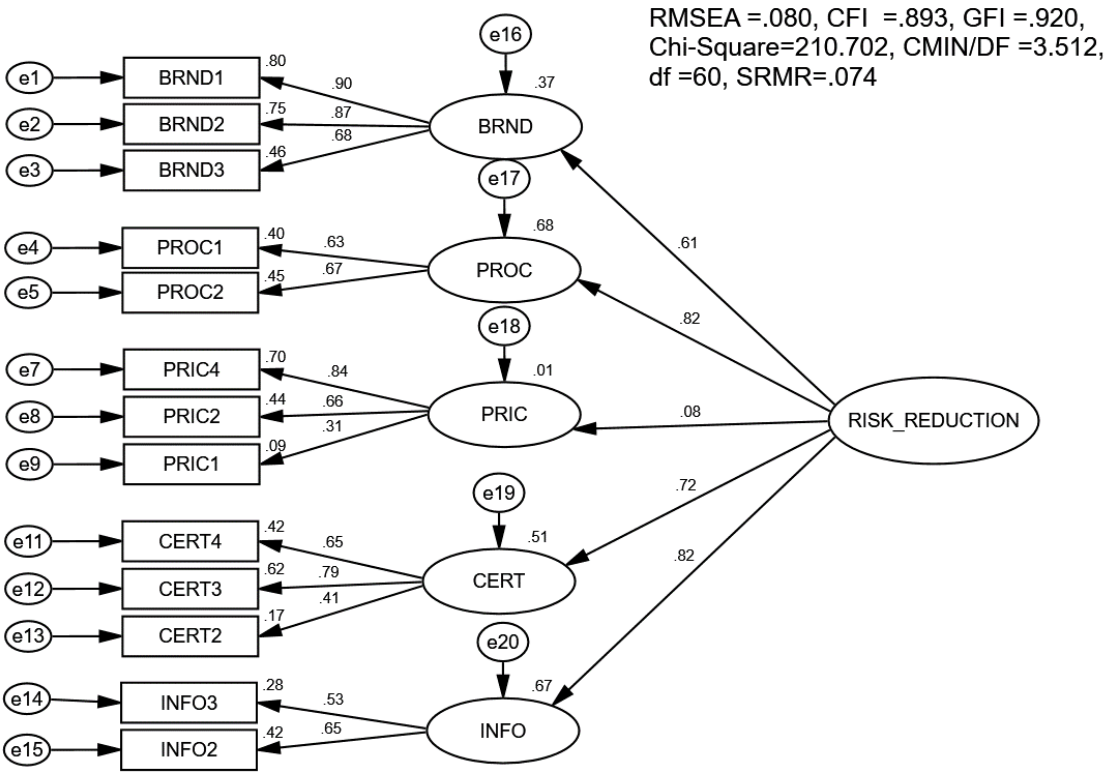

Figure 5.8 Second order CFA model for consumer risk reduction strategies (preliminary model)

Model fit indices indicate a poor fit of the sample data. Awang (2015) suggests that if the MI between variables is greater than 15.00, the variables are redundant. The MI indicates that PRIC1 and INFO2 were redundant because the MI between PRIC1 and INFO2 is 26.046 (see Appendix D1). To resolve this problem, Awang (2015) suggests deleting the lowest factor loading item or covariancing them. In this case we covarianced PRIC1 and INFO2 (see Figure 5.9). A relationship between PRIC1 and INFO2 is well supported in the literature (see Molinillo, Vidal-Branco, & Japutra,

2020; Thøgersen, Pedersen, & Aschemann-Witzel, 2019). Thøgersen et al. (2019) find that consumers in Denmark, Germany, France, China and Thailand were willing to pay high prices for organic products if they had sufficient information about the organic products. Consumers preferred to purchase organic products from trusted producers and preferred to keep organic products they purchased separately from other products (Thøgersen et al., 2019). Molinillo et al. (2020) reveal that consumers in Brazil and Spain frequently purchase organic products at a premium price if they have more information and communication about organic products.

The model contained 13 observed variables with 91 observed variances and co-variances (13[13+1]/2) and 32 estimated parameters (12 regression weights, 19 variances and one co-variance). The model identification shows that the second order CFA model for consumer risk reduction strategies, with 59 degrees of freedom (91-32), was over identified; there were more observed variances and co-variances than estimated parameters.

For the second order CFA model, Byrne (2010) suggests that the identification status of the higher order portion of the model should be checked. The modified second order CFA model for consumer risk reduction strategies consists of five first-order factors with 15 pieces of information 5([5+1]/2) and 10 estimated parameters (five regression weights and five residuals) resulting in over identification, with five degrees of freedom (15-10). The model identification satisfies the requirements suggested by Byrne (2010). Therefore, the modified second order CFA model for consumers' risk reduction strategies can be further estimated.

The model fit result of the second order CFA model for consumer risk reduction strategies indicate a good fit. All model fit indices satisfied the recommended thresholds. The goodness of fit results of the modified second order CFA model for consumers' risk reduction strategies are presented in Table 5.19.

Table 5.19 Goodness of fit results for the second-order CFA model for consumers' risk perceptions (modified model)

Goodness of Fit Index	Value
Chi-Square (χ^2)	181.867
Degrees of Freedom (df)	59
Normed Chi-Square (χ^2/df)	3.082
Goodness of Fit Index (GFI)	0.931
Standardised Root Mean Residual (SRMR)	0.067
Comparative Fit Index (CFI)	0.913
Root Mean Square Error of Approximation (RMSEA)	0.073

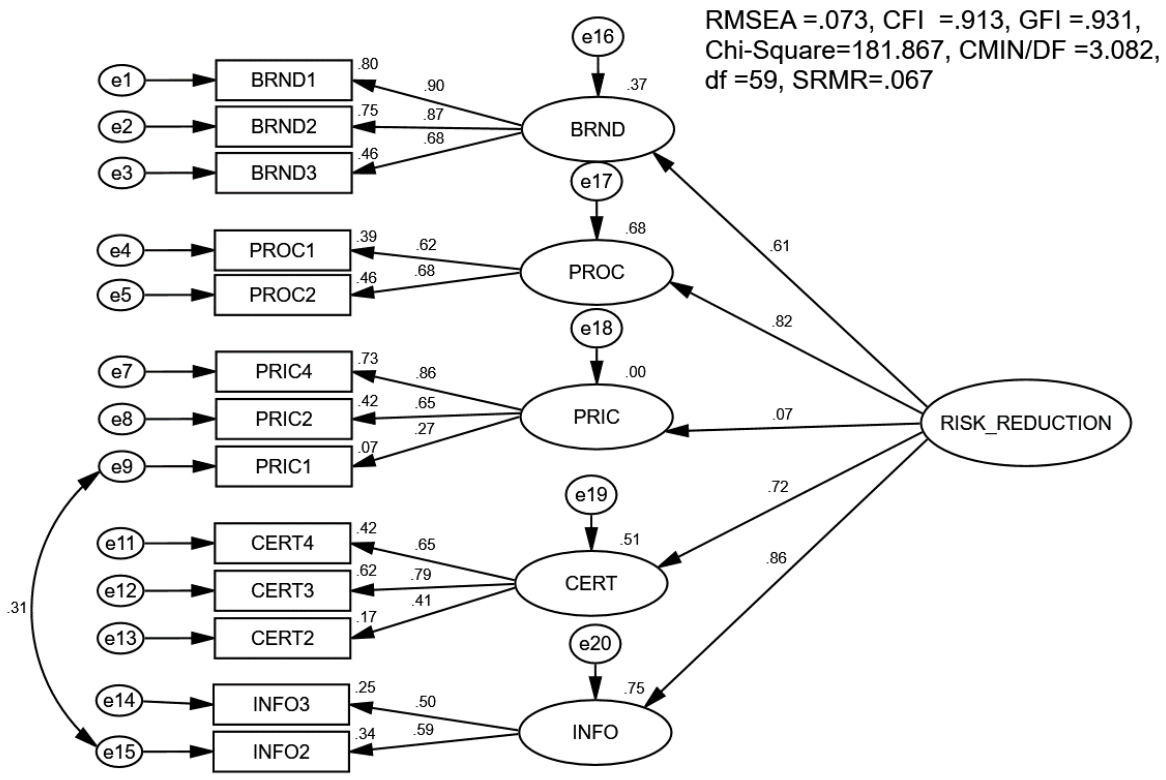

Figure 5.9 The second order CFA model for consumers' risk reduction strategies (modified model)

Table 5.20 presents the standardised solutions of the second order CFA model (modified model) for consumers' risk reduction strategies. All factor loadings except PRIC were statistically significant at the 0.001 level. The results in Table 5.20 support the reliability and validity of the second order CFA for consumers' risk reduction strategies. The factor loading values indicate that the most reliable and strongest indicator of RISK_REDUCTION was INFO (β = 0.864). It was significant at the 0.001 level. The result supports hypothesis (H9c) which states that there is a positive relationship between information and consumers' risk reduction strategies. The second most reliable indicator of RISK_REDUCTION was PROC (β= 0.824) which is also significant at the 0.001 level. This finding supports hypothesis (H9a) which states that there is a positive relationship between process and consumers' risk reduction strategies. The third significant indicator of RISK_REDUCTION was CERT (β= 0.717), which is also significant at the 0.001 level. This result supports hypothesis (H9d) that there is a positive relationship between certification and consumers' risk reduction strategies. The fourth significant indicator of RISK_REDUCTION was BRND (β= 0.611) which is also significant at the 0.001 level. The finding supports hypothesis (H9e) which states that there is a positive relationship between brand and consumers' risk reduction strategies. However, the findings indicate that PRIC (β= 0.068) is not a significant indicator of RISK_REDUCTION. This does not support hypothesis (H9b) which states that there is a positive relationship between price and consumers' risk reduction

strategies. In short, these results partially support hypotheses (H9a), (H9c), (H9d), and (H9e) but do not support hypothesis (H9b).

These findings are consistent with Yeung et al.'s (2010) study that reports that consumers' risk reduction strategy construct is a hierarchical construct consisting of five sub-dimensions: information, process, certificate, brand and price. More importantly, Yeung et al.(2010) find that searching for information, examining the process, and choosing certified products and well-known brands are significant indicators of consumers' risk reduction strategies. However, seeking discounted prices is not a significant risk reduction strategy when purchasing poultry (Yeung et al., 2010). The findings are also consistent with Yormirzoev and Teuber's (2017) study in Tajikistan which revealed that, when purchasing food products that may contain GMO ingredients, consumers search for information, choose certified products and trusted production processes. Yormirzoev and Teuber (2017) conclude that price is not an important indicator of consumers' risk reduction strategies when purchasing food.

Additionally, the second order latent variable, represented by RISK_REDUCTION, explained 74.7 per cent of the variance for INFO, 67.9 per cent for PROC, 51.4 per cent for CERT, 37.3 per cent for BRND but only 0.5 per cent for PRIC. This indicates that consumers want to reduce their risk and are most likely to search for additional information to ensure that organic products are kept separate from conventional ones. Consumers then choose trusted certificates and well-known brands. Interestingly, the results indicate that the effect of searching for information is twice as much as the effect of choosing well-known brands on consumers' risk reduction strategies. In short, consumers first search for information, choosing a well-known organic product brand is the least used risk reduction strategy when purchasing organic products.

Six sub-dimensions of consumer risk perception constructs and five sub-dimensions of consumer risk reduction strategy constructs were considered latent variables in the model. Once the model is fit, we can impute the observed variables from the latent variables (Arbuckle, 2017). The observed variables are appropriate for further analysis. In this study, we used the AMOS data imputation function to impute six observed variables from the six sub-dimensions of the consumers' risk perceptions construct and five observed variables from the five sub-dimensions of the consumers' risk reduction strategies construct. These 11 observed variables were then used for further analysis (refer to section 3.5).

Table 5.20 The standardised solutions of the second order CFA model for consumers' risk reduction strategies

Variable	Factor Loading	R^2
BRND	0.611***	0.373
PROC	0.824 (6.596)***	0.679
PRIC	0.068 (0.987)	0.005
CERT	0.717 (6.457)***	0.514
INFO	0.864 (6.775)***	0.747
BRND1	0.896 (19.219)***	
BRND2	0.868***	
BRND3	0.680 (14.692)***	
PROC1	0.624***	
PROC2	0.681 (7.776)***	
PRIC1	0.271 (3.719)***	
PRIC2	0.649 (4.255)***	
PRIC4	0.856***	
CERT2	0.406 (6.5)***	
CERT3	0.787 (8.969)***	
CERT4	0.646***	
INFO2	0.586***	
INFO3	0.499 (6.268)***	

*, **, *** statistically significant at the 0.1, 0.01 and 0.001 levels, respectively.

5.2.3 First order CFA for five constructs

The first order CFA model for five constructs was designed to examine the relationships between the five constructs. The five constructs are consumers' perceptions of organic products' attributes (PERCEPTION); consumers' attitudes towards organic products (ATTITUDE); knowledge (KNOWLEDGE); lifestyle (LIFESTYLE); and consumers' WTP premium prices for organic products (WTP).

Initially, these five constructs were measured using 55 items. The item parcelling method was used to group the 55 items into 18 parcels to minimise measurement errors when analysing the constructs (Matsunaga, 2008). Item parcelling means individual items are aggregated into one or more parcels and one uses these parcels instead of the observed variables (items) (Kishton & Widaman, 1994; Matsunaga, 2008). Parcelled items were formed by combining two or more items into one parcel (to

create composite items) (Matsunaga, 2008; Rogers & Schmitt, 2004). In this study, 55 items from five constructs (PERCEPTION, ATTITUDE, KNOWLEDGE, LIFESTYLE and WTP) were grouped into 18 parcels using the content method suggested by Landis et al. (2000) (see Table 5.21). As suggested by Bonti-ankomah and Yiridoe (2006); Sriwaranun (2010) and Voon et al. (2011), consumers' perceptions of organic product attributes consist of perceptions on health benefits, the availability of organic products, quality, and trust in organic products. Sriwaranun (2011) and Voon et al. (2011) recommend that consumers' attitudes toward organic products include attitudes toward food safety, prices, ethics and the environment. Consumers' knowledge about organic products consists of understanding how organic products are produced and handled, and knowledge about how organic products differ from conventional products (Roitner-Schobesberger et al., 2008; Sriwaranun, 2011). Consumer lifestyles consist of green lifestyle, cook at home, dine out and healthy lifestyle (Sriwaranun, 2011; Vanit-Anunchai & Schmidt, 2006; Voon et al., 2011). Based on Voon et al.'s (2011) suggestion, consumers' WTP premium prices for organic products consists of the frequency of purchasing organic products, expenditure for organic products, the premium price paid for organic products and the experience purchasing organic products.

Table 5.21 Item parcelling for the five constructs

Construct	Number of measurement items	Number of parcels	Items in the parcel	Parcel Name
PERCEPTION	12 (P1-12)	4	P1,2 (Health)	PER1
			P3,4,5,6 (Availability)	PER2
			P7,8,10,12 (Quality)	PER3
			P9, 11 (Trust)	PER4
ATTITUDE	9 (A1-9)	3	A1, 3, 5 (Food safety)	ATT1
			A2, 4, 6 (Environment)	ATT2
			A7, 8, 9 (Price)	ATT3
KNOWLEDGE	6 (K1-6)	3	K1, 4 (Produced)	KNO1
			K2, 5 (Handled)	KNO2
			K3, 6 (Different)	KNO3
LIFESTYLE	11 (L1-11)	4	L1, 5, 8, 11 (Cook at home)	LIF1
			L6, 7 (Healthy)	LIF2
			L2, 3, 4 (Dine out)	LIF3
			L9, 10 (Green)	LIF4
WTP	17 (W1-17)	4	W1-4 (Frequency)	WTP1
			W5-8 (Expenditure)	WTP2
			W9-12 (Premium price)	WTP3
			W13-17 (Experience)	WTP4

Table 5.21 shows the five constructs and their individual items, including the parcelled items. The consumer perceptions of organic products' attributes construct were measured using four parcels of items (formed from 12 items). The consumer attitudes towards organic products construct was measured using three parcels (formed from nine items). The consumers' knowledge about organic products construct was measured using three parcels (formed from six items). The consumer's

lifestyle construct was measured using four parcels (formed from 11 items). The consumer's WTP premium prices for organic products construct was measured using four parcels (formed from 17 items). In summary, 18 parcels were formed using 55 items. These 18 parcels were used as observed variables to conduct the first order CFA for the five constructs.

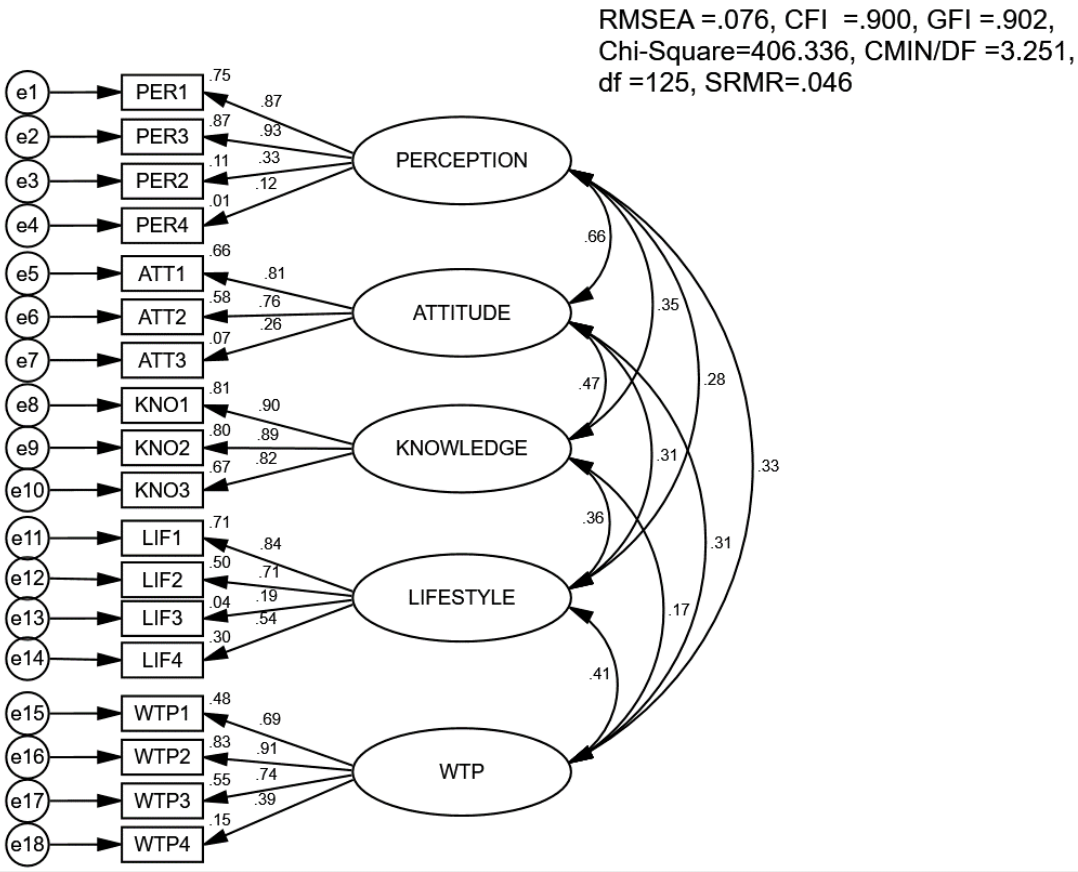

Figure 5.10 The first order CFA model for five constructs (preliminary model)

The first order CFA model for the five constructs was designed to test the relationship between the five constructs and their observed variables (see Figure 5.10). The model consists of 18 observed variables with 171 observed variances and co-variances (18[18+1]/2) and 46 estimated parameters (13 regression weights, 10 co-variances and 23 variances). The first order CFA model for five constructs with 125 degrees of freedom (171-46) was over identified; there were more observed variances and co-variances than estimated parameters. The model identification satisfied the requirements suggested by Byrne (2010). Therefore, we can conduct the estimation of the first order CFA model for the five constructs.

The results of the preliminary first order model for five constructs indicates that most items had factor loadings above the recommended threshold of 0.50 and were statistically significant at the 0.001 per cent level. However, the factor loadings of PER2, PER4, ATT3, LIF3 and WTP4 were below the recommended 0.5 threshold (Bagozzi & Yi, 1988; Hair et al., 2010; Janssens et al., 2008)

The model fit indices for the preliminary first order model for the five constructs (GFI and CFI), were above the recommended thresholds (see Table 5.22). Low factor loadings of items cause issues with model validity. The AVE and CR of PERCEPTION, ATTITUDE and LIFESTYLE were lower than the recommended threshold. Therefore, model modifications were required to improve the model validity to get a better model fit.

Table 5.22 Goodness of fit results of the first order CFA for five constructs (preliminary model)

Goodness of Fit Index	Value
Chi-Square (χ^2)	406.336
Degree of Freedom (df)	125
Normed Chi-Square (χ^2/df)	3.251
Goodness of Fit Index (GFI)	0.902
Standardised Root Mean Residual (SRMR)	0.046
Comparative Fit Index (CFI)	0.900
Root Mean Square Error of Approximation (RMSEA)	0.076

To satisfy the model fit indices and to improve model validity, the following items, PER2, PER4, ATT3, LIF3 and WTP4, were removed from the analysis because of low factor loadings (less than 0.5 as suggested by Awang (2015)). The MI from AMOS between LIF4 and WTP3 was 16.847 (see Table 5.23). That MI shows that LIF4 and WTP3 are redundant because the MI is greater than the recommended threshold of 15 (Awang, 2015). We can either covariance them or delete the one that has the lower factor loading (Awang, 2015b). We removed LIF4 from the analysis.

Table 5.23 Deleted observed variables of the five constructs

Variables	Reason for deletion
PER2	Low factor loading (<0.5)
PER4	Low factor loading (<0.5)
ATT3	Low factor loading (<0.5)
LIF3	Low factor loading (<0.5)
LIF4	MI (16.847) with WTP3
WTP4	Low factor loading (<0.5)

Note: MI = modification index for error term correlation

Twelve observed variables for measuring the five constructs remained after six observed variables were removed. These 12 variables measured five constructs: two measure the PERCEPTION construct, two measure the ATTITUDE construct, three measure the KNOWLEDGE construct, two measure the LIFESTYLE construct, and three measure the WTP construct (see Figure 5.11).

The modified first order measurement model for the five constructs consists of 12 observed variables with 78 observed variances and co-variances (12[12+1]/2) and 34 estimated parameters (seven regression weights, 10 co-variances and 17 variances). The modified first-order CFA model for the five constructs with 44 degrees of freedom (78-34) was over identified. There were more observed variances and co-variances than estimated parameters indicating that the model identification is

acceptable (Byrne, 2010). The modified first order measurement model for the five constructs is suitable for further analysis.

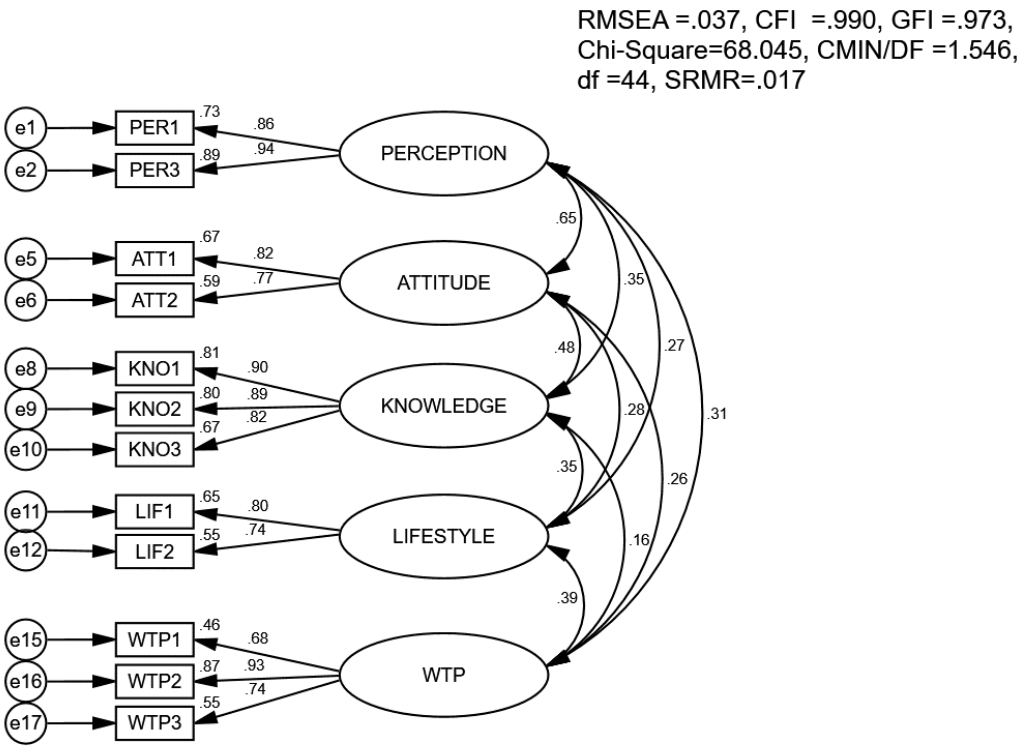

Figure 5.11 First order CFA model for five constructs (modified model)

The model fit result of the modified first order CFA model for the five constructs indicates a good model fit. All model fit indices satisfied the recommended thresholds. Table 5.24 presents the goodness of fit indices of the modified first-order model for the five constructs.

Table 5.24 Goodness of fit results of the first-order CFA for five constructs (modified model)

Goodness of Fit Index	Value
Chi-Square (χ^2)	68.045
Degrees of Freedom (df)	44
Normed Chi-Square (χ^2/df)	1.546
Goodness of Fit Index (GFI)	0.973
Standardised Root Mean Residual (SRMR)	0.017
Comparative Fit Index (CFI)	0.990
Root Mean Square Error of Approximation (RMSEA)	0.037

The standardised solutions and correlations of the first order CFA model for the five constructs are summarised in Table 5.25. All standardised factor loadings estimated were statistically significant.

Table 5.25 The standardised solutions and correlations of first order CFA model for five constructs

Variable	Factor Loading	Correlation
KNO2	0.893 (23.585)***	ATTITUDE <--> PERCEPTION 0.651
KNO1	0.898***	PERCEPTION <--> KNOWLEDGE 0.346
LIF2	0.744***	ATTITUDE <--> KNOWLEDGE 0.476
WTP2	0.931***	PERCEPTION <--> LIFESTYLE 0.270
WTP1	0.678 (13.391)***	PERCEPTION <--> WTP 0.306
WTP3	0.741 (14.529)***	ATTITUDE <--> LIFESTYLE 0.281
LIF1	0.804 (8.093)***	ATTITUDE <--> WTP 0.255
PER1	0.856***	KNOWLEDGE <--> LIFESTYLE 0.355
KNO3	0.821 (20.935)***	KNOWLEDGE <--> WTP 0.161
ATT1	0.816***	LIFESTYLE <--> WTP 0.389
ATT2	0.766 (12.272)***	
PER3	0.942 (17.169)***	

*, **, *** statistically significant at the 0.1, 0.01, and 0.001 level, respectively

Model validity measures

The CR and AVE results of the first order CFA model for five constructs are summarised in Table 5.26.

Table 5.26 The CR and AVE results of the first order CFA model for five constructs

Variable	Construct Reliability (CR)	Average Variance Extracted (AVE)
PERCEPTION	0.895	0.811
ATTITUDE	0.770	0.626
KNOWLEDGE	0.904	0.759
LIFESTYLE	0.750	0.600
WTP	0.831	0.625

The CFI was 0.990 is above the 0.90 threshold suggested by Byrne (2010). This suggests that the first order CFA model for the five constructs had adequate unidimensionality. The CR of the constructs ranged from 0.904 to 0.750, i.e., greater than 0.6, as suggested by Awang (2015). Therefore, the CRs of these constructs indicate that the measurements for the five constructs had adequate reliability.

All factor loadings were statistically significant. The factor loadings ranged from 0.942 to 0.678, i.e., above the 0.5 threshold suggested by Awang (2015b). Thus, they have adequate convergent validity.

The AVE of the five constructs ranged from 0.811 to 0.600 are above the 0.5 threshold suggested by Kline (2015). This suggests the measurements of these five constructs had adequate convergent validity.

The correlation coefficients for the five constructs range from 0.161 to 0.651 (see Table 5.25). Kline (2015) below the 0.850 threshold suggests all. This suggests that the measurements of the five constructs have adequate discriminant validity.

5.2.4 The CFA model for the seven constructs

The CFA model for the seven constructs was designed to examine the relationships between the identified constructs (consumers' perceptions of organic product attributes (PERCEPTION), consumers' attitudes to organic products (ATTITUDE), consumers' knowledge about organic products (KNOWLEDGE), consumer lifestyles (LIFESTYLE), consumers' risk perceptions (RISK_PERCEPTION), consumers' risk reduction strategies (RISK_REDUCTION) and consumers' WTP premium prices for organic products (WTP)) and the observed variables (see Figure 5.12). The CFA model for all seven constructs consists of 23 observed variables. The model tests the relationships between the seven constructs and their observed variables (Figure 5.12). The model includes 276 observed variances and co-variances (23[23+1]/2) and 67 estimated parameters (16 regression weights, 21 co-variances and 30 variances). The model identification shows that the CFA model for seven constructs with 209 degrees of freedom (276-67), was over identified; there were more observed variances and co-variances than estimated parameters. Model identification was satisfied based on Byrne's (2010) study.

The results of the preliminary CFA model for seven constructs indicate that most items had factor loadings above the recommended threshold of 0.50 and were statistically significant at the 0.001 level. However, the factor loadings of PHY, FUNC, FIN and PRIC were below the recommended 0.5 threshold (Bagozzi & Yi, 1988; Hair et al., 2010; Janssens et al., 2008). Also, the GFI of the preliminary CFA model for the seven constructs was below the recommended threshold of 0.9 (see Table 5.27). Thus, model modifications were required to improve the model fit.

Table 5.27 Goodness of fit results for the CFA for seven constructs (preliminary model)

Goodness of fit index	Value
Chi-Square (χ^2)	603.317
Degrees of Freedom (df)	209
Normed Chi-Square (χ^2/df)	2.887
Goodness of Fit Index (GFI)	0.878
Standardised Root Mean Residual (SRMR)	0.037
Comparative Fit Index (CFI)	0.911
Root Mean Square Error of Approximation (RMSEA)	0.069

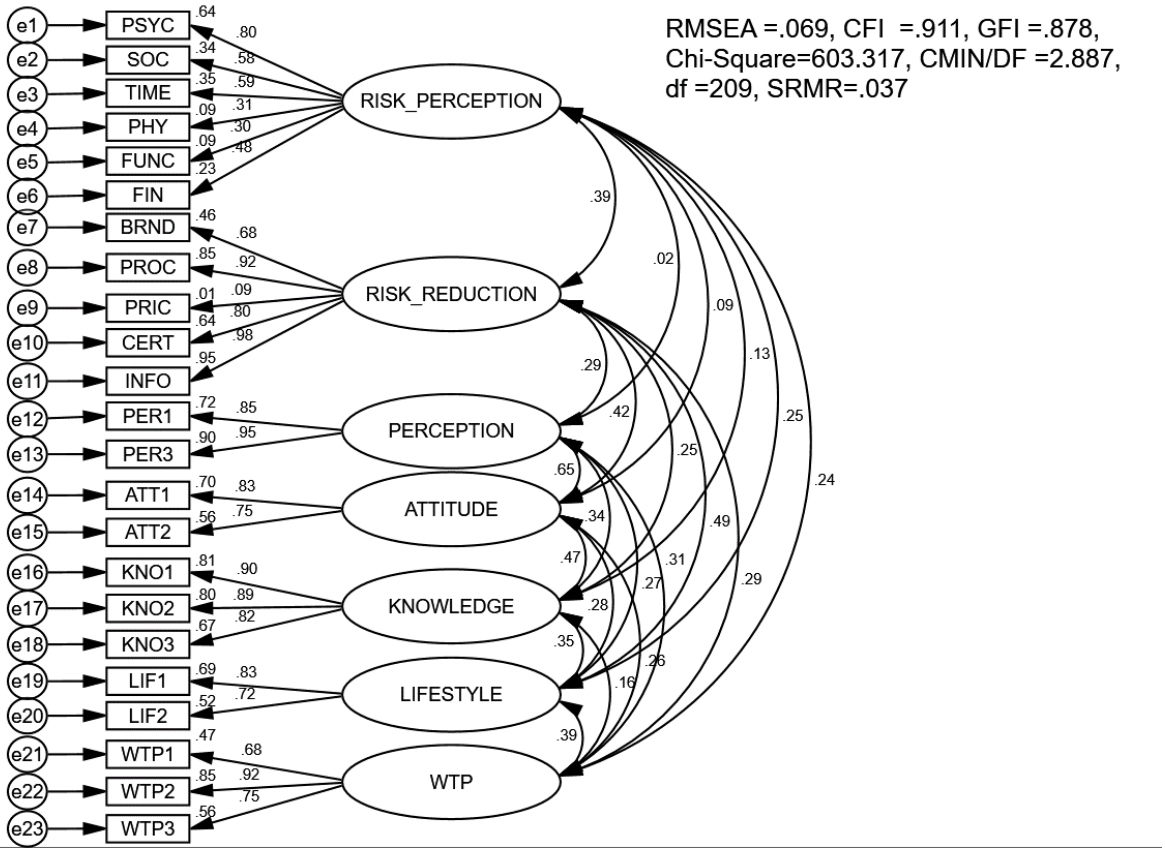

Figure 5.12 CFA model for seven constructs (the preliminary model)

To satisfy the goodness of fit indices and to improve model validity, the following variables, PHY FUNC FIN and PRIC, were removed from the analysis because of low factor loadings (less than 0.5), as suggested by Awang (2015). After these four observed variables were removed, 19 observed variables were used to measure the seven constructs as follows: three for the RISK_PERCEPTION construct; four for the RISK_REDUCTION construct; two for the PERCEPTION construct; two for the ATTITUDE construct; three for the KNOWLEDGE construct; two for the LIFESTYLE construct; and three for the WTP construct (see Figure 5.13).

The modified CFA model for the seven constructs contained 19 observed variables with 190 observed variances and co-variances (19[19+1]/2) and 59 estimated parameters (12 regression weights, 21 co-variances and 26 variances). The modified CFA model for the seven constructs, tested with 131 degrees of freedom (190-59), was over identified; there were more observed variances and co-variances than estimated parameters. The model identification satisfies Byrne's recommendations (2010). Therefore, the modified CFA model for the seven constructs can be further estimated.

The model fit result of the modified CFA model for the seven constructs indicated a good model fit. All model fit indices satisfied the recommended thresholds. The goodness of fit results for the modified CFA for seven constructs are summarised in Table 5.28.

Table 5.28 Goodness of fit results of the CFA for seven constructs (modified model)

Goodness of Fit Index	Value
Chi-Square (χ^2)	299.335
Degrees of Freedom (df)	131
Normed Chi-Square (χ^2/df)	2.285
Goodness of Fit Index (GFI)	0.926
Standardised Root Mean Residual (SRMR)	0.031
Comparative Fit Index (CFI)	0.959
Root Mean Square Error of Approximation (RMSEA)	0.057

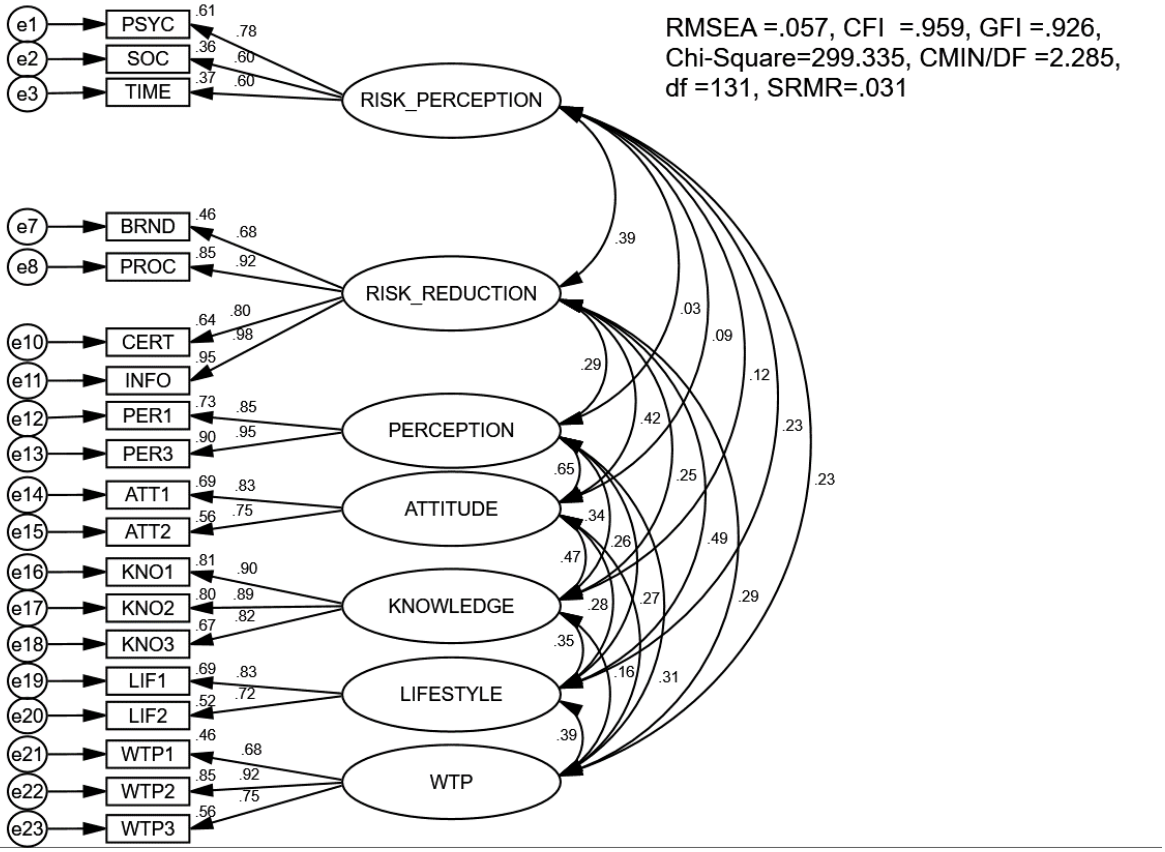

Figure 5.13 The CFA model for seven constructs (modified model)

The factor loadings and correlations of the CFA model for the seven constructs are summarised in Table 5.29. All estimated factor loadings are statistically significant.

Table 5.29 Standardised solutions and correlations of the CFA model for seven constructs

Variable	Factor Loading	Correlation
KNO2	0.893 (23.577) ***	ATTITUDE <--> PERCEPTION 0.648
KNO1	0.898 ***	PERCEPTION <--> KNOWLEDGE 0.344
LIF2	0.719 ***	ATTITUDE <--> KNOWLEDGE 0.470
WTP2	0.922 ***	PERCEPTION <--> LIFESTYLE 0.271
WTP1	0.682 (13.573) ***	PERCEPTION <--> WTP 0.307
WTP3	0.747 (14.784) ***	ATTITUDE <--> LIFESTYLE 0.275
LIF1	0.832 (9.767) ***	ATTITUDE <--> WTP 0.255
PER1	0.853 ***	KNOWLEDGE <--> LIFESTYLE 0.347
KNO3	0.821 (20.944) ***	KNOWLEDGE <--> WTP 0.162
ATT1	0.833 ***	LIFESTYLE <--> WTP 0.390
ATT2	0.751 (12.753) ***	RISK_PERCEPTION <--> RISK_REDUCTION 0.39
PER3	0.947 (17.224) ***	PERCEPTION <--> RISK_PERCEPTION 0.034
PSYC	0.782 (8.617) ***	PERCEPTION <--> RISK_REDUCTION 0.286
SOC	0.602 (8.460) ***	ATTITUDE <--> RISK_PERCEPTION 0.091
INFO	0.975 (17.172) ***	ATTITUDE <--> RISK_REDUCTION 0.421
CERT	0.801 (14.690) ***	KNOWLEDGE <--> RISK_PERCEPTION 0.120
PROC	0.921 (16.582) ***	KNOWLEDGE <--> RISK_REDUCTION 0.249
BRND	0.676 ***	LIFESTYLE <--> RISK_PERCEPTION 0.235
TIME	0.604 ***	LIFESTYLE <--> RISK_REDUCTION 0.488
		WTP <--> RISK_PERCEPTION 0.230
		WTP <--> RISK_REDUCTION 0.290

*, **, *** statistically significant at the 0.1, 0.01, 0.001 level, respectively.

Model validity measures

The CR and AVE results of the CFA model for seven constructs are summarised in Table 5.30.

Table 5.30 CR and AVE results of the CFA model for seven constructs

Variable	Construct Reliability (CR)	Average Variance extracted (AVE)
PERCEPTION	0.896	0.811
ATTITUDE	0.771	0.628
KNOWLEDGE	0.904	0.759
LIFESTYLE	0.753	0.605
WTP	0.831	0.625
RISK_PERCEPTION	0.704	0.446
RISK_REDUCTION	0.912	0.725

The CFI was 0.959 is above the 0.90 threshold suggested by Byrne (2010). The CFI indicates that the CFA model for the seven constructs had adequate unidimensionality. The CRs of the constructs range from 0.912 to 0.704. These are greater than 0.6 as suggested by Awang (2015). Therefore, the CRs of these constructs indicate that the measurements for the seven constructs had adequate reliability.

All factor loadings were statistically significant. The factor loadings range from 0.975 to 0.602 were above the 0.5 threshold suggested by Awang (2015b). This means they exhibit adequate convergent

validity. The AVE of most constructs range between 0.811 and 0.605, above the 0.5 threshold suggested by Kline (2015). The AVE value of the risk perception construct was 0.446 but it is considered acceptable because the CR of this construct is greater than 0.6 as suggested by Fornell and Larcker (1981). Therefore, the AVEs of these constructs indicate that the measurements for the seven constructs had adequate convergent validity.

The correlation coefficients of the seven constructs range from 0.034 to 0.648 and did not exceed the 0.850 threshold suggested by Kline (2015) (see Table 5.29). This implies that the measurements of all seven constructs exhibit adequate discriminant validity. In addition, all seven latent constructs in this study were examined to confirm that the constructs were discriminant of each other based on Fornell and Larcker's recommendation (1981). Fornell and Larcker (1981) suggest that discriminant validity is satisfied if the square root of the AVE of the constructs is higher than the correlation between the constructs. In this study, the square roots of the AVEs of the seven constructs were greater than their correlation. The discriminant validity index summary in Table 5.31 shows that, based on Fornell and Larcker's (1981) study, discriminant validity for all seven constructs is satisfied.

Table 5.31 The discriminant validity index summary for the seven constructs

INDEX	PERCEPTION	ATTITUDE	KNOWLEDGE	LIFESTYLE	WTP	RISK_ PERCEPTION	RISK_ REDUCTION
PERCEPTION	**0.901**						
ATTITUDE	0.648	**0.793**					
KNOWLEDGE	0.344	0.470	**0.871**				
LIFESTYLE	0.271	0.275	0.347	**0.778**			
WTP	0.307	0.255	0.162	0.390	**0.790**		
RISK_PERCEPTION	0.034	0.091	0.120	0.235	0.230	**0.668**	
RISK_REDUCTION	0.286	0.421	0.249	0.488	0.290	0.390	**0.851**

5.2.5 The normality of data tests

Once the goodness of fit indices were met, the measurement model data should be tested for normality. This must be done before using SEM (Awang, 2015b). Skewness and kurtosis are used to determine the normal distribution of the measured items (Kline, 2015). Skewness is the balance of distribution and refers to whether the data lean to one side (right or left). Kurtosis examines whether the data peak or are flat compared with the normal distribution (Hair et al., 2006). This study has a large sample (over 200) thus, we use Awang's (2015) absolute values of up to 1.5 for skewness and 7.0 for kurtosis.

The normality tests show that the highest absolute values of skewness and kurtosis are 1.036 and -0.671, respectively, and do not exceed Awang's (2015) thresholds (see Table 5.32). In short, the variables in the data set are normally distributed.

Table 5.32 Test of normality distribution for all variables in the measurement model for seven constructs

Variable	min	max	skew	c.r.	kurtosis	c.r.
INFO	0.771	3.993	-0.257	-2.074	0.509	2.056
TIME	0.816	3.684	-0.269	-2.178	-0.215	-0.869
BRND	0.992	4.949	-0.241	-1.949	-0.204	-0.826
PROC	0.790	3.928	-0.323	-2.612	0.540	2.182
CERT	0.781	3.890	-0.293	-2.367	0.441	1.781
SOC	1.020	4.861	0.238	1.920	-0.646	-2.612
PSYC	1.092	4.644	-0.398	-3.215	-0.200	-0.810
PER3	2.000	5.000	-0.226	-1.829	0.003	0.014
ATT2	1.333	5.000	-0.383	-3.098	0.501	2.025
ATT1	1.667	5.000	-0.131	-1.058	-0.448	-1.812
KNO3	1.000	5.000	-0.602	-4.869	0.577	2.331
PER1	2.000	5.000	-0.306	-2.476	-0.059	-0.237
LIF1	1.250	5.000	-0.429	-3.467	0.467	1.889
WTP3	1.000	5.000	**1.036**	8.371	0.664	2.685
WTP1	1.250	5.000	0.205	1.655	**-0.671**	-2.713
WTP2	1.000	5.000	0.748	6.043	-0.029	-0.116
LIF2	1.000	5.000	-0.295	-2.381	0.187	0.755
KNO1	1.000	5.000	-0.597	-4.828	0.145	0.585
KNO2	1.500	5.000	-0.467	-3.778	0.159	0.642
Multivariate					48.210	16.895

After assessing the unidimensionality, validity, and reliability of all seven constructs in the conceptual research model and testing the normality of the data distribution (including testing the normal distribution for all variables in the final measurement models), we use SEM to estimate our models.

5.3 Structural equation model (SEM)

The SEM was designed to test causal paths, reflecting hypotheses (H1 to H7), and to examine the relationships between the seven constructs based on the conceptual research model (see Figure 5.14). The SEM consists of four exogenous variables (consumers' perceptions of organic product attributes (PERCEPTION), consumers' attitudes towards organic products (ATTITUDE), consumers' knowledge of organic products (KNOWLEDGE), and consumer lifestyle (LIFESTYLE) and three endogenous variables (consumers' risk perceptions (RISK_PERCEPTION), consumers' risk reduction

strategies (RISK_REDUCTION) and consumers' WTP premium prices for organic products (WTP)). The results are used to answer our research objectives and hypotheses.

The SEM consists of 19 observed variables with 190 data points of observed variances and co-variances (19[19+1]/2) and 51 estimated parameters (19 regression weights, six co-variances and 26 variances). The SEM tested with 139 degrees of freedom (190-51) and thus was over identified; there were more observed variances and co-variances than estimated parameters. The model identification satisfies the requirements suggested by Byrne (2010). Therefore, the SEM model can be further estimated.

The model fit result of the preliminary to SEM indicates a good fit. All model fit indices satisfied the recommended thresholds. The GFI and CFI, were above the recommended thresholds of 0.9 (see Table 5.33). However, according to AMOS this model is a non-recursive model. There is one non-recursive between risk perception and risk reduction variables in the model. Therefore, the stability index was used to determine whether the model was stable (Arbuckle, 2017).

Table 5.33 The goodness of fit results of the SEM (preliminary model)

Goodness of Fit Indices	Value
Chi-Square (χ^2)	356.503
Degrees of Freedom (df)	139
Normed Chi-Square (χ^2/df)	2.565
Goodness of Fit Index (GFI)	0.910
Standardised Root Mean Residual (SRMR)	0.051
Comparative Fit Index (CFI)	0.947
Root Mean Square Error of Approximation (RMSEA)	0.063
Stability Index (For Non-recursive Model)	57.285

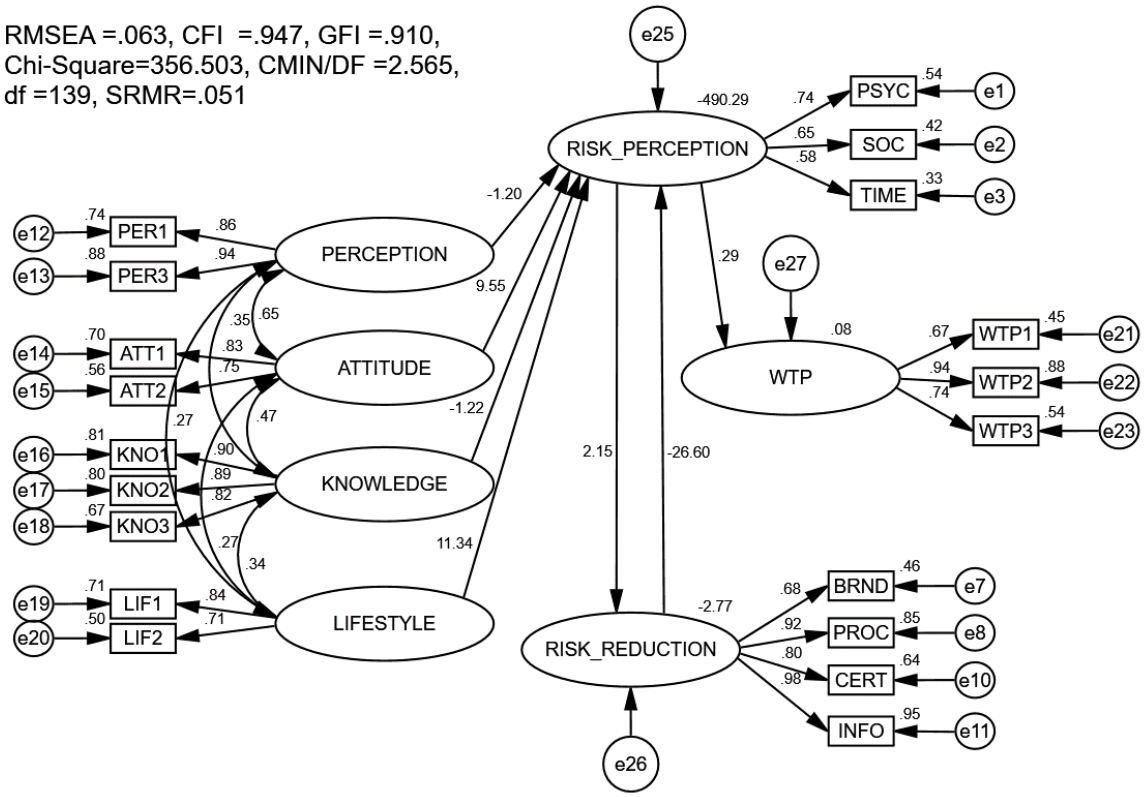

Figure 5.14 The preliminary structural equation model

Arbuckle (2017) suggests that If the stability index is less than one, the model is stable because the systems of linear equations associated with the model are stable. If the stability index is greater than one, then the model is unstable. An unstable model leads to problems of interpretation. It is impossible to use an unstable model for analysis (Arbuckle, 2017). The stability index of this model is 57.285 (see Table 5.33), which suggests that the model is unstable.

The AMOS result 57.285 is caused by interactions of the risk reduction and risk perception variables. The stability index confirms that hypotheses (H5) (risk reduction strategies) and (H6) (risk perceptions) cause the model's instability. Therefore, one of these hypotheses needs to be removed to improve the stability and allow further analysis.

Hypothesis (H6) states that consumer risk perceptions influence consumer risk reduction strategies. Hypothesis (H5) states that consumer risk reduction strategies influence consumer risk perceptions. Hypothesis (H6) is well supported in the literature (Mitchell 1999; Yeung & Morris, 2006; Yeung et al., 2010). Yeung et al. (2010) note that consumers who perceive high levels of risk will use risk reduction strategies before purchasing food. Yeung and Morris (2006) report that consumer risk perceptions can encourage consumer risk reduction behaviours. The past 30 years of literature confirm that consumer risk perceptions influence their risk reduction strategies (Mitchell, 1999). However, hypothesis (H5), which states that risk reduction strategies influence risk perceptions, was debatable

(Angulo & Gil, 2007; Bruwer, Fong & Saliba, 2013; Henson & Caswell, 1999; Yeung et al., 2010; Yeung &Yee, 2003). Yeung et al. (2010) claim that consumer risk reduction strategies may influence a consumer's perceived risk and intention to purchase food. Angulo and Gil (2007) reveal that consumer risk reduction strategies directly influence a consumer's intention to purchase, including their WTP premium prices for food products. In addition, risk reduction strategies are significant factors influencing a consumer's WTP premium prices for several products, such as beef (Angulo & Gil, 2007), wine (Bruwer et al., 2013), eggs (Henson & Caswell, 1999) and poultry (Yeung &Yee, 2003).

Based on the relevant literature, hypothesis (H5) (consumer risk reduction strategies influence consumer risk perceptions) was removed from the analysis. In addition, a new relationship, suggested in the literature, that consumer risk reduction strategies directly influence consumers' WTP premium prices for organic products was added in place of hypothesis (H5) (see Figure 5.15).

After removing hypothesis (H5) and adding a new hypothesis to the model, the SEM consists of 19 observed variables with 190 data points of observed variances and co-variances (19[19+1]/2) and 51 estimated parameters (19 regression weights, six co-variances and 26 variances). The SEM (modified form), with 139 degrees of freedom (190-51), was over identified; there were more observed variances and co-variances than estimated parameters. The model identification is considered acceptable as suggested by Byrne (2010).

The model fit result of the modified SEM indicated a poor fit with the sample data. Some model fit indices did not satisfy the recommended thresholds (see Table 5.34). Therefore, further model modification was required to improve the fit.

Table 5.34 The goodness of fit results of the modified SEM

Goodness of fit index	Value
Chi-Square (χ^2)	426.826
Degrees of Freedom (df)	139
Normed Chi-Square (χ^2/df)	3.071
Goodness of Fit Index (GFI)	0.894
Standardised Root Mean Residual (SRMR)	0.050
Comparative Fit Index (CFI)	0.929
Root Mean Square Error of Approximation (RMSEA)	0.073

The MI from AMOS indicated that some observed variables in the SEM were redundant. If the MI between variables is greater than 15.00, the variables are redundant (Awang, 2015a). The highest MI was 33.764 (between SOC and INFO). To deal with redundant variables, one can either delete one of two redundant variables or set these two variables' error terms as a free parameter (co-variance them). In this case, we co-varianced the SOC and INFO variables.

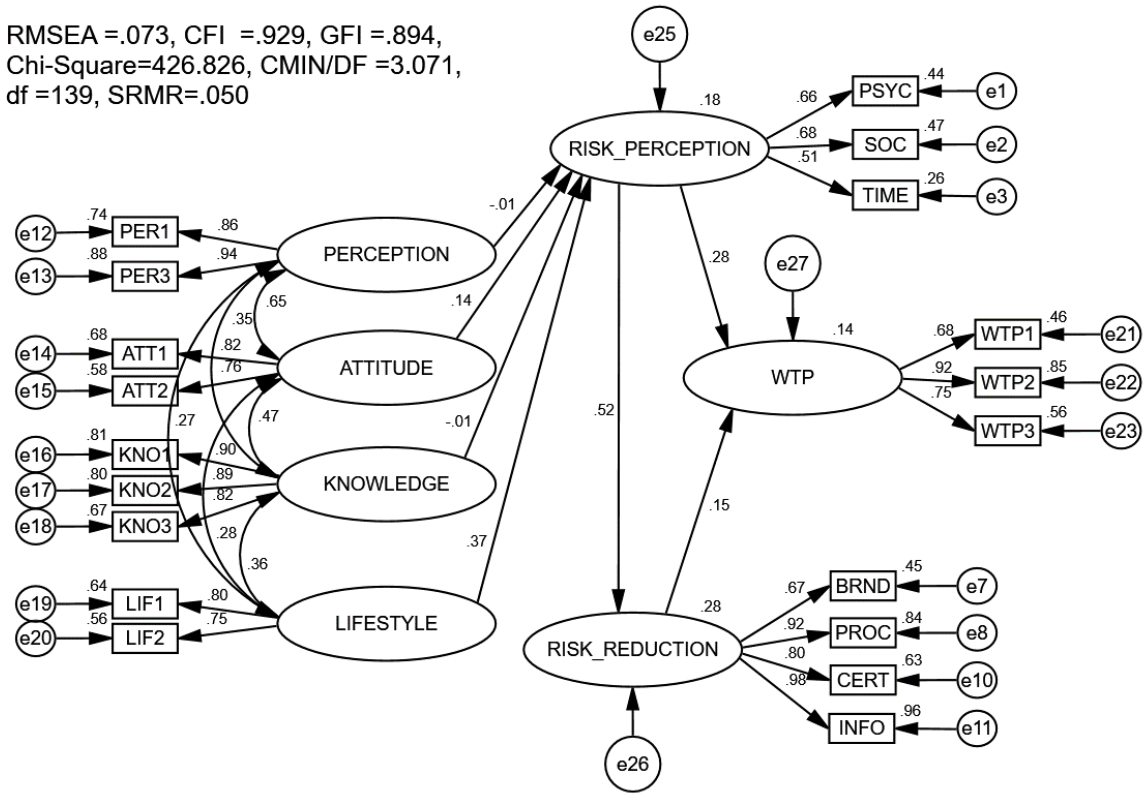

Figure 5.15 The modified structural equation model

The relationship between SOC and INFO is well supported in the literature (see Yeung et al., 2010; Nuttavuthisit & Thøgersen, 2019), in relation to risk reduction strategies. Yeung et al.'s (2010) findings show that consumers ask their family and friends for information to reduce their risk when purchasing poultry. Nuttavuthisit and Thøgersen (2019) also support the relationship between SOC and INFO. They find that consumers ask and rely on information from their family and friends when they feel uncertain about purchasing organic products at high prices. After estimating the modified structural model in AMOS, there were still redundant variables left in the model. The MI from AMOS indicated that the MI between PSYC and TIME (15.605) was higher than the 15.00 threshold as recommended by Awang (2015a). Therefore, co-variance between PSYC and TIME was used to solve the issue of redundant variables. The relationship between psychological risk (PSYC) and time risk (TIME), when consumers purchase organic products, is well supported in the literature (see Nuttavuthisit & Thogersen, 2015; Sangkumchaliang & Huang, 2012). Nuttavuthisit and Thogersen find that Thai consumers purchase organic products at high prices and often purchase at the same shop/store to avoid being cheated (products have been sprayed with chemicals) and because they realise that there is a limited supply of organic products. Sangkumchaliang and Huang (2012) reveal that consumers who are concerned about the authenticity of organic products usually buy these products whenever they are available because they know that organic product availability depends on planting and harvesting seasons.

After two pairs of the redundant variables were co-varianced (SOC and INFO, PSYC and TIME), the model consists of 19 observed variables with 190 data points of observed variances and co-variances (19[19+1]/2) and 53 estimated parameters (19 regression weights, 26 variances and eight co-variances) (see Figure 5.16.). The final SEM, with 137 degrees of freedom (190-53), was over identified; there were more observed variances and co-variances than estimated parameters. The model identification is considered acceptable as suggested by Byrne (2010). The final SEM can now be estimated.

The model fit results of the final SEM indicate a good fit with the sample data; all model fit indices satisfy the recommended threshold. Table 5.35 presents the goodness of fit results for the final SEM.

Table 5.35 Goodness of fit results of the SEM (final model)

Goodness of Fit Index	Values
Chi-Square (χ^2)	317.961
Degrees of Freedom (df)	137
Normed Chi-Square (χ^2/df)	2.321
Goodness of Fit Index (GFI)	0.928
Standardised Root Mean Residual (SRMR)	0.032
Comparative Fit Index (CFI)	0.956
Root Mean Square Error of Approximation (RMSEA)	0.058

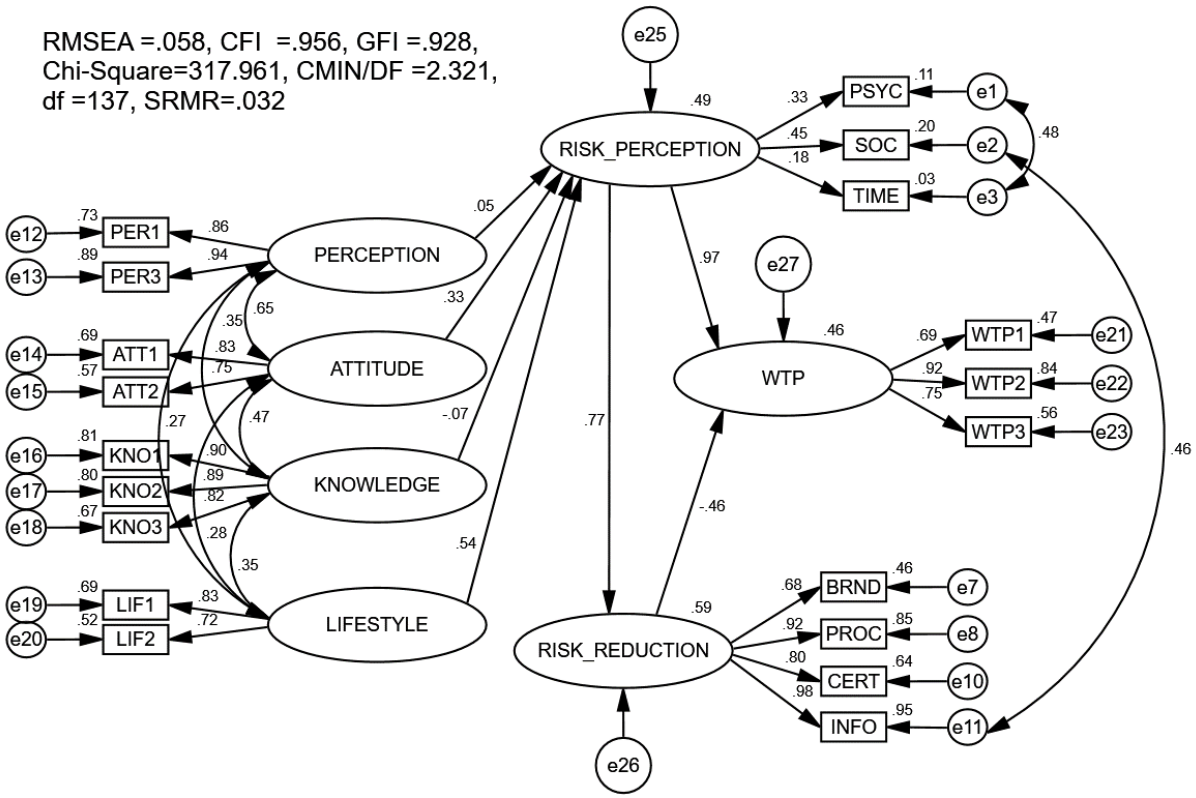

Figure 5.16 The final structural equation model

Table 5.36 presents the factor loadings of the final SEM of the seven constructs. The results indicate that all estimates in the model are statistically significant at the 0.01 level. These results support the reliability and validity of the measurements related to the SEM.

Table 5.36 Standardised solutions of the SEM

Variable label	Factor Loading
KNO2	0.893 ***
KNO1	0.897 ***
LIF2	0.722 ***
WTP2	0.919 ***
WTP1	0.686 ***
WTP3	0.747 ***
LIF1	0.828 ***
PER1	0.857 ***
KNO3	0.821 ***
ATT1	0.829 ***
ATT2	0.754 ***
PER3	0.942 ***
PSYC	0.329 ***
SOC	0.451 **
INFO	0.975 ***
CERT	0.803 ***
PROC	0.923 ***
BRND	0.675 ***
TIME	0.178 ***

*, **, *** statistically significant at the 0.1, 0.01 and 0.001 level, respectively

Table 5.37 shows the relationship between the constructs in the final SEM and hypotheses' assessment. The effects of all constructs in the final SEM, WTP, RISK_PERCEPTION, LIFESTYLE, PERCEPTION, ATTITUDE, KNOWLEDGE, and RISK_REDUCTION, are discussed next.

WTP

The results show that 46 per cent of the variance of the WTP was associated with RISK_PERCEPTION and RISK_REDUCTION, suggesting that both variables are major determinants of WTP. The results show that the coefficient path between RISK_PERCEPTION and WTP is high (β = 0.97) (see Figure 5.16). The finding supports hypothesis (H7), which states that consumer risk perception factors positively impact a consumer's WTP premium price for organic products. Surprisingly, the coefficient path of RISK_REDUCTION and WTP is moderate but negative (β = -0.46). This is a new contribution to this field of study because our finding is the first confirmation that consumers' risk reduction strategies negatively influence their WTP premium prices for organic products. On one hand, the result suggests that if consumers perceive high levels of risk, they will pay higher prices for organic products. On the other hand, if consumers use risk reduction strategies, they are less willing to pay high prices. The effect of these constructs on consumers' WTP premium prices for organic products are discussed in following sub-sections.

The findings show that RISK_PERCEPTION has the highest casual effect (β = 0.97) on WTP. The effect of consumers' risk perceptions on their WTP premium prices for organic products was expected, since it is consistent with previous studies on several different products. For example, Bruwer et al. (2013) reveal that consumers who perceive high levels of risk are willing to pay higher prices for wine. In addition, Bruwer et al.'s study found that consumers who have high levels of perceived risk also have high levels of social risk. In terms of poultry, Yeung and Morris (2001) find that consumers' risk perceptions significantly influence their WTP premium prices for poultry products. Angulo and Gil's (2007) reveal that increased levels of perceived risk mean that consumers are more likely to pay higher prices for beef products. In sum, our findings suggest that consumers who perceive high levels of risk will pay higher prices than consumers who perceive lower levels of risk.

Surprisingly, the findings show that RISK_REDUCTION has a negative casual effect (β = -0.46) on WTP. The finding is consistent with previous studies. For example, Yeung et al. (2010) reported that as more consumers use risk reduction strategies, the lower their perceptions of risk and the less they are willing to pay for poultry products. Nuttavuthisit and Thøgersen's (2019) investigation of Thai consumers' purchases of organic products revealed that confidence in organic products is an important factor influencing consumers' purchases of them. Nuttavuthisit and Thøgersen conclude that if consumers have high confidence in organic products and do not use their risk reduction strategies, they are more likely to pay higher prices for organic products.

Our model shows the factor loading values of each item in WTP. They indicate the importance of each item in the WTP construct (see Figure 5.16). The most reliable and strongest indicator of WTP was WTP2 (expenditure) with β = 0.919 and a significance level of 0.001, followed by WTP3 (premium price) with β= 0.747 and a significance level of 0.001, and WTP1 (frequency) with β= 0.686 and a significance level of 0.001. The results indicate consumers' WTP for organic products can increase because of consumers' risk perceptions, decrease through consumers' risk reduction strategies, or both. More specifically, the higher consumers' WTP for organic products, the higher their expenditure on organic products (WTP2), followed by higher premium prices that consumers paid (WTP3) and the higher the frequency of organic product purchases (WTP1). This mean that consumers who have high risk perceptions are more likely to purchase greater quantities of organic products and pay more money for them, including paying a higher premium price; as previously reported in Chapter 4, this premium price is higher than their estimated WTP premium prices for organic products. Lastly, consumers who have high risk perceptions are more likely to purchase organic products more frequently than consumers who have lower risk perceptions. Our findings contradict previous studies (Nuttavuthisit & Thogersen, 2015; Sriwaranun, 2011) that indicate that when the price of organic products increases consumers reduce the amount they buy. In contrast, we find that consumers will not change their purchases of organic products, regardless of whether the

price increases or decreases. Changes in consumers' purchases of organic products depend on their risk perceptions and their risk reduction strategies, not the price.

RISK_PERCEPTION

The model demonstrates that LIFESTYLE, ATTITUDE, PERCEPTION and KNOWLEDGE are important determinants of RISK_PERCEPTION. The results show that 49.4 per cent of RISK_PERCEPTION variance is explained by LIFESTYLE, ATTITUDE, PERCEPTION and KNOWLEDGE (see Figure 5.16). This indicates that consumers' risk perceptions are not only influenced by knowledge, perceptions and attitudes towards the products, as revealed in previous studies (Lagerkvist et al., 2013; Leikas et al., 2007), but also by consumer lifestyle. The impact of consumer lifestyle, attitudes, perceptions and knowledge on consumers' risk perceptions is consistent with previous studies; e.g., see Voon et al.'s (2011) study on organic products in Malaysia and Sriwaranun's (2011) research on organic products in Thailand. Also, the variance of consumers' risk perceptions is consistent with Bearth, Cousin and Siegrist's (2014) study on food additives in Switzerland, which found that perceptions, attitudes, and knowledge explain 56.0 per cent of the variance of risk perceptions. Although consumer lifestyle, attitudes, perceptions and knowledge are important determinants, the effects of each variable on consumers' risk perceptions differ. The effect of lifestyle, attitudes, perceptions and knowledge on consumers' risk perceptions are discussed next.

LIFESTYLE

Among the RISK_PERCEPTION determinants, LIFESTYLE has the highest casual effect on RISK_PERCEPTION. This finding supports the study's hypothesis (H4) which states that there is a positive relationship between consumer lifestyle and risk perception factors on consumers' WTP premium prices for organic products. The effect of LIFESTYLE on RISK_PERCEPTION has the greatest effect when compared with the other determinants (the coefficient path between LIFESTYLE and RISK_PERCEPTION is the greatest with $\beta = 0.54$ in the final SEM model). In short, any changes in lifestyle will be reflected in consumers' risk perceptions (see Figure 5.16). Our findings imply that if consumers have a healthy lifestyle, strict diet or prefer to cook at home, they are more likely to have higher risk perceptions when purchasing organic products. The finding is consistent with Nuttavuthisit and Thogersen (2015) who find that consumers' lifestyle has a positive impact on their risk perceptions. The authors find that differences in consumer lifestyle are associated with different risk perceptions. For example, consumers who are health conscious are more likely to be more concerned about chemical contaminants in non-organic products that claim to be organic, whereas consumers who have a strict diet and prefer to cook at home are more likely to be concerned about organic product availability and what organic products are in season (Nuttavuthisit & Thogersen, 2015). Our finding is also consistent with Charlebois, Juhasz, Foti, and Chamberlain's (2017) study

which revealed that consumer lifestyle has a strong positive relationship with consumers' risk perceptions when purchasing organic products. Charlebois et al. (2017) find that Canadian consumers who have a healthy lifestyle or strict diet have high risk perceptions associated with organic product fraud (non-organic chicken sold as organic) or inaccurate organic product labels. Consumers who have experienced product fraud are more likely to trust other consumers, including their family and friends, as a risk reduction strategy rather than from retailers or advertisers (Charlebois et al., 2017).

ATTITUDE

ATTITUDE was the second most important determinant influencing RISK_PERCEPTION with a β value of 0.33 (see Figure 5.16). This finding supports the study's hypothesis (H2) which states that there is a positive relationship between consumers' attitudes towards organic products and their risk perception factors on their WTP premium prices for organic products. The effect of attitude towards organic products on consumers' risk perceptions is consistent with Nuttavuthisit and Thogersen's (2015) study which revealed that consumers' attitudes towards organic products have a positive relationship with their risk perception when purchasing organic products. The authors find that Thai consumers who have a positive attitude towards organic products have higher expectations of food safety and perceive that organic products are safe and free from chemical contaminants. The authors report that organic products in Thailand are sold at approximately twice the price of conventional products. Nuttavuthisit and Thogersen (2015) conclude that consumers who have a positive attitude towards organic products have high risk perceptions about the authenticity of organic products they purchase because many non-organic products that claim to be organic are sold in the markets. Similarly, our finding is consistent Mkhize and Ellis' (2020) study that revealed that South African consumers have a positive attitude towards organic products. Mkhize and Ellis explain that consumers who have a positive attitude towards organic products have great concerns and scepticism about the authenticity of organic products. The authors reveal that consumers believe that organic products are good for their health. However, when these consumers purchase organic products, they feel uncomfortable because they cannot identify which product is organic and they have to pay high prices for these products (Mkhize & Ellis, 2020).

PERCEPTION

The results show that PERCEPTION had no significant effect on RISK_PERCEPTION. In short, the findings do not support the study's hypothesis (H1), which states that there is a positive relationship between consumers' perceptions of organic product attributes and risk perception factors on their WTP premium prices for organic products. The finding is consistent with Ha, Shakur and Pham Do's (2020) study on food products in Vietnam, indicating that consumers' perceptions of food product

attributes do not significantly influence their risk perceptions. The authors find that information about food incidents such as food poisoning or contamination drive consumers' risk perceptions when purchasing food such as fruit, vegetables and meat.

KNOWLEDGE

The results show that KNOWLEDGE has no significant influence on RISK_PERCEPTION. This finding does not support the study's hypothesis (H3) which states that there is a negative relationship between consumers' knowledge about organic products and their risk perception factors on their WTP premium prices for organic products. This finding contradicts Bonti-ankomah and Yiridoe's (2006) study which found that consumers' knowledge of organic products influences consumers' confidence or risk perceptions when purchasing organic products. However, our results are consistent with Voon et al.'s (2011) study on organic products in Malaysia. They note that consumers' knowledge about organic products has no impact on consumers' risk perceptions and their WTP premium prices for organic products. Voon et al. (2011) conclude that consumers' risk perception when purchasing organic products depends on their attitude towards organic products not on their knowledge of organic products.

RISK_REDUCTION

The results show that RISK_PERCEPTION is an important determinant of RISK_REDUCTION. The findings indicate that RISK_PERCEPTION has a high effect (β = 0.77 in the final SEM) on RISK_REDUCTION and explains 59 per cent of the variance of RISK_REDUCTION (see Figure 5.16). This finding support study hypothesis (H6) which states that consumers' risk perception factors positively impact consumer risk reduction strategies when buying organic products.

The positive, significant effect of consumer risk perceptions on consumer risk reduction strategies is consistent with previous studies on conventional food. For example, Yeung et al. (2010) report that risk perception has a significant effect on consumers' risk reduction strategies for poultry. Likewise, Bruwer et al. (2013) report that consumer risk perceptions have a positive influence on consumers' risk reduction strategies when purchasing wine. Finally, Angulo and Gil (2007) maintain that consumer risk perceptions are an important influence on consumers' risk reduction strategies when purchasing beef. The different effects of consumer risk perceptions on risk reduction strategies in these studies may reflect the different food types. The effect of consumer risk perceptions on consumer risk reduction strategies supports the view that the risk factors play an important role in consumers' decision-making when purchasing food products (Blackwell et al., 2001). The consumers' risk perception effect on consumer risk reduction strategies is consistent with Yeung and Morris's (2006) study, which found that consumer risk perceptions influence consumers' risk reduction strategies, particularly in relation to food poisoning.

Relationships among RISK_PERCEPTION, RISK_REDUCTION and WTP

In summary, the relationships among RISK_PERCEPTION, RISK_REDUCTION and WTP in the SEM have demonstrated that RISK_PERCEPTION positively influences WTP and RISK_REDUCTION. In contrast, RISK_REDUCTION negatively influences WTP. These findings suggest that the greater consumers' risk perceptions are, the more they are willing to pay for organic products and the greater their use of risk reduction strategies. However, the more consumers use risk reduction strategies, the less they are willing to pay for organic products.

Significantly, an increase in consumers' risk perceptions increases their WTP premium prices for organic products, but an increase in consumers' risk reduction strategies decreases their WTP premium prices for organic products. The effect of consumers' risk reduction strategies on consumers' WTP premium prices for organic products is about half the effect of consumers' risk perceptions on consumers' WTP premium prices for organic products. These effects mean that if consumers use all their risk reduction strategies, they are willing to pay only half the original premium price for organic products. Therefore, minimising the use of consumers' risk reduction strategies will increase their WTP premium prices for organic products.

Consumer risk reduction strategies include searching for information, understanding transport and handling processes, selecting trusted certificates and choosing well-known brands. Therefore, to minimise consumers use of risk reduction strategies, shops or stores should provide more information about the products and their handling/storage procedures, use trusted certification schemes and offer well-known brands. When consumers do not need to use their risk reduction strategies, the negative effect on their WTP premium prices for organic products will decrease.

In conclusion, consumers who have high risk perception are willing to pay higher prices for organic products. This means that consumers who fear being cheated from inauthentic organic products, or are concerned about wasting their time finding organic products, or worry about being accepted by society, or their family and friends, are willing to pay higher prices for organic products. At the same time, they will search and use their risk reduction strategies to reduce these perceived risks. However, if consumers have difficulty using their risk reduction strategies, e.g., it is difficult to find information, they have concerns about the storage and handling processes, or questions about the certificates or brands, they will not be willing to pay higher prices for organic products. If shops or stores provide information about the organic products they sell, how they store those products, and display the certificates and/or brands in ways that the consumers can see them, then consumers will be more willing to pay higher prices for organic products because they do not need to use their risk reduction strategies. They will also have lower levels of scepticism. This finding is consistent with Yeung et al.'s (2010) study, which revealed that UK consumers are willing to pay more for poultry

when shops or stores provide them with the information about the product, as well as certificates and offer a well-known brand. In these instances, consumers are less likely to employ risk reduction strategies. Our finding is also consistent with Bai, Wang and Gong's (2019) study, which revealed that Chinese consumers are willing to pay more for organic products when stores provide them with information about organic products, including processes and brand. Bai et al. (2019) find these consumers purchase organic products because their social group influenced them. Consumers in Bai et al.'s (2019) study purchased organic products because organic products are considered luxury food because of their high price; therefore, whoever purchases organic products will be accepted by their social group as rich people (Bai et al., 2019).

Table 5.37 Hypotheses tests using the SEM

Outcome	Determinant	Standardised Estimate (β)	Critical Ratio	Hypothesis	Assessment
RISK_PERCEPTION (R^2 = 0.494)	PERCEPTION	0.052	0.648 (ns)	H1	*Not Supported*
	ATTITUDE	0.328	2.322 (*)	H2	*Supported*
	KNOWLEDGE	-0.067	-0.967 (ns)	H3	*Not Supported*
	LIFESTYLE	0.541	2.856 (**)	H4	*Supported*
	RISK_REDUCTION			Removed H5	
RISK_REDUCTION (R^2 = 0.595)	RISK_PERCEPTION	0.771	2.960 (**)	H6	*Supported*
WTP (R^2 = 0.463)	RISK_PERCEPTION	0.968	2.446 (*)	H7	*Supported*
	RISK_REDUCTION	-0.458	-2.149 (**)		*New contribution*

*, **, *** significant at the 0.1, 0.01, 0.001 level, respectively.

5.4 Chapter summary

This chapter has summarised the study's data and results. It has outlined how these results answer the research questions and objectives. The chapter tested all hypotheses listed in Chapter 2. EFA was used to explore the underlying factor structure of consumer risk perceptions and consumer risk reduction strategy constructs. CFA was used to verify all constructs in the measurement models. SEM was used to analyse the structural relationships between consumers' perceptions of organic product attributes, consumers' attitudes towards organic products, consumers' knowledge about organic products, consumer lifestyle, consumer risk perceptions, consumer risk reduction strategies and consumers' WTP premium prices for organic products. Table 5.38 summarises the results.

Table 5.38 A summary of the study's results

Hypothesis	Result
H1: There is a positive relationship between consumers' perceptions of organic products' attributes and their risk perception factors on their WTP premium prices for organic products.	**Not Supported**
H2: There is a positive relationship between consumers' attitudes to organic products and their risk perception factors on their WTP premium prices for organic products.	**Supported**
H3: There is a negative relationship between consumers' knowledge about organic products and their risk perception factors on their WTP premium prices for organic products.	**Not Supported**
H4: There is a positive relationship between consumers' lifestyle and their risk perception factors on their WTP premium prices for organic products.	**Supported**
H5: There is a negative relationship between consumers' risk reduction strategies and their risk perception factors which impacts on their WTP premium prices for organic products.	**Not Supported**
H6: Consumers' risk perception factors positively impact their risk reduction strategies when they purchase organic products.	**Supported**
H7: Consumers' risk perception factors positively impact their WTP premium prices for organic products.	**Supported**
H8: There is a positive relationship between consumers' perceived psychological risk (H8a), consumers' perceived time risk (H8b), consumers' perceived physical risk (H8c), consumers' perceived social risk (H8d), consumers' perceived financial risk (H8e), consumers' perceived functional risk (H8f) and their risk perceptions on their WTP premium prices for organic products.	**Supported**
H9: There is a positive relationship between process (H9a), price (H9b), information (H9c), certification (H9d), brand (H9e) and consumers' risk reduction strategies on their risk perceptions when purchasing organic products.	**Partially Supported**.

The next chapter discusses the contributions and implications of the empirical results. The limitations including suggestions for future research are also addressed.

Chapter 6

Conclusions and Implications

This chapter summarises the study. It begins with a brief description of the study's objectives, followed by the methods and empirical results. The chapter outlines the study's contributions to the current literature on organic product marketing and presents the theoretical and practical implications. It also discusses the implications of the study's findings for producers, marketers and policymakers. The chapter concludes with a discussion of the study's limitations and recommendations for future research.

6.1 Summary and empirical findings

The global organic market growth has increased over the past three decades and driven by a greater awareness of and desire for healthier, safer products and environmental concerns. On the demand side, consumers' demand for organic products has steadily increased over the past 30 years. The organic product market has increased by 15 to 20 per cent every year since 1999 (Willer & Lernoud, 2019). On the supply side, the total amount of organic farmland has also increased every year. The share of organic farmland, compared with conventional farmland, has increased from 0.3 per cent in 1999 to 1.4 per cent in 2017 (Willer & Lernoud, 2019). However, the increase in organic farmland is not as fast as the increase in the demand for organic products. Increasing the amount of organic farmland depends on the number of farm conversions from conventional farming methods to organic farming techniques (Willer & Lernoud, 2019). Converting from conventional to organic farming is not easy for farmers or producers because they must modify their production methods, which can result in lower yields and higher production costs (Suwanmaneepong et al., 2020). These reasons explain why increased organic product supply has not kept up with the demand for organic products. Many studies have shown that the organic product supply is insufficient to meet consumer needs. Previous studies from the past three decades have indicated that key barriers to the growth of the organic product market are a lack of supply, high prices and difficulties associated with identifying genuine organic products (Nuttavuthisit & Thogersen, 2015; Sangkumchaliang & Huang, 2012; Sriwaranun, 2011; Voon et al., 2011; Willer & Lernoud, 2019). A limited supply of organic products leads to higher prices. Currently, organic products are considered niche products as illustrated by their high prices and small market share.

Understanding the factors that affect the supply of and demand for organic produce is crucial for enhancing the growth and sustainability of the organic product market and organic farming. Most previous studies have recommended that organic farmers or producers produce more products that

are organic and/or reduce their prices to encourage consumers to purchase more goods that are organic. However, these recommendations put pressure only on the supply side and do not work. Evidence from the past three decades clearly shows that increased supply does not result in lower prices and even if farmers/producers produce more, the supply is still insufficient to meet demand (Buder et al., 2014; Davies et al., 1995; FAO, 2014; Willer & Lernoud, 2019). Globally, organic product sales increased approximately six-fold over from 1999 to 2017. However, the conversion of organic farmland has not kept pace with the increase in demand (Willer & Lernoud, 2019). If this trend continues, organic product supply will not meet the demand. Currently, organic products are produced in 181 countries, but approximately 90 per cent of these organic products are sold in only two regions: North America and Europe (Willer & Lernoud, 2019). The rest of the world (Latin America, Asia, Oceania and Africa) have a high demand for organic products, but the supply is inadequate (Willer & Lernoud, 2019). In short, global organic product supply lags far behind the demand for it. To develop the current organic product market, we must consider both the demand and supply side of the organic product business.

To develop the demand side, we must first understand consumer needs and wants when purchasing organic products, especially when prices are high and the supply of the products is limited. Once we have a better understanding of consumers' purchasing behaviours, marketers and retailers can provide what consumers want. Ideally, consumers should be able to purchase organic products at market prices, which are typically higher than conventional product prices, with high levels of confidence in what they purchase. Consumers should feel confident and satisfied that the organic products they purchase are safer and healthier. Understanding consumers' attitudes, particularly their perceptions of risk, are crucial for developing appropriate marketing strategies. However, there is limited research in the area. Thus, we need a comprehensive study of consumers' purchasing behaviour that explores all factors (including environmental influences and consumer decision-making), that impact the purchase of organic products.

This study investigates organic product purchasers' behaviour. To obtain a more complete picture of consumers' purchasing behaviours towards organic products, we surveyed both organic and non-organic product purchasers. We tested them using the same set of variables (and co-variates) to determine if there are any differences or similarities. The data collected from both groups of consumers provide us with a greater understanding of consumers' attitudes towards purchasing organic products.

The summary and major findings in this chapter consist of two parts. Part one presents the survey results for all surveyed respondents (organic and non-organic product purchasers), part two focuses solely on the results of organic product purchasers. Part two provides an overview of the significant

variables in the conceptual model. SEM is used to analyse the interrelationships between seven latent variables in the conceptual model. This chapter summarises the four research objectives' findings:

1. To develop a model of consumers' WTP premium prices for organic products in Thailand with regard to risk perceptions and risk reduction strategies.
2. To analyse the determinants of risk perceptions affecting consumers purchase of organic products in Thailand.
3. To identify the significant factors in the risk reduction strategies influencing consumers' willingness to purchase organic products in Thailand.
4. To investigate the interrelationships among risk perceptions, risk reduction strategies and consumers' WTP premium prices for organic products.

Nine hypotheses were developed to answer the research objectives:

- Hypotheses (H1 to H7) address research objective 1.
- Hypotheses (H8a), (H8b), (H8c), (H8d), (H8e) and (H8f) address research objective 2.
- Hypotheses (H9a), (H9b), (H9c), (H9d) and (H9e) address research objective 3.
- Hypotheses (H5 to H7) address research objective 4.

6.1.1 Summary and major findings for the surveyed organic and non-organic product purchaser respondents

The difficulty in identifying organic products is one of the greatest barriers for the growth of this market. One significant factor in food marketing is the risk consumers feel when purchasing food, especially when purchasing at higher prices. Though consumer risk perceptions have been widely studied in relation to conventional products (poultry, eggs, beef and wine), (Mitchell, 1999; Rintamaki, Kanto, Kuusela, & Spence, 2006; Yeung & Morris, 2001), there are no similar studies on organic products. To develop the organic product market, it is important to have a good understanding of consumer behaviour, especially organic product purchasers' risk perceptions and their purchase behaviour towards organic products

The study analysed the causes and effects of consumers' WTP premium prices for organic products. This study investigated consumers' risk perceptions and risk reduction strategies, both of which influence their WTP premium prices for organic products. The study explored the interrelationships among all possible factors and consumers' WTP premium prices for organic products, including how often consumers reported purchasing organic products and their expenditure on organic products. To gain specific information, this study investigated consumers' WTP premium prices for four specific organic products in Thailand: organic lettuce, jasmine rice, orange juice and coffee. Thailand was

chosen for our study because the organic product market is in its initial stage of development, which is like many other countries' organic product markets, especially developing countries.

This study used a survey questionnaire to gather information from the respondents. The survey questionnaire consisted of questions on the respondents' grocery purchase behaviour, perceptions and attitudes towards organic products, knowledge of organic products, their lifestyle, including their experiences in purchasing organic products, and their WTP a premium price for specific organic products. The questionnaire was administered at grocery stores, supermarkets, health food stores, and fresh markets in Bangkok, Thailand. The mall intercept and convenience sampling techniques were used to interview grocery purchasers who were over 18 years of age. The survey was conducted over six weeks from 15 March to 30 April, 2018. One thousand six hundred and fifty questionnaires were distributed and 1,512 were completed. The useable response rate was 91.6 per cent.

This study used descriptive statistics to summarise the surveyed respondents' characteristics. The Chi-square test and independent-sample t-test were used to evaluate differences and similarities between organic and non-organic product purchasers. The paired sample t-test was used with the organic product purchasers' information to evaluate the difference between the actual premium price paid and the WTP a premium price for specific organic products. The single bounded contingency valuation method was used to investigate consumers' WTP a premium price for specific organic products. The results for the mean of both groups' (organic and non-organic product purchasers) the WTP premium prices for organic lettuce, jasmine rice, orange juice and coffee are presented in Chapter 4.

Most surveyed respondents were female, aged between 23 and 47 years old. For marital status, approximately half of the surveyed respondents were single, and half were married. Most had completed at least a bachelor's degree and worked as officers for private companies. Half of the respondents were single adults living with others, followed by couples living with children in their household. In terms of grocery purchasing behaviour, most respondents purchased groceries at fresh markets. Purchasers of organic product preferred to purchase groceries at grocery departments, supermarkets and health goods stores, whereas non-organic product purchasers usually purchased groceries at fresh markets. Over 51 per cent of the respondents purchased organic products; 48.2 per cent did not purchase organic products. The main reasons for not purchasing organic products are that they cost too much, they are difficult to find and there is a lack of availability. Both groups of purchasers agree that organic products are not easy to find and lack variety in these products.

The respondents were asked about their perceptions of organic product attributes, their attitudes towards organic products, their knowledge of organic products, their lifestyle, their risk perceptions,

their risk reduction strategies and their WTP premium prices for organic products. We used these questions as the measurement items to measure all latent variables in the conceptual model. The conceptual model included seven latent variables: consumer perceptions of organic product attributes, consumer attitudes towards organic products, consumer knowledge of organic products, consumer lifestyle, consumers' risk perceptions, consumers' risk reduction strategies when purchasing organic products and consumers' WTP premium prices for organic products. Below is a summary of the findings from the measurement items (questions) related to all seven latent variables.

- Consumer perceptions of organic product attributes is one latent variable included in the conceptual model. Consumer perceptions of organic product attributes give us more information about consumers' understanding of organic products. Most of the surveyed respondents believe that organic products are safer, healthier, tastier, have a better appearance and have more nutrients than conventional products. However, the respondents noted that organic products are difficult to find because of limited availability. The results show that organic product purchasers have a better perception of organic product attributes than non-organic product purchasers do. Organic product purchasers exhibited greater trust in organic product labels and certificates than non-organic product purchasers did. The findings are consistent with Thøgersen et al.'s (2019) study, which revealed that organic product purchasers in Germany, France, Denmark, China and Thailand trust the appearance of organic products. Purchasers of organic products feel more confident when purchasing organic products are certified. However, non-organic product purchasers in Thailand (and China) have less confidence in organic product certificates or labels (Thøgersen et al., 2019). They are confused with too many certificates or labels in the markets.

- Consumer attitudes toward organic products is a significant latent variable influencing consumer risk perceptions and affecting consumers' WTP premium prices for organic products in the conceptual model. Overall, respondents exhibited positive attitudes towards the nutritional value, health, environmental and ethical benefits of purchasing organic products. However, organic product purchasers have more positive attitudes about the health, nutritional, environmental and ethical benefits than non-organic product purchasers do. In addition, individuals who buy organic products do so to support local farmers. The results show that non-organic product purchasers react negatively towards the higher cost of organic products. They believe that organic products are only for people with high incomes. This finding is similar to Almli, Asioli and Rocha's (2019) investigation of consumer attitudes towards organic products in Norway, Romania, and Turkey, which revealed that consumers who have positive attitudes towards organic products have high expectations about health

and food safety. Almli et al. (2019) conclude that Turkish, Romanian and Norwegian individuals who have positive attitudes about health and are interested in natural products have higher concerns about food contamination and greater demands for safer food. Our finding is consistent with Voon et al.'s (2011) study about consumers' attitudes towards organic products in Malaysia which found that consumers' attitudes towards organic products positively influence consumers' perceived risk and their WTP premium prices for organic products. Our finding is also supported by Nuttavuthisit and Thøgersen's (2019) study which revealed that organic product purchasers in Thailand have a positive attitude towards organic products. They purchase organic products because they want safer food and want to support local farmers (Nuttavuthisit & Thøgersen, 2019). The authors conclude that organic products purchasers believe that organic products are safer, healthier and more environmentally friendly than conventional products. However, non-organic product purchasers have a negative attitude towards organic products. They perceive that organic products are difficult to identify, and the prices are too expensive (Nuttavuthisit & Thøgersen, 2019).

- Consumers' knowledge of organic products is a latent variable in the conceptual model investigating consumers' WTP premium prices for organic products. The findings provide a holistic picture of consumer behaviour. Most respondents believe they had excellent knowledge of how organic produce is produced, handled and differs from conventional products. Most respondents also strongly agreed that organic products are free from chemical fertilisers, pesticides and GMOs. Our results show that organic product purchasers believe that they had a better understanding of organic product handling and transporting than non-organic products purchasers. Organic products purchasers had a strong belief that organic products are free from chemical fertilisers, pesticides and GMOs. These findings are consistent with Nuttavuthisit and Thogersen's (2015) study which indicated that Thai consumers who usually purchase organic products have higher levels of knowledge about organic products. These consumers usually purchase organic products from the same shop or store (Nuttavuthisit & Thogersen, 2015). Nuttavuthisit and Thogersen conclude that organic product purchasers buy organic products based on their knowledge and understanding, whereas non-organic product purchasers buy organic products based on price and convenience (they buy them when they see them). Our finding is also consistent with Singh and Verma's (2017) investigation of the factors that influence consumers' purchase of organic products in India. That study revealed that knowledge of organic products is an important factor influencing consumers' intentions to purchase organic products. However, the intention to purchase may not always lead to actual purchases because many other

factors are involved when consumers purchase organic products (Singh & Verma, 2017). Singh and Verma conclude that consumers who regularly purchase organic products have more knowledge of organic products than consumers who do not purchase organic products.

- Consumer lifestyle is a significant latent variable that influences consumer risk perceptions. This ultimately affects their WTP premium prices for organic products. Most of the surveyed respondents have strict diets and eat a lot of fruit and vegetables. Most consumers are concerned about the environment and prefer to use reusable bags. They also recycle as much as possible and limit their household waste. Many of the respondents dine out occasionally and exercise sometimes. Our results show that organic product purchasers eat vegetables and fruit more often, are stricter with their diet and are more concerned about environmental problems than non-organic products purchasers are. In addition, organic product purchasers prefer to cook at home and are less likely to buy takeaway food than non-organic product purchasers are. Respondents who cook at home are more likely to purchase organic products and demand more for healthy food. In contrast, non-organic product purchasers prefer to buy takeaway food. This result is consistent with Sriwaranun's (2011) study which revealed that Thai people prefer to purchase food from street stalls or restaurants because it is more convenient than cooking food themselves. Respondents who prefer to buy food from street stalls or restaurants are more likely to be non-organic product purchasers. Respondents who have high concerns about their health prefer to cook at home and are more likely to be organic product purchasers (Sriwaranun, 2011). Our study's results are also similar to Pícha and Navrátil's (2019) research in the Czech Republic. Pícha and Navrátil reveal that consumers who have a healthy, environmentally friendly lifestyle have high levels of concern for food safety and the environment. Pícha and Navrátil conclude that a healthy, environmentally friendly lifestyle has a positive relationship with consumer risk perceptions when purchasing organic products.

- Consumer risk perceptions is a significant latent variable influencing both consumers risk reduction strategies and consumers' WTP premium prices for organic products. Most respondents were concerned about food safety (particularly pesticide residues) and expressed concern about how organic products are processed. The respondents also fear being cheated dislike the time it takes to find organic products. The respondents are worried about wasting their money when they purchase organic products. Organic product purchasers are concerned about pesticide residues, food safety and how organic products are processed. In contrast, non-organic product purchasers are more concerned about the time it takes to find organic food and about wasting their money. However, both groups fear being cheated when buying organic products. The results are consistent with Nuttavuthisit

and Thogersen's (2015) study that revealed that Thai non-organic product purchasers are concerned about the high price of organic products and the difficulty in finding them. The findings are also similar to Vega-Zamora, Torres-Ruiz and Parras-Rosa's (2019) investigation of Spanish consumers that found that consumers are concerned about the authenticity of organic products when purchasing them at a higher price. Consumers also question the functionality of organic products; this refers to whether the organic products are more nutritious and better than conventional products (Vega-Zamora et al., 2019).

- The consumers' risk reduction strategy variable significantly influences consumers' WTP premium prices for organic products. The results show that respondents use many risk reduction strategies. Most respondents use the following strategies to reduce their risk when they purchase organic products: ask for information from family and friends or read consumer guides; look for organic certificates; purchase the same brand or from the same store; look for lower prices; and buy from shops that keep organic product separately. Our results show those who purchase organic produce prefer to buy from the same store or buy the same brand. They also actively look for information about organic products and buy products that have organic certification. The findings are consistent with Siwaranun's (2011) and Sangkumchaliang and Huang's (2012) studies that found that Thai consumers usually purchase organic products at the same market and often look for trusted organic certificates. Both sets of respondents (organic and non-organic product purchasers), prefer to buy organic products from shops that keep them separate from conventional products and buy when the price is cheaper.

The respondents' estimated WTP premium prices for the four specified organic products

The single bounded contingency valuation method was used to examine respondents' WTP premium prices for organic products. We presented respondents with a series of questions about organic products and asked them how much more they were willing to pay for them. All respondents were asked how much they were willing to pay for four specified organic products: organic lettuce, jasmine rice, orange juice and coffee. The respondents' WTP premium price results are summarised below:

- Respondents' WTP a premium price for a specific organic product was 40.92 per cent higher than the conventional product price. When comparing the two groups of consumers, organic product purchasers exhibited a much higher WTP premium price for organic products. The organic product purchasers were willing to pay 44.54 per cent more for an organic product compared with non-organic product purchasers who were willing to pay only 37.02 per cent

higher than the conventional product price. The findings are supported by Sriwaranun's (2011) study that revealed that Thai consumers are willing to pay up to 25 per cent more for organic products compared with conventional products. Sriwaranun concludes that organic product purchasers were willing to pay higher prices than non-organic product purchasers were. The findings agree with Wongprawmas and Canavari's (2017) work. Their investigation of Thai consumers revealed that consumers are willing to pay 58 per cent more for organic products compared with conventional products. Similarly, Yu, Gao and Zeng's (2014) study found that Chinese consumers are willing to pay 47 per cent more for organic products than conventional products.

- In terms of the respondents' estimated WTP premium prices for four specified organic products, the results show that organic product purchasers exhibited higher WTP premium prices for all four specified organic products than non-organic product purchasers did. For example, organic product purchasers were willing to pay 28.78 per cent more than the conventional product price for organic lettuce, whereas non-organic product purchasers were willing to pay only 23.21 per cent more for the same product. For organic jasmine rice, organic product purchasers were willing to pay 26.97 per cent more than the price for conventional jasmine rice, whereas the non-organic product purchasers were willing to pay only 21.64 per cent more. For organic orange juice, organic product purchasers were willing to pay 25.80 per cent more than conventional orange juice, whereas non-organic product purchasers were willing to pay 22.25 per cent more. For organic coffee, organic product purchasers were willing to pay 28.35 per cent more than for conventional coffee, whereas the non-organic product purchasers were willing to pay only 24.32 per cent more. The findings are consistent with Bhattarai's (2019) study which revealed that consumers in Nepal are willing to pay 25 per cent more for organic vegetables than conventional vegetables. Bhattarai suggests that consumers who do not purchase organic products are willing to pay less than organic product purchasers for organic vegetables. Similarly, Nandi, Bokelmann, Gowdru and Dias (2017) reveal that Indian consumers are willing to pay 25 per cent more for organic vegetables. For organic rice, the findings are consistent with Riccioli et al.'s (2020) study that revealed that Chinese consumers who purchase organic rice are willing to pay 19.4 per cent more than for conventional rice. For organic fruit juice, the findings agree with Tóth, Migliore, Schifani and Rizzo's (2020) study that reported that consumers who purchase organic products in Hungary are willing to pay 48 per cent more for organic fruit juice (that contains all natural ingredients and no preservatives) than for conventional fruit juice. Consumers who do not purchase organic products are willing to pay less than consumers who purchase organic fruit juice. For organic coffee, our finding supports Nica's (2020) study

which revealed that organic product purchasers in European countries are willing to pay 40 per cent more for organic coffee than for conventional coffee (Nica, 2020). Nica suggests that non-organic product purchasers are willing to pay less than organic product purchasers for organic coffee.

6.1.2 A summary of and the major findings for organic product purchasers based on the conceptual model

6.1.2.1 Consumers actual purchases and their experience of purchasing organic products

Only organic product purchasers were asked about their experiences in purchasing organic products. The results show the four types of organic product affect purchasers' experiences. These experiences are based on the frequency of organic product purchases, expenditure on organic products, the premium price they pay for organic products and their experiences in purchasing organic products.

- For the frequency of purchasing organic products, the results show that organic product purchasers purchased organic vegetables on average once a week, organic rice and juice two or three times a month and organic coffee at least once a month. Their expenditure on organic products (from 100 per cent of the money they allocated for vegetables) was 45 per cent to purchase organic vegetables and 55 per cent on conventional vegetables. For organic rice and juice (from the total allocated amount), they spent 40 per cent on organic rice and juice and 60 per cent on the same conventional products. For organic coffee, they spent 20 per cent on organic coffee and 80 per cent on conventional coffee. They paid a premium price for organic vegetables; up to 40 per cent higher than the conventional vegetable price. They also paid a premium price for organic rice and juice, approximately 35 per cent higher than the conventional price. For organic coffee, they paid a premium price of approximately 20 per cent more than conventional coffee.

- In terms of experiences in purchasing organic products, the results show that the organic product purchasers were happy to purchase organic products even at high prices. They purchased organic products because the benefits outweighed the costs and the higher prices of organic products reflect higher quality. These findings are consistent with Nica's (2020) study which found that organic product purchasers in the US are willing to pay 20 per cent or more for organic groceries such as vegetables, fruit and juice than for conventional groceries. Nica reveals that organic product purchasers purchase organic groceries more than once a week. Our findings are consistent with Rizzo et al.'s (2020) study that found that organic product purchasers in Italy are willing to pay premium prices for organic products because of the expected benefits. Rizzo et al. (2020) reveal that organic product purchasers buy organic

products at least once a week and that they are willing to pay 78.9 per cent more for organic olive oil than for the conventional oil. Ninety per cent of organic product purchasers claimed that they consumed organic olive oil every day for good health (Rizzo et al., 2020).

- The organic product purchasers were asked to indicate the actual premium price paid compared with their WTP premium price for the four specified organic products. The results show that the actual premium prices that organic product purchasers paid for the four specified organic products were higher than their WTP premium prices for these same products. The results show that organic product purchasers paid higher prices than their WTP premium prices for organic vegetables, jasmine rice and orange juice. The results are consistent with Tóth et al.'s (2020) study that found that organic product purchasers in Hungary paid an actual premium price for organic products higher than their WTP a premium price. The results agree with Wongprawmas and Canavari's (2017) study that showed that organic product purchasers in Thailand paid actual prices for organic products that were higher than their WTP premium prices. Significantly, they paid higher premium prices for well-known organic product brands. Wongprawmas and Canavari's (2017) results suggest that brand is important for safeguarding consumer confidence and increasing their WTP premium prices for organic products. However, for organic coffee, organic product purchasers paid less than their WTP a premium price. The reason that the respondents' actual premium price was lower than their WTP a premium price for organic coffee was because most respondents (approximately 80 per cent) had never purchased organic coffee.

6.1.2.2 The structure of consumers' risk perceptions and risk reduction strategy variables (Research objectives 2 and 3)

We used only the organic product purchasers' data to test our hypotheses based on the conceptual model. EFA was used to analyse the factors used in the measurement models. CFA was used to reconfirm the EFA results and to test and validate the latent variables in the measurement models. Finally, SEM was used to investigate the relationship between the latent variables in the conceptual model. The results show that consumers' risk perceptions and risk reduction strategy variables are hierarchical. There are six first order consumer risk perception dimensions: psychological risk, functional risk, social risk, financial risk, physical risk and time risk. Consumer risk reduction strategies consist of five first order dimensions: brand, process, price, and certification and information risk reduction strategies. The findings are now discussed.

6.1.2.2.1 Consumer risk perceptions

The results of the measurement model for consumer risk perceptions support hypotheses (H8a), (H8b), (H8c), (H8d), (H8e) and (H8f). The results confirm that there are significant positive

relationships between the six indicators (psychological risk, functional risk, social risk, financial risk, physical risk and time risk) and consumer risk perceptions. This shows that consumers evaluate their risk perception based on the six indicators. The results are consistent with Yeung and Morris's (2001) study that found that consumer risk perceptions have a positive relationship with the six risk factors. Our findings are also consistent with Machado Nardi et al.'s (2020) study that found that the six risk factors are positively associated with consumer risk perceptions. Vainio et al.'s (2020) investigation of consumer risk perceptions in Finland reveals that consumers' perceptions of food safety risk can be divided into six indicators. For consumer risk perceptions, our study finds that psychological risk is the most important factor, followed by time risk, social risk, financial risk, functional risk, and physical risk.

In our study, psychological risk is the most important indicator for measuring consumer risk perceptions. The result confirms that there is a significant positive relationship between the psychological risk and risk perceptions. This result is consistent with Mitchell's (2001) study which revealed a significant positive relationship between psychological risk and consumer risk perceptions. Nuttavuthisit and Thogersen (2015) report that consumers are concerned about the high psychological risk when purchasing organic products; that is, being cheated when purchasing organic products at a high price or losing face because they purchase goods that are not truly organic.

The next most important indicator for predicting consumer risk perceptions is time risk. The result shows that there is a significant positive relationship between time risk and consumer risk perceptions. The result is consistent with Mitchell's (2001) study that reported that time risk has a significant positive relationship with risk perceptions. Sriwaranun (2011) notes that consumers do not have time to find organic products, therefore they sometimes pay a higher price to buy organic products wherever they find them rather than shopping around for a cheaper price. This consumer purchasing behaviour is driven by time risk.

The next indicator to measure consumer risk perceptions is social risk. There is a positive relationship between social risk and consumer risk perceptions. The finding is consistent with Yeung and Morris' (2006) study that reported that social risk has a significant positive relationship with consumer risk perceptions. Nuttavuthisit and Thogersen (2015) also find that social risk has a positive relationship with consumer risk perceptions of purchasing organic products.

Financial risk is the next most important indicator for measuring consumer risk perceptions. The result confirms that there is a significant positive relationship between financial risk and consumers' risk perceptions. The result is consistent with Voon et al.'s (2011) study that revealed that financial risk has a positive relationship with consumer risk perceptions. Yeung and Morris (2006) find that

consumers perceived a higher risk if they felt that they had wasted their money when purchasing food products at high prices.

The next important indicator for measuring consumer risk perceptions is functional risk. There is a significant positive relationship between functional risk and consumer risk perceptions. The result is consistent with Wang and Tsai's (2014) study that found that functional risk has a positive relationship with consumer risk perceptions when purchasing organic products. In other words, consumers are concerned about the quality and safety of organic products. If consumers feel uncertain about the quality of organic products they have purchased, they experience high functional risk. The findings are consistent with Vainio et al.'s (2020) study that found that consumers who are health conscious have high levels of perceived functional risk and have greater concerns about food safety.

The least important indicator for measuring consumer risk perceptions is physical risk. Physical risk has a significant positive relationship with consumer risk perceptions. This finding is consistent with Mitchell's (2001) study that found that physical risk is an important risk perception associated with the purchase of food products. These findings are support Machado Nardi et al.'s (2020) study that revealed that consumers who prefer organic products or natural foods are more concerned about food safety risks, especially physical and functional risks.

6.1.2.2.2 Consumer risk reduction strategies

The results of the measurement model of consumers risk reduction strategies support hypotheses (H9a), (H9c), (H9d), and (H9e). However, hypothesis (H9b) is not supported. The results confirm that there are significant positive relationships between four of the five indicators and consumer risk reduction strategies. The results also indicate that consumers consider their risk reduction strategies based on four indicators (information, process, certification and brand). Information is the most important indicator, followed by process, certification and brand. However, price is not an important indicator for measuring risk reduction strategies.

Information is the most important indicator for measuring consumer risk reduction strategies. The result confirms that there is a significant positive relationship between information and risk reduction strategies. This result is consistent with Yeung et al.'s (2010) study that reported that information has a significant positive relationship with consumer risk reduction strategies. Yee, Yeung and Morris (2005) reveal that information is the most important indicator related to consumer risk reduction strategies; it influences consumers' food purchasing decisions. This result suggests that consumers want more information about organic products and that marketing (particularly related to food safety) plays a crucial role in the consumers' purchasing decisions.

The next most important indicator for measuring consumer risk reduction strategies is the process. The result shows that there is a significant positive relationship between risk reduction strategies and process. This finding contradicts Yeung et al.'s (2010) study that reported that process is not an important indicator for risk reduction strategies because it does not have a significant relationship with consumer risk reduction strategies. Yeung et al. (2010, p. 312) define "process" as consumers' storage of food such as consumers keeping food they purchased in a fridge or store separate from other products. However, our study focused on retailers' storage of organic produce; keeping organic products separate from conventional produces. We asked the respondents about various processes: e.g., "Did you buy organic products from shops that keep organic products separate from other products?" and "Did you look for organic products from different shops?". Our results differ from previous studies because our definition of "process" refers to how retailers keep organic products at their store/shop. The literature defines "process" as how consumers keep organic products at their home. Our findings are consistent with Ranjbar Shamsi, Omidi Najafabad, and Hosseini's (2020) study in Turkey that revealed that consumers who purchase organic products prefer to buy organic products that are kept separate from conventional products. The authors suggest that shops should have designated areas for organic products, which would increase consumers' confidence (Ranjbar Shamsi et al., 2020).

The next most important indicator for consumer risk reduction strategies is certification. The result shows that there is a significant positive relationship between consumer risk reduction strategies and certification. The findings are consistent with Yeung et al.'s (2010) study that indicated that certification, in particular, and quality assurance from a lab or the government, are significant indicators for measuring consumer risk reduction strategies. These findings are consistent with several studies (e.g., Achilleas & Anastasios, 2008; Hatanaka et al., 2005; Nicoleta-Andreea & Anca, 2011). Achilleas and Anastasios (2008) reveal that consumers actively look for certification when purchasing organic products to reduce their risks. Similarly, Hatanaka et al. (2005) report that organic certification is a significant factor influencing consumers' intentions to purchase organic products. Nicoleta-Andreea and Anca (2011) indicate that consumers look for trustworthy certificates to reduce their uncertainty when purchasing organic products.

Brand is the fourth most important indicator for measuring consumer risk reduction strategies. The results show that consumer risk reduction is positively related to brand. This result is consistent with Ness et al's (2010) study that indicated that brand is an important indicator of consumer risk reduction strategies when purchasing food. Consumers look for well-known brands when purchasing food, e.g., Yeung et al.'s (2010) study revealed that choosing a well-known brand is a common risk reduction strategy for consumers purchasing poultry products. Rintamaki et al.(2006) report that consumers choose well-known brands when purchasing wine at high prices. Fernández-Barcala and

González-Díaz (2006) reveal that brand is an important factor that influences consumer purchases of vegetables and fruit in European countries; consumers value well-known brands and were willing to pay higher prices for vegetables and fruit from familiar brands.

Our study shows price was not an important indicator of consumer risk reduction strategies. In short, there is no significant relationship between price and consumer risk reduction strategies. The result is consistent with Yeung et al.'s (2010) study on food marketing (especially food safety reporting) which found that price is not a significant factor for measuring risk reduction strategies and, more importantly, that discounted prices do not affect consumers' purchasing decisions. In contrast, several previous studies have argued that consumers will purchase more organic products when prices are lower (Bryła, 2016; Magistris & Gracia, 2008; Sriwaranun, 2011; Xie et al., 2015).

6.1.2.3 The relationships among all seven latent variables (Research objectives 1 and 4)

To answer all hypotheses, SEM was used to investigate the relationships among all seven latent variables in the conceptual model. These seven latent variables are: consumers' WTP premium prices for organic products; consumers' risk perceptions; consumers' risk reduction strategies; consumers' perceptions of organic product attributes; consumers' attitudes towards organic products; consumers' knowledge of organic products; and consumers' lifestyle. The SEM results support hypotheses (H2), (H4), (H6) and (H7). However, hypotheses (H1) and (H3) are not supported. Hypothesis (H5) was removed because it destabilised the SEM.

Hypothesis (H1) indicates that there is no significant positive relationship between consumers' perceptions of organic product attributes and consumers' risk perceptions. However, Hypothesis (H2) indicates that consumers' attitudes towards organic products positively influences consumers' risk perceptions when purchasing organic products. The result supports the perception that consumers who have positive attitudes towards organic products also have a high risk attitude when purchasing organic products. This implies that consumers who have a positive attitude towards organic products are more likely to be health conscious and they have high expectations on safety and healthy foods when purchasing organic products. These consumers have high risk perceptions when purchasing organic products such as concern about the authenticity of organic products, wasting time to purchase them and the lack of product variety. The positive relationship between consumer attitudes and organic products and consumer risk perceptions is supported by prior research (e.g., Almli et al., 2019; Bánáti, 2011; Mkhize & Ellis, 2020; Voon et al., 2011).

Hypothesis (H3) proposes that there is no significant negative relationship between consumers' knowledge of organic products and consumer risk perceptions related to the purchase of organic products. However, Hypothesis (H4) indicates that the consumers' lifestyle positively influences their

risk perceptions when purchasing organic products. This implies that consumers who have a healthy lifestyle, have a strict diet or prefer cooking at home exhibit high levels of perceived risk when purchasing organic products. Our findings are consistent with Pícha and Navrátil's (2019) study that revealed that consumers' healthy lifestyles positively influence consumers' risk perceptions when purchasing organic products. The positive relationship between consumer lifestyle and consumer risk perception is supported by prior research (e.g., Charlebois, Juhasz, Foti, & Chamberlain, 2017; Nuttavuthisit & Thogersen, 2015; Sriwaranun, 2011).

Hypothesis (H5) shows that the consumers' risk reduction strategies variable affecting the consumers' risk perception variable is a problematic hypothesis. Hypothesis (H5) is part of a non-recursive model that required using the stability index. The stability index of this model exceeds the 1.0 threshold indicating that the model is unstable and therefore impossible to analyse (Arbuckle, 2017). Therefore, Hypothesis (H5) was deleted based on the relevant literature (see Angulo & Gil, 2007; Bruwer et al., 2013; Henson & Caswell, 1999; Yeung & Yee, 2003). The result confirms that deleting Hypothesis (H5) from the analysis makes the model recursive and, therefore, further analysis could be conducted.

Hypothesis (H6) indicates that consumers' risk perceptions positively influence consumers' risk reduction strategies. Likewise, Hypothesis (H7) indicates that consumers' risk perceptions also positively influence consumers' WTP premium prices for organic products. The results provide empirical evidence that consumers' risk perception is a significant variable that positively influences consumers' risk reduction strategies and consumers' WTP premium prices for organic products. The positive relationship between consumers' risk perception and consumers' risk reduction strategies supports previous studies (e.g., Mitchell, 1999; Williams & Hammitt, 2001; Yeung & Morris, 2006). The positive relationship between consumers' risk perception and consumers' WTP premium prices for food products is also consistent with prior studies (Brunel, 2004; Bruwer et al., 2013; Yeung et al., 2010).

The relationship between consumers' risk reduction strategies and their WTP premium prices for organic products indicates that consumers' risk reduction strategies negatively influence consumers' WTP premium prices for organic products. The result is a new contribution to the organic product marketing literature and provides empirical evidence that consumers' risk reduction strategies is a significant variable that negatively influences consumers' WTP premium prices for organic products. The finding indicates that an increase in consumers' risk reduction strategies decreases consumers' WTP premium prices for organic products. In brief, the higher the use of risk reduction strategies, the lower the price consumers are willing to pay for organic products. In other words, consumers are willing to pay more for organic products if they do not need to use risk reduction strategies. The

negative relationship between consumers' risk reduction strategies and consumers' WTP premium prices for food products reinforces prior studies (e.g., Buzby, Fox, Ready & Crutchfleld, 1998; Henson 1996; Mitchell, 1993; Wang & Tsai, 2014; Yeung et al., 2010).

6.2 Implications of the study's findings

6.2.1 Theoretical implications

1) This study is the first to investigate consumer risk perceptions and risk reduction strategies and their impact on WTP premium prices for organic products in Thailand. The results confirm that consumer risk perceptions and risk reduction strategies significantly influence consumers' WTP premium prices for organic products. The findings provide a better understanding of consumers' decision-making when purchasing organic products. From previous literature, we investigated possible variables influencing consumers' WTP premium prices for organic products. The relevant variables are: consumers' attitudes towards organic products (health consciousness, environment, ethics); consumers' perceptions of organic product attributes (food safety, nutritious, availability and trust); and consumers' lifestyle (healthy lifestyle, cooking at home, buying takeaway food or dining out) (see Magistris & Gracia, 2008; Magnusson et al., 2003; Sriwaranun, 2011; Van Doorn & Verhoef, 2015). This study includes emotional variables in the model: consumers' risk perceptions and risk reduction strategies. These factors have not been studied before in relation to organic products. The results confirm that these variables significantly impact consumers' WTP premium prices for organic products.

2) The SEM approach is appropriate to conceptualise and measure consumers' WTP premium prices for organic products. This study provides a robust evaluation of consumers' WTP premium prices for organic products using SEM. Seven latent variables of the WTP premium prices for organic products model were tested. The results show that these measurement models have a good model fit and adequate reliability and validity. The findings confirm that the SEM developed for this study adequately capture consumers' WTP premium prices for organic products. Our empirical results also support the use of SEM for analysing how latent variables interact with each other and how the variables impact consumers' WTP premium prices for organic products. The results also reveal the cause and effect of consumers' risk perceptions and their risk reduction strategies that influence their WTP premium prices for organic products. This study is the first to investigate how consumers perceive risk when purchasing organic products using the consumers' WTP premium prices for organic products model, which simultaneously analyses all possible relevant variables: perceptions, attitudes,

knowledge, lifestyle (which includes perceived risks and risk reduction strategies). These variables were derived from previous studies and EBM theory.

3) Previous research has established that consumers' perceptions of organic products' attributes, consumers' attitudes towards organic products, consumers' knowledge of organic products and consumers' lifestyle are significant factors in explaining consumers' risk perceptions and WTP premium prices for organic products (see Magistris & Gracia, 2008; Magnusson et al., 2003; Sriwaranun, 2011; Van Doorn & Verhoef, 2015). Our findings confirm that consumer lifestyle and attitudes toward organic products have significant influence on consumers' risk perceptions and their WTP premium prices for organic products. However, consumers' perceptions of organic product attributes and their knowledge of organic products have no significant effect. Our findings are consistent with Ha, Shakur and Pham Do's (2019) study in Vietnam that found that consumers' perceptions of organic product attributes have no impact on their risk perceptions and WTP premium prices for organic products. Our findings are also consistent with Kashif et al.'s (2020) study in Pakistan and Malaysia that indicated that knowledge has no influence on consumers' risk perceptions and their intention to purchase organic products. Our findings related to consumer lifestyle (cooking at home and healthy lifestyle) are consistent with Sriwaranun's (2011) study that found that Thai lifestyles have a significant impact on consumers' food purchasing decisions. The results on consumer attitudes toward organic products is similar to those in Voon et al.'s (2011) study that reported that consumers' WTP a premium price for organic products is driven by consumer attitudes towards organic products. More importantly, consumers' individual lifestyle choices (cooking at home and healthy lifestyle) have a stronger influence on their risk perceptions than consumers' attitudes toward organic products (such as consumers' beliefs about health and the environmental impact of organic products). Consumers' risk perceptions are driven more by consumers' lifestyle than their attitudes about organic products. In other words, consumers' daily activities have a stronger influence on their risk perceptions when purchasing organic products than their beliefs or thoughts about organic products. The findings are consistent with Ditlevsen, Sandøe and Lassen's (2019) study in Denmark that revealed that consumers' daily activities (such as eating high quality foods, especially organic foods), are considered part of a healthy lifestyle. Ditlevsen et al. (2019) conclude that consumers who have a healthy lifestyle perceive high levels of risk and have high expectations about the health benefits of consuming organic products.

4) This study's findings provide an important contribution to the literature on organic product marketing, especially in the area of consumer decision-making. The results confirm that consumers' risk perceptions affect their decision to purchase organic products. Consumer

risk perceptions positively influence consumers' WTP premium prices for organic products. The finding is consistent with Yeung et al.'s (2010) study that revealed that consumers' risk perceptions influence their decision to purchase food products. Consumer risk perceptions also positively influence their risk reduction strategies, indicating that consumers seek to reduce their risks, especially when they consider these risks to be high. These findings are consistent with Mitchell (1999), Yeung and Yee (2003), Yeung et al.'s (2010) studies that showed that consumers' risk perceptions influence their risk reduction strategies. Evidence from our study reveals that consumers look for information, process, certificates and brand to reduce their risks when purchasing organic products. However, these risk reduction strategies negatively influence consumers' WTP premium prices for organic products. In short, the higher the use of risk reduction strategies, the lower the price consumers are willing to pay for organic products.

5) The fifth theoretical implication relates to the indicator of consumer risk perceptions and their risk reduction strategies. The results show three indicators underpinning consumer risk perceptions and four indicators underpinning consumer risk reduction strategy variables. Our study identifies the comparative importance of these indicators. The results show that social risk perception is the most important indicator of consumer risk perceptions and that information is the most important indicator of consumer risk reduction strategies. These findings are consistent with previous studies on conventional products (e.g., Bruwer et al., 2013; Mitchell, 1999; Yeung & Morris, 2006). These studies reveal that social risk is a most significant variable influencing consumer purchases of conventional products such as poultry, milk and wine. In terms of risk reduction strategies, our finding is consistent with Yeung and Yee (2003) and Yeung et al. (2010) who confirm that information is the most important factor influencing consumer purchases of conventional products such as poultry and eggs.

6) Our study shows that price reduction is not a significant factor influencing consumers' purchase of organic products. This finding contradicts several previous studies (e.g., Roitner-Schobesberger et al., 2008; Sangkumchaliang & Huang, 2012; Sriwaranun, 2011; Voon et al., 2011). These earlier studies, which investigate consumer behaviour when purchasing organic products, contend that price reduction is the most important factor influencing consumer purchases of organic products. Most of the previous studies contend that reducing organic products' prices will increase the purchase of these products. For example, Nica (2020) suggests that lowering the price of organic products will persuade European consumers to buy more. Similarly, Nandi et al.'s (2017) survey of consumers in India found that the high price of organic products is the most significant barrier. Nandi et al.(2017) suggest reducing the price of these products to increase purchases. In contrast, our study finds that price

reductions do not increase consumers' purchase of organic products. In fact, consumers do not even think about price reductions, nor is it a risk reduction strategy. The results confirm that price reduction is not a significant indicator of risk reduction strategies in our model.

6.2.2 Practical implications

The results provide some useful information for policymakers, marketing executives and/or farmers. These individuals/groups can use this information to improve their marketing strategies or to increase consumer confidence in organic products.

1) The findings show that consumers' lifestyle influences their perceived risks. If they have a healthy lifestyle and usually cook at home, they tend to perceive greater risks, especially social (SOC), psychological (PSYC) and time risks (TIME). Therefore, farmers, marketers and policymakers should develop and implement effective marketing strategies based on these results. Retailers or sellers need to use strategies that involve family members and friends, such as the retailer, to create a referral-marketing programme (i.e., current consumers who have purchased organic products recommend these products to their family and friends). This strategy should work well because consumers are more likely to have high social risk when purchasing organic products. Retailers/marketers should also promote organic products in their stores using authentic certificate schemes. They should provide information about what vegetables and fruit are in season because organic produce is grown at different times of the year. Providing information about the availability/season of each organic product and promoting organic product certificates should encourage consumers to buy more because consumers have high psychological and time risks. However, consumers perceived lower risks, especially physical (PHY), functional (FUNC) and financial risks (FIN). Our findings indicate that consumers are not concerned about the quality of organic products, chemical residue or waste their money when they purchase organic products. The findings also indicate that consumers understand that organic products are safe and good for their health. The findings clearly show that consumers are only concerned about the organic products' authenticity and the time risk associated with locating these products.

2) The findings indicate that if consumers have a higher level of perceived risks, they will spend more (as shown by variable WTP2 in the SEM), and they will pay a higher premium price (as shown by variable WTP3 in the SEM). They will also purchase organic products more frequently (as shown by variable WTP1 in the SEM). In sum, consumers who usually cook at home tend to exhibit higher risks and are willing to pay more for organic products. These consumers will purchase more organic products, more frequently, and pay higher prices. Retailers or sellers should thus encourage consumers to cook more at home. This could be

done by creating in-store marketing that popularises home cooking. Other strategies include introducing new recipes that use organic products or have instore cooking demonstrations hosted by a professional chef, located in the organic products sales area. In addition, consumers who have a positive attitude towards organic products believe that organic products are good for the environment because they produced without chemicals. These consumers also perceive greater levels of risk when purchasing organic products and are willing to pay higher prices for organic products. Marketers and retailers should educate consumers about the environmental problems caused by the chemicals used in conventional agriculture. This message may persuade consumers who are concerned about the environment to purchase more products that are organic because they are free from pesticides, herbicides and synthetic fertilisers and are produced using environmentally friendly processes.

3) The findings related to consumers' risk reduction strategies are valuable for the organic product business. Retailers, marketers and farmers can use this information to develop and implement their marketing strategies or their production activities effectively. This study's results indicate that consumers who have high perceived risks try to reduce their risk by searching for information (as shown by variable INFO in the SEM), related to the production and storage of organic products (as shown by variable PROC in the SEM). They also want confirmation on the authenticity of the organic products (they look for trusted certificates (as shown by variable CERT in the SEM)) and buy well-known brands of organic products (as shown by variable BRND in the SEM). However, the finding shows that consumers do not look for price reductions (as shown by the variable PRIC in the SEM) when purchasing organic products. Suggestions regarding marketing strategies or production activities based on each variable's finding are outlined below:

    - Based on the results, information is the most important variable that consumers look for when purchasing organic products. In addition, there is a covariance between the social risk (SOC) and information (INFO) in our model. Thus, there is a positive relationship between information and social risk. This indicates that organic product information must reflect consumers' needs. Consumers who search for more information about organic products are likely to have higher levels of social risk. Based on our findings, consumers want stores to provide more information about organic products. As they also obtain information from their social networks (family and friends), retailers or marketers should not underestimate the power of information sharing. Word of mouth plays an important role in marketing strategies because it is informal information that consumers believe and search for. Consumers use social media in daily life; Facebook, Twitter and

Instagram are common social platforms that people used to connect with each other. These networks play an integral role in information sharing.

- The results indicate that process (PROC) is one of the most significant variables that consumers use to reduce their risk when purchasing organic products. Consumers are particularly concerned about whether organic products are kept separate from conventional products. Thus, it is important for sellers to explain their transport and storage processes to consumers to provide a greater confidence. Likewise, marketers should ensure that consumers could clearly see the process that all organic products sold in shops or stores are processed separately. Retailers or marketers should provide consumers with more information about how organic products are grown, transported and stored.

- The empirical result shows that a trusted certificate (CERT) is one of the most effective consumer risk reduction strategies. Our study found that consumers look for organic products that are certified. The survey result shows consumers have confidence in both Thai and international certifications of organic products. Organic farmers or producers should carefully consider what certification schemes to use. Our results suggest that organic farmers or producers who sell organic products in Thailand should participate in the Thai certification programme rather than in international certification schemes. The fee for participating in a domestic organic certification scheme such as the Agriculture Certificate Thailand scheme (ACT) is cheaper than an international certification programme (ACT, 2016). More importantly, the process of obtaining domestic certification is easier for farmers than international certification (ACT, 2016). Consumers want to know who certifies the organic products and how the certification is carried out, rather than what the certificate is for and how the farmers receive such certification. Certification programmes should educate consumers about organic production, transport and handling. This information will increase consumers' confidence when purchasing or consuming organic products. All these items can be included under one marketing tool called "brand".

- The results indicate that brand (BRND) is a significant strategy that consumer choose to reduce their risk. Brand is an important marketing tool used to represent product or service attributes (Kotler, 2012). Our finding indicates that consumers think about brand when purchasing organic products, which means that brand, can be used as a marketing tool for organic products. Marketers can link the significant strategies (such as information, process and certificates) into one brand and use this brand to communicate

with consumers about organic products. For example, marketers can link interesting stories about their organic products into a brand or link unique information about the organic products into a brand, or the special production, transport and storage processes into the brand. More importantly, branding could effectively develop to make it easy for consumers to recognise the brand and to build brand awareness, including brand loyalty. For example, marketers or sellers should clearly label their products. Likewise, marketers may promote organic product brands via social media and at purchase points in stores or shops. A brand should reflect consumers' lifestyles and could guarantee organic product quality and good handling processes. In addition, marketers or sellers can use this study's findings on risk reduction strategies as guidelines for developing new marketing strategies.

- The results show that consumers do not look for price discount (PRIC). In short, discounted price is not a significant strategy that consumers choose to reduce their risk when purchasing organic products. Reducing the price for organic products is one of the most popular recommendations from previous studies over the past thirty years. However, our findings contradict previous studies' findings. Our results also show that consumers do not look for lower prices when purchasing organic products, which means that discounted prices should not be used to persuade consumers to buy organic products. Consumers will not buy more or feel more confident when they purchase organic products at discounted prices. Marketers and retailers should provide consumers with other risk reduction strategies, such as providing more information about organic products and their handling and storage processes. They should also use trusted certificates or brands to persuade consumers to purchase organic products. If supermarkets or stores compete with other stores offering lower prices, we recommend sales promotion programme such as a buy one, get one free strategy. This promotion strategy can be used to compete with other stores or to clear out excess stock at the end of a season (Kotler, 2012). For example, Aigner, Wilken and Geisendorf (2019) who investigated promotion programmes for organic products in Germany found that sales promotion strategy such as offering the free products is more effective in persuading consumers to purchase more organic products than offering discounted prices. Retailers or marketers could use sales promotion programmes instead of subsidising their price discounts. By not discounting their prices and offering sales promotions instead, consumers will feel more confident about the product's authenticity and get more value for their money.

- This study's findings can be used as guidelines for marketers/retailers, such as health food stores, supermarkets or fresh markets, to manage their marketing budget effectively to enhance consumers' organic food consumption with high confidence. Marketers/retailers should allocate their marketing budget to marketing activities that consumers expect to receive. For example, the findings confirm that consumers want information about organic products, including recommendations from their friends and family. Marketers/retailers should allocate a portion of their marketing communication budget to develop their social media presence (Facebook, Instagram, Twitter) instead of relying on mass communication forms such as television, radio, newspapers and billboards. The use of social media is not only much cheaper than the mass media but also social media can deliver more information and content; they can be used to communicate more frequently and rapidly and it is two-way communication. This study's findings can also be used as guidelines for organic farmers or producers to invest their money effectively. Farmers do not need to invest in a certification programme that is very expensive and may not encourage consumers to purchase organic products. Instead, farmers should invest their money in options that are cheaper and more effective. For example, farmers can work together as a group to produce organic products and present their stories on behalf of the farmer group, their village or cooperative, to tell consumers their stories. The study' findings indicate that these stories or information about organic products is more effective in persuading consumers to purchase organic products than certificates. This example is one of many options that farmers can use to encourage consumers to purchase their organic products with confidence. Similarly, farmers or producers can add value to the organic products they sell without reducing prices.

- The findings from this study can be used in both developed and developing countries whose markets are in the early stages of organic product market development. Policymakers, marketers and farmers can use these findings to determine their own strategies to encourage greater consumption of and confidence in organic products. This study was conducted in Thailand where the organic market is relatively new, the products are sold at a high price and consumers have limited information about organic products. This study's findings should apply to similar markets in other countries.

- This study's findings may also be useful for other agricultural products that are difficult to identify, such as organic/free-range chicken, eggs, beef and other food products. In addition, the marketing strategies developed in this study could apply to other expensive foods (luxury food items). For example, we could use the same marketing strategies with

expensive foods, starting with providing information (telling interesting stories) that impact consumers' purchasing decisions, followed by information about handling processes and certification programmes. These strategies have been shown in earlier studies on WAGYU and KOBE beef from Japan (Kimura, 2015). Our marketing strategies are similar to those identified by Kimura (2015). This involved explaining the story of WAGYU and KOBE beef to consumers. Consumers were also provided with information about the special handling processes and certification/accreditation schemes.

6.3 Limitations of the study

- The scope of this study is limited because the objectives were based on a proposed model and hypotheses. The study's model investigated and represented only organic product purchasers' behaviour. This study has identified how organic product purchasers think and behave when purchasing organic products. It has also provided information about how to encourage them to purchase organic products with more confidence. However, in the real market, the proportion of consumers who do not purchase organic products is larger than organic product purchasers. Therefore, the study's findings represent only a small proportion of consumers, not all potential consumers.

- Previous studies have use attitude behaviour models such as the theory of reasoned action (TRA) and the theory of planned behaviour (TPB) to predict consumers' behaviour (Chen, 2007; Zagata, 2012). However, this study does not use these theories because they are not appropriate for the study. First, these theories mostly investigate consumers' attitude and perception behaviour (internal factors) (Ajzen, 1991). The investigations related to organic products using these theories do not address feeling and emotion investigation (Voon et al., 2011). Second, these theories cannot cover all influencing factors involved in consumers decision making processes such as social factors (family and friends) and personal factors (lifestyle) which are critically influence consumers' behaviour (Blackwell et al., 2001). Third, to investigate consumers' risk perception, the theories underpinning the conceptual research model need to focus on the processes of consumers' decision-making, not an outcome (Mitchell, 1999). The TPB focuses on result such as an intension to purchase organic products (Zagata, 2012). The theory investigating risk perceptions should focus on consumers decision-making processes because risk perception occurs in the decision processes before the actual purchases (Solomon et al., 2013).

- A third limitation relates to the sample selection. We used convenience sampling (more specifically, the mall intercept approach), which is a nonprobability sampling method. Therefore, the sample may not accurately represent the population of organic and non-

organic product purchasers in Thailand. Also, we surveyed consumers only at specific locations such as supermarkets, healthy goods stores and fresh markets. We surveyed at places that sold both organic and non-organic products (a small number of locations) as opposed to places that sell only conventional products. Even though convenience sampling is the most appropriate method to use in this study (Cooper & Schindler, 2011), scholars must be careful generalising our results because they cannot be applied to all organic product purchasers. The findings of this study may be used/applied to organic product purchasers' behaviour and their decision-making processes when purchasing organic products in other countries where the organic product market development is similar to Thailand.

- The fourth limitation relates to the fact that the organic produce market in Thailand is in its infancy. Organic products market share is only two per cent (Panyakul, 2016) and the number of purchasers of organic products is small compared with the total number of consumers. The variety of organic products sold in Thailand is also limited. However, the study's model required a large sample size for analysis. To obtain enough information, we asked respondents about four of the most popular organic products in Thailand: organic vegetables, rice, juice and coffee, as suggested by Panyakul (2016). We used the information derived from the four organic products to represent the organic products in general. We did not analyse consumers' purchasing behaviour for a specific organic product. Investigating a single organic product is useful for obtaining a greater understanding of consumer behaviour because individuals behave differently when purchasing different products (Blackwell et al., 2001). However, our study's results represent organic products, in general, not specific organic products.

- Finally, this study used a single bound technique to collect information about consumers' WTP a premium price for specified organic products. The single bound technique was used to minimise the number of questions asked. We also used closed-end questions to make it easier for the respondents to complete the survey and to decrease the number of respondents who did not answer specific questions. We found that the consumers' WTP a premium price for specified organic products (organic vegetables, rice and juice) was lower than the actual premium price that they paid for those products. This finding is consistent with Nandi et al.'s (2017) study that surveyed consumers in India. The authors found that consumers' WTP premium prices for organic vegetables and fruits was lower than the market prices; the authors believe this finding was because of the use of the single bound technique. The finding is consistent with Sriwaranun's (2011) study indicating that the consumers' WTP a premium price for organic products was lower than the retail prices at that time. However, the findings from Sriwaranun's study based on the double-bound technique, show that

consumers' WTP a premium price for organic products was not much different from the actual retail prices compared with the differences found from our study. Therefore, using the double bound technique may more precisely collect data related to the consumers' WTP premium prices for organic products than the single bound technique. Calia and Strazzera's (2000) study indicates that the double bound technique produces a more precise price point than the single bound technique.

6.4 Recommendations for future study

- This study used SEM to analyse data only from organic product purchasers. Future studies can apply the SEM model to both organic and non-organic product purchasers to investigate differences between these two groups of consumers. There is a lack of studies on consumers' purchase of organic products especially using the SEM approach. This model provides a better understanding of the complexity around consumer purchasing decisions. The number of individuals who do not purchase organic products is much larger than the number of organic product purchasers. Therefore, there is great scope for development of the market. Future studies could compare organic and non-organic product purchaser models to determine any major differences. The findings can be used to motivate non-organic product purchasers to purchase organic products and to encourage purchasers who already buy organic products to purchase more with greater confidence.

- Future studies can consider latent growth curve modelling, which is a longitudinal analysis technique (Kline, 2015). Using the latent growth curve modelling technique would allow researchers to analyse and estimate the growth of consumers' WTP premium prices for organic products over time. The latent growth curve model is useful for analysing changes in consumers' WTP premium prices for organic products over time. In particular, when retailers or sellers apply new marketing strategies (such as providing more information to consumers, explaining organic product processes, emphasising brand names and certification processes), latent growth curve modelling could be useful to investigate these changes. Future research can also investigate changes to consumers' WTP premium prices for organic products when the market situation changes (e.g., incidences of food poisoning and food contamination, economic crises that affect consumers' purchasing power, pandemics that affect people's lives, and natural disasters that affect agricultural production), to determine the effect on consumers' risk perceptions and their risk reduction strategies.

- Future studies can use our model to investigate a single organic product. This would enable researchers to collect more specific information, about not only consumer lifestyles, attitudes towards the chosen product, risk perceptions and risk reduction, but also their WTP

premium prices. Based on the literature, consumers' risk perceptions and risk reduction strategies differ depending on the food. Understanding consumers' views and decision-making when purchasing organic products may help marketers and policymakers design effective strategies to encourage consumers to purchase organic products with greater confidence.

- Future studies can investigate how cultural differences affect consumers' purchasing behaviour toward organic products. Cultural differences can impact brand choice, product safety, product impact on the environment, workers' conditions, discrimination, fair price, etc. For example, some cultures believe that consumption should avoid inflicting any harm on the environment, to maintain fair-trade principles and to contribute to working conditions, as well as animal and human health. These consumers choose food that is eco-friendly and healthy, such as organic products. Thus, it becomes imperative to acquire knowledge about the impact of cultural differences on the consumers' attitudes towards organic products.

- Organic product sales and consumption in each country not only depend on cultural differences but also on other macro variables such as national policies, politic and legal matters, certification, national label, financial support to farmers, including organic product production capacities, and the price of organic products. Future studies can integrate cultural differences, macro variables and the findings from our study to investigate multi-dimensional levels of demand for organic products in various countries. The findings from these studies will be probably more important for the sustainability of organic product consumption than individual-level investigations.

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Appendix A

A.1 Invitation for respondents participated in the survey

Faculty of Commerce

T 64 3 325 2811
F 64 3 325 3847
PO Box 84, Lincoln University
Lincoln 7647, Christchurch
New Zealand

www.lincoln.ac.nz

Dear Respondent,

If you are aged 18 years or above, you are invited to participate in a survey that constitutes part of my PhD thesis at Lincoln University, New Zealand. This is part of my research project titled "An empirical study of consumers' risk perception and risk reduction strategies affecting the willingness to pay for organic products". The research aims to identify the factors that influence consumers' risk perception and risk reduction strategies and how they affect your willingness to pay for organic products in Thailand. The findings will help organic producers to meet the consumers' requirements and will also help in planning marketing strategies for developing the organic product market in Thailand.

This research is completely voluntary in nature and you are free to decide not to participate at any time during the process of completing the questionnaire, including withdrawal of any information you have provided. However, if you answer all the questions in the questionnaire that I will ask, it will be understood that you are 18 years of age or older and have consented to participate in this survey and consent to publication of the results of this research with the understanding the anonymity will be preserved. Only summary results and conclusions from this survey will be reported without giving any of your personal details.

Your participation is of great assistance to this research. This survey will take maximum 40 minutes to complete.

If you have any question or concerns, please feel free to contact me on (081) 6465392 or by email at Wannapol.Suphaskuldamrong@lincolnuni.ac.nz. Alternatively, you may contact my supervisors Professor Christopher Gan and/or Associate Professor David Cohen. Professor Christopher Gan can be contacted at +64 3 4230227 or Christopher.Gan@lincoln.ac.nz; Associate Professor David Cohen can be contacted at +64 3 4230249 or David.Cohen@lincoln.ac.nz.

Thank you for your kind co-operation and assistance.

Yours sincerely,

Wannapol Suphaskuldamrong
PhD Candidate
Faculty of Agribusiness and Commerce
Lincoln University

Research Supervisors:

Dr. Christopher Gan Professor Faculty of Agribusiness and Commerce Lincoln University	Dr. David Cohen Associate Professor Faculty of Agribusiness and Commerce Lincoln University

This project has been reviewed and approved by the Lincoln University Human Ethics Committee.

A.2 The survey questionnaire

Lincoln University
Te Whare Wānaka o Aoraki

Survey of Consumers' thoughts and action when purchasing organic products in Thailand

For each question, please tick your answer(s); otherwise, please follow the instructions given to answer the questions. Your participation is voluntary and all of your answers will be kept confidential.

Section I. ***Grocery shopping behaviour***

1. Where do you usually purchase your groceries? (Check all that apply)
   Department store (e.g. Central, The Mall, Robinson's) [ ]
   Discount store (e.g. Tesco Lotus, Big C) [ ]
   Supermarket (e.g. Tops Supermarket, Villa Market, Food Land) [ ]
   Natural/ health food store (e.g. Lemon Farm, Aden) [ ]
   Convenience store (e.g. 7-Eleven, Lotus Express) [ ]
   Wet market/ farmers' markets [ ]
   Shopping online (home delivery) [ ]
   Other(s) please specify _____ [ ]

2. Please indicate how often you cook at home either for you or your family, buy takeaway food or dine out. Please tick in the blanks provided. (Check all that apply)

	Never	***Rarely***	***Sometimes***	***Often***	***Always***
1. I cook my meals.	[ ]	[ ]	[ ]	[ ]	[ ]
2. I do not buy takeaway food.	[ ]	[ ]	[ ]	[ ]	[ ]
3. I do not dine out	[ ]	[ ]	[ ]	[ ]	[ ]

3. Are you a vegetarian?
   No [ ]
   Yes [ ]

4. Do you have health problems that determine your food choices?
   No [ ]
   Yes [ ]

5. Below is a series of statements about ***your lifestyle.*** Please circle the number that best fits your level of agreement with each statement, where 1 means "Strongly Disagree (SD)" and 5 means "Strongly Agree (SA)".

	SD ⮟	⮟	***Neutral*** ⮟	⮟	***SA*** ⮟
1. I exercise regularly.	1	2	3	4	5
2. I often eat vegetables and fruits.	1	2	3	4	5
3. I keep a strict diet.	1	2	3	4	5
4. I usually read/check quality labels before buying food products.	1	2	3	4	5
5. I purchase most of my groceries at the same place regularly.	1	2	3	4	5
6. I prefer to recycle as much of my household waste as possible.	1	2	3	4	5
7. I use reusable bags when I shop.	1	2	3	4	5
8. I prefer to buy foods that are environmentally friendly.	1	2	3	4	5

6. Below is a series of statements about ***your knowledge about organic products*.** Please circle the number that best fits your level of agreement with each statement, where 1 means "Strongly Disagree" and 5 means "Strongly Agree".

	SD ⮟	⮟	***Neutral*** ⮟	⮟	***SA*** ⮟
I understand how organic products are...					
1. produced.	1	2	3	4	5
2. handled from farms to retailers.	1	2	3	4	5
3. different from conventional products.	1	2	3	4	5
"Organic products" are those that are free from ...					
4. chemical fertilizers.	1	2	3	4	5
5. pesticides.	1	2	3	4	5
6. genetically modified organisms (GMOs).	1	2	3	4	5

7. Below is a series of statements about ***your perception of and attitudes towards organic products***. Please circle the number that best fits your level of agreement with each statement, where 1 means "Strongly Disagree" and 5 means "Strongly Agree".

	SD		***Neutral***		***SA***
1. Organic products are safe	1	2	3	4	5
2. Organic products are popular because vegan diets are popular.	1	2	3	4	5
3. Eating organic products is fashionable.	1	2	3	4	5
4. Organic products are not easily found in grocery stores.	1	2	3	4	5
5. In Thailand, there is a small variety of organic products compared with non-organic.	1	2	3	4	5
6. There are a lot of places to buy organic products.	1	2	3	4	5
7. Organic products are tastier than non-organic.	1	2	3	4	5
8. The appearance of organic products (freshness, colour, texture) is better than non-organic.	1	2	3	4	5
9. Organic product labels are trustworthy.	1	2	3	4	5
10. I trust that the seller of organic products are honest about the organic nature of their products.	1	2	3	4	5
11. I trust international organic certification.	1	2	3	4	5
12. Thai government certification for organic products is trustworthy.	1	2	3	4	5
13. Organic products are healthier than non-organic.	1	2	3	4	5
14. Organic products have more nutrients than non-organic.	1	2	3	4	5
15. The phrase "organic products" really means nothing artificial.	1	2	3	4	5
16. Pesticide and herbicide residues on farms have an effect on the environment.	1	2	3	4	5
17. I buy organic products because I want to support local farmers/ producers.	1	2	3	4	5
18. Organic products are more environmentally friendly.	1	2	3	4	5
19. Organic products are not more expensive than non-organic.	1	2	3	4	5
20. Only consumers with higher incomes can afford organic products.	1	2	3	4	5

21. High price is not a problem if the product is genuinely organic.	1	2	3	4	5

Section II. ***Your Experience and expenditures purchasing organic products.***

8. Please indicate how often you purchase these ***organic products*** in the blanks provided.

	Never Purchase ⮟	***Rarely (Once a month)*** ⮟	***Sometimes (2-3 times a month)*** ⮟	***Often (Once a week)*** ⮟	***Always (More than once a week)*** ⮟
1. Vegetables	[ ]	[ ]	[ ]	[ ]	[ ]
2. Rice	[ ]	[ ]	[ ]	[ ]	[ ]
3. Juice	[ ]	[ ]	[ ]	[ ]	[ ]
4. Coffee	[ ]	[ ]	[ ]	[ ]	[ ]
5. None of these	[ ] [Please go to Q10]				

8.1. What proportion of your purchase of these products are organic?

	Never Purchase ⮟	***1-15%*** ⮟	***16-30%*** ⮟	***31-45%*** ⮟	***46-60%*** ⮟	***61-75%*** ⮟	***76-90%*** ⮟	***91-100%*** ⮟
1. Vegetables	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
2. Rice	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
3. Juice	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
4. Coffee	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

8.2. How much **more** are you willing to pay for organic products compared to the conventional products?

	Never Purchase ⮟	***1-15%*** ⮟	***16-30%*** ⮟	***31-45%*** ⮟	***46-60%*** ⮟	***61-75%*** ⮟	***76-90%*** ⮟	***91-100%*** ⮟
1. Vegetables	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
2. Rice	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
3. Juice	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
4. Coffee	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

9. Below is a series of statements about ***your experience in purchasing organic products***. Please circle the number that best fits your level of agreement with each statement, where 1 means "Strongly Disagree" and 5 means "Strongly Agree".

	SD		***Neutral***		***SA***
1. The higher price of organic products reflects their higher quality.	1	2	3	4	5
2. I will continue to consume organic products regardless of increases in price.	1	2	3	4	5
3. I buy organic products because the benefits outweigh the costs.	1	2	3	4	5
4. I would still buy organic products even though non-organic are cheaper.	1	2	3	4	5
5. Buying organic products is the right thing to do even if they cost more.	1	2	3	4	5

(Next proceed to Q12)

10. Why do you not purchase organic products? (Check all that apply)

High price.	[ ]
Poor appearance.	[ ]
Lack of variety.	[ ]
Hard to find.	[ ]
Low quality.	[ ]
Poor taste.	[ ]
Not really organic.	[ ]
Hard to understand.	[ ]
Prefer conventional products.	[ ]
Do not trust certification	[ ]
Lack of information.	[ ]
Other(s) please specify _____	[ ]

11. What would persuade you to purchase organic products? (Check all that apply)

Lower prices	[ ]
Increased availability	[ ]
Better appearance	[ ]
Higher quality	[ ]
More package sizes	[ ]
Environmentally friendly packaging	[ ]
Wider range of products	[ ]
Trust in organic certification	[ ]
More information	[ ]
Other(s) please specify _____	[ ]

Section III. ***Risk perception and risk reduction strategies.***

12. Below is a series of statements about ***your risk perceptions*** about ***organic products***. Please circle the number that best fits your level of agreement with each statement, where 1 means "Strongly Disagree" and 5 means "Strongly Agree".

	SD		***Neutral***		***SA***
1. I worry about pesticide residue when buying food products.	1	2	3	4	5
2. I am concerned about food safety even if the product claims to be organic.	1	2	3	4	5
3. I am never really certain that the organic product I purchased are really organic	1	2	3	4	5
4. I do not easily trust product claims that a product is really organic.	1	2	3	4	5
5. I do not have time to find organic products.	1	2	3	4	5
6. Limited supply makes buying organic products harder.	1	2	3	4	5
7. I try to buy organic products whenever they are available.	1	2	3	4	5
8. Non-organic products that claim to be organic can harm my health.	1	2	3	4	5
9. I am concerned about the cumulative effects of pesticides in my food.	1	2	3	4	5
10. I am concerned about how organic products are processed.	1	2	3	4	5
11. I would be embarrassed if I purchased the product at high price but the product has been treated with chemicals.	1	2	3	4	5
12. I fear being cheated when purchasing organic products.	1	2	3	4	5
13. I would lose face if I purchased non-organic products that claimed to be organic.	1	2	3	4	5
14. My family and friends will blame me for not doing the right thing if I do not eat organic products.	1	2	3	4	5
15. I would be out of fashion if I did not eat organic products.	1	2	3	4	5
16. I waste my money if I buy non-organic products that claimed to be organic.	1	2	3	4	5
17. I would save money and buy more if I did not buy organic products.	1	2	3	4	5

18. I think using the words "organic product" is only a marketing strategy to sell at higher prices.	1	2	3	4	5
19. Paying a higher price for organic products is wasteful.	1	2	3	4	5
20. Truly organic products taste better than conventional products.	1	2	3	4	5
21. Truly organic products are more nutritious than conventional one.	1	2	3	4	5
22. I think that organic products are not as safe as they claim to be.	1	2	3	4	5

13. Below is a series of statements about ***your risk reduction strategies*** when buying organic products. Please circle the number that best fits your level of agreement with each statement, where 1 means "Strongly Disagree" and 5 means "Strongly Agree".

	SD		***Neutral***		***SA***
	⮟	⮟	⮟	⮟	⮟
1. I purchase organic products of the same brand regularly.	1	2	3	4	5
2. I purchase organic products at the same store regularly.	1	2	3	4	5
3. I always choose well-known or popular brands of organic products.	1	2	3	4	5
4. Thai government org. certification is not trustworthy.	1	2	3	4	5
5. I purchase organic products certified by private certification bodies.	1	2	3	4	5
6. I purchase organic products certified by international certification bodies.	1	2	3	4	5
7. I purchase organic products that can be traced back to the farmer.	1	2	3	4	5
8. I read consumer guides regularly.	1	2	3	4	5
9. I do not read in-store product information leaflets regularly.	1	2	3	4	5
10. My family and friends provide advice on organic products.	1	2	3	4	5
11. I do not inspect organic products before I purchase.	1	2	3	4	5
12. I do not purchase organic products with price reductions.	1	2	3	4	5
13. I prefer to buy organic products if the price is the same as conventional products.	1	2	3	4	5
14. I do not shop around to compare organic product prices.	1	2	3	4	5

15. I buy organic product from shops that keep organic products separate from conventional products.	1	2	3	4	5
16. I prefer to buy organic products from shops that buy organic products directly from the farmers that produce them.	1	2	3	4	5
17. I store organic products separately from conventional products.	1	2	3	4	5

Section IV: ***Willingness to pay***

This section presents information about organic products and asks how much would you be willing to pay for them.

Organic products are from a production management system which promotes agro-ecosystem health. They have no synthetic chemical input, for example artificial fertilizers, pesticides, and synthetic growth stimulants, and they do not use genetically engineered organisms (GMOs) in the production process.

14. Based on the meaning of organic products above, how much ***more*** would you be willing to pay for ***organic products*** than for conventional products (Please state the percentage you would be willing to pay in the blank)

I am willing to pay _____ % more than conventional product price

15. Suppose that ***conventional lettuces*** usually cost ***80*** Baht per kilogram. What is the maximum amount you would be willing to pay for 1 kilogram of ***organic lettuces***?

(Units: Baht)

80	***85***	***90***	***95***	***100***	***105***	***110***	***115***	***120***	***125***	***130***	***135***	***140***	***145***	***150***	***155***
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

16. Suppose that ***conventional jasmine rice*** usually cost ***160*** Baht per 5 kilogram pack. What is the maximum amount you would be willing to pay for 5 kilogram pack of ***organic jasmine rice***?

(Units: Baht)

160	***170***	***180***	***190***	***200***	***210***	***220***	***230***	***240***	***250***	***260***	***270***	***280***	***290***	***300***	***310***
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

17. Suppose that ***conventional orange juice*** usually cost ***80*** Baht per 1 Litre. What is the maximum amount you would be willing to pay for 1 Litre of ***organic orange juice***?

(Units: Baht)

80	***85***	***90***	***95***	***100***	***105***	***110***	***115***	***120***	***125***	***130***	***135***	***140***	***145***	***150***	***155***
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

18. Suppose that ***conventional coffee (Roast and ground coffee espresso)*** usually cost ***120*** Baht per 250 grams pack. What is the maximum amount you would be willing to pay for 250 grams pack of ***organic coffee***?

(Units: Baht)

120	***130***	***140***	***150***	***160***	***170***	***180***	***190***	***200***	***210***	***220***	***230***	***240***	***250***	***260***	***270***
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

Section V. ***About you***

19. What is your gender?

Male	[ ]
Female	[ ]

20. What is your age?

18-22 years old	[ ]
23-27 years old	[ ]
28-32 years old	[ ]
33-37 years old	[ ]
38-42 years old	[ ]
43-47 years old	[ ]
48-52 years old	[ ]
53-57 years old	[ ]
58-62 years old	[ ]
63-67 years old	[ ]
Older than 67	[ ]
Prefer not to say	[ ]

21. What is your marital status?

1. Single/Never Married	[ ]
2. Engaged	[ ]
3. Married	[ ]
4. De facto relationship	[ ]
5. Divorced/Separated	[ ]
6. Widow/widower	[ ]
7. Others (please specify) _____	

22. What is highest level of education you have achieved?

1. Primary school	[ ]
2. Secondary school	[ ]
3. Technical or vocational school (2 years)	[ ]
4. Bachelor degree	[ ]
5. Master's degree	[ ]
6. Doctorate (e.g., Ph.D. M.D. ...)	[ ]
7. Other(s) please specify _____	

23. What is your occupation?

1. Student [ ]
2. Government officer [ ]
3. Private company officer/ clerk [ ]
4. Self employed [ ]
5. Farmer [ ]
6. Housewife/ husband [ ]
7. Labourer [ ]
8. Retired [ ]
9. Unemployed [ ]
10. Other(s) please specify _____

24. What is your monthly household income?

1. Less than 15,000 Baht [ ]
2. 15,000-30,000 Baht [ ]
3. 30,001-45,000 Baht [ ]
4. 45,001-60,000 Baht [ ]
5. 60,001-75,000 Baht [ ]
6. 75,001-90,000 Baht [ ]
7. 90,001-105,000 Baht [ ]
8. 105,001-120,000 Baht [ ]
9. 120,001-135,000 Baht [ ]
10. 135,001-150,000 Baht [ ]
11. Over 150,000 Baht [ ]
12. Prefer not to say [ ]

25. Which of the following best describes the structure of your household?

1. Single adult living alone [ ]
2. Single adult living with others [ ]
3. Couple, without children [ ]
4. Couple with a child (or children) [ ]
5. Single parent with a child (or children) [ ]
6. Extended family (grandparents or other relatives) [ ]
7. Other(s) (please specify)_____

26. The number of people living in your household is (please state):_____ persons

*Your participation in this survey **is greatly appreciated**. Thank you for your time and if you have further comments about Organic products, please feel free to comment in the space provided below. Once again, we assure you that your identity will remain **STRICTLY CONFIDENTIAL.***

I agree to participate in this survey: Yes [ ] No [ ]

A.3 Variables and measurement instrumentation development

Table A3.1 Items measuring consumers' WTP premium prices for organic product variable in terms of consumers' experiences and actual expenditure on organic products

Variable	Description of Variables	Source
W1	What proportion of your purchases of vegetables are organic?	(Panyakul, 2016; Sriwaranun, 2011; Voon et al., 2011)
W2	What proportion of your purchases of rice are organic?	(Panyakul, 2016; Sriwaranun, 2011; Voon et al., 2011)
W3	What proportion of your purchases of juice are organic?	(Panyakul, 2016; Sriwaranun, 2011; Voon et al., 2011)
W4	What proportion of your purchases of coffee are organic?	(Panyakul, 2016; Sriwaranun, 2011; Voon et al., 2011)
W5	How often you purchase organic vegetables?	(Panyakul, 2016; Sriwaranun, 2011; Voon et al., 2011)
W6	How often you purchase organic rice?	(Panyakul, 2016; Sriwaranun, 2011; Voon et al., 2011)
W7	How often you purchase organic juice?	(Panyakul, 2016; Sriwaranun, 2011; Voon et al., 2011)
W8	How often you purchase organic coffee?	(Panyakul, 2016; Sriwaranun, 2011; Voon et al., 2011)
W9	How much are you willing to pay for organic vegetables compared to conventional products.	(Panyakul, 2016; Sriwaranun, 2011; Voon et al., 2011)
W10	How much are you willing to pay for organic rice compared to conventional products.	(Panyakul, 2016; Sriwaranun, 2011; Voon et al., 2011)
W11	How much are you willing to pay for organic juice compared to conventional products.	(Panyakul, 2016; Sriwaranun, 2011; Voon et al., 2011)
W12	How much are you willing to pay for organic coffee compared to conventional products.	(Panyakul, 2016; Sriwaranun, 2011; Voon et al., 2011)
W13	The higher price of organic products reflects their higher quality.	(Sangkumchaliang & Huang, 2012; Voon et al., 2011)
W14	I will continue to consume organic products regardless of increases in price.	(Nuttavuthisit & Thogersen, 2015; Voon et al., 2011)
W15	I buy organic products because the benefits outweigh the costs.	(Sriwaranun, 2011; Voon et al., 2011)
W16	I would still buy organic products even though non-organic products are cheaper.	(Sangkumchaliang & Huang, 2012; Voon et al., 2011)
W17	Buying organic products is the right thing to do even if they cost more.	(Nuttavuthisit & Thogersen, 2015; Voon et al., 2011)

Table A 3.2 Items measuring consumers' risk perceptions

Variable	Description of Variables	Source
PSY1	I would be embarrassed if I purchased the product at high price but the product has been treated with chemicals.	(Sangkumchaliang & Huang, 2012)
PSY2	I fear being cheated when purchasing organic products.	(Nuttavuthisit & Thogersen, 2015)
PSY3	I would lose face if I purchased non-organic products that claimed to be organic.	(Nuttavuthisit & Thogersen, 2015)
PSY4	I waste my money if I buy non-organic products that claimed to be organic.	(Mitchell, 2001; Nuttavuthisit & Thogersen, 2015)
TIME1	I do not have time to find organic products.	(Yeung & Morris, 2006)
TIME2	Limited supply makes buying organic products harder.	(Nuttavuthisit & Thogersen, 2015)
TIME3	I try to buy organic products whenever they are available.	(Roitner-Schobesberger et al., 2008)
PHY1	Non-organic products that claim to be organic can harm my health.	(Nuttavuthisit & Thogersen, 2015)
PHY2	Truly organic products taste better than conventional products.	(Roitner-Schobesberger et al., 2008; Sangkumchaliang & Huang, 2012; Yeung & Morris, 2001)
PHY3	Truly organic products are more nutritious than conventional one.	(Sriwaranun, 2011; Yeung & Morris, 2001)
SOC1	I am never really certain that the organic products I purchased are really organic	(Nuttavuthisit & Thogersen, 2015)
SOC2	I do not easily trust product claims that a product is really organic.	(Nuttavuthisit & Thogersen, 2015; Roitner-Schobesberger et al., 2008)
SOC3	I would be out of fashion if I did not eat organic products.	(Mitchell, 2001; Nuttavuthisit & Thogersen, 2015)
SOC4	My family and friends will blame me for not doing the right thing if I do not eat organic products.	(Sangkumchaliang & Huang, 2012; Voon et al., 2011)
FIN1	I think that organic products are not as safe as they claim to be.	(Nuttavuthisit & Thogersen, 2015)
FIN2	I would save money and buy more if I did not buy organic products.	(Yeung & Morris, 2006)
FIN3	I think using the words "organic product" is only a marketing strategy to sell at higher prices.	(Nuttavuthisit & Thogersen, 2015)
FIN4	Paying a higher price for organic products is wasteful.	(Nuttavuthisit & Thogersen, 2015)
FUNC1	I worry about pesticide residue when buying food products.	(Sangkumchaliang & Huang, 2012)
FUNC2	I am concerned about how organic products are processed.	(Mitchell, 2001; Sangkumchaliang & Huang, 2012)
FUNC3	I am concerned about the cumulative effects of pesticides in my food.	(Mitchell, 2001; Roitner-Schobesberger et al., 2008; Sriwaranun, 2011)
FUNC4	I am concerned about food safety even if the product claims to be organic.	(Nuttavuthisit & Thogersen, 2015)

Table A 3.3 Items measuring consumers' risk reduction strategies

Variable	Description of Variables	Source
BRND1	I purchase organic products of the same brand regularly.	(Yeung et al., 2010)
BRND2	I purchase organic products at the same store regularly.	(Roitner-Schobesberger et al., 2008; Yeung et al., 2010)
BRND3	I always choose well-known or popular brands of organic products.	(Yeung et al., 2010)
CERT1	Thai government org. certification is not trustworthy.	(Roitner-Schobesberger et al., 2008; Yeung et al., 2010)
CERT2	I purchase organic products certified by private certification bodies.	(Sakagami, 2006; Yeung et al., 2010)
CERT3	I purchase organic products certified by international certification bodies.	(Sakagami, 2006; Yeung et al., 2010)
CERT4	I purchase organic products that can be traced back to the farmer.	(Roitner-Schobesberger et al., 2008; Yeung et al., 2010)
INFO1	I read consumer guides regularly.	(Yeung et al., 2010)
INFO2	I store organic products separately from conventional products.	(Nuttavuthisit & Thogersen, 2015a; Yeung et al., 2010)
INFO3	My family and friends provide advice on organic products.	(Yeung et al., 2010)
PRIC1	I do not purchase organic products with price reductions.	(Yeung et al., 2010)
PRIC2	I read in-store product information leaflets regularly.	(Yeung et al., 2010)
PRIC3	I do not shop around to compare organic product prices.	(Yeung et al., 2010)
PRIC4	I inspect organic products before I purchase.	(Yeung et al., 2010)
PROC1	I buy organic product from shops that keep organic products separate from conventional products.	(Roitner-Schobesberger et al., 2008; Yeung et al., 2010)
PROC2	I prefer to buy organic products from shops that buy organic products directly from the farmers that produce them.	(Sangkumchaliang & Huang, 2012; Yeung et al., 2010)
PROC3	I prefer to buy organic products if the price is the same as conventional products.	(Roitner-Schobesberger et al., 2008; Yeung et al., 2010)

Table A 3.4 Items measuring consumers' perceptions of organic product attributes

Variable	Description of Variables	Source
P1	Organic products are safe.	(Voon et al., 2011)
P2	Organic products are popular because vegan diets are popular.	(Voon et al., 2011)
P3	Eating organic products is fashionable.	(Voon et al., 2011)
P4	Organic products are not easily found in grocery stores.	(Sriwaranun, 2011)
P5	In Thailand, there is a small variety of organic products compared with non-organic.	(Sriwaranun, 2011)
P6	There are a lot of places to buy organic products.	(Voon et al., 2011)
P7	Organic products are tastier than non-organic.	(Nuttavuthisit & Thogersen, 2015; Sriwaranun, 2011)
P8	The appearance of organic products (freshness, colour, texture) is better than non-organic.	(Roitner-Schobesberger et al., 2008; Sriwaranun, 2011)
P9	Organic product labels are trustworthy.	(Roitner-Schobesberger et al., 2008; Sangkumchaliang & Huang, 2012)
P10	I trust that the sellers of organic products are honest about the organic nature of their products.	(Voon et al., 2011)
P11	I trust international organic certification.	(Nuttavuthisit & Thogersen, 2015)
P12	Thai government certification for organic products is trustworthy.	(Nuttavuthisit & Thogersen, 2015)

Table A 3.5 Items measuring consumers' attitudes towards organic products

Variable	Description of Variables	Source
A1	Organic products are healthier than non-organic.	(Sangkumchaliang & Huang, 2012; Sriwaranun, 2011)
A2	Organic products have more nutrients than non-organic.	(Sriwaranun, 2011) (Nutthavutisit, 2015)
A3	The phrase "organic products" really means nothing artificial.	(Nuttavuthisit & Thogersen, 2015)
A4	Pesticide and herbicide residues on farms have an effect on the environment.	(Sriwaranun, 2011)
A5	I buy organic products because I want to support local farmers/producers.	(Sriwaranun, 2011)
A6	Organic products are more environmentally friendly.	(Bonti-ankomah & Yiridoe, 2006; Sriwaranun, 2011; Voon et al., 2011)
A7	Organic products are not more expensive than non-organic.	(Sriwaranun, 2011; Voon et al., 2011)
A8	Only consumers with higher incomes can afford organic products.	(Sriwaranun, 2011; Voon et al., 2011)
A9	High price is not a problem if the product is genuinely organic.	(Nuttavuthisit & Thogersen, 2015; Sangkumchaliang & Huang, 2012)

Table A 3.6 Items measuring consumers' knowledge about organic products

Variable	Description of Variables	Source
K1	I understand how organic products are produced.	(Willer et al., 2015)
K2	I understand how organic products are handled from farms to retailers.	(Roitner-Schobesberger et al., 2008; Sriwaranun, 2011)
K3	I understand how organic products are different from conventional products.	(Willer et al., 2015)
K4	Organic products are free from chemical fertilisers.	(Basha et al., 2015; Sriwaranun, 2011; Willer et al., 2015)
K5	Organic products are free from pesticides.	(Willer et al., 2015)
K6	Organic products are free from genetically modified organisms (GMOs).	(Shafie & Rennie, 2012)

Table A 3.7 Items measuring consumers' lifestyles

Variable	Description of Variables	Source
L1	I cook my meals.	(Sriwaranun, 2011; Vanit-Anunchai & Schmidt, 2006)
L2	I do not buy takeaway food.	(Sriwaranun, 2011; Vanit-Anunchai & Schmidt, 2006)
L3	I do not dine out.	(Sriwaranun, 2011; Vanit-Anunchai & Schmidt, 2006)
L4	I exercise regularly.	(Sriwaranun, 2011)
L5	I often eat vegetables and fruits.	(Voon et al., 2011)
L6	I keep a strict diet.	(Sriwaranun, 2011)
L7	I usually read/check quality labels before buying food products.	(Sriwaranun, 2011)
L8	I purchase most of my groceries at the same place regularly.	(Yeung et al., 2010)
L9	I prefer to recycle as much of my household waste as possible.	(Sriwaranun, 2011)
L10	I use reusable bags when I shop.	(Sriwaranun, 2011)
L11	I prefer to buy foods that are environmentally friendly.	(Roitner-Schobesberger et al., 2008; Sriwaranun, 2011)

Appendix B

B.1 Skewness and Kurtosis (the whole data set) and organic product purchasers: data sets one and two

The whole data set					Organic product purchasers (Data set one)				Organic product purchasers (Data set two)			
Variables	N	Mean	Skewness	Kurtosis	N	Mean	Skewness	Kurtosis	N	Mean	Skewness	Kurtosis
L1	1512	3.35	-0.111	-0.902	392	3.43	-0.257	-0.896	392	3.42	-0.193	-0.936
L2	1512	3.42	-0.197	-0.438	392	3.35	-0.153	-0.568	392	3.38	-0.152	-0.437
L3	1512	3.34	0.010	-0.592	392	3.31	0.177	-0.660	392	3.41	0.046	-0.584
L4	1512	3.69	-0.555	-0.205	392	3.65	-0.447	-0.482	392	3.70	-0.649	-0.248
L5	1512	4.10	-0.872	0.992	392	4.19	-0.873	1.009	392	4.20	-1.003	1.282
L6	1512	3.38	-0.194	-0.019	392	3.44	-0.359	0.297	392	3.47	-0.193	-0.343
L7	1512	3.89	-0.488	-0.063	392	4.01	-0.549	0.019	392	3.98	-0.618	-0.034
L8	1512	3.60	-0.492	0.113	392	3.67	-0.570	0.393	392	3.59	-0.541	0.175
L9	1512	3.39	-0.351	-0.310	392	3.50	-0.461	-0.214	392	3.44	-0.439	-0.395
L10	1512	3.82	-0.768	0.162	392	3.88	-0.935	0.755	392	3.88	-0.858	0.125
L11	1512	3.84	-0.371	-0.080	392	3.94	-0.165	-0.850	392	3.94	-0.643	0.293
K1	1512	3.80	-0.551	0.249	392	3.95	-0.636	0.240	392	3.84	-0.683	0.440
K2	1512	3.57	-0.294	-0.117	392	3.71	-0.273	-0.434	392	3.57	-0.274	-0.142
K3	1512	3.79	-0.455	0.098	392	3.96	-0.510	0.241	392	3.85	-0.579	0.074
K4	1512	4.12	-1.176	1.139	392	4.29	-1.380	1.920	392	4.14	-1.242	1.249
K5	1512	4.23	-1.454	**1.996**	392	4.41	-1.791	**3.763**	392	4.31	-1.608	**2.598**
K6	1512	3.89	-0.830	0.138	392	4.08	-1.171	0.807	392	3.90	-0.895	0.295
P1	1512	4.04	-0.759	0.769	392	4.16	-0.937	0.912	392	4.10	-0.743	0.774
P2	1512	3.90	-0.632	0.644	392	3.92	-0.784	1.069	392	4.00	-0.633	0.501
P3	1512	3.35	-0.399	-0.006	392	3.28	-0.459	-0.047	392	3.40	-0.396	-0.035
P4	1512	3.65	-0.530	-0.143	392	3.66	-0.510	-0.334	392	3.61	-0.516	-0.283
P5	1512	3.85	-0.643	0.069	392	3.88	-0.799	0.178	392	3.87	-0.681	-0.017
P6	1512	3.32	-0.276	-0.466	392	3.47	-0.351	-0.472	392	3.30	-0.358	-0.593
P7	1512	3.24	-0.133	0.071	392	3.35	-0.077	0.059	392	3.32	-0.129	-0.044
P8	1512	3.64	-0.496	0.002	392	3.70	-0.493	-0.179	392	3.74	-0.457	-0.121
P9	1512	2.89	0.022	-0.324	392	2.89	0.044	-0.495	392	2.75	0.113	-0.402
P10	1512	3.46	-0.267	-0.090	392	3.46	-0.234	-0.125	392	3.53	-0.206	-0.342
P11	1512	2.95	-0.039	-0.123	392	2.88	-0.058	-0.235	392	2.85	0.024	-0.337
P12	1512	3.39	-0.287	0.265	392	3.42	-0.360	0.320	392	3.45	-0.245	0.020
A1	1512	3.86	-0.522	0.273	392	3.98	-0.638	0.497	392	4.05	-0.687	0.804
A2	1512	3.38	-0.233	-0.152	392	3.44	-0.222	-0.203	392	3.45	-0.281	-0.332
A3	1512	3.95	-0.720	0.083	392	4.12	-0.814	0.200	392	3.97	-0.762	0.059
A4	1512	4.15	-0.979	0.723	392	4.30	-1.128	1.403	392	4.27	-1.083	0.916
A5	1512	3.56	-0.382	-0.254	392	3.64	-0.389	-0.368	392	3.58	-0.429	-0.429
A6	1512	4.07	-0.663	0.301	392	4.22	-0.651	-0.044	392	4.18	-0.794	0.542
A7	1512	2.91	0.068	-0.942	392	2.95	-0.033	-0.992	392	2.74	0.260	-0.877
A8	1512	3.18	-0.167	-0.641	392	3.14	-0.229	-0.702	392	3.13	-0.077	-0.818
A9	1512	3.18	-0.198	-0.741	392	3.25	-0.210	-0.783	392	3.30	-0.262	-0.740

B.1 Skewness and Kurtosis (whole data set) and organic product purchasers: data set one and data set two (continued)

The whole data set					Organic product purchasers (Data set one)				Organic product purchasers (Data set two)			
Variables	N	Mean	Skewness	Kurtosis	N	Mean	Skewness	Kurtosis	N	Mean	Skewness	Kurtosis
W1	784	3.59	-0.119	-0.857	392	3.60	-0.005	-0.946	392	3.59	-0.027	-1.184
W2	784	3.13	-0.044	-1.046	392	3.10	0.001	-1.018	392	3.16	-0.090	-1.065
W3	784	3.14	-0.221	-0.824	392	3.14	-0.255	-0.761	392	3.15	-0.195	-0.882
W4	784	2.00	1.054	-0.104	392	1.92	1.149	0.145	392	2.09	0.962	-0.324
W5	784	4.23	0.437	-0.846	392	2.85	0.409	-0.924	392	2.85	0.468	-0.757
W6	784	3.73	0.554	-0.799	392	2.54	0.635	-0.715	392	2.59	0.476	-0.865
W7	784	3.66	0.528	-0.724	392	2.51	0.511	-0.753	392	2.53	0.542	-0.700
W8	784	2.26	**1.546**	1.542	392	1.64	**1.700**	2.204	392	1.80	**1.402**	1.008
W9	784	3.83	0.724	-0.132	392	2.60	0.756	-0.045	392	2.63	0.695	-0.201
W10	784	3.41	0.709	-0.125	392	2.37	0.781	0.041	392	2.39	0.639	-0.279
W11	784	3.37	0.665	-0.202	392	2.33	0.707	-0.020	392	2.38	0.624	-0.353
W12	784	2.26	1.387	1.063	392	1.67	1.499	1.490	392	1.77	1.288	0.727
W13	784	3.33	-0.365	-0.428	392	3.34	-0.345	-0.335	392	3.32	-0.384	-0.509
W14	784	3.23	-0.121	-0.472	392	3.23	-0.054	-0.434	392	3.23	-0.186	-0.500
W15	784	3.67	-0.459	0.224	392	3.68	-0.406	0.163	392	3.66	-0.507	0.282
W16	784	3.49	-0.292	0.027	392	3.50	-0.219	0.017	392	3.49	-0.347	0.012
W17	784	3.35	-0.179	-0.288	392	3.36	-0.212	-0.237	392	3.33	-0.147	-0.323
FUNC1	1512	3.95	-0.708	0.486	392	4.01	-0.653	0.332	392	4.05	-0.772	0.404
FUNC4	1512	3.70	-0.452	0.126	392	3.62	-0.524	0.443	392	3.75	-0.351	-0.454
SOC1	1512	3.31	-0.209	-0.256	392	3.23	-0.141	-0.337	392	3.23	-0.128	-0.420
SOC2	1512	3.45	-0.328	-0.190	392	3.37	-0.189	-0.430	392	3.44	-0.403	-0.217
TIME1	1512	3.39	-0.381	-0.116	392	3.20	-0.218	-0.148	392	3.19	-0.203	-0.437
TIME2	1512	3.45	-0.341	-0.233	392	3.37	-0.309	-0.246	392	3.27	-0.164	-0.725
TIME3	1512	3.42	-0.321	0.041	392	3.60	-0.470	0.465	392	3.54	-0.357	-0.272
PHY1	1512	3.55	-0.373	-0.272	392	3.63	-0.489	-0.141	392	3.62	-0.378	-0.357
FUNC3	1512	3.93	-0.612	0.262	392	4.01	-0.645	0.313	392	4.06	-0.700	0.553
FUNC2	1512	3.69	-0.406	0.355	392	3.75	-0.313	0.135	392	3.74	-0.408	0.302
PSYC1	1512	3.25	-0.307	-0.638	392	3.19	-0.255	-0.696	392	3.25	-0.269	-0.767
PSYC2	1512	3.40	-0.418	-0.255	392	3.35	-0.313	-0.269	392	3.44	-0.509	-0.310
PSYC3	1512	3.25	-0.307	-0.530	392	3.20	-0.207	-0.618	392	3.15	-0.253	-0.674
SOC4	1512	2.45	0.142	-0.690	392	2.32	0.205	-0.723	392	2.36	0.272	-0.687
SOC3	1512	2.41	0.180	-0.703	392	2.28	0.182	-0.801	392	2.29	0.362	-0.577
PSYC4	1512	3.42	-0.452	-0.480	392	3.41	-0.422	-0.576	392	3.46	-0.489	-0.564
FIN2	1512	3.07	-0.230	-0.039	392	2.97	-0.184	-0.050	392	2.96	-0.221	-0.027
FIN3	1512	3.52	-0.454	-0.219	392	3.45	-0.447	-0.218	392	3.52	-0.371	-0.480
FIN4	1512	2.75	0.045	-0.279	392	2.60	0.197	-0.246	392	2.62	0.098	-0.337
PHY2	1512	3.12	-0.166	0.214	392	3.18	-0.176	0.018	392	3.23	-0.111	0.051
PHY3	1512	3.25	-0.304	-0.019	392	3.35	-0.277	-0.023	392	3.32	-0.265	-0.096
FIN1	1512	2.92	-0.051	-0.216	392	2.89	-0.070	-0.393	392	2.87	0.058	-0.207
BRND1	1512	3.22	-0.258	-0.256	392	3.33	-0.252	-0.461	392	3.36	-0.213	-0.465
BRND2	1512	3.26	-0.349	-0.282	392	3.43	-0.444	-0.301	392	3.34	-0.325	-0.499
BRND3	1512	3.32	-0.346	-0.128	392	3.47	-0.322	-0.267	392	3.46	-0.387	-0.236

B.1 Skewness and Kurtosis (whole data set) and organic product purchasers: data set one and data set two (continued)

The whole data set					Organic product purchasers (Data set one)				Organic product purchasers (Data set two)			
Variables	N	Mean	Skewness	Kurtosis	N	Mean	Skewness	Kurtosis	N	Mean	Skewness	Kurtosis
CERT1	1512	3.07	-0.123	-0.138	392	3.06	-0.126	-0.392	392	3.03	0.053	-0.275
CERT2	1512	3.26	-0.295	0.358	392	3.31	-0.273	0.269	392	3.25	-0.306	0.207
CERT3	1512	3.55	-0.238	0.009	392	3.55	-0.282	-0.019	392	3.60	-0.231	-0.195
CERT4	1512	3.72	-0.334	-0.029	392	3.82	-0.396	0.009	392	3.73	-0.211	-0.522
INFO1	1512	3.81	-0.502	0.085	392	3.96	-0.682	0.266	392	3.91	-0.608	0.015
PRIC2	1512	2.52	0.352	-0.520	392	2.38	0.574	-0.266	392	2.38	0.495	-0.373
INFO3	1512	3.09	-0.357	-0.173	392	3.14	-0.381	-0.137	392	3.11	-0.324	-0.346
PRIC4	1512	2.41	0.450	-0.464	392	2.34	0.572	-0.193	392	2.22	0.639	-0.160
PRIC1	1512	2.77	-0.007	-0.073	392	2.74	0.052	0.206	392	2.76	-0.001	-0.082
PROC3	1512	3.69	-0.459	-0.123	392	3.72	-0.432	-0.242	392	3.79	-0.444	-0.244
PRIC3	1512	3.09	-0.211	-0.489	392	3.13	-0.158	-0.481	392	3.11	-0.201	-0.691
PROC1	1512	3.30	-0.239	0.163	392	3.39	-0.199	0.155	392	3.29	-0.258	-0.026
PROC2	1512	3.66	-0.404	0.119	392	3.77	-0.359	-0.226	392	3.75	-0.433	0.061
INFO2	1512	3.06	-0.197	-0.112	392	3.04	-0.070	0.017	392	3.01	-0.074	-0.445

B.2 Surveyed respondents' lifestyle

Statement	Organic product purchaser (n=784)					Non-organic product purchaser (n=728)					Total (n=1,512)				
	SD	D	N	A	SA	SD	D	N	A	SA	SD	D	N	A	SA
I cook my meals.	5.4	18.6	27.3	25.6	23.1	5.6	20.6	34.9	19.9	19.0	5.5	19.6	31.0	22.9	21.1
I do not buy takeaway food.	12.0	33.8	35.1	16.7	2.4	13.7	36.7	34.9	12.8	1.9	12.8	35.2	35.0	14.8	2.2
I do not dine out.	13.8	27.7	40.4	17.1	1.0	13.5	28.8	36.1	18.4	3.2	13.6	28.2	38.4	17.7	2.1
I exercise regularly.	2.9	12.1	23.0	38.4	23.6	2.3	8.1	27.2	40.7	21.7	2.6	10.2	25.0	39.5	22.7
I often eat vegetables and fruits.	0.6	2.2	12.9	45.7	38.6	1.2	3.0	19.1	47.5	29.1	0.9	2.6	15.9	46.6	34.1
I keep a strict diet.	3.3	9.3	40.3	32.7	14.4	3.4	11.3	46.4	28.8	10.0	3.4	10.3	43.3	30.8	12.3
I usually read/check quality labels before buying food products.	0.5	4.2	21.2	43.8	30.4	1.2	4.9	31.2	40.7	22.0	0.9	4.6	26.0	42.3	26.3
I purchase most of my groceries at the same place regularly.	1.5	8.4	28.3	49.0	12.8	1.8	9.8	31.5	43.3	13.7	1.7	9.1	29.8	46.2	13.2
I prefer to recycle as much of my household waste as possible.	4.6	12.8	29.3	37.6	15.7	5.2	13.6	38.9	31.0	11.3	4.9	13.2	33.9	34.5	13.6
I use reusable bags when I shop.	3.3	7.0	18.2	40.9	30.5	3.2	8.0	25.0	38.2	25.7	3.2	7.5	21.5	39.6	28.2
I prefer to buy foods that are environmentally friendly.	0.8	2.7	26.8	40.9	28.8	1.4	3.7	35.3	39.3	20.3	1.1	3.2	30.9	40.1	24.7

B.3 Surveyed respondents' knowledge of organic products

Statement	Organic product purchaser (n=784)					Non-organic product purchaser (n=728)					Total (n=1,512)				
	SD	D	N	A	SA	SD	D	N	A	SA	SD	D	N	A	SA
I understand how organic products are produced.	0.9	5.6	20.5	48.6	24.4	1.4	5.8	30.8	45.7	16.3	1.1	5.7	25.5	47.2	20.5
I understand how organic products are handled from farms to retailers.	1.3	8.2	33.5	39.3	17.7	2.3	9.3	38.0	37.6	12.6	1.8	8.7	35.7	38.5	15.3
I understand how organic products are different from conventional products.	0.6	4.8	22.2	48.1	24.2	1.1	5.9	32.8	44.9	15.2	0.9	5.4	27.3	46.6	19.9
Organic products are free from chemical fertilizers.	2.2	3.8	12.0	34.8	47.2	3.2	4.7	17.0	37.9	37.2	2.6	4.2	14.4	36.3	42.4
Organic products are free from pesticides.	2.0	2.7	7.7	32.7	55.0	3.7	4.1	13.9	36.0	42.3	2.8	3.4	10.6	34.3	48.9
Organic products are free from genetically modified organisms (GMOs).	4.3	4.7	19.1	31.1	40.7	3.6	6.7	26.8	33.0	29.9	4.0	5.7	22.8	32.0	35.5

B.4 Surveyed respondents' perception of and attitude towards organic products

Statement	Organic product purchaser (n=784)					Non-organic product purchaser (n=728)					Total (n=1,512)				
	SD	D	N	A	SA	SD	D	N	A	SA	SD	D	N	A	SA
Organic products are safe	0.3	3.7	11.9	50.8	33.4	0.8	3.6	19.6	52.6	23.4	0.5	3.6	15.6	51.7	28.6
Organic products are popular because vegan diets are popular.	0.5	4.2	17.1	55.2	23.0	1.0	4.0	25.4	50.7	19.0	0.7	4.1	21.1	53.0	21.0
Eating organic products is fashionable.	6.1	10.3	38.0	34.3	11.2	4.9	10.2	40.1	33.5	11.3	5.6	10.3	39.0	33.9	11.2
Organic products are not easily found in grocery stores.	2.3	12.6	23.9	42.1	19.1	2.5	8.1	28.2	42.0	19.2	2.4	10.4	25.9	42.1	19.2
In Thailand, there is a small variety of organic products compared with non-organic.	1.5	8.9	18.1	43.6	27.8	1.0	5.9	25.3	45.1	22.8	1.3	7.5	21.6	44.3	25.4
There are a lot of places to buy organic products.	3.4	17.7	27.3	40.2	11.4	4.1	17.0	37.6	31.9	9.3	3.8	17.4	32.3	36.2	10.4
Organic products are tastier than non-organic.	3.6	10.7	46.4	27.3	12.0	5.2	14.7	48.1	25.8	6.2	4.4	12.6	47.2	26.6	9.2
The appearance of organic products (freshness, colour, texture) is better than non-organic.	1.3	8.8	26.5	43.1	20.3	3.4	8.4	32.4	40.2	15.5	2.3	8.6	29.4	41.7	18.0
Organic product labels are trustworthy.	5.9	18.5	38.8	25.6	11.2	5.6	20.3	45.6	21.4	7.0	5.8	19.4	42.1	23.6	9.2
I trust that the seller of organic products are honest about the organic nature of their products.	2.2	10.6	37.8	34.8	14.7	3.2	9.8	39.6	36.0	11.5	2.6	10.2	38.6	35.4	13.2
I trust international organic certification.	4.3	19.6	42.7	24.4	8.9	6.6	20.6	49.6	17.3	5.9	5.4	20.1	46.0	21.0	7.5
Thai government certification for organic products is trustworthy.	2.0	9.3	40.6	39.0	9.1	3.2	8.9	46.6	33.2	8.1	2.6	9.1	43.5	36.2	8.6

B.4 Surveyed respondent's perception of and attitude towards organic products (continued)

Statement	Organic product purchaser (n=784)					Non-organic product purchaser (n=728)					Total (n=1,512)				
	SD	D	N	A	SA	SD	D	N	A	SA	SD	D	N	A	SA
Organic products are healthier than non-organic.	0.8	2.4	19.6	48.9	28.3	1.4	5.5	33.1	42.9	17.2	1.1	3.9	26.1	46.0	22.9
Organic products have more nutrients than non-organic.	3.1	12.0	36.9	33.5	14.5	4.1	11.5	43.4	30.6	10.3	3.6	11.8	40.0	32.1	12.5
The phrase "organic products" really means nothing artificial.	0.8	6.0	17.2	40.1	36.0	1.8	7.1	23.4	40.9	26.8	1.3	6.5	20.2	40.5	31.5
Pesticide and herbicide residues on farms have an effect on the environment.	0.6	2.4	12.4	37.2	47.3	1.5	5.2	19.1	39.3	34.9	1.1	3.8	15.6	38.2	41.3
I buy organic products because I want to support local farmers/ producers.	2.9	11.1	29.6	34.7	21.7	3.7	8.9	36.8	34.9	15.7	3.3	10.1	33.1	34.8	18.8
Organic products are more environmentally friendly.	0.3	1.8	14.5	44.3	39.2	1.0	3.3	24.3	44.9	26.5	0.6	2.5	19.2	44.6	33.1
Organic products are not more expensive than non-organic.	15.1	27.4	24.9	23.0	9.7	13.3	22.9	29.5	22.1	12.1	14.2	25.3	27.1	22.6	10.8
Only consumers with higher incomes can afford organic products.	8.4	21.4	29.6	29.3	11.2	6.0	17.3	36.3	28.4	12.0	7.3	19.4	32.8	28.9	11.6
High price is not a problem if the product is genuinely organic.	7.8	18.1	28.8	29.2	16.1	11.0	18.7	32.8	27.3	10.2	9.3	18.4	30.8	28.3	13.2

B.5 Surveyed respondents' risk perception when purchasing organic products

Statement	Organic product purchaser (n=784)					Non-organic product purchaser (n=728)					Total (n=1,512)				
	SD	D	N	A	SA	SD	D	N	A	SA	SD	D	N	A	SA
Psychological risk															
I would be embarrassed if I purchased the product at high price but the product has been treated with chemicals.	12.2	12.2	34.1	24.1	17.3	11.3	8.8	37.0	25.7	17.3	11.8	10.6	35.4	24.9	17.3
I fear being cheated when purchasing organic products.	7.5	9.7	35.3	30.5	17.0	7.3	8.8	37.0	31.2	15.8	7.4	9.3	36.1	30.8	16.4
I would lose face if I purchased non-organic products that claimed to be organic.	12.2	12.0	37.2	23.1	15.4	9.3	9.2	37.1	28.4	15.9	10.8	10.6	37.2	25.7	15.7
I waste my money if I buy non-organic products that claimed to be organic.	9.9	9.2	31.0	27.4	22.4	8.2	9.5	33.2	31.0	18.0	9.1	9.3	32.1	29.2	20.3
Functional risk															
I worry about pesticide residue when buying food products.	0.6	4.1	18.4	45.8	31.1	1.8	4.3	24.0	45.7	24.2	1.2	4.2	21.1	45.8	27.8
I am concerned about how organic products are processed.	1.3	3.6	33.0	43.4	18.8	2.2	4.7	35.9	42.4	14.8	1.7	4.1	34.4	42.9	16.9
I am concerned about the cumulative effects of pesticides in my food.	0.8	2.7	20.0	45.3	31.3	1.5	4.9	27.7	41.6	24.2	1.1	3.8	23.7	43.5	27.8
I am concerned about food safety even if the product claims to be organic.	1.4	7.4	30.0	43.8	17.5	1.4	5.5	30.1	45.5	17.6	1.4	6.5	30.0	44.6	17.5

B.5 Surveyed respondents' risk perception when purchasing organic products (continued)

Statement	Organic product purchaser (n=784)					Non-organic product purchaser (n=728)					Total (n=1,512)				
	SD	D	N	A	SA	SD	D	N	A	SA	SD	D	N	A	SA
Social risk															
I am never really certain that the organic product I purchased are really organic	4.0	18.0	38.4	30.4	9.3	3.2	11.1	39.3	34.9	11.5	3.6	14.7	38.8	32.5	10.4
I do not easily trust product claims that a product is really organic.	3.7	13.8	34.3	34.7	13.5	2.9	9.3	36.8	37.2	13.7	3.3	11.6	35.5	35.9	13.6
I would be out of fashion if I did not eat organic products.	31.6	20.3	38.5	6.9	2.7	24.2	17.3	42.3	12.2	4.0	28.0	18.8	40.3	9.5	3.3
My family and friends will blame me for not doing the right thing if I do not eat organic products.	28.7	22.6	37.1	9.1	2.6	21.8	19.6	42.4	12.6	3.4	25.4	21.2	39.7	10.8	3.0
Financial risk															
I think that organic products are not as safe as they claim to be.	8.7	24.2	42.2	20.2	4.7	7.4	19.6	46.7	21.0	5.2	8.1	22.0	44.4	20.6	5.0
I would save money and buy more if I did not buy organic products.	10.3	14.5	49.2	20.0	5.9	6.3	13.3	44.9	27.6	7.8	8.4	14.0	47.2	23.7	6.8
I think using the words "organic product" is only a marketing strategy to sell at higher prices.	5.1	11.4	32.1	32.8	18.6	4.5	8.1	32.4	36.1	18.8	4.8	9.8	32.3	34.4	18.7
Paying a higher price for organic products is wasteful.	12.0	33.0	39.2	13.5	2.3	7.7	22.5	45.7	19.9	4.1	9.9	28.0	42.3	16.6	3.2

B.5 Surveyed respondent's risk perception when purchasing organic products (continued)

Statement	Organic product purchaser (n=784)					Non-organic product purchaser (n=728)					Total (n=1,512)				
	SD	D	N	A	SA	SD	D	N	A	SA	SD	D	N	A	SA
Physical risk															
Non-organic products that claim to be organic can harm my health.	2.9	9.4	30.9	35.5	21.3	3.6	11.1	35.4	33.9	15.9	3.2	10.3	33.1	34.7	18.7
Truly organic products taste better than conventional products.	4.5	13.9	46.4	26.9	8.3	5.8	14.8	53.7	22.1	3.6	5.1	14.4	49.9	24.6	6.0
Truly organic products are more nutritious than conventional one.	4.0	12.1	40.6	32.9	10.5	7.3	12.8	44.6	28.6	6.7	5.6	12.4	42.5	30.8	8.7
Time risk															
I do not have time to find organic products.	6.6	15.3	39.9	28.1	10.1	2.9	6.9	33.0	42.3	15.0	4.8	11.2	36.6	34.9	12.4
Limited supply makes buying organic products harder.	4.7	16.8	33.0	32.4	13.0	1.6	7.4	35.3	41.5	14.1	3.2	12.3	34.1	36.8	13.6
I try to buy organic products whenever they are available.	2.0	8.9	33.0	42.2	13.8	4.0	12.0	45.9	30.8	7.4	3.0	10.4	39.2	36.7	10.7

B.6 Surveyed respondents' risk reduction strategies when purchasing organic products

Statement	Organic product purchaser (n=784)					Non-organic product purchaser (n=728)					Total (n=1,512)				
	SD	D	N	A	SA	SD	D	N	A	SA	SD	D	N	A	SA
Brand															
I purchase organic products of the same brand regularly.	2.9	17.0	33.5	35.7	10.8	6.3	15.8	44.1	29.7	4.1	4.6	16.4	38.6	32.8	7.6
I purchase organic products at the same store regularly.	4.0	15.9	29.2	39.3	11.6	6.7	15.0	42.3	31.0	4.9	5.3	15.5	35.5	35.3	8.4
I always choose well-known or popular brands of organic products.	4.1	11.4	34.4	34.3	15.8	6.7	13.2	42.7	32.3	5.1	5.4	12.2	38.4	33.3	10.6
Process															
I buy organic product from shops that keep organic products separate from conventional products.	4.5	9.9	44.5	29.5	11.6	4.9	9.6	48.2	28.3	8.9	4.7	9.8	46.3	28.9	10.3
I prefer to buy organic products from shops that buy organic products directly from the farmers that produce them.	1.7	5.0	32.5	37.4	23.5	3.7	4.9	40.0	35.3	16.1	2.6	5.0	36.1	36.4	19.9
I do not shop around to compare organic product prices.	8.9	18.4	34.7	27.9	10.1	10.6	14.7	41.1	25.8	7.8	9.7	16.6	37.8	26.9	9.0
Price															
I do not purchase organic products with price reductions.	10.6	24.1	48.9	12.6	3.8	11.3	22.1	46.4	16.1	4.1	10.9	23.1	47.7	14.3	4.0
I read in-store product information leaflets regularly.	4.2	11.0	26.1	36.0	22.7	4.8	16.5	34.8	28.7	15.2	4.5	13.6	30.3	32.5	19.1
I prefer to buy organic products if the price is the same as conventional products.	2.2	6.4	31.6	33.4	26.4	4.3	6.3	35.2	32.7	21.6	3.2	6.3	33.3	33.1	24.1
I inspect organic products before I purchase.	3.2	9.7	24.2	38.0	24.9	4.0	16.1	29.1	32.8	18.0	3.6	12.8	26.6	35.5	21.6

B.6 Surveyed respondents' risk reduction strategies when purchasing organic products (continued)

Statement	Organic product purchaser (n=784)					Non-organic product purchaser (n=728)					Total (n=1,512)				
	SD	D	N	A	SA	SD	D	N	A	SA	SD	D	N	A	SA
Certificate															
Thai government org. certification is not trustworthy.	6.4	21.2	41.3	24.1	7.0	6.9	13.9	49.0	23.8	6.5	6.6	17.7	45.0	23.9	6.7
I purchase organic products certified by private certification bodies.	3.2	11.6	45.5	33.5	6.1	2.9	10.4	50.0	32.1	4.5	3.0	11.0	47.7	32.9	5.4
I purchase organic products certified by international certification bodies.	1.8	7.8	37.4	36.9	16.2	2.2	6.7	42.2	35.7	13.2	2.0	7.3	39.7	36.3	14.7
I purchase organic products that can be traced back to the farmer.	1.0	5.0	32.8	37.6	23.6	1.9	4.9	35.6	41.1	16.5	1.5	5.0	34.1	39.3	20.2
Information															
I read consumer guides regularly.	0.9	5.5	21.3	43.9	28.4	1.6	4.9	33.9	42.3	17.2	1.3	5.2	27.4	43.1	23.0
My family and friends provide advice on organic products.	8.3	14.7	39.9	30.6	6.5	9.9	12.4	46.0	26.2	5.5	9.1	13.6	42.9	28.5	6.0
I store organic products separately from conventional products.	8.8	17.2	44.9	20.8	8.3	9.6	10.0	48.9	24.2	7.3	9.2	13.8	46.8	22.4	7.8

B.7 Correlation matrix of surveyed respondent's risk perception when purchasing organic products

Variable	Statement	FUNC1	FUNC4	SOC1	SOC2	TIME1	TIME2	TIME3	PHY1	FUNC3	FUNC2	PSY1
FUNC1	I worry about pesticide residue when buying food products.	1.000	.517**	.192**	.294**	.147**	.156**	.247**	.268**	.497**	.385**	0.019
FUNC4	I am concerned about food safety even if the product claims to be organic.		1.000	.411**	.494**	.266**	.215**	.130*	.140**	.389**	.353**	0.047
SOC1	I am never really certain that the organic product I purchased are really organic			1.000	.626**	.362**	.243**	-0.076	-0.024	.142**	.204**	.167**
SOC2	I do not easily trust product claims that a product is really organic.				1.000	.275**	.288**	-0.035	.118*	.233**	.292**	.173**
TIME1	I do not have time to find organic products.					1.000	.422**	-0.048	0.062	0.039	.126*	.168**
TIME2	Limited supply makes buying organic products harder.						1.000	0.040	.150**	0.090	.147**	.239**
TIME3	I try to buy organic products whenever they are available.							1.000	.239**	.119*	.222**	0.071

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

B.7 Correlation matrix of surveyed respondent's risk perception when purchasing organic products (continued)

Variable	Statement	FUNC1	FUNC4	SOC1	SOC2	TIME1	TIME2	TIME3	PHY1	FUNC3	FUNC2	PSY1
PHY1	Non-organic products that claim to be organic can harm my health.								1.000	.344**	.202**	.185**
FUNC3	I am concerned about the cumulative effects of pesticides in my food.									1.000	.451**	0.005
FUNC2	I am concerned about how organic products are processed.										1.000	.227**
PSYC1	I would be embarrassed if I purchased the product at high price but the product has been treated with chemicals.											1.000

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

B.7 Correlation matrix of surveyed respondent's risk perception when purchasing organic products (continued)

Variable	Statement	PSY2	PSY3	SOC4	SOC3	PSY4	FIN2	FIN3	FIN4	PHY2	PHY3	FIN1
PSYC2	I fear being cheated when purchasing organic products.	1.000	.479**	.126*	.128*	.328**	.199**	.256**	0.048	-0.039	0.076	.185**
PSYC3	I would lose face if I purchased non-organic products that claimed to be organic.		1.000	.363**	.352**	.403**	.153**	.149**	-0.058	0.018	.189**	0.024
SOC4	My family and friends will blame me for not doing the right thing if I do not eat organic products.			1.000	.742**	.149**	.250**	0.036	.262**	.190**	.179**	0.043
SOC3	I would be out of fashion if I did not eat organic products.				1.000	.217**	.232**	0.080	.235**	.153**	.167**	0.015
PSYC4	I waste my money if I buy non-organic products that claimed to be organic.					1.000	.180**	.157**	0.004	.147**	.178**	.112*
FIN2	I would save money and buy more if I did not buy organic products.						1.000	.327**	.278**	0.034	0.080	.206**
FIN3	I think using the words "organic product" is only a marketing strategy to sell at higher prices.							1.000	.118*	0.005	-0.034	.241**
FIN4	Paying a higher price for organic products is wasteful.								1.000	.165**	0.069	.344**
PHY2	Truly organic products taste better than conventional products.									1.000	.566**	0.064
PHY3	Truly organic products are more nutritious than conventional one.										1.000	-0.094
FIN1	I think that organic products are not as safe as they claim to be.											1.000

**. Correlation is significant at the 0.01 level (2-tailed), *. Correlation is significant at the 0.05 level (2-tailed).

B.8 Correlation matrix of surveyed respondent's risk reduction strategies when purchasing organic products

Variable	Statement	BRND1	BRND2	BRND3	CERT1	CERT2	CERT3	CERT4	INFO1
BRND1	I purchase organic products of the same brand regularly.	1.000	.711**	.575**	.166**	.189**	.348**	.246**	0.071
BRND2	I purchase organic products at the same store regularly.		1.000	.547**	.130*	.185**	.256**	.152**	0.086
BRND3	I always choose well-known or popular brands of organic products.			1.000	.138**	.264**	.371**	.319**	.196**
CERT1	Thai government org. certification is not trustworthy.				1.000	.138**	.240**	.128*	0.022
CERT2	I purchase organic products certified by private certification bodies.					1.000	.340**	.180**	0.025
CERT3	I purchase organic products certified by international certification bodies.						1.000	.472**	.255**
CERT4	I purchase organic products that can be traced back to the farmer.							1.000	.372**
INFO1	I read consumer guides regularly.								1.000

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

B.8 Correlation matrix of surveyed respondent's risk reduction strategies when purchasing organic products (continued)

Variable	Statement	PRIC2	INFO3	PRIC4	PRIC1	PROC3	PRIC3	PROC1	PROC2	INFO2
PRIC2	I read in-store product information leaflets regularly.	1.000	0.072	.431**	.185**	-0.084	.136**	0.051	-0.068	0.018
INFO3	My family and friends provide advice on organic products.		1.000	.105*	.148**	-0.045	0.058	.101*	.124*	.313**
PRIC4	I inspect organic products before I purchase.			1.000	.301**	-.153**	.178**	-0.009	-.174**	0.003
PRIC1	I do not purchase organic products with price reductions.				1.000	-0.092	.150**	0.062	-0.012	.185**
PROC3	I prefer to buy organic products if the price is the same as conventional products.					1.000	-0.006	.162**	.328**	0.071
PRIC3	I do not shop around to compare organic product prices.						1.000	.234**	0.073	0.077
PROC1	I buy organic product from shops that keep organic products separate from conventional products.							1.000	.391**	.425**
PROC2	I prefer to buy organic products from shops that buy organic products directly from the farmers that produce them.								1.000	.342**
INFO2	I store organic products separately from conventional products.									1.000

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Appendix C

C.1 Factor extraction table (consumers' risk perceptions)

Total variance explained

Component	Initial Eigenvalue			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.244	19.289	19.289	4.244	19.289	19.289	2.917	13.259	13.259
2	2.771	12.595	31.884	2.771	12.595	31.884	2.587	11.760	25.018
3	2.313	10.513	42.397	2.313	10.513	42.397	2.069	9.404	34.422
4	1.612	7.325	49.722	1.612	7.325	49.722	1.949	8.857	43.279
5	1.179	5.360	55.082	1.179	5.360	55.082	1.883	8.560	51.839
6	1.062	4.828	59.910	1.062	4.828	59.910	1.776	8.071	59.910
7	0.999	4.546	64.456						
8	0.899	4.088	68.545						
9	0.801	3.643	72.188						
10	0.766	3.482	75.670						
11	0.706	3.211	78.880						
12	0.591	2.688	81.568						
13	0.570	2.592	84.160						
14	0.545	2.476	86.636						
15	0.510	2.318	88.954						
16	0.460	2.092	91.047						
17	0.428	1.945	92.992						
18	0.372	1.691	94.682						
19	0.349	1.585	96.267						
20	0.328	1.493	97.760						
21	0.278	1.261	99.021						
22	0.215	0.979	100.000						

Extraction Method: Principal Component Analysis.

Rotated component matrix with VARIMAX rotation (consumers' risk perceptions)

Factor	Component					
	1	2	3	4	5	6
PSY3	0.819					
PSY1	0.726					
PSY2	0.695					
PSY4	0.595					
FUNC1		0.799				
FUNC3		0.777				
FUNC4		0.733				
FUNC2		0.665				
SOC3			0.880			
SOC4			0.878			
FIN1				0.705		
FIN3				0.634		
FIN2				0.615		
FIN4				0.583		
PHY2					0.873	
PHY3					0.862	
TIME2						0.787
TIME1						0.787

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax.

C.2 Factor extraction table (consumers' risk reduction strategies)

Total variance explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.528	20.755	20.755	3.528	20.755	20.755	2.327	13.690	13.690
2	2.172	12.777	33.532	2.172	12.777	33.532	2.115	12.441	26.131
3	1.658	9.751	43.283	1.658	9.751	43.283	1.992	11.716	37.847
4	1.294	7.612	50.895	1.294	7.612	50.895	1.782	10.483	48.330
5	1.212	7.128	58.023	1.212	7.128	58.023	1.648	9.693	58.023
6	0.916	5.390	63.414						
7	0.829	4.874	68.288						
8	0.800	4.707	72.994						
9	0.737	4.333	77.327						
10	0.665	3.913	81.241						
11	0.580	3.410	84.651						
12	0.544	3.201	87.852						
13	0.505	2.969	90.821						
14	0.470	2.766	93.587						
15	0.452	2.658	96.245						
16	0.383	2.253	98.498						
17	0.255	1.502	100.000						

Extraction Method: Principal Component Analysis.

Rotated component matrix with VARIMAX rotation

(consumers' risk reduction strategies)

Factor	Component				
	1	2	3	4	5
BRND2	0.883				
BRND1	0.858				
BRND3	0.724				
PROC2		0.719			
PROC1		0.699			
PROC3		0.588			
PRIC4			0.768		
PRIC2			0.725		
PRIC1			0.517		
PRIC3			0.495		
CERT3				0.713	
CERT2				0.700	
CERT4				0.610	
INFO3					0.783
INFO2					0.663

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax.

Appendix D

D.1 Modification indices for the second order CFA model for consumer risk reduction strategies (preliminary model)

			M.I.	Par Change
e9	<-->	e20	41.269	.257
e15	**<-->**	**e9**	**26.046**	**.229**
e4	<-->	e20	20.031	.164
e11	<-->	e17	11.659	.092
e5	<-->	e11	25.669	.157