

**A WILLINGNESS TO PAY STUDY OF HERITAGE
INTERPRETATION: A CASE STUDY OF THE
HISTORIC CITY OF AYUTTHAYA**

Wiroj Lakkhanaadisorn

**A Dissertation Submitted in Partial
Fulfillment of the Requirements for the Degree of
Doctor of Philosophy (Economics)
School of Development Economics
National Institute of Development Administration
2013**

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ABSTRACT

Title of Dissertation	A Willingness to Pay Study of Heritage Interpretation: A Case Study of the Historic City of Ayutthaya
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In general, the contingent valuation studies applied to the valuation of cultural heritage sites are usually carried out for the purpose of physical conservation. However, to conserve the heritage site sustainably, heritage interpretation is one of the main factors that cannot be neglected. As a result, this study was conducted to elicit the value of the restoration and improvement of heritage interpretation (information board, exhibits, booklets, pamphlets, tourist guide services, etc.) with the selection of the Historic City of Ayutthaya as a study site.

A contingent valuation (CV) survey with 2 hypothetical programs was employed and the payment vehicle used in this study was the one-day package entrance fee. According to this study, firstly, it is interesting to explore whether the heritage interpretation's value of three historic sites is different to the values of fifteen historic sites or not. It was found that the scope test was qualified. The respondents can distinguish the values of two hypothetical programs whose scope are different. The respondents are willing to pay more for the larger project that contains more historic sites. This can reflect that the respondents did not pay for the improvement of heritage interpretation because they would just like to express good citizenship or an altruistic mind which is called warm glow giving phenomenon.

Secondly, due to two hypothetical programs being assumed in this study, it is interesting to scrutinize whether the elicited value of the first hypothetical project affected the elicited value of the second hypothetical project or not. It was found that the anchoring bias did not have any statistically significant influence in this study.

Single bounded dichotomous choice, double bounded dichotomous choice and open ended questions were used to find the expected willingness to pay. With regard to single bounded dichotomous choice question, in cases where simple linear utility function with logistic regression is assumed, the individual's willingness to pay for three historic sites and fifteen historic sites are 137.44 Baht and 422.44 Baht respectively as well as in cases are log-normal utility function with logistic regression is assumed, the individual's willingness to pay for 3 historic sites and 15 historic sites are 229.24 Baht and 1,404.71 Baht respectively.

For double bounded dichotomous choice questions, in cases where the utility function is considered simple linear with logistic regression, the individual's willingness to pay for three historic sites and fifteen historic sites are 220.77 Baht and 484.23 Baht respectively as well as in cases are log-normal utility function with logistic regression is assumed, the individual's willingness to pay for three historic sites and fifteen historic sites are 411.28 Baht and 933.07 Baht respectively. By the way, in the case of open ended questions, the expected willingness to pay for three historic sites and fifteen historic sites are 126.50 Baht and 317.11 Baht respectively.

Belief in Buddhism, educational level and income are the statistically significant positive determinant of willingness to pay. Unfortunately, the distance decay that was previously expected to be seen in this study did not play any statistically significant role on the respondent's willingness to pay. This means that the locality or the distance between the respondent's residence province and Ayutthaya province is not a statistically significant variable. So, the ownership and sense of belonging of local people or Thai visitors who live near the Historic City of Ayutthaya is supposed to be no more or less of a concern.

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This dissertation could not have been accomplished without the good collaboration of the director of the TAT's Ayutthaya Office, Mr. Pramote Sapyen and director of the Phranakhon Si Ayutthaya Historical Park, Mr. Chaiyanan Bussayarat who are very important persons in the administration of the Historic City of Ayutthaya. The information obtained from the interview with them helped me to fulfill my dissertation by linking the findings from the research and the real situation in administering the Historic City of Ayutthaya and made this dissertation more practical and reliable.

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Wiroj Lakkhanaadisorn

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ABBREVIATIONS

Abbreviations

Equivalence

ANZECC	Australian and New Zealand Environment Conservation Council
ATLAS	the Association for Tourism and Leisure Education
CVM	Contingent Valuation Method
DC	Dichotomous Choice Question
EEPSEA	Economy and Environment Program for Southeast Asia
ICCROM	International Centre for the Study of the Preservation and Restoration of Cultural Property
ICOMOS	International Council on Monuments and Sites
IUCN	International Union for Conservation of Nature
NESDB	National Economic and Social Development Board
NOAA	National Oceanic and Atmospheric Administration
OE	Open Ended Question
TAT	Tourism Authority of Thailand
UN	United Nations
UNESCO	United Nations Educational, Scientific and Cultural Organization
WTO	World Tourism Organization
WTP	Willingness to Pay

CHAPTER 1

INTRODUCTION

1.1 Background

As most Thai people already know, the Historic City of Ayutthaya was listed as a World Heritage Site by World Heritage Center of the United Nations Educational, Scientific and Cultural Organization (UNESCO) in December 13, 1991 (1991: 50-51). According to the Advisory Body Evaluation Report, it described that the Historic City of Ayutthaya deserved to be listed as a World Heritage Site because it obviously exhibits the development of a true national Thai art that is outstandingly unique and invaluable.

Nowadays, the protection and conservation of the Historic City of Ayutthaya is implemented in accordance with the Act on Ancient Monuments, Antiques, Objects of Art and National Museums of 1961 and reinforced by zoning regulations under the City Planning Act of 1975.

With regard to the new concept of cultural heritage site conservation nowadays, regulations only are not enough to conserve cultural heritage sites. Moreover, if the goal of World Heritage listing of cultural heritage sites is taken into account, a thorough understanding among stakeholders regarding a particular World Cultural Heritage Site is the thing that should be realized. Therefore, both regulation and education should be employed (Drost, 1996: 481-483; Choi and Sirakaya, 2006: 1281-1284; Bramwell and Lane, 1993: 2; Bramwell and Lane, 1999: 3). Especially in the educational process, heritage interpretation is the key factor to deliver not only the information about a typical cultural heritage site toward visitors but it can also motivate visitors to experience the authenticity, beauty, wonder, inspiration, historic context and spiritual meaning that lie behind the ruins and remains (Tilden, 2007: 3).

According to the International Cultural Tourism Charter, Managing Tourism at Places of Heritage Significance, 1999 adopted by ICOMOS at the 12th General Assembly in Mexico, October 1999, which stated that Interpretation and presentation

programmes should facilitate and encourage a high level of public awareness and support necessary for the long term survival of the natural and cultural heritage. Interpretation programmes should present the significance of heritage places, traditions and cultural practices within the past experience and present diversities of the area and the host community, including that of minority cultural or linguistic groups. The visitor should always be informed of the differing cultural values that may be ascribed to a particular heritage resource.

So, heritage interpretation should be regarded as an important and effective process for presenting and communicating the authentic values of culture and history that lie behind the cultural heritage sites to the visitors who access them. Although heritage interpretation must be implemented based on facts, it is not just information provision with straightforward methodology. Heritage interpretation should involve factual information, education, inspiration and also impressive experience of those heritage sites to the visitors (Nuryanti, 1996: 252).

In general, heritage interpretation is often arranged for mainly service foreign visitors instead of local visitors. For this perspective, Peleggi (1996: 445) examined the relevance of Thailand's heritage attractions to both international and domestic tourism and found that the cultural heritage tourism with well-prepared heritage interpretation has only a slight impact on foreign visitors but generates a major influence on domestic tourism sector because the values perceived by foreign visitors are only use values from their visitation for instance, aesthetic value and recreational value. But local visitors who are the real owners of those cultural heritage sites can perceive more than use values that are nonuse values for example, ethnic value, spiritual value, etc. Therefore, with regard to cultural heritage tourism, local visitors should indeed be focused on.

Currently, the heritage interpretation preparation of the Historic City of Ayutthaya or Ayutthaya Historical Park is under the joint responsibility of the Department of Fine Arts, Tourism Authority of Thailand (TAT) and Phranakorn Si Ayutthaya Provincial Administration Organization. Since cultural heritage tourism is the one of the important mechanisms of cultural heritage site conservation and cultural awareness creation, cultural heritage tourism should present a high quality interpretation in order to cultivate the visitor's understanding of the authentic value of that cultural heritage site and teach visitors to realize the need for conservation.

So far, the direction of heritage interpretation is not concurrently and conspicuously determined among the relevant stakeholders for example, the Department of Fine Arts, Tourism Authority of Thailand (TAT) and Phranakorn Si Ayutthaya Provincial Administration Organization. In addition, heritage interpretation is never regarded as an important issue that should be materialized earnestly and urgently, even though it is a theoretically significant element in cultural heritage site conservation. This research aims at understanding the perceptions and opinions of Thai visitors who visit Ayutthaya Historical Park, what they think about the existing heritage interpretation of Ayutthaya Historical Park and their expectation of quality improvement of existing heritage interpretation and how much they are willing to contribute toward such improvements. The findings attained from this research can be probably applied to create a tourism and conservation policy in order to enhance the quality of heritage interpretation of the Historic City of Ayutthaya, thus the aim is to cultivate the awareness, appreciation and pride of the authentic value of the Historic City of Ayutthaya in Thai visitors who are its real owners. Hopefully, when Thai visitors perceive the authentic value of the Historic City of Ayutthaya, those good quality Thai visitors will willingly collaborate themselves in cultural tourism and sustainable conservation.

1.2 Description of the Problem

At present, the Tourism Authority of Thailand (TAT) takes responsibility for the promotion of cultural heritage tourism in the Historic City of Ayutthaya at Wat Si Sanphet, Wat Mahathat and Wat Chaiwatthanaram which are the top three famous historic sites that attract a lot of visitors each year. To observe the current heritage interpretation of the Historic City of Ayutthaya, the author consequently decided to visit these three historic sites on August 7, 2011 and found that there are a lot of heritage interpretation issues that need significant improvement.

Ordinarily, to access each historic site in Ayutthaya Historical Park, Thai visitors have to pay an entrance fee of only 10 Baht per visitor at TAT's Tourism Information Center located at the entrance to these historic sites are shown in Figure 1.1 below.



Figure 1.1 TAT's Information Center of Ayutthaya

Disappointedly, except for the ticket, any brochures, booklets or even tourism maps of the Historic City of Ayutthaya were not provided to visitors because of the very cheap entrance fee. However, there were some booklets compiled by Chaiwat Worachetwarawat, a local academician sold to interested visitors but there were only a few visitors bought them. Therefore, almost all visitors would access the historic site with only a ticket as shown in Figure 1.2 without any heritage interpretation materials or services. This means almost all visitors have to wander around inside the historic site and it is quite impossible that the visitors will comprehend and obtain the the knowledge and experience that they deserve to know during the visitation. According to the observations by the author, almost all visitors just went sightseeing through the ancient remains inside the historic site and took some photographs. Therefore, with respect to the limitation of heritage interpretation services at present, the priceless authentic value of the Historic City of Ayutthaya was rarely disclosed and conveyed to the visitors, especially Thai visitors who are its owners.

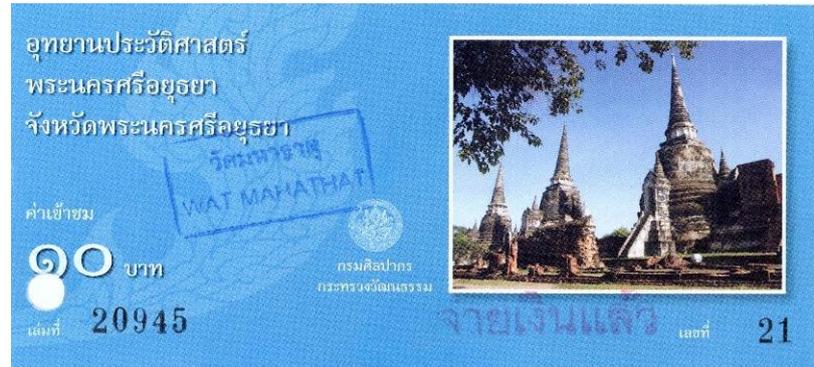
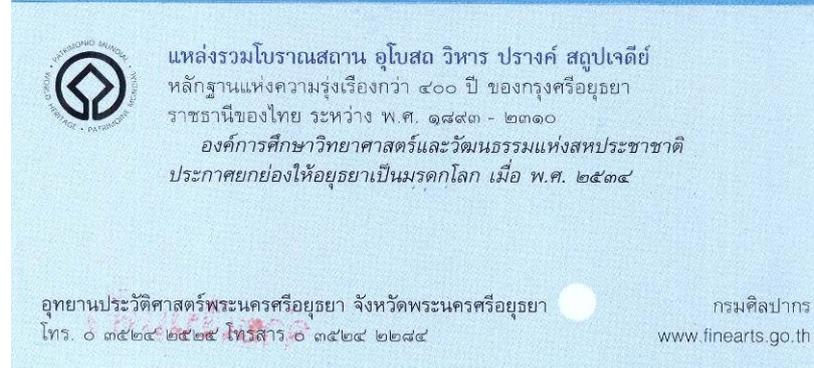
Ticket frontTicket back

Figure 1.2 Entrance ticket of Wat Mahathat in Ayutthaya Historical Park

Dispersedly, even information panels regarding tourist maps of the Historic City of Ayutthaya were seldom found. During the survey in Wat Si Sanphet and Wat Mahathat, although these two historic sites are usually promoted as the most important sites, there no tourist map inside displayed, so the visitors who do not have a tourist map in their hands are not able to efficiently plan the route to the next interesting site. Fortunately, a tourist map of the Historic City of Ayutthaya is still displayed at the Tourism Information Center at Wat Chaiwatthanaram which is the one of three important sites (Wat Si Sanphet, Wat Mahathat and Wat Chaiwatthanaram) promoted by Tourism Authority of Thailand.

In front of the entrance gates of Wat Mahathat, Wat Sisanphet and Wat Chaiwatthanaram, there was the audio tour self – guided service shown in Figure 1.3 This audio tour self-guided service is provided in two languages, Thai and English for visitors. The visitors could voluntarily pay 100 Baht for one site’s service or 150 Baht for all three major sites.

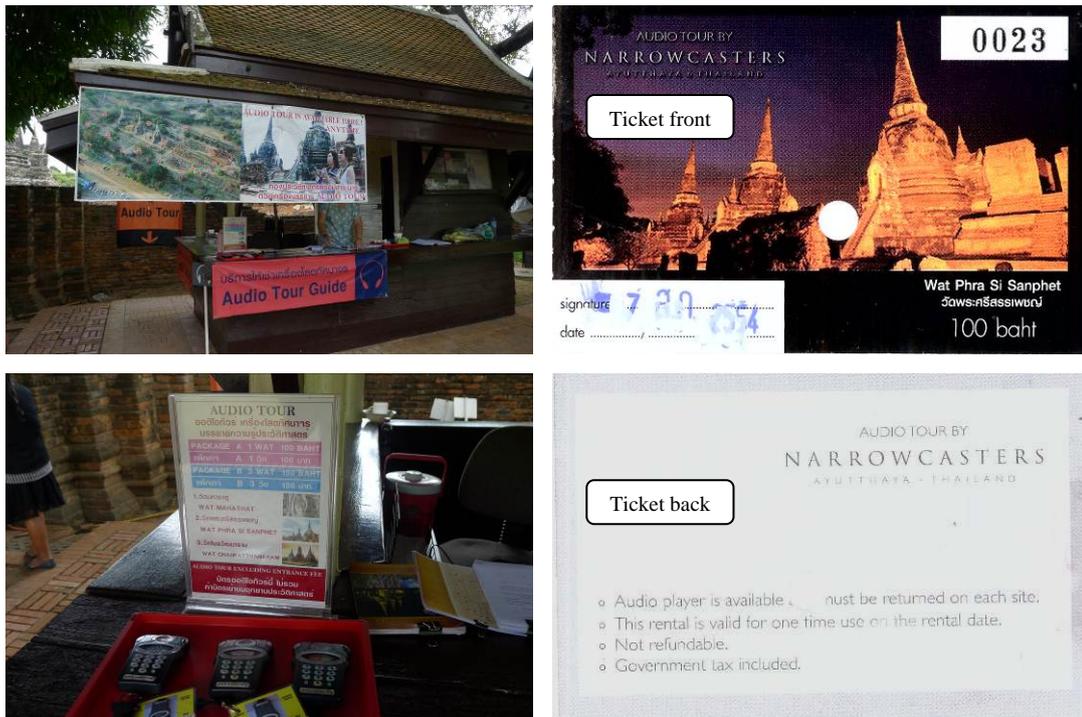


Figure 1.3 Audio Tour Self-Guided Service in Ayutthaya Historical Park

According to the trial use of the audio tour self-guided service by the author, the audio device could not automatically detect and describe the contents with regard to each important ruin located inside the historic site. According to Figure 1.4, the visitor had to select the audio file number and correctly match it with the post number in order to listen to the audio file.



Figure 1.4 The Use of Audio Tour in Ayutthaya Historical Park

Notwithstanding, that almost all contents of the audio files seemed to be ordinary facts usually found in history textbooks without any highlight or interesting facts. Moreover, most of the audio files were not directly commensurate with the ruins in the number post. For example, post number 8 was located in front of in a typical ubosot, audio file number 8 was supposed to describe the architectural, cultural and historic contents about such a specific ubosot that was in front of the visitor, instead it described the state of society in the Ayutthaya period. Unfortunately, the audio device only roughly described general issues in some short sentences and plain voice tone. None of the intriguing historic and cultural details of the remains located in the historic site could be expected from this audio tour service. Therefore, with this kind of this device, it is impossible to motivate visitors to experience the nostalgia of the past and have a good awareness of the authentic value (including historic value, spiritual value, ethnic value, cultural value, etc.) of the site during their visitations. Surprisingly, according to the observation by author, there were only a few Thai visitors paying for the audio tour self-guided service. Most of Thai visitors will go into each historic site with only a ticket and camera.

For the existing heritage interpretations of the Historic City of Ayutthaya in three major sites, Wat Si Sanphet, Wat Mahathat and Wat Chaiwatthanaram in Figure 1.5,

the existing interpretation panels contained only very short sentences or limited information regarding the places in each historic site. Most of them only informed only what the places in front of visitors are called but did not describe their cultural and historical importance or their stories in the past. Unfortunately, some of interpretation panels disappeared or were out of order without any suitable upkeep. Most of the existing interpretation panels and information boards inside the historical sites were not adequately maintained and they were not attractive enough yet to interest the visitors. Most of visitors did not pay attention to the interpretation panels located around the site.

In addition to three major sites, almost all heritage interpretation in other historical sites located in the area of the Historic City of Ayutthaya are neglected and inadequately maintained to be appropriately functional. For example, the heritage interpretation of twelve famous historic sites that are Wat Mongkol Bophit, Wat Thammikarat, Wat Phra Ram, Wat Buddhaisawan, Wat Phanan Choeng, Wat Maheyong, Wat Yai Chaimongkol, Wat Rajburana, Wat Suwandararam, Wat Na Phra Men, Wat Kudidao and Wat Barom Buddharam were ignored or uninteresting enough to attract the visitors' attention.

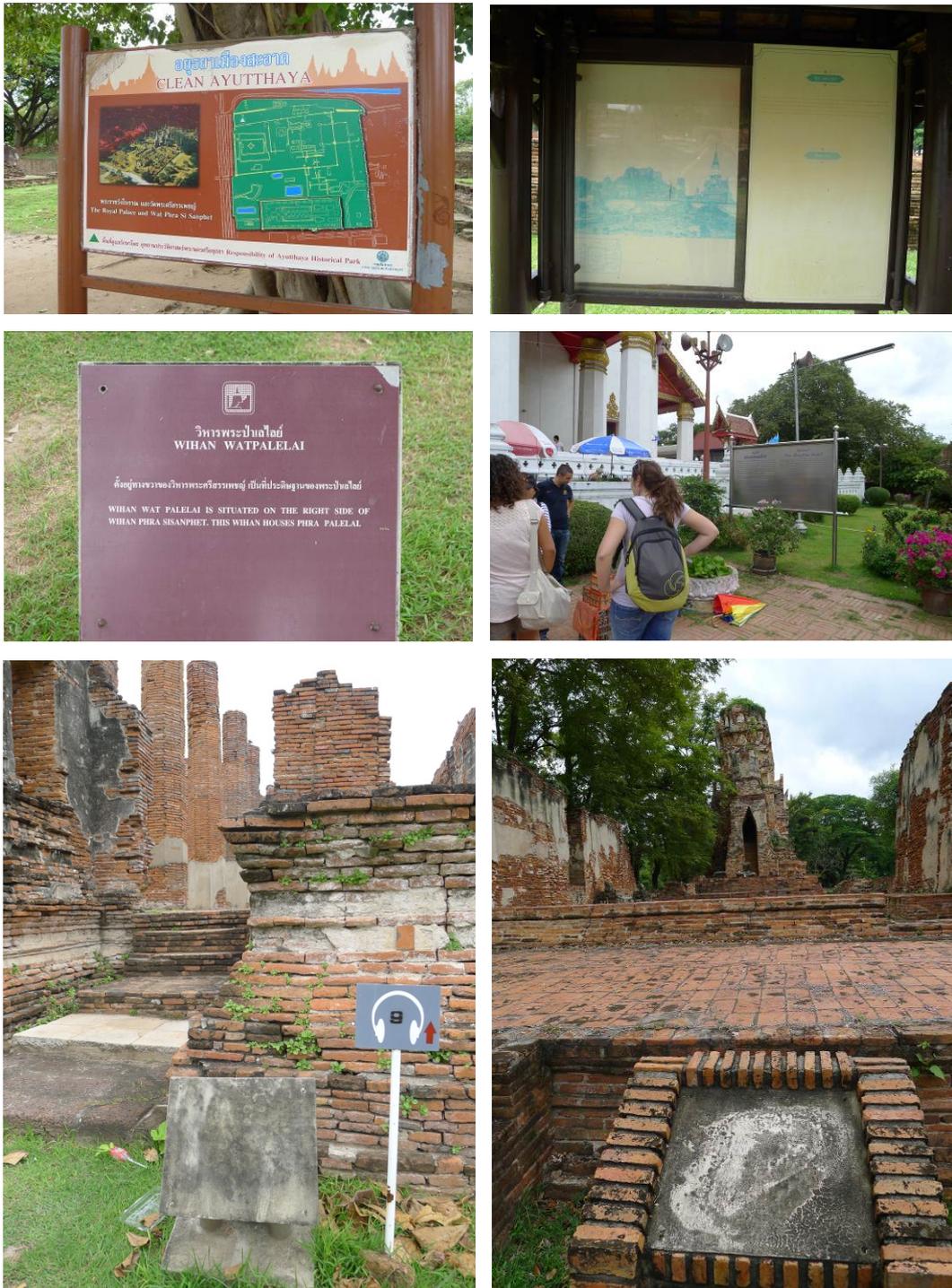


Figure 1.5 The Existing Interpretation Panels in Ayutthaya Historical Park

According to the afore-mentioned detail of the existing interpretation of the Historic City of Ayutthaya, including scarcity of brochures, booklets and tourist maps

and the poor quality of the existing heritage interpretation materials and services for example, interpretation panels, information boards cannot properly educate, interest or motivate the visitors to perceive and be aware of the authentic value of the Historic City of Ayutthaya. Basically, the visitors who do not perceive the authentic value and importance of the historic site cannot behave themselves as good quality visitors that are willing to collaborate or dedicate themselves to conservation projects of the historic site or sustainable tourism policies because they do not know the reasons why those historic sites deserve to be conserved. If this situation still persists without any appropriate counter measures, the sense of belonging, value awareness of Thai visitors and other Thai people, especially local communities in the area of the Historic City of Ayutthaya will gradually decrease, thus it is possible that conservation projects or sustainable tourism policies proposed in the short future will not be supported by Thai people, especially local communities around the Historic City of Ayutthaya even though it is a priceless heritage from our ancestors to our generation (Aas et al., 2005: 44-45; Byrd, 2007: 6-7; Sautter and Leisen, 1999: 325-326; Cruz, 2005: 82; Choi and Sirakaya, 2006: 1281-1284; Drost, 1996: 481-483; Nuryanti, 1996: 257-258; Mazzanti, 2002: 532; MacDonald and Jolliffe, 2003: 318-320).

It can be concluded that cultural heritage tourism without the perception of the total value and authenticity of cultural heritage sites will sooner or later definitely cause social problems and conflicts among stakeholders. For this above – mentioned concern, Russo (2002: 168-170) studied and proposed the model of the vicious circle of tourism development in heritage cities or historic sites shown in Figure 1.6. Before proceeding to the failure of cultural heritage tourism, it begins from the increase of tourism demand that results in a wider divergence between costs and benefits of cultural heritage tourism. Thus, the quantity of visitors and the visitation period will continuously decrease, because of the poor quality of characteristics and interpretations of the sites. Finally, if the appropriate counter measures are not implemented in time, the quality will decline and the cultural heritage sites will become notorious and lose all their authentic value.

UNESCO (1972) is today the best universal legal instrument in heritage conservation, ratified by 187 countries and covering 890 sites protected under this system (Rossler, 2010: 1). The 1972 Convention provides for a framework for

international cooperation to safeguard priceless cultural heritage. However, from the practice in the past, as most World Heritage nominations were prepared and processed by central institutions and ministries and inscribed on the World Heritage List without consultation with local communities, visitors and other stakeholders.

Consequently, the current cultural heritage strategies mostly emphasize the participation of stakeholders. The communication and interpretation in order to enhance the public awareness, involvement, collaboration, cooperation and support are inevitable (Rossler, 2010: 3; Operational Guidelines for Implementation of the UNESCO, 2008: 1-3; Fleming, 2008: 2; ANZECC Working Group on National Parks and Protected Area Management Benchmarking and Best Practice Program, 2001: 23-24, 48-53).

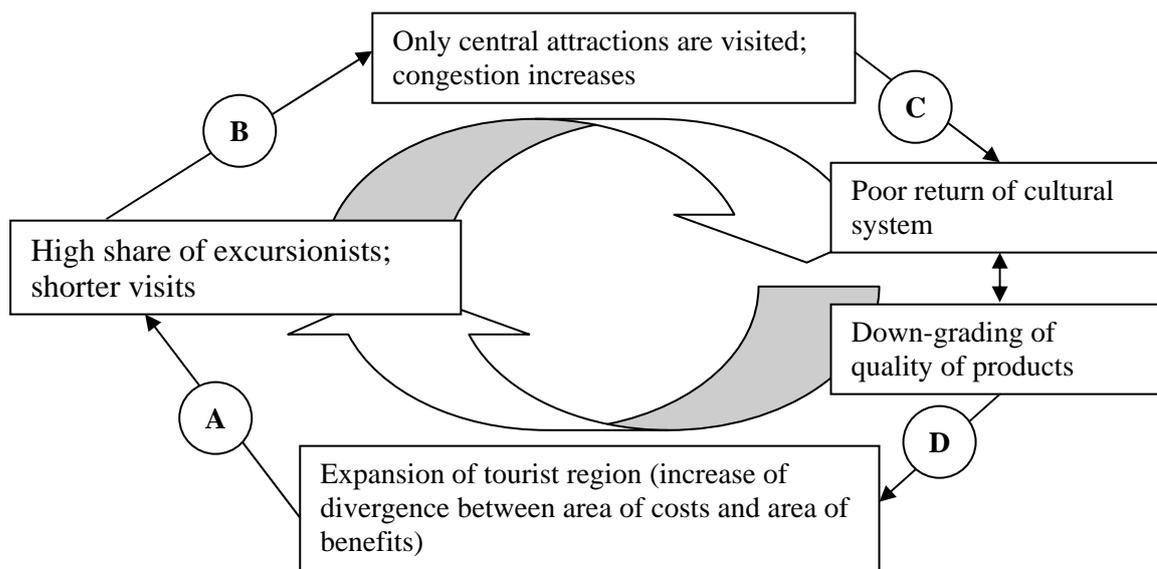


Figure 1.6 The Vicious Circle of Tourism Development of Heritage Destinations

In case of the Historic City of Ayutthaya, due to the parties who are responsible for administration and conservation of the Historic City of Ayutthaya do not have adequate information with regard to the impact of the interpretation of cultural heritage. Moreover, they do not precisely know the viewpoints of visitors regarding the issues of the heritage interpretation and their willingness to pay. As a result, the appropriate interpretation policies to educate and communicate the total value of the Historic City of Ayutthaya to Thai visitors and motivate them to possess

public awareness and ownership of the Historic City of Ayutthaya have definitely not been determined and implemented yet.

1.3 Research Objectives

The general objectives of this study are to estimate the value of the improved interpretation of the Historic City of Ayutthaya in the perspective of domestic cultural heritage tourism.

The specific objectives are:

1.3.1 To evaluate the level of awareness and viewpoints of Thai visitors with regard to cultural heritage tourism in the Historic City of Ayutthaya;

1.3.2 To evaluate the viewpoints of Thai visitors with regard to the existing heritage interpretation and their expectation of interpretation improvement and upkeep in the Historic City of Ayutthaya;

1.3.3 To determine their willingness to pay for the improved heritage interpretation of the Historic City of Ayutthaya;

1.3.4 To identify the factors that affect their willingness to pay;

1.3.5 To identify the reasons why Thai visitors may not be willing to pay for the improvement of interpretation of the Historic City of Ayutthaya;

1.3.6 To develop a funding mechanism for the improvement and sustainable upkeep of the heritage interpretation of the Historic City of Ayutthaya.

1.4 Scope of the Study

The areas of this study are the valuation study of the improvement of heritage interpretation of the Historic City of Ayutthaya that consists of 15 culturally and historically important sites, Wat Si Sanphet, Wat Mahathat, Wat Chaiwatthanaram, Wat Mongkol Bophit, Wat Thammikarat, Wat Phra Ram, Wat Buddhaisawan, Wat Phanan Choeng, Wat Maheyong, Wat Yai Chaimongkol, Wat Rajburana, Wat Suwandararam, Wat Na Phra Men, Wat Kudidao and Wat Barom Buddharam, so that they can communicate their total value to Thai people who visit these sites.

The Historic City of Ayutthaya is selected as the study site because it is listed in the UNESCO World Cultural Heritage Sites. Currently, the quality of its interpretation is so low that it cannot arouse and inspire Thai visitors to perceive its total value. Consequently, public awareness and sense of belonging are difficult to cultivate in the mindset of Thai people, who are the common owners of the Historic City of Ayutthaya, especially Ayutthaya people, who reside in the province where the historic site is located. In addition to the low quality of its current heritage interpretation, there is another issue of concern which is the Historic City of Ayutthaya is at risk of being delisted from the UNESCO list of World Heritage Sites because of unplanned urban development and community expansion that is threatening the conservation of the historic sites in the area of the Historic City of Ayutthaya. If the local people and other Thai people can comprehend the unfathomable authentic value of the Historic City of Ayutthaya, this issue should not arise.

1.5 Research Questions

The study will seek to answer the following questions:

1.5.1 Are Thai visitors to the Historic City of Ayutthaya aware of the importance of the heritage interpretation of the Historic City of Ayutthaya?

1.5.2 Are Thai visitors to the Historic City of Ayutthaya willing to contribute towards the heritage interpretation of the Historic City of Ayutthaya?

1.5.3 If they are, what is the maximum they are willing to pay for the improvement of the heritage interpretation of the Historic City of Ayutthaya?

1.5.4 If they are not, what are the reasons for not being willing to pay?

CHAPTER 2

LITERATURE REVIEW

2.1 Definition and Classification of Cultural Heritage

Before starting the exploration of the economics of cultural heritage. It is necessary to ensure the definition of cultural heritage. Unfortunately, a clear definition of cultural heritage that could be directly used in economic analysis does not exist yet. According to Convention Concerning the Protection of the World Cultural and Natural Heritage, the following can be considered “Cultural Heritage”.

2.1.1 Monuments

Architectural works, works of monumental sculpture and painting, elements or structures of an archaeological nature, inscriptions, cave dwellings and combinations of features, which are of outstanding universal value from the point of view of history, art or science;

2.1.2 Groups of Buildings

Groups of separate or connected buildings which, because of their architecture, their homogeneity or their place in the landscape, are of outstanding universal value from the point of view of history, art or science;

2.1.3 Sites

Works of man or the combined works of nature and man, and areas including archaeological sites which are of outstanding universal value from the historical, aesthetic, ethnological or anthropological point of view.

The cultural heritage is composed of works of art and architecture, cultural artifacts and also the common belief of the predecessor generations. To simplify the

meaning of cultural heritage, cultural heritage can be considered the inheritance, including tangible assets and intangible assets reflecting our ancestor's way of life. The tangible assets are composed of works of art and architecture, for example, while intangible assets comprise common beliefs, traditions and moral norms, for example (Koboldt, 1995: 3).

General classification of cultural heritage could be shown in Table 2.1 (Klamer and Zuidhof, 1999: 26).

Table 2.1 Classification of Cultural Heritage

Tangible Heritage	
	Built heritage
	Monuments: buildings, sculptures, inscriptions, cave dwellings
Immovable	(Listed) buildings: buildings in use
	Groups of buildings: city centers
	Sites (also underwater): archaeological, historical, ethnological Cultural landscapes
	Artifacts
	Paintings
	Sculptures
	Objects
	Collections
Movable	Media
	Audiovisual media
	Books
	Plays
	Scores
	Consumer and industrial goods

Table 2.1 (Continued)

Intangible Heritage
Art expressions: music, dance, literature, theater
Martial arts
Languages
Living cultures
(Oral) traditions
Narratives
Revolutions
Networks
Folklore

To differentiate tangible cultural heritage from an inherited object, the cultural heritage must be valued not only with regard to the potential use for which they were originally produced, but for their connection to the cultural development of a society. The tangible cultural heritage is considered the value of communication regarding cultural development of the past (Koboldt, 1995: 4).

However, according to the definition of UNESCO and ICOMOS, there are several definitions of cultural property or cultural heritage in diverse perspective over a period of time that is defined in Table 2.2 below (ICCRUM, 2005: 16-45).

Table 2.2 The Definition of Cultural Heritage or Cultural Property

Year	Definition of cultural property or cultural heritage
1954	<p>Cultural property shall cover irrespective of origin or ownership:</p> <ol style="list-style-type: none"> 1. Movable or immovable property of great importance to the cultural heritage of every people, such as monuments of architecture, art or history, whether religious or secular; archaeological sites; groups of buildings which, as a whole, are of historical or artistic interest; works of art; manuscripts, books and other objects of

Table 2.2 (Continued)

Year	Definition of cultural property or cultural heritage
1964	<p>artistic, historical or archaeological interest; as well as scientific collections and important collections of books or archives or of reproductions of the property defined above;</p> <p>2. Buildings whose main and effective purpose is to preserve or exhibit the movable cultural property such as museums, large libraries and depositories of archives, and refuges intended to shelter, in the event of armed conflict;</p> <p>3. Centers containing a large amount of cultural property.</p> <p>Cultural property means movable and immovable property of great importance to the cultural heritage of a country, such as works of art and architecture, manuscripts, books and other property of artistic, historical or archaeological interest, ethnological documents, type specimens of flora and fauna, scientific collections and important collections of books and archives, including musical archives.</p>
1968	<p>1. The term “cultural property” applies to:</p> <p>1) Immovables, such as archaeological and historic or scientific sites, structures or other features of historic, scientific, artistic or architectural value, whether religious or secular, including groups of traditional structures, historic quarters in urban or rural built-up areas and the ethnological structures of previous cultures still extant in valid form. It applies to such immovables constituting ruins existing above the earth as well as to archaeological or historic remains found within the earth. The term cultural property also includes the setting of such property;</p> <p>2) Movable property of cultural importance including that existing in or recovered from immovable property and that concealed in the earth, which may be found in archaeological or historic sites or elsewhere.</p>

Table 2.2 (Continued)

Year	Definition of cultural property or cultural heritage
1970	<p>2. The term “cultural property” includes not only the established and scheduled architectural, archaeological and historic sites and structure, but also the unscheduled or unclassified vestiges of the past as well as artistically or historically important recent sites and structures.</p> <p>The term “cultural property” means property which, on religious or secular grounds, is specifically designated by each State as being of importance for archaeology, prehistory, history, literature, art or science and which belongs to the following categories:</p> <ol style="list-style-type: none"> <li>1) rare collections and specimens of fauna, flora, minerals and anatomy, and objects of palaeontological interest; <li>2) property relating to history, including the history of science and technology and military and social history, to the life of national leaders, thinkers, scientists and artists and to events of national importance; <li>3) products of archaeological excavations (including regular and clandestine) or of archaeological discoveries; <li>4) elements of artistic or historical monuments or archaeological sites which have been dismembered; <li>5) antiquities more than one hundred years old, such as inscriptions, coins and engraved seals; <li>6) objects of ethnological interest; <li>7) property of artistic interest, such as: <ol style="list-style-type: none"> <li>i) pictures, paintings and drawings produced entirely by hand on any support and in any material (excluding industrial designs and manufactured articles decorated by hand); <li>ii) original works of statuary art and sculpture in any material; <li>iii) original engravings, prints and lithographs;

Table 2.2 (Continued)

Year	Definition of cultural property or cultural heritage
1972	<p>iv) original artistic assemblages and montages in any material;</p> <p>8) rare manuscripts and incunabula, old books, documents and publications of special interest (historical, artistic, scientific, literary, etc.) singly or in collections;</p> <p>9) postage, revenue and similar stamps, singly or in collections;</p> <p>10) archives, including sound, photographic and cinematographic archives;</p> <p>11) articles of furniture more than one hundred years old and old musical instruments.</p> <p>The following shall be considered as cultural heritage.</p> <p>1) monuments: architectural works, works of monumental sculpture and painting, including cave dwellings and inscriptions, and elements, groups of elements or structures of special value from the point of view of archaeology, history, art or science;</p> <p>2) groups of buildings: groups of separate or connected buildings which, because of their architecture, their homogeneity or their place in the landscape, are of special value from the point of view of history, art of science;</p> <p>3) sites: topographical areas, the combined works of man and of nature, which are of special value by reason of their beauty or their interest from the archaeological, historical, ethnological or anthropological points of view.</p>
1978	<p>Movable cultural property shall be taken to mean all movable objects which are the expression and testimony of human creation or of the evolution of nature and which are of archaeological, historical, artistic, scientific or technical value and interest, including items in the following categories:</p>

Table 2.2 (Continued)

Year	Definition of cultural property or cultural heritage
(i)	products of archaeological exploration and excavations conducted on land and under water;
(ii)	antiquities such as tools, pottery, inscriptions, coins, seals, jewelry, weapons and funerary remains, including mummies;
(iii)	items resulting from the dismemberment of historical monuments;
(iv)	material of anthropological and ethnological interest;
(v)	items relating to history, including the history of science and technology and military and social history, to the life of peoples and national leaders, thinkers, scientists and artists and to events of national importance;
(vi)	items of artistic interest, such as paintings and drawings, produced entirely by hand on any support and in any material (excluding industrial designs and manufactured articles decorated by hand); original prints, and posters and photographs, as the media for original creativity; original artistic assemblages and montages in any material; works of statuary art and sculpture in any material; works of applied art in such materials as glass, ceramics, metal, wood, etc.;
(vii)	manuscripts and incunabula, codices, books, documents or publications of special interest;
(viii)	items of numismatic (medals and coins) and philatelic interest;
(ix)	archives, including textual records, maps and other cartographic materials, photographs, cinematographic films, sound recordings and machine – readable records;
(x)	items of furniture, tapestries, carpets, dress and musical instruments;
(xi)	zoological, botanical and geological specimens.

Table 2.2 (Continued)

Year	Definition of cultural property or cultural heritage
2003	The intangible cultural heritage means the practices, representations, expressions, knowledge, skills-as well as the instruments, objects, artifacts and cultural spaces associated therewith- that communities, groups and, in some cases, individuals recognize as part of their cultural heritage. This intangible cultural heritage, transmitted from generation to generation, is constantly recreated by communities and groups in response to their environment, their interaction with nature and their history, and provides them with a sense of identity and continuity, thus promoting respect for cultural diversity and human creativity. The intangible cultural heritage is composed of (a) oral traditions and expressions, including language as a vehicle of the intangible cultural heritage; (b) performing arts; (c) social practices, rituals and festive events; (d) knowledge and practices concerning nature and the universe; (e) traditional craftsmanship.

As highlighted in the previous paragraphs regarding the definition of cultural heritage, cultural heritage deserves to receive the public support because i) it can be used to preserve local identity and prestige of the communities; ii) it can support and generate an economic impact on local tourism; iii) it can be used as an educational source for local people and other people who are interested in culture (Mazzanti, 2002: 532).

2.2 Economics of Cultural Heritage

The conclusion of the Economics and Heritage Conservation Meeting organized by the Getty Conservation Institute in December 1998 (Mason, 1999: 2) and, there are 2 aspects of cultural heritage in the economic perspective as follows

1) There are various economic values of cultural heritage for example, aesthetic value, cultural value, political value, educational value. The importance or

priority of each value depends on each stakeholder who participates in the heritage conservation process.

2) Cultural heritage is considered the public property. Therefore, the concept of public good can be applied in economic analysis of cultural heritage.

Mason (1999: 4-6) stated that economic valuation of cultural heritage possibly encourages or discourages public policies, public participation or communities' collaboration toward the use of cultural heritage. With regard to the economic framework, the conservation and administration of cultural heritage can be managed through financing, incentives scheme, etc. However, when dealing with heritage conservation from the economic perspective, market failure has to be inevitably taken into account because cultural heritage is considered a public good as per the above mentioned. In cases where the market mechanism does not work, other arrangements must be made to finance or raise funds for conservation programs.

In addition, Mason (1999: 8-9) concluded that an economic analysis of cultural heritage can also examine an individual's understanding and attitudes towards cultural heritage, the institutional framework dealing with cultural heritage administration and the economic role of cultural heritage management from both the perspective of tourism and conservation

Basically, heritage can be considered a public good due to it not being managed effectively through market mechanisms. The overall value of the heritage is not reflected by the prices individuals pay in the market. Due to public good showing the limitations of markets and economic exchanges and economic institutions, non-market institutions for example, contingent valuation method are considered to examine the real willingness to pay for cultural heritage and to find the most appropriate administration of cultural heritage in the society (Ready and Navrud, 2002: 3-5).

2.2.1 The Value of Cultural Heritage

Mason (2002: 9-10) discussed about the typology of cultural heritage values and raised the examples of heritage value typologies determined by different researches and organizations shown in Table 2.3 as follows.

Table 2.3 Summary of Heritage Value Typologies Devised by Various Scholars and Organizations

Reigl (1902)	Lipe (1984)	Burra Charter (1998)	Frey (1997)	English Heritage (1997)
Age	Economic	Aesthetic	Monetary	Cultural
Historical	Aesthetic	Historic	Option	Educational and academic
Commemorative	Associative - Symbolic	Scientific	Existence	Economic
Use	Informational	Social (including spiritual, political, national, other cultural)	Bequest	Resource
Newness			Prestige	Recreational
			Educational	Aesthetic

However, the typology of cultural heritage values that is most often associated with heritage sites and conservation issues can be classified into two major categories- sociocultural values and economic values (Mason, 1999: 10; Throsby, 2001: 11) that are shown in Table 2.4

Table 2.4 Provisional Typology of Heritage Values

Sociocultural values	Economic values
Historical	Use (market) value
Cultural/Symbolic	Nonuse (nonmarket) value
Social	Existence
Spiritual/religious	Option
Aesthetic	Bequest

The sociocultural value of cultural heritage constitutes 1) spiritual value that is associated with religious artifacts and places; 2) aesthetic value that is the result and

appreciation of the creativity and endeavor of the artists and; 3) symbolic value that are the denotative meanings reflected from a specific object or place; 4) historical value that is the route or connection that enables the people to know about the past; 5) educational value that is of benefit to people and they learn from the past; 6) social value that influences things that generate and maintain the culture and identity of the society.

With regard to economic value, Bille (1997: 3-5) stated that the total economic value of a good can be estimated by the following basic equation (Bille, 1997: 3-5; Serageldin, 1999: 25; Ready and Navrud, 2002: 7; Klamer and Zuidhof, 1999: 31 and Mason, 2002: 13);

$$TV = UV + NUV$$

where TV = Total value
 UV = use value
 NUV = non-use value

In principle, use value is composed of extractive use value and non-extractive use value. Extractive use value is direct use value that derives from goods. In the context of forest or other environment, extractive use value would be derived from timber or extracted natural resources. Nonetheless, In the context of cultural heritage goods or sites, since they are always regulated and controlled by the authorities, it is quite impossible to gain the extractive use value form them. However, non-extractive use value can be perceived by recreation and scenery enjoyment.

In addition to use value, Non-use value tries to clarify the other forms of value derived from the existence of a typical cultural heritage site. Although one does not probably visit these sites, one would feel discontented if those sites were destroyed. This kind of value is called existence value (the value that people derive from realizing that some specific sites still exists, even though they do not have any opportunities to visit them). Bille (2002: 203) concluded that non-use value of cultural heritage site consists of option value (the value obtained from maintaining the sites

for the opportunity of visitation in the future) and bequest value (the altruistic value to conserve the cultural heritage sites for future generations).

The categories of economic values attributed to cultural heritage can be concluded in Figure 2.1 below.

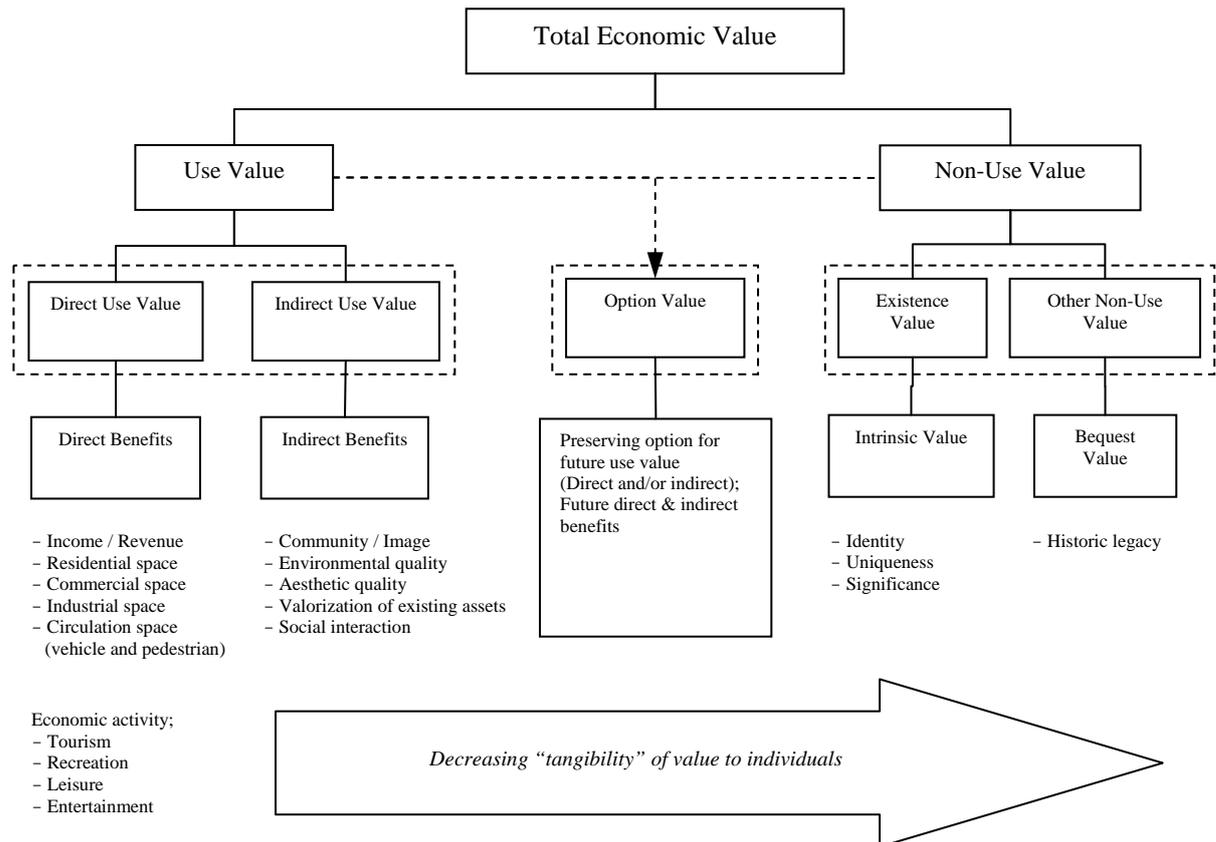


Figure 2.1 Categories of Economic Values Attributed to Cultural Heritage Assets

There are common grounds between an economist and a culturalist's perspectives on valuing cultural heritage (Mason, 1999: 11; Ready and Navrud, 2002: 3-5; Bluestone et al., 1999: 19-20).

1) The public always regards the cultural heritage as the things that are priceless. However, regarding the economic domain, the term of priceless means the cultural heritage as the public goods cannot be priced through normal price mechanisms. Convincingly, cultural heritage can contingently generate various benefits to the

society and those benefits are impossible to be priced in the normal market like other commodities.

2) Cultural heritage is regarded as the asset that appreciates over time but good upkeep is inevitably needed. Therefore, the investment, financing for the conservation and subsidiary schemes should be considered

3) Sustainability is a term that can lead conservation and economic development to a balanced and constructive solution for the society.

4) To conserve the cultural heritage sites in the present time, the roles of nonprofit organizations, nongovernmental institutes and communities are extremely significant. Dealing with cultural heritage conservation nowadays should have people take more responsibility.

5) However, the major differences between economic and cultural perspectives in cultural heritage conservation are that economics possesses a convincing foundation and mathematical models in order to explain what they think about cultural heritage conservation but there is no concrete foundation in perspective from culturalist field yet.

Although the conservation of cultural heritage deserves to be the direct duties of culturalists, historians and connoisseurs, most conservation measures have to be conducted with a government subsidiary or involvement. Moreover, to sustainably conserve the cultural heritage sites, adequate funding is inevitably essential. As a result, the financing plan for cultural heritage conservation and the conservation plan are issues that need to be simultaneously considered (Klamer and Zuidhof, 1999: 24).

With regard to a financing plan, investment, government subsidiary or resources allocation, economics is able to contribute a lot to cultural heritage conservation. Economics can play role in the valuing of heritage and provide administrative ideas to cultural heritage sites' stakeholders, especially policy makers. Cultural economics can model the cultural values and economic values of a particular cultural heritage site and can lead relevant authorities and communities to shape the conservation practices and community development policies to be a best-fit model (Mason, 1999: 8; Klamer and Zuidhof, 1999: 24).

Environmental economics foundations are often applied in the field of cultural heritage conservation because there is a resemblance between cultural heritage

conservation and environment conservation. Due to both environmental goods and cultural heritage goods being considered public goods and which encounter with market failure. Therefore, several concepts, tools, and methods applied to environmental economics can be applied in cultural heritage conservation (Mason, 1999: 16; Serageldin, 1999: 24). Contingent valuation (CV) method is an internationally recognized and often used methodology. This method will be more reliable if the roles of relevant institutions are prudently taken into account. Also, the full consideration of involvement of each stakeholder has to be carefully considered according to a correct priority (Mason, 1999: 17; Klamer and Zuidhof, 1999: 24).

2.2.2 The Valuation of Cultural Heritage

Nowadays, the economic valuation of cultural heritage has increasingly been recognized as a fundamental part of conservation and economic development policies (Mourato and Mazzanti, 2002: 53, Frey, 2000: 231-232, Darnell, 1998: 189-191)

Ready and Navrud (2002: 3) and Mason (2002: 8) stated that the authorities or organizations that have the missions to protect and preserve historic sites, ancient buildings and artifacts from decay by weather, pollution, urban development and the use of public or communities have to consider the issues of fund acquisition, budget allocation and other supplementary measures. As a result, they have to deal with a lot of questions with regard to cultural heritage conservation as follows.

- 1) Should we raise taxes to raise funds for cultural heritage site upkeep?
- 2) What is the proper level of budget for cultural heritage conservation?
- 3) What are the appropriate sources of funds for cultural heritage conservation?
- 4) Should cultural heritage goods be self funded through entrance fees or donations?
- 5) How can we determine the appropriate regulations, disciplines, participation and involvement of each relevant stakeholder?

Mason (2002: 5, 27) stated that assessment of the values belonging to a particular cultural heritage site should be considered an important step of the conservation processes because when the authentic values or total values of a typical

cultural heritage are revealed, it can shape the decisions that can lead to appropriate, discretionary and comprehensive policies. Nevertheless, the assessment of cultural heritage values is quite difficult because there are many kinds of values. Although it is difficult, it must be done. To estimate the value of any cultural heritage site efficiently, the process that should be deliberated systematically is shown in Figure 2.2

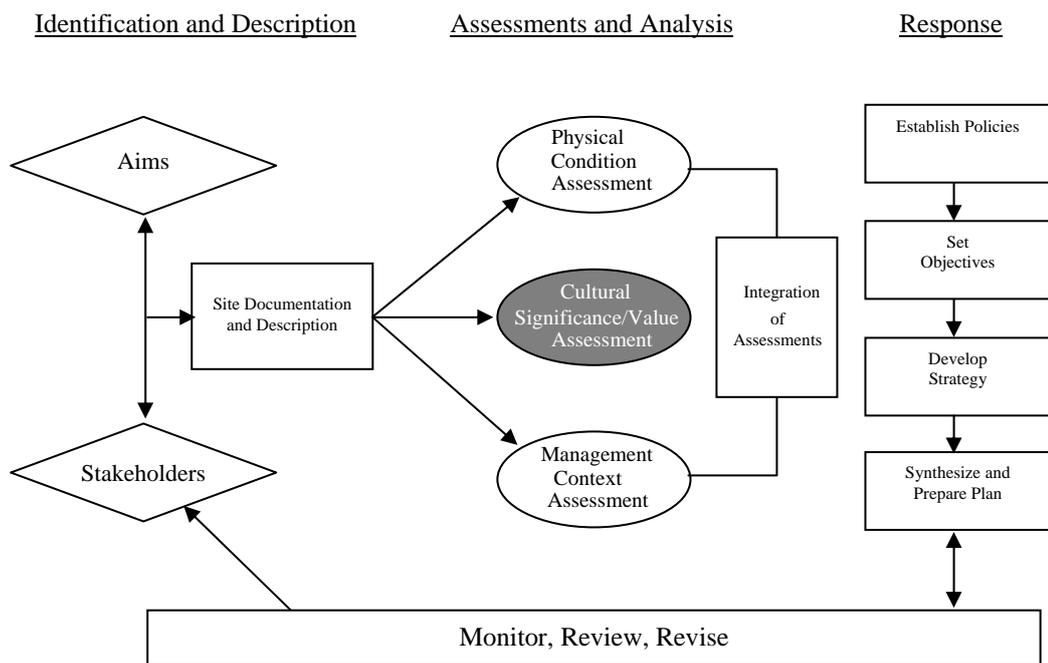


Figure 2.2 Planning Process Methodology of Valuation Based Conservation

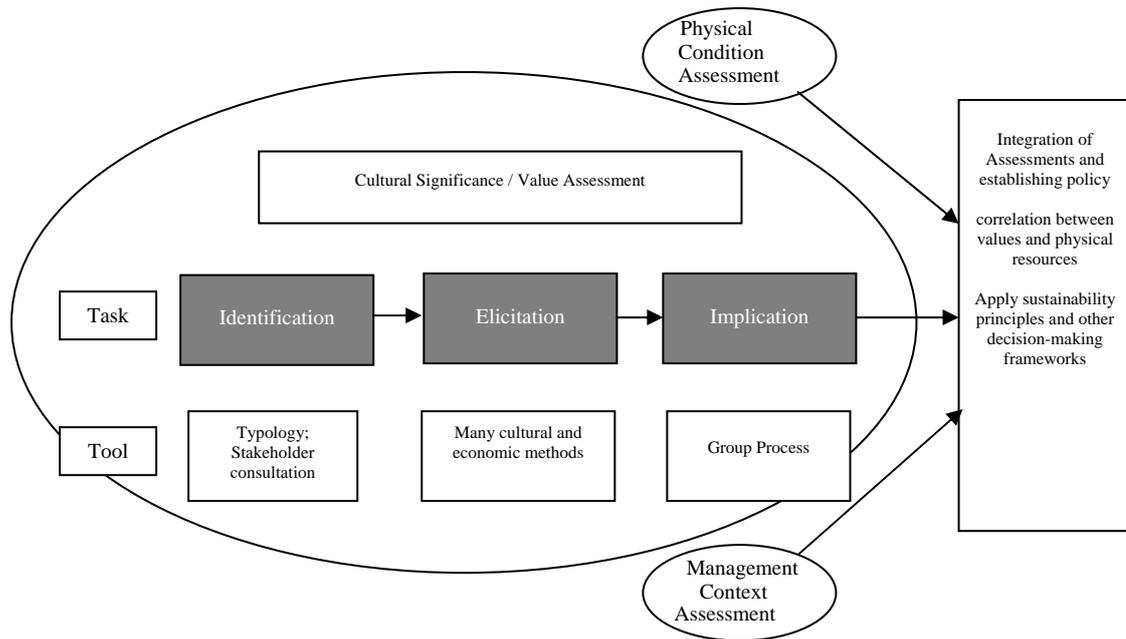


Figure 2.3 Cultural Significance / Value Assessment

According to Figure 2.2 and Figure 2.3, in the value assessment process, the following three issues which have to be considered are;

1) **Identification:** The roles and priority of each stakeholder are the essential issue in value assessment. Therefore, identifying the stakeholders and encouraging them to participate in cultural heritage value assessment is inevitable step. As it is believed that if all relevant stakeholders are brought into the valuation process, it will improve both accuracy and efficacy of the result. Vice versa, if certain relevant stakeholders are ignored, the estimated value of such cultural heritage is possibly incorrect and unreliable.

2) **Elicitation:** The appropriate economic method should be selected prudently in order to elicit the values of a particular cultural heritage. The methods used in valuing environmental resources are often applied in valuing cultural heritage site.

3) **Implication:** After the concealed value of a typical cultural heritage is revealed, it is extremely essential to apply the assessed value into the decision making or policy formulation process. Each determinant should be explained as to how it influences the value of such cultural heritage and the issues that are associated

with administrative context will consequently be proposed. Such issues include some practical issues for example, financing, roles of relevant organizations, proposed regulatory framework and government subsidies. Notwithstanding, to propose the recommendations that can be practically employed on the ground, the physical conditions of the assessed cultural heritage site and the estimated result from the valuation process have to be simultaneously deliberated.

With regard to environmental economic foundation (Ready and Navrud, 2002: 10-11), the value of a good is defined as either 1) the amount of money that the consumer is willing to pay to obtain the good (willing to pay, WTP) or 2) the amount of money that the good's owner is willing to accept in exchange for the relinquishment of the good's ownership (willing to accept, WTA).

If we let Q^0 represent a current physical condition or status quo of the cultural heritage site and Q^1 represent latter physical condition of cultural heritage site that is changed from the status quo, then we can value the difference between Q^0 and Q^1 .

The individual's utility function, individual's wealth or income, Y and physical states of the cultural heritage site (Q^0 and Q^1) have to be applied to examine the value of the difference between Q^0 and Q^1 (WTP). The individual's utility is given by $V(Y, Q)$. In cases where an individual is willing to pay for a change from Q^0 to Q^1 , then the maximum amount of money that individual is willingly to give up in order to achieve Q^1 instead of Q^0 is given by:

$$V(Y, Q^0) = V(Y - WTP, Q^1)$$

As per the afore-mentioned, the cultural heritage goods cannot be traded in the markets with the normal price mechanism and it is rational enough to be considered public goods because 1) the benefits generated by cultural heritage goods are non-rival in consumption. This means two different individuals can enjoy sightseeing at the cultural heritage site at the same time without significant annoyance to each other; 2) the cultural heritage site cannot ultimately rule an individual out of enjoying the cultural heritage site. This means all people have the right to access the cultural heritage site. Although there is some degree of excludibility for example, entrance

fees, access quota policy, these schemes cannot utterly prevent people who would like to enjoy sightseeing at the cultural heritage site from visiting the site.

With regard to the two above - mentioned conditions, the market does not work to provide an appropriate supply of cultural heritage goods in the market and the price mechanism cannot properly work to balance the demand and supply of such cultural heritage goods. This means the real price of cultural heritage goods is no longer directly observed through the normal market exchange. Therefore, non-market valuation will be an essential tool to figure out this situation. In principle, non-market valuation consists of two categories which are:

1) Reveal preference technique is the valuation techniques of a non-market good by examining how an individual responds or behaves under the influence of specific cultural heritage goods or environmental goods. The individuals' behavior will reveal the authentic value of such cultural heritage goods or environmental goods they perceive. The commonly used reveal preference methods are Travel Cost Method and Hedonic Pricing Method (Boyle, 2003: 259, Ready and Navrud, 2002: 12, Mourato and Mazzanti, 2002: 54-55).

2) Stated preference technique is a type of non-market valuation method by allowing respondents to directly state their perceived value on typical cultural heritage goods or environmental goods under hypothetical situation (Ready and Navrud, 2002: 20). Contingent Valuation Method (CVM) is the most often used stated preference technique. It discovers the total value of a particular heritage site by allowing individuals to express their willingness to pay for it. Currently, this method is often applied in heritage conservation projects because it can convert the qualitative perception of respondents into a quantitative value (Mason, 2002: 22).

Contingent valuation method (CVM) is the most popular stated preference technique. It can be applied to assess the economic feasibility of public policies for the improvement project of the environmental quality and it can also be applied to a conservation or restoration project of a cultural heritage site. Based on welfare economics, CVM assumes that the amounts of money stated by respondents that are related to respondent preferences toward specific cultural heritage goods under an assumed hypothetical situation. In addition, CVM is able to gather all kinds of benefits from cultural heritage goods, including non-use values. With regard to

cultural heritage site conservation, cultural heritage goods arguably generate considerable non-use benefits. No matter whatever reasons are cited, these non-use benefits cannot be ignored in the valuation process (Mourato and Mazzanti, 2002: 55, 59). Importantly, National Oceanic and Atmospheric Administration (NOAA) panel attested that CVM studies could produce estimates that are reliable enough to be used in a judicial process of natural resource damage assessment including non-use values (Arrow, 1993: 4602). Therefore, CVM is considered one of the appropriate valuation techniques to assess the authentic value of a particular cultural heritage site.

With regard to CVM survey disciplines, CV questionnaires possess some distinct features from ordinary questionnaires as follows (Boulier and Goldfarb, 1998: 11-15).

- 1) Questionnaires contain the hypothetical situation of environmental good or cultural heritage good that are not traded in the market.

- 2) Respondents will be asked to make a decision on monetary evaluation of the condition change of typical environmental goods or cultural heritage goods in a hypothetical situation.

The design of a CV questionnaire consists of three stages. The first stage consists of identifying the good to be valued, creating the hypothetical scenario, and preparing the appropriate value elicitation format and willingness-to-pay question. In the second stage, questions on attitudes and opinions toward the good to be valued and questions on respondents' socio-economic characteristics will be prepared. The third stage consists in pretesting the draft questionnaire to make sure that the content, question wording and question format are understandable by respondents (Bateman et al., 2002: 112). These above-mentioned stages are exhibited in Table 2.5.

Table 2.5 Stage of CV Questionnaire Design

Stage	Topic	Description
1.	Formulating the valuation problem	Identifying the policy change to be valued Writing a meaningful and understandable valuation scenario. Choosing an elicitation format (open ended, payment card, dichotomous choice) and asking the WTP question.
2.	Selecting additional questions	1) Questions on attitudes, perceptions, and opinions 2) Questions on socio – economic characteristics
3.	Pretesting the questionnaire	1) Focus groups 2) One-to-one interviews or interview in depth 3) Field pilot or pretest

Fisher (1996: 19) stated that the issue that researchers have to remind themselves of when deciding to apply CVM in the valuation of environmental goods or cultural heritage goods is incentive compatibility. Incentive compatibility will occur when respondents feel that they will obtain some incentive to overstate or understate the willingness to pay money for environmental goods or cultural heritage goods. For example, when a donation is used as a payment vehicle in CV questions, respondents have an incentive to overstate the WTP amounts in the survey to make sure that the environmental good or cultural heritage good is still provided. After the environmental good or cultural heritage good is still provided, they will not donate as previously stated and they can freely use that good as a free rider. To potentially avoid this problem, the use of a tax or an entrance fee as a payment vehicle in the WTP questions should be considered rather than a charitable donation. Moreover, the problem of embedding should be also concerned. This problem will occurs when the respondents cannot separate the conservation value of one cultural heritage site out of the whole value of all the historical sites in a region. Therefore, the pretest of questionnaires is an extremely necessary process that has to be done in order to reduce the serious effects of the embedding (Bateman et al., 2002: 112).

2.2.3 Contingent Valuation of Cultural Heritage Sites

People derive a lot of benefit from cultural heritage. If they visit a typical cultural heritage site, they probably obtain use benefits in the form of educational, recreational and aesthetic values. In addition to use values, a cultural heritage site might generate values even to those who do not visit the site. Non – use value includes benefits that people enjoy because they know the site is being preserved. People probably desire the others have the opportunity to visit (altruistic values) and some people might gain benefit from site preservation for future generation (bequest values) or themselves who are the current non – visitor may have the chance to become a visitor in the future (option values). Simply, people might be motivated by a desire that the site be preserved, even if none ever actually visits it (existence values) (Ready and Navrud, 2002: 7).

The answer to the question “Why value cultural heritage?” is that organizations whose duties to protect and preserve cultural heritage sites from the ravages of weather, pollution, development and even use by the public have to deal with the following questions (Ready and Navrud, 2002: 3).

- 1) Should preservation and restoration efforts be supported by tax revenues?
- 2) Should cultural heritage goods be self-supporting, either through entrance fees or donation?
- 3) What is the proper level of expenditure on cultural heritage?

So far, there are limited stated-preference studies of cultural heritages. The majority of the studies come from Europe (55%). Some 23% of the studies were carried out in the US and Canada (Mourato and Mazzanti, 2002: 60). Almost all these studies deal with the purpose of conservation or restoration of cultural assets from the ruin of weather, pollution or urban development. However, heritage interpretation programs contain a lot of benefits of conservation including the enrichment of visitor experience, enriching the public support, arousing citizen concern and assisting the people in gaining the sense of belonging to such cultural heritages. In economic terms, these afore-mentioned benefits enhance people’s utilities and increase the non - market demand from the public for given heritages (Carver et al., 2003: 88). That is the main reason behind this CV study of cultural heritage interpretation of Ayutthaya Historic City.

Seenprachawong (2006: 13-22) assessed the value of restoring the historic temple in the central region of Thailand. A contingent valuation (CV) survey with close-ended questions was carried out and two payment vehicles including the amount of a one-time surcharge in income tax and a one-time voluntary contribution (donation) were used. Furthermore, this research explored the question of whether respondents are able to identify their values for two temples versus their values for ten temples. It was found that respondents did pass this scope test that means the respondents will pay more for a greater number of restored temples. The study indicated that it does not matter if the payment vehicle is in the form of income tax or a donation. It was found that an individual is willing to pay 214 Baht in a one-time income tax surcharge or 243 Baht as a voluntary donation to finance the preservation program of ten historic temples. Income was an important factor that complies with the economic theory, a high-income respondent had a higher WTP than a low-income respondent. A higher-educated respondent had a higher WTP than the lower-educated. The attitude towards the decision to preserve the temples was not found statistically significant. Moreover, it was also found that male respondents had a lower WTP than female respondents and older respondents had a lower WTP than younger ones.

Pollicino and Maddison (2002: 53-66) valued the impact of air pollution on Lincoln Cathedral in the east of England. This study used the double bounded dichotomous-choice technique with and the chosen payment vehicle was an increase in annually paid household taxes to pay for the shorter cleaning cycle from the 40-year cleaning cycle to the 10-year cleaning cycle. This study founded that starting-point bias exists. The mean willingness to pay of people was £49.77 per household per year. It is found that the coefficients of all attitudinal variables are correctly signed but their significances are marginal. With respect to socio-economic variables, it is seen that apart from income and the dummy variable for local people, no other socio-economic variable was significant.

Tuan (2006: 1, 18-25) estimated the economic benefits that would be produced by a restoration and preservation plan for the World Heritage Site of My Son Sanctuary in Vietnam. This study used the single bounded dichotomous choice questions and the payment vehicle was entrance fee for visitors, while for non-visitors it was a tax. The mean WTP estimates vary among four groups of respondents. Amongst visitors to My Son, foreign visitors would be willing to pay much more than

Vietnamese visitors (foreign visitors would be willing to pay \$8.78 and Vietnamese visitors \$1.67). For foreign visitors to My Son, most of the variables in the model had the expected signs and were significant. With Vietnamese visitors to My Son, the following variables had the expected signs and were significant.

Kim et al. (2007: 317-321) estimated the use value of a World Heritage Site of Changdeok Palace in Korea. The type of question was closed-ended (or dichotomous choice). The mean WTP values were 5,706 Won (\$5.70) in a log-linear model and 6,005 Won (\$6.00) in a log-logit model. The payment vehicle was admission price. In a linear-logit model, price bids, income, perception on the level of current admission price, perception on visit value for the paid admission price, satisfaction with the level of current admission price at this site and belief in a high level of attachment to cultural heritage tourism resources were significant at the .01 level or the .05 level. In a log-logit model, Log (price bids), perception on the level of current admission price, perception of visit value for the admission price and the level of attachment to cultural heritage tourism resources were significant at the .01 level whereas Log (income) and satisfaction with the level of current admission price to this site were significant at the .05 level.

Mourato et al. (2002: 68-85) estimated the value of Bulgarian Christian-Orthodox monasteries in Bulgaria. This study was used open-ended CV question and the CV program would be financed through increased taxes. Income and age are found to be significant determinants of WTP with the value of conservation varying positively with income and inversely with age. Attitudes and perceptions also have a strong influence over willingness to pay with those who feel a sense of responsibility over heritage preservation willing to pay more. As expected, those who visited a larger number of monastery attributed a higher value to preservation. Besides, according to the econometric model, those who were willing to pay a positive amount for monasteries preservation were prepared to pay on average BGL3,203 (US\$6.4) per household per year. Average over the whole sample yields a mean WTP of BGL1,943 (US\$3.9) and a median of BGL500(US\$1). The expected willingness to pay from the Tobit model equals US\$0.64.

Table 2.6 below presents and overviews the studies valuing, mainly historical buildings, monuments and cultural sites. All of these studies apply the contingent

valuation method which contains the advantage of measuring both use and non-use values arising from cultural capital.

Table 2.6 Overview of Contingent Valuation Studies of Cultural Goods

Authors	Cultural Asset	Type of Value	WTP (US\$)	WTP Definition	Sample Size
Mourato, Kontoleon and Danchev, 2002	Bulgarian monasteries	Value of preservation	0.6-1.00	Household, Annual, Open-ended question, Tax	487 (all Bulgarians)
Pollicino and Maddison, 2001	Lincoln cathedral, UK	Value of aesthetic changes due to air pollution	1-2 (per year of soiling)	Household, Annual, Dichotomous-choice question, Tax	328 (Lincolnshire residents)
Mourato et al., 2001	Surrey History Centre, UK	Total value	29 (Users) and 14.5 (Nonusers)	Household, Annual, Payment card, Tax	60 (Pilot)
Mourato et al., 2001	Hulton Getty Picture Library, UK	Value of preventing deterioration	7 (Nonusers)	Household, Annual, Payment card, Tax	35 (Pilot)
Santagata and Signorello, 2000	Napoli Musei Aperti, Italy	Total value	11 (Users) and 4 (Nonusers)	Individual, Annual, Open-ended question and Dichotomous-choice question, Donation	468 (Naples residents)
Hett and Mourato, 2000	Machu Picchu, Peru	Value of access	26-47 (Citadel), 35-62 (Inca Trail) and 6 (Cable car)	Individual, per visit, Payment card, entrance fee	711 (Citadel) and 303 (Inca Trail)

Table 2.6 (Continued)

Authors	Cultural Asset	Type of Value	WTP (US\$)	WTP Definition	Sample Size
Holt, Elliott and Moore, 1999	St. Louis public libraries, USA	Total value	4	Household, Annual, Open-ended question, Tax	236 (Public), 75 (Teachers) and 25 (Business)
Whitehead, Chambers and Chambers, 1998	St. Genevieve Academy, Missouri, USA	Preservation value	5-6	Individual, one-time, Payment card, Donation	132 (Missouri residents)
Roche Rivera, 1998	Colón Theatre, Buenos Aires, Argentina	Value of rehabilitation	58	Individual, Annual, Dichotomous-choice question, Tax	3,036 (Buenos Aires residents)
Riganti and Willis, 1998	Campi Flegrei archaeological park, Naples, Italy	Value of conservation	216	Individual, Annual (5 years), Dichotomous-choice question, Donation	480 and 422 (City residents)
Carson et al., 1997	Fes Medina, Morocco	Non-Moroccan value of rehabilitation	38-70 (Fes visitors), 22-31 (Morocco visitors) and 6-17 (Europe nonvisitors)	Individual, Per trip (Visitors)/ One-time (Nonvisitors), Dichotomous-choice question, Tax	471 (Fes visitors), 126 (Morocco visitors) and 30 (Experts)
Scarpa, Sirchia and Bravi, 1997	Rivoli Castle, Italy	Valuing the right to access at present charges	28-33	Individual, Annual, Dichotomous-choice question, Donation	1,323 (Visitors)

Table 2.6 (Continued)

Authors	Cultural Asset	Type of Value	WTP (US\$)	WTP Definition	Sample Size
Garrod et al., 1996	Historical buildings in Grainger City, Newcastle, UK	Value of renovation	16-22	Household, Annual, Open-ended question, Tax	217 (City residents)
Powe and Willis, 1996	Warkworth Castle, UK	Value of visitor benefits	4	Individual, Per visit, Open-ended question, fee	201 (Visitors)
Hansen, 1997	Royal Theatre, Copenhagen	Value of continuing current activities	9-24	Individual, Annual, Open-ended question, Tax	1,843 (Danes)
Willis, 1994	Durham Cathedral, UK	Value of access	1.4	Individual, Per visit, Open-ended question, fee	92 (Visitors)
Martin, 1994	Musée de la Civilisation, Quebec, Canada	Total value of Quebec museum	8	Individual, Annual, Open-ended question, Tax	1,231

2.3 Sustainable Tourism

The concept of sustainable development was first mentioned by the International Union for the Conservation of Nature and Natural Resources (IUCN, 1980) and sustainable development was defined as the development that meets the needs of the present generation without taking advantage of future generations. The development of the present generation will not compromise the possibility of development that will occur to meet the next generation's needs (WCED, 1987: 43).

To apply the concept of sustainable development in the domain of tourism, the definition of sustainable tourism should be tourism development that meets the needs

of present visitors and hosts while the conservation has to be done for future visitors and hosts. This means the economic value, recreational value and social value from tourism have to be fulfilled, while cultural integrity, socio-cultural authenticity of host community, ecological conditions, biological diversity and economic potential have to be simultaneously maintained (Torrent: 2008: 884-885).

Tourism can be considered sustainable if 1) The tourism policy is concerned with the wellbeing of future generation; 2) fair allocation of economic benefits is done; 3) the conservation is simultaneously done with the tourism development; 4) communities and society have to participate and cooperate with the tourism policy (Lane, 2005: 13-15; Cruz, 2005: 82; Liu, 2003: 472; Bramwell and Lane, 1993: 1-2; Cater, 1993: 85-90). Community involvement is the most essential element of sustainable tourism (Sautter and Leisen, 1999: 325-326). Community has to take part in development – control policies and relevant regulations for example, land zoning, visitor quotas and closed periods. In addition to regulation, education for visitors and other stakeholders is also an important program to let them know the information and knowledge about the tourism site. The primary objectives of education are to cultivate good behavior and attitude in visitors and stakeholders. However, to accomplish sustainable tourism with the afore-mentioned statements, appropriate continual tourism investment is needed. Restoration, conservation, tourism infrastructure improvement, tourism promotion and administration need fund. The lack of funding is a chronic problem in tourism development. Therefore, funding and budgeting have to be inevitably taken into account in implementing sustainable tourism policy (Choi and Sirakaya, 2006: 1281-1284; Briassoulis, 2002: 1081-1082).

Pedersen (2002: 24-25) stated that current tourism has common trends that can be shown as follows

- 1) Visitors are more interested in environmental protection and cultural conservation;
- 2) Cultural tourism seems to be expanding and visitors would like to gain cultural experience during their trips.
- 3) Visitors tend to seek more information and knowledge about the tourism site.

With regard to current tourism trends, it is a good prospect to earnestly promote and implement a sustainable tourism policy in both ecotourism sites and cultural heritage sites. In cases where sustainable tourism policy is neglected, the tourism will gradually endanger the communities, culture integrity, socio-economic characteristics of the tourism sites and itself (Pedersen, 2002: 32-34).

In the case of World heritage sites, Pedersen (2002: 46-47) proposed that tourism policy must be aligned with authenticity value and the social and cultural context of the site. Therefore, the tourism policy should be composed of the following aspects.

1) Tourism policy has to generate and sustain local employment and revenue allocation between entrepreneur and local people has to be fair.

2) Tourism campaigns permitted at the site have to comply with the tradition, culture and way of life of local communities.

3) Tourism should provide the education and information to visitors and local communities to enhance their appreciation of the site's values and inspire them with positive attitudes toward the existence of the tourism site.

4) Tourism policy has to provide the appropriate infrastructures for visitors, especially safety infrastructure. Simultaneously, the conservation and restoration of the site has to be done.

The cooperation among government, local community and tourism industry is essential for sustainable tourism. However, a tourism development unavoidably produces certain negative effects but the concept of sustainable tourism will mitigate the negative impact of tourism without sacrificing its benefits. A community should focus more on the ecological sustainability and cultural integrity. Government should play the role as a regulator to materialize the fair allocation and equity of tourism development among stakeholders whereas tourism industry should emphasise economic sustainability at the tourism site (Alampay, 2005: 4-5; Mckercher et al., 2004: 394; Drost, 1996: 479). The conceptual framework of cooperation among government, local community and tourism industry is exhibited in Figure 2.4.

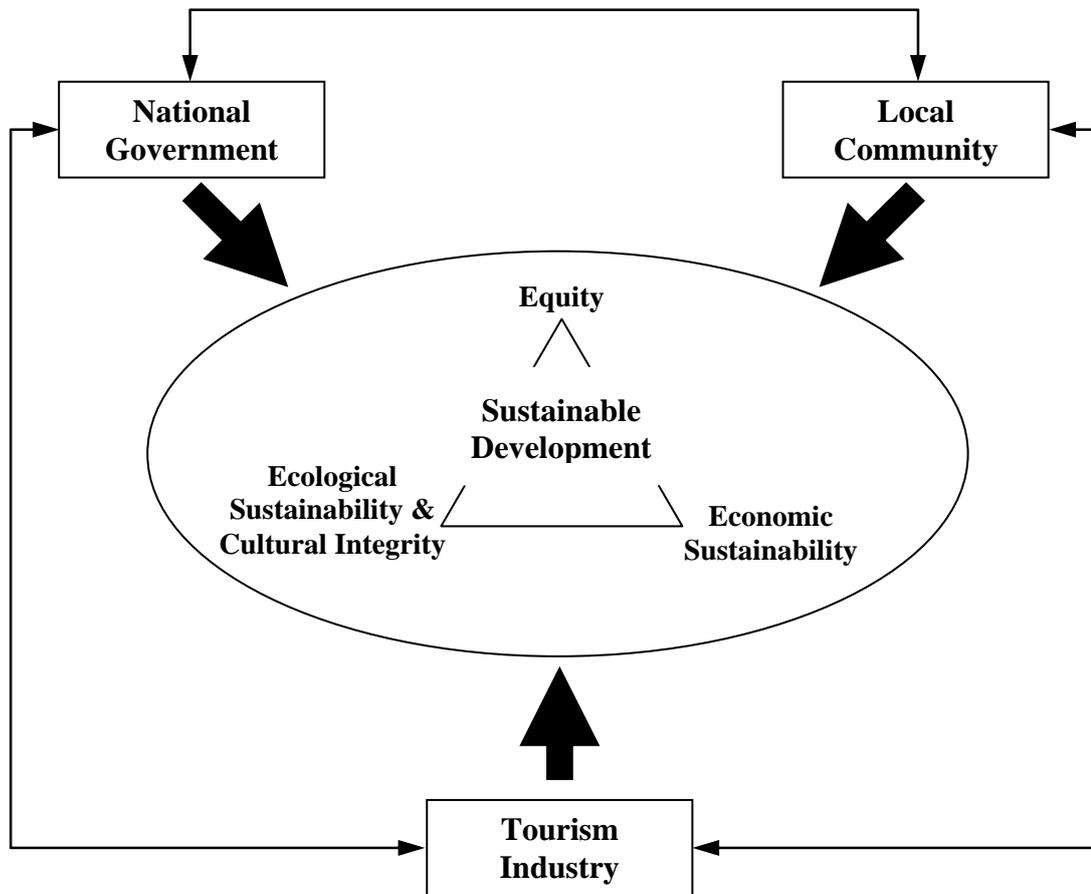


Figure 2.4 Conceptual Framework for Research on Sustainable Tourism Development

2.4 Thailand's Tourism Policy

According to the website of the Tourism Authority of Thailand (TAT), Thailand had the obvious policy in promoting tourism earnestly in 1924 when a department was established under the Authority of Royal State Railways in order to service and provide tourism information to the foreign visitors and tourists who would like to travel in Thailand. In 1959, Tourism Organization of Thailand was established to promote tourism in Thailand. Due to the fast growth of the tourism industry in Thailand, the Tourism Organization of Thailand then was upgraded to be the Tourism Authority of Thailand in 1979. In 2010, the Tourism Authority of Thailand reported a total of 156,437,103 visitors that consists of 122,522,114 Thai visitors and 33,914,989

international visitors. The growth rate from 2009 of the number of total visitors, Thai visitors and international visitors are 25.28%, 25.02% and 26.22% respectively. For tourism revenue, the total tourism revenue in 2010 was 904,376.06 million Baht that consists of 402,574.39 million Baht from Thai visitors and 501,801.67 million Baht from international visitors. The growth from 2009 of total tourism revenue, domestic tourism revenue and international tourism revenue are 26.29%, 52.04% and 11.18% respectively. The huge growth rate of domestic tourism revenue reflects its gigantic potential.

Regarding tourism information of Ayutthaya province, Ayutthaya province as compared to other provinces in the central region of Thailand is regarded as the province which has the most visitors annually. In 2010, the number of total visitors of Ayutthaya province is 6,534,638 visitors and that is composed of 5,151,247 Thai visitors and 1,383,391 international visitors. Surprisingly, the growth rate of the number of visitors from 2009 is significantly tremendous. The growth rate of Total visitors, Thai visitors and international visitors are 82.37%, 90.55% and 57.22% respectively. Correspondingly, the total tourism revenue in 2010 rose up to 9,943.32 million Baht that consist of 7,060.41 million Baht of Thai visitors and 2,882.91 million Baht of international visitors. Definitely, the growth rate of total tourism revenue, domestic tourism revenue and international tourism revenue in Ayutthaya province are reportedly 125.43%, 146.57% and 86.30% respectively. With regard to this above mentioned information in tourism of Ayutthaya province, the tourism in Ayutthaya province, especially domestic tourism has considerable potential and ignorance should not be acceptable.

Regarding the tourism policy of the Tourism Authority of Thailand, Sustainable tourism is the mainstream principle in policy formulation. The details of the policy can be briefly as follows.

- 1) Tourism is regarded as an important economic instrument to generate employment for people and revenue for the community and country.
- 2) Tourism promotion should take a role in creating quality visitors. At the same time, domestic travel should be vigorously supported.
- 3) The awareness of environment's conservation and pride of uniqueness of Thai culture will be cultivated in Thai visitors.

4) Tourism promotion should encourage visitors to visit other unpopular tourism sites in order to reduce congestion in well-known tourism sites.

5) Cooperation and participation among government, local community, non-profit organizations and the tourism industry should be created in the tourism policy.

In addition to the tourism policy of the Tourism Authority of Thailand, sustainable tourism was incorporated into both 10th (2007-2011) and 11th (2012-2016) national economic and social development plan in the session on the service sector. The major objective of sustainable in the plan is to develop a sustainable economy in the country. Also, the term of cultural tourism was mentioned in the plan (Office of National Economic and Social Development Board, 2006: 83-84; Office of National Economic and Social Development Board, 2011: 81). From the economic perspective, cultural tourism has the ability to improve income distribution and generate income to the community with less leakage of expenditure out of the local economy. Furthermore, local reliance based service, local employment and local trade are the outstanding economic benefit of cultural tourism (Malhotra, 2005: 36-45).

According to the above-mentioned policies and tourism growth information of Ayutthaya province, the development of domestic tourism or local tourism, especially cultural tourism can be regarded as an important instrument to materialize sustainable tourism in Thailand. Furthermore, cultural tourism is able to make Thai people realize the valuable things like cultural integrity and pride of Thai uniqueness because it has potential to provide Thai visitors not only use value, like recreational value but it can also provide the visitors with invaluable non-use value for example, cultural value, historical value, social value, spiritual value. Hopefully, it is expected that after these values are embedded in Thai visitor minds, they will be willing to collaborate together in other cultural conservation programs, whenever they have an opportunity to do so.

2.5 Cultural Heritage Tourism

Cultural heritage tourism is defined as movements and activities of visitors in both tangible and intangible cultural attractions for example, historic sites, archeological vestiges, antiques, traditions and folklore outside their normal place of residence with

the intention to gather cultural motivation, information and experience (Mckercher and Cros, 2002: 4; Ivanovic, 2008: 77; Prentice, 1994: 312; Timothy and Nyaupane, 2009: 3; Poria et al., 2001: 1048).

Basically, tourism development is often believed to possibly jeopardize the cultural integrity, cultural authenticity of cultural heritage sites. However, several researches identify that appropriate tourism policies can support the conservation project of the cultural heritage sites (Henderson, 2002: 254). The destination focusing only on conserving the existing of historic site and community's way of life with regardless of tourism exploiting would fail in business purpose that can provide the adequate fund to sustain the conservation project. Conversely, the destinations that attempt to achieve only tourism business goals would confront with the deterioration of culture and tradition. Therefore, the government or the relevant organizations have to implement both appropriate tourism promotion and suitable cultural heritage conservation at the same time (Li, 2003: 258).

Drost (1996: 482) stated that one of the goals of World Heritage Listing is to encourage the understanding and sharing of experiences among people regarding important heritage sites located across the world. To achieve that goal, although the development of tourism is essential, it should be implemented without sacrificing the uniqueness and authenticity of that heritage site. Both education and regulation are considered important approaches to achieve both tourism and conservation purposes. If both education and regulations are appropriately implemented, the people will not feel only they would like to visit the cultural heritage site for recreational purpose but they will also have a sense of belonging and would like to participate in the conservation project to keep the cultural heritage site in good condition sustainably (Uriely et al., 2002: 861). In fact, cultural heritage tourism and conservation promotion should be done in the perspective of domestic tourism, instead of international tourism because the local visitors can perceive more non-use values, especially cultural value, spiritual value, ethnic value and existing value as compared to foreign visitors (Peleggi, 1996: 445; Park, 2010: 132). Therefore, the first priority of cultural heritage tourism and conservation should be done by focusing on local people instead of foreign visitors.

Nuryanti (1996: 257-258) and McManus (1997: 97-98) examined the roles of cultural heritage tourism. The cultural heritage tourism can provide valuable nostalgia to the visitors and encourage them to have a notable experience of the past. The appropriate direction of cultural heritage tourism should focus on the accurate history of the past and narrative of traditional lifestyle of indigenous people. The authenticity, history context and traditional way of life can appeal to people who visit and spend the money for their tourism needs while their spending can benefit the communities and tourism facility improvement. Besides, it can be still considered the significant source of fund to conserve the cultural heritage site (Li, 2003: 258). To succeed the goal of cultural heritage tourism, heritage interpretive tools that are both of personal interpretation (for example, tourist guide and information staff) and nonpersonal interpretation (for example, information board, pamphlet and booklet) should be well administered. Unfortunately, they are poorly prepared especially, in developing countries. The involvement of public and private sectors, nonprofit organizations and communities is vitally necessary for heritage site administration that is the combination of conservation, gentrification, rehabilitation, renovation, restoration and tourism development.

Cultural heritage tourism offers certain advantages for conservation. Entrance fee, concession and donation can provide fund for restoration and conservation of cultural heritage sites (Pedersen, 2002: 11). With regard to entrance fee, the authorities should set the entrance fee to generate revenue to support local development projects but the entrance fee should not be so expensive that it prevents ordinary people from visiting the cultural heritage site. Too expensive entrance fees can be considered elitism and possibly conflict with educational purposes. Hazardously, if the entrance fee is too expensive for local people, they will feel that the existing of cultural heritage site is for visitors from other provinces only and it is not beneficial for local communities at all. This perception can cause a loss of local collaboration and will be a major obstacle in tourism development and cultural heritage site conservation. Therefore, multi-level entrance fee policy should be considered through raising fees for nonlocal visitors or, especially foreign visitors while reducing it for local people or students (Pedersen, 2002: 47). Donations can be considered a source of fund that it obtains from the visitors who voluntarily pay for the cultural heritage site but it

possibly confronts with the free riding problem. Certain visitors possibly access the cultural heritage site without paying. Moreover, the revenue from donations is not stable and the fluctuation of donations is a hindrance to cultural heritage site administration. With regard to concession fees, a concession fee is the revenue obtained from local people licensed to provide services to visitors. Although permitting people to sell products can help a community's economy, it probably causes a tourism problem in itself. Visitors possibly feel threatened by aggressive hawkers, or local vendors who cannot afford to pay for concession may use unauthorized areas to sell their products or services and this can jeopardize the discipline and orderliness of cultural heritage site (Pedersen, 2002: 73-74).

2.6 Heritage Interpretation

Interpretation is the translation of information to audiences in order to facilitate their correct comprehension and understanding of a particular thing (Ward and Wilkinson, 2006: 2-3). Therefore, Heritage interpretation can be regarded as an artful communication process to translate the facts and figures regarding tradition, culture, archaeology and history from scientist, culturalist and historian to visitors or laymen who access the cultural heritage site.

In addition to fact communication, heritage interpretation is provocative and inspirational. Good heritage interpretation can motivate the audiences to have a sense of belonging to the cultural heritage site, nostalgic experience and the impressive emotion of visitation. So far, heritage interpretation is defined in several perspectives and can be shown in Figure 2.5 below.

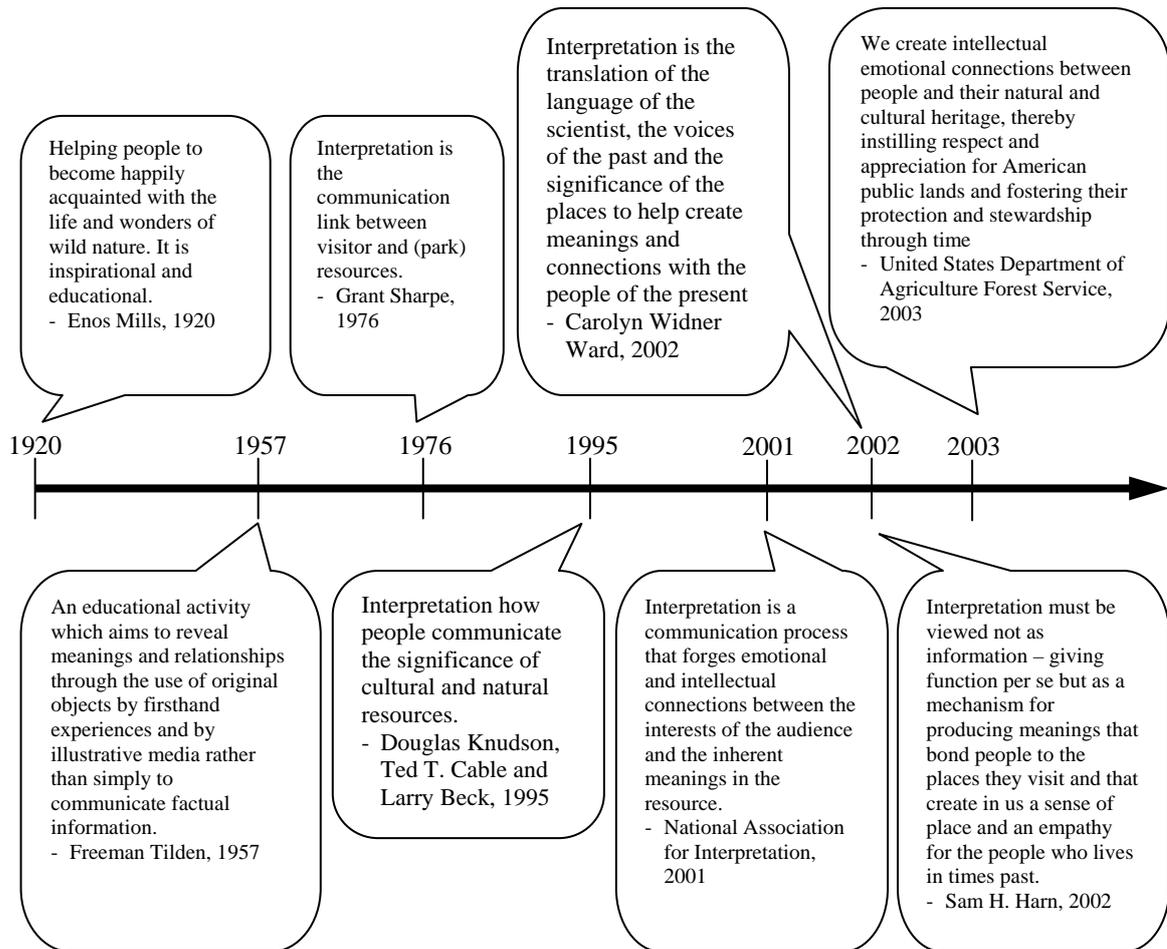


Figure 2.5 Interpretation Definitions through Time

Freeman Tilden, the father of modern interpretation, developed the principle of interpretation that is still used until today (Tilden, 2007: 2-18). Tilden stated that heritage interpretation is not an instruction or information provision but it is provocation based on accurate information. Moreover, the most effective heritage interpretation is to link what is being displayed or described during the visitation to the experience the visitor and to let them perceive and feel about whatever they know. The aim of heritage interpretation is not only the understanding of visitors but it is also the experience, feeling and inspiration based on that understanding.

Interpretation methods can be in the form of one or more of the following forms (UNESCO and Institute for Tourism Studies: IFT, 2007: 4-4) which are

- 1) Printed Information: brochure, pamphlet, booklet, guidebook, map;
- 2) Presentation: exhibit, signage, information board, video presentation, audio tour, website, sound and light show;
- 3) Tourist guide

However, Ward and Wilkinson (2006: 4-5) divided interpretation into two basic types, which are personal and non-personal interpretations. Personal interpretation is the interpretive services that use people to interpret contents regarding the tourism sites to visitors for example, tourist guide services, events and demonstrations. Non-personal interpretation is the interpretive services where visitors gain the tourism experience through provided media for example, information boards, exhibits, brochures, interactive multimedia and audio tour system.

As compared with personal-interpretation, Non-personal interpretation can provide the guide services to more visitors and is more economical. However, low quality of non-personal interpretation can lead to a notorious image of the sites. Therefore, a good quality and well-prepared condition of the non-personal interpretive instruments should be continuously maintained.

As already mentioned, Personal interpretation is direct person-to-person activities between interpreters and visitors. As a result, personal interpretation can be arranged to matches with the visitors and the interpreters can respond to the visitors' doubts and interests immediately. The well-trained interpreters and adequate number of interpreters are able to convey a more authentic experience to the visitors as compared to non-personal interpretive media. Likewise, poorly-trained interpreters, and poor preparation and presentation can leave dissatisfaction in visitors.

To achieve the goals of both cultural heritage tourism and cultural heritage site conservation at the same time, heritage interpretation is an important instrument because heritage interpretation is about communicating a cultural heritage site's values to visitors. Tourist guides and several interpretive tools can facilitate the understanding and appreciation of cultural heritage sites to the visitors and they can also inspire and motivate visitors to have a sense of belonging to the sites, they visit. After they experience and perceive the site's value, they will voluntary create their own public awareness of the importance of the cultural heritage site and will be

willing to participate in cultural heritage conservation programs (UNESCO and Institute for Tourism Studies: IFT, 2007: 4-3; Nuryanti, 1996: 254).

Futhermore, heritage interpretation is the key to ensure the quality of the tourism experience. Successful interpretation is important for both tourism management and site conservation. Reportedly, sustainable tourism will be formulated when tourism development and conservation are effectively and simultaneously implemented. That means heritage interpretation can be regarded as one of the processes to establish sustainable tourism (Moscardo, 1996: 376; Macdonald and Jolliffe, 2003: 309-310). There are two core goals of heritage interpretation that are 1) to enhance the visitor experience during their visitation to the cultural heritage site and 2) to ensure that the public will perceive the site's authentic value and voluntarily support any conservation projects. Effective heritage interpretation can relieve congestion through providing information of other historic sites and encourage visitors to visit unpopular historic sites by self-guided walking tours. Furthermore, well-prepared heritage interpretation can foster good behavior in the visitors and it is believed that well - behaved visitors, who perceive the authentic values of the sites will be willing to give the public support and collaboration in culutural heritage site's conservation programs (Moscardo, 1996: 378-379).

In addition to the tourism purpose for visitors, heritage interpretations are regarded as an important souce of knowledge for local people. If local people realize the history that lie behind their own residential area and really know the cultural background of their homeland, they will perceive the authentic values of cultural heritage site located in their residential area and they will feel that the existence of a cultural heritage site is a vital part of their community and way of life. Sense of belonging of local people is very important to generate community participation in any conservation program. Conclusively, heritage interpretation is not only for visitors but it is also extremely necessary for local people (Wager, 1995: 517; Kim et al., 2007: 317; Mason, 2002: 11; Garrod and Fyall, 2000: 702; Poria et al., 2003: 250; Prentice et al., 1998: 15-20; Fallon and Kriwoken, 2003: 305-306; Poria et al., 2006: 171-173; Choi and Sirakaya, 2005: 1284; Pedersen, 2002: 22-26; Vafadari, 2008: 266-267; Gilmore, 2007: 256).

The traditional model of interpretation based on Veverka (1994) and Cherem and David (1977) is shown in Figure 2.6. With regard to this traditional model, the available information of historic sites will be the origin of heritage interpretation. The objectives and techniques used in interpretation will be based on the available information regarding a particular historic site. The visitors just receive the information from the interpretation and feedback whether they are satisfied in providing the interpretation program or not. However, Jacobson and Marynowski (1998: 2-3) proposed that the appropriate heritage interpretation model should incorporate visitors into the interpretation process that is shown in Figure 2.7. The characteristics, attitudes, background knowledge about the historic site and socio-economic information of visitors should be taken into account in the design of interpretive techniques and services. The new model proposed by Jacobson will begin with cultural heritage management goals (both tourism and conservation) and understanding of visitor characteristics, attitudes, background knowledge about the site and socio-economic information. The heritage interpretation of Jacobson' model is to shift the existing knowledge, attitudes or behaviors of the visitors to the desirable stage in accordance with tourism development and the cultural heritage sites conservation policy.

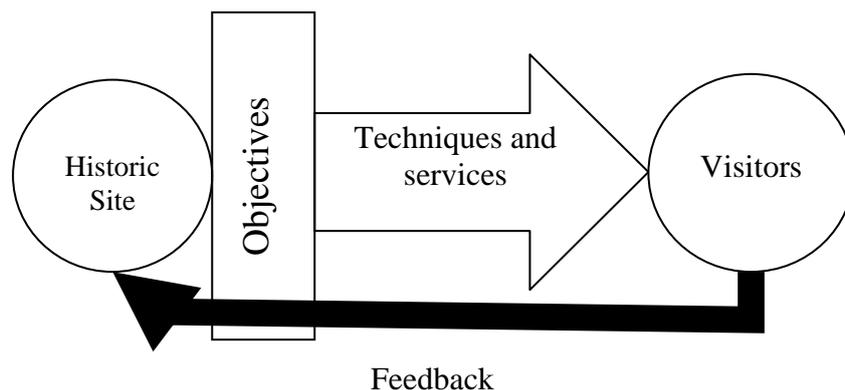


Figure 2.6 Traditional Model of Interpretation (after Veverka, 1994; Cherem and David, 1977)

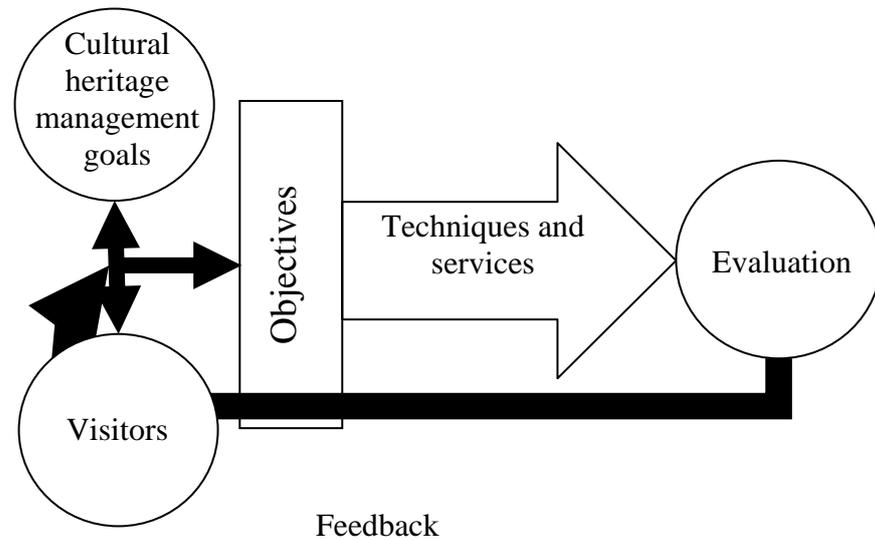


Figure 2.7 The Audience-Focused Model of Interpretation

The traditional interpretation model is not broad enough to fulfill cultural heritage management goals because visitors are varied. They can be local people or remote visitors from other provinces or foreign visitors. Although the heritage interpretation context has to be prepared based on facts but their techniques and formats have to be prepared to meet the characteristics, attitudes, background knowledge about the site and needs of each group of visitors (Jacobson and Marynowski: 1998, 4; Kohl and Eubanks, 2008: 64).

In the perspective of visitors, Moscardo (1996: 382-391) stated that mindfulness of visitors is the main criterion to evaluate the quality of heritage interpretation at cultural heritage sites.

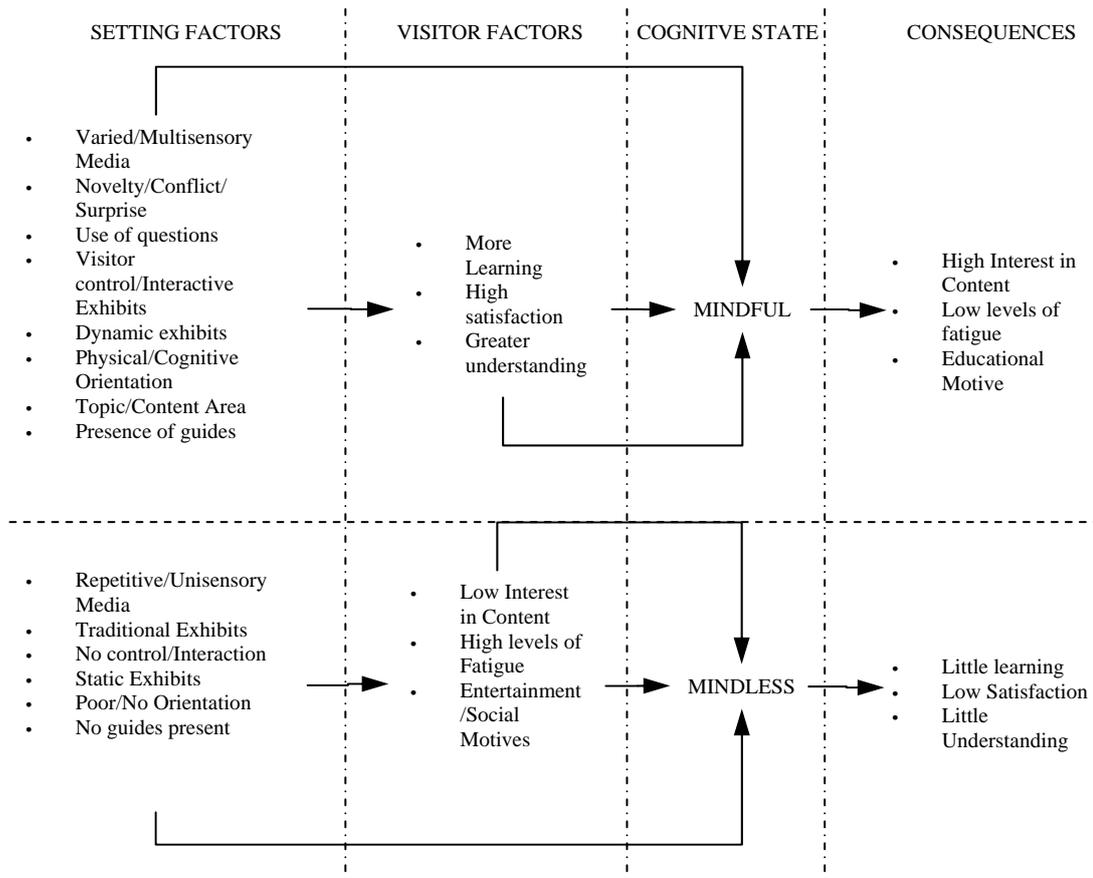


Figure 2.8 Mindfulness Model of Visitor Behavior and Cognition at Built Heritage Sites

Figure 2.8 describes a mindfulness model of visitor behavior at cultural heritage sites. Setting factor is the condition of each interpretive tool in cultural heritage site. Basically, the interpretive tools are composed of exhibits, signages and displays located around the cultural heritage site, printed materials for example, maps, guidebooks and pamphlets. The visitor factor is the visitor's motivation for visitation and attitudes toward the cultural heritage site. The combination of these two factors will determine whether visitors will be mindful or mindless. Mindful visitors will enjoy their visit, feel satisfied with their visit, spend longer time and more money, and learn more from their visit and also be more aware of their behavior in keeping the good condition of cultural heritage site.

To keep the visitors mindful of heritage interpretation, interpretive tools used in the interpretation process have to be designed in a format that can appeal to the

visitors. The effective interpretation and interpretive tools can be described with the following concepts.

1) Good heritage interpretation has to provide interaction between visitor and interpretive tools. Basically, visitors prefer interactive exhibits to traditional exhibits. They will spend more time and learn more from interactive exhibits than from static exhibits. Furthermore, the visitors also prefer a guidebook that is designed in the format of question-and-answer to the conventionally descriptive format.

2) The variety of heritage interpretive tools can attract the visitor's interest. Moving exhibits are more attractive than static exhibits. the visitors tend to spend more time and feel more interested in exhibits or objects that can be touched. Nowadays, various technologies can be incorporated into interpretive tools. It was found that video presentation or narrated visual presentation or audio tour or pre-recorded station stop or sound and light show are more effective and attractive than traditional wall display.

3) A tourist guide who always asks visitors questions and encourages discussion during the trip enable the visitors to learn more and feel more interested.

4) Visitors would rather use map and information board for self-guided tour than ask the staff, especially in a crowded situation.

Nevertheless, heritage interpretation is not always positive. It possesses both potentials and pitfalls (Bramwell and Lane, 2005: 20-25). Therefore, preparation of heritage interpretation has to be prudently done with the following potentials and pitfalls.

2.6.1 Potentially positive effects

2.6.1.1 Heritage interpretation can be used to encourage visitors to move away from vulnerable environments and crowded sites to other unpopular destinations. Therefore, the unattractive historic sites will be promoted and tourism revenue will be accordingly distributed.

2.6.1.2 Interpretive services can provide economic benefit to the community by attracting visitors to various places in the cultural heritage site and

encourage them to stay longer. Certainly, if the visitors stay longer, they will spend more (Pedersen, 2002: 73).

2.6.1.3 When visitors have more understanding of cultural heritage sites and the people who live there by well-prepared heritage interpretive facilities, they will be impressed with the quality of the site's condition and perceive its existing value. The visitors who have this awareness will be well-behaved visitors who are ready to encourage themselves to participate in any conservation programs to sustain the cultural heritage sites they were once proud to visit.

2.6.1.4 Appropriate interpretive services have to attract the communities to participate in any processes of interpretation. Community involvement can foster a sense of belonging of cultural heritage site in local people, especially the younger generation. In any conservation programs, the community involvement is regarded as a key success factor that cannot be ignored.

2.6.2 Pitfalls

2.6.2.1 Due to the limited spending time of visitors at a destination, interpretive services are sometimes not detailed and comprehensive enough. For some issues of cultural heritage site, there are several aspects regarding the site. Brief interpretation can possibly ignore certain meaningful aspects.

2.6.2.2 Overstated interpretation can distort the authentic value of cultural heritage site. Impressiveness based on misunderstanding is very hazardous for heritage interpretation.

2.6.2.3 Some interpretive activities that are held too often can intrude and threaten the way of life of local community. Furthermore, some interpretive services or facilities that are created for convenience and entertainment can probably imperil the condition of cultural heritage site.

2.6.2.4 History often involves political issues. If interpretation is done based on political interests without reliable facts and proven historic evidence, it can cause misunderstanding among people and social conflict.

2.6.2.5 If interpretative activities are too expensive, it will serve only the elite and breed of the mission of interpretation for society and people will gradually lose their ownership of a cultural heritage site.

According to all the above-mentioned with regard to interpretation, interpretation is extremely important for cultural heritage management. The interpretation can influence how visitors perceive the total value of specific cultural heritages and lead and provoke them to be aware of and participate in other conservation programs. Therefore, interpretation is an inevitable factor of cultural heritage management.

2.7 Heritage Interpretation Programs in Thailand

According to the Tourism Authority of Thailand's policies, cultural tourism will be therefore used as the significant mechanism to motivate Thai people to be aware and proud of Thai culture, tradition and uniqueness. At present, the Tourism Authority of Thailand gathered the database of tourism sites across Thailand and listed 1,515 sites as the cultural tourism sites. The majority of cultural tourism sites are Buddhist temples, ancient palaces and Buddhist related buildings for example, Ubosots and Viharns in historic temples. As known before, Buddhism is deemed to be a component of Thai society and culture. Therefore, the Buddhist ceremonies and traditional events are usually used as a scheme to attract visitors to visit these cultural tourism sites and these events can be regarded as the main heritage interpretation programs that have been frequently employed these days. However, the Buddhist ceremonies and traditional events are intermittently organized according to the religious and traditional festivals, such as Visakha Bucha Day, Loy Krathong festival and Songkran festival. Actually, although there are cultural and historic contexts included in the events, these events should be regarded as tourism promotion rather than heritage interpretation programs because these events are organized to attract more visitors to Ayutthya province in the festival period while the context regarding authentic values of the Historic City of Ayutthaya for example, its historic value and cultural value are not really focused on as they should. However, the important thing that should be kept in mind is that the Historic City of Ayutthaya belongs to all Thai people whatever religion they are. Therefore, the Buddhism context that is too often incorporated into the traditional events probably overwhelms other valuable contexts of the Historic City of Ayutthaya and it is possible to rule other people, who are not Buddhist out of the Historic City of Ayutthaya after all. Figure 2.9 shows some

traditional events held in Ayutthaya province. Normally, the tourists and visitors will find it enjoyable and be impressed with the activities and shows in the events but they actually gain less experience about the culture and history of Ayutthaya which is the core of heritage interpretation programs.



Figure 2.9 Traditional Events in Ayutthaya Province

In addition, although these traditional events can possibly be regarded as some kinds of heritage interpretation programs, it is impossible to frequently hold these

events because organizing these traditional events needs a tremendous budget. As a result, these traditional events can only be intermittently organized each year.

Currently, the traditional events are the heritage interpretation programs that are often used to promote cultural tourism in Ayutthaya province while other kinds of heritage interpretation programs such as information boards, information displays and tourist guide services, etc. are not earnestly utilized as often as they should be. (Pradech Payakwichian, 2007: 2; Pohnlapat Unapohm, 2013: 3).

According to the ICOMOS Charter for the Interpretation and Presentation of Cultural Heritage Sites ratified by the 16th General Assembly of ICOMOS, Québec (Canada), on 4 October 2008, heritage interpretation is an instrument that enables cultural tourism to be developed at the same time with conservation of cultural heritage site. To generate sustainable tourism, the seven principles of heritage interpretation were determined and exhibited below.

1) Heritage interpretation should be used to generate public awareness and engagement in the conservation programs of cultural heritage sites.

2) Heritage interpretation should be used to communicate the meaning and understanding of cultural heritage sites to their visitors and stakeholders.

3) Heritage interpretive programs and interpretive instruments should be implemented in compliance with the cultural settings and social contexts of cultural heritage sites.

4) Heritage interpretation should be used to preserve the authenticity of cultural heritage sites by communicating precise and accurate contents.

5) Long-term maintenance and good upkeep of the interpretive facilities have to be ensured and the interpretive contents should be regularly reviewed to ensure the appropriate communication.

6) The stakeholders of cultural heritage sites and associated communities should be engaged in the development and implementation of interpretive programs.

7) New technologies and continuous staff training should be used to maintain the quality of interpretive programs.

In conclusion, to meet the goal of heritage interpretation, besides the intermittent traditional events, the other types of heritage interpretation programs for example, information board, displays, brochure, and tourist guide services should be considered

for the tourists and visitors because these heritage interpretive tools are really important components to cultivate the awareness and ownership of the Hisotoric City of Ayutthaya in the visitors, especially Thai visitors and local peple and these are necessary for a heritage sites conservation and sustainable tourism.

CHAPTER 3

METHODOLOGY

In general, researchers traditionally use tourist spending during the visitation to a particular cultural heritage site to estimate the value of such an historic site (Carver et al., 2003: 84) but this principle does not adequately explain the total value of that cultural heritage site. Indeed, it is impossible to estimate the marginal value of heritage interpretation which is one of the important elements of cultural heritage tourism. As afore-mentioned in the last chapter, heritage interpretation should be considered a non-market good and its price cannot be observed through a market price. Although heritage interpretation is believed to be essential and important for both tourism and conservation purposes, it is often neglected when compared to other tourism facilities, especially in developing countries. In fact, information regarding the value of heritage interpretation can help decision makers a lot (legislators, agency administrators, local officials, etc.) in allocating an appropriate budget to provide, maintain and restore interpretive services in accordance with its value or importance.

Figure 3.1 illustrates an example of how one could determine the economic value of interpretation for a particular historic site. The vertical axis represents the value of willingness to pay (WTP) to conserve the historic site. The horizontal axis represents the number of respondents (users and non- users) who are willing to pay a particular amount to conserve the historic site. The line WTP w/i represents the maximum willingness to pay across individuals for the historic site without interpretive facilities while line WTP w/o is for cases where interpretive facilities are provided. To derive an economic value of heritage interpretation, the difference in the value of WTP function (WTP w/i-WTP w/o) can provide an estimate. Notwithstanding, in cases of poorly-prepared heritage interpretive facilities this value can be negative because $WTP\ w/i < WTP\ w/o$.

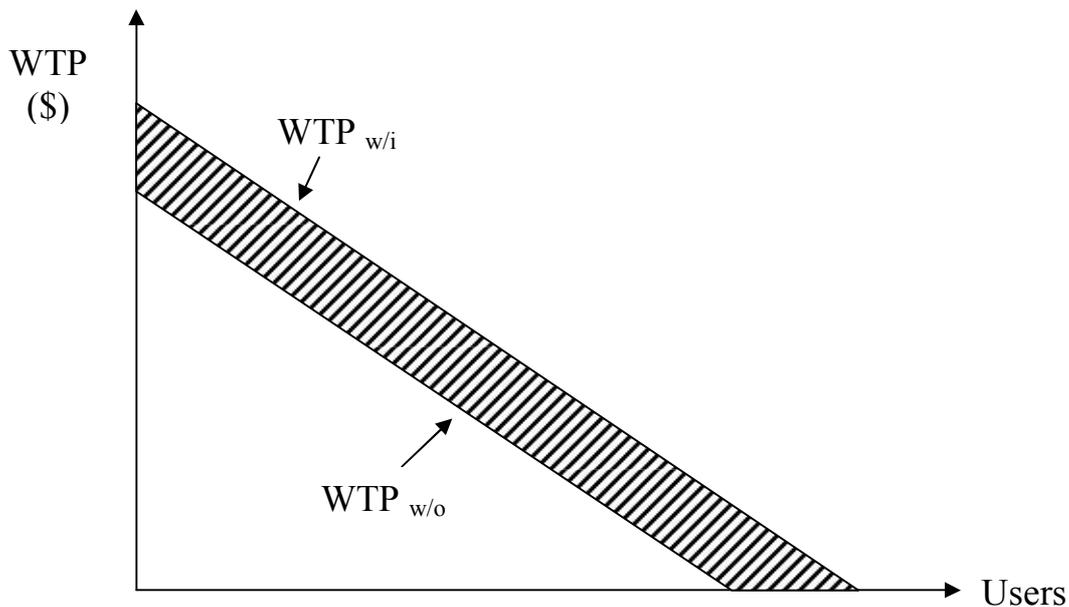


Figure 3.1 A Graphical View of the Value of Interpretation (Willingness to Pay)

Basically, stated-preference technique, especially CVM (Contingent Valuation Method) is often used in the field of environmental economic valuation. But in recent years, CVM has been adopted to apply to cultural heritage economics. Nevertheless, there are still only a few CVM studies in valuation of heritage or historic sites. The majority of the studies come from Europe (55%) and USA and Canada (23%) (Mourato and Mazzanti, 2002: 60-61). In addition, most CVM studies regarding cultural heritage economic valuation is conducted for the purpose of physical restoration of a particular historic site, but there are very few studies that focus on heritage interpretation. In general, the value of heritage interpretation is conventionally incorporated into the total value of a typical historic site. As afore-mentioned, heritage interpretation is already known to be very important in cultural tourism development and historic site conservation but none know its quantitative value. The heritage interpretation is one effective way to increase the whole value of a particular historic site. The value of heritage interpretation is necessary for the administration of a cultural heritage site, especially in the process of allocating budget and acquiring adequate funds to provide and maintain the interpretive facilities and services for visitors and other people who visit the historic sites. With regard to the economic perspective, quality improvement of heritage interpretation can be expressed as a larger rightward shift of willingness to pay function in Figure 3.1 (Carver et al., 2003:

89-90). In Thailand, there are 4 cultural heritage sites which consist of Sukhothai Historical Park, located in Sukhothai province, Si Satchanalai Historical Park located in Sukhothai province, Kamphaeng Phet Historical Park located in Kamphaeng Phet province and Ayutthaya Historical Park located in Ayutthaya province. Table 3.1 reports the number of Thai visitors a year in six provinces. Ayutthaya, Sukhothai and Kamphaeng Phet are the provinces that possess World Cultural Heritage Sites while Chiang Mai, Krabi and Phuket are popular tourism provinces that have a lot of Thai visitors each year.

Among these popular tourism provinces, Ayutthaya is considered the province having a lot of Thai visitors each year. For this reason, as a result, the Historic City of Ayutthaya or Ayutthaya Historic Park deserves to be selected as the study site for this CV study that focuses on the value of heritage interpretation.

Table 3.1 Number of Thai Visitors to Ayutthaya, Sukhothai and Kamphaeng Phet in 2007-2011

Year	The number of Thai visitors a year in each province					
	Ayutthaya	Sukhothai	Kamphaeng Phet	Chiang Mai	Krabi	Phuket
2011	3,967,499	592,599	423,764	3,622,511	1,324,679	2,844,472
2010	5,151,247	599,468	344,123	3,345,629	1,238,058	965,192
2009	2,703,316	451,558	395,109	3,101,790	1,082,515	887,365
2008	2,873,217	575,568	432,753	3,842,550	1,399,903	1,693,194
2007	2,593,106	471,999	365,417	3,601,727	936,782	1,722,243

With regard to the cultural importance of the Historic City of Ayutthaya at the level of the international domain, World Heritage Center of United Nations Educational, Scientific and Cultural Organization (UNESCO) (1991: 50-51) described The Historic City of Ayutthaya in its Advisory Body Evaluation Report that Ayutthaya was established around A.D. 1350 by King Ramadhipati 1 (King U-Thong) who made Ayutthaya his capital city which therefore became the second Siamese capital city. There are several phases of Ayutthaya which can be described as follows.

- 1) The period between its foundation and the coalition with Sukhothai (A.D. 1350-1438)
- 2) The period of the great wars (A.D. 1438-1628)
- 3) The period of westernization (A.D. 1628-1733)
- 4) The last phase before it was destroyed (A.D. 1733 to the end of 18th century)

Initially, Ayutthayan art was influenced by Sukhothai. However, in the 2nd phase, the true national art of Ayutthaya was therefore created with several cultural influences. Until 17th century, western culture began to be assimilated and influenced Ayutthayan art.

Ayutthaya grew to be a wealthy city with a high density population and become a hub of international trade. The wealth of Ayutthaya induced the neighboring countries to invade Ayutthaya many times and caused Ayutthaya yielded twice. For the second surrender in 1767, Ayutthaya was definitely destroyed during the war with Burmese. Nothing remains but there were still a few vestiges left. The main architectural feature of Ayutthaya is the Prang (reliquary towers) which did not exist in the Sukhothai period. To compete with Sukhothai, The kings of Ayutthaya extremely constructed a lot of monasteries for example, Wat Mahathat, Wat Si Sanphet. There are a lot of pictures of the Historic City of Ayutthaya posted in the website of UNESCO World Heritage Convention and some pictures are shown in Figure 3.2 as follows.



Figure 3.2 The Historic City of Ayutthaya

Source: UNESCO World Heritage Convention Website, 2008.

In 1908, King Rama V declared Ayutthaya a protected zone and initiated restoration and renovation work in Ayutthaya. Then, the Fine Arts Department identified the central area of Ayutthaya province as “Ayutthaya Historic City” and took major responsibilities for its upkeep.

In December 13, 1991, the Historic City of Ayutthaya was listed as a World Heritage Site of UNESCO with regard to criterion (iii) which stated that Ayutthaya bears excellent witness to the period of development of a true national Thai art. For all the afore-mentioned reasons of both tourism development perspective and cultural conservation sphere, the Historic City of Ayutthaya is considered an interesting study site for the valuation of the heritage interpretation restoration and improvement program.

3.1 Theoretical Concept of Nonmarket Goods and Welfare Measures

3.1.1 Theoretical Model of Nonmarket Goods

Flores (2003: 27-29) concluded that nonmarket valuation is necessary and distinct from neoclassical price theory of market goods. An individual may desire improved air or water quality or the preservation of an endangered species for any reason including for personal use, bequests to future generations, or simply for the existence of the resource.

Preference ordering can be represented through a utility function defined over goods. For our purposes, $X = [x_1, x_2, \dots, x_n]$ denotes a list or vector of all of the levels for the n market goods that the individual chooses. The k nonmarket goods are similarly listed as $Q = [q_1, q_2, \dots, q_k]$. The utility function assigns a single number, $U(X, Q)$, for each bundle of goods (X, Q) . For any two bundles, (X^A, Q^A) and (X^B, Q^B) , the respective numbers assigned by the utility function are such that $U(X^A, Q^A) > U(X^B, Q^B)$ if and only if (X^A, Q^A) is preferred over (X^B, Q^B) .

For market goods, the individual chooses the amount of each good to buy based on preferences, the relative prices of the market goods $P = [p_1, p_2, \dots, p_n]$, and available income. The basic choice problem is how to obtain the highest possible utility level when spending income y towards the purchase of market goods is subject to a rationed level of nonmarket goods.

$$\max_X U(X, Q) \text{ s.t. } P \cdot X \leq y, \quad Q = Q^0 \quad \text{----- (3.1)}$$

There are 2 constraints that people face in equation (3.1). First, the total expenditure on market goods cannot exceed income, and second, the levels of the nonmarket goods are fixed. The X that solves this problem then depends on the level of income (y), the prices of all of the market goods (P), and the level of nonmarket goods (Q). For each market good, we have an optimal demand function that depends on these three elements, $x_i^* = x_i(P, Q, y)$; the vector of optimal demands can be written similarly, $X^* = X(P, Q, y)$. If we plug the set of optimal demands into the utility function, we will obtain the indirect utility function, $U(X^*, Q) = v(P, Q, y)$. Up to this

point, the highest obtainable level of utility depends on prices, the levels of nonmarket goods, and income.

3.1.2 Compensating and Equivalent Welfare Measures

Flores (2003: 29-30) concluded that policies that provide for the nonmarket often involve costs. Basically, the values of the projects have to be assessed as to whether the benefits justify the costs. There are two basic measures of value. The first one is the amount of income that relevant consumers would allocate (in the form of fee, fare, tax, etc.) after the policies have been implemented in order to have them retain their utilities to status quo utility level. This amount of income that has to be paid for this given policy denotes C . Letting 0 superscripts represents the initial conditions or status quo and 1 superscripts denote the new condition after the policies are implemented with using C as the budget. This is the compensating welfare measure. The indirect utility function is expressed below.

$$v(P^0, Q^0, y^0) = v(P^1, Q^1, y^1 - C) \quad \text{----- (3.2)}$$

The second basic welfare measure is the amount of additional income that the relevant consumers need with the initial conditions and they will be willing to accept the subsequent changes. This is the equivalent welfare measure. E represents the additional income paid for individual and the equation is shown below.

$$v(P^0, Q^0, y^0 + E) = v(P^1, Q^1, y^1) \quad \text{----- (3.3)}$$

Let $U^0 = v(P^0, Q^0, y^0)$ represents the utility level of status quo and $U^1 = v(P^1, Q^1, y^1)$ is the utility level after a change in income, prices and / or nonmarket goods. We can also describe C and E by using the expenditure function.

$$C = e(P^1, Q^1, U^1) - e(P^1, Q^1, U^0) \quad \text{----- (3.4)}$$

$$E = e(P^0, Q^0, U^1) - e(P^0, Q^0, U^0) \quad \text{----- (3.5)}$$

In expenditure terms, $y^0 = e(P^0, Q^0, U^0)$ and $y^1 = e(P^1, Q^1, U^1)$. Therefore, C and E can be written as follows.

$$E = e(P^0, Q^0, U^1) - e(P^1, Q^1, U^1) + (y^1 - y^0) \quad \text{----- (3.6)}$$

$$C = e(P^0, Q^0, U^0) - e(P^1, Q^1, U^0) + (y^1 - y^0) \quad \text{----- (3.7)}$$

3.1.3 Variation Welfare Measures for a Change in Price i

Hanley and Spash (1993: 33) explained the compensating and equivalent variation for a price fall

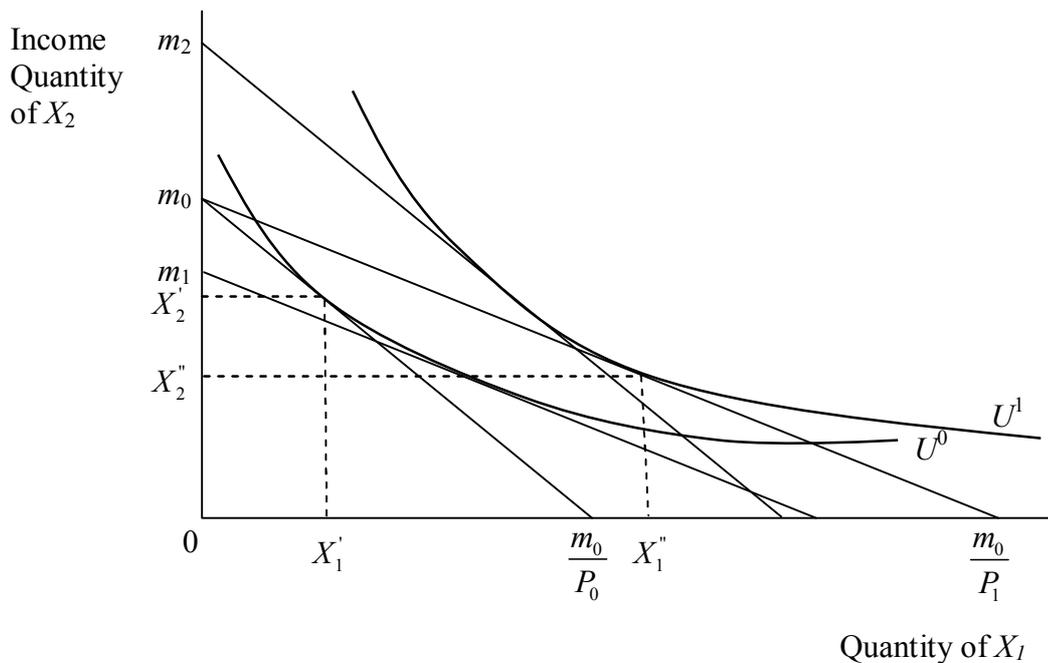


Figure 3.3 Compensating and Equivalent Variations for a Price Fall

In Figure 3.3, two goods X_1 and X_2 . Good X_2 is regarded as a composite good with a price of unity. Good X_1 has an initial price of p_0 . The initial equilibrium for the consumer is at point (X_1', X_2') . If the environment is improved and decreases the cost of producing Good X_1 and causes the price of Good X_1 to decrease from p_0 to p_1 . With regard to constant income of m_0 , the consumption of Good X_2 falls from X_2' to X_2'' and Good X_1 consumed increases from X_1' to X_1'' . The compensating variation (CV) of

price fall is the amount of money when it is taken away from the consumer and he or she will feel as happy as he or she felt before the price fall (his or her utility is held at the initial level of U^0). In this case, the compensating variation (CV) is the sum of money $m_0 - m_1$.

For the equivalent variation (EV), the equivalent variation of a price fall is the amount of money that when it is given to the consumer and the consumer will feel more happy when the situation of price fall occurs, or the utility of the consumer is kept at the post – change utility of U^1 . In this case, the equivalent variation (EV) is the sum of money $m_2 - m_0$.

Flores (2003: 33-35) mentioned that a policy that provides a price decrease for good i , $p_i^0 > p_i^1$. Hicks referred to the compensating welfare measure for a price change as compensating variation (CV) and the equivalent welfare measure as equivalent variation (EV). Since a price decrease makes the consumer better off so, both CV and EV are surely positive. P_{-i} represents the price of other goods except good i or price vector left after removing p_i .

$$CV = e(p_i^0, P_{-i}^0, Q^0, U^0) - e(p_i^1, P_{-i}^0, Q^0, U^0) \quad \text{----- (3.8)}$$

Using Roy's identity, So we will obtain the following.

$$= \int_{p_i^1}^{p_i^0} x_i^h(s, P_{-i}^0, Q^0, U^0) ds \quad \text{----- (3.9)}$$

$$EV = e(p_i^0, P_{-i}^0, Q^0, U^1) - e(p_i^1, P_{-i}^0, Q^0, U^1) \quad \text{----- (3.10)}$$

Using Roy's identity, So we will obtain the following.

$$= \int_{p_i^1}^{p_i^0} x_i^h(s, P_{-i}^0, Q^0, U^1) ds \quad \text{----- (3.11)}$$

The compensating variation (CV) and equivalent variation (EV) can be depicted in Figure 3.4. The contingent variation (CV) is the area A and equivalent variation is the sum of area A and area B.

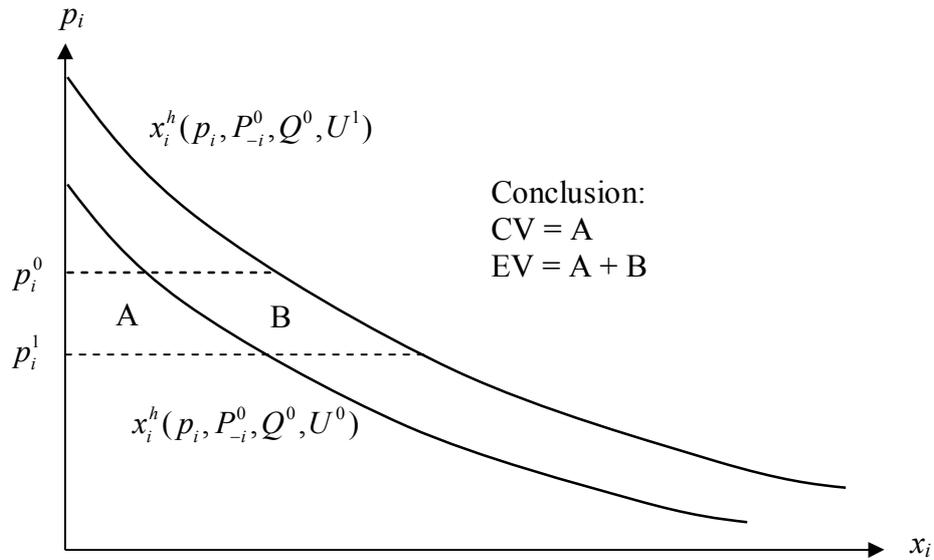


Figure 3.4 Compensating and Equivalent Variation for a Decrease in p_i

3.1.3 Welfare Measures for a Change in Nonmarket Good j

Hanley and Spash (1993: 36) explained the compensating and equivalent measures that are referred to as compensating surplus (CS) and equivalent surplus (ES). These surplus measures are used in cases where the public goods are discrete. For example, in cases where government is preparing to legislate to reduce the concentration of air pollution, consumers cannot freely choose the concentration of air pollution they want to consume.

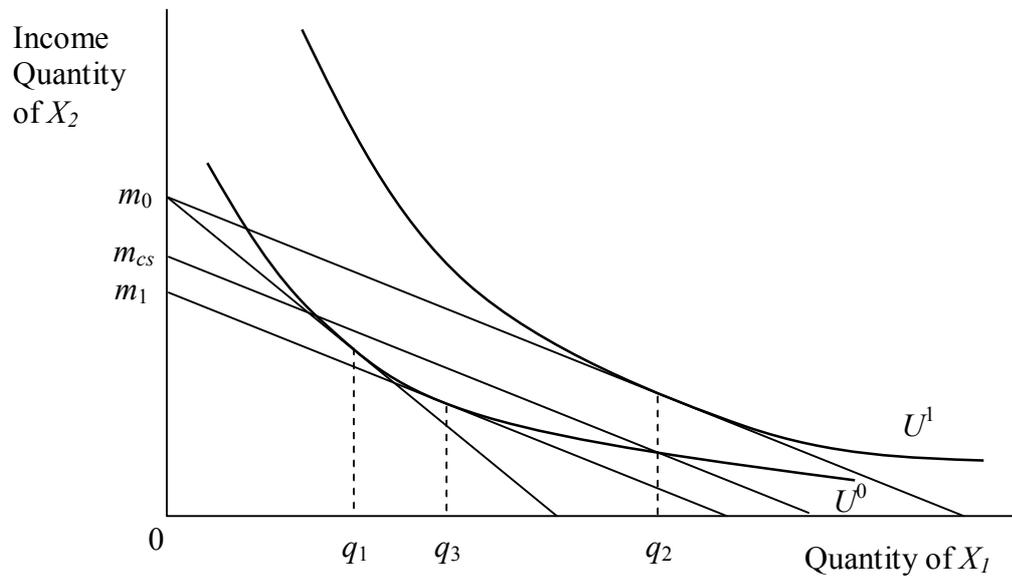


Figure 3.5 Compensating Surplus for a Quantity Increase

According to Figure 3.5, before the Good X_1 is cheaper, the consumer consumes q_1 of good X_1 at utility U^0 . With the cheaper good X_1 , actually, the consumer should consume q_3 of good X_1 but the consumer cannot adjust the quantity of good X_1 consumed independently and he or she is forced to consume good X_1 at q_2 . Therefore, the compensating surplus (CS) is the amount of $m_0 - m_{cs}$ while the compensating variation (CV) is $m_0 - m_1$.

In Figure 3.6, the consumer is constrained to the original consumption level. With regard to equivalent variation, no relative price change but the consumer will require the increase of income to reach utility level of U^1 . With more income instead he or she will purchase good X_1 more toward q_4 but he or she is restricted to consume good X_1 at q_1 as the same. Hence, the equivalent surplus (ES) is the amount of $m_0 - m_{es}$, while the equivalent variation is $m_0 - m_2$

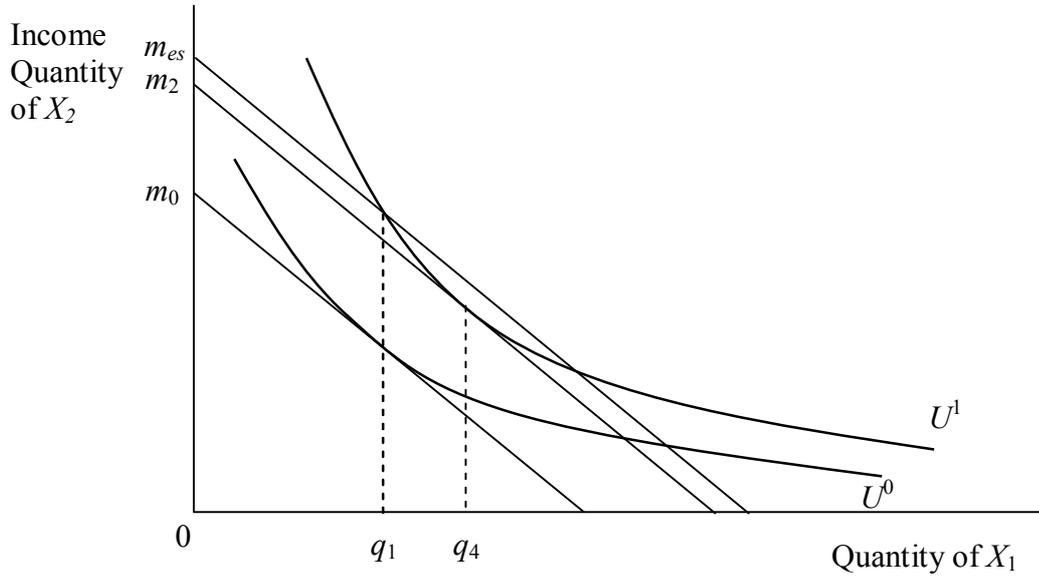


Figure 3.6 Equivalent Surplus for a Quantity Increase

Flores (2003: 36-37) used the expenditure function to represent compensating surplus (CS) and equivalent surplus (ES) as follows.

$$CS = e(p^0, Q^0, U^0) - e(p^0, Q^1, U^0) \quad \text{----- (3.12)}$$

Letting Q_{-j} refers to the vector of nonmarket goods left after removing q_j , so we will obtain

$$= e(P^0, q_j^0, Q_{-j}^0, U^0) - e(P^0, q_j^1, Q_{-j}^0, U^0) \quad \text{----- (3.13)}$$

$$= \int_{q_i^0}^{q_i^1} p_i^v(P^0, s, Q_{-j}^0, U^0) ds \quad \text{----- (3.14)}$$

$$ES = e(p^0, Q^0, U^1) - e(p^0, Q^1, U^1) \quad \text{----- (3.15)}$$

$$= e(P^0, q_j^0, Q_{-j}^0, U^1) - e(P^0, q_j^1, Q_{-j}^0, U^1) \quad \text{----- (3.16)}$$

$$= \int_{q_i^0}^{q_i^1} p_i^v(P^0, s, Q_{-j}^0, U^1) ds \quad \text{----- (3.17)}$$

In Figure 3.7, the compensating surplus (CS) is area A and the area of both A and B represent the equivalent surplus.

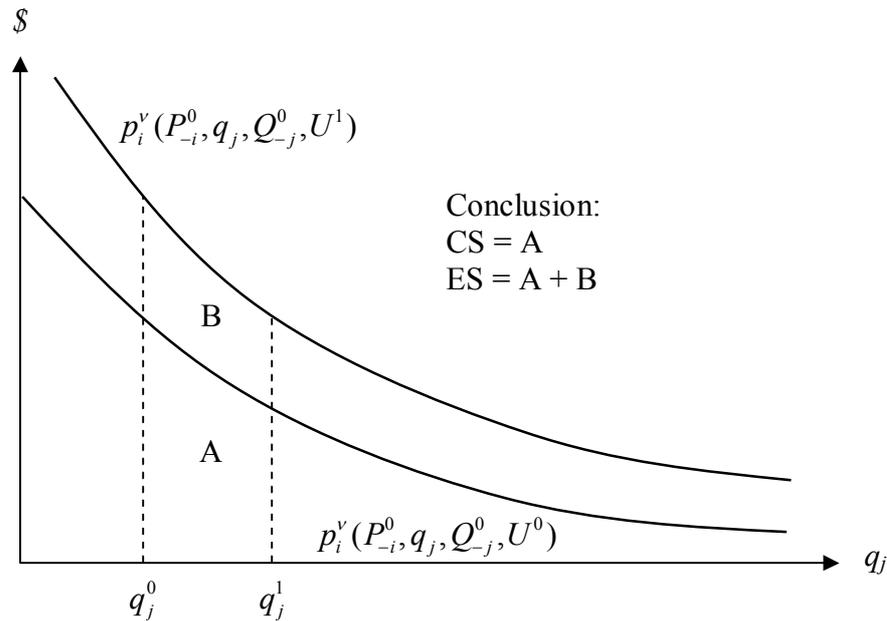


Figure 3.7 Compensating and Equivalent Surplus for an Increase in q_j

To let someone who does not have an economic background realize the concept of compensating and equivalent welfare measures, if the terms of willingness to pay (WTP) and willingness to accept (WTA) compensation are used to explain it, it will be easier to understand. WTP is typically associated with a desirable change and WTA is associated with a negative change (Flores, 2003: 38). The concept of WTP and WTA are concluded in the following Table 3.2.

Table 3.2 CV, EV, WTP and WTA for a Price Change

Welfare Measure	Price Increase (Negative change)	Price Decrease (Desirable change)
EV (Implied property right in the change)	WTP to avoid	WTA to forgo
CV (Implied property right in the status quo)	WTA to accept	WTP to obtain

3.2 Contingent Valuation Method (CVM)

Boyle (2003: 111) mentioned that contingent valuation is a survey-based methodology for eliciting values people place on goods, services, and amenities. The first contingent valuation study was conducted by Davis (1963) to estimate the value of big game hunting in Maine. In the beginning, the use of contingent valuation seemed to be not that popular until it was used in the legal case of Exxon Valdez oil spill and the National Oceanic and Atmospheric Administration (NOAA) responded with a blue ribbon panel to evaluate the credibility of using contingent valuation to estimate nonuse values. The NOAA panel concluded that contingent valuation studies can produce estimates reliable enough to be the starting point for a judicial or administrative determination of natural resource damages (Carson and Hanemann, 2005: 840; Boyle, 2003: 113).

Carson and Hanemann (2005: 845-848) stated that contingent valuation uses a survey to measure people's willingness to pay (WTP) or willingness to accept (WTA). The valuation implies a contrast between 2 situations. What is being valued as a change in level of nonmarket goods (q) and let q changes from q^0 to q^1 . Therefore, the person's utility is changed from $u^0 \equiv v(p, q^0, y)$ to $u^1 \equiv v(p, q^1, y)$. If the change is improvement, $u^1 > u^0$ and if the change is deterioration, $u^1 < u^0$ and if the situation is indifferent, $u^1 = u^0$ the compensation variation C which satisfies

$$v(p, q^1, y - C) = v(p, q^0, y) \quad \text{----- (3.18)}$$

C measures the individual's maximum willingness to pay (WTP) to secure the change.

Contingent valuation can be classified into 4 types as follows (Haab and McConnell, 2002: 18; Udomsak Seenprachawong, 2012: 86).

Open Ended CV: A CV question in which the respondent is asked to provide the interviewer with a point estimate of his or her willingness to pay. The weakness of the open ended CV is that respondents probably spend more time estimating their willingness to pay and this leads to strategic bias which is a situation where

respondents try to provide the willingness to pay at less than it should be. According to strategic bias, the variance is quite high.

Bidding Game: A CV question format in which individuals are iteratively asked whether they would be willing to pay a certain amount. The amounts are raised up, if the respondent answers “yes” until he or she says “no”. In contrast, the amounts are reduced, if the respondent answers “no” until he or she says “yes”. Nevertheless, using the Bidding Game probably confronts a starting point bias because the first proposed amount asked will influence no more or less the answer of willingness to pay from the respondent.

Payment Cards: A CV question format in which individuals are asked to choose a willingness to pay point estimate (or range of estimates) from a list of values predetermined by the surveyors, and shown to the respondent on a card. This contingent valuation format probably causes range bias because the surveyors have to select the payment cards and propose them to the respondent.

Dichotomous or discrete choice contingent valuation or closed ended question or referendum question: A CV question format in which respondents are asked simple yes or no questions to the respondents to obtain back the respondents’ yes-or-no opinion of the offered willingness to pay for example, “Would you be willing to pay \$... for ...?” The important benefit of closed ended question is that it is able to eliminate the bias called starting point bias and it is very comfortable for respondents to answer the question because they only consider the offered willingness to pay asked by the researcher and reply yes or no. Basically, a closed ended question is composed of a single bounded dichotomous choice question and double bounded dichotomous choice question.

In this study, the closed ended question and open ended are applied to estimate the willingness to pay by Thai tourists in the aspect of the improvement of the heritage interpretation of The Historic City of Ayutthaya. However, the principles of closed ended question and open ended question should be discussed more in detail in the following paragraphs. As mentioned previously, a closed ended question is composed of single bounded dichotomous choice question and double bounded dichotomous choice question that are explained as follows. Single bounded dichotomous choice question:

The respondents will be asked only one yes-or-no question and they just consider the offered willingness to pay from the researcher and reply yes or no for example, “Would you be willing to pay \$ x for ...?” The process of the single bounded dichotomous choice question is extremely simple and shown in Figure 3.8.

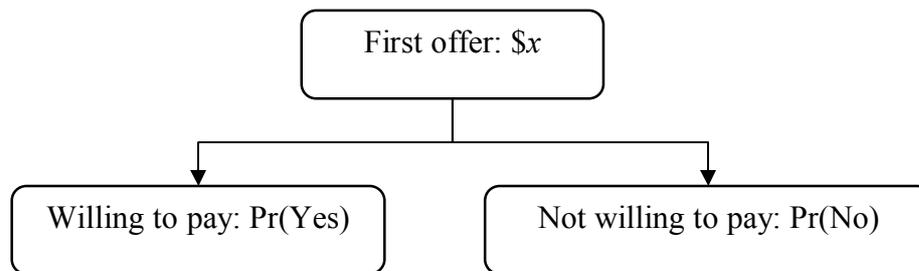


Figure 3.8 The Process of Single Bounded Dichotomous Choice Question

According to single bounded dichotomous choice question, it has certain limitations regarding the expected willingness to pay and its variance. The obtained expected willingness to pay and its variance from single bounded dichotomous choice question is probably higher than it should be (Bateman et al., 2002: 146; Mitchell and Carson, 1998: 87). Consequently, a double bounded dichotomous choice question is developed and applied to cope with the above-mentioned limitations.

Double bounded dichotomous choice question:

According to a double bounded dichotomous choice question, the respondents will be asked 2 times, yes-or-no questions regarding their willingness to pay. First of all, like single bounded dichotomous choice question, the researcher will ask the respondents a yes-or-no question regarding the willingness to pay for example, “Would you be willing to pay \$ x for ...?” and allow the respondents to consider and answer yes or no. After the respondents answer yes or no, the next question with the second offer of willingness to pay will be asked later with the following principles.

1) In case that respondents answer “Yes” for the first offered willingness to pay (x), according to t -statistics = 1.96 \approx 2 with 95% of confidence level, the researcher will double the first offered willingness to pay and ask the respondents again for example, “Would you be willing to pay \$ $2x$ for ...?” and allow the respondents to consider and answer yes or no for the second offer.

2) In case that respondents answer “No” for the first offered willingness to pay (x), according to t -statistics = $1.96 \approx 2$ with 95% of confidence level, the researcher will halve the first offered willingness to pay and ask the respondents again for example, “Would you be willing to pay $\frac{x}{2}$ for ...?” and allow the respondents to consider and answer yes or no for the second offer.

The process of double bounded dichotomous choice question can be shown as Figure 3.9

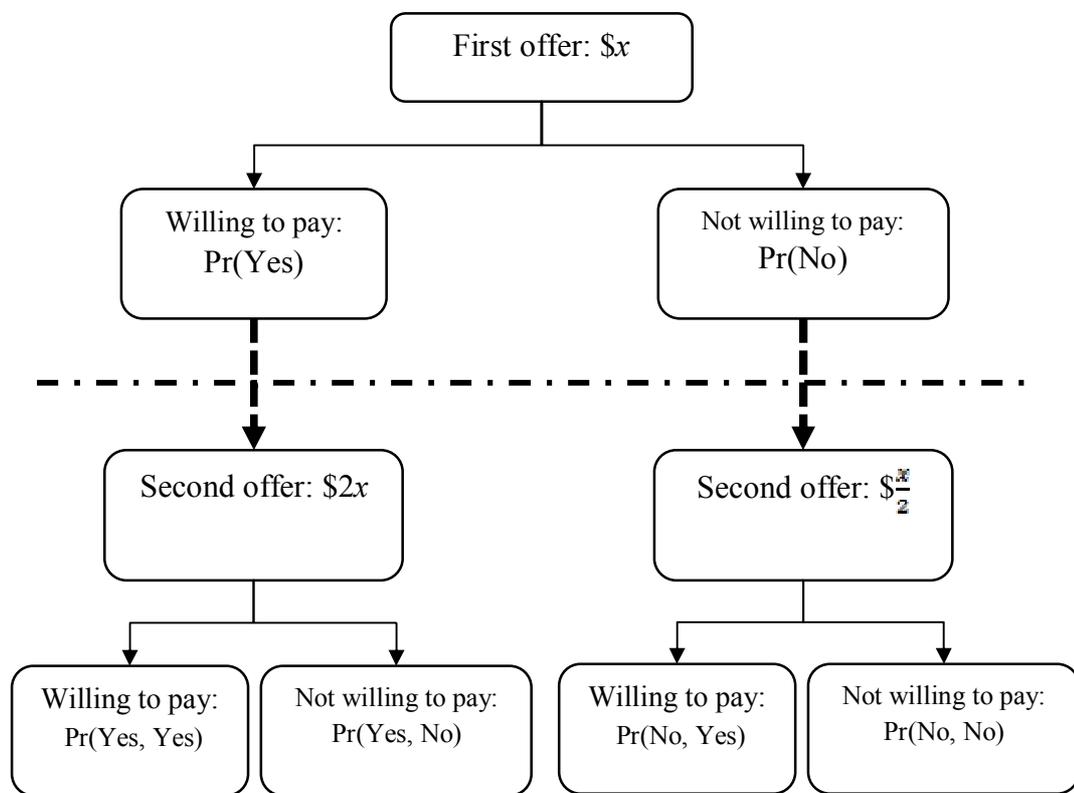


Figure 3.9 The Process of Double Bounded Dichotomous Choice Question

3.2.1 Random Utility Model

Habb and McConnell (2002: 24), Holmes and Adamowicz (2003: 188) stated that the Random Utility Model first developed by McFadden (1973) (Bockstael and Freeman, 2005: 557) is the basic model for analyzing dichotomous CV responses. However, several recent works in environmental valuation is still based on random utility maximization (RUM).

According to the Random Utility Model, there are 2 alternatives, so that indirect utility for respondent j can be written

$$u_{ij} = u_i(y_j, \mathbf{z}_j, \varepsilon_{ij}) \quad \text{----- (3.19)}$$

where $i = 1$ is the state or condition where the CV program is implemented and can be called as the final state and $i = 0$ for status quo. The determinants of utility are y_j , the j^{th} respondent's income, \mathbf{z}_j , an m -dimensional vector of respondent's socioeconomic variables and attributes of the CV program and ε_{ij} , a random error term with zero mean which is the component of preferences known to the respondent but not observed by the researcher. The j^{th} respondent will be willing to pay t_j if his utility in state $i = 1$ is greater than his utility in status quo (state $i = 0$) that can be exhibited in equation 3.20.

$$u_1(y_j - t_j, \mathbf{z}_j, \varepsilon_{1j}) > u_0(y_j, \mathbf{z}_j, \varepsilon_{0j}) \quad \text{----- (3.20)}$$

The probability of a yes response is the probability that the respondent thinks that he is better off in the proposed scenario, even with the required payment, so that $u_1 > u_0$. For respondent j , this probability is

$$\Pr(\text{yes}_j) = \Pr(u_1(y_j - t_j, \mathbf{z}_j, \varepsilon_{1j}) > u_0(y_j, \mathbf{z}_j, \varepsilon_{0j})) \quad \text{----- (3.21)}$$

This probability statement can be used as the starting point for non- parametric approaches. But it is too general for parametric estimation. Two modeling decisions are needed. First, the functional form of $u(y_j, \mathbf{z}_j, \varepsilon_{ij})$ must be chosen. Second, the distribution of ε_{ij} must be specified. Virtually, all approaches often specify the utility function as additionally separable in deterministic and stochastic preferences.

$$u_i(y_j, \mathbf{z}_j, \varepsilon_{ij}) = v_i(y_j, \mathbf{z}_j) + \varepsilon_{ij} \quad \text{----- (3.22)}$$

The $v_i(y_j, \mathbf{z}_j)$ is sometimes written with an argument about quality or characteristics of the CV scenario: $v_i(y_j, \mathbf{z}_j) = v_i(y_j, \mathbf{z}_j, q_i)$. With equation 3.22, the probability statement for respondent j in equation 3.21 becomes

$$\Pr(yes_j) = \Pr[v_1(y_j - t_j, \mathbf{z}_j) + \varepsilon_{1j} > v_0(y_j, \mathbf{z}_j) + \varepsilon_{0j}] \quad \text{----- (3.23)}$$

Once utility is specified as the sum of random and deterministic components, the differences in the random components between the status quo and CV scenario cannot be identified, and so the random term can be written as $\varepsilon_j \equiv \varepsilon_{1j} - \varepsilon_{0j}$. Then let $F_\varepsilon(a)$ be the probability where the random variable ε is less than a . Hence the probability of a yes is

$$\Pr(yes_j) = 1 - F_\varepsilon[-(v_1(y_j - t_j, \mathbf{z}_j) - v_0(y_j, \mathbf{z}_j))] \quad \text{----- (3.24)}$$

Equation (3.23) represents the point of departure for all of the random utility described below.

3.2.1.1 The Random Utility Model with a Linear Utility Function

The Linear utility function results when the deterministic part of the preference function is linear in income and covariates.

$$v_{ij}(y_j) = \boldsymbol{\alpha}_i \mathbf{z}_j + \beta_i(y_j) \quad \text{----- (3.25)}$$

where y_j is individual j 's income, \mathbf{z}_j is an m – dimensional vector of variables related to individual j and $\boldsymbol{\alpha}_i$ is an m – dimensional vector of parameters, so that $\boldsymbol{\alpha}_i \mathbf{z}_j = \sum_{k=1}^m \alpha_{ik} \mathbf{z}_{jk}$. A CV question induces the respondent to choose between the proposed conditions at the required payment t and the current state. The deterministic utility for the proposed CV scenario is

$$v_{1j}(y_j - t_j) = \boldsymbol{\alpha}_1 \mathbf{z}_j + \beta_1(y_j - t_j) \quad \text{----- (3.26)}$$

where t_j is the price offered to the j^{th} respondent. The status quo utility is

$$v_{0j}(y_j) = \alpha_0 z_j + \beta_0 y_j \quad \text{----- (3.27)}$$

The change in deterministic utility is

$$v_{1j} - v_{0j} = (\alpha_1 - \alpha_0) z_j + \beta_1 (y_j - t_j) - \beta_0 y_j \quad \text{----- (3.28)}$$

In this case, it is reasonable to assume that the marginal utility of income is constant between the two CV states. Therefore, $\beta_1 = \beta_0 = \beta$ and the utility difference becomes

$$v_{1j} - v_{0j} = \alpha z_j - \beta t_j \quad \text{----- (3.29)}$$

where $\alpha = \alpha_1 - \alpha_0$ and $\alpha z_j = \sum_{k=1}^m \alpha_k z_{jk}$. With the deterministic part of preferences specified, the probability of responding yes becomes

$$\Pr(\text{yes}_j) = \Pr(\alpha z_j - \beta t_j + \varepsilon_j > 0) \quad \text{----- (3.30)}$$

where $\varepsilon_j = \varepsilon_{1j} - \varepsilon_{0j}$

To proceed in estimating the parameters of the utility difference, it is necessary to specify the nature of the random terms. The assumption that the ε_j are independently and identically distributed (IID) with mean zero, two widely used distributions are the normal and logistic. Both the normal and logistic are symmetric. Thus the probability of yes for respondent j can be estimated as

$$\begin{aligned} \Pr(\alpha z_j - \beta t_j + \varepsilon_j > 0) &= \Pr(-(\alpha z_j - \beta t_j) < \varepsilon_j) \\ &= 1 - \Pr(-(\alpha z_j - \beta t_j) > \varepsilon_j) \\ &= \Pr(\varepsilon_j < \alpha z_j - \beta t_j) \end{aligned} \quad \text{----- (3.31)}$$

For symmetric distributions $F(x) = 1 - F(-x)$. Suppose that $\varepsilon_j \sim N(0, \sigma^2)$. It is necessary to convert $\varepsilon_j \sim N(0, \sigma^2)$ to a standard normal ($N(0, 1)$) variable. Let $\theta = \frac{\varepsilon_j}{\sigma}$. Then $\theta \sim N(0, 1)$ and

$$\begin{aligned} \Pr(\varepsilon_j < \alpha z_j - \beta t_j) &= \Pr\left(\theta < \frac{\alpha z_j}{\sigma} - \frac{\beta}{\sigma} t_j\right) \\ &= \Phi\left(\frac{\alpha z_j}{\sigma} - \frac{\beta}{\sigma} t_j\right) \end{aligned} \quad \text{----- (3.32)}$$

where $\Phi(x)$ is the cumulative standard normal. Equation 3.32 is the probit model. Note that the probability is now in terms of parameters divided by an unknown variance. This is a fundamental characteristic of dichotomous dependent variables.

When ε is distributed logistic, it has mean zero and variance $\frac{\pi^2 \sigma_L^2}{3}$. Normalizing by σ_L creates a logistic variable with mean zero and variance $\frac{\pi^2}{3}$. If $\varepsilon \sim$ logistic $(0, \frac{\pi^2 \sigma_L^2}{3})$ then $\frac{\varepsilon}{\sigma_L} = \theta \sim$ logistic $(0, \frac{\pi^2}{3})$. The standard logistic has a variance $\frac{\pi^2}{3}$ times the standard normal and so will have parameters $\frac{\pi}{\sqrt{3}}$ ($= 1.814$) times the probit parameters. The probability that a variate distributed as a standard logit is less than or equal to x equals $\frac{1}{(1 + e^{-x})}$. Then the probability that respondent j answers yes is

$$\Pr(\text{yes}_j) = \frac{1}{1 + e^{-\left(\frac{\alpha z_j}{\sigma_L} - \frac{\beta t_j}{\sigma_L}\right)}} \quad \text{----- (3.33)}$$

Practically, the estimation of parameters comes from the maximization of the likelihood function. Suppose the sample size is T and let $I_j = 1$ if respondent j answers yes. The likelihood function becomes

$$L(\alpha, \beta | \mathbf{y}, \mathbf{z}, \mathbf{t}) = \prod_{j=1}^T \left[\Phi\left(\frac{\alpha z_j}{\sigma} - \frac{\beta t_j}{\sigma}\right) \right]^{I_j} \left[1 - \Phi\left(\frac{\alpha z_j}{\sigma} - \frac{\beta t_j}{\sigma}\right) \right]^{1 - I_j} \quad \text{----- (3.34)}$$

for the probit and when the logit is estimated $\frac{1}{1 + e^{-\left(\frac{\alpha z_j}{\sigma} - \frac{\beta t_j}{\sigma}\right)}}$ is substituted for

$$\Phi\left(\frac{\alpha z_j}{\sigma} - \frac{\beta t_j}{\sigma}\right).$$

Maximum likelihood routines use the log of the likelihood function to calculate the maximum likelihood estimates. Hence, the log likelihood function is

$$\ln L(\alpha, \beta | y, \mathbf{z}, \mathbf{t}) = \sum_{j=1}^T I_j \ln \left[\Phi\left(\frac{\alpha z_j}{\sigma} - \frac{\beta t_j}{\sigma}\right) \right] + (1 - I_j) \ln \left[1 - \Phi\left(\frac{\alpha z_j}{\sigma} - \frac{\beta t_j}{\sigma}\right) \right] \quad \text{----- (3.35)}$$

for probit or

$$\ln L(\alpha, \beta | y, \mathbf{z}, \mathbf{t}) = \sum_{j=1}^T I_j \ln \left[\frac{1}{1 + e^{-\left(\frac{\alpha z_j}{\sigma} - \frac{\beta t_j}{\sigma}\right)}} \right] + (1 - I_j) \ln \left[1 - \frac{1}{1 + e^{-\left(\frac{\alpha z_j}{\sigma} - \frac{\beta t_j}{\sigma}\right)}} \right] \quad \text{----- (3.36)}$$

for logit. Maximization of the likelihood functions yields unique estimates of the parameter functions $\frac{\alpha}{\sigma}$ and $\frac{\beta}{\sigma}$. Defining a new $1 \times (m + 1)$ parameter vector $\beta^* = \left\{ \frac{\alpha}{\sigma}, -\frac{\beta}{\sigma} \right\}$ where m is the number of covariates in \mathbf{z} including the constant and a new individual – specific $1 \times (m + 1)$ data vector $\mathbf{X}_j = \{z_j, t_j\}$, the log likelihood function for the linear random utility probit becomes

$$\ln L(\beta^* | y, \mathbf{X}) = \sum_{j=1}^T I_j \ln [\Phi(\mathbf{X}_j \beta^*)] + (1 - I_j) \ln [1 - \Phi(\mathbf{X}_j \beta^*)] \quad \text{----- (3.37)}$$

and for the logit model becomes

$$\ln L(\beta^* | y, \mathbf{X}) = \sum_{j=1}^T I_j \ln \left[\frac{1}{1 + e^{-\mathbf{X}_j \beta^*}} \right] + (1 - I_j) \ln \left[1 - \frac{1}{1 + e^{-\mathbf{X}_j \beta^*}} \right] \quad \text{----- (3.38)}$$

Equation 3.37 and 3.38 represent the standard forms of the probit and logit log likelihood functions estimated by most econometric packages. A lower

bound of the variance-covariance matrix for the maximum likelihood parameter estimates can be found by inverting the negative of the expected value of the matrix of second derivatives of the log likelihood function evaluated as the parameter estimates

$$V(\beta^*) = \left[-E \left(\frac{\partial^2 \ln L(\beta^* | y, X_j)}{\partial \beta^{*i} \partial \beta^{*f}} \right) \right]^{-1} \quad \text{----- (3.39)}$$

3.2.1.2 Calculating Willingness to Pay with the Linear Random Utility Model

The ultimate goal of most practical dichotomous choice CV studies is to calculate willingness to pay and the effects of covariates on *WTP*. In general, willingness to pay is the amount of money that makes the respondent indifferent between the status quo and the proposed CV scenario. For the linear random utility model defined in equations (3.28) and (3.29), *WTP* can be defined as

$$\alpha_1 z_j + \beta(y_j - WTP_j) + \varepsilon_{j1} = \alpha_0 z_j + \beta y_j + \varepsilon_{j0} \quad \text{----- (3.40)}$$

Solving equation (3.40) for *WTP* yields

$$WTP_j = \frac{\alpha_1 z_j}{\beta} + \frac{\varepsilon_{j1}}{\beta} \quad \text{----- (3.41)}$$

There are two measures of central tendency with respect to preference uncertainty. One is the expectation of willingness to pay with respect to preference uncertainty (ε)

$$E_\varepsilon(WTP_j | \alpha, \beta, z_j) = \frac{\alpha_1 z_j}{\beta} \quad \text{----- (3.42)}$$

$$E_\varepsilon(WTP_j | \alpha, \beta, z_j) = \left[\frac{\alpha_1}{\sigma} / \frac{\beta}{\sigma} \right] z_j \quad \text{----- (3.43)}$$

The second measure of central tendency is the median or 50th percentile of the distribution with respect to preference uncertainty ($Md_{\varepsilon}(WTP_j)$). To solve the median WTP , find the WTP that solves the expression that the probability is $u_1 > u_0 = 0.5$

$$\begin{aligned} & \Pr[\alpha_1 z_j + \beta(y_j - Md_{\varepsilon}(WTP_j)) + \varepsilon_{j1} > \alpha_0 z_j + \beta y_j + \varepsilon_{j0}] = 0.5 \\ & = \Pr[Md_{\varepsilon}(WTP_j) > \frac{\alpha_1 z_j}{\beta} + \frac{\varepsilon_{j1}}{\beta}] = 0.5 \end{aligned} \quad \text{----- (3.44)}$$

Since ε is symmetric with mean zero, this expression yields

$$Md_{\varepsilon}(WTP_j | \alpha, \beta, z_j) = \frac{\alpha_1 z_j}{\beta} \quad \text{----- (3.45)}$$

$$Md_{\varepsilon}(WTP_j | \alpha, \beta, z_j) = \left[\frac{\alpha_1}{\beta} / \frac{\sigma}{\sigma} \right] z_j \quad \text{----- (3.46)}$$

In the case of a linear utility function and a symmetric, mean zero error, the mean and median WTP with respect to random preferences are equal. Each respondent has an expected or median WTP with respect to preference uncertainty. Besides, expected or median WTP depends on the socioeconomic exogenous variables z_j . Therefore, the expected WTP can be calculated based on the mean of socioeconomic exogenous variables as

$$E_{\varepsilon}(WTP_j | \alpha, \beta, \bar{z}) = \left[\frac{\alpha_1}{\beta} / \frac{\sigma}{\sigma} \right] \bar{z} \quad \text{----- (3.47)}$$

3.2.1.3 The Random Utility Model with Log Linear in Income

According to equation (3.23), the derivation of an estimable version of the random utility model begins with the probability statement:

$$\Pr(yes_j) = \Pr[v_1(y_j - t_j, z_j) + \varepsilon_{1j} > v_0(y_j, z_j) + \varepsilon_{0j}] \quad \text{----- (3.48)}$$

Consider a utility function of the form

$$v_i(y_j, \mathbf{z}_j) + \varepsilon_{ij} = \beta \ln(y_j) + \boldsymbol{\alpha}_i \mathbf{z}_j + \varepsilon_{ij} \quad \text{----- (3.49)}$$

This utility function relaxes the constant marginal utility of income across individuals implicit in the linear utility function. Differentiating with respect to income yields the individual – specific expression for marginal utility of income

$$\frac{\partial v_i}{\partial y_j} = \frac{\beta}{y_j} \quad \text{----- (3.50)}$$

which is a decrease in income assuming $\beta > 0$. Substituting the log-linear in income utility function into the random utility probability expression (3.48).

$$\begin{aligned} \Pr(\text{yes}_j) &= \Pr(\beta \ln(y_j - t_j) + \boldsymbol{\alpha}_1 \mathbf{z}_j + \varepsilon_{1j} > (\beta \ln(y_j - t_j) + \boldsymbol{\alpha}_0 \mathbf{z}_j + \varepsilon_{0j})) \\ &= \Pr(\beta \ln(y_j - t_j) - \ln(y_j)) + (\boldsymbol{\alpha}_1 - \boldsymbol{\alpha}_0) \mathbf{z}_j + (\varepsilon_{1j} - \varepsilon_{0j}) > 0 \\ &= \Pr\left(\beta \ln\left(\frac{y_j - t_j}{y_j}\right) + \boldsymbol{\alpha} \mathbf{z}_j > -\varepsilon_j\right) \end{aligned} \quad \text{----- (3.51)}$$

Here $\boldsymbol{\alpha} = \boldsymbol{\alpha}_1 - \boldsymbol{\alpha}_0$ and $\varepsilon_j = \varepsilon_{1j} - \varepsilon_{0j}$. Assuming ε_j is distributed normally with mean zero and variance σ^2 results in standard normal probability of a yes response.

$$\Pr(\text{yes}_j) = \Phi\left(\frac{\beta \ln\left(\frac{y_j - t_j}{y_j}\right) + \boldsymbol{\alpha} \mathbf{z}_j}{\sigma}\right) = \Phi(\mathbf{X}_j \boldsymbol{\beta}^*) \quad \text{----- (3.52)}$$

Where $\mathbf{X}'_j = \left\{ \mathbf{z}_j, \ln\left(\frac{y_j - t_j}{y_j}\right) \right\}$ and $\boldsymbol{\beta}^* = \left\{ \frac{\boldsymbol{\alpha}}{\sigma}, \frac{\beta}{\sigma} \right\}$. The parameter vector $\boldsymbol{\beta}^*$ can be estimated by running a simple probit on the data matrix \mathbf{X}_j . If ε_j is instead assumed to be distributed logistically, then the probability of a yes response becomes

$$\Pr(\text{yes}_j) = \frac{1}{1 + e^{-\mathbf{X}_j \boldsymbol{\beta}^*}} \quad \text{----- (3.53)}$$

And parameters can be estimated with a logit model on the no/ yes response with $\mathbf{X}_j = \left\{ \mathbf{z}_j, \ln \left(\frac{y_j - \varepsilon_j}{y_j} \right) \right\}$.

3.2.1.4 Calculating Willingness to Pay Using the Log-Linear in Income Random Utility Model

The willingness to pay can be computed by equating utility in the improved state to utility in the status quo state and solving the income difference (*WTP*).

$$\alpha_1 \mathbf{z}_j + \beta \ln(y_j - WTP_j) + \varepsilon_{1j} = \alpha_0 \mathbf{z}_j + \beta \ln(y_j) + \varepsilon_{0j} \quad \text{----- (3.54)}$$

Willingness to pay obtained from equation (3.53) is

$$WTP_j(\varepsilon_j, \alpha, \beta, \mathbf{z}_j, y_j) = y_j - y_j e^{\left(-\left(\frac{\alpha}{\beta} \mathbf{z}_j + \frac{\varepsilon_j}{\beta} \right) \right)} \quad \text{----- (3.55)}$$

For probit model, if ε_j is assumed to be normal distributed with mean zero and unknown variance σ^2 then the expected value of willingness to pay is

$$E_\varepsilon(WTP|\alpha, \beta, \mathbf{z}_j, y_j) = y_j - y_j e^{-\frac{\alpha}{\beta} \mathbf{z}_j + \frac{1}{2} \frac{\sigma^2}{\beta^2}} \quad \text{----- (3.56)}$$

Because ε_j is a mean zero symmetric random variate, the median willingness to pay (50th percentile) is computed by setting $\varepsilon_j = 0$ in equation (3.54).

$$Md_\varepsilon(WTP|\alpha, \beta, \mathbf{z}_j, y_j) = y_j - y_j e^{-\frac{\alpha}{\beta} \mathbf{z}_j} \quad \text{----- (3.57)}$$

For logit model, if ε_j is assumed to be logistically distributed with mean zero and unknown variance $\frac{\pi^2 \sigma^2}{3}$ then $e^{-\frac{\varepsilon_j}{\beta}}$ is distributed with mean $\frac{\left(\frac{\sigma}{\beta} \right) \pi}{\sin\left(\frac{\sigma}{\beta} \pi \right)}$. The expected value of willingness to pay is

$$E_{\varepsilon}(WTP|\alpha, \beta, \mathbf{z}_j, y_j) = y_j - y_j \frac{\left(\frac{\varepsilon}{\beta}\right)^{\pi}}{\sin\left(\frac{\varepsilon}{\beta}\pi\right)} e^{-\frac{u}{\beta}z_j} \quad \text{----- (3.58)}$$

The median willingness to pay (50th percentile) is computed by setting $\varepsilon_j = 0$.

$$Md_{\varepsilon}(WTP|\alpha, \beta, \mathbf{z}_j, y_j) = y_j - y_j e^{-\frac{u}{\beta}z_j} \quad \text{----- (3.59)}$$

3.2.1.5 The Turnbull Estimator

With regard to discrete choice contingent valuation questions, if the respondent answers yes, then willingness to pay is greater than or equal to the offered price, and if the answer is no, willingness to pay is less than the offer prices. Variation in the characteristics of sampled individuals and variation in the price offered respondents provide the information needed to estimate sample willingness to pay. For each respondent, the researcher records the offered price, the yes/ no response, and individual specific covariates that can include demographic, socioeconomic and attitudinal information from the respondent, such as education, age, income, etc.

Consider a random sample of \mathbf{T} respondents each offered one of the M distinct prices, indexed $\{t_j | j = 1, 2, \dots, M\}$. Let WTP_i be individual i 's wiliness to pay for the proposal. If the individual responds yes to the question "Are you willing to pay $\$t_j$ for the project?", then we know that $WTP_i \geq t_j$. Otherwise, $WTP_i < t_j$. Since WTP is unobservable, it can be regarded as a random variable with a cumulative distribution function $F_w(W)$, the probability that willingness to pay is less than W . Therefore,

$$\Pr(WTP_i < t_j) = F_w(t_j) \quad \text{----- (3.60)}$$

Let $F_w(t_j) = F_j$ For simplicity. Hence,

$$\Pr(WTP_i < t_j) = F_j \quad \text{----- (3.61)}$$

Assume that this probability is the same for different individuals offered the same price. The M offered prices now divide the full sample T into a vector of M sub-samples $\mathbf{T} = \{T_1, T_2, \dots, T_M\}$ with $\sum_{j=1}^M T_j = T$. $\mathbf{Y} = \{Y_j | j = 1, 2, \dots, M\}$ and $\mathbf{N} = \{N_j | j = 1, 2, \dots, M\}$, where Y_j is the number of “yes” responses to bid price t_j and N_j is the number of “no” responses.

When samples are large and as the offered price increases, the proportion of observed no responses to each bid should increase ($F_j \leq F_{j+1}$). As the bid price increases, we would expect the distribution function to monotonically converge to one for large sample sizes. However, because of random sampling, we often observe non-monotonic empirical distribution functions for some offered prices ($F_j > F_{j+1}$ for some j). In this case, we can impose a monotonicity restriction on the distribution-free estimator that is known as the Turnbull distribution-free estimator. If a monotonically increasing distribution function is to be guaranteed, a monotonicity restriction ($F_j \leq F_{j+1} | \forall j$) must be imposed. For further reference, Table 3.3 summarizes the definitions and parameter relations that will be used in deriving the Turnbull distribution-free estimator.

Table 3.3 Definitions and Relations for the Turnbull Estimator

Parameter	Definition	Relation
f_j	$\Pr(\$t_{j-1} \leq WTP < \$t_j)$	
F_j	$\Pr(WTP \leq \$t_j)$	$F_j = \sum_{i=1}^j f_i$
f_j	$\{f_1, f_2, \dots, f_{M+1}\}$	$f_j = F_j - F_{j-1}$
F_{M+1}	1) Cumulative distribution function (CDF) at upper bound of WTP 2) Typically $t_{M+1} = \infty$	$F_{M+1} = 1$
F_0	1) Cumulative distribution function (CDF) at lower bound of WTP 2) Typically $t_0 = 0$	$F_0 = 0$
M	Number of bids	

Table 3.3 (Continued)

Parameter	Definition	Relation
Y_j	Number of yes responses to bid t_j	
N_j	Number of no responses to bid t_j	
T_j	Total number offered bid t_j	$T_j = Y_j + N_j$

The log-likelihood function to estimate $F_j, j = 1, 2, \dots, M$ subject to the monotonicity restriction ($F_j \leq F_{j+1} | \forall j$) is

$$\ln L(F_1, F_2, \dots, F_M | \mathbf{Y}, \mathbf{N}, \mathbf{T}) = \sum_{j=1}^M [N_j \ln(F_j) + Y_j \ln(\mathbf{1} - F_j)] \quad \text{----- (3.62)}$$

Imposing the monotonicity restriction ($F_j \leq F_{j+1}$), the log – likelihood maximization problem becomes

$$\begin{aligned} \max_{F_1, F_2, \dots, F_M} \ln L(F_1, F_2, \dots, F_M | \mathbf{Y}, \mathbf{N}, \mathbf{T}) &= \sum_{j=1}^M [N_j \ln(F_j) + Y_j \ln(1 - F_j)] \\ \text{subject to } F_j &\leq F_{j+1} | \forall j \end{aligned} \quad \text{----- (3.63)}$$

This problem can be written in terms of the probability mass point $\{f_1, f_2, \dots, f_{M+1}\}$ rather than the distribution function (F_1, F_2, \dots, F_M) where $f_j = F_j - F_{j-1}$. Intuitively, we can regard f_j as the response to price increases. Therefore, let $F_j = \sum_{i=1}^j f_i$, $F_0 = 0$, $F_{M+1} = 1$ and the vector of probabilities $\mathbf{f} = \{f_1, f_2, \dots, f_{M+1}\}$ represents a discrete form of the density function. Thereby, the equation (3.63) can be written in

$$\begin{aligned} \max_{\mathbf{f}} \ln L(\mathbf{f} | \mathbf{Y}, \mathbf{N}, \mathbf{T}) &= \sum_{j=1}^M [N_j \ln(\sum_{k=1}^j f_k) + Y_j \ln(1 - \sum_{k=1}^j f_k)] \\ \text{subject to } f_j &\geq 0 \text{ for all } j \end{aligned} \quad \text{----- (3.64)}$$

According to the Khun-Tucker first-order conditions for a maximum, the equation (3.64) results in

$$\frac{\partial \ln L}{\partial f_i} = \sum_{j=i}^M \left(\frac{N_j}{\sum_{k=1}^j f_k} - \frac{Y_j}{1 - \sum_{k=1}^j f_k} \right) \leq 0$$

$$f_i \geq 0$$

$$f_i \ln \frac{\partial L}{\partial f_i} = 0$$

To find the solution to the likelihood maximization problem, the set of first order conditions must be solved recursively. To solve for f_1 , the first two first-order conditions now hold with equality and can be differentiated to find

$$\frac{\partial \ln L}{\partial f_1} - \frac{\partial \ln L}{\partial f_2} = \frac{N_1}{f_1} - \frac{Y_1}{1-f_1} = 0 \quad \text{----- (3.65)}$$

$$f_1 = \frac{N_1}{Y_1 + N_1} \quad \text{----- (3.66)}$$

If $f_3 > 0$ we can subtract $\frac{\partial \ln L}{\partial f_3}$ from $\frac{\partial \ln L}{\partial f_2}$ to obtain

$$f_2 = \frac{N_2}{Y_2 + N_2} - f_1 \quad \text{----- (3.67)}$$

Therefore, f_2 is positive if

$$\frac{N_2}{Y_2 + N_2} > \frac{N_1}{Y_1 + N_1} \quad \text{----- (3.68)}$$

If the proportion of respondents saying “no” to t_2 is strictly greater than the proportion saying “no” to t_1 , then the probability that WTP falls in the interval $(t_1, t_2]$ is positive and equal to the difference in the proportions. This pattern continues for the full vector of density estimates $\{f_1, f_2, \dots, f_{M+1}\}$. Thereby,

$$f_j = \frac{N_j}{Y_j} - \sum_{k=1}^{j-1} f_k$$

Since $F_k = \sum_{k=1}^j f_k = \frac{N_j}{T_j}$, $f_j = \frac{N_j}{T_j} - \frac{N_{j-1}}{T_{j-1}}$. Suppose $\frac{N_2}{Y_2 + N_2} < \frac{N_1}{Y_1 + N_1}$, the proportion of respondents saying “no” to t_2 is less than the proportion of respondents saying “no” to t_1 causing a violation of the monotonicity assumption for a valid cumulative distribution function. If we impose the non – negativity constraint, then $f_2 = 0$. If $f_3 \neq 0$, we can subtract $\frac{\partial \ln L}{\partial f_2}$ from $\frac{\partial \ln L}{\partial f_1}$ with $f_2 = 0$ to obtain the Turnbull first – order conditions.

$$\frac{\partial \ln L}{\partial f_1} - \frac{\partial \ln L}{\partial f_2} = \frac{N_1 + N_2}{f_1^*} - \frac{Y_1 + Y_2}{1 - f_1^*} = 0 \quad \text{----- (3.69)}$$

Where the * superscript denotes the Turnbull estimate. Hence,

$$f_1^* = \frac{N_1 + N_2}{N_1 + N_2 + Y_1 + Y_2} \quad \text{----- (3.70)}$$

Define $N_j^* = N_j + N_{j+1}$, $Y_j^* = Y_j + Y_{j+1}$ and then

$$f_1^* = \frac{N_j^*}{Y_j^* + N_j^*} - \sum_{k=1}^{j-2} f_k^* \quad \text{----- (3.71)}$$

If f_j is still negative, then this process is repeated until a position f_1^* is computed such

as $f_1^* > 0$. Then define $F_1^* = \frac{N_j^*}{T_j^*}$.

Once the monotonicity violations are removed, the inequality constraints become non-binding and the maximum likelihood problem can be treated as unrestricted

$$\max_{F_1, F_2, \dots, F_M} \ln L(F_1, F_2, \dots, F_M | \mathbf{Y}^*, \mathbf{N}^*) = \sum_{j=1}^{M^*} [N_j^* \ln(F_j) + Y_j^* \ln(1 - F_j)] \quad \text{----- (3.72)}$$

and yields maximum likelihood estimates of $F_1^* = \frac{N_j^*}{T_j^*}$ where M^* prices represent the pooled price ranges with a variance on the estimator of

$$V(F_j^*) = \frac{F_j^*(1-F_j^*)}{T_j^*} \text{ where } j = 1, 2, \dots, M^* \quad \text{----- (3.73)}$$

The variance of the f_j^* 's are also straightforward. Since F_j^* and F_{j+1}^* have zero covariance.

$$V(f_j^*) = V(F_j^*) - V(F_{j-1}^*) = \frac{F_j^*(1-F_j^*)}{T_j^*} + \frac{F_{j-1}^*(1-F_{j-1}^*)}{T_{j-1}^*} \quad \text{----- (3.74)}$$

The covariance (f_i^*, f_j^*) is

$$\begin{aligned} cov(f_i^*, f_j^*) &= cov(F_i^* - F_{i-1}^*, F_j^* - F_{j-1}^*) \\ &= cov(F_i^*, F_j^*) - cov(F_{i-1}^*, F_j^*) - cov(F_i^*, F_{j-1}^*) + cov(F_{i-1}^*, F_{j-1}^*) \\ &= \begin{cases} -V(F_i^*) & j-1 = i \\ -V(F_j^*) & i-1 = j \\ 0 & \text{otherwise} \end{cases} \end{aligned} \quad \text{----- (3.75)}$$

3.2.1.6 A Lower Bound Estimate for Willingness to Pay for a Single Price Case

Consider a case in which all individuals are offered the same price t . In this case, an estimate of expected willingness to pay will be the product of the offered price and the probability of willingness to pay being above the price t ($1 - F(t)$).

$$E(WTP) = \int_0^U W dF_W(W) \quad \text{----- (3.76)}$$

where U is upper bound to the range of WTP . Let $[0, U]$ is $[0, t)$ and $[t, U]$, the expected value of willingness to pay can be written

$$E(WTP) = \int_0^t W dF_W(W) + \int_t^U W dF_W(W) \quad \text{----- (3.77)}$$

Because $F_W(W)$ is a cumulative distribution function and is increasing. Therefore, replacing the variable of integration by the lower limit will result in an expression less than or equal to $E(WTP)$ that is a lower bound on willingness to pay.

$$E(WTP) \geq \int_0^t 0 dF_W(W) + \int_t^U t dF_W(W) = t \cdot (1 - F_W(t)) \quad \text{----- (3.78)}$$

According to the Turnbull estimate, $1 - F_W(t) = \frac{Y}{T}$, then the lower bound on expected willingness to pay is

$$E_{LB}(WTP) = t \cdot \frac{Y}{T} \quad \text{----- (3.79)}$$

3.2.1.7 A Lower Bound Estimate for Willingness to Pay for the Multiple Price Case

Recall the definition of willingness to pay from equation (3.76)

$$E(WTP) = \int_0^U W dF_W(W) \quad \text{----- (3.80)}$$

where U is the upper bound on the range of WTP . The range of willingness to pay can be divided into $M^* + 1$ subranges, $\{0 - t_1, t_1 - t_2, \dots, t_{M^*} - U\}$. Therefore, the expected willingness to pay can be written as

$$E(WTP) = \sum_{j=0}^{M^*} \left[\int_{t_j}^{t_{j+1}} W dF_W(W) \right] \quad \text{----- (3.81)}$$

where $t_0 = 0$ and $t_{M^*+1} = U$. Because $F_W(W)$ is an increasing function. Therefore,

$\int_{t_j}^{t_{j+1}} W dF_W(W) \geq \int_{t_j}^{t_{j+1}} t_j dF_W(W)$ and so, this following expression can be obtained.

$$E(WTP) \geq \sum_{j=0}^{M^*} t_j [F_W(t_{j+1}) - F_W(t_j)] \quad \text{----- (3.82)}$$

Remind that $\int_{t_j}^{t_{j+1}} t_j dF_W(W) = t_j [F_W(t_{j+1}) - F_W(t_j)]$ and $F_W(0) = 1, F_W(U) = 0$. Let $F_W(t_j) = F_j^*$. As a result, the estimate of the lower bound on willingness to pay is

$$E_{LB}(WTP) = \sum_{j=0}^{M^*} t_j (F_{j+1}^* - F_j^*) \quad \text{----- (3.83)}$$

where $F_j^* = \frac{N_j^*}{T_j^*}$, $F_0^* = 1$ and $F_{M^*+1}^* = 0$. One advantage of the lower bound estimate of WTP is the distribution of the estimator. Since the f_j^* 's are normal and the t_j are fixed, the $E_{LB}(WTP)$ is also normal. Therefore,

$$E_{LB}(WTP) = \sum_{j=0}^{M^*} t_j \cdot f_{j+1}^* \quad \text{----- (3.84)}$$

The variance of the lower bound estimate is

$$V(E_{LB}(WTP)) = \sum_{j=0}^{M^*} t_j^2 V(f_{j+1}^*) + \sum_{i=1}^{M^*} \sum_{j=1}^{M^*} t_j t_i \text{cov}(f_{j+1}^*, f_{i+1}^*) \quad \text{----- (3.85)}$$

Remember that $V(f_j^*) = V(F_j^*) + V(F_{j-1}^*)$ and

$$\text{cov}(f_i^*, f_j^*) = \begin{cases} -V(F_i^*) & j-1=i \\ -V(F_j^*) & i-1=j \\ 0 & \text{otherwise} \end{cases}$$

Therefore, the variance of the expected lower bound can be simply written as

$$V(E_{LB}(WTP)) = \sum_{j=1}^{M^*} \frac{F_j^*(1-F_j^*)}{T_j^*} (t_j - t_{j-1})^2 \quad \text{----- (3.86)}$$

$$= \sum_{j=1}^{M^*} V(F_j^*) (t_j - t_{j-1})^2 \quad \text{----- (3.87)}$$

Conclusively, $E_{LB}(WTP)$ is normally distributed with mean defined in the equation (3.83) and variance defined in equation (3.86)

$$E_{LB}(WTP) \sim N\left(\sum_{j=0}^{M^*} t_j(F_{j+1}^* - F_j^*), \sum_{j=1}^{M^*} \frac{F_j^*(1-F_j^*)}{T_j^*} (t_j - t_{j-1})^2\right) \dots \dots (3.88)$$

3.2.1.8 The Bivariate Dichotomous Choice Model

For the double bounded model, the respondents will be asked two bid prices. The second bid price offered to the respondent will depend on the answer (yes or no) from the first bid price. In general, in cases where the respondent says “yes” to the first bid price, then the respondent will be asked a second bid price which is higher than the first. Vice versa, if the respondent says “no” to the first bid price, the second bid price will decrease. Let t^1 be the first bid price and t^2 be the second. The bounds on WTP are

- 1) $t^1 \leq WTP < t^2$ for the yes – no responses;
- 2) $t^1 > WTP \geq t^2$ for the no – yes responses;
- 3) $WTP \geq t^2$ for the yes – yes responses;
- 4) $WTP < t^1$ for the no – no responses;

Basically, econometric model for the double bounded data comes from the formulation

$$WTP_{ij} = \mu_i + \varepsilon_{ij}$$

where WTP_{ij} represents the j^{th} respondent’s willingness to pay and $i = 1, 2$ represents the first and second answers. μ_1 and μ_2 are the means for the first and second responses respectively. Let the means depend on individual covariates, $\mu_{ij} = \mathbf{z}_{ij}\beta$.

To construct the likelihood function, it is necessary to derive the probability of observing each of the possible two-bid response sequences (yes-yes, yes-no, no-yes, no-no). The probability that respondent j answers is given by

$$\begin{aligned}\Pr(\text{yes}, \text{no}) &= \Pr(WTP_{1j} \geq t^1, WTP_{2j} < t^2) \\ &= \Pr(\mu_1 + \varepsilon_{1j} \geq t^1, (\mu_2 + \varepsilon_{2j} < t^2)) \quad \text{----- (3.89)}\end{aligned}$$

$$\begin{aligned}\Pr(\text{yes}, \text{yes}) &= \Pr(WTP_{1j} > t^1, WTP_{2j} \geq t^2) \\ &= \Pr(\mu_1 + \varepsilon_{1j} > t^1, (\mu_2 + \varepsilon_{2j} \geq t^2)) \quad \text{----- (3.90)}\end{aligned}$$

$$\begin{aligned}\Pr(\text{no}, \text{no}) &= \Pr(WTP_{1j} < t^1, WTP_{2j} < t^2) \\ &= \Pr(\mu_1 + \varepsilon_{1j} < t^1, (\mu_2 + \varepsilon_{2j} < t^2)) \quad \text{----- (3.91)}\end{aligned}$$

$$\begin{aligned}\Pr(\text{no}, \text{yes}) &= \Pr(WTP_{1j} < t^1, WTP_{2j} \geq t^2) \\ &= \Pr(\mu_1 + \varepsilon_{1j} < t^1, (\mu_2 + \varepsilon_{2j} \geq t^2)) \quad \text{----- (3.92)}\end{aligned}$$

The j^{th} contribution to the likelihood function becomes

$$\begin{aligned}L_j(\mu|t) &= \Pr(\mu_1 + \varepsilon_{1j} \geq t^1, (\mu_2 + \varepsilon_{2j} < t^2)^{YN} \\ &\quad \cdot \Pr(\mu_1 + \varepsilon_{1j} \geq t^1, (\mu_2 + \varepsilon_{2j} \geq t^2)^{YY} \\ &\quad \cdot \Pr(\mu_1 + \varepsilon_{1j} < t^1, (\mu_2 + \varepsilon_{2j} < t^2)^{NN} \\ &\quad \cdot \Pr(\mu_1 + \varepsilon_{1j} < t^1, (\mu_2 + \varepsilon_{2j} \geq t^2)^{NY}) \quad \text{----- (3.93)}\end{aligned}$$

where $YN = 1$ for a yes-no answer, 0 otherwise, $YY = 1$ for a yes-yes answer, 0 otherwise, $NN = 1$ for a no-no answer, 0 otherwise and $NY = 1$ for a no-yes answer, 0 otherwise. If the errors are assumed to be normally distributed with means 0 and respective variances of σ_1^2 and σ_2^2 then WTP_{1j} and WTP_{2j} have a bivariate normal distribution with means μ_1 and μ_2 , variances σ_1^2 and σ_2^2 and correlation coefficient $\rho = \frac{\sigma_{12}}{\sqrt{\sigma_1^2 + \sigma_2^2}}$ and σ_{12} is the covariance between the errors for the two WTP functions. The

likelihood function for the bivariate probit model can be derived as follows. The probability that $WTP_{1j} < t^1$ and $WTP_{2j} < t^2$ (no – no response) is

$$\Pr(\mu_1 + \varepsilon_{1j} < t^1, (\mu_2 + \varepsilon_{2j} < t^2)) = \Phi_{\varepsilon_1 \varepsilon_2} \left(\frac{t^1 - \mu_1}{\sigma_1}, \frac{t^2 - \mu_2}{\sigma_2}, \rho \right)$$

The probability of a no – yes response is

$$\Pr(\mu_1 + \varepsilon_{1j} < t^1, (\mu_2 + \varepsilon_{2j} \geq t^2) = \Phi_{\varepsilon_1 \varepsilon_2} \left(\frac{t^1 - \mu_1}{\sigma_1}, -\frac{t^2 - \mu_2}{\sigma_2}, -\rho \right)$$

The probability of a yes – no response is

$$\Pr(\mu_1 + \varepsilon_{1j} \geq t^1, (\mu_2 + \varepsilon_{2j} < t^2) = \Phi_{\varepsilon_1 \varepsilon_2} \left(-\frac{t^1 - \mu_1}{\sigma_1}, \frac{t^2 - \mu_2}{\sigma_2}, -\rho \right)$$

The probability of a yes – yes response is

$$\Pr(\mu_1 + \varepsilon_{1j} \geq t^1, (\mu_2 + \varepsilon_{2j} \geq t^2) = \Phi_{\varepsilon_1 \varepsilon_2} \left(-\frac{t^1 - \mu_1}{\sigma_1}, -\frac{t^2 - \mu_2}{\sigma_2}, \rho \right)$$

Defining $y_{1j} = 1$ if the response to the first question is yes, and 0 otherwise, $y_{2j} = 1$ if the response to the second question is yes, and 0 otherwise, $d_{1j} = 2y_{1j} - 1$ and $d_{2j} = 2y_{2j} - 1$, the j^{th} contribution to the bivariate probit likelihood function becomes

$$L_j(\mu|t) = \Phi_{\varepsilon_1 \varepsilon_2} \left(d_{1j} \left(\frac{t^1 - \mu_1}{\sigma_1} \right), d_{2j} \left(\frac{t^2 - \mu_2}{\sigma_2} \right), d_{1j} d_{2j} \rho \right) \dots (3.94)$$

In case there is no covariance between the error terms from the two dichotomous choice responses ($\sigma_{12} = 0$ or $\rho = 0$), the the j^{th} contribution to the likelihood function becomes

$$\begin{aligned} L_j(\mu|t) &= \Phi_{\varepsilon_1 \varepsilon_2} \left(d_{1j} \left(\frac{t^1 - \mu_1}{\sigma_1} \right), d_{2j} \left(\frac{t^2 - \mu_2}{\sigma_2} \right), d_{1j} d_{2j} 0 \right) \\ &= \Phi_{\varepsilon_1} \left(d_{1j} \left(\frac{t^1 - \mu_1}{\sigma_1} \right) \right) \Phi_{\varepsilon_2} \left(d_{2j} \left(\frac{t^2 - \mu_2}{\sigma_2} \right) \right) \dots (3.95) \end{aligned}$$

3.2.1.9 Open-Ended Questions

The earliest contingent valuation questions were simply questions that asked the respondents the maximum amount they would pay. However, open-ended questions are subject to a variety of ambiguous responses. For example, individuals protest by responding with zeros or higher than it should plausibly be.

The econometric issues with open-ended questions are limited to learning about whether the responses are systematic functions of covariates or sample splitting or other aspects of the questionnaires or are individual. Typically, one would have an individual's response as WTP_i , and the sample mean would be $\frac{\sum_{i=1}^T WTP_i}{T}$. One might want to estimate a model such as

$$WTP_i = f(\mathbf{z}_i, \varepsilon_i)$$

where \mathbf{z}_i is a vector of individual's covariates, including income and a random element ε_i . Since $WTP_i \geq 0$ is determined as the assumption in the estimation of willingness to pay, Tobit model can be usually applied in this case.

When sampling from a sample frame that includes users as well as non-users of the recreational site, one frequently finds censored data. The observations are censored at zero for people who take no trips. In a statistical sense, the censoring means that the complete distribution of the dependent variable may not be observable and the unobservable portion of the distribution is massed at zero.

Suppose that the potential demand curve for the site for individual i in the population is given by

$$\mathbf{x}_i^* = f(\mathbf{z}_i) + \varepsilon_i \quad \text{----- (3.96)}$$

where \mathbf{z}_i is the row vector of M demands an argument that

$\mathbf{z}_i = (p_{ij}, j = 1, 2, 3, \dots, n; q_j, j = 1, 2, 3, \dots, n, \mathbf{y}_i^f)$, the price of a trip for individual i to the j^{th} site is given by $p_{ij} = c_{ij} + w_i t_{ij}$, q_j represents the quality at the j^{th} site, \mathbf{y}_i^f denotes full income given by $\mathbf{y}_i^f = \mathbf{y}_i^0 + w_i T_i$ and ε_i is a random term that may represent a measurement error or specification error.

The Tobit model is estimated when the specification of the individual demand function is given by

$$f(\mathbf{z}_i) = \mathbf{z}_i\boldsymbol{\beta} \quad \text{----- (3.97)}$$

where $\boldsymbol{\beta}$ is an $M \times 1$ column vector of parameters to be estimated and ε_i is distributed normally with mean zero and constant variance; $\varepsilon_i \sim N(0, \sigma^2)$. Letting $\Phi\left(\frac{\mathbf{z}_i\boldsymbol{\beta}}{\sigma}\right) = \int_{-\infty}^{\frac{\mathbf{z}_i\boldsymbol{\beta}}{\sigma}} \phi(t) dt$, $\phi(t)$ being the density function for an $N(0, 1)$ variate.

$$L(\boldsymbol{\beta}, \sigma | \mathbf{x}, \mathbf{z}) = \prod_{i=1}^T [1 - \Phi\left(\frac{\mathbf{z}_i\boldsymbol{\beta}}{\sigma}\right)]^{1-I_i} \cdot \left[\frac{1}{\sigma} \phi\left(\frac{x_i - \mathbf{z}_i\boldsymbol{\beta}}{\sigma}\right)\right]^{I_i} \quad \text{----- (3.98)}$$

since

$$\begin{aligned} \Pr(f(\mathbf{z}_i) + \varepsilon_i \leq 0) &= \Pr(\mathbf{z}_i\boldsymbol{\beta} + \varepsilon_i \leq 0) \\ &= \Pr(\varepsilon_i \leq -\mathbf{z}_i\boldsymbol{\beta}) \\ &= 1 - \Pr\left(\frac{\varepsilon_i}{\sigma} \leq \frac{\mathbf{z}_i\boldsymbol{\beta}}{\sigma}\right) \\ &= 1 - \Phi\left(\frac{\mathbf{z}_i\boldsymbol{\beta}}{\sigma}\right) \end{aligned}$$

The log-likelihood function for the Tobit model is

$$\ln(L(\boldsymbol{\beta}, \sigma | \mathbf{x}, \mathbf{z})) = \sum_{i=1}^T (1 - I_i) \ln[1 - \Phi\left(\frac{\mathbf{z}_i\boldsymbol{\beta}}{\sigma}\right)] + I_i \{\ln\left[\phi\left(\frac{x_i - \mathbf{z}_i\boldsymbol{\beta}}{\sigma}\right)\right] - \ln(\sigma)\} \quad \text{----- (3.99)}$$

Basically, the value of access to the site can be calculated as the willingness to pay. This is calculated as the area under the utility-constant demand curve for the site. The Tobit model is almost always estimated linear in parameters and covariates and this linear form leads to a measure of willingness to pay.

For simplicity, write the latent demand function as $x_i^+ = \beta_{0i}^+ + \beta_1 C_i^0$, where C^0 is the current own-site travel cost and β_{0i}^+ is either a constant or a linear in parameters function of covariate other than own-site travel cost, plus the error term.

Let $0 = \beta_0^+ + \beta_1 C^*$ determine the choke price that sets a quantity equal to zero such as $C^* = -\frac{\beta_0^+}{\beta_1}$. Integrating under the demand curve from the current price C^0 to the choke price C^* yields consumer surplus, which equals willingness to pay in this case.

$$\begin{aligned} WTP &= \int_{C^0}^{C^*} (\beta_0^+ + \beta_1 C) dC \\ &= \beta_0^+ C^* + \frac{\beta_1 C^{*2}}{2} - \left[\beta_0^+ C^0 + \frac{\beta_1 (C^0)^2}{2} \right] \quad \text{----- (3.100)} \end{aligned}$$

The following simplification holds for any C :

$$\begin{aligned} \beta_0^+ C + \frac{\beta_1 C^2}{2} &= \frac{2\beta_0^+ \beta_1 C + \beta_1^2 C^2}{2\beta_1} \\ &= \frac{(\beta_0^+ + \beta_1 C)^2}{2\beta_1} - \frac{(\beta_0^+)^2}{2\beta_1} \end{aligned}$$

By definition, $\beta_0^+ + \beta_1 C^* = 0$ and $\beta_0^+ + \beta_1 C^0 = x^+$. Therefore, after rearranging the equation (3.100), the willingness to pay can be estimated by

$$WTP = -\frac{(x^+)^2}{2\beta_1} \quad \text{----- (3.101)}$$

A consistent estimate of $E(x)$ denoted $\hat{E}(x)$ is found by substituting consistent estimates of β . With measurement error a consistent estimate of the value of access to the site or willingness to pay from the Tobit model is

$$\widehat{WTP} = -\frac{(\hat{E}(x))^2}{2\hat{\beta}_1} \quad \text{----- (3.102)}$$

3.2.2 Validity of Contingent Valuation Method

Brown (2003: 104); Bishop (2003: 544-556), Udomsak Seenprachawong (2013: 125-128); Israngkura (1998: 68-69) and Carson et al. (1996: 2-3) mentioned the validity in stated preference methods and especially contingent valuation method (CVM).

To conduct CV survey efficiently, the CV study's guideline of NOAA (National Oceanic and Atmospheric Administration) stated that the result of CV study will be accredited if it possesses the validity. The CV study that suffers from these following problems will be judged as an unreliable study,

- 1) A high nonresponse rate;
- 2) Inadequate responsiveness to the scope of the hypothetical project;
- 3) Lack of understanding of the task by respondents;
- 4) Lack of belief in the full restoration scenario;
- 5) "yes" or "no" votes on the hypothetical referendums that do not clearly explained about the cost and value of the program,

Validity, in terms of nonmarket valuation, is the accuracy, reliability and precision of the estimate of mean willingness to pay derived from a contingent valuation study. The surest way to assess the validity of a stated preference measure would be to compare the result of a survey with a purchasing behavior of the same population in the market. Nevertheless, assessing validity in nonmarket valuation is not easy to conduct.

In principle, the validity of contingent valuation consists of three types of validity as follows.

- 1) Construct validity deals as to whether the measure under investigation relates to the theory. This may be evaluated in two ways: 1) by comparing the measure with other measures and they should give a similar result (e.g., comparing willingness to pay amount resulted from a contingent valuation method of another result from travel cost method). This is called "convergent validity"; 2) by investigating the conformance between the results, variables' coefficients with theory (e.g., examining how willingness to pay an amount varies with income). This is called "theoretical validity" (Bishop, 2003: 549).

- 2) Content validity looks at the quality of the survey instruments. The question to ensure the content validity is usually composed of 1) are the items to be valued obviously described to the respondents?; 2) is the payment vehicle reasonable?; 3) does the sample represent the population?; and 4) is the statistical model appropriate? With regard to payment vehicle, Udomsak Seenprachawong (2013: 127) and Brown (2003: 105) stated that the payment vehicle should be

adequately explained, so that the respondents realize that the hypothetical scenario can occur in real life and their answers of willingness to pay will obligate them. This is essential to reduce the problem of overestimated willingness to pay. Furthermore, the donation and tax payment is not considered applicable in cases of use value because the respondents probably underestimate the willingness to pay if free-riding by others, who do not pay, cannot be prevented.

3) Criterion validity refers to the comparison of the contingent values to values from actual cash transactions. If contingent values compare well with values from actual cash transactions in an experimental market, that is important evidence of validity.

3.2.2.1 How to Assess Validity of a Contingent Valuation Study

However, to ensure the validity of a CV survey, there is a set of questions which researchers should ask themselves before conducting a CV study. The set of questions is exhibited as follows (Bishop, 2003: 545-547).

1) Was the econometric model consistent with a theory, especially contingent valuation theory?

2) Were the attributes of good being valued completely identified? Information of good being valued is important enough to be gained through consulting with relevant policy makers, scientists and through applying focus groups before conducting field survey.

3) Were the economic parameters adequately incorporated? If draft survey materials are pretested or a focus group is conducted before conducting the field survey, the study will be more reliable.

4) Were respondents aware of their budget constraints and of the current status of good being valued and its substitutes? The respondents need to be reminded about such things to give rational responses to contingent valuation questions.

5) Was the context for valuation fully specified and incentive compatible? Asking respondents how much they would be willing to pay for the proposed conservation program would not be enough. However, people may decide to pay as “good citizens” rather than revealing their real willingness to pay. A payment vehicle has to be appropriately selected (Boyle, 2003: 131).

6) Did respondents agree with the proposed scenario? If respondents feel that the hypothetical is not rational or not possible or not detailed enough, they may reject revealing their willingness to pay amounts and this can lead to a poor quality survey. Content validity will be fulfilled, if respondents believe in the proposed scenario.

7) Were survey questions of the questionnaire complete? The questions in the questionnaire are not only designed to elicit value but also to be prepared to gather other useful information for example, socio-economic data and attitudes towards the good being valued for validity assessment and qualitative conclusion.

8) Was the survey method appropriate? The survey method affects validity. It is necessary to decide whether the survey should be done by mail or telephone or personal interview. No single survey method is outstandingly superior to others. However, in the case of surveying populations in which there is no list and the researcher would like to collect the information from people who are not likely to respond willingly by mail, email or telephone, it is necessary to use visual instruments during the asking of questions, in-person interview should be selected according to Table 3.4 (Champ, 2003: 71).

Table 3.4 Strength (+) and Weakness (-) of the Various Mode of Administration

	In – person interview	Telephone	Mail	Web based or email
Control over how the survey is administered	+	+	–	+
Ability to use visual aids	+	–	+	+
Ability to survey the population for which there is no list	+	+	–	–
Interviewer effects	–	–	+	+

9) Were qualitative research procedures for example, pretests and pilots sufficient to find and correct defects in questionnaire and relevant survey instruments? Focus groups and pilot survey should be done before the official field survey.

10) How complete and obvious are all the statements in any survey materials? If written survey materials or any statements appearing in a questionnaire are ambiguous, the study's content validity will possibly not be executed?

3.2.2.2 Strengths and Weaknesses of Response Formats of Contingent Valuation Questions

Initially, hypothetical bias arises because contingent valuation questions are hypothetical. Some respondents who do not thoroughly realize the status quo and final scenario after CV program or lack of familiarity of payment vehicle are able to overstate or understate the willingness to pay. Some respondents who support or oppose the CV program might overstate or understate the willingness to pay respectively (Israngkura, 1998: 68; Champ et al., 2009: 166).

According to three most commonly used formats that are open-ended question, payment-card question and dichotomous choice question, Seenprachawong (2013: 122) and Boyle (2003: 137-141) stated that each of the three main response formats has strengths and weaknesses shown in Table 3.5. According to dichotomous choice contingent valuation question in the form of "take-it-or-leave-it", there are some desirable properties for incentive compatible revelation of preference (Hoehn and Randall, 1987: 226-247). This is not the case for open-ended and payment-card questions because if the respondents want to see a policy change occur, they can state an open-ended value or pick a payment card amount that exceeds their actual willingness to pay that is called "strategic bias".

Table 3.5 Strengths and Weaknesses of Contingent Valuation Response Formats

Characteristics	Open Ended	Payment Card	Dichotomous Choice
Theoretically incentive compatible	No	No	Has some desirable properties
Bid design required	No	Yes	Yes
Responses/ statistical efficiency	Continuous	Interval	Interval
Potential problems	Zero bids, fair share responses, starting point bias (in case of bidding games)	Anchoring	Anchoring, yes saying, voting as good citizens

Udomsak Seenprachawong (2013: 121) stated that bidding games that estimate the willingness to pay by offering several bidding prices can be offered to the respondents. First of all, the interviewer will select the starting bidding price and offer to the respondents. If the respondent replies “yes” for the first offered bid, the bidding price will be continuously increased until such respondent says “no”. Vice versa, if the respondent replies “no” for the first offered bid, the bidding price will be continuously reduced until such respondent says “yes”. Basically, the final bid that the respondent is willing to pay correlates with the starting bid because the respondents usually anchor themselves with the starting bid offered by the interviewer. With regard to a high starting bid, the willingness to pay will be high accordingly. Likewise, in the case of a low starting bid, thus the willingness to pay will be low. These afore-mentioned issues are called starting point bias and anchoring.

Responses to open-ended questions result in a continuous distribution of responses on the interval $[0, +\infty)$, while responses to dichotomous-choice questions indicate only whether each respondent’s values lie below $(-\infty, \$B)$ or above $[\$B, +\infty)$. Payment-card responses reveal whether the respondents’ values stand in a $k + 1$ interval where k is the number of bid amounts on the payment cards. Thus in terms of

estimating central tendency, open-ended questions provide the most efficient while dichotomous-choice questions provide the least efficient estimates (Boyle, 2003: 129).

In addition to not being incentive compatible, open-ended questions are considered to yield an unusually high percentage of responses of \$0 or open-ended questions cannot provide enough structure to motivate respondents to put in the effort to answer with a specific dollar amount. Hence, open-ended questions are susceptible to elicit “fair share” responses (Boyle, 2003: 142).

Often, dichotomous-choice questions yield welfare estimates that are greater than those of open-ended and payment-card questions. The high proportion of \$0 responses of open-ended questions and anchoring on the bid amounts in dichotomous-choice questions both are likely to contribute to this disparity. However, Welsh and Pole (1998: 178) found another reason, that is, the respondents who are unsure will answer yes to a dichotomous-choice question (Boyle, 2003: 142).

Although the open-ended questions have a positive aspect over dichotomous-choice questions to avoid anchoring on bid amounts, the incentive incompatibility can occur because of a high proportion of responses \$0. Nevertheless, in comparison to iterative-bidding questions, dichotomous-choice questions can be used to avoid but have to remind themselves that dichotomous-choice questions are not free from anchoring problems (Boyle et al., 1997: 1496; Boyle et al., 1998: 389; Green et al., 1998: 96). Besides, the respondents have a propensity to say they would pay high bid amounts that exceed their true values and the welfare estimates will be consequently inflated.

Another problem has been termed “yea saying” which is the propensity of some respondents to answer yes to any bid amount offered to them (Berrens et al., 1997: 256; Blamey et al., 1999: 132; Holmes and Kramer, 1995: 125). This effect further reduces the efficiency of dichotomous-choice data (Boyle, 2003: 140). Udomsak Seenprachawong (2013: 122) stated that the reason that the respondents say “yea” immediately without rational consideration is that respondents realize that a given CV program or scenario is a good thing that should be done and everyone should support it as a good citizen. Herriges and Shogren (1996: 121) and Udomsak Seenprachawong (2013: 122) mentioned that “yea saying” will exacerbate anchoring

because responses to the second bid are influenced by the magnitude of the initial bid and cause the welfare estimates exceed their true values.

Nonetheless, the problem of “yea saying” can be reduced by using “cheap talk script” that is the short script that the respondents will read or realize before they answer their willingness to pay for the given CVM scenario. Cheap talk script will have the respondents always reminding themselves that this typical CVM scenario is not just a hypothetical program and the respondents have to take financial responsibility for paying for this given CV program if it is really implemented in the near future Udomsak Seenprachawong (2013: 123). To reduce the effect of “yea saying”, the researchers have to keep respondents reminding themselves that they have the responsibility to pay what they answer for in the CV program (Cumming and Taylor, 1998: 209).

Payment-card questions and multiple-bounded-dichotomous-choice questions appear to remove the tendency of anchoring and yea saying because there is not any single bid for respondents to focus on. Especially, payment-card questions obviously appear to avoid anchoring because there is no one bid amount to anchor on. Respondents see all k bids and must circle just one of them. Despite the increased efficiency of double-bounded-dichotomous-choice questions, the anchoring that is introduced by the second bid amount reduces the usefulness of this question format. (Boyle, 2003: 143).

Regarding the perspective of criterion validity, to compare the estimated willingness to pay from the survey with the actual cash transaction that respondents have to pay for the CV program in a real situation, the difference between the estimated willingness to pay from open-ended questions and the actual cash transaction is lower than which from the case of dichotomous-choice questions. The anchoring to the bid amounts of dichotomous-choice questions is able to explain such a wider difference. Therefore, multiple-bounded-dichotomous-choice questions or payment-card questions should be considered to apply to reduce such a wider difference (Brown et al. 1996: 160).

Although multiple-bounded questions may be considered to be applied to reduce such anchoring, it is not ready for policy analyses yet because of their experimental status. However, Incentive compatibility is one consideration in

choosing a contingent-valuation response format but it is not a deciding factor (Boyle, 2003: 141).

3.2.2.3 Scope Test, Embedding Effect, Distance Decay and Anchoring Bias

With regard to scope test which is the one factor in construct validity, Udomsak Seenprachawong (2013: 127-128) and Bishop (2003: 550, 554) stated that if the scope of a particular CV program is changed no matter in term of quantity or quality, the willingness to pay has to be changed accordingly. The wider scope should yield a higher willingness to pay. Normally, if people desire more restored historic sites or better restoration, they ought to be willing to pay more for the additional requirements.

With regard to this study, respondents are believed to be sensitive to the number of historic sites in the heritage interpretation restoration and improvement program, and they are supposed to pay more if the number of historic sites in the program is increased. Nevertheless, in cases where the respondents are not sensitive to the scope of the project or there is no statistical evidence that the respondents will be willing to pay more for the larger project, this reflects that the individuals just pay to perform their good citizenship or from altruism only, which is called the warm glow giving phenomenon in economic terms (Andreoni 1990: 477)

With regard to another issue of CV program's scope, in cases where respondents answer the same willingness to pay for two CV programs in which their scopes are significantly distinct. This problem is called embedding effect (Israngkura, 1998: 69). Embedding effect is caused by respondents just being aware themselves and would like to take part in CV programs but they do not pay attention to the scope of the CV programs.

Carson (1997: 153) studied the sensitivity to scope in determining the value of non-market goods and found that the value estimates are sensitive to scope. Furthermore, regarding the construct validity of contingent valuation, the scope test is highly recommended by NOAA (Udomsak Seenprachawong, 2013: 128).

In the theoretical concept of environmental economics, the value of environmental goods is expected to decline according to the increase of distance between the beneficiary and the environmental good. CV study neglecting the effect of distance decay possibly causes over-estimated total value (Bateman et al., 2006:

455). Direct use-values deserve to decline with respect to the distance between respondent's residential area and environmental good because the respondent has fewer opportunities to use it. However, non-use value of both users and non-users is also considered to decline according to the distance (Sutherland and Walsh, 1985: 290; Hanley et al. 2003: 302) because the respondent who lives farther away will have less ownership, knowledge and awareness of such environmental good (Pate and Loomis, 1997: 205) but the discount rate is fewer than direct use-value (Brown et al. 2002: 63).

Likewise, distance decay is also expected to be found in any CV study of a particular cultural heritage site. The respondents who do not live in the province the cultural heritage site is located in probably are not willing to pay (Pollicino and Maddison, 2001: 144). On the other hand, the respondents who live farther away may be willing to pay less than respondents, who are local people, or their residences are not far from the cultural heritage site (Tuan et al., 2009: 12). Similarly to the case of environmental good, the reason of distance decay in value of a cultural heritage good is where the respondents who live farther away possibly have fewer opportunities to use it as compared to respondents who live nearby. In addition, they probably have less knowledge and awareness of the importance of a given cultural heritage. Certainly, none would like to pay more for a thing that he or she is not aware of.

With regard to anchoring bias, the anchoring effect occurs if the respondents are uncertain of the true value of the non-market good. The initial value that the respondent knows before being asked by researcher will affect the respondent's elicited value in stated preference valuation study. It is like respondent anchoring his or her value with the prior known informative value before he or she elicits the value to the researcher. If the respondent knows the true cost of the proposal or realize or self-estimate that the cost of a proposed hypothetical program is cheap, the respondent will undercut his or her elicited value and this will lead to being willing to pay a reduced amount (Herridges and Shogren, 1996: 129; Whitehead, 2002: 296; Albertini et al. 1997: 323).

3.3 Development of Survey Instruments

The restoration and improvement of heritage interpretation is the one of the main parts of cultural heritage conservation and preservation. Therefore, the restoration and improvement of heritage interpretation in World Heritage Site of The Historic City of Ayutthaya may generate a lot of economic benefits.

Two focus group sessions were conducted. The first focus group was conducted with eight attendees (the optimal number of attendees is 8-12 (Boyle, 2003: 138)) who used to visit Ayutthaya Historic City and organized in January 16, 2012 at TCIF Tower, Bangna, Bangkok. The aim of the first focus group sessions was to gather the information and attitudinal viewpoints to define the good, valuation scenarios, the question's format in the questionnaire and the appropriate payment vehicle.

According to the first focus group, the main summary could be concluded as follows.

1) The focus group had the consensus that current heritage interpretation materials and services in Ayutthaya Historic City are attentively poor and urgently need restoration or improvement.

2) The focus group had the consensus that heritage interpretation materials and services are an important mechanism to motivate visitors to be aware of the authentic value of the Historic City of Ayutthaya. Hence, the restoration and improvement of heritage interpretation are an unavoidable part of the historic site's conservation or preservation programs.

3) The focus group indicated that Thai visitors who visit the Historic City of Ayutthaya do not expect to gain only use value for example, recreational value, aesthetic value but they also expect to gain value from knowing that the historic sites are being appropriately preserved. These findings led the researcher to conclude that a stated-preference method would be preferable because it is able to estimate all benefits including direct-use value, passive-use value and non-use value (Udomsak Seenprachawong, 2006: 5).

4) The focus group indicated that the suitable payment vehicle for this study should be one-day entrance fee because the entrance fee is probably more

realistic than tax or donation for the visitors. Moreover, the entrance fee the payment vehicle that has a mechanism to prevent free riders, so the entrance fee should provide an incentive in a compatible format to elicit the respondents' willingness to pay (Udomsak Seenprachawong, 2012: 126). Although the use of the entrance fee may have provided an anchoring bias because the respondents probably relate their willingness to pay to a common fee for visiting other cultural heritage sites, the entrance fee is still an appropriate payment vehicle because The Historic City of Ayutthaya is a World Heritage Site that is rarely substitutable by other cultural heritage sites (Tuan, 2006: 22).

After the first focus group had been conducted, the survey visual materials and questionnaire were developed and prepared. This survey questionnaire was allocated into three parts and composed of 1) Socio-economic information of the respondents; 2) attitudinal viewpoints of the respondents regarding heritage interpretation and site management in the Historic City of Ayutthaya and; 3) the elicitation of respondents' willingness to pay.

After the survey instruments had been developed, the second focus group was conducted with 8 attendees (the optimal number of attendees is 8-12 (Boyle, 2003: 138)) who had visited Ayutthaya Historic City in February 24, 2012 at TCIF Tower, Bangna, Bangkok. The survey materials including a script to be read by the person administering the survey, survey visual materials and survey questionnaires. The visual materials showing their present conditions of heritage interpretation in the Historic City of Ayutthaya, and illustrating the proposed heritage interpretation improvement program were presented and used in the second focus group to confirm the content validity. According to the second focus group, there were some ambiguous words and phrases in the survey visual materials and questionnaire and they were modified and finalized for the pretest survey. With respect to one-day package entrance fee that will be used as the payment vehicle of this study for two hypothetical programs, the suggestion from focus group indicated that

- 1) In case of heritage interpretation improvement program for three major sites in the Historic City of Ayutthaya that consists of Wat Si Sanphet, Wat Mahathat and Wat Chaiwatthanaram, the optimal number of bids of entrance fee

should be eleven bids starting from 100, 120, 140, 160, 180, 200, 220, 240, 260, 280, 300 Baht and;

2) In case of heritage interpretation restoration program for fifteen sites in the Historic City of Ayutthaya that consists of Wat Si Sanphet, Wat Mahathat, Wat Chaiwatthanaram, Wat Mongkol Bophit, Wat Thammikarat, Wat Phra Ram, Wat Buddhaisawan, Wat Phanan Choeng, Wat Maheyong, Wat Yai Chaimongkol, Wat Rajburana, Wat Suwandararam, Wat Na Phra Men, Wat Kudidao and Wat Barom Buddharam, the optimal number of bids of entrance fee should be eleven bids starting from 200, 240, 280, 320, 360, 400, 440, 480, 520, 560, 600 Baht.

To reduce the effect of “yea saying”, it is necessary that the researchers have to keep respondents reminding themselves that they have the responsibility to pay what they answer for the CV program (Cumming and Taylor, 1998: 203-215). Therefore, the survey questionnaire was four-color designed and printed with offset printing process so that the questionnaire looks official and makes respondents officially concentrate during the survey. Some clothes bags were also prepared to give to the respondents as the token so that the respondents could cooperate collaboratively during the survey. Theoretically, a field pretest should be conducted with at least 50 – 100 observations (Boyle, 2003: 138). Therefore, the field pretest of this study was conducted with 110 observations in April 6-20, 2012 at the entrance gate of three major sites of the Historic City of Ayutthaya they were Wat Si Sanphet, Wat Mahathat and Wat Chaiwatthanaram. The respondents were asked after they visited inside the site. According to the pretest, no ambiguous situations of the survey visual materials or questionnaire occurred during the field pretest. Furthermore, with regard to the official four-color printed questionnaire, the respondents collaborate and paid attention in answering the questions during the survey.

Figure 3.10 present the probability of “yes” answers on eleven different entrance fee bids in case of heritage interpretation restoration program for three major sites only and Figure 3.11 present the probability of “yes” answers for eleven different entrance fee bids in the case of a heritage interpretation restoration program for fifteen culturally valuable sites in the Historic City of Ayutthaya including three major sites.

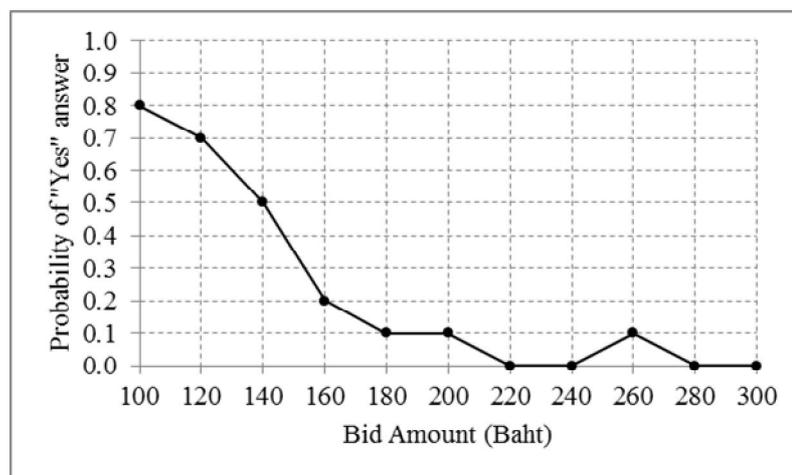


Figure 3.10 Probability of a “Yes” Answer under Heritage Interpretation Restoration Program for 3 Major Sites

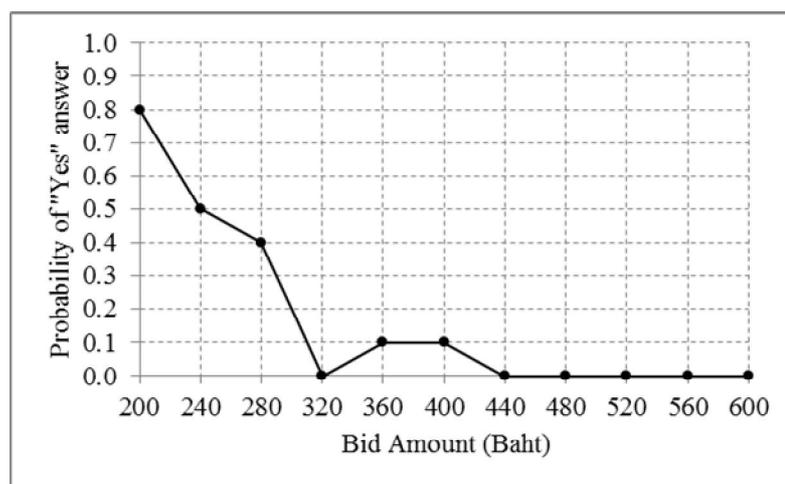


Figure 3.11 Probability of a “Yes” Answer under Heritage Interpretation Restoration Program for 15 Sites

Theoretically, dichotomous-choice questions require a selection of bids. Alberini (1995a: 287-306 and 1995b: 83-95), Kanninen (1993a: S1-S11; 1993b: 138-146 and 1995: 114-125) and Udomsak Seenprachawong (2013: 122) showed that an optimal design has a small number of bids (5-8). In practice, the probability of “Yes” answers to the maximum bid should be almost 1 and the probability of a “Yes” answer of the minimum bid should be lower than 0.1.

Regarding the afore-mentioned, from Figure 3.9, the researcher decided to change the bid price of one-day entrance fee for 3-major-site heritage interpretation restoration and improvement program from 11 previous bid prices (100, 120, 140, 160, 180, 200, 220, 240, 260, 280, 300) to be 7 bid prices (80, 100, 120, 140, 160, 180, 200). Likewise, from Figure 3.10, the researcher also decided to change the bid price for 15-site hypothetical programs from 11 bid prices (200, 240, 280, 320, 360, 400, 440, 480, 520, 560, 600) to be 7 bid prices (180, 200, 220, 240, 260, 280, 300) instead. After the field pretest had been prudently considered, the bid prices were adapted and some phrases in the questionnaire were modified a little bit to make it clearer and then finalized for the main survey.

The main survey was conducted from June 17-July 20, 2012 at the exits of Wat Si Sanphet, Wat Mahathat and Wat Chaiwatthanaram which are the most notable sites and have the most visitors who come to the Historic City of Ayutthaya usually to visit those sites.

3.4 CV Questionnaire

A four-color offset printed questionnaire was used in this survey to have the respondents feel that this survey was an official survey to improve and restore the heritage interpretation in the Historic City of Ayutthaya. The questionnaire was divided into 3 main sections. These are described in more detail below.

Section 1 consists of 14 questions that scrutinize the socio-demographic information of Thai visitors including gender, age, marital status, residence province, education, occupation and income, etc. For this section, the interviewer had the respondents fill in the questionnaire by themselves. For sections 2 and 3, the interviewer face-to-face asked the respondents and filled in the answers to the questionnaire himself.

Section 2 consists of 14 questions that investigate the general attitudes of Thai visitors to the Historic City of Ayutthaya, their reasons for visiting, their knowledge background of the Historic City of Ayutthaya and its controversial issues, their traveling information for example, number of trip members, number of visiting days, number and type of accommodation, number of times visited before, the opinion of the existing heritage interpretation of the Historic City of Ayutthaya, etc.

Section 3 of the questionnaire gives a clear description of current heritage interpretation in the Historic City of Ayutthaya by using brief statements, some photographs and a geographical map. With these survey instruments, it can describe the good that the respondents were asked to value. The main purpose of this section is to illustrate the status quo of the heritage interpretation inside the Historic City of Ayutthaya, and it was later explained that such low quality heritage interpretation will gradually decrease the awareness and authentic value of the Historic City of Ayutthaya. The crucial obstacle in figuring out this problem is the insufficiency of budget and no funding mechanism for continuous upkeep. Then, two hypothetical heritage interpretation improvement programs were presented. It was explained that both programs would improve the quality of heritage interpretation of the Historic, City of Ayutthaya but Program 1 will cover only three major sites that are Wat Si Sanphet, Wat Mahathat and Wat Chaiwatthanaram while the scope of Program 2 will cover 15 important sites that are Wat Si Sanphet, Wat Mahathat, Wat Chaiwatthanaram, Wat Mongkol Bophit, Wat Thammikarat, Wat Phra Ram, Wat Buddhaisawan, Wat Phanan Choeng, Wat Maheyong, Wat Yai Chaimongkol, Wat Rajburana, Wat Suwandararam, Wat Na Phra Men, Wat Kudidao and Wat Barom Buddharam (3 major sites in Program 1 are also in the Program 2). Figure 3.12 and Figure 3.13 will express the status quo and improved state of the heritage interpretation inside Ayutthaya Historical Park respectively. Table 3.6 gives a detailed description of the information provided to respondents.



Figure 3.12 Status Quo of Heritage Interpretation inside Ayutthaya Historical Park



Figure 3.13 The Improved State of Heritage Interpretation inside Ayutthaya Historical Park

Regarding the status quo, almost all information boards at the historic sites inside the Historic City of Ayutthaya have deteriorated without any upkeep. If a Thai visitor would like to visit any historic site, the visitor has to pay just 10 Baht per person per site for the entrance fee (No package based entrance fee). After the visitors pay 10 Baht entrance fee, the visitors will receive only a ticket and be allowed to go inside the historic site by themselves without any guide services or even any booklets,

pamphlets or brochures. Nonetheless, from the improved state of the hypothetical heritage interpretation restoration and improvement program, enough information boards will be appropriately arranged and physically maintained in good quality condition and an attractive appearance. Moreover, a booklet detailing the historical, cultural context of such an historic site will be prepared for the visitors. Also, guide service will be arranged and the visitors are able to select a convenient shift to join a group with the tourist guide according to the announced timetable.

Table 3.6 Description of the Scenario Provided to Respondents

Text read by interviewer	Description of visual materials used
<p>As you may know, The Historic City of Ayutthaya is one of the most important cultural heritage sites in Thailand. Because of its uniqueness it was listed by UNESCO as a World Heritage Site in 1991. Currently, the Historic City of Ayutthaya is at risk of being delisted from the UNESCO list of World Heritage Sites because of cultural and historical restoration and conservation problems.</p>	<p>1) Have the respondents to fill in the socio – demographic information in section 1.</p> <p>2) Use card number 1 and number 2 to ask the respondents regarding their general attitudes of the Historic City of Ayutthaya in section 2.</p>
<p>One of the reasons behind the conservation problem is the considered low awareness of Thai people as well as Thai visitors of the value and importance of the Historic City of Ayutthaya. Therefore, the restoration and improvement of the heritage interpretation inside the site is one of the key measures to resolve the problems.</p>	
<p>1. Current Condition of Heritage Interpretation of the Historic City of Ayutthaya: Currently, the quality of the heritage interpretation inside the Historic City of Ayutthaya is so low that it cannot provoke, inspire or motivate the visitors to perceive the total value of the sites (Show card number 3).</p>	<p>1) Use card number 3 to present the current situation of heritage interpretation of the Historic City of Ayutthaya.</p>

Table 3.6 (Continued)

Text read by interviewer	Description of visual materials used
<p>Unfortunately, government resources are too limited to improve and restore the heritage interpretation. As a result, the visitors who come to visit the Historic City of Ayutthaya are not aware of its cultural and historical value and importance. There is a concern that if a major effort is not undertaken the Historic City of Ayutthaya's intrinsic and authentic value will be ignored by Thai people.</p>	
<p>2. Proposed Heritage Improvement Programs:</p> <p>1) Program1: Heritage interpretation restoration and improvement program for 3 major sites in the Historic City of Ayutthaya (Wat Si Sanphet, Wat Mahathat and Wat Chaiwatthanaram)</p> <p>2) Program2: Heritage interpretation restoration and improvement program for 15 sites in the Historic City of Ayutthaya (Wat Si Sanphet, Wat Mahathat, Wat Chaiwatthanaram, Wat Mongkol Bophit, Wat Thammikarat, Wat Phra Ram, Wat Buddhaisawan, Wat Phanan Choeng, Wat Maheyong, Wat Yai Chaimongkol, Wat Rajburana, Wat Suwandararam, Wat Na Phra Men, Wat Kudidao and Wat Barom Buddharam)</p>	<p>2) Use card number 4 to present 2 programs of heritage interpretation improvement for 3 major sites and 15 sites in the Historic City of Ayutthaya.</p>

As mentioned before, since one-day package entrance fee are a mandatory payment mechanism that can effectively prevent free riders, it is believed that this payment vehicle can motivate the respondents to truthfully state their preferences for heritage interpretation restoration and improvement of the Historic City of Ayutthaya.

In this study, single bounded dichotomous choice questions, double bounded dichotomous choice questions and open ended questions are used to elicit the respondents' willingness to pay for two hypothetical heritage restoration and improvement programs (Program 1 for 3 major sites and program 2 for 15 sites) as shown in Figure 3.14. The respondents were asked the following questions:

“Suppose that we were to have a referendum that everyone would pay a special fee via an increase in one-day entrance fees of X Baht. This fund would be managed in perpetuity to ensure the improvement, restoration and upkeep of the heritage interpretation of Wat Si Sanphet, Wat Mahathat and Wat Chaiwatthanaram which are at risk. In effect, this would be a bequest by the current generation to future generations. If more than half of the people vote “Yes”, then the referendum is passed, and the one-day entrance fee will be increase to X Baht per person. If more than half of the people vote “NO”, the current condition of heritage interpretation will continue.”

If the respondents say “Yes”, the interviewer will double the previous one-day entrance fee bid and ask the respondent again. If the respondents disagree to pay the first one-day entrance fee bid, the interviewer will reduce the proposed one-day entrance fee bid by half and resubmit it to the respondents to answer “Yes” or “No”. Finally, the interviewer will ask the open ended question to the respondents “How much is your maximum willingness to pay for the heritage restoration and improvement program and give the respondents a chance to answer with a figure that they are willing to pay.

Likewise, the procedure of program 2 is the same as the procedure for program 1 but the number of historic sites will be increased from 3 major sites to 15 sites which are Wat Si Sanphet, Wat Mahathat, Wat Chaiwatthanaram, Wat Mongkol Bophit, Wat Thammikarat, Wat Phra Ram, Wat Buddhaisawan, Wat Phanan Choeng, Wat Maheyong, Wat Yai Chaimongkol, Wat Rajburana, Wat Suwandararam, Wat Na Phra Men, Wat Kudidao and Wat Barom Buddharam.



- = 3 major sites that are Wat Si Sanphet, Wat Mahathat and Wat Chaiwatthanaram in Program 1
- ▲ = Another 12 sites added up into Program 2. So there are 15 historic sites in Program 2

Figure 3.14 Two Hypothetical Heritage Interpretation Restoration and Improvement Programs in Ayutthaya Map

3.5 Sample Selection

The survey method for gathering primary data on the CV in this study was the face-to-face interview. Due to the Historic City of Ayutthaya, especially Ayutthaya Historical Park being the property of all Thai people, all Thai people have the right to visit the Historic City of Ayutthaya. According to the policy of the Fine Art Department, the entrance fee of 10 Baht per site will be collected from Thai visitors who are older than or equal to 20 years old only. Therefore, the population is Thai people who are older than or equal to 20 years old. According to National Statistical Office, there are 46,729,157 Thai people who older than or equal to 20 years old in 2011. Hence, the population size in this study should be considered 46,729,157 people.

According to information of the Tourism Authority of Thailand in 2011, there are 4,890,949 visitors visiting Ayutthaya province. The total visitors consisted of 3,967,499 Thai visitors (81.12%) and 923,450 foreign visitors (18.88%). With regard

to Thai visitors who visit Ayutthaya Historical Park, according to the interview with director of the Phranakhon Si Ayutthaya Historical Park, Mr. Chaiyanan Bussayarat, he said that there are only around 350,000 Thai visitors who visit Ayutthaya Historical Park from the total of 3-4 million Thai visitors who visit Ayutthaya province.

With regard to the survey procedure, ideally, the study should have obtained willingness to pay information from a randomly drawn sample of the Thai visitors in each heritage site in Ayutthaya province. Realistically, most visitors who visit the Ayutthaya Historical Park usually visit 3 major sites in the Historic City of Ayutthaya which are Wat Si Sanphet, Wat Mahathat and Wat Chaiwatthanaram.

For the afore-mentioned reason, it was decided to conduct the survey in front of the exits of three major sites in the Historic City of Ayutthaya which are Wat Si Sanphet (368 observations), Wat Mahathat (325 observations) and Wat Chaiwatthanaram (24 observations). The visitors who visited these three most well-known sites could be assumed to have knowledge and attitudes that would be representative of the visitors who visit the Historic City of Ayutthaya. Notwithstanding, the number of observations of Wat Chaiwatthanaram are fewer than the number of observations of both Wat Si Sanphet and Wat Mahathat because Wat Chaiwatthanaram was severely affected by the 2011 flood in Ayutthaya province and closed for restoration at that time. The respondents were selected by a systematic random sampling procedure. The interviewer chose every 5th visitor exiting the three major sites and asked after they had the experience in heritage interpretation for such a site so that the respondents are able to realize the current situation and were ready to willingly give truthful viewpoints.

According to Yamane's sample size computation (Yamane: 1973: 727), the sample size could be computed by this following formula.

$$n = \frac{N}{1 + Ne^2}$$

where n = sample size

N = the size of population

e = level of precision or sampling error (it is assumed to be 5%)

$$n = \frac{46,729,157}{1 + (46,729,157)(0.05)^2}$$

$n \approx 400$ observations

In practice, for a study population of size 1,000, approximately 200-300 observations are required for a 5% sampling error. The sensitivity of the sampling error to sample size decreases as the population increases in size. Whether the size of the study population is 10,000 or 100,000,000, a sample size of approximately 380 is needed (Salant and Dillanman, 1994: 55; Udomsak Seenprachawong, 2013: 119)

In this case, the sample size is considered 717 observations and the main survey was conducted from June 17-July 20, 2012 (both weekdays and weekends) with two hypothetical contingent valuation programs. Each respondent will be asked regarding two heritage restoration and improvement programs. Program 1 is for only three major sites which are Wat Si Sanphet, Wat Mahathat and Wat Chaiwatthanaram and program 2 is for fifteen sites in the Historic City of Ayutthaya which are Wat Si Sanphet, Wat Mahathat, Wat Chaiwatthanaram, Wat Mongkol Bophit, Wat Thammikarat, Wat Phra Ram, Wat Buddhaisawan, Wat Phanan Choeng, Wat Maheyong, Wat Yai Chaimongkol, Wat Rajburana, Wat Suwandararam, Wat Na Phra Men, Wat Kudidao and Wat Barom Buddharam.

There were 370 respondents asked to elicit their willingness to pay for program 1 before program 2 and there were 347 respondents asked to elicit their willingness to pay for program 2 before program 1. The survey design is summarized in Figure 3.15.

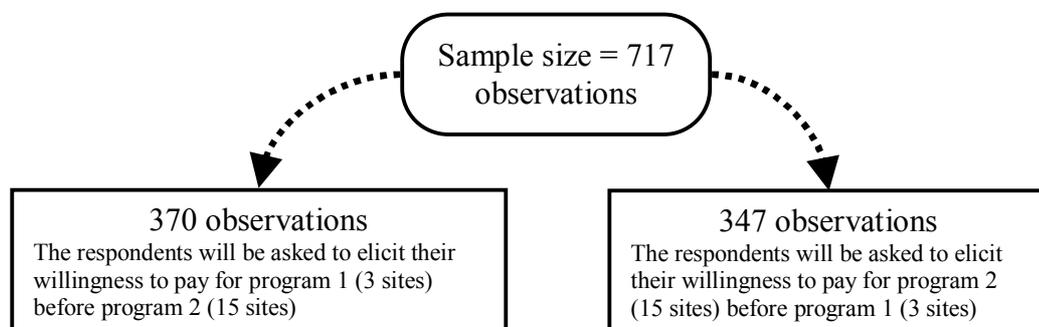


Figure 3.15 Survey Design

CHAPTER 4

EMPIRICAL RESULTS

4.1 Profile of Respondents

The first section of the questionnaire was intended to gather the socio-economic characteristics and personal information of the respondents. Following Table 4.1-Table 4.2 and Figure 4.1-4.8 exhibit socio – economic characteristics of the respondents.

Table 4.1 Profile of Respondents

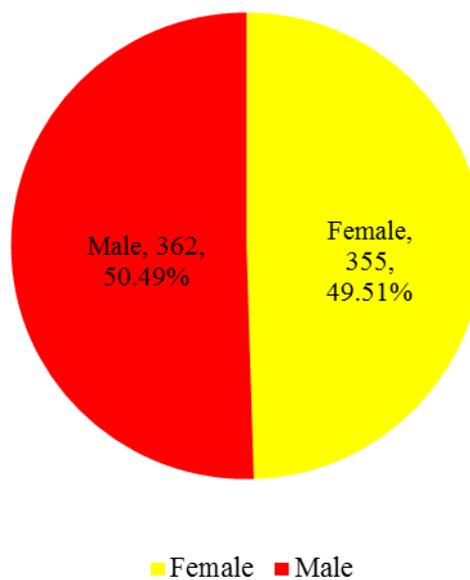
Characteristics	Frequency	Percentage
Gender		
Female	355	49.51
Male	362	50.49
Religion		
Buddhism	690	96.23
Christianity	12	1.67
Islam	15	2.09
Marital Status		
Single	394	54.95
Married	287	40.03
Divorced	17	2.37
Widowed	19	2.65
Place of Residence		
Bangkok and vicinity	385	53.70
Ayutthaya province	117	16.32
Others	215	29.99

Table 4.1 (Continued)

Characteristics	Frequency	Percentage
Level of education		
No official education	2	0.28
Secondary school (6 th grade)	26	3.63
High school (12 th grade)	145	20.22
Technical diploma	169	23.57
Bachelor's degree	342	47.70
Master's degree and above	33	4.60
Occupation		
Government employee	124	17.29
Own business	159	22.18
Employee of private firm	400	55.79
Student	26	3.63
Retiree	4	0.56
Unemployed	4	0.56
Monthly income (Baht)		
2,501-5,000	6	0.84
5,001-7,500	18	2.51
7,501-10,000	36	5.02
10,001-15,000	169	23.57
15,001-20,000	129	17.99
20,001-25,000	102	14.23
25,001-50,000	140	19.53
50,001-75,000	66	9.21
75,001-100,000	12	1.67
Over 100,000	39	5.44
Monthly expenditure (Baht)		
0 -2,500	1	0.14
2,501-5,000	26	3.63
5,001-7,500	71	9.90
7,501-10,000	114	15.90

Table 4.1 (Continued)

Characteristics	Frequency	Percentage
10,001-15,000	182	25.38
15,001-20,000	103	14.37
20,001-25,000	58	8.09
25,001-50,000	101	14.09
50,001-75,000	24	3.35
75,001-100,000	6	0.84
Over 100,000	31	4.32

**Figure 4.1** Distribution of Respondent Profiles According to Gender

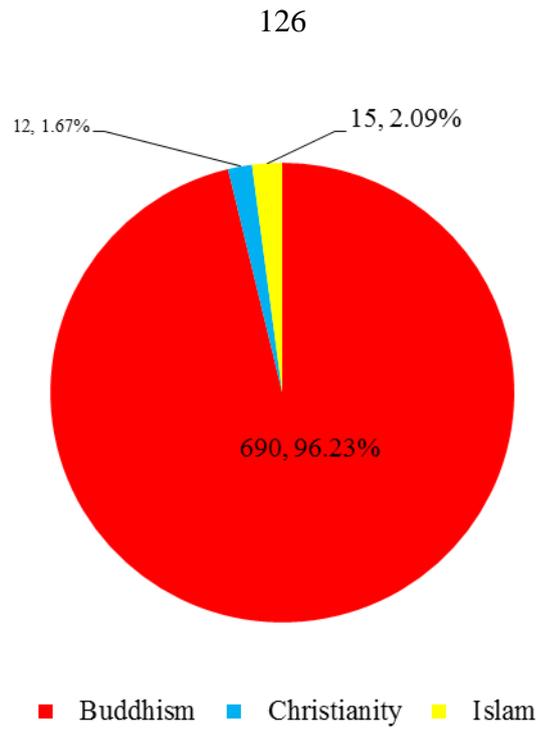


Figure 4.2 Distribution of Respondent Profiles According to Religion

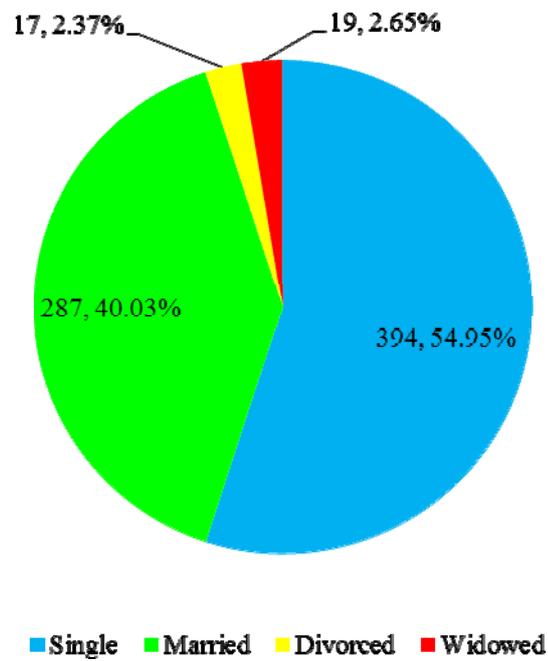


Figure 4.3 Distribution of Respondent Profiles According to Marital Status

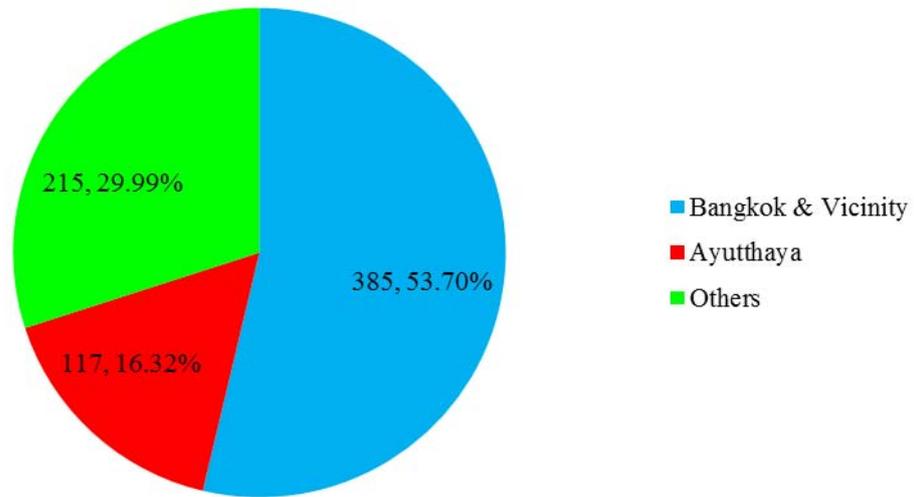


Figure 4.4 Distribution of Respondent Profiles According to Province of Residence

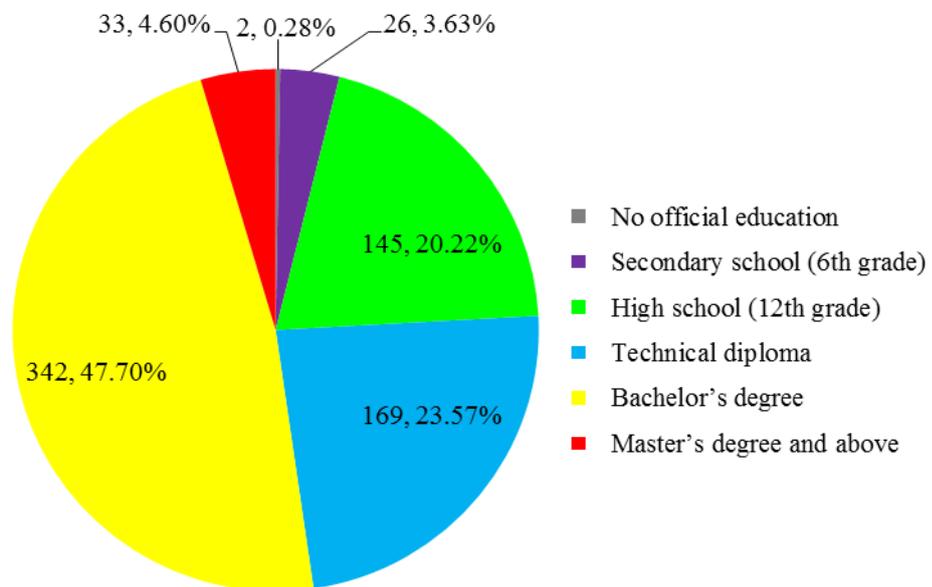


Figure 4.5 Distribution of Respondent Profiles According to Educational Level

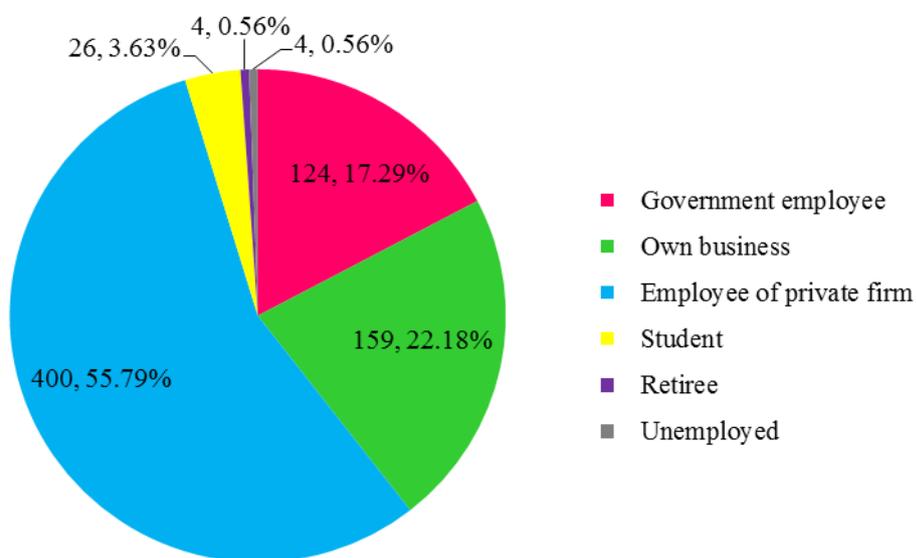


Figure 4.6 Distribution of Respondent Profiles According to Occupation

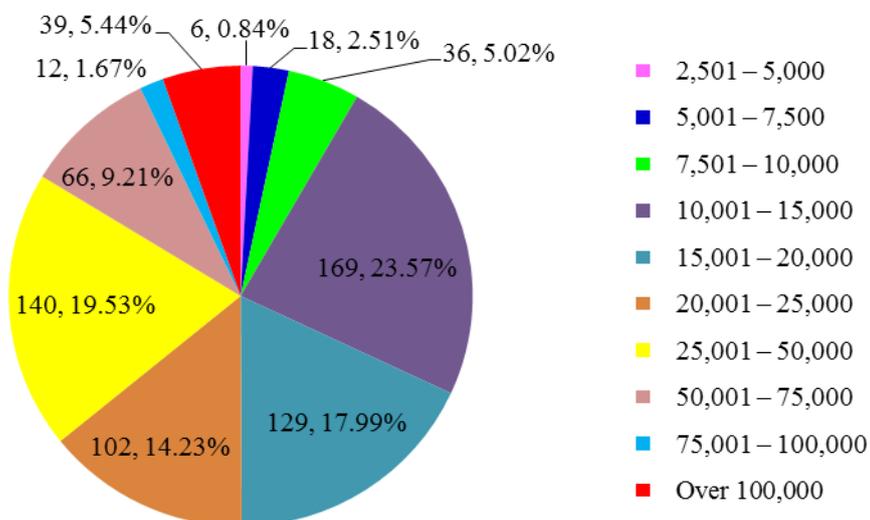


Figure 4.7 Distribution of Respondent Profiles According to Monthly Income

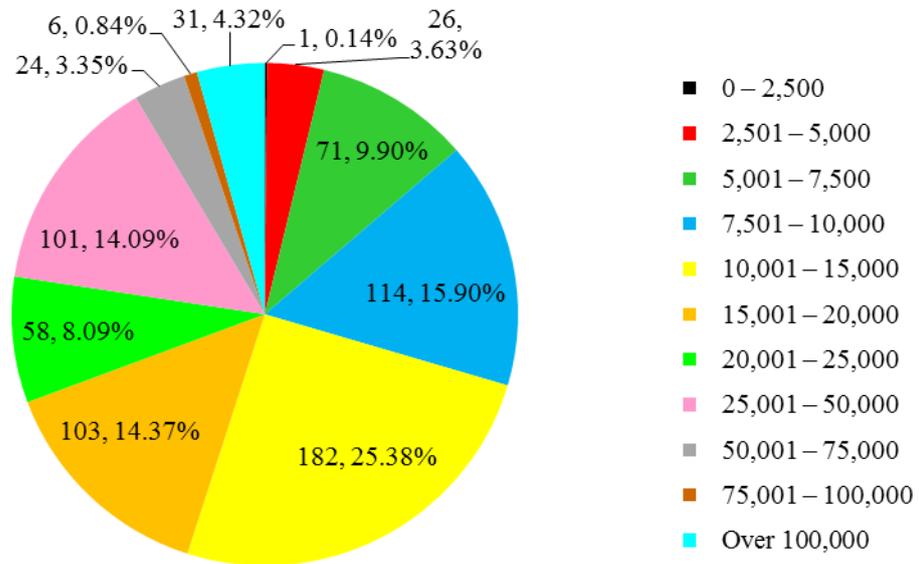


Figure 4.8 Distribution of Respondent Profiles According to Monthly Expenditure

Table 4.2 Socio-Economic Characteristics of Respondents

Description	Mean	Standard Deviation
Age of respondents (year- old)	37.23	10.52
The number of household members of respondents	4.06	2.18
Monthly income of respondents (Baht per month)	32,622.51	33,050.71
Monthly expenditure of respondents (Baht per month)	24,247.34	30,335.55
The number of schooling years of respondents (Years)	14.17	2.56

4.2 Travel Information of Respondents and Attitudes Toward the Historic City of Ayutthaya

The second section of the questionnaire is composed of travel information of respondents and their attitudes toward heritage interpretation of the Historic City of

Ayutthaya. Table 4.3-Table 4.4 conclude the travel information of respondents who visit the Historic City of Ayutthaya. The average number of trip members visiting the Historic City of Ayutthaya is approximately 5. There are 569 respondents from 717 respondents (79.36%) who spend only one day in Ayutthaya province and there are just 148 respondents who travel to Ayutthaya province and stay there more than a day. Amazingly, although the Historic City of Ayutthaya is considered World Cultural Heritage Site that there are substantial historic contexts, cultural issues and considerable authentic values lie behind, most visitors usually spend just a day or quite short period in visiting it. This probably because such considerable values are not extracted enough to be shown and described to the visitors, especially Thai visitors who are its real owners. However, due to Ayutthaya being a province that is not too far from Bangkok and being quite convenient to travel to, this causes visitors who are Bangkok people tending to visit the Historic City of Ayutthaya more often as compared to other cultural heritage sites. As a result, the average number of visits by visitors to the Historic City of Ayutthaya in the last 12 months including this time is approximately 2.95. Furthermore, there are 649 respondents from 717 respondents (90.52%) who committed themselves to revisiting the Historic City of Ayutthaya again in the next 12 months.

Table 4.3 Travel Information of Respondents 1

Description	Mean	Standard Deviation
The number of trip members who visit the Historic City of Ayutthaya (Including the respondent)	5.12	2.66
The number of days that the respondent stay in Ayutthaya province	1.28	0.48
The number of times that the respondent visited the Historic City of Ayutthaya in last 12 months including this time	2.95	2.36

Table 4.4 Travel Profile of Respondents 2

Description	Frequency	Percentage
Type of accommodation		
Hotel	77	52.03
Resort	12	8.11
Own house / Relatives / Friends	48	32.43
Guest house	11	7.43
The purposes of visit		
Ancient remains, art and architecture sightseeing	672	93.72
Religious ceremony	639	89.12
Historically educational trip	217	30.26
Photographing	389	54.25
Recreation	545	76.01
Food	275	38.35
Shopping	315	43.93
The knowledge and understanding regarding Ayutthaya which visitors gain after they visit the site		
Very good	19	2.65
Good	292	40.73
Fair	373	52.02
Poor	31	4.32
Very poor	2	0.28
The number of respondents who know that the Historic City of Ayutthaya was listed as a World Heritage Site	643	89.68
The number of respondents who know that the Historic City of Ayutthaya is currently at risk of being delisted from the UNESCO list of World Heritage Sites	392	54.67

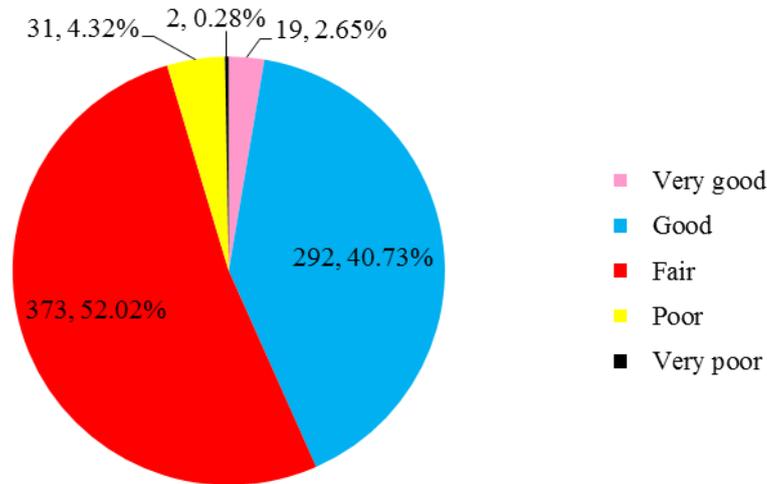


Figure 4.9 Current Quality of Heritage Interpretation in Respondent's Perceptions

According to Figure 4.9, the respondents were asked about how much knowledge and understanding regarding Ayutthaya they gained from the current situation of heritage interpretation inside the historic site during their visitations. This question can provide information about the respondents' perception toward the quality of the current heritage interpretation located inside the historic sites. There are 56.62% of all respondents who feel that the quality of current heritage interpretation is in poor to fair level while there are 43.38% of respondents feel the quality of current heritage interpretation is at a good to very good level.

According to Table 4.4, the top three purposes of visiting Ayutthaya provinces are 1) to sightsee or tour inside and around the Historic City of Ayutthaya to watch the ancient remains, art and architecture in Ayutthaya period (93.72%); 2) to make a merit and do some religious ceremonies under Buddhist beliefs (89.12%); 3) to have recreation in Ayutthaya province (76.01%) while there are only 30.26% of respondents who visited the Historic City of Ayutthaya because they would like to acquire knowledge and background information about it. Another interesting issue that the researcher would like to know is how much Thai visitors know about UNESCO related information of the Historic City of Ayutthaya. It was found that there are 643 respondents from 717 respondents (89.68%) who knew that the Historic City of Ayutthaya was listed as a World Heritage Site by UNESCO but there were just 392 respondents (54.67%) who knew that it is currently at risk of being delisted

because of poor administration, conflict among stakeholder and unplanned urban development.

In addition to respondents' travel information, the second section of the questionnaire was also employed to scrutinize the respondents' attitudes and perceptions with regard to the general administration and heritage interpretation management of the Historic City of Ayutthaya and this afore-mentioned information is shown in Table 4.5, Table 4.6 and Table 4.7.

Table 4.5 Attitudes toward the Administration and Knowledge Background of the Historic City of Ayutthaya (in percentages)

Statement	1	2	3	4	5	6	0
1. How much background knowledge or fundamental understanding of Ayutthaya do you know?	0.56	4.32	21.20	43.65	25.38	4.74	0.14
2. How much about management problems and administration conflicts of the Historic City of Ayutthaya do you know?	12.83	11.58	17.57	11.44	2.93	0.98	42.68
3. How interested would you be to follow up the management problems and administration conflicts of the Historic City of Ayutthaya?	4.32	5.58	12.55	20.08	18.83	10.04	28.59
4. How well – prepared are current heritage interpretation materials and services for example, tourist guide services, pamphlets, booklets, information board, etc. inside the Ayutthaya Historical Park?	4.18	8.79	27.75	31.80	18.97	6.28	2.23
5. How important are explanations, education and provision of the knowledge regarding Ayutthaya to the visitors?	0.00	0.56	1.12	4.32	26.92	66.81	0.28

Notes: 1 = Seldom, 2 = Slightly, 3 = Moderately, 4 = Much, 5 = Very much, 6 = Extremely, 0 = Don't know

Table 4.6 Attitudes toward the Existence of the Historic City of Ayutthaya
(in Percentages)

Statement	1	2	3	4	5	6	0
1. The Historic City of Ayutthaya is a place for religious ceremonies.	13.25	10.32	8.65	15.34	25.10	20.78	6.56
2. The Historic City of Ayutthaya is an important tourism site of Thailand.	0.00	0.00	0.14	0.84	15.62	83.40	0.00
3. The Historic City of Ayutthaya is a historical, arts and cultural learning site.	0.00	0.00	0.14	0.84	10.18	88.84	0.00
4. The Historic City of Ayutthaya is a heritage that deserves to be conserved for next generation.	0.00	0.00	0.00	0.14	3.35	96.51	0.00
5. The Historic City of Ayutthaya is a representative of the pride and dignity of Thai people and it can reflect Thainess and the national uniqueness of our country.	0.00	0.00	0.14	0.28	4.74	94.84	0.00
6. The Historic City of Ayutthaya is a local community's way of life.	0.28	0.56	2.79	15.20	29.85	50.21	1.12

Notes: 1 = Strongly disagree, 2 = Somewhat disagree, 3 = Neither agree nor disagree, 4 = Somewhat agree, 5 = Agree, 6 = Strongly agree, 0 = Don't know

According to Table 4.5, although administrative problems and conflicts among stakeholders of the Historic City of Ayutthaya are publicly criticized, the respondents did not pay much attention to those controversial issues. There are less than 50% (42.68%) of respondents who have no idea about the administrative problems of Ayutthaya. According to Table 4.6, It was found that the respondents attribute the importance of the Historic City of Ayutthaya to the aspect of it being a significant tourism site, influential learning site and an inheritance that deserves to be conserved for the next generation and for the pride and dignity of Thailand. However, the

respondents did not regard much about its importance to the community's way of life and its benefits for religious activities, especially Buddhist ceremonies.

Table 4.7 Attitudes toward the Heritage Interpretation of the Historic City of Ayutthaya

Description	Frequency	Percentage
The most interesting issue that the respondents would like to gain from visiting the Historic City of Ayutthaya		
History of Ayutthaya	385 (2.37)	53.70
Aesthetic art and architecture in Ayutthaya period	165 (1.79)	23.01
Tradition and way of life in the Ayutthaya period	167 (1.84)	23.29
<u>Note:</u> the figure in the bracket is the score on full 3 – mark basis		
The most important heritage interpretation in respondent's point of view		
Information boards and displays	346 (4.04)	48.26
Brochures and booklets	54 (2.55)	7.53
Tourist guide	173 (3.38)	24.13
Cultural and traditional demonstration	119 (3.00)	16.60
Audio – guide system	25 (2.03)	3.49
<u>Note:</u> the figure in the bracket is the score on full 5 – mark basis		
The need to improve and restore the heritage interpretation of the Historic City of Ayutthaya		
Strongly agree	410	57.18
Agree	305	42.54
Disagree	2	0.28
Strongly disagree	0	0.00

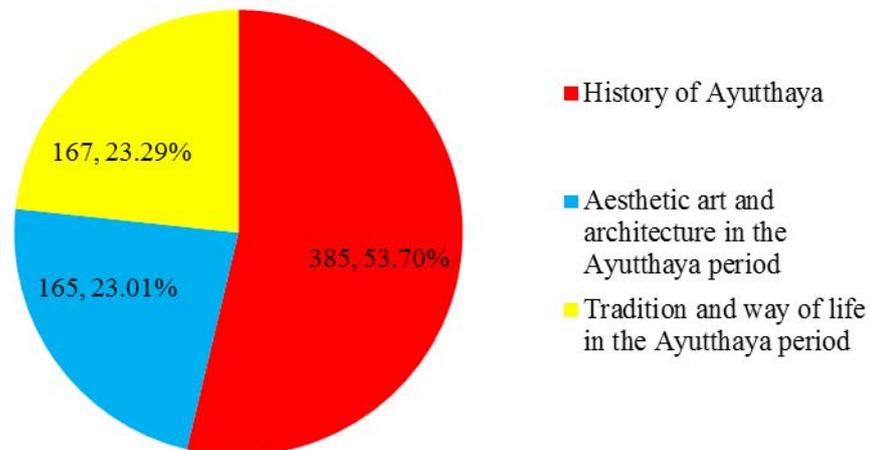


Figure 4.10 The Most Favorite Issue during a Visit to the Historic City of Ayutthaya in the Respondents' Viewpoint

According to Table 4.7 and Figure 4.10, among the context about Ayutthaya's history, art and architecture and the tradition or way of life of the Ayutthaya people, the most favorite issue that visitors would like to know and experience during their visit to the Historic City of Ayutthaya is the context of history which accounts for 53.70% (more than half) while the interest in Ayutthaya's tradition and Ayutthaya's art and architecture rank second and third at quite a comparable percentage. 23.29% of total respondents chose the traditions as the most favorite issue while 23.01% of total respondents prefer the context of Ayutthaya's art and architecture the most.

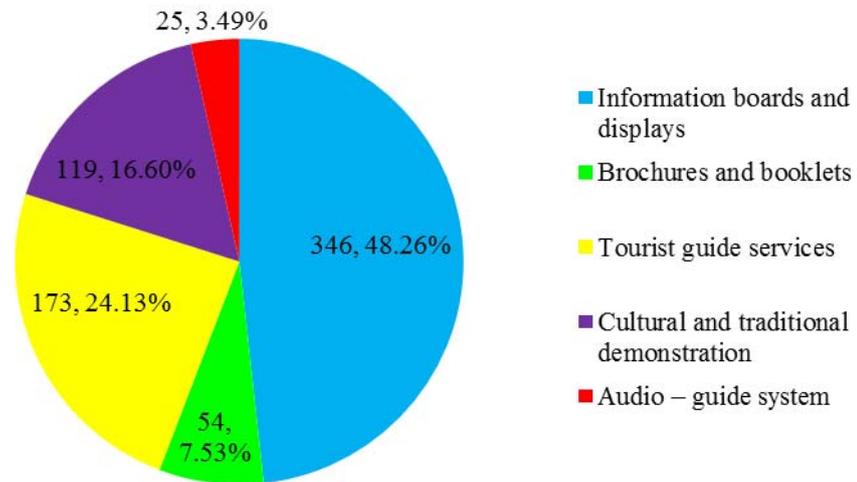


Figure 4.11 The Most Important Heritage Interpretation Tool in Respondents' Viewpoints

According to Figure 4.11, from the perspective of the most essential heritage interpretation inside the Historic City of Ayutthaya is that in the respondents' viewpoints, the survey's results identify that the information boards and displays located inside the historic sites are the most important heritage interpretation. There are 48.26% of respondents who considered that it ranked first among the three types of heritage interpretation tools. The tourist guide is the runner up at 24.13% and the events or the demonstrations of Ayutthaya's culture and tradition come third and account for 16.60%.

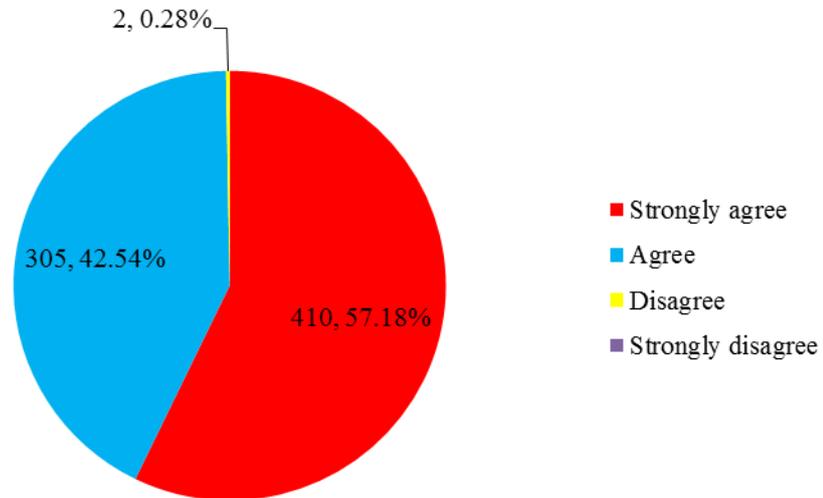


Figure 4.12 What Respondents Think about the Heritage Interpretation Restoration and Improvement Program in Ayutthaya Historical Park

Furthermore, according to Figure 4.12, when the respondents were asked whether the current the Historic City of Ayutthaya required improvement or not, there are 99.72% of the respondents agreed that the improvement of the current heritage interpretation inside the historic site is needed. Besides, the percentage of the respondents who feel strongly agree in such heritage interpretation improvement is up to 57.18% while there are only 2 respondents from 717 respondents who disagreed with the heritage interpretation restoration and improvement program. These results can reflect more or less that the current heritage interpretation inside the Ayutthaya Historical Park deserves to be restored and improved.

4.3 Analysis of Respondent's Responses

According to this study, there are total of 717 respondents and all respondents will be asked about two hypothetical CV programs that are heritage interpretation restoration and improvement program for 3 major historic sites and 15 historic sites in the Historic City of Ayutthaha (or Ayutthaya Historical Park). In each hypothetical program, each respondent will be asked with 3 kinds of CV questions which are single bounded dichotomous choice questions, double bounded dichotomous choice

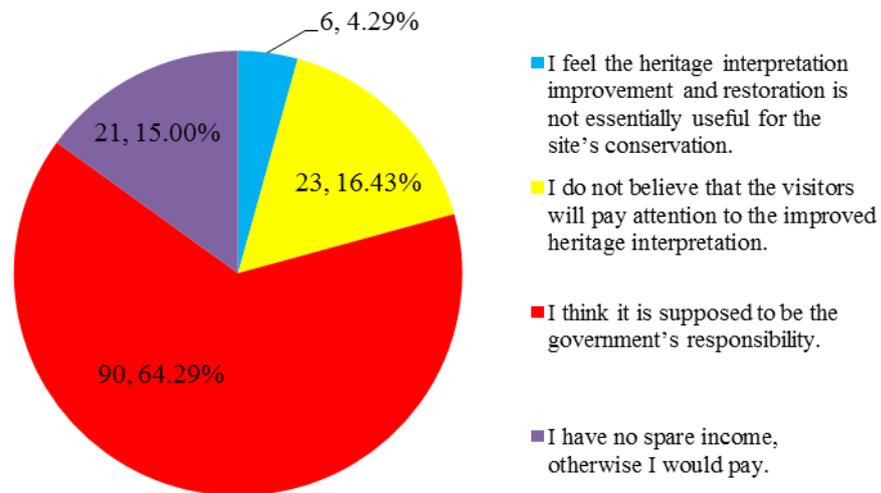
questions and open ended questions. According to the conducted survey, 370 respondents were asked the 3-major-site program before 15-site program and 347 respondents were asked the 15-site program before 3-site program. However, before the respondents will be elicited for their willingness to pay for the restoration and improvement of heritage interpretation inside the Historic City of Ayutthya, each respondent will be asked whether he or she is willing to pay for an increase in the entrance fees for restoration and improvement of heritage interpretation or not (the current entrance fee equals 10 Baht per person per site which means if the respondent would like to visit 3 major historic sites as a tour package, they have to pay 30 Baht for the entrance fee.) There were only 94 respondents accounting for 13.11% (from total 717 respondents) who rejected paying for the increase in the entrance fees. The main reasons for unwillingness to pay are presented in Table 4.8. Vice versa, the motives which lie behind the respondents' decision to pay more in entrance fees for such CV programs are shown in Table 4.9 respectively.

Table 4.8 Reasons for Respondents' Non-Willingness to Pay

Reasons	No. of responses	Percentage of responses
I feel the heritage interpretation restoration and improvement is not essentially useful for the historic site's conservation.	6	4.29
I do not believe that the visitors will pay attention to the improved heritage interpretation.	23	16.43
I think it is supposed to be the government's responsibility.	90	64.29
I have no spare income, otherwise I would pay.	21	15.00

Table 4.9 Reasons for Respondents' Willingness to Pay

Reasons	No. of responses	Percentage of responses
For my own benefit to gain the historical and cultural knowledge regarding Ayutthaya	431	26.39
For the community in Ayutthaya province to have them learn about their own valuable history and culture	215	13.17
For future generations	458	28.05
For the pride of our nation and national uniqueness	529	32.39

**Figure 4.13** The Reasons for Respondents' Non-Willingness to Pay

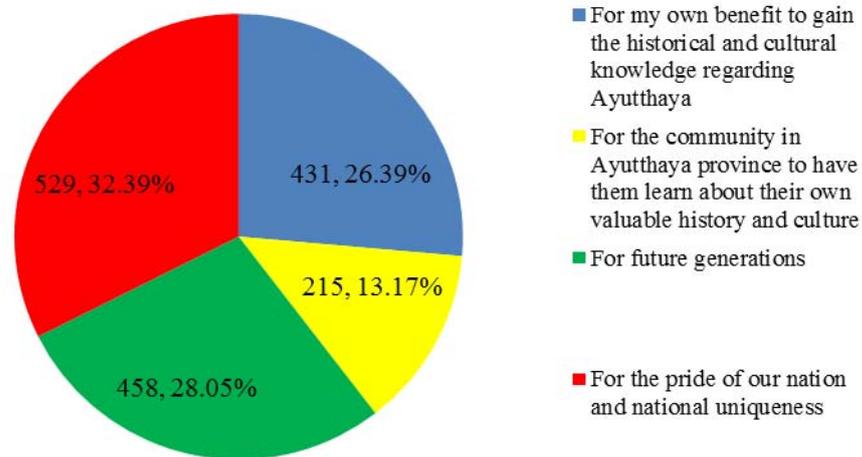


Figure 4.14 The Reasons for Respondents' Willingness to Pay

According to Figure 4.13, most respondents who refused to pay more entrance fee feel that the upkeep of the heritage interpretation inside the World Heritage Site like the Historic City of Ayutthaya should have been the government's responsibility. Nevertheless, according to Figure 4.14, in the perspective of the respondents who are willing to pay more in entrance fees to improve and maintain the heritage interpretation's quality of the Historic City of Ayutthaya, the first ranked reason is that they feel that the good quality of heritage interpretation can maintain the Historic City of Ayutthaya in a good condition that meaningfully portrays the ethnic value, pride and uniqueness of Thailand. The second ranked reason is to conserve the historic sites for future generations. The third ranked reason is to fulfill their own benefit by experiencing the knowledge and background of Ayutthaya during their visit and the last one is to restore and improve the heritage interpretation for the local community to help them to conserve their own community's way of life.

Before the single bounded dichotomous choice question, double bounded dichotomous choice question and open ended question will be proposed to the respondents, The respondents have to answer whether they are willing to pay a higher one-day package entrance fee for the restoration and improvement of heritage interpretation in the Historic City of Ayutthaya or not. According to Figure 4.15, there are 623 respondents (86.89%) who reportedly answered that they are willing to pay

more if the heritage interpretation restoration and improvement program is going to be implemented while 94 respondents (13.11%) say that they are not willing to pay. Table 4.10 and Figure 4.16-Figure 4.23 present the socio-demographic characteristics of both respondents who are willing and unwilling to pay a higher one-day package entrance fee for the restoration and improvement of heritage interpretation in the Historic City of Ayutthaya.

It is reasonable to assume that the respondents who are not willing to pay were the respondents who have low income and are less educated because the average schooling years of the willing-to-pay respondents is longer than the average schooling years of the unwilling-to-pay respondents and the average monthly income of the willing-to-pay respondents is greater than the average monthly income of the unwilling-to-pay respondents.

To verify these assumptions, a multivariate analysis of the determinants of “who is in the market” (people who are willing to pay for heritage interpretation improvement programs) was done. Table 4.11 shows the result of the logit model analysis. The dependent variable was defined as “1” if a respondent is willing to pay more for the one-day package entrance fee, and defined as “0” if a respondent is unwilling to pay more for the entrance fee. The definition of each variable used in this model is described in Table 4.12. It was found that Buddhism, education and income are statistically significant variables. As a result, this means that people who are “in the market” and willing to pay for the restoration and improvement of heritage interpretation inside the Historic City of Ayutthaya tend to be Buddhist, the well-educated and have high-income. Amazingly, local visitors who live in Ayutthaya province and previously supposed to be individuals who should have been in the market and willing to pay for the improved heritage interpretation of the Historic City of Ayutthaya located in their residence province. But, according to the study based on the statistics foundation, the local visitors are not in the market.

Table 4.10 Profile of the Respondents Willingness and Unwillingness to Pay for the Heritage Interpretation Restoration and Improvement of the Historic City of Ayutthaya

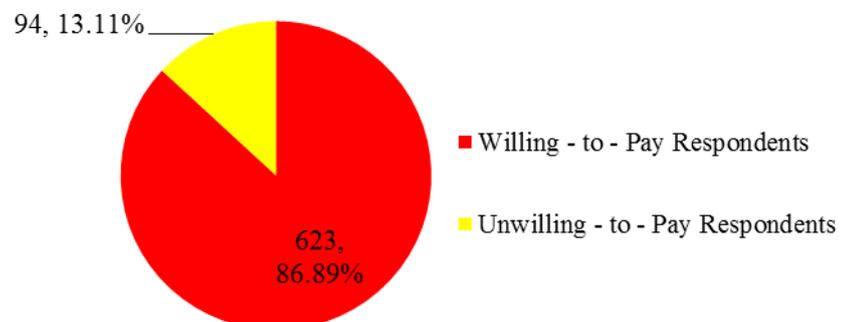
Characteristics	Respondents willing to pay		Respondents unwilling to pay	
	(n = 623)		(n = 94)	
	Frequency	%	Frequency	%
Gender				
Female	313	50.24	42	44.68
Male	310	49.76	52	55.32
Age				
Note: The figure in the bracket is standard deviation.	37.29	(10.54)	36.84	(10.42)
Religion				
Buddhism	607	97.43	83	88.30
Christianity	8	1.28	4	4.26
Islam	8	1.28	7	7.45
Marital Status				
Single	347	55.70	47	50.00
Married	245	39.33	42	44.68
Divorced	15	2.41	2	2.13
Widowed	16	2.57	3	3.19
Place of Residence				
Bangkok and vicinity	341	54.74	44	46.81
Ayutthaya province	100	16.05	17	18.09
Others	182	29.21	33	35.11
Level of education				
No official education	2	0.32	0	0.00
Secondary school (6 th grade)	22	3.53	4	4.26
High school (12 th grade)	118	18.94	27	28.72
Technical diploma	138	22.15	31	32.98
Bachelor's degree	310	49.76	32	34.04

Table 4.10 (Continued)

Characteristics	Respondents willing to pay		Respondents unwilling to pay	
	(n = 623)		(n = 94)	
	Frequency	%	Frequency	%
Master's degree	33	5.30	0	0.00
Schooling years				
Note: The figure in the bracket is the standard deviation.	14.28 (2.58)		13.44 (2.30)	
Occupation				
Government employee	112	17.98	12	12.77
Own business	138	22.15	21	22.34
Employee of private firm	340	54.57	60	63.83
Student	25	4.01	1	1.06
Retiree	4	0.64	0	0.00
Unemployed	4	0.64	0	0.00
Monthly income (Baht)				
2,501 – 5,000	6	0.96	0	0.00
5,001 – 7,500	16	2.57	2	2.13
7,501 – 10,000	30	4.82	6	6.38
10,001 – 15,000	141	22.63	28	29.79
15,001 – 20,000	109	17.50	20	21.28
20,001 – 25,000	87	13.96	15	15.96
25,001 – 50,000	123	19.74	17	18.09
50,001 – 75,000	62	9.95	4	4.26
75,001 – 100,000	12	1.93	0	0.00
Over 100,000	37	5.94	2	2.13
Monthly income (Baht)				
Note: The figure in the bracket is the standard deviation.	33,868.85 (34,196.49)		24,362.19 (22,569.83)	

Table 4.10 (Continued)

Characteristics	Respondents willing to pay		Respondents unwilling to pay	
	(n = 623)		(n = 94)	
	Frequency	%	Frequency	%
Monthly expenditure (Baht)				
0-2,500	1	0.16	0	0.00
2,501-5,000	21	3.37	5	5.32
5,001-7,500	65	10.43	6	6.38
7,501-10,000	102	16.37	12	12.77
10,001-15,000	146	23.43	36	38.30
15,001-20,000	87	13.96	16	17.02
20,001-25,000	53	8.51	5	5.32
25,001-50,000	90	14.45	11	11.70
50,001-75,000	22	3.53	2	2.13
75,001-100,000	6	0.96	0	0.00
Over 100,000	30	4.82	1	1.06
Monthly expenditure (Baht)		25,191.09 (31,699.74)	17,992.52 (17,849.97)	
<u>Note:</u> The figure in the bracket is the standard deviation.				

**Figure 4.15** The Proportion between Willing-to-Pay Respondents and Unwilling-to-Pay Respondents

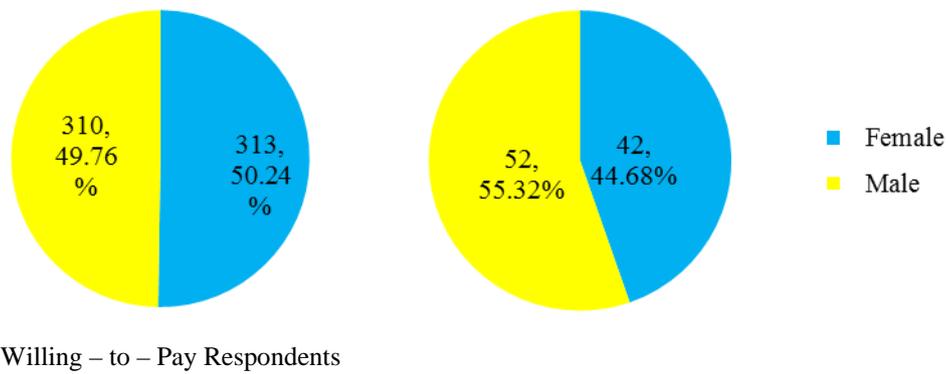


Figure 4.16 Profile of Willing-to-Pay Respondents and Unwilling-to-Pay Respondents According to Gender

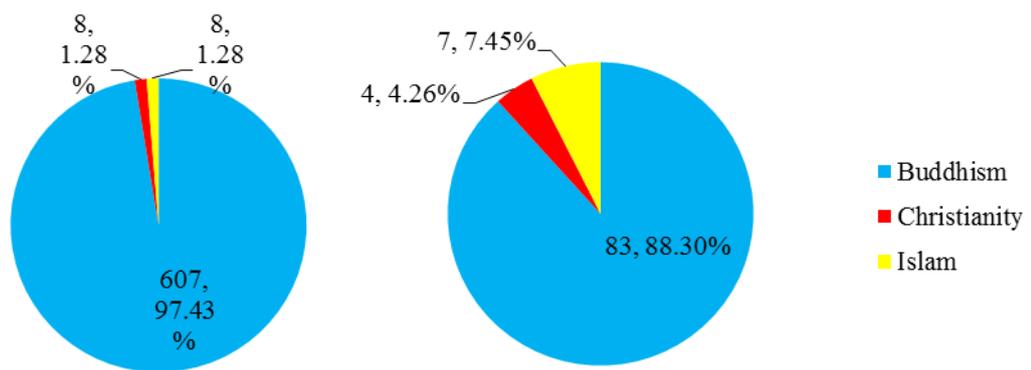


Figure 4.17 Profile of Willing-to-Pay Respondents and Unwilling-to-Pay Respondents According to Religion

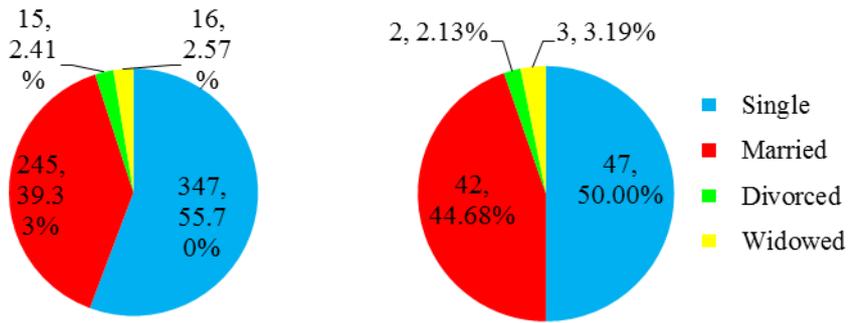


Figure 4.18 Profile of Willing-to-Pay Respondents and Unwilling-to-Pay Respondents According to Marital Status

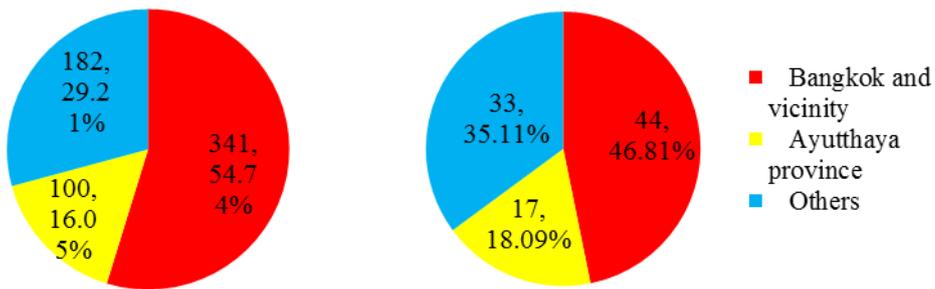


Figure 4.19 Profile of Willing-to-Pay Respondents and Unwilling-to-Pay Respondents According to Marital Status

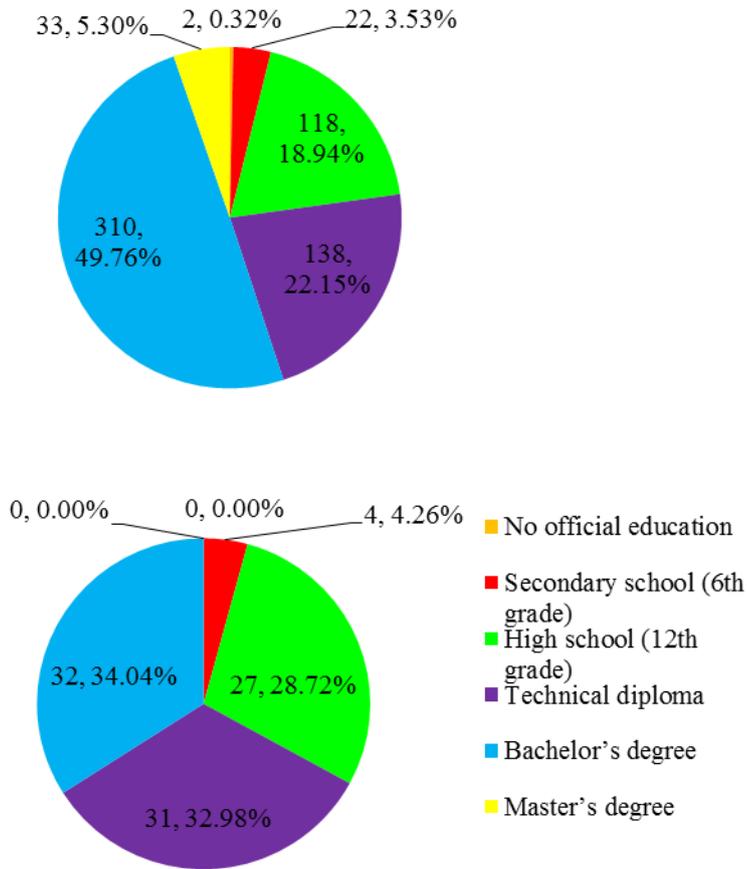


Figure 4.20 Profile of Willing-to-Pay Respondents and Unwilling-to-Pay Respondents According to Educational Level

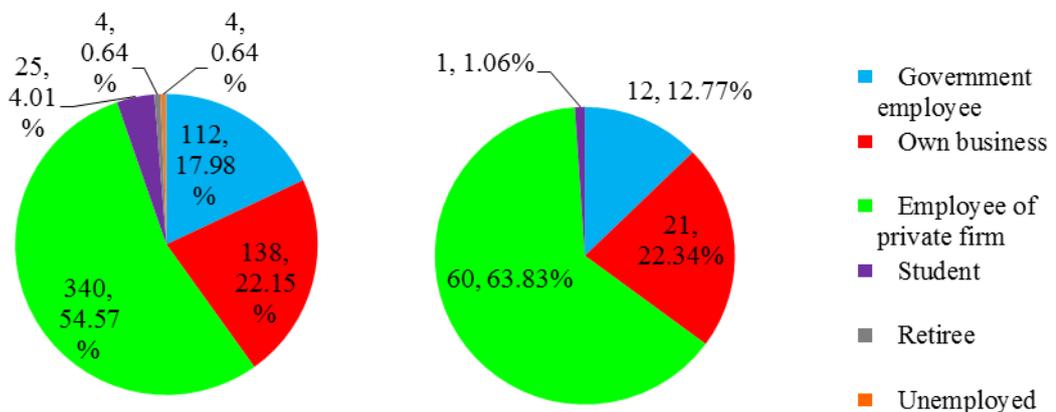


Figure 4.21 Profile of Willing-to-Pay Respondents and Unwilling-to-Pay Respondents According to Occupation

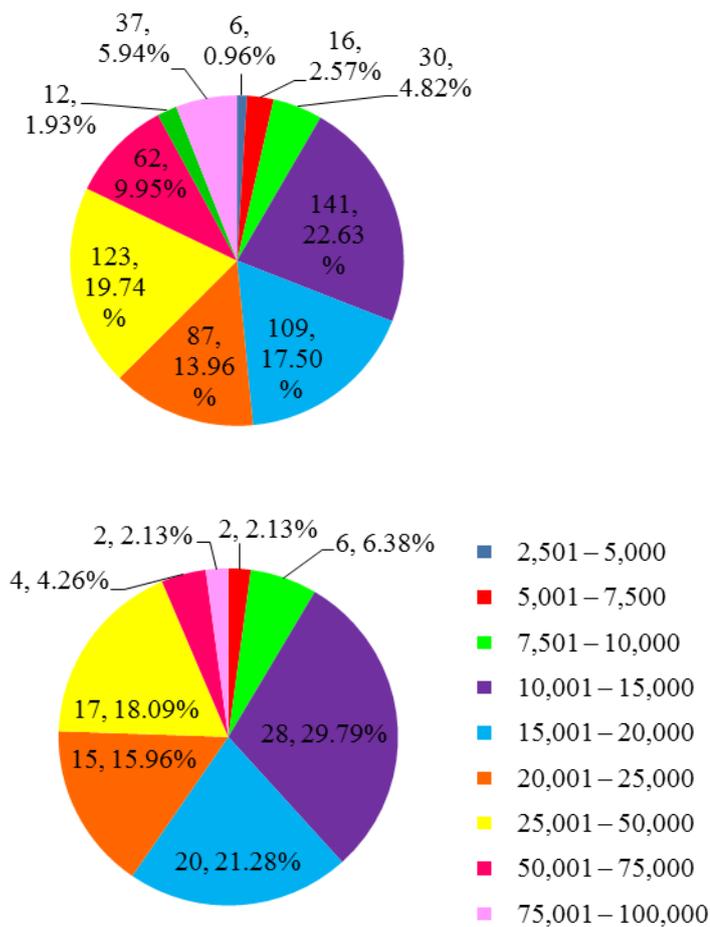
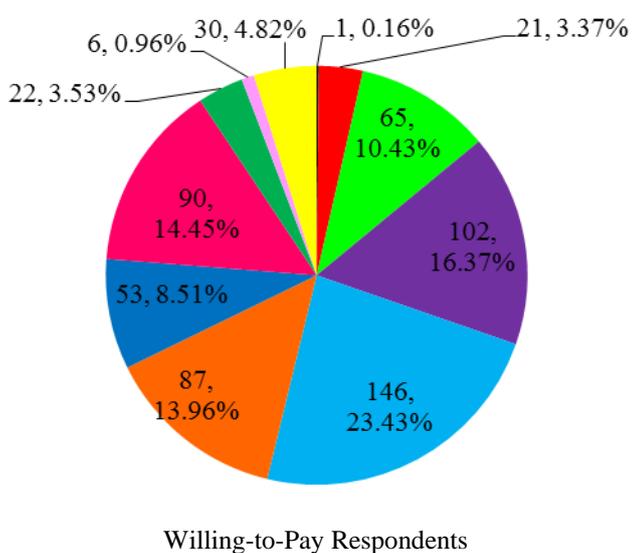


Figure 4.22 Profile of Willing-to-Pay Respondents and Unwilling-to-Pay Respondents According to Monthly Income



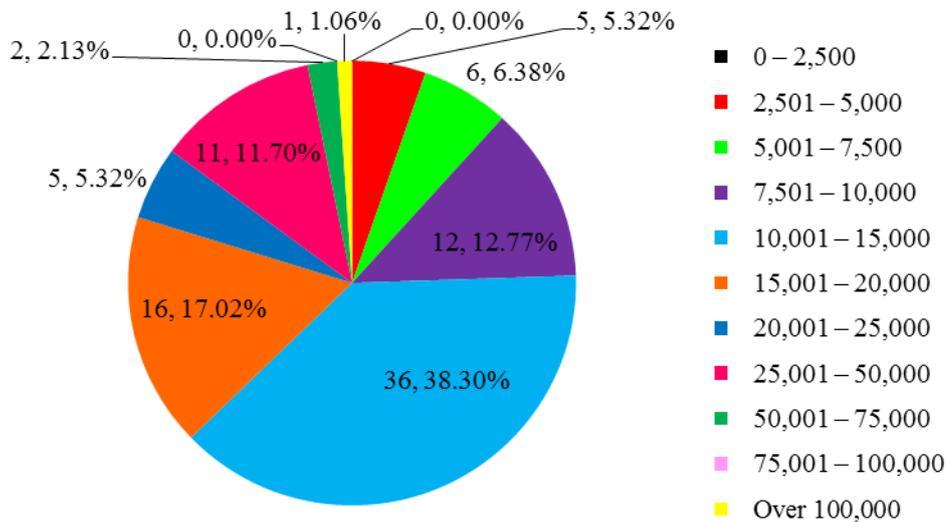


Figure 4.23 Profile of Willing-to-Pay Respondents and Unwilling-to-Pay Respondents According to Monthly Expenditure

Table 4.11 A Multivariate Analysis of the Determinants of “who is in the market”

Variable	Coefficient	Standard Error	t-ratio	P-value
Constant	- 1.7043	1.0378	- 1.642	.1005
SEX	- .3015	.2334	- 1.291	.1966
AGE	.1170E-01	.1500E-01	.780	.4352
BUDD	1.6375**	.4283	3.823	.0001
SING	0.3525	.2824	1.248	.2119
LOCA	.1537E-01	.3090	.050	.9603
EDU	.9863E-01**	.4333E-01	2.276	.0228
FAM	- .4502E-01	.5442E-01	- .827	.4081
INC	.1453E-04**	.5813E-05	2.500	.0124

Notes: ** = significant at 5%. Variables which are significant are in bold.

Table 4.12 Definition of Variables Used in Analysis of the Determinants of “who is in the market”

Variable	Definition
SEX	SEX = 1 if the respondent is male SEX = 0 if the respondent is female
AGE	The respondent's age (Years)
BUDD	BUDD = 1 if the respondent is Buddhist BUDD = 0 if the respondent is non Buddhist
SING	SING = 1 if the respondent is single SING = 0 if the respondent is married, divorced or widowed
LOCA	LOCA = 1 if the respondent is an Ayutthaya resident LOCA = 0 if the respondent is another provinces' resident
EDU	The respondent's schooling years (Years)
FAM	The number of household's members of respondent including respondent
INC	The respondent's monthly income (Baht per month)

4.4 Estimation of WTP and Analysis of Factors Influencing WTP

In this study, single bounded dichotomous choice questions, double bounded dichotomous choice questions and open ended questions are employed to estimate the willingness to pay for two heritage interpretation programs, 3-major-site program and 15-site program. To estimate the willingness to pay, both socio-economic variables and attitudinal variables have to be incorporated into the model.

To set the plausible criteria to select the attitudinal variables to be imposed into the contingent valuation model so that they will be investigated for their influences on WTP, the correlation between each pair of attitudinal variables in Table 4.5 and Table 4.6 are necessary to be considered. Table 4.13 describes the definition of each attitudinal variable adopted from Table 4.5 and Table 4.6. Table 4.14 reports the correlation coefficients between each pair of attitudinal variables. There are 3 pair

of respondents' attitudes that are weakly and significantly correlated. The first pair is the correlation between the respondents' attitudes toward the tourism value of the Historic City of Ayutthaya and their attitude toward the benefit of religious ceremonies of the Historic City of Ayutthaya. Secondly, the respondents' perception toward the administrative problem of the Historic City of Ayutthaya does not correlate to their perception regarding the quality of current heritage interpretation inside the Historic City of Ayutthaya (Pearson correlation = 0.009). Thirdly, the feeling regarding pride in the existence of the Historic City of Ayutthaya does not correlate to the quality of the current heritage interpretation inside the Historic City of Ayutthaya (Pearson correlation = - 0.006). Notwithstanding, there is a very strong correlation between respondents' attitude toward the tourism value of the Historic City of Ayutthaya and their perceptions toward the educational value, bequest value and the pride in the existence of the Historic City of Ayutthaya (Pearson correlation = 0.550, 0.389, 0.385 respectively).

Table 4.13 Definition of Attitudinal Variables

Statement	Viable
<u>Notes:</u> 1 = Seldom, 2 = Slightly, 3 = Moderately, 4 = Much, 5 = Very much, 6 = Extremely, 0 = Don't know	
How much background knowledge or fundamental understanding of Ayutthaya do you have?	BASE
How much about management problems and administration conflicts of the Historic City of Ayutthaya do you know?	PROB
How interested would you be in follow up the management problems and administration conflicts of the Historic City of Ayutthaya?	INT
How well-prepared are current heritage interpretation materials and services for example, tourist guide service, pamphlet, booklet, information board, etc. inside the Ayutthaya Historical Park?	SERV
How important are explanation, education and provision of knowledge regarding Ayutthaya to the visitors?	IMPO
<u>Notes:</u> 1 = Strongly disagree, 2 = Somewhat disagree, 3 = Neither agree nor disagree, 4 = Somewhat agree, 5 = Agree, 6 = Strongly agree, 0 = Don't know	

Table 4.13 (Continued)

Statement	Viable
The Historic City of Ayutthaya is the place for religious ceremonies.	CEREM
The Historic City of Ayutthaya is an important tourism site of Thailand.	TOUR
The Historic City of Ayutthaya is a historical, arts and cultural learning site.	LEARN
The Historic City of Ayutthaya is a heritage that deserves to be conserved for future generations.	NEWGEN
The Historic City of Ayutthaya is a representative of the pride and dignity of Thai people and it can reflect Thainess and the national uniqueness of our country.	PRIDE
The Historic City of Ayutthaya is a local community's way of life.	COMMU

Table 4.14 Correlation between Different Attitudes toward Heritage Interpretation Restoration and Improvement Program

	BASE	PROB	INT	SERV	IMPO	CEREM	TOUR	LEARN	NEWGEN	PRIDE	COMMU
BASE	1										
PROB	0.318*	1									
INT	0.322*	0.586*	1								
SERV	-0.074	0.009	0.032	1							
IMPO	0.168*	0.067	0.148*	0.124*	1						
CEREM	-0.184*	-0.067	-0.189*	0.178*	-0.058	1					
TOUR	0.173*	-0.095*	-0.012	-0.049	0.253*	-0.004	1				
LEARN	0.171*	-0.041	0.024	0.023	0.291*	0.029	0.550*	1			
NEWGEN	0.036	-0.078	-0.014	-0.023	0.183*	0.024	0.389*	0.390*	1		
PRIDE	0.136*	-0.011	-0.040	-0.006	0.191*	-0.013	0.385*	0.411*	0.455*	1	
COMMU	-0.100*	0.019	0.005	0.151*	0.023	0.228*	0.112*	0.112*	0.038	0.095*	1

Notes: * = significant at 5%

According to Table 4.14 under the obtained correlation coefficients of each pair of attitudinal variables, due to the lower correlation coefficient values, three attitudinal variables, BASE, SERV and NEWGEN are considered to be imposed onto the contingent valuation model.

4.4.1 Estimation of WTP with the Single Bounded Dichotomous Choice Technique

With regard to single bounded dichotomous choice question, the level of WTP bids was investigated using logistic regression to model the respondents' responses against 3 attitudinal variables and 8 socio-economic variables. As afore-mentioned, the respondents would be asked about two hypothetical programs that are the heritage interpretation restoration and improvement for 3 major historic sites and another program is for 15 historic sites. To examine the effect of anchoring bias, the sample size is separated into 2 groups. From 717 respondents, 370 respondents would be asked to elicit their own willingness to pay for a 3-major-site program (Program 1) before a 15-site program (Program 2) and the rest (347 respondents) would be asked for their willingness to pay for a 15-site program (Program 2) before a 3-major-site program (Program 1). Furthermore, some variables will be imposed on the model in order to test some intriguing methodological issues which are distance decay and scope test. Nonetheless, Table 4.15 exhibits the definitions of all variables used in this contingent valuation model.

Table 4.15 Definition of Variables Used in Single Bounded Dichotomous Choice Valuation Technique

Variable	Definition
TBID	Bid amount of 3 – major – site program
FBID	Bid amount of 15 – site program
SEX	SEX = 1 if the respondent is male. SEX = 0 if the respondent is female.
AGE	The respondent's age (Years)
BUDD	BUDD = 1 if the respondent is Buddhist. BUDD = 0 if the respondent is non Buddhist.
SING	SING = 1 if the respondent is single. SING = 0 if the respondent is married, divorced or widowed.

Table 4.15 (Continued)

Variable	Definition
LOCA	LOCA = 1 if the respondent is Ayutthaya resident. LOCA = 0 if the respondent is not Ayutthaya resident.
BANG	BANG = 1 if the respondent is a Bangkok resident BANG = 0 if the respondent is not a Bangkok resident.
PROV	The distance between the respondent's residence province and Ayutthaya province (Kilometers)
EDU	The respondent's schooling years (Years)
FAM	The number of household's members of respondent including respondent
INC	The respondent's monthly income (Baht per month)
BASE	How much knowledge background of Ayutthaya do you currently have? (Likert scale 0 – 6)
SERV	How well – prepared do respondents feel about current heritage interpretation of the Historic City of Ayutthaya for example, brochures, displays, tourist guides, signs, information board, etc.? (Likert scale 0 – 6)
NGEN	How do respondents agree with the statement of the Historic City of Ayutthaya is a valuable heritage that should be conserved for the future generations? (Likert scale 0 – 6)
ANCH	ANCH = 1 if the 3 – major – site program is proposed before 15 – site program ANCH = 0 if the 15 – site program is proposed before 3 – major – site program
SCOP	SCOP = 1 if it is the answer for 15 – site program. SCOP = 0 if it is the answer for 3 – major – site program.

With regard to the hypothesis of each variable imposed into the model. Theoretically, the coefficients of TBID and FBID are expected to be negative because when the value of the bid amount is escalated, the respondent should tend to reject or

say “No” to accept a higher bid amount. Regarding respondent’s income, INC’s coefficient is expected to be positive. The positive sign of INC’s coefficient will be commensurate with economic theory. That means a respondent who has more income should tend to be willing to pay more than a respondent who has less. With regard to other socio-economic variables, according to several contingent valuation studies (Mourato et al. 2002: 81; Riganti and Willis, 2002: 151; Bille, 2002: 224; Santagata and Signorello, 2002: 245), in case of gender, it was found that the male respondents are often willing to pay more than female respondents, especially for the conservation of a particular valuable cultural heritage site because several valuation studies were found that male visitors or tourists often perceive the value of the conservation program more than the female do (Nuva and Shamsudin, 2009: 180). Therefore, the sign of SEX variable’s coefficient is expected to be positive.

Due to the context of Buddhism being usually used to promote tourism in Ayutthaya province and that most visitors often go to Ayutthaya province to perform some Buddhism ceremonies, make a merite and pay respect to Buddha statues in the temples or monasteries. Hence, BUDD variable’s coefficient deserves to be positive which means the Buddhist visitors should be willing to pay more for the heritage interpretation improvement program in the Historic City of Ayutthaya. With regard to the age of respondents or the AGE variable, its coefficient is expected to be negative because the older respondents who have more family responsibilities should have a higher expenditure burden than younger ones. According to several valuation studies, the coefficient of a respondent’s age can be positive or negative. It depends on the awareness of the old and the young towards a particular conservation program. Between the younger and the older generations, who are more aware of the conservation of a particular cultural heritage site they should be willing to pay more for it. In the case of respondent’s marital status or SING variable, the sign of SING variable’s coefficient is previously believed to be positive because the single have a lower expenditure burden than do the married. Therefore, they are believed to be willing to pay more than the espoused. However, the sign of coefficient of marital status is not certain. Some valuation studies found that it is often statistically insignificant and provides positive correlation with willingness to pay the amount because married people are probably more aware of the bequest value of a cultural

heritage site and they would like to conserve it in good condition for their children so that their children can have the opportunity to see and learn about it in the future.

In the case of FAM variable that represents the number of respondent's household members or respondent's family size, several valuation studies (Bille, 2002: 224; Santagata and Signorello, 2002: 248) often provide negative signs of coefficient of family size, number of children and number of household member because a respondent who has a lot of household members (or more children in family) has to be more careful about his or her spending and has to allocate some part of his or her income to look after them, so he or she can probably not pay more for any conservation programs. However, whether it will be positive or negative, it is quite trivial because family size or number of household member is often statistically insignificant.

The variable regarding education is extremely interesting because it is often positively relative to willingness to pay the amount and statistically significant (Mourato et al. 2002: 81; Riganti and Willis, 2002: 151; Bille, 2002: 224; Santagata and Signorello, 2002: 245). The more education regarding a cultural heritage site or background knowledge associated with a proposed historic site visitors have, the higher and deeper they perceive its value. Ordinarily, if the visitors really perceive the authentic and intrinsic value of a particular cultural heritage site and realize its importance to the society they live in, they will be ready to contribute more themselves to protect it. Conclusively, EDU variable's coefficient and BASE variable's coefficient are expected to be positive. Furthermore, since the visitors who come from Bangkok and its vicinity are considered to have more education on average and information on Ayutthaya as compared to people of other regions, they should be more interested and enthusiastic in paying for the proposed heritage interpretation restoration and improvement program than others who come from other provinces. If this assumption is correct, the sign of BANG variable's coefficient should be positive.

According to two attitudinal variables that are SERV and NGEN, since interpretive facilities, activities and services in the Historic City of Ayutthaya are not well prepared and ready to service visitors who go sight seeing inside. The respondents who are dissatisfied with current interpretive facilities are believed to

voluntarily engage themselves in proposed heritage interpretation restoration and improvement projects while the respondents who are pleased to go sightseeing in the historic site without better interpretive facilities will not be willing to pay for this project. For this above-mentioned reason, SERV variable's coefficient should be negative. In case of NGEN variable, respondents who believe that well-prepared heritage interpretation of the Historic City of Ayutthaya is necessary for future generation will tend to pay and collaborate in proposed heritage interpretation restoration and improvement projects and the sign of NGEN variable's coefficient should be positive accordingly.

With regard to distance decay mentioned before, willingness to pay is rationally anticipated to diminish according to the increase in distance between respondent's residence and the Historic City of Ayutthaya. Therefore, PROV's coefficient should be negative while LOCA's coefficient should be positive.

With regard to anchoring bias, since there are 2 hypothetical programs in this CV study, the first program is heritage interpretation restoration and improvement program for 3 major historic sites and another one is for 15 historic sites. In cases where anchoring bias occurs, expected willingness to pay will be statistically significantly declined if 3-major-site program is proposed to respondent before 15-site program. Vice versa, in cases where larger program is proposed, the expected willingness to pay will be statistically more significant. Therefore, the sign of ANCH variable's coefficient is likely to be negative but it is really expected to be statistically insignificant because anchoring bias is not expected to occur.

With regard to the scope test, SCOP variable is incorporated into the model to conduct a scope test. Since there are 2 hypothetical heritage interpretation restoration and improvement projects in this study. The larger project covers 15 historic sites and the smaller project covers only 3 major historic sites. The concern is that respondents will be not sensitive to the scope of the project and they will just pay to perform some altruistic donation to a conservation project regardless of the scope. In this case, the willingness to pay an amount for 15-site projects will not be different from the willingness to pay an amount for 3-major-site projects. To prove that this study passes the scope test, the willingness to pay the amount for 15-site projects has to be

statistically more significant more than for the 3-major-site project. Therefore, the SCOP variable's coefficient is expected to be positive and statistically significant.

Table 4.16 reports the logit model of WTP bids for the heritage interpretation restoration and improvement for 3 popular historic sites and Table 4.17 reports the logit model of WTP bids for the heritage interpretation restoration and improvement for 15 historic sites in the Historic City of Ayutthaya.

Table 4.16 Parameter Estimates of the Logit Model for 3-Major-Site Heritage Interpretation Restoration and Improvement Program (Single Bounded DC)

Variable	Coefficient	Standard Error	t – ratio	P – Value
Constant	-3.3871	2.8166	-1.203	.2291
TBID	-.2056E-01**	.2278E-02	-9.024	.0000
SEX	.3239E-01	.1742	.186	.8525
AGE	.5960E-02	.1112E-01	.536	.5921
BUDD	1.0172**	.5011	2.030	.0424
SING	-.1931	.2108	-.916	.3596
PROV	.2661E-03	.5627E-03	.473	.6363
EDU	.8519E-01**	.3654E-01	2.331	.0197
FAM	-.4853E-01	.4236E-01	-1.146	.2519
INC	.1844E-04**	.3836E-05	4.807	.0000
BASE	.2250**	.9741E-01	2.309	.0209
SERV	-.1301*	.6811E-01	-1.910	.0561
NGEN	.5102	.4449	1.147	.2514
ANCH	.4115E-01	.1714	.240	.8103

Notes: * = significant at 10% ** = significant at 5% Variables in bold are statistically significant.

Table 4.17 Parameter Estimates of the Logit Model for 15-site Heritage Interpretation Restoration and Improvement Program (Single Bounded DC)

Variable	Coefficient	Standard Error	t – ratio	P – Value
Constant	-1.5539	2.8420	-.547	.5845
FBID	-.5792E-02**	.1446E-02	-4.007	.0001
SEX	-.1027	.1798	-.571	.5679
AGE	.7958E-02	.1192E-01	.668	.5043
BUDD	1.4103**	.4635	3.043	.0023
SING	.1703	.2204	.772	.4398
PROV	-.5337E-03	.5663E-03	-.942	.3460
EDU	.9616E-01**	.3694E-01	2.603	.0092
FAM	.2177E-01	.4476E-01	.486	.6268
INC	.1976E-04**	.5157E-05	3.831	.0001
BASE	.1600	.9976E-01	1.604	.1087
SERV	-.1018	.7038E-01	-1.446	.1482
NGEN	-.8850E-02	.4435	-.020	.9841
ANCH	.2759	.1820	1.516	.1295

Notes: * = significant at 10% ** = significant at 5% Variables in bold are statistically significant.

According to Table 4.16, Table 4.16 contains the results of the econometric estimations of the heritage interpretation restoration and improvement for 3 famous historic sites in the Historic City of Ayutthaya (Wat Si Sanphet, Wat Mahathat and Wat Chaiwatthanaram). The coefficient on the bid variable is negative and strongly significant indicating that the higher bids are more likely to be declined by the respondents so, this result is commensurate to the theoretical concept. Income was also found to be a significantly positive determinant of WTP that complies with the theoretical requirement. Educational level and Buddhism were found to be significantly positive determinants of WTP. This implies the higher-educated people incline to pay

more for the improved heritage interpretation. For gender, marital status and family size, none of these variables is significant at a 95% level of confidence.

Amazingly, in principle of distance decay, the average value or willingness to pay is usually believed to decay with increasing distance from the historic site (Tuan et al. 2009: 10; Pollicino and Maddison, 2001: 141). But in this study, the coefficient on PROV, the distance between the respondent's residence province and Ayutthaya province was positive instead of negative based on the theory. This indicates that the visitors who come from long-distance provinces are likely to pay more than local visitors or visitors who live near the Historic City of Ayutthaya. However, it cannot be concluded utterly because it is not statistically significant at a 95% level of confidence. However, because of the insignificance of this variable, it can reflect neither nor less that the visitors who live in or near the Historic City of Ayutthaya do not have the inclination to pay more for the restoration and improvement of heritage interpretation in case of 3-major-site program. This is possibly supposed to be an issue of concern.

With regard to the attitudinal variables imposed into the model, it was noticed that the respondents who have more background knowledge about Ayutthaya tend to pay significantly more for the improved heritage interpretation. Furthermore, it was also found that the respondents who are aware of the quality of the heritage interpretation, because of the significantly negative coefficient on the SERV variable reflecting Thai visitors' expectation on the quality of heritage interpretation and their sensitivities to current conditions of the heritage interpretation in the Historic City of Ayutthaya. The negative sign can imply that Thai visitors cannot bear to accept the low quality of the heritage interpretation and they are willing and ready to pay for such improvements accordingly. In the matter of the attitude toward the purpose of conservation for the next generation, it was found that this attitude does not significantly influence the willingness to pay because its coefficient is not significant at a 95% level of confidence. Thus, it is reasonable to imply that Thai visitors still perceive that the heritage interpretation for only 3 popular historic sites is an aspect of tourism and recreational purpose for their own benefits rather than its bequest value for the next generation or existing values for the society and communities.

From the perspective of anchoring bias, due to each respondent eliciting his or her willingness to pay for two hypothetical heritage interpretation restoration and improvement programs, it was a concern whether the bid amount and the answer regarding the willingness to pay for the first proposed hypothetical program will influence the willingness to pay for the next proposed program. Therefore, it was decided to incorporate a dummy variable into the model. This dummy variable, ANCH, will become “1” if the respondents are asked to evince their willingness to pay for program 1 (for 3 major historic sites) before program 2 (for 15 historic sites). Vice versa, in case that program 2 was proposed before, the dummy variable will become “0” instead. According to the econometric result in Table 4.16, although the respondents who are asked about the program 1 (for 3 major historic sites) before program 2 (for 15 historic sites) seem to pay more than in the case where program 2 is proposed before program 1. However, this variable is not statistically significant at a 95% confidence level. As a result, it can be concluded that the anchoring bias can be neglected and is not necessary to be concerned about it very much.

Table 4.17 contains the results of the econometric estimations of the heritage interpretation restoration and improvement program 2 for 15 historic sites in the Historic City of Ayutthaya (Wat Si Sanphet, Wat Mahathat, Wat Chaiwatthanaram, Wat Mongkol Bophit, Wat Thammikarat, Wat Phra Ram, Wat Buddhaisawan, Wat Phanan Choeng, Wat Maheyong, Wat Yai Chaimongkol, Wat Rajburana, Wat Suwandararam, Wat Na Phra Men, Wat Kudidao and Wat Barom Buddharam). In consonance with the theory, the obtained coefficient on the bid variable and income are negative and positive respectively with a statistically significant 95% confidence level like the case of 3-major-site program. Buddhism, Income and education level are still found to be significantly positive determinants of WTP like the case of 3 major sites. Unfortunately, with regard to the attitudinal variables imposed in the model, none of these variables are statistically significant at 95% of confidence level. Since the incorporated attitudinal variables reflect the respondents’ viewpoints toward the current heritage interpretation they just experience it and the payment vehicle used in this study is one-day package entrance fee. Hence, it is possible that the respondents possibly consider the benefits of the heritage interpretation inside in the facet of their own recreational and tourism purposes rather than its indirect-use or non-use value.

These afore-mentioned reasons are considered rational explanations for the statistical insignificance of all attitudinal variables in the case of 15 historic sites

From the perspective of distance decay, it was found that the willingness to pay is inversely proportionate to the distance between the respondent's home province and Ayutthaya province. But it cannot be concluded that the distance decay occurs in this case because its coefficient is just weakly significant. Similar to the case of 3 major sites, the remaining demographic variables which are gender, age, marital status, family size do not have any statistically significant role on the willingness to pay.

Pertaining to the anchoring bias, nothing should be of concern because it had no strongly significant influence at a 95% confidence level. So, it has strong statistical evidence that no anchoring bias can cause a serious problem in this study in both the 3-major-site case and 15-site case.

According to the insignificance of the PROV variable and no statistical occurrence of distance decay in this study, it is supposed to be of concern whether local visitors or Ayutthaya visitors who live in the the province where the Historic City of Ayutthaya is located are willing to pay for the improved heritage interpretation or not. To completely clarify this anxiety, two dummy variables, LOCA and BANG, are put into the model instead of PROV variable. If LOCA = 1 and BANG = 0, this means this specific respondent is Ayutthaya visitor and if LOCA = 0 and BANG = 1, this means this typical respondent is the individual who live in Bangkok or its vicinity. In cases where both LOCA and BANG are equal to 0, this means this particular respondent lives in other provinces in Thailand.

From a total of 717 respondents, there are 117 Ayutthaya visitors. 385 respondents live in Bangkok and vicinity and 215 visitors come from other provinces. Based on a simple linear utility model, the mean willingness to pay of Ayutthaya visitors, Bangkok (and vicinity) visitors and others can be shown in Figure 4.24 below.

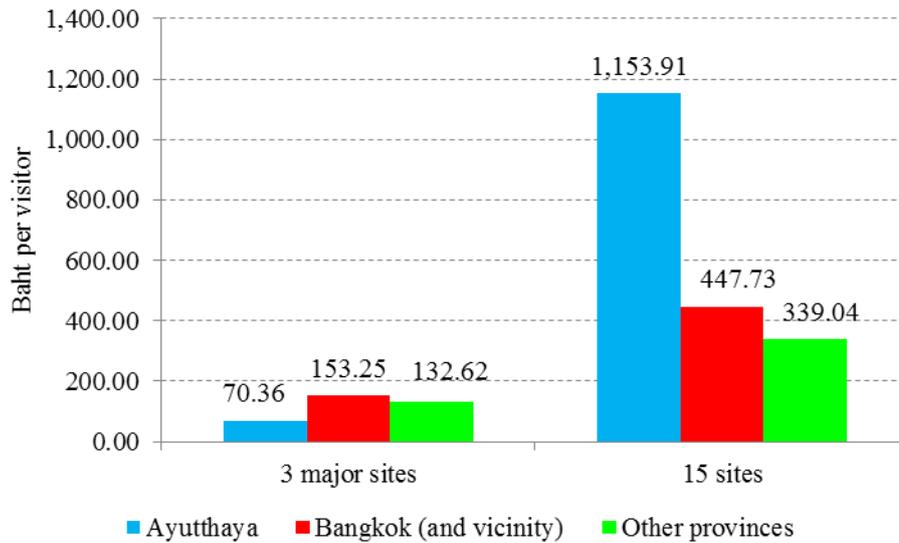


Figure 4.24 Mean WTP for 3 Major – Site Program and 15-Site Program Obtained from Ayutthaya Visitors, Bangkok (and vicinity) Visitors and Other Provinces Visitors

According to Figure 4.24, in the case of 3 famous historic sites, the mean willingness to pay for Ayutthaya visitors is just 70.36 Baht per visitor which is the lowest among the visitors who come from Bangkok and vicinity (153.25 Baht per visitor) and other provinces (132.62 Baht per visitor). But in the case of 15 historic sites which is the larger scope of the heritage interpretation restoration and improvement program, the mean willingness to pay for Ayutthaya is 1,153.91 Baht per visitor which is the highest mean willingness to pay as compared to the visitors from Bangkok and vicinity (447.73 Baht per visitor) and other provinces (339.04 Baht per visitor). After the LOCA variable and BANG variable are put into the model instead of the PROV variable, the empirical results in the case of 3 major historic sites and 15 historic sites can be exhibited in Table 4.18 and Table 4.19 respectively, below.

Table 4.18 Parameter Estimates of the Logit Model for 3-Major-Site Heritage Interpretation Restoration and Improvement Program (Single Bounded DC) with the LOCA variable and BANG variable

Variable	Coefficient	Standard Error	t – ratio	P – Value
Constant	-3.1765	2.8374	-1.120	.2629
TBID	-.2047E-01**	.2286E-02	-8.955	.0000
SEX	-.1051E-01	.1759	-.060	.9524
AGE	.4405E-02	.1126E-01	.391	.6957
BUDD	.9789**	.4971	1.969	.0489
SING	-.1958	.2112	-.927	.3539
LOCA	-.2587	.2749	-.941	.3468
BANG	.2497	.1981	1.261	.2074
EDU	.7899E-01**	.3686E-01	2.143	.0321
FAM	-.4013E-01	.4232E-01	-.948	.3429
INC	.1706E-04**	.3827E-05	4.458	.0000
BASE	.2306**	.9816E-01	2.349	.0188
SERV	-.1215*	.6838E-01	-1.777	.0756
NGEN	.4902	.4443	1.103	.2699
ANCH	.3272E-01	.1720	.190	.8492

Notes: * = significant at 10% ** = significant at 5% Variables in bold are statistically significant.

According to Table 4.18, the statistical significant variables and their signs in the model that impose a LOCA variable and BANG variable into the model instead of PROV variable are the same. The coefficients of the LOCA variable and BANG variable are not statistically significant at a 95% confidence level. Based on statistical theory, this can imply that the willingness to pay by Ayutthaya visitors, Bangkok and vicinity visitors and other provinces visitors are not statistically different even though the negative sign of LOCA's coefficient possibly implies that an Ayutthaya visitor will pay less and positive sign of BANG's coefficient probably identify that the visitors who live in Bangkok and vicinity will pay more.

Table 4.19 Parameter Estimates of the Logit Model for 15-Site Heritage Interpretation Restoration and Improvement Program (Single Bounded DC) with the LOCA variable and BANG variable

Variable	Coefficient	Standard Error	t – ratio	P – Value
Constant	-2.1431	2.8847	-.743	.4575
FBID	-.5920E-02**	.1447E-02	-4.091	.0000
SEX	-.1128	.1824	-.619	.5362
AGE	.1000E-01	.1201E-01	.833	.4049
BUDD	1.5021**	.4636	3.240	.0012
SING	.1454	.2217	.656	.5120
LOCA	.5529**	.2680	2.063	.0391
BANG	.4898**	.2028	2.415	.0157
EDU	.9229E-01**	.3739E-01	2.468	.0136
FAM	.2944E-01	.4540E-01	.648	.5167
INC	.1972E-04**	.5234E-05	3.768	.0002
BASE	.1490	.1005	1.482	.1384
SERV	-.9251E-01	.7061E-01	-1.310	.1902
NGEN	.9053E-02	.4474	.020	.9839
ANCH	.2692	.1830	1.471	.1412

Notes: * = significant at 10% ** = significant at 5% Variables in bold are statistically significant.

According to Table 4.19, when the LOCA variable and BANG variable are imposed into the model instead of the PROV variable, the variables of the bid amount, Buddhism, educational level (or schooling years) and income are still statistically significant at a 95% confidence level and their signs are the same as the model in Table 4.17. Nevertheless, the most intriguing point is the LOCA variable and BANG variable are statistically significant at a 95% confidence level. The positive sign of their coefficients reflects that Ayutthaya visitors and the visitors from Bangkok and

vicinity are willing to pay more for the restoration and improvement of heritage interpretation in the 15-site heritage interpretation restoration and improvement program.

Although there is no distance decay phenomena in both 3-major-site program and 15-site program, Ayutthaya visitors and the visitors from Bangkok and vicinity are willing to pay more for the restoration and improvement of heritage interpretation for 15 historic sites in the Historic City of Ayutthaya. This identifies that local people and Bangkok and vicinity people probably realize that the larger scope heritage interpretation restoration and improvement project is not only implemented for tourism purpose, but it is also a part of conservation measures that enable Thai people who are the real owners of the Historic City of Ayutthaya to perceive its authentic value. Therefore, both Ayutthaya visitors and the visitors from Bangkok and vicinity are willing to pay for the improved heritage interpretation in a large-scale project instead of a limited-scale project which will be done for tourism benefits only. Conclusively, if the large-scale heritage interpretation restoration and improvement project is decided upon, it is possible to gain the collaboration from local people and the visitors from Bangkok and vicinity. Nonetheless, because there is no statistical evidence of distance decay in this study, it can be implied that Thai visitors who live in other provinces nearby Ayutthaya are not willing to pay more for the improved heritage interpretation in the Historic City of Ayutthaya and its continual upkeep. As a result, campaigns to create a sense of belonging to the Historic City of Ayutthaya of Thai people, especially those who live near Ayutthaya are still necessary and should be done.

4.4.2 Estimation of WTP with the Double Bounded Dichotomous Choice Technique

With regard to the double bounded dichotomous choice technique, the respondents will be asked about their willingness to pay for the improvement of heritage interpretation of both 3 major sites and 15 sites in the Historic City of Ayutthaya. After the first bid amount is proposed to the respondents, the second question will be offered to the respondents depending on “Yes” or “No” in the first reply to the first question. In cases where the typical respondent answers “Yes” to the first question, the bid amount will be doubled and repropose to the respondent as the

second question and lets the respondent answer “Yes” or “No” again. Nonetheless, in cases where the respondent answer “No” for the first question, the bid amount will be decreased by half and reoffered to the respondent to reconsider to say “Yes” or “No” again. The sample size of 717 respondents is divided into two groups to correspond with the single bounded dichotomous choice technique, 370 respondents will be asked to evince their own willingness to pay for 3-major-site program (Program 1) before the 15-site program (Program 2) and the rest (347 respondents) will be asked their willingness to pay for the 15-site program (Program 2) before the 3-major-site program (Program 1).

In the matter of the double bounded dichotomous choice analysis, 2 models were employed in this study. Model 1 contains the statistically significant dependent variables in the single bounded dichotomous choice technique that consists of bid amount, Buddhist religion, education level or schooling years and monthly income while only bid amount and anchoring – test variable were imposed in Model 2.

Table 4.20 reports the logit model of WTP bids for the heritage interpretation restoration and improvement program 1 (3-major-site program) and Table 4.21 reports the logit model of WTP bids for the heritage interpretation restoration and improvement program 2 (15-site program).

Table 4.20 Parameter Estimates of the Logit Model for 3-major-site Heritage Interpretation Restoration and Improvement Program (Double Bounded DC)

Variable	Model 1		Model 2	
	Coefficient	P - Value	Coefficient	P - Value
Constant	-.2851	.6931	1.9727**	.0000
TBID	-.1041E-01**	.0000	-.9005E-02**	.0000
BUDD	.8431	.1482		
EDU	.8304E-01**	.0028		
INC	.14832E-04**	.0000		
ANCH			.2936E-01	.8493

Notes: * = significant at 10%

** = significant at 5%

Table 4.21 Parameter Estimates of the Logit Model for 15-site Heritage Interpretation Restoration and Improvement Program (Double Bounded DC)

Variable	Model 1		Model 2	
	Coefficient	P - Value	Coefficient	P - Value
Constant	.6578E-01	.9150	2.620**	.0000
FBID	-.6397E-02**	.0000	-.5591E-02**	.0000
BUDD	.6405	.1689		
EDU	.1106**	.0001		
INC	.2365E-04**	.0000		
ANCH			.1628	.2386

Notes: * = significant at 10%

** = significant at 5%

According to Model 1 in Table 4.20 and Table 4.21, the empirical results from both cases of 3-major-site and 15*site heritage interpretation improvement projects in the Historic City of Ayutthaya show that respondent's income, education level (or schooling years) are statistically positive determinants of WTP at a 95% confidence level while the coefficient on bid amount is statistically negative at a 95% confidence level. The signs of these above coefficients are still commensurate with the theory. Nevertheless, although the Buddhism has a positive relationship with the willingness to pay, it is not statistically significant at a 95% confidence level. Conclusively, the statistically significant variables in the case of double bounded dichotomous choice technique are bid amount, education level and income but Buddhism is not. As a result, according to both the single bounded dichotomous choice question and double bounded dichotomous choice question, the important variable which is always statistically significant is education level.

Model 2 was used to investigate the existence of the anchoring bias. According to Table 4.20 and Table 4.21, the empirical results reported no statistically significant influence of anchoring for both the 3-major-site case and the 15-site case. So, the anchoring bias should still not be of concern.

4.4.3 Estimation of WTP with the Open Ended Technique

As previously mentioned, each respondent has to twice answer “Yes” or “No” for a particular proposed bid amount that is in form of one – day package entrance fee twice for two hypothetical programs regarding the restoration and improvement of heritage interpretation. The first program is for 3 famous historic sites and the other is for 15 historic sites. However, before finishing the interview, each respondent will be given the chance to evince their maximum one-day package entrance fee (willingness to pay) for both 2 heritage interpretation restoration and improvement programs with open-ended question “How much is your maximum one-day entrance fee for the improved heritage interpretation of 3 popular historic sites (or 15 historic sites)?” The Tobit model is employed to model the 717 respondents’ responses with 8 socio-economic variables, 3 attitudinal variables and 1 anchoring – test variable. Similar to the previous cases, There are 370 respondents will be asked to evince their own willingness to pay for 3-major-site program (Program 1) before 15-site program (Program 2) and the rest (347 respondents) will be asked their willingness to pay for the 15-site program (Program 2) before the 3-major-site program (Program 1).

Table 4.22 reports the Tobit model of WTP bids for the heritage interpretation restoration and improvement program 1 (3-major-site program) and Table 4.23 reports the Tobit model of WTP bids for the heritage interpretation restoration and improvement program 2 (15-site program).

Table 4.22 Parameter Estimates of the Tobit Model for 3-Major-Site Heritage Interpretation Restoration and Improvement Program (Open Ended)

Variable	Coefficient	Standard Error	t – ratio	P – Value
Constant	-92.5443	102.9687	-.899	.3688
SEX	-2.5375	6.3837	-.397	.6910
AGE	-.7597*	.4004	-1.897	.0578
BUDD	35.5703**	16.6535	2.136	.0327
SING	-19.5690**	7.7454	-2.527	.0115
PROV	-.1837E-02	.2019E-01	-.091	.9275

Table 4.22 (Continued)

Variable	Coefficient	Standard Error	t – ratio	P – Value
EDU	4.3711**	1.3520	3.233	.0012
FAM	-2.2257	1.5461	-1.440	.1500
INC	.70690E-03**	.1103E-03	6.408	.0000
BASE	9.1805**	3.5507	2.586	.0097
SERV	-2.4246	2.4742	-.980	.3271
NGEN	19.2149	16.3609	1.174	.2402
ANCH	7.9547	6.3071	1.261	.2072

Notes: * = significant at 10%

** = significant at 5% Variables in bold are statistically significant.

Table 4.23 Parameter Estimates of the Tobit Model for 15-site Heritage Interpretation Restoration and Improvement Program (Open - Ended)

Variable	Coefficient	Standard Error	t – ratio	P – Value
Constant	-178.9522	209.9194	-.852	.3939
SEX	-9.0502	13.0143	-.695	.4868
AGE	-1.8604**	.8163	-2.279	.0227
BUDD	108.9102**	33.9511	3.208	.0013
SING	-28.6808*	15.7903	-1.816	.0693
PROV	-.1648E-01	.4116E-01	-.400	.6888
EDU	11.0188**	2.7563	3.998	.0001
FAM	-2.7179	3.1520	-.862	.3885
INC	.2188E-02**	.2249E-03	9.728	.0000
BASE	24.4784**	7.2387	3.382	.0007
SERV	-12.9608**	5.0441	-2.569	.0102
NGEN	34.5598	33.3546	1.036	.3001
ANCH	13.2855	12.8580	1.033	.3015

Notes: * = significant at 10%

** = significant at 5% Variables in bold are statistically significant.

According to Table 4.22, the socio-economic variables that are statistically significant in the case of the 3-major-site heritage improvement program are composed of the respondent's age, being Buddhist, marital status, education level, monthly income. With regard to attitudinal variables, only background knowledge about Ayutthaya is still the statistically significant variable. The willingness to pay positively varies with the respondent's income still conforming to the economic theory like the previous cases. Moreover, it was found that the Buddhist, women, and young people tend to be willing to pay more for the restoration and improvement of the heritage interpretation while the single have the tendency to pay less. Furthermore, it was also found that the respondents who have longer schooling years or a higher education level and those who have more background knowledge or information about Ayutthaya tend to voluntarily pay more for a one-day package entrance fee.

According to Table 4.23, in case of the 15-site heritage improvement program, the statistically significant socio-economic variables of this case are the same as the case of the 3-major-site program. As regards the attitudinal variables, besides the background knowledge about Ayutthaya, the perception regarding the current quality of heritage interpretation inside the historic site is the inverse determinant of willingness to pay. That means the individual who is aware of the low quality of the current heritage interpretation will be willing to pay more for the improved heritage interpretation inside the historic sites.

Unfortunately, similar to the case of single bounded dichotomous choice technique, the distance between residence province of the visitors should be expected to be negative and statistically significant because it was believed that the visitors who live in the Historic City of Ayutthaya nearby should willingly pay more than those who live in the distant provinces but reportedly results showed that it was not statistically significant at all. This possibly implies that the collaboration of Thai visitors in the restoration and improvement of the heritage interpretation inside the Historic City of Ayutthaya does not correlate with the respondents' living places. The visitors who live near the Historic City of Ayutthaya do not have the inclination to pay more than others who live far away. A sense of belonging and ownership of Thai people over the Historic City of Ayutthaya deserves to be regarded as an interesting issue that should be earnestly implemented in practice.

4.4.4 Mean and Median of Willingness to Pay and Aggregate Willingness to Pay

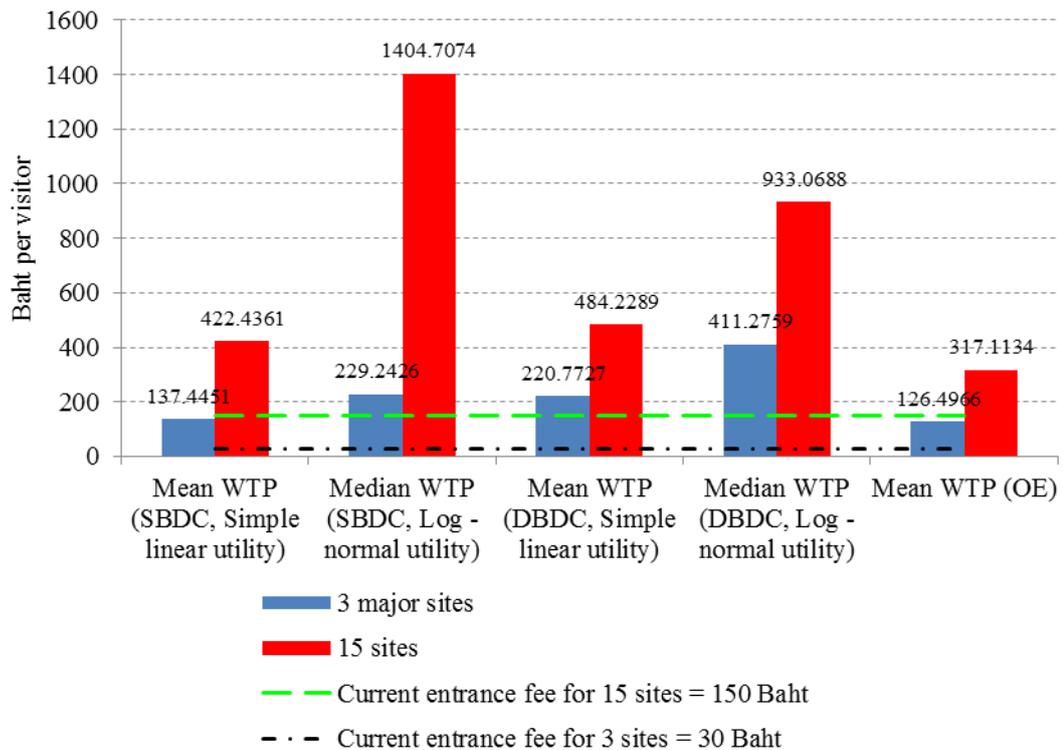
Table 4.24 reports the mean WTP, Median WTP and the aggregate WTP obtained from several models used in this study. The Mean and Median WTP are computed by parametric estimation based on both the assumption of simple linear utility function and log – normal utility function respectively with logistic regression. With regard to the open ended technique, the Tobit model was applied in calculations.

Table 4.24 Mean and Median of WTP Estimates and Aggregate WTP

	3 major sites	15 sites
Number of Thai visitors	≈ 350,000 visitors per year	
Single bounded dichotomous choice technique:		
E(WTP) (Linear utility function with logistic regression)	137.4451 Baht	422.4361 Baht
Log likelihood function	- 450.9604	- 421.9610
Median WTP (Log – normal utility function with logistic regression)	229.2426 Baht	1,404.7074 Baht
Log likelihood function	- 455.2545	- 423.0360
Aggregate WTP	48,105,785 – 80,234,910 Baht per year	147,852,635 – 491,647,590 Baht per year
Double bounded dichotomous choice technique:		
E(WTP) (Linear utility function with logistic regression)	220.7727 Baht	484.2289 Baht
Log likelihood function	- 1,088.023	- 971.1131
Median WTP (Log – normal utility function with logistic regression)	411.2759 Baht	933.0688 Baht
Log likelihood function	- 1,102.995	- 975.2798

Table 4.24 (Continued)

	3 major sites	15 sites
Aggregate WTP	77,270,445-143,946,565 Baht per year	169,480,115- 326,574,080 Baht per year
Open ended technique:		
E(WTP)	126.4966 Baht	317.1134 Baht
Log likelihood function	- 4,192.205	- 4,702.923
Aggregate WTP	44,273,810 Baht per year	110,989,690 Baht per year

**Figure 4.25** Mean and Median of WTP for 3 Major-Site Program and 15 – Site Program Obtained from All Techniques

According to Figure 4.25, it is observed that the willingness to pay for the heritage interpretation improvement program for 15 historic sites is greater than the willingness to pay for 3 popular historic sites whatever kind of CV techniques,

including single bounded DC with both simple linear utility function and log-normal utility function, double bounded DC with both simple linear utility function and log-normal utility function and also open ended question are used. To statistically implement the scope test, the single bounded dichotomous choice technique was applied. As known before, no anchoring bias is supposed to be statistically concerned at a 95% confidence level. This means each respondent asked about 2 hypothetical heritage interpretation restoration and improvement program can be treated as 2 individuals independently. Supposedly, it is like the first individual will evince his or her willingness to pay for heritage interpretation program for 3 major historic sites and after that he or she will act as if he or she is another individual who will evince his or her willingness to pay for such a program for 15 historic sites. With this assumption, the sample size will be doubled to 1,434 samples. As a result, another variable, SCOP, should be incorporated into the model along with some socio-economic variables and certain attitudinal variables. The SCOP variable will become “1” in case of 15-site program and it will become “0” if it represents 3-major-site program. Based on single bounded dichotomous choice technique, the empirical results are shown in Table 4.25 below.

Table 4.25 Scope Test based on Single Bounded Dichotomous Choice Technique

Variable	Coefficient	Standard Error	t – ratio	P – Value
Constant	-3.2480	1.8902	-1.718	.0857
BID	-.1009E-01**	.1233E-02	-8.189	.0000
SEX	-.3185E-01	.1228	-.259	.7954
AGE	.7397E-02	.7999E-02	.925	.3551
BUDD	1.1881**	.3445	3.448	.0006
SING	-.1493E-01	.1498	-.100	.9206
PROV	-.1457E-03	.4006E-03	-.364	.7161
EDU	.8709E-01**	.2572E-01	3.386	.0007
FAM	-.1289E-01	.2989E-01	-.431	.6662

Table 4.25 (Continued)

Variable	Coefficient	Standard Error	t – ratio	P – Value
INC	.1864E-04**	.3035E-05	6.141	.0000
BASE	.1847**	.6840E-01	2.700	.0069
SERV	-.1145**	.4791E-01	-2.390	.0168
NGEN	.1939	.2963	.654	.5128
SCOP	2.2370**	.1917	11.670	.0000

Notes: * = significant at 10% ** = significant at 5% Variables in bold are statistically significant.

Statistically, it was found that the SCOP variable possesses a significantly positive coefficient at a 95% confidence level. This means the willingness to pay will increase if the scope of the heritage interpretation restoration and improvement program is scaled up. Thus, it is able to be implied that the results from this CV study qualify the scope test. As a result, individuals are willing to pay more for the improved heritage interpretation if the number of heritage sites in the heritage interpretation restoration and improvement program increase.

For the 3-major-site heritage interpretation improvement program, in the case of both single bounded DC and double bounded DC, median WTP based on log-normal utility function is greater than the mean WTP based on the simple linear utility function.

For the 15-site heritage interpretation improvement program, in the cases of both single bounded DC and the double bounded DC, median WTP under assumption of log-normal utility function is still greater than the mean WTP under the assumption of simple linear utility function.

To compare the mean WTP derived from the single bounded DC with the mean WTP derived from the double bounded DC, in the case of the 3-major-site heritage interpretation improvement program under the assumption of linear utility function, the mean WTP computed from the single bounded DC is less than the mean WTP computed from the double bounded DC. Likewise, in case that log-normal utility

function is assumed, the result is still the same. However, in the case of the 15 – site heritage interpretation improvement program with linear utility function, the mean WTP computed from double bounded DC is greater than that calculated from single bounded DC like the case of the 3-major-site program. Nonetheless, in the case that log-normal utility function is assumed, the result is vice versa. The median WTP derived from single bounded DC is greater than the median WTP calculated from the double bounded DC.

As afore-mentioned, the current entrance fee for Thai visitors who would like to visit the heritage sites in the Historic City of Ayutthaya (or Ayutthaya Historical Park) is just 10 Baht per person per site and it will be collected from adult visitors only. Moreover, currently, no package based entrance fee is provided for the visitors yet. However, in this study the one-day package entrance fee for 3 major historic sites and 15 historic sites are employed as the payment vehicle and it was also proved that 623 respondents from a total of 717 respondents accept this entrance fee concept. Due to a one-day package entrance fee, the visitors can access more than one site during the visit to the Historic City of Ayutthaya. Furthermore, the package based entrance fee that is collected from the visitor just once is probably more convenient than paying the entrance fee at each site. Therefore, the one-day package entrance fee should be an additional alternative for the visitors besides the per-site entrance fee concept that is traditionally implemented at present.

According to Figure 4.25, with regard to the current entrance fee, each visitor has to pay a 30 Baht of entrance fee to visit 3 major historic sites and a 150 Baht of entrance fee to visit 15 historic sites. According to this study, the one-day package entrance fee for 3 major historic sites is estimated at between 126.4966-229.2426 Baht per visitor (for the purpose of heritage interpretation restoration and improvement). This means the entrance fee for the 3-major-site package can be increased by up to 321.66%-664.14%. As the case of the 15 sites, one-day package entrance fee for 15 historic sites is estimated at between 317.1131-1,404.7074 Baht per visitor. This means the entrance fee for the 15-major-site package can be increased by up to 111.41% - 836.47%. It was found that the one-day package entrance fee has huge room for an increase from Thai visitors. With the one-day package entrance fee concept and the increase of the entrance fee, these policies will

possibly enable the relevant authority to gain more income and provide adequate funds to sustainably and continuously arrange a budget for the restoration and improvement of heritage interpretation in the Historic City of Ayutthaya.

To compute the aggregate WTP, the number of visitors who visit the Historic City of Ayutthaya is essential information. According to the interview with director of the Phranakhon Si Ayutthaya Historical Park, Mr. Chaiyanan Bussayarat, he said that there are around 350,000 Thai visitors per year who visit Ayutthaya Historical Park from a total 3-4 million Thai visitors who visit Ayutthaya province. Therefore, the number of 350,000 Thai visitors a year will be used to calculate the aggregate WTP for the heritage interpretation restoration and improvement of the Historic City of Ayutthaya.

According to Table 4.24, the single bounded DC yields an aggregate estimate of 48,105,785-80,234,910 Baht per year for the 3-major-site heritage interpretation improvement program and 147,852,635-491,647,590 Baht per year for the 15-site heritage interpretation program. With regard to double bounded DC, the aggregate WTP is equal to 77,270,445-143,946,565 Baht per year for the 3-major-site heritage interpretation improvement program and 169,480,115-326,574,080 Baht per year for the 15-site heritage interpretation program. However, in the case of the open ended question, the aggregate WTP of 44,273,810 Baht per year and 110,989,690 Baht per year are obtained from the 3-major-site and the 15-site heritage interpretation improvement programs, respectively.

To select the best-fit model, in principle, the log likelihood value will be used as the criteria. Normally, log likelihood value will be negative. The model that provides the greater log likelihood function value (less negative or nearer to zero) is the better-fit model. In this study, it was found that the value of log likelihood function of single bounded dichotomous choice question is the greatest (the least negative) among all models in both cases of the 3-major-site program and the 15-site program. Therefore, it is reasonable enough to conclude that the values of mean willingness to pay obtained from the single bounded dichotomous choice question deserve to be the best-fit estimated willingness to pay for the heritage interpretation restoration and improvement program of the Historic City of Ayutthaya. Hence, the mean willingness to pay for the heritage interpretation program for 3 major historic sites and 15 historic

sites are considered 137.4451 Baht per visitor and 422.4366 Baht per visitor respectively.

As a result, the aggregate WTP for 3-major-site heritage interpretation restoration and improvement program approximately yields 48 million Baht per year and the 15-site heritage interpretation restoration and improvement program provides an aggregate WTP of 148 million Baht per annum. The aggregate WTP of each heritage interpretation restoration and improvement program seems to be enormous and adequate enough to restore, maintain and enhance the quality of the heritage interpretation in the Historic City of Ayutthaya with this self-funded mechanism.

CHAPTER 5

CONCLUSION AND POLICY IMPLICATION

5.1 Discussion on the Empirical Results

This study focused on employing contingent valuation (CV) with several techniques, including single bounded dichotomous choice, double bounded dichotomous choice and open ended techniques to elicit the value of the heritage interpretation of the cultural heritage. Due to the Historic City of Ayutthaya being the one of the most famous World Heritage Sites in Thailand, it deserves to be selected as the study site of this research. In this study, the one-day package entrance fee was used as the payment vehicle because of its incentive compatibility and the ability of free rider prevention. First of all, according to this study, the WTPs that derive from several models afore mentioned were compared to one another.

Among all CV techniques used in this study, the lowest mean WTP is obtained from the open ended technique. Mean WTP for the heritage interpretation restoration and improvement program for 3 major sites is equal to 126.4966 Baht per visitor while 317.1134 Baht per visitor is the mean WTP for the 15-site program.

In this study, two assumptions of utility function were made. The first one is linear utility function and the other is log-normal utility function. It was found that the median WTPs under the assumption of log-normal utility function are always greater than the mean WTPs under the assumption of linear utility function for both the 3 – major-site program and the 15-site program whether the single bounded DC or double bounded DC is applied in computing results.

Pertaining to the difference between the mean WTP from single bounded DC and the mean WTP from double bounded DC, two utility functions are also assumed. The first assumption is linear utility function and the other is log-normal utility function. With the logistic regression, the results can be concluded as follows.

In the case of the 3-major-site program;

1) Under the assumption of linear utility function, the mean WTP from the double bounded DC (220.7727 Baht per visitor) is 60.63% greater than the mean WTP from the single bounded DC (137.4451 Baht per visitor).

2) Under the assumption of log-normal utility function, the median WTP from double bounded DC (411.2759 Baht per visitor) is 79.41% greater than the median WTP from the single bounded DC (229.2426 Baht per visitor).

In the case of the 15-site program;

1) Under the assumption of linear utility function, the mean WTP from the double bounded DC (484.2289 Baht per visitor) is 14.63% greater than the mean WTP from single bounded DC (422.4361 Baht per visitor).

2) Under the assumption of log-normal utility function, the median WTP from the double bounded DC (933.0688 Baht per visitor) is 33.58% less than the median WTP from the single bounded DC (1,404.7074 Baht per visitor).

Therefore, among all techniques used to estimate the willingness to pay for the improved heritage interpretation, it can be concluded as follows and shown in Figure 5.1 and Figure 5.2.

1) In the case of the 3-major-site program (Figure 5.1),

(1) Linear utility: Mean $WTP_{DBDC} > \text{Mean } WTP_{SBDC} > \text{Mean } WTP_{OE}$

(2) Log-normal utility: Median $WTP_{DBDC} > \text{Median } WTP_{SBDC} > \text{Mean } WT_{OE}$

2) In case of 15-site program (Figure 5.2),

(1) Linear utility: Mean $WTP_{DBDC} > \text{Mean } WTP_{SBDC} > \text{Mean } WTP_{OE}$

(2) Log-normal utility: Median $WTP_{SBDC} > \text{Median } WTP_{DBDC} > \text{Mean } WT_{OE}$

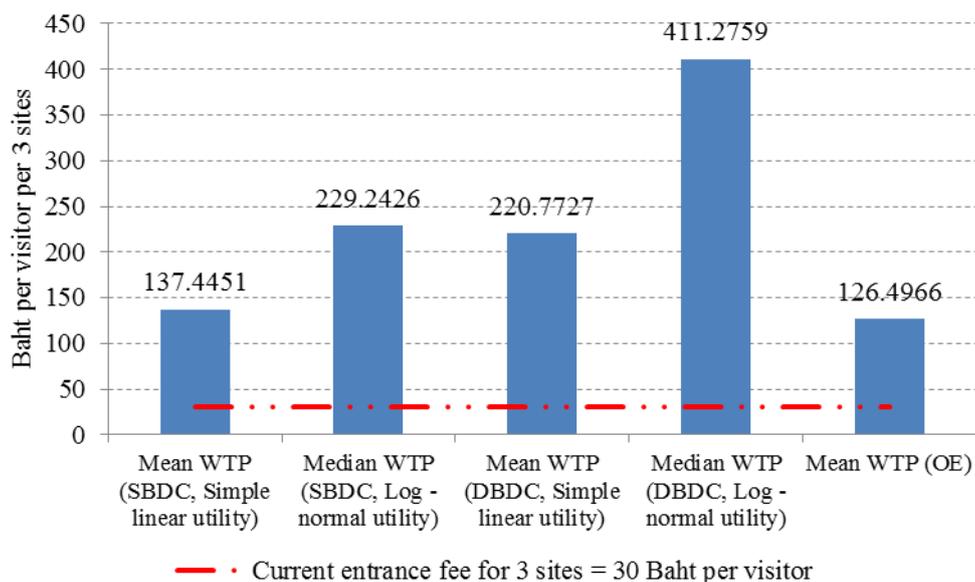


Figure 5.1 Mean and Median Willingness to Pay in the Case of the 3-Major-Site Heritage Interpretation Restoration and Improvement Program

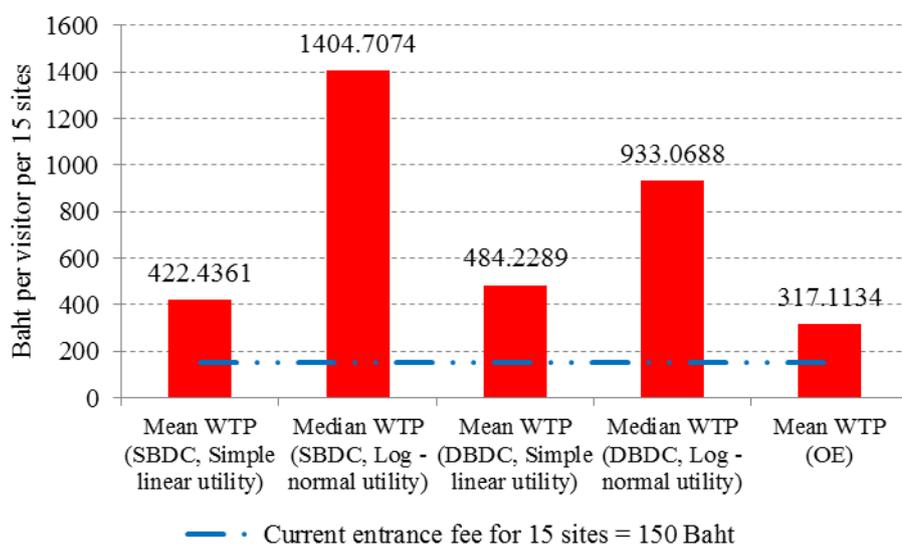


Figure 5.2 Mean and Median Willingness to Pay in the Case of the 15-Site Heritage Interpretation Restoration and Improvement Program

Currently, the traditional entrance fee to Ayutthaya Historical Park is collected on a per-site basis without any package scheme. Normally, Thai visitors have to pay an entrance fee of 10 Baht per person at each site they would like to visit. Therefore,

the almost all revenue from the entrance fee is collected from certain notable historic sites only. The visitors do not have any motive to visit other historic sites in Ayutthaya Historical Park. In this study, the payment vehicle was considered the one-day package entrance fee instead of per-site entrance fee. From a total 717 of respondents, up to 623 respondents are ready to pay for a one-day package entrance fee. So, the one-day package entrance fee should be regarded as the policy to be disseminate to the visitors encourage them to visit other historic sites instead of visiting only the well-known ones.

Table 5.1 reports the statistically significant variables and their influences on WTP of single bounded DC, double bounded DC and open ended technique for both the 3-major-site and 15-site heritage interpretation restoration and improvement programs.

Table 5.1 Statistically Significant Variables of Each CV Method and Their Influences on WTP

Single bounded dichotomous choice technique:		
Influence on WTP	Statistically Significant Variables	
	Program 1 (3 major sites)	Program 2 (15 sites)
Positive	BUDD, EDU, INC, BASE	BUDD, EDU, INC, LOCA, BANG
Inverse	TBID, SERV	FBID
Double bounded dichotomous choice technique:		
Influence on WTP	Statistically Significant Variables	
	Program 1 (3 major sites)	Program 2 (15 sites)
Positive	EDU, INC	EDU, INC
Inverse	TBID	FBID
Open ended technique:		
Influence on WTP	Statistically Significant Variables	
	Program 1 (3 major sites)	Program 2 (15 sites)
Positive	BUDD, EDU, INC, BASE	BUDD, EDU, INC, BASE
Inverse	AGE, SING	AGE, SING, SERV

First, according to Table 5.1, no matter which CV techniques were used, it was found that the educational level (or schooling years) and respondent's income are statistically significant variables and they are positive determinants of WTP. In addition to educational level, based on the single bounded DC, the background knowledge about Ayutthaya is also a positively statistically significant variable for the 3-major-site program. Anyway, in the case of open ended questions, the background knowledge about Ayutthaya is the statistically positive determinant of WTP for both the 3-major-site program and the 15-site program. Conclusively, the signs of these coefficients can be interpreted as follows.

1) Education can be treated as an effective mechanism to enable Thai visitors to pay more for the heritage interpretation at the heritage sites. The more education the people have, the more willingness they have to pay.

2) Furthermore, Thai visitors who have more background knowledge and information about Ayutthaya tend to voluntarily pay more for the one-day package entrance fee. Thus, it is essential to conduct the campaign to promote the importance of Ayutthaya to all Thai people so that they will have a sense of belonging and be ready and voluntarily participate in the conservation programs.

3) According to the empirical results from some techniques, the Buddhist context is regarded as a positive WTP's determinant. This is not the satisfactory issue because the Historic City of Ayutthaya belongs to all Thai people no matter what religion they are. The existence of the Historic City of Ayutthaya is not for Buddhist ceremonies only because it contains considerable values for example, historical value, spiritual value, ethnic value and aesthetic value. All authentic values of the Historic City of Ayutthaya are so valuable and meaningful that it should not be treated as only a place for conducting religious ceremonies. However, it is necessary to implement any policies on the ground to extract the authentic value of the Historic City of Ayutthaya and convey to all Thai visitors or Thai people so that they can gain and absorb a correct understanding of it.

4) According to this study, it was found that Thai visitors who know more about Ayutthaya will be willing to pay a higher entrance fee. This means that Thai visitors who gain or have the adequate information about Ayutthaya will be aware of the usefulness and importance of the heritage interpretation. Therefore, an

investment in the quality of heritage interpretations in the Historic City of Ayutthaya is an important matter that can enable Thai visitors to gain enough useful knowledge and impressive experiences during their visitation. Plus, after they know and experience the valuable context of Ayutthaya from well-prepared heritage interpretation services inside, they will realize the necessity of the provision of heritage interpretation materials and services in the historic sites and this will stimulate them to tend to be willing to pay more for the maintenance and improvement of heritage interpretation. Conclusively, good quality heritage interpretation will create good quality visitors who are willingness to pay for the heritage interpretation. Therefore, an investment on heritage interpretation should be considered an appropriate instrument to generate the self-funded mechanism in sustainable heritage conservation.

Second, the scope test was also tested in this study. Initially, there is a concern that the visitors may offer to pay more since they just want to act as good citizens and want to altruistically participate and dedicate some money to the program but do not perceive the real value of the heritage interpretation. This phenomenon is called “Warm glow giving”. Anyway, whether in case of single bounded DC or double bounded DC or open ended question, the mean WTPs for the 15-site program are always greater than the mean WTPs for the 3-major-site program. The comparison between the estimated WTP obtained from the 3-major-site program and the computed WTP deriving from the 15-site program can be concluded as follows.

1) In the case of the single bounded dichotomous choice question,

(1) Linear utility: The mean WTP of the 15-site program is 207.35% greater than the mean WTP of 3-major-site program ($\text{Mean WTP}_{15 \text{ sites}} > \text{Mean WTP}_{3 \text{ major sites}}$).

(2) Log-normal utility: WTP of 15-site program is 512.76% greater than the mean WTP of 3-major-site program ($\text{Median WTP}_{15 \text{ sites}} > \text{Median WTP}_{3 \text{ major sites}}$).

2) In the case of the double bounded dichotomous choice question,

(1) Linear utility: The mean WTP of 15-site program is 119.33% greater than the mean WTP of 3-major-site program ($\text{Mean WTP}_{15 \text{ sites}} > \text{Mean WTP}_{3 \text{ major sites}}$).

(2) Log-normal utility: WTP of 15-site program is 126.87% greater than the mean WTP of 3-major-site program ($\text{Median WTP}_{15 \text{ sites}} > \text{Median WTP}_{3 \text{ major sites}}$).

3) In the case of the open ended question, the mean WTP of the 15-site program is 150.69% greater than the mean WTP of the 3-major-site program ($\text{Mean WTP}_{15 \text{ sites}} > \text{Mean WTP}_{3 \text{ major sites}}$).

To statistically confirm, a single bounded dichotomous choice technique is applied to statistically prove the scope effect and it was statistically found that the willingness to pay will increase when the number of the historic sites in the heritage interpretation restoration and improvement program is scaled up with a 95% confidence level. This can confirm that this contingent valuation study did pass the scope test. The respondents can distinguish the value of the heritage interpretation according to the number of historic sites in the program. According to the scope test, it was found that when the scale of heritage interpretation restoration and improvement program is larger, the individuals are willing to pay more WTP for the incremental improved heritage interpretations. Therefore, with above-mentioned statistical verification, warm-glow giving is supposed to be not of much concern.

Third, due to the respondents having to answer the questions and evince their willingness to pay for 2 heritage interpretation restoration and improvement programs. Program 1 is prepared for only 3 famous historic sites in the Historic City of Ayutthaya that are Wat Si Sanphet, Wat Mahathat and Wat Chaiwatthanaram and the scope of Program 2 is larger than the scope of Program 1 and it is arranged for 15 historic sites including Wat Si Sanphet, Wat Mahathat, Wat Chaiwatthanaram, Wat Mongkol Bophit, Wat Thammikarat, Wat Phra Ram, Wat Buddhaisawan, Wat Phanan Choeng, Wat Maheyong, Wat Yai Chaimongkol, Wat Rajburana, Wat Suwandararam, Wat Na Phra Men, Wat Kudidao and Wat Barom Buddharam. In principle, there is a concern whether the respondents would probably anchor their elicited WTP on the previous heritage interpretation improvement program and it will cause a certain bias when they state their WTP for the later program proposed. Therefore, a dummy variable, ANCH (If Program 1 is proposed before Program 2 this variable will become 1 and if Program 2 is proposed before Program 1 it will become 0), will be incorporated into the model in order to test the effect of anchoring bias. Fortunately,

ANCH variable is not statistically significant at a 95% confidence level, whether the single bounded DC or double bounded DC or open ended questions are applied. This is rational enough to imply that no anchoring bias should be of serious in this study.

Fourth, in the matter of distance decay, it is previously expected that the visitors who are the local people or live near Ayutthaya province will be willing to pay for the improved heritage interpretation more than visitors who live in far away provinces. Amazingly, according to the empirical results in both the single bounded DC and open ended questions, the distance between respondent's residence province and Ayutthaya province, PROV, is not a statistically significant variable at all. However, based on the single bounded DC, when the LOCA variable (the dummy variable that will equal 1 if the respondent is an Ayutthaya person.) and BANG variable (the dummy variable that will be equal to 1 if the respondent is a resident in Bangkok and vicinity.) are imposed into the model, it was found that these two variables are statistically significant in the case of the heritage interpretation restoration and improvement program for 15 historic sites at a 95% confidence level. The empirical result reflects that although there is no statistical evidence of distance decay, local visitors who live in Ayutthaya which is the province where the Historic City of Ayutthaya is located and the visitors who live in Bangkok and vicinity who are well-educated visitors are still willing to pay significantly more at a 95% confidence level for the large -scale project that will restore and improve the existing heritage interpretation in the 15 historic sites around the Historic City of Ayutthaya. This probably means that the local people are ready to collaborate in the improvement of a large enough project that covers the almost all of Ayutthaya province because it seem to be a project for Ayutthaya people or local communities rather than just a tourism promotion project for tourists or visitors like the case of the 3-major-site project. Decisively, in spite of no evidence of distance decay, at least, local visitors and the visitors who live in Bangkok and vicinity are still willing to pay significantly more for the heritage interpretation restoration and improvement program if the project is large-scale enough. However, because of the no distance decay phenomenon, it can be concluded that the visitors who come from other provinces that is not a long distance from Ayutthaya province are not willing to coordinate in the restoration and improvement of the existing heritage interpretation. They do possibly not have

enough sense of belonging or ownership to perceive the importance of the good quality or well-prepared heritage interpretation or they probably think they are only visitors or tourists and heritage interpretation should be the responsibility of the government or communities that live nearby. This should be regarded as somewhat an alarming issue from the perspective of tourism policy makers.

5.2 Conclusions

According to the discussion above, four major conclusions can be summarized from this study;

5.2.1 Most of the economic valuations of cultural heritage sites in Thailand and other countries were often conducted in the area of physical preservation and conservation for example, restoration of the physical appearance or structure of the historic site or ancient buildings. Nonetheless, this study showed that besides contingent valuation being used to estimate the non-market values of the cultural heritage sites in conservation purpose, it is able to be used to estimate the value of the heritage interpretation that is the one of essential mechanisms in cultural heritage site conservation.

5.2.2 This study can possibly conclude that Thai visitors have a positive attitude and agree with the project to restore and improve the quality of the existing heritage interpretation materials and services of the Historic City of Ayutthaya because they would like to obtain knowledge and experience of valuable and meaningful historical, cultural, aesthetic and architectural issues of Ayutthaya that was once the capital city of Thailand during their visitation. Furthermore, normally, the entrance fee to each historic site is charged visitors on a site by site basis. But in this case, a one-day package entrance fee is utilized as the payment vehicle and this kind of concept is accepted by Thai visitors. Fortunately, the concept of tour package should be used as a mechanism to attract the visitors to try visiting other unpopular sites and spread the visitors to other sites around the area to reduce the congestion problems that often occur at the top three famous historic sites in the Historic City of Ayutthaya.

5.2.3 There are just a proportion of 13.11% of 717 respondents who are not willing to pay even any to restore and improve the existing heritage interpretation of the Historic City of Ayutthaya. That is not seriously substantial enough when compared to the proportion of the respondents who are willing to pay. According to the survey, there are several reasons why some respondents are not willing to pay more for the improved heritage interpretation materials and services. Some of them are confronting budget constraints but the majority reckons that the provision and upkeep of the heritage interpretation inside the historic sites should be done by the government. According to this study, it was found that the percentage of the respondents who are willing to pay for the heritage interpretation restoration and improvement program to all respondents is proportionally large. The current entrance fee is somewhat low and the values of mean willingness to pay deriving from all CVM techniques used in this study are noticeably more than the current entrance fee. This can imply that the consumer surplus of the consumption of the Historic City of Ayutthaya is still so abundant that there is a stupendous opportunity to increase the entrance fee for the purpose of heritage interpretation sustainably improvement and upkeep.

5.2.4 In the matter of the aggregate WTP, the aggregate WTPs derived from this study are approximately 48 million Baht per year for the 3-major-site program and roughly 148 million Baht per annum for the 15-site program. With these values, it is possible and reasonable to consider the possibility to increase the entrance fees and arrange one-day package entrance fee scheme for Thai visitors. The increased entrance fee and one-day package entrance fee will probably generate adequate funds to improve and maintain the quality of the heritage interpretation of the Historic City of Ayutthaya. Plus, the good quality of heritage interpretation can possibly generate a self-funded mechanism so that the heritage interpretation can be sustainably administered for the sake of Thai visitors who are the real owners of the Historic City of Ayutthaya. In summary, a well-prepared and good quality heritage interpretation can convey a good quality historical and cultural context to visitors and cultivate the visitors to be the well-behaved. Finally, such well-behaved visitors will voluntarily and willingly collaborate in any campaigns and programs to conserve the historic sites, which they have already perceived to have authentic value and meaningful importance.

5.3 A Proposed Management Scheme and Policy Implication

To complete the summary of this study, the interview with the relevant people, director of the TAT's Ayutthaya Office, Mr. Pramote Sapyen and director of the Phranakhon Si Ayutthaya Historical Park, Mr. Chaiyanan Bussayarat who are important persons in the administration of the Historic City of Ayutthaya in both the aspects of tourism and conservation was organized in February 23, 2012.

Pramote Sapyen stated that the administrative problem of the Historic City of Ayutthaya is probably caused by many parties. Currently, the stakeholders consist of the municipality, Treasury Department, Fine Arts Department, Department of Religious Affairs, etc. Although there are continuous meetings among these parties but certain essential decisions cannot be made because of the nonconformity in the law and regulations of each party. This seriously causes administrative problems of the Historic City of Ayutthaya. A lot of necessary projects have remained static and delayed. In the administration of the historic sites of Ayutthaya province, he stated that TAT's office has only the duties to promote tourism across the province and assign the officials to collect the entrance fees from the visitors but TAT's office does not have the authority to restore or maintain or improve whatever is located in the Historic City of Ayutthaya. The responsibility for upkeep and quality improvement of the heritage interpretation inside the historic sites belongs to the Fine Arts Department.

Additionally, Pramote Sapyen provided his opinion that the heritage interpretation is categorized as a necessary facility in cultural heritage tourism and he confidently believed that if the heritage interpretation materials and services inside the historic sites are improved and well-maintained, they can enable the visitors to gain useful information and the impressive context of each historic site. Once the tourists or visitors are motivated to perceive and experience the valuable issues regarding the authentic value of the Historic City of Ayutthaya, the visitors are supposed to be willing to pay a higher entrance fee.

Furthermore, Mr. Pramote Sapyen proposed the idea regarding the best fit model to effectively administer the Historic City of Ayutthaya. He stated that it is necessary to attract local people to take part in any tourism promotion campaigns or

conservation projects so that the local people will have the ownership and feel themselves to be an important part of historical site conservation. At present, there are a lot of Ayutthaya people who emigrate from other provinces to Ayutthaya province in order to work in the industrial estates. Therefore, although they are Ayutthaya people officially, they do not know much about the important and valuable historical background of Ayutthaya. To educate them regarding the historical and cultural values of Ayutthaya are essential measures that should be implemented as soon as possible. Mr. Pramote Sapyen concerned that if this problem continues without appropriate and well-timed countermeasures, the Ayutthaya people probably gradually lose their sense of belonging to the Historic City of Ayutthaya. In his opinion, heritage interpretation is not only a necessary thing for the visitors but it is also essential for the local people especially those who emigrate from other provinces. Table 5.2 shows the number of enterprises and the number of insured persons (under the Social Security Act B.E. 2533). From 2005-2011, it can be noticed that the number of insured persons has increased continuously from 2005 to 2011.

Table 5.2 The Number of Enterprises and Insured People from 2005-2011

Year	2005	2006	2007	2008	2009	2010	2011
Population in Ayutthaya	746,919	754,595	760,712	769,126	775,157	782,096	787,653
Number of enterprises	4,194	4,428	4,635	4,671	4,850	5,054	5,235
Number of insured persons	301,258	324,271	347,972	334,079	336,965	364,667	330,582

By the way, according to the interview with the director of the Phranakhon Si Ayutthaya Historical Park, Mr. Chaiyanan Bussayarat, he thought that it is not necessary yet to increase the entrance fee of Phranakhon Si Ayutthaya Historical Park because he thought that if the entrance fee is raised, it can cause the side effect of preventing certain Thai people, who have the limited incomes or Thai children to access and visit the Historic City of Ayutthaya. He stressed that the Historic City of

Ayutthaya belongs to every Thai and all Thai people should have the equal right to visit Phranakhon Si Ayutthaya Historical Park for any purpose. He believed that his organization, the Fine Arts Department, is still able to maintain the quality of heritage interpretation materials and services at some satisfactory level despite the limited budget. Indeed, in his own opinion, he would not like to even collect the entrance fee from Thai visitors in order to attract more Thai visitors to visit Phranakhon Si Ayutthaya Historical Park. He would like to increase the number of Thai visitors.

However, he agreed that the heritage interpretation is necessary for the visitors, especially Thai visitors who are the real owners of the Historic City of Ayutthaya. Currently, Phranakhon Si Ayutthaya Historical Park has plan to improve the heritage interpretation materials, especially the information board inside the Historic City of Ayutthaya. But this project is necessary to be somewhat delayed and has to be gradually implemented because of the limited budget and waiting for donations from some organizations.

Conclusively, according to the empirical study and the interview, to achieve the goal of restoration and improvement of heritage interpretation of the Historic City of Ayutthaya, the appropriate management scheme illustrated in Figure 5.3 is proposed along the following lines.

- 1) The administration of the Historic City of Ayutthaya is confronting the market failure. The market cannot yield economically efficient investment in heritage interpretation at the Historic City of Ayutthaya because the historic sites or cultural heritage sites are regarded as public goods. Hence, the provision of the heritage interpretation is caused by non-market impacts where private production and consumption decisions are not taken into account. According to this study, it was found that the mean willingness to pay for the improved heritage interpretation is much more than the current entrance fee. This reflects that there is still a prodigious consumer surplus in the utilization of historic sites in the Historic City of Ayutthaya. Therefore, it is an excellent opportunity for the relevant policy makers to review the prospects in increasing the entrance fees for visiting the historic sites in the Historic City of Ayutthaya to gain more revenue so that such incremental revenue can be used for the restoration and improvement of the existing heritage interpretation materials and services.

2) Besides market failure, the administration of the Historic City of Ayutthaya is also encountering the problem of both policy failure and institutional failure. With regard to policy failure, the relevant laws and regulations that each relevant party has to follow sometimes conflict with each other, especially the laws associated with the construction, public facility provisions and other urban development projects. As a result, there are a lot of issues that cannot be made. Especially, the projects associated with legislative conflicting issues have to be postponed. As regards institutional failure, the institutional failure occurs when the legislation and policies are ready to support the implementation of various aspects of sustainable management, but still nothing occurs on the ground because these policies are not implemented. In the case of the administration of the Historic City of Ayutthaya, although there has already been the administrative committee of the Historic City of Ayutthaya at present, the administration of the Historic City of Ayutthaya cannot be implemented as smoothly and harmoniously as it should be because the current committee consist of too many parties for example, the Governor of Ayutthaya province as the chairman of the committee, Director of Revenue Department, Chamber President of Ayutthaya province, Commander of Ayutthaya Provincial Police, President of Ayutthaya Tourism Business Association, President of Culture Council Association of Thailand, Director of Ayutthaya Primary Educational Service Area, Ayutthaya Provincial Chief Public Prosecutor, Director of Ayutthaya Provincial Natural Resources and Environment Office, Treasury official, the representative of National Office of Buddhism, Mayor of Ayutthaya Municipality, Director of TAT's Ayutthaya Office, Public Works and Town Planning official, Lands official, Ayutthaya Provincial Commercial Officer and archeologist. Thus, there are too many parties in the committee. To some extent, with respect to a traditionally bureaucratic system, some necessary tasks that should be timely done cannot be decided by the incumbent committee and some essential projects have to be postponed. For example, in the case of heritage interpretation restoration and improvement, in fact, Tourism Authority of Thailand (TAT) has the potential to acquire the funds to invest in heritage interpretation materials and services inside the Ayutthaya Historical Park. But, in practice, TAT cannot implement this kind of project because TAT does not have the legislative authority inside the historic sites of

Ayutthaya province. Legislatively, the upkeep of ancient remains and historic sites across Thailand is the duty of the Fine Arts Department but the Fine Arts Department does not have enough budget and procedure to raise adequate fund to provide the appropriate heritage interpretation materials and services in the Historic City of Ayutthaya. Hence, to improve and maintain the quality of heritage interpretation in the Historic City of Ayutthaya efficiently and effectively, it is necessary to set up a special committee with a limited role only for the improvement, restoration and upkeep of heritage interpretation and promotion of cultural tourism and sustainable conservation of the Historic City of Ayutthaya. Practically, this specific committee can possibly be established based on the public organization concept. This typical committee should consist of the relevant parties only (not too many). In principle, The committee members will probably consist of the representatives of Tourism Authority of Thailand, the representatives of the Fine Arts Department and the representatives of communities in Ayutthaya province for example, Phranakorn Sri Ayutthaya Provincial Administration Organization and Ayutthaya City Municipality. Furthermore, the conspicuous roles and responsibilities of each party in this organized committee should be officially and lawfully determined so that the cultural tourism campaigns, conservation projects, especially the improvement of heritage interpretation materials and services in the Historic City of Ayutthaya can be decided and implemented in a timely manner.

3) The increase of entrance fees and/ or arrangement of a one-day tourism package in the Historic City of Ayutthaya should be earnestly considered. Due to abundant consumer surplus found in this study which identifies that the current entrance fee is considered cheap, it is an auspicious opportunity to use the increase of entrance fees and one-day tourism package as an instrument to raise funds for heritage interpretation restoration and improvement program. With the concept of a one-day package entrance fee, this scheme can not be only used to accumulate more funds to improve the heritage interpretation materials and services inside the historic sites but it can also be a tactical scheme to motivate visitors who usually visit only a few famous historic sites when they come to Ayutthaya province to try visiting and sightseeing at other historic sites that are not yet well known. The concept of a tourism package will probably be able to support the promotion of tourism at other less well

known historic sites. Also, it can alleviate the congestion problems in more popular historic sites. Moreover, with more income from the tourism package as compared to the per-site entrance fee, this will yield enough revenue that can be impartially allocated as adequate budget to improve and maintain the heritage interpretation materials and services of all the historic sites in the Historic City of Ayutthaya, whether they are well known or not.

4) To promote the cultural tourism and implement the conservation program at the same time with the sustainability principle, it is necessary to have the communities and local people participate and also gain certain benefits from heritage interpretation programs. Indeed, there are a lot of heritage interpretation programs, especially personal interpretation for example, tourist guide service, traditional demonstration and local events that local people are able to coordinate and give a hand. Therefore, if the heritage interpretation programs can create jobs, employment and income for the local people, it can ensure that the heritage interpretation programs will continue to exist and be the fundamental structure to sustainably and simultaneously create cultural tourism and heritage conservation.

5) Heritage interpretation and educational program regarding the Historic City of Ayutthaya should be earnestly implemented through every possible channel to not only visitors or tourists but also to other Thai people. According to this study identifying that education is a statistically positive determinant of willingness to pay for the improved heritage interpretation, the historical and cultural context of Ayutthaya should be more emphasized and incorporated into the formal school curriculum to have students realize the profound historical and cultural importance of Ayutthaya. Besides, the heritage interpretation program should be considered investing in order to have all Thai visitors comprehensively perceive the authentic values of the Historic City of Ayutthaya when they have the opportunity to visit Ayutthaya province. As reported by empirical results, it was found that the well-educated visitors and the visitors who have more background knowledge about Ayutthaya will perceive the value of heritage interpretation materials and services and be willing to pay more for the restoration and improvement of the heritage interpretation inside the historic sites. This implies that good quality and well-prepared heritage interpretation can generate good quality or well – behaved visitors

and then such good quality visitors are ready to pay more to support the good quality of heritage interpretation in order to keep them in sustainable existence. Therefore, the investment in heritage interpretation materials and services can rely on itself with a self – funded mechanism concept. If sufficient income can be gained from the well-maintained heritage interpretation, it can probably be used as the budget to sustainably conserve the Historic City of Ayutthaya and other cultural heritage sites. Conclusively, self-funded mechanism and good quality visitors are the key factors to formulate sustainable conservation and cultural tourism in historic sites at the same time.

6) To have the local people to effectively participate in any conservation programs, It is necessary to implement certain programs to educate local people in Ayutthaya province regarding the history of Ayutthaya so that they perceive the historical and cultural importance of Ayutthaya that is their living place. Because there are many Ayutthaya residents who immigrate from other provinces for working purposes at present. Due to non-Ayutthaya born residents, they do not adequately know about the historical and cultural importance of Ayutthaya. If this kind of situation still proceeds without any countermeasures, the Ayutthaya residents will gradually lose their sense of belonging to the Historic City of Ayutthaya and cause a lot of obstacles in conservation and development issues that need community collaboration in the future. Moreover, in accordance with the empirical results, it was found that Ayutthaya visitors are willing to pay more for the large-scale heritage interpretation restoration and improvement project. Thus, it can be implied that if the heritage interpretation restoration and improvement project is broad enough that the local communities can gain benefits from the invested heritage interpretation and the target of the improvement is focused on local communities rather than tourism purposes, local people are ready to collaborate and willingly pay more for such heritage interpretation policy.

7) Due to no distance decay statistically existing in this study, it identifies that the people who live in other provinces except Ayutthaya and Bangkok and vicinity do not have the ownership or sense of belonging to the Historic City of Ayutthaya. The possibly feel that they are just visitors or tourists who go sightseeing or visiting a tourist venue. This is an important task for relevant authorities to implement policies to cultivate Thai people who live throughout the country to realize

profoundly the priceless authentic value of the Historic City of Ayutthaya and possess a sense of belonging. The valuable knowledge, impressive experience and profound understanding via well-prepared heritage interpretation materials and services can effectively convey the meaningfully authentic value of the site to all Thai people. It is utterly believed that if Thai people realize profoundly the value of the Historic City of Ayutthaya, they will be willing to pay and collaborate in any conservation programs as its owners are not just ordinary visitors or tourists.

8) Buddhist ceremonies or activities should be employed carefully in promoting tourism in the Historic City of Ayutthaya because the Historic City of Ayutthaya belongs to all Thai people who have the different religions. Therefore, promoting tourism in the Historic City of Ayutthaya should focus on its historical value, cultural value. Although the Buddhist tends to be willing to pay for the heritage interpretation improvement at a 95% confidence level, the Buddhist context should not be used too often, in promoting tourism to the Historic City of Ayutthaya because it possibly dominates the authentic values of the site.

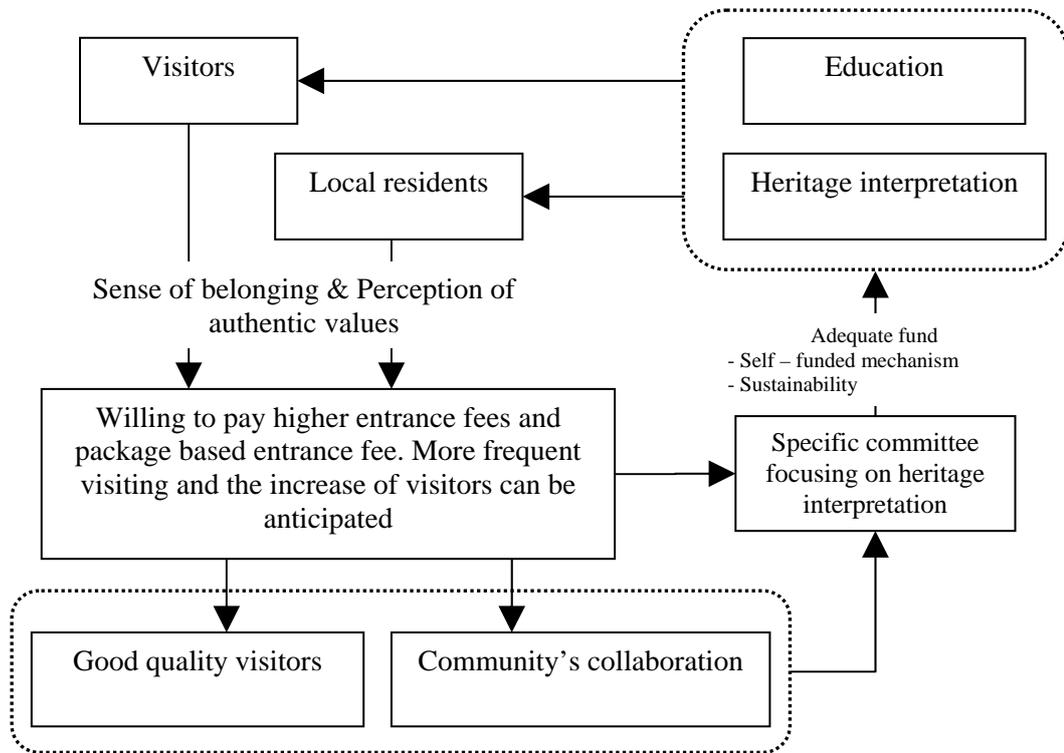


Figure 5.3 Management Scheme for Heritage Interpretation Restoration and Improvement Program in the Historic City of Ayutthaya

At present, the entrance fees to other cultural heritage sites and historic sites in Thailand is considered quite cheap and there is a lot of room to increase them to gain more revenue to implement any useful conservation programs or sustainable tourism campaigns. According to this study, it is believed that a reasonable increase in the entrance fee and the arrangement of tourism package schemes can be a self-funding instrument to raise adequate funds to promote cultural tourism, restore and improve heritage interpretation materials and services, and implement other conservation projects sustainably and continuously. Thereby, to some extent, this study can be used as a reference for other cultural heritage sites or historic sites in Thailand so that the relevant authorities can review their own entrance fee policies and consider to appropriately adjusting them to raise more funds to arrange cultural tourism programs, improve current heritage interpretation and implement any useful conservation projects. As a result, the sustainable conservation based cultural tourism can be achievable throughout all of Thailand.

However, it is interesting to further study the value of each issue of heritage interpretation for example, historical content, cultural content, traditional content, arts and architectural content. Futhermore, the value of each heritage interpretation instrument for example 1) booklets, brochures and pamphlets 2) tourist guide service 3) information board, sign and exhibit 4) event and demonstration 5) multimedia service is also interesting. Each value of these above-mentioned things are extremely intriguing to study in detail because if the value of each element is conspicuously discovered, the relevant authorities can determine the priority of the investment in heritage interpretation correctly. Anyway, to discover these values, the choice experiment should be considered.

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APPENDICES

APPENDIX A
QUESTIONNAIRE AND SURVEY INSTRUMENTS



สถาบันบัณฑิตพัฒนบริหารศาสตร์
คณะพัฒนาการเศรษฐกิจ
โครงการวิจัยคุณิพนธ์ระดับปริญญาเอก

แบบสอบถาม

**งานวิจัยเพื่อปรับปรุงสื่ออธิบายความรู้ภายในอุทยานประวัติศาสตร์
พระนครศรีอยุธยา สำหรับนักท่องเที่ยวชาวไทย**

แบบสอบถามนี้เป็นส่วนหนึ่งของงานวิจัยระดับปริญญาเอก ทำการศึกษาโดย นายวิโรจน์ ลักขณาอดิศร คณะพัฒนาการเศรษฐกิจ สถาบันบัณฑิตพัฒนบริหารศาสตร์ (นิด้า) เพื่อนำผลการวิจัยไปใช้เป็นแนวทางในการบริหารจัดการอุทยานประวัติศาสตร์พระนครศรีอยุธยาให้เกิดประสิทธิภาพสูงสุด ในแง่ของการอนุรักษ์ การท่องเที่ยว การเป็นแหล่งเรียนรู้ และความภาคภูมิใจของคนในชาติ ตลอดจนประโยชน์อื่นๆ ต่อชุมชน และสังคม

ด้วยเหตุนี้ คำตอบของท่านจึงมีความสำคัญเป็นอย่างยิ่งต่อการทำวิจัยในครั้งนี้ ดังนั้นจึงขอความกรุณาจากท่านในการตอบแบบสอบถาม และให้สัมภาษณ์ ตามข้อเท็จจริงอย่างครบถ้วน เพื่อประโยชน์ของงานวิจัยนี้ โดยข้อมูลที่ได้รับจากท่าน ทางผู้วิจัยจะถือเป็นความลับอย่างเคร่งครัด โดยไม่มีการเปิดเผยไม่ว่ากรณีใดๆ

สถานที่สัมภาษณ์ วัดพระศรีสรรเพชญ์ วัดมหาธาตุ
 วัดไชยวัฒนาราม

ผู้สัมภาษณ์ วันที่สัมภาษณ์/...../.....
เวลาเริ่มสัมภาษณ์.....เวลาสิ้นสุดการสัมภาษณ์.....

แบบสอบถามส่วนที่ 1: ข้อมูลด้านเศรษฐกิจและสังคม

คำแนะนำ : ขอความกรุณาจากท่านในการกรอกแบบสอบถามในส่วนที่ 1 ด้วยตัวท่านเอง

- 1.1 เพศ 1. ชาย 2. หญิง
- 1.2 อายุ ปี
- 1.3 ศาสนา 1. พุทธ 3. อิสลาม
2. คริสต์ 4. อื่นๆ โปรดระบุ
- 1.4 สถานภาพสมรส 1. โสด 2. สมรส 3. หย่าร้าง 4. หม้าย
- 1.5 ปัจจุบันท่านอาศัยอยู่ในจังหวัด
- 1.6 ระดับการศึกษา
1. ไม่ได้ศึกษาในระบบสามัญ 5. ปริญญาตรี
2. ประถมศึกษา 6. ปริญญาโท
3. มัธยมศึกษา 7. อื่นๆ โปรดระบุ
4. ปวช. / ปวส.
- 1.7 อาชีพ
1. รับราชการ / รัฐวิสาหกิจ 5. เกษียณ
2. ธุรกิจส่วนตัว 6. ไม่ได้ทำงาน
3. พนักงาน / ลูกจ้าง 7. อื่นๆ โปรดระบุ
4. นักเรียน / นักศึกษา
- 1.8 จำนวนสมาชิกภายในครัวเรือนซึ่งพักอาศัยรวมกัน (รวมตัวท่านด้วย) คน
- 1.9 รายได้ต่อเดือนของท่าน 1.10 รายได้ต่อเดือนของท่าน และคู่สมรสรวมกัน
(ตอบเฉพาะท่านที่มีคู่สมรส)

<input type="checkbox"/>	1.	0 - 2,500	บาท
<input type="checkbox"/>	2.	2,501 - 5,000	บาท
<input type="checkbox"/>	3.	5,001 - 7,500	บาท
<input type="checkbox"/>	4.	7,501 - 10,000	บาท
<input type="checkbox"/>	5.	10,001 - 15,000	บาท
<input type="checkbox"/>	6.	15,001 - 20,000	บาท
<input type="checkbox"/>	7.	20,001 - 25,000	บาท
<input type="checkbox"/>	8.	25,001 - 50,000	บาท
<input type="checkbox"/>	9.	50,001 - 75,000	บาท
<input type="checkbox"/>	10.	75,001 - 100,000	บาท
<input type="checkbox"/>	11.	100,000 บาทขึ้นไป	

<input type="checkbox"/>	1.	0 - 2,500	บาท
<input type="checkbox"/>	2.	2,501 - 5,000	บาท
<input type="checkbox"/>	3.	5,001 - 7,500	บาท
<input type="checkbox"/>	4.	7,501 - 10,000	บาท
<input type="checkbox"/>	5.	10,001 - 15,000	บาท
<input type="checkbox"/>	6.	15,001 - 20,000	บาท
<input type="checkbox"/>	7.	20,001 - 25,000	บาท
<input type="checkbox"/>	8.	25,001 - 50,000	บาท
<input type="checkbox"/>	9.	50,001 - 75,000	บาท
<input type="checkbox"/>	10.	75,001 - 100,000	บาท
<input type="checkbox"/>	11.	100,000 บาทขึ้นไป	

1.11 รายจ่ายต่อเดือนของท่าน

<input type="checkbox"/>	1.	0 – 2,500	บาท
<input type="checkbox"/>	2.	2,501 – 5,000	บาท
<input type="checkbox"/>	3.	5,001 – 7,500	บาท
<input type="checkbox"/>	4.	7,501 – 10,000	บาท
<input type="checkbox"/>	5.	10,001 – 15,000	บาท
<input type="checkbox"/>	6.	15,001 – 20,000	บาท
<input type="checkbox"/>	7.	20,001 – 25,000	บาท
<input type="checkbox"/>	8.	25,001 – 50,000	บาท
<input type="checkbox"/>	9.	50,001 – 75,000	บาท
<input type="checkbox"/>	10.	75,001 – 100,000	บาท
<input type="checkbox"/>	11.	100,000 บาทขึ้นไป	

1.12 ท่านคิดว่ารายได้ของท่านอยู่ในระดับใดเมื่อเทียบกับ อัตราค่าจ้างขั้นต่ำในเขตกรุงเทพมหานคร ประจำปี พ.ศ. 2555 (วันละ 300 บาท หรือเดือนละ 9,000 บาท)

1. สูงกว่ามาก
 2. สูงกว่าเล็กน้อย
 3. ประมาณเทียบเท่ากับอัตราค่าจ้างขั้นต่ำในเขตกรุงเทพมหานคร
 4. ต่ำกว่าเล็กน้อย
 5. ต่ำกว่ามาก

1.13 ลักษณะของบ้านที่ท่านพักอาศัยอยู่

- 1 ห้องนอน 2 ห้องนอน 3 ห้องนอน 4 ห้องนอน มากกว่า 4 ห้องนอน

1.14 ลักษณะความเป็นเจ้าของของที่พักอาศัย

1. เป็นเจ้าของเอง 3. เป็นบ้านพักข้าราชการ / บ้านพักสวัสดิการ
 2. เป็นผู้อาศัย 4. เป็นผู้เช่า



แบบสอบถามส่วนที่ 2 : ทัศนคติเกี่ยวกับอุทยาน ประวัติศาสตร์พระนครศรีอยุธยา

คำแนะนำ : ขอความกรุณาท่านในการให้สัมภาษณ์ และตอบคำถามในแบบสอบถาม
ส่วนที่ 2 แก่เจ้าหน้าที่

- 2.1 ในการมาท่องเที่ยวที่จังหวัดพระนครศรีอยุธยาในครั้งนี้ท่านมีสมาชิกที่ร่วมเดินทางมากับท่านด้วยทั้งหมด
กี่คน (รวมตัวของท่านเองด้วย)
- 1 คน 2 คน 3 – 5 คน 5 – 10 คน
- มาเที่ยวเป็นหมู่คณะ หรือกรุ๊ปทัวร์
- 2.2 จำนวนวันที่ท่านเดินทางมาท่องเที่ยวในจังหวัดพระนครศรีอยุธยาในครั้งนี้
- 1 วัน (ไปเช้าเย็นกลับ) 2 วัน 3 วัน มากกว่า 3 วัน
- หมายเหตุ: ในกรณีที่ตอบว่า 2 วัน, 3 วัน หรือมากกว่า 3 วัน ให้ตอบคำถามเพิ่มเติมที่ข้อ 2.3 ด้วย
- 2.3 ประเภทของที่พัก ในการเดินทางมาท่องเที่ยวที่จังหวัดพระนครศรีอยุธยาในครั้งนี้
1. โรงแรม 2. รีสอร์ท 3. บ้านพักของตนเอง / ญาติ / เพื่อน / คนรู้จัก
4. เกสต์เฮาส์ 5. อื่นๆ โปรดระบุ.....
- 2.4 ท่านมีวัตถุประสงค์ใดในการมาท่องเที่ยวที่จังหวัดพระนครศรีอยุธยา (สามารถตอบได้มากกว่า 1 ข้อ)
1. เพื่อชมโบราณสถาน ศิลปะ และสถาปัตยกรรมภายในอุทยานประวัติศาสตร์
2. ทำบุญ ไหว้พระหรือประกอบพิธีกรรมทางศาสนา
3. ท่องเที่ยวเชิงประวัติศาสตร์เพื่อหาความรู้ทางประวัติศาสตร์
4. ถ่ายภาพตามสถานที่ที่น่าสนใจต่างๆ
5. พักผ่อนหย่อนใจ
6. หาดูอาหารรับประทาน
7. เลือกซื้อสินค้าตามตลาด และแหล่งจำหน่ายสินค้า
8. อื่นๆ โปรดระบุ
- 2.5 ท่านทราบหรือไม่ว่าอุทยานประวัติศาสตร์พระนครศรีอยุธยา ได้รับการขึ้นทะเบียนเป็นมรดกโลกจาก UNESCO
1. ทราบ 2. ไม่ทราบ
- 2.6 ท่านทราบข่าวหรือไม่ว่าอุทยานประวัติศาสตร์พระนครศรีอยุธยา มีความเสี่ยงที่จะถูกถอดถอนจากการขึ้น
ทะเบียนมรดกโลกจาก UNESCO
1. ทราบ 2. ไม่ทราบ
- 2.7 ในรอบ 12 เดือนที่ผ่านมา ท่านมีโอกาสมาท่องเที่ยวที่อุทยานประวัติศาสตร์พระนครศรีอยุธยาเป็นจำนวนทั้ง
สิ้นกี่ครั้ง (นับรวมครั้งนี้ด้วย)
- 1 ครั้ง 2 ครั้ง 3 ครั้ง 4 ครั้ง
- 5 ครั้ง มากกว่า 5 ครั้ง

2.8 หลังจากการมาเที่ยวที่อุทยานประวัติศาสตร์พระนครศรีอยุธยาในครั้งนี้ ท่านคิดว่าในอีก 12 เดือนข้างหน้า จะมีโอกาสมาเที่ยวที่อุทยานประวัติศาสตร์พระนครศรีอยุธยาอีกหรือไม่

1. มี 2. ไม่มี

2.9 หลังจากที่ท่านได้มาเที่ยวชมภายในอุทยานประวัติศาสตร์พระนครศรีอยุธยา แล้วท่านมีความรู้ความเข้าใจเกี่ยวกับสมัยกรุงศรีอยุธยาเพิ่มขึ้นมากน้อยเพียงไร

1. มากที่สุด 2. มาก 3. ปานกลาง 4. น้อย 5. น้อยที่สุด

2.10 ท่านมีความรู้ความเข้าใจและความสนใจในอุทยานประวัติศาสตร์พระนครศรีอยุธยา มากน้อยเพียงไร
หมายเหตุ: ให้ผู้ตอบแบบสอบถามอ่านบัตรข้อมูลที่ 1: ทศนคติต่ออุทยานประวัติศาสตร์พระนครศรีอยุธยา

คำถาม	น้อยที่สุด - - - - ->มากที่สุด						ไม่ทราบ
1. ท่านมีความรู้ และความเข้าใจเกี่ยวกับสมัยกรุงศรีอยุธยา มากน้อยเพียงไร	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. ท่านทราบปัญหาในการบริหารจัดการอุทยานประวัติศาสตร์พระนครศรีอยุธยา มากน้อยเพียงไร	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. ท่านสนใจที่จะติดตามปัญหาในการบริหารจัดการอุทยานประวัติศาสตร์พระนครศรีอยุธยา มากน้อยเพียงไร	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. ท่านคิดว่าปัจจุบันอุทยานประวัติศาสตร์พระนครศรีอยุธยา ได้ให้บริการความรู้แก่นักท่องเที่ยว เช่น มีคฤหาสน์, จุลสาร, ป้ายอธิบาย ฯลฯ ได้ดีมากน้อยเพียงไร	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. ท่านคิดว่าการอธิบาย และการให้ความรู้แก่นักท่องเที่ยว นั้น สำคัญมากน้อยเพียงไร	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2.11 ท่านมีความคิดเห็นอย่างไร เกี่ยวกับคำกล่าวที่อธิบายถึงอุทยานประวัติศาสตร์พระนครศรีอยุธยา ดังต่อไปนี้
หมายเหตุ: ให้ผู้ตอบแบบสอบถามอ่านบัตรข้อมูลที่ 2: อุทยานประวัติศาสตร์พระนครศรีอยุธยา

คำกล่าว	ไม่เห็นด้วยอย่างยิ่ง - - - - -> เห็นด้วยอย่างยิ่ง						ไม่ทราบ
1. อุทยานประวัติศาสตร์พระนครศรีอยุธยา เป็นสถานที่ในการประกอบพิธีกรรมทางศาสนา	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. อุทยานประวัติศาสตร์พระนครศรีอยุธยา เป็นแหล่งท่องเที่ยวที่สำคัญของไทย	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. อุทยานประวัติศาสตร์พระนครศรีอยุธยา เป็นแหล่งเรียนรู้ทางประวัติศาสตร์ ศิลปะ และวัฒนธรรม	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. อุทยานประวัติศาสตร์ เป็นมรดกที่ควรอนุรักษ์ให้แก่รุ่นลูก รุ่นหลาน	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. อุทยานประวัติศาสตร์พระนครศรีอยุธยา เป็นความภูมิใจของคนในชาติ สะท้อนถึงความเป็นไทย และเอกลักษณ์ของชาติ	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. อุทยานประวัติศาสตร์พระนครศรีอยุธยา เป็นส่วนหนึ่งของวิถีชีวิตชุมชน	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



2.12 ท่านคิดว่าในการมาเที่ยวอุทยานประวัติศาสตร์พระนครศรีอยุธยา ข้อมูล และความรู้เกี่ยวกับเรื่องใดที่ท่านต้องการรับทราบมากที่สุด **กรุณาเรียงลำดับ 1 – 3**

หมายเหตุ : 1 = สนใจมากที่สุด, 2, 3 = สนใจน้อยที่สุด

ข้อมูลเกี่ยวกับประวัติศาสตร์ในสมัยกรุงศรีอยุธยา

ข้อมูลเกี่ยวกับศิลปกรรม และสถาปัตยกรรมในสมัยกรุงศรีอยุธยา

ข้อมูลเกี่ยวกับสภาพสังคม ประเพณี และวัฒนธรรมในสมัยกรุงศรีอยุธยา

2.13 ท่านคิดว่ารูปแบบสื่อในการอธิบายความรู้ประเภทใด ที่มีความจำเป็น และตรงกับความต้องการของท่านในการเยี่ยมชมโบราณสถาน ในอุทยานประวัติศาสตร์พระนครศรีอยุธยามากที่สุด **กรุณาเรียงลำดับ 1 – 5**

หมายเหตุ : 1 = จำเป็นมากที่สุด, 2, 3, 4, 5 = มีความจำเป็นน้อยที่สุด

ป้ายที่แสดงภาพจำลอง และอธิบายข้อมูลตามจุดต่างๆ ในโบราณสถาน

สื่อสิ่งพิมพ์ต่างๆ เช่น แผ่นพับ หรือหนังสือเล่มเล็กๆ

มัลติมีเดีย หรือเจ้าหน้าที่นำเที่ยว ที่คอยอธิบายให้ความรู้ และความเข้าใจต่างๆ

กิจกรรมสาธิต หรือการแสดงที่จำลองความเป็นอยู่ ประเพณี และวัฒนธรรมต่างๆ ของคนในสมัยกรุงศรีอยุธยา

ระบบไฮด์ทอล์คนอร์ (Audio Tour) ที่นักท่องเที่ยวสามารถสวมหูฟัง และฟังข้อมูลต่างๆ ที่ผู้เชี่ยวชาญบันทึกไว้ได้ ระหว่างเดินเที่ยวชมภายในโบราณสถาน

2.14 ท่านเห็นด้วยหรือไม่ หากมีการปรับปรุงสื่ออธิบายความรู้เกี่ยวกับกรุงศรีอยุธยา เพื่อให้กับนักท่องเที่ยวชาวไทย ได้มีความรู้ความเข้าใจในประวัติศาสตร์ และศิลปวัฒนธรรมในสมัยกรุงศรีอยุธยามากขึ้น ระหว่างที่ท่องเที่ยวภายในอุทยานประวัติศาสตร์พระนครศรีอยุธยา

1. เห็นด้วยอย่างยิ่ง

2. เห็นด้วย

3. ไม่เห็นด้วย

4. ไม่เห็นด้วยอย่างยิ่ง

แบบสอบถามส่วนที่ 3: คำถามเกี่ยวกับการประเมินมูลค่า

คำแนะนำ: ขอความกรุณาท่านในการให้สัมภาษณ์ และตอบคำถามในแบบสอบถาม ส่วนที่ 3 แก่เจ้าหน้าที่

หมายเหตุ : ก่อนการสัมภาษณ์ในข้อที่ 3.1 ในส่วนที่ 3 นี้ ขอให้เจ้าหน้าที่ผู้สัมภาษณ์ นำเอาบัตรข้อมูลที่ 3 ซึ่งระบุเกี่ยวกับ สื่อในการให้ความรู้แก่นักท่องเที่ยวในปัจจุบัน ของอุทยานประวัติศาสตร์พระนครศรีอยุธยาให้ผู้ถูกสัมภาษณ์ได้ดูก่อน จากนั้นจึงเริ่มต้นถามคำถามตามลำดับ และพยายามเน้นย้ำว่าเงินที่จ่ายในที่นี่ จะถูกนำไปปรับปรุง และพัฒนาสื่อในการให้ความรู้แก่นักท่องเที่ยวชาวไทย เพื่อเปลี่ยนจากสภาพปัจจุบัน เป็นสภาพที่ปรับปรุงแล้วตามรูปที่ปรากฏในบัตรข้อมูลที่ 3 **โดยให้ผู้ถูกสัมภาษณ์พิจารณาถึงรายได้ของตนเองก่อนที่จะตอบคำถามด้วย**

3.1 หากในอนาคตอันใกล้นี้ มีหน่วยงานที่เข้ามารับผิดชอบในการปรับปรุงสื่อในการอธิบายให้ความรู้แก่นักท่องเที่ยว ท่านยินดีที่จะจ่ายเงินค่าเข้าชมโบราณสถาน **เพิ่มขึ้นจากเดิมซึ่งเก็บอยู่ที่ 30 บาทต่อคน** ในการท่องเที่ยวใน **โบราณสถาน 3 แห่ง** ภายในอุทยานประวัติศาสตร์พระนครศรีอยุธยา อันได้แก่ **วัดพระศรีสรรเพชญ์ วัดมหาธาตุ และวัดไชยวัฒนาราม** หรือไม่

1. ยินดีจ่าย เพราะเหตุผลใด (เลือกตอบได้หลายข้อ จากนั้นตอบข้อที่ 3.2 ต่อ)
- () เพื่อที่ท่านจะได้หาความรู้ทางด้านประวัติศาสตร์ และศิลปวัฒนธรรมของกรุงศรีอยุธยา
 - () เพื่อให้ชุมชนในจังหวัดพระนครศรีอยุธยาได้เรียนรู้ความสำคัญทางประวัติศาสตร์ และวัฒนธรรมของท้องถิ่นตนเอง
 - () เพื่อให้ลูกหลาน และคนในรุ่นต่อไป ได้เรียนรู้ถึงความสำคัญทางประวัติศาสตร์ และวัฒนธรรมของกรุงศรีอยุธยา และความเป็นไทย
 - () เพื่อเป็นการธำรงรักษาเอกลักษณ์ของชาติ และความเป็นไทยให้ดำรงคงอยู่ต่อไป
 - () อื่นๆ โปรดระบุ
2. ไม่ยินดีจ่าย เพราะเหตุผลใด (เลือกตอบได้หลายข้อ จากนั้นตอบข้อที่ 3.3 และ 3.5 ต่อ)
- () ไม่เห็นประโยชน์ในการปรับปรุงสื่อในการอธิบายความรู้แก่นักท่องเที่ยว
 - () ไม่คิดว่านักท่องเที่ยวจะให้ความสนใจกับสื่อในการอธิบายความรู้ต่างๆ ที่จัดทำขึ้น
 - () การปรับปรุงสื่อการอธิบายความรู้แก่นักท่องเที่ยวเป็นความรับผิดชอบของภาครัฐอยู่แล้ว
 - () รายได้ไม่เพียงพอที่จะจ่าย แต่ยินดีที่จะจ่ายหากมีรายได้เพิ่มมากขึ้น
 - () อื่นๆ โปรดระบุ

3.2 ในกรณีที่มีการ**ปรับเพิ่มค่าเข้าชมโบราณสถาน 3 แห่ง** ภายในอุทยานประวัติศาสตร์พระนครศรีอยุธยา อันได้แก่ **วัดพระศรีสรรเพชญ์ วัดมหาธาตุ และวัดไชยวัฒนาราม** โดยจะนำเอาค่าเข้าชมที่เก็บเพิ่มขึ้นมาใช้ในการปรับปรุงสื่อในการอธิบายความรู้ต่างๆ ภายในอุทยานประวัติศาสตร์แก่นักท่องเที่ยวชาวไทย ท่านมีความเต็มใจจะจ่ายค่าเข้าชมเป็นเงินเป็นจำนวนเงิน **A บาทต่อคน** เพื่อเป็นค่าเข้าชม **โบราณสถานทั้ง 3 แห่ง** ดังกล่าวหรือไม่

<input type="checkbox"/> 1. ยินดีจ่าย	<input type="checkbox"/> 2. ไม่ยินดีจ่าย
ถ้า ปรับเพิ่ม ค่าเข้าชม โบราณสถาน 3 แห่ง เป็น $2 \times A$ บาทต่อคน ท่านมีความเต็มใจที่จะจ่ายหรือไม่ <input type="checkbox"/> 1. ยินดีจ่าย <input type="checkbox"/> 2. ไม่ยินดีจ่าย	ถ้า ปรับลด ค่าเข้าชม โบราณสถาน 3 แห่ง เป็น $A \div 2$ บาทต่อคน ท่านมีความเต็มใจที่จะจ่ายหรือไม่ <input type="checkbox"/> 1. ยินดีจ่าย <input type="checkbox"/> 2. ไม่ยินดีจ่าย

หมายเหตุ :

A	80	100	120	140	160	180	200
$2 \times A$	160	200	240	280	320	360	400
$A \div 2$	40	50	60	70	80	90	100

3.3 ค่าเข้าชมโบราณสถานทั้ง 3 แห่งสูงสุดที่ท่านเต็มใจจะจ่าย คือ บาทต่อคน

หมายเหตุ : ก่อนการสัมภาษณ์ในข้อที่ 3.4 ขอให้เจ้าหน้าที่ผู้สัมภาษณ์ นำเอาบัตรข้อมูลที่ 4 ซึ่งระบุเกี่ยวกับการปรับปรุงสื่อในการให้ความรู้ในโบราณสถานในอุทยานประวัติศาสตร์พระนครคีรีอยุธยา **เพิ่มเติมจากเดิมอีก 12 แห่ง รวมทั้งสิ้นเป็น 15 แห่ง ซึ่งครอบคลุมวัดโบราณสำคัญทั้งหมดในอุทยานประวัติศาสตร์พระนครคีรีอยุธยา** อันได้แก่ วัดพระศรีสรรเพชญ์ วัดมหาธาตุ วัดไชยวัฒนาราม วัดมณฑลพิตร วัดธรรมิกราช วัดพระราม วัดพุทธไสยาสน์ วัดพนัญเชิง วัดมเหยงคณ์ วัดใหญ่ชัยมงคล วัดราชบูรณะ วัดสุวรรณดาราราม วัดหน้าพระเมรุ วัดกุฎีดาว และวัดบรมพุทธาราม ให้ผู้ถูกสัมภาษณ์ได้ดูก่อน จากนั้นจึงเริ่มต้นถามคำถามตามลำดับ

3.4 ในกรณีที่มีการ**ปรับเพิ่มค่าเข้าชมโบราณสถาน 15 แห่ง** ภายในอุทยานประวัติศาสตร์พระนครคีรีอยุธยา โดยจะนำเอาค่าเข้าชมที่เก็บเพิ่มขึ้นมาใช้ในการปรับปรุงสื่อในการอธิบายความรู้ต่างๆ ภายในอุทยานประวัติศาสตร์แก่นักท่องเที่ยวชาวไทย ท่านมีความเต็มใจจะจ่ายค่าเข้าชมเป็นเงินเป็นจำนวนเงิน **$A+100$ บาทต่อคน** เพื่อเป็นค่าเข้าชม**โบราณสถานทั้ง 15 แห่ง** ดังกล่าวหรือไม่

<input type="checkbox"/> 1. ยินดีจ่าย	<input type="checkbox"/> 2. ไม่ยินดีจ่าย
ถ้า ปรับเพิ่ม ค่าเข้าชม โบราณสถาน 15 แห่ง เป็น $2 \times (A+100)$ บาทต่อคน ท่านมีความเต็มใจที่จะจ่ายหรือไม่ <input type="checkbox"/> 1. ยินดีจ่าย <input type="checkbox"/> 2. ไม่ยินดีจ่าย	ถ้า ปรับลด ค่าเข้าชม โบราณสถาน 15 แห่ง เป็น $(A+100) \div 2$ บาทต่อคน ท่านมีความเต็มใจที่จะจ่ายหรือไม่ <input type="checkbox"/> 1. ยินดีจ่าย <input type="checkbox"/> 2. ไม่ยินดีจ่าย

หมายเหตุ :

A	80	100	120	140	160	180	200
$A + 100$	180	200	220	240	260	280	300
$2 \times (A + 100)$	560	400	440	480	520	560	600
$(A + 100) \div 2$	90	100	110	120	130	140	150

3.5 ค่าเข้าชมโบราณสถานทั้ง 15 แห่งสูงสุดที่ท่านเต็มใจจะจ่าย คือ บาทต่อคน

ขอขอบคุณที่ให้ความร่วมมือในการให้สัมภาษณ์ และตอบแบบสอบถามชุดนี้



สถาบันบัณฑิตพัฒนบริหารศาสตร์ คณะพัฒนาการเศรษฐกิจ

โครงการวิจัยเพื่อปรับปรุงสื่ออธิบายความรู้
ภายในอุทยานประวัติศาสตร์พระนครศรีอยุธยา
สำหรับนักท่องเที่ยวชาวไทย

เพื่อนำผลการวิจัยมาจัดทำข้อเสนอทางนโยบายในการ
ปรับปรุงการบริหารจัดการนครประวัติศาสตร์
จังหวัดพระนครศรีอยุธยา



บัตรข้อมูลที่ 1

ทัศนคติต่ออุทยานประวัติศาสตร์พระนครศรีอยุธยา

คำแนะนำ : ขอให้ท่านแสดงทัศนคติเกี่ยวกับอุทยานประวัติศาสตร์พระนครศรีอยุธยา
ในประเด็นดังต่อไปนี้

โดย 0 หมายถึง น้อยที่สุด และ 5 หมายถึง มากที่สุด

1. ท่านมีความรู้ และความเข้าใจเกี่ยวกับสมัยกรุงศรีอยุธยาอย่างน้อยเพียงไร
2. ท่านทราบปัญหาในการบริหารจัดการอุทยานประวัติศาสตร์พระนครศรีอยุธยา
อย่างน้อยเพียงไร
3. ท่านสนใจที่จะติดตามปัญหาในการบริหารจัดการอุทยานประวัติศาสตร์
พระนครศรีอยุธยาอย่างน้อยเพียงไร
4. ท่านคิดว่าปัจจุบันอุทยานประวัติศาสตร์พระนครศรีอยุธยาได้ให้บริการความรู้
แก่นักท่องเที่ยววงเที่ยว เช่น มัคคุเทศก์, จุลสาร, ป้ายอธิบาย ฯลฯ ได้ดีอย่างน้อย
เพียงไร
5. ท่านคิดว่าการอธิบาย และการให้ความรู้แก่นักท่องเที่ยววงเที่ยว นั้น สำคัญอย่างน้อย
เพียงไร



บัตรข้อมูลที่ 2

อุทยานประวัติศาสตร์พระนครศรีอยุธยา

คำแนะนำ : ขอให้ท่านแสดงความคิดเห็นต่อคำกล่าวเกี่ยวกับอุทยาน
ประวัติศาสตร์พระนครศรีอยุธยาในประเด็นดังต่อไปนี้

โดย 0 หมายถึง ไม่เห็นด้วยอย่างยิ่ง และ 5 หมายถึง เห็นด้วยอย่างยิ่ง

1. อุทยานประวัติศาสตร์พระนครศรีอยุธยา เป็นสถานที่ในการประกอบพิธีกรรมทางศาสนา
2. อุทยานประวัติศาสตร์พระนครศรีอยุธยา เป็นแหล่งท่องเที่ยวที่สำคัญของไทย
3. อุทยานประวัติศาสตร์พระนครศรีอยุธยา เป็นแหล่งเรียนรู้ทางประวัติศาสตร์ ศิลปะ และวัฒนธรรม
4. อุทยานประวัติศาสตร์พระนครศรีอยุธยา เป็นมรดกที่ควรอนุรักษ์ให้แก่รุ่นลูกรุ่นหลาน
5. อุทยานประวัติศาสตร์พระนครศรีอยุธยา เป็นความภูมิใจของคนในชาติสะท้อนถึงความเป็นไทย และเอกลักษณ์ของชาติ
6. อุทยานประวัติศาสตร์พระนครศรีอยุธยา เป็นส่วนหนึ่งของวิถีชีวิตชุมชน



บัตรข้อมูลที่ 3

การปรับปรุงสื่ออธิบายความรู้แก่นักท่องเที่ยว

- ปัจจุบันเก็บค่าเข้าชม 30 บาท
- เข้าเยี่ยมชมโบราณสถาน 3 แห่ง ได้แก่
วัดพระศรีสรรเพชญ์ วัดมหาธาตุ และวัดไชยวัฒนาราม

1. ป้ายอธิบายความรู้ภายในโบราณสถาน

สภาพปัจจุบัน



▲ แผ่นป้ายอธิบายต่างๆ ชำรุดทรุดโทรม อยู่ในสภาพที่ไม่น่าสนใจ

การปรับปรุง



ภาพจำลอง



พระที่นั่งสรรเพชญมหาปราสาท

ฐาน และกำแพงบางส่วนที่ท่านเห็นอยู่นี้ เดิมเป็นที่ตั้งของพระที่นั่งสรรเพชญมหาปราสาท ซึ่งสร้างขึ้นโดยพระราชดำริของสมเด็จพระบรมไตรโลกนาถ ในระหว่างปี พ.ศ. ๑๙๙๑-๒๐๓๑ ซึ่งเป็นช่วงเวลากรุงศรีอยุธยาเจริญรุ่งเรืองมาก เป็นศูนย์กลางแห่งอำนาจของราชอาณาจักรสยาม พระที่นั่งสรรเพชญมหาปราสาท เคยใช้เป็นสถานที่ประกอบพิธีสำคัญของราชสำนักและเป็นที่รับแขกบ้านแขกเมืองของพระมหากษัตริย์ เช่น พระราชพิธีบรมราชาภิเษก รัชราชทูต ฯลฯ แต่พระที่นั่งองค์นี้ถูกเผาทำลายลงทั้งหมดเมื่อเสียกรุงศรีอยุธยาแก่พม่าในปี พ.ศ. ๒๓๑๐

▲ มีป้ายอธิบายความรู้ทางประวัติศาสตร์ และศิลปวัฒนธรรมที่ถูกต้อง ครบถ้วน มีภาพจำลอง หรือภาพประกอบที่สวยงาม

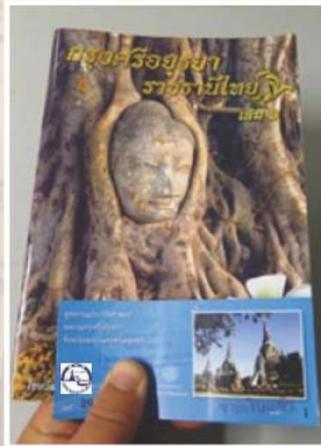
2. สื่อสิ่งพิมพ์สำหรับบริการนักท่องเที่ยว

สภาพปัจจุบัน



- ▲ นักท่องเที่ยวได้รับเพียงบัตรเข้าชมเท่านั้น ไม่มีเอกสาร แผ่นพับ หรือสื่อสิ่งพิมพ์ใดๆ แจกให้กับนักท่องเที่ยว เพื่ออ่านหาความรู้

การปรับปรุง



- ▲ มีหนังสือที่อธิบายเกี่ยวกับประวัติศาสตร์ และ ศิลปวัฒนธรรมในสมัยกรุงศรีอยุธยา ขนาด A5 (210 mm x 148 mm) พิมพ์ 4 สี มีจำนวนหน้าประมาณ 20 หน้า แจกให้กับนักท่องเที่ยว เพื่อให้ นักท่องเที่ยวสามารถค้นหาความรู้ประกอบการท่องเที่ยวได้ด้วยตนเอง



3. เจ้าหน้าที่ หรือมัคคุเทศก์

สภาพปัจจุบัน



- ▲ นักท่องเที่ยวเดินชมภายในโบราณสถานด้วยตนเอง โดยไม่มีเจ้าหน้าที่ หรือมัคคุเทศก์นำพาเข้าเยี่ยมชม และอธิบายความรู้ต่างๆ ให้

การปรับปรุง



- ▲ มีเจ้าหน้าที่ หรือมัคคุเทศก์นำพาเข้าเยี่ยมชมโบราณสถาน วันละ 3-4 รอบ รอบละประมาณ 1-2 ชั่วโมง เพื่ออธิบายความรู้ทางประวัติศาสตร์ และศิลปวัฒนธรรมในสมัยกรุงศรีอยุธยาให้แก่นักท่องเที่ยว



บัตรข้อมูลที่ 4

การปรับปรุงสื่ออธิบายความรู้ในโบราณสถานเพิ่มเติม
จาก 3 แห่งเป็น 15 แห่ง

โครงการที่ 1

การปรับปรุงสื่ออธิบายความรู้ในโบราณสถาน 3 แห่ง

โครงการที่ 1 เป็นโครงการปรับปรุงสื่ออธิบายความรู้สำหรับนักท่องเที่ยวชาวไทย ในโบราณสถานที่เป็นแหล่งท่องเที่ยวสำคัญ 3 แห่ง ได้แก่

● 3 แห่ง = วัดพระศรีสรรเพชญ์ วัดมหาธาตุ และวัดไชยวัฒนาราม

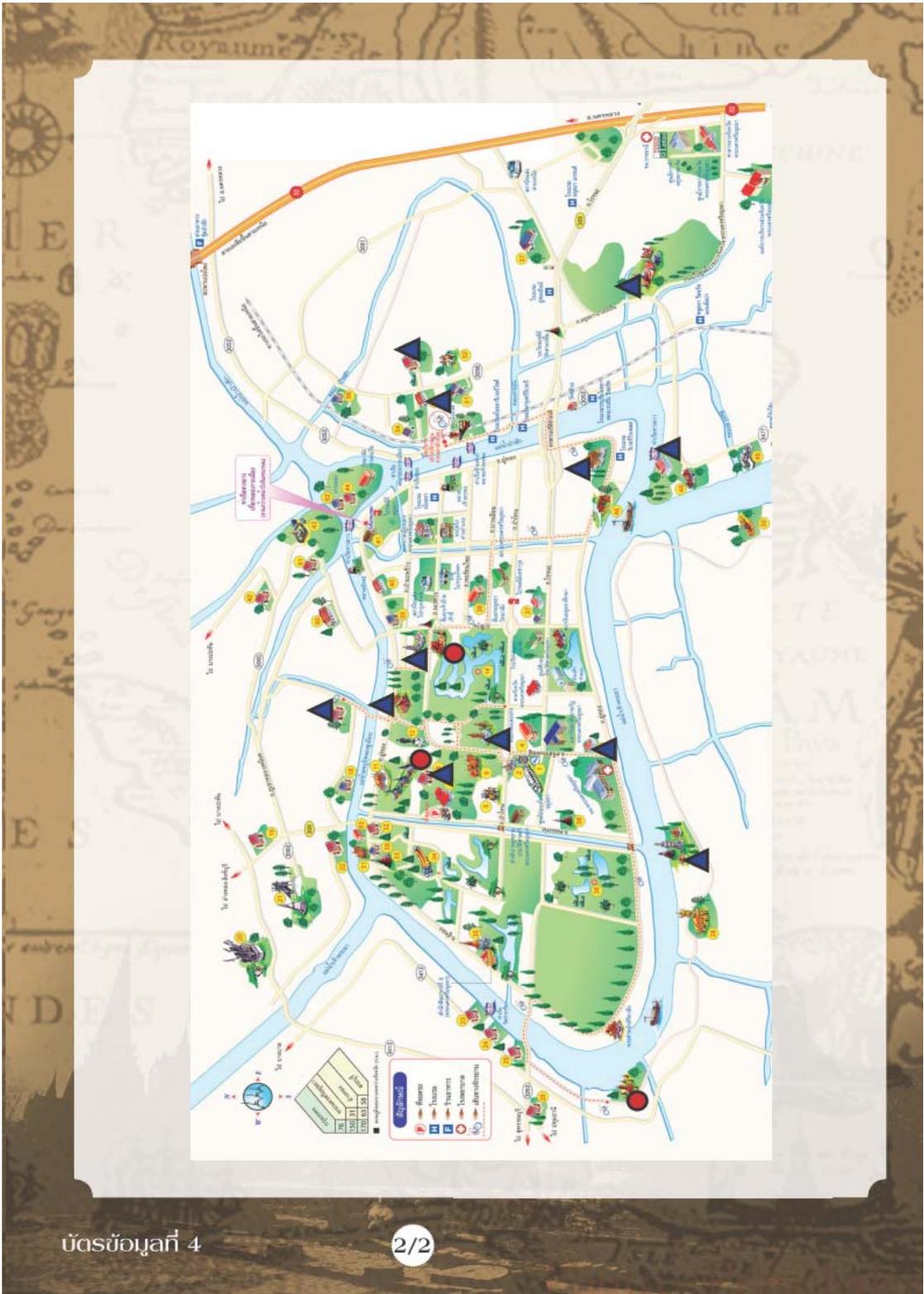
โครงการที่ 2

การปรับปรุงสื่ออธิบายความรู้ในวัดโบราณในอุทยาน
ประวัติศาสตร์พระนครศรีอยุธยาทั้งหมด 15 แห่ง

โครงการที่ 2 เป็นโครงการปรับปรุงสื่ออธิบายความรู้สำหรับนักท่องเที่ยวชาวไทย ครอบคลุมวัดโบราณสำคัญทั้งหมดภายในอุทยานประวัติศาสตร์พระนครศรีอยุธยา จำนวน 15 แห่ง ได้แก่

● 3 แห่ง = วัดพระศรีสรรเพชญ์ วัดมหาธาตุ และวัดไชยวัฒนาราม

▲ 12 แห่ง = วัดมงคลบพิตร วัดธรรมิกราช วัดพระราม วัดพุทธไสยาสน์ วัดพนัญเชิง วัดมเหยงคณ์ วัดใหญ่ชัยมงคล วัดราชบูรณะ วัดสุวรรณดาราราม วัดหน้าพระเมรุ วัดกุฎีดาว และวัดบรมพุทธาราม



บัตรข้อมูลที่ 4

APPENDIX B
QUESTIONNAIRE IN ENGLISH



National Institute of Development Administration

School of Development Economics

Doctoral Dissertation

Questionnaire

The Valuation of Heritage Interpretation: A Case Study of the Historic City of Ayutthaya

This interview is intended to assist the doctoral research of Mr. Wiroj Lakkhanaadisorn, Ph.D. candidate in Economics at School of Development Economics, NIDA. All information you provide will be held in strict confidence and after this research is completely done, some interesting findings will probably proposed to the relevant policy makers in order to improve the heritage interpretation programs of the Historic City of Ayutthaya. Your answers will not be disclosed or released to others in any way that could identify you.

Interview Place: Wat Si Sanphet Wat Mahathat
 Wat Chaiwatthanaram

Interviewer

Interview Date/...../..... Interview Time –

Part 1: Socio – Economic Information

Note: Please fill in this part of questionnaire by yourself.

- 1.1 Gender 1. Male 2. Female
- 1.2 Age years
- 1.3 Religion 1. Buddhism 3. Islam
 2. Christianity 4. Others (Please identify)
- 1.4 Marital Status 1. Single 2. Married
 3. Separated / Divorced 4. Widowed
- 1.5 Residential province is
- 1.6 Educational Level
 1. No Schooling 5. Bachelor Degree
 2. Elementary 6. Master Degree
 3. Secondary 7. Others (Please specify)
 4. Pre – College / Vocational
- 1.7 Occupation
 1. Government Officer / State – Enterprise Officer 4. Student
 2. Business Owner 5. Retired
 3. Private firm’s employee 6. No job
 7. Others (Please identify)
- 1.8 The size of household (Including yourself) persons

1.9 Your monthly income

<input type="checkbox"/> 1.	0 – 2,500 Baht
<input type="checkbox"/> 2.	2,501 – 5,000 Baht
<input type="checkbox"/> 3.	5,001 – 7,500 Baht
<input type="checkbox"/> 4.	7,501 – 10,000 Baht

1.10 Your monthly income and
your spouse’s monthly
income (For married
respondent only)

<input type="checkbox"/> 1.	0 – 2,500 Baht
<input type="checkbox"/> 2.	2,501 – 5,000 Baht
<input type="checkbox"/> 3.	5,001 – 7,500 Baht
<input type="checkbox"/> 4.	7,501 – 10,000 Baht

<input type="checkbox"/> 5.	10,001 – 15,000 Baht
<input type="checkbox"/> 6.	15,001 – 20,000 Baht
<input type="checkbox"/> 7.	20,001 – 25,000 Baht
<input type="checkbox"/> 8.	25,001 – 50,000 Baht
<input type="checkbox"/> 9.	50,001 – 75,000 Baht
<input type="checkbox"/> 10.	75,001 – 100,000 Baht
<input type="checkbox"/> 11.	100,000 Baht or more than

<input type="checkbox"/> 5.	10,001 – 15,000 Baht
<input type="checkbox"/> 6.	15,001 – 20,000 Baht
<input type="checkbox"/> 7.	20,001 – 25,000 Baht
<input type="checkbox"/> 8.	25,001 – 50,000 Baht
<input type="checkbox"/> 9.	50,001 – 75,000 Baht
<input type="checkbox"/> 10.	75,001 – 100,000 Baht
<input type="checkbox"/> 11.	100,000 Baht or more than

1.11 Your monthly expense

<input type="checkbox"/> 1.	0 – 2,500 Baht
<input type="checkbox"/> 2.	2,501 – 5,000 Baht
<input type="checkbox"/> 3.	5,001 – 7,500 Baht
<input type="checkbox"/> 4.	7,501 – 10,000 Baht
<input type="checkbox"/> 5.	10,001 – 15,000 Baht
<input type="checkbox"/> 6.	15,001 – 20,000 Baht
<input type="checkbox"/> 7.	20,001 – 25,000 Baht
<input type="checkbox"/> 8.	25,001 – 50,000 Baht
<input type="checkbox"/> 9.	50,001 – 75,000 Baht
<input type="checkbox"/> 10.	75,001 – 100,000 Baht
<input type="checkbox"/> 11.	100,000 Baht or more than

1.12 What is your opinion regarding your current monthly income as compared to the minimum wage rate in Bangkok Metropolitan area (Daily wage is equal to 300 Baht per day or 9,000 Baht per month).

- 1. Significantly higher
- 2. Slightly higher
- 3. comparable
- 4. Slightly lower
- 5. Significantly lower

1.13 How many bedrooms are in your house?

- 1 bedroom 2 bedrooms 3 bedroom
- 4 bedrooms more than 4 bedrooms

1.14 How would you describe your current status in your house or place of residence?

- 1. Owner 3. Resident in the welfare house
- 2. Occupant 4. Tenant

- 2.6 Did you know that the Historic City of Ayutthaya is at risk of being delisted from the World Heritage List of UNESCO?
 1. Yes 2. No
- 2.7 From last 12 months until now, how many times did you visit the Ayutthaya Historical Park (Including this time)?
 1 time 2 times 3 times 4 times
 5 times more than 5 times
- 2.8 After you visit the Ayutthaya Historical Park in this time, will you have an opportunity to revisit within next 12 months?
 Yes No
- 2.9 After you access the historic sites in the area of Ayutthaya Historical Park in this time, how much knowledge detailing Ayutthaya did you receive from this visit?
 A great deal Much Somewhat Little Seldom
- 2.10 How much background information regarding the Historic City of Ayutthaya did you have before?

Note: Please have the respondent read the information card number 1 during the interview in question 2.10

Question	The lowest ---► The highest						Do not know
1. How much background knowledge or fundamental understanding of Ayutthaya do you have?	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 9
2. How much about management problems and administration conflicts of the Historic City of Ayutthaya do you know?	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 9
3. How interested would you be to follow up the management problems and administration conflicts of the Historic City of Ayutthaya?	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 9

4. How well – prepared are current heritage interpretation materials and services for example, tourist guide services, pamphlets, booklets, information board, etc. inside the Ayutthaya Historical Park?	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 9
5. How important are explanations, education and provision of the knowledge regarding Ayutthaya to the visitors?	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 9

2.11 How do you think about these following statements associated with the Historic City of Ayutthaya?

Note: Please have the respondent read the information card number 2 during answer the question 2.11

Statement	Disagree -----▶ Agree					
	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
1. The Historic City of Ayutthaya is a place for religious ceremonies.	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
2. The Historic City of Ayutthaya is an important tourism site of Thailand.	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
3. The Historic City of Ayutthaya is a historical, arts and cultural learning site.	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
4. The Historic City of Ayutthaya is a heritage that deserves to be conserved for future generations.	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
5. The Historic City of Ayutthaya is a representative of the pride and dignity of Thai people and it can reflect Thainess and the national uniqueness of our country.	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
6. The Historic City of Ayutthaya is a local community's way of life.	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5

- 2.12 According to the trip to Ayutthaya Historical Park, what is the most interesting content regarding Ayutthaya that you would like to experience or gain knowledge about it? Please place the order.

Note: 1 = the most interested and 3 = the least interested

- The history of Ayutthaya
- Arts and architecture in the Ayutthaya period
- Society and culture in the Ayutthaya period

- 2.13 What is the most necessary heritage interpretation during visiting inside the historic sites in the area of Ayutthaya Historical Park? Please place the order.

Note: 1 = the most necessary and 5 = the least necessary

- Labels and information boards located in the Ayutthaya Historical Park
- Pamphlets, booklets, brochures, etc.
- Tourist guide services
- Demonstrations and events
- Audio tour or audio media

- 2.14 After you visit the Ayutthaya Historical Park, Do you know more about Ayutthaya?

1. A great deal 2. Much 3. Somewhat
4. Little 5. Rarely

- 2.15 Do you agree if there is a project to restore and improve the heritage interpretation of the Historic City of Ayutthaya so that Thai visitors can gain more experience and knowledge about the history, culture, arts of Ayutthaya?

1. Strongly agree 2. Agree 3. Disagree 4. Strongly disagree

Part 3: Valuation Question

Note: Please answer the questions and provide the correct information during the interview.

Note: Before interview in Part 3, the interviewer will show the respondent the card number 3 regarding the current situation of the heritage interpretation inside the Historic City of Ayutthaya and the hypothetical project to restore and improve them. Importantly, the interviewer has to stress that the amount of one – day entrance fee that the respondent reply will be analyzed and proposed to the policy maker to reconsider the entrance fee policy and used to arrange the budget of heritage interpretation restoration and improvement. (Stress that the respondent is probably able to pay entrance fee more and he or she should keep thinking about his or her own income level before replying the question.)

3.1 In case that there is an organization or incumbent committee that take responsibility to improve the heritage interpretation in the Historic City of Ayutthaya, are you willing to pay one – day entrance fee more than the current entrance fee of 30 Baht per visitor in visiting 3 major cultural heritage sites that are Wat Si Sanphet, Wat Mahathat and Wat Chaiwatthanaram?

1. Yes, I am willing to pay more because (Can select more than one reason and then go to question 3.2)
- I can learn the history and culture regarding the Ayutthaya period from the improved heritage interpretation.
 - The communities in Ayutthaya province can use them to learn about their own history and culture.
 - The people in next generation can learn about the history and culture regarding the Ayutthaya period.
 - I would like to maintain the national uniqueness and Thainess sustainably.
 - Others (Please specify)

- 2. No, I am not willing to pay more because (Can select more than one reason and then go to question 3.3 and 3.5)
 - The heritage interpretation is not useful.
 - The visitors are not supposed to be interested in heritage interpretation.
 - The restoration and improvement of heritage interpretation should be the responsibility of government indeed.
 - I do not have enough income to pay more but I am willing to pay if my income is adequate.
 - Others (Please specify)

3.2 In case that the one – day entrance fee to 3 major sites that are Wat Si Sanphet, Wat Mahathat and Wat Chaiwatthanaram in the Historic City of Ayutthaya increases and the incremental revenue from the increase of such one – day entrance fee will be allocated to restore and improve the heritage interpretation in the Historic City of Ayutthaya for Thai visitors. Are you willing to pay A Baht per person for one – day entrance fee for 3 major sites?

<input type="checkbox"/> 1. Yes, I am willing to pay	<input type="checkbox"/> 2. No, I am no willing to pay
If the one – day entrance fee for 3 major sites becomes <u>2×A Baht per person</u> , are you still willing to pay for? <input type="checkbox"/> 1. Yes <input type="checkbox"/> 2. No	If the one – day entrance fee for 3 major sites becomes <u>A ÷ 2 Baht per person</u> , are you willing to pay for? <input type="checkbox"/> 1. Yes <input type="checkbox"/> 2. No

Note:

A	80	100	120	140	160	180	200
2 × A	160	200	240	280	320	360	400
A ÷ 2	40	50	60	70	80	90	100

3.3 Your maximum willingness to pay for 3 major sites in form of one – day entrance fee is Baht per person.

Note: Before interview in question 3.4, the interviewer will show the respondent the card number 4 that is the detail of hypothetical project to improve heritage interpretations in 15 historic sites including 3 major sites. This project

probably covers all important historic sites in the Historic City of Ayutthaya. 15 historic sites are composed of Wat Si Sanphet, Wat Mahathat, Wat Chaiwatthanaram, Wat Mongkol Bophit, Wat Thammikarat, Wat Phra Ram, Wat Buddhaisawan, Wat Phanan Choeng, Wat Maheyong, Wat Yai Chaimongkol, Wat Rajburana, Wat Suwandararam, Wat Na Phra Men, Wat Kudidao and Wat Barom Buddharam. After the respondent read the detail of the hypothetical project in card number 4, the interviewer will ask the respondent the questions.

- 3.4 In case that the one – day entrance fee to 15 historic sites that are Wat Si Sanphet, Wat Mahathat, Wat Chaiwatthanaram, Wat Mongkol Bophit, Wat Thammikarat, Wat Phra Ram, Wat Buddhaisawan, Wat Phanan Choeng, Wat Maheyong, Wat Yai Chaimongkol, Wat Rajburana, Wat Suwandararam, Wat Na Phra Men, Wat Kudidao and Wat Barom Buddharam in the Historic City of Ayutthaya increases and the incremental revenue from the increase of such one – day entrance fee will be allocated to improve and restore the heritage interpretation in the Historic City of Ayutthaya for Thai visitors. Are you willing to pay A + 100 Baht per person for one – day entrance fee for 15 sites?

<input type="checkbox"/> 1. Yes, I am willing to pay	<input type="checkbox"/> 2. No, I am no willing to pay
If the one – day entrance fee for 3 major sites becomes $2 \times (A + 100)$ Baht per person, are you still willing to pay for? <input type="checkbox"/> 1. Yes <input type="checkbox"/> 2. No	If the one – day entrance fee for 3 major sites becomes $(A + 100) \div 2$ Baht per person, are you willing to pay for? <input type="checkbox"/> 1. Yes <input type="checkbox"/> 2. No

Note:

A	80	100	120	140	160	180	200
A + 100	180	200	220	240	260	280	300
$2 \times (A + 100)$	560	400	440	480	520	560	600
$(A + 100) \div 2$	90	100	110	120	130	140	150

- 3.5 Your maximum willingness to pay for 15 sites in form of one – day entrance fee is Baht per person.

APPENDIX C

PRINTOUT FROM LIMDEP

LOGIT; Lhs=PAY ;Rhs=one,SEX,AGE,BUDD,SING,LOCA,EDU,FAM,INC\$

--> LOGIT; Lhs=PAY ;Rhs=one,SEX,AGE,BUDD,SING,LOCA,BANG,EDU,FAM,INC\$
 Normal exit from iterations. Exit status=0.

```

+-----+
| Multinomial Logit Model
| Maximum Likelihood Estimates
| Model estimated: Jul 05, 2013 at 01:48:29PM.
| Dependent variable          PAY
| Weighting variable         None
| Number of observations      717
| Iterations completed        6
| Log likelihood function     -261.4928
| Restricted log likelihood    -278.5372
| Chi squared                 34.08868
| Degrees of freedom          9
| Prob[ChiSq > value] =      .8618034E-04
| Hosmer-Lemeshow chi-squared = 34.50691
| P-value= .00003 with deg.fr. = 8
+-----+
    
```

Variable	Coefficient	Standard Error	b/St.Er.	P[Z >z]	Mean of X
Characteristics in numerator of Prob[Y = 1]					
Constant	-1.793159457	1.0451596	-1.716	.0862	
SEX	-.3124078382	.23414585	-1.334	.1821	.50488145
AGE	.1212043284E-01	.14977940E-01	.809	.4184	37.234310
BUDD	1.642842241	.42880852	3.831	.0001	.96234310
SING	.3408672518	.28294469	1.205	.2283	.54951185
LOCA	.1246634378	.34377180	.363	.7169	.16317992
BANG	.1849554464	.26107685	.708	.4787	.53695955
EDU	.9622213157E-01	.43678667E-01	2.203	.0276	14.168759
FAM	-.4152972103E-01	.54889783E-01	-.757	.4493	4.0599721
INC	.1406587780E-04	.58175404E-05	2.418	.0156	32622.509

(Note: E+nn or E-nn means multiply by 10 to + or -nn power.)

Matrix: LastOf
 [10.4]

```

+-----+
| Information Statistics for Discrete Choice Model.
| M=Model MC=Constants Only M0=No Model
| Criterion F (log L)         -261.49285      -278.53719      -496.98653
| LR Statistic vs. MC        34.08868          .00000          .00000
| Degrees of Freedom          9.00000          .00000          .00000
| Prob. Value for LR         .00009            .00000          .00000
| Entropy for probs.         261.49285        278.53719        496.98653
| Normalized Entropy         .52616            .56045            1.00000
| Entropy Ratio Stat.        470.98736        436.89868          .00000
| Bayes Info Criterion       582.16138        616.25006        1053.14874
| BIC - BIC(no model)       470.98736        436.89868          .00000
| Pseudo R-squared           .06119            .00000          .00000
| Pct. Correct Prec.        86.88982          .00000          50.00000
| Means:
|   y=0   y=1   y=2   y=3   yu=4   y=5,   y=6   y>=7
| Outcome .1311 .8689 .0000 .0000 .0000 .0000 .0000 .0000
| Pred.Pr .1311 .8689 .0000 .0000 .0000 .0000 .0000 .0000
| Notes: Entropy computed as Sum(i)Sum(j)Pfit(i,j)*logPfit(i,j).
|         Normalized entropy is computed against M0.
|         Entropy ratio statistic is computed against M0.
|         BIC = 2*criterion - log(N)*degrees of freedom.
|         If the model has only constants or if it has no constants,
|         the statistics reported here are not useable.
+-----+
    
```

```

+-----+
| Fit Measures for Binomial Choice Model |
| Logit      model for variable PAY      |
+-----+
| Proportions P0= .131102   P1= .868898 |
| N =      717 N0=      94   N1=      623 |
| LogL =   -261.49285 LogL0 = -278.5372 |
| Estrella = 1-(L/L0)^(-2L0/n) = .04788 |
+-----+
|      Efron |      McFadden |      Ben./Lerman |
|      .05000 |      .06119   |      .78418      |
|      Cramer |      Veall/Zim. |      Rsqrd_ML    |
|      .05270 |      .10380   |      .04643      |
+-----+
| Information Akaike I.C. Schwarz I.C. |
| Criteria          .75730      588.73645 |
+-----+

```

Frequencies of actual & predicted outcomes
 Predicted outcome has maximum probability.
 Threshold value for predicting Y=1 = .5000
 Predicted

Actual	Predicted		Total
	0	1	
0	4	90	94
1	4	619	623
Total	8	709	717

=====
 Analysis of Binary Choice Model Predictions Based on Threshold = .5000
 =====

Prediction Success

```

-----
Sensitivity = actual 1s correctly predicted          99.358%
Specificity = actual 0s correctly predicted           4.255%
Positive predictive value = predicted 1s that were actual 1s  87.306%
Negative predictive value = predicted 0s that were actual 0s  50.000%
Correct prediction = actual 1s and 0s correctly predicted  86.890%
-----

```

Prediction Failure

```

-----
False pos. for true neg. = actual 0s predicted as 1s          95.745%
False neg. for true pos. = actual 1s predicted as 0s           .642%
False pos. for predicted pos. = predicted 1s actual 0s        12.694%
False neg. for predicted neg. = predicted 0s actual 1s         50.000%
False predictions = actual 1s and 0s incorrectly predicted    13.110%
-----

```

```

LOGIT;Lhs=TY ;
Rhs=ONE, TBID, SEX, AGE, BUDD, SING, PROV, EDU, FAM, INC, BASE, SERV, NGEN, ANCH$
.....

```

```

--> LOGIT;Lhs=TY ;
Rhs=ONE, TBID, SEX, AGE, BUDD, SING, PROV, EDU, FAM, INC, BASE, SERV, ...
Normal exit from iterations. Exit status=0.

```



```

+-----+
| Fit Measures for Binomial Choice Model |
| Logit      model for variable TY      |
+-----+
| Proportions P0= .511855  P1= .488145  |
| N =      717  N0=      367  N1=      350 |
| LogL =   -407.28746  LogL0 =  -496.7850 |
| Estrella = 1-(L/L0)^(-2L0/n) = .24062  |
+-----+
|      Efron |      McFadden |      Ben./Lerman |
|      .22587 |      .18015   |      .61334     |
|      Cramer |      Veall/Zim. |      Rsqrd_ML   |
|      .22624 |      .34394   |      .22092     |
+-----+
| Information Akaike I.C. Schwarz I.C. |
| Criteria      1.17514      906.62599 |
+-----+

```

Frequencies of actual & predicted outcomes
 Predicted outcome has maximum probability.
 Threshold value for predicting Y=1 = .5000
 Predicted

Actual	Predicted		Total
	0	1	
0	264	103	367
1	116	234	350
Total	380	337	717

=====
 Analysis of Binary Choice Model Predictions Based on Threshold = .5000
 =====

Prediction Success

```

-----
Sensitivity = actual 1s correctly predicted          66.857%
Specificity = actual 0s correctly predicted          71.935%
Positive predictive value = predicted 1s that were actual 1s 69.436%
Negative predictive value = predicted 0s that were actual 0s 69.474%
Correct prediction = actual 1s and 0s correctly predicted 69.456%
-----

```

Prediction Failure

```

-----
False pos. for true neg. = actual 0s predicted as 1s 28.065%
False neg. for true pos. = actual 1s predicted as 0s 33.143%
False pos. for predicted pos. = predicted 1s actual 0s 30.564%
False neg. for predicted neg. = predicted 0s actual 1s 30.526%
False predictions = actual 1s and 0s incorrectly predicted 30.544%
-----

```

```

=====
LOGIT;Lhs=FY ;
Rhs=ONE,FBID,SEX,AGE,BUDD,SING,PROV,EDU,FAM,INC,BASE,SERV,NGEN,ANCH$
.....

```

```

--> LOGIT;Lhs=FY ;
Rhs=ONE,FBID,SEX,AGE,BUDD,SING,PROV,EDU,FAM,INC,BASE,SERV,...
Normal exit from iterations. Exit status=0.

```



```

+-----+
| Fit Measures for Binomial Choice Model |
| Logit      model for variable FY      |
+-----+
| Proportions P0= .288703   P1= .711297 |
| N =      717 N0=      207   N1=      510 |
| LogL =   -386.19460 LogL0 = -430.9071 |
| Estrella = 1-(L/L0)^(-2L0/n) = .12338 |
+-----+
|      Efron |      McFadden |      Ben./Lerman |
|      .11462 |      .10376   |      .63720      |
|      Cramer |      Veall/Zim. |      Rsqrd_ML    |
|      .11665 |      .20315   |      .11726      |
+-----+
| Information Akaike I.C. Schwarz I.C. |
| Criteria      1.11630      864.44027 |
+-----+

```

Frequencies of actual & predicted outcomes
 Predicted outcome has maximum probability.
 Threshold value for predicting Y=1 = .5000
 Predicted

Actual	Predicted		Total
	0	1	
0	32	175	207
1	29	481	510
Total	61	656	717

=====
 Analysis of Binary Choice Model Predictions Based on Threshold = .5000
 =====

Prediction Success

```

-----
Sensitivity = actual 1s correctly predicted          94.314%
Specificity = actual 0s correctly predicted          15.459%
Positive predictive value = predicted 1s that were actual 1s  73.323%
Negative predictive value = predicted 0s that were actual 0s  52.459%
Correct prediction = actual 1s and 0s correctly predicted      71.548%
-----

```

Prediction Failure

```

-----
False pos. for true neg. = actual 0s predicted as 1s          84.541%
False neg. for true pos. = actual 1s predicted as 0s           5.686%
False pos. for predicted pos. = predicted 1s actual 0s        26.677%
False neg. for predicted neg. = predicted 0s actual 1s        47.541%
False predictions = actual 1s and 0s incorrectly predicted      28.452%
-----

```

LOGIT;Lhs=TY ; Rhs=ONE,TBID\$

.....

--> RESET

-->

READ;FILE="D:\dissertation_progress\Run.CVM\e4.ayutthaya.xls";format=xls;...

--> LOGIT;Lhs=TY ; Rhs=ONE,TBID\$

Normal exit from iterations. Exit status=0.


```

+-----+
| Information Akaike I.C. Schwarz I.C. |
| Criteria      1.26488      153.51569 |
+-----+

```

Frequencies of actual & predicted outcomes
 Predicted outcome has maximum probability.
 Threshold value for predicting Y=1 = .5000
 Predicted

```

-----+-----
Actual  0    1 | Total
-----+-----
    0    79    0 |    79
    1    38    0 |    38
-----+-----
Total   117    0 |   117

```

=====
 Analysis of Binary Choice Model Predictions Based on Threshold = .5000
 =====

Prediction Success

```

-----+-----
Sensitivity = actual 1s correctly predicted          .000%
Specificity = actual 0s correctly predicted          100.000%
Positive predictive value = predicted 1s that were actual 1s *****%
Negative predictive value = predicted 0s that were actual 0s  67.521%
Correct prediction = actual 1s and 0s correctly predicted    67.521%
-----+-----

```

Prediction Failure

```

-----+-----
False pos. for true neg. = actual 0s predicted as 1s          .000%
False neg. for true pos. = actual 1s predicted as 0s          100.000%
False pos. for predicted pos. = predicted 1s actual 0s        *****%
False neg. for predicted neg. = predicted 0s actual 1s         32.479%
False predictions = actual 1s and 0s incorrectly predicted     32.479%
-----+-----

```

LOGIT;Lhs=FY ; Rhs=ONE,FBID\$

.....
 --> LOGIT;Lhs=FY ; Rhs=ONE,FBID\$
 Normal exit from iterations. Exit status=0.

```

+-----+
| Multinomial Logit Model |
| Maximum Likelihood Estimates |
| Model estimated: Jul 05, 2013 at 00:58:40PM. |
| Dependent variable      FY |
| Weighting variable      None |
| Number of observations   117 |
| Iterations completed     3 |
| Log likelihood function  -71.36322 |
| Restricted log likelihood -71.38619 |
| Chi squared              .4594116E-01 |
| Degrees of freedom       1 |
| Prob[ChiSq > value] =    .8302828 |
| Hosmer-Lemeshow chi-squared = 7.51689 |
| P-value= .48202 with deg.fr. = 8 |
+-----+

```

```

+-----+-----+-----+-----+-----+
|Variable | Coefficient | Standard Error |b/St.Er.|P[|Z|>z] | Mean of X|
+-----+-----+-----+-----+-----+
          Characteristics in numerator of Prob[Y = 1]
Constant   1.083924120   1.1013988   .984   .3250
FBID      -.9393526189E-03 .43667440E-02  -.215   .8297   247.17949
(Note: E+nn or E-nn means multiply by 10 to + or -nn power.)

```

Matrix: LastO
[2,4]

```

+-----+-----+-----+-----+-----+
| Information Statistics for Discrete Choice Model.
| M=Model MC=Constants Only M0=No Model
| Criterion F (log L)      -71.36322      -71.38619      -81.09822
| LR Statistic vs. MC      .04594          .00000          .00000
| Degrees of Freedom      1.00000          .00000          .00000
| Prob. Value for LR      .83028          .00000          .00000
| Entropy for probs.      71.36322          71.38619          81.09822
| Normalized Entropy      .87996          .88024          1.00000
| Entropy Ratio Stat.     19.47000          19.42406          .00000
| Bayes Info Criterion    147.48861        147.53455        166.95861
| BIC - BIC(no model)    19.47000          19.42406          .00000
| Pseudo R-squared       .00032          .00000          .00000
| Pct. Correct Prec.     70.08547          .00000          50.00000
| Means:      y=0      y=1      y=2      y=3      yu=4      y=5,      y=6      y>=7
| Outcome     .2991   .7009   .0000   .0000   .0000   .0000   .0000   .0000
| Pred.Pr     .2991   .7009   .0000   .0000   .0000   .0000   .0000   .0000
| Notes: Entropy computed as Sum(i)Sum(j)Pfit(i,j)*logPfit(i,j).
| Normalized entropy is computed against M0.
| Entropy ratio statistic is computed against M0.
| BIC = 2*criterion - log(N)*degrees of freedom.
| If the model has only constants or if it has no constants,
| the statistics reported here are not useable.
+-----+-----+-----+-----+

```

```

+-----+-----+-----+-----+-----+
| Fit Measures for Binomial Choice Model
| Logit model for variable FY
+-----+-----+-----+-----+
| Proportions P0= .299145 P1= .700855
| N = 117 N0= 35 N1= 82
| LogL = -71.36322 LogL0 = -71.3862
| Estrella = 1-(L/L0)^(-2L0/n) = .00039
+-----+-----+-----+-----+
| Efron | McFadden | Ben./Lerman
| .00030 | .00032 | .58083
| Cramer | Veall/Zim. | Rsqrd_ML
| .00035 | .00071 | .00039
+-----+-----+-----+-----+
| Information Akaike I.C. Schwarz I.C.
| Criteria 1.25407 152.25079
+-----+-----+-----+-----+

```

Frequencies of actual & predicted outcomes
 Predicted outcome has maximum probability.
 Threshold value for predicting Y=1 = .5000

	Predicted		
Actual	0	1	Total
0	0	35	35
1	0	82	82
Total	0	117	117


```

+-----+
| Information Statistics for Discrete Choice Model.
|           M=Model MC=Constants Only M0=No Model
| Criterion F (log L)      -241.84860      -264.22577      -266.86166
| LR Statistic vs. MC      44.75434          .00000          .00000
| Degrees of Freedom        1.00000          .00000          .00000
| Prob. Value for LR        .00000          .00000          .00000
| Entropy for probs.       241.84860          264.22577          266.86166
| Normalized Entropy        .90627          .99012          1.00000
| Entropy Ratio Stat.       50.02612          5.27178          .00000
| Bayes Info Criterion     489.65045          534.40479          539.67657
| BIC - BIC(no model)      50.02612          5.27178          .00000
| Pseudo R-squared         .08469          .00000          .00000
| Pct. Correct Prec.       64.15584          .00000          50.00000
| Means:      y=0   y=1   y=2   y=3   yu=4   y=5,   y=6   y>=7
| Outcome     .4416 .5584 .0000 .0000 .0000 .0000 .0000 .0000
| Pred.Pr     .4416 .5584 .0000 .0000 .0000 .0000 .0000 .0000
| Notes: Entropy computed as Sum(i)Sum(j)Pfit(i,j)*logPfit(i,j).
|         Normalized entropy is computed against M0.
|         Entropy ratio statistic is computed against M0.
|         BIC = 2*criterion - log(N)*degrees of freedom.
|         If the model has only constants or if it has no constants,
|         the statistics reported here are not useable.
+-----+

```

```

+-----+
| Fit Measures for Binomial Choice Model
| Logit model for variable TY
+-----+
| Proportions P0= .441558 P1= .558442
| N = 385 N0= 170 N1= 215
| LogL = -241.84860 LogL0 = -264.2258
| Estrella = 1-(L/L0)^(-2L0/n) = .11438
+-----+
| Efron | McFadden | Ben./Lerman
| .11186 | .08469 | .56218
| Cramer | Veall/Zim. | Rsqrd_ML
| .11223 | .18001 | .10974
+-----+
| Information Akaike I.C. Schwarz I.C.
| Criteria 1.26675 495.60370
+-----+

```

Frequencies of actual & predicted outcomes
 Predicted outcome has maximum probability.
 Threshold value for predicting Y=1 = .5000

	Predicted		
Actual	0	1	Total
0	97	73	170
1	65	150	215
Total	162	223	385

=====
 Analysis of Binary Choice Model Predictions Based on Threshold = .5000

Prediction Success

```

-----
Sensitivity = actual 1s correctly predicted      69.767%
Specificity = actual 0s correctly predicted      57.059%
Positive predictive value = predicted 1s that were actual 1s 67.265%
Negative predictive value = predicted 0s that were actual 0s 59.877%
Correct prediction = actual 1s and 0s correctly predicted 64.156%

```

Prediction Failure

False pos. for true neg. = actual 0s predicted as 1s 42.941%
False neg. for true pos. = actual 1s predicted as 0s 30.233%
False pos. for predicted pos. = predicted 1s actual 0s 32.735%
False neg. for predicted neg. = predicted 0s actual 1s 40.123%
False predictions = actual 1s and 0s incorrectly predicted 35.844%
=====

LOGIT:Lhs=FY ; Rhs=ONE,FBID\$
.....

--> LOGIT:Lhs=FY ; Rhs=ONE,FBID\$
Normal exit from iterations. Exit status=0.

```

+-----+
| Multinomial Logit Model
| Maximum Likelihood Estimates
| Model estimated: Jul 05, 2013 at 01:34:02PM.
| Dependent variable            FY
| Weighting variable            None
| Number of observations        385
| Iterations completed          4
| Log likelihood function       -205.4432
| Restricted log likelihood      -212.8548
| Chi squared                   14.82323
| Degrees of freedom            1
| Prob[ChiSq > value] =        .1180715E-03
| Hosmer-Lemeshow chi-squared = 8.20831
| P-value= .41339 with deg.fr. = 8
+-----+

```

```

+-----+-----+-----+-----+-----+-----+
| Variable | Coefficient | Standard Error | b/St.Er. | P[|Z|>z] | Mean of X |
+-----+-----+-----+-----+-----+-----+

```

Characteristics in numerator of Prob[Y = 1]

Variable	Coefficient	Standard Error	b/St.Er.	P[Z >z]	Mean of X
Constant	2.755818992	.44519244	6.190	.0000	
FBID	-.6155147238E-02	.16032661E-02	-3.839	.0001	255.01299

(Note: E+nn or E-nn means multiply by 10 to + or -nn power.)

[Matrix: LastO](#)
[2,4]

```

+-----+
| Information Statistics for Discrete Choice Model.
| M=Model MC=Constants Only    M0=No Model
| Criterion F (log L)           -205.44321       -212.85482       -266.86166
| LR Statistic vs. MC           14.82323           .00000           .00000
| Degrees of Freedom            1.00000           .00000           .00000
| Prob. Value for LR            .00012           .00000           .00000
| Entropy for probs.            205.44321           212.85482       266.86166
| Normalized Entropy            .76985           .79762           1.00000
| Entropy Ratio Stat.           122.83691          108.01369       .00000
| Bayes Info Criterion          416.83965          431.66288       539.67657
| BIC - BIC(no model)          122.83692          108.01369       .00000
| Pseudo R-squared              .03482           .00000           .00000
| Pct. Correct Prec.            76.36364           .00000           50.00000
| Means:                        y=0    y=1    y=2    y=3    yu=4   y=5,   y=6   y>=7
| Outcome                       .2416  .7584  .0000  .0000  .0000  .0000  .0000  .0000
| Pred.Pr                       .2416  .7584  .0000  .0000  .0000  .0000  .0000  .0000
| Notes: Entropy computed as Sum(i)Sum(j)Pfit(i,j)*logPfit(i,j).
|        Normalized entropy is computed against M0.
|        Entropy ratio statistic is computed against M0.
+-----+

```

```
|      BIC = 2*criterion - log(N)*degrees of freedom.
|      If the model has only constants or if it has no constants,
|      the statistics reported here are not useable.
+-----+
```

```
+-----+
| Fit Measures for Binomial Choice Model |
| Logit      model for variable FY      |
+-----+
```

```
| Proportions P0= .241558   P1= .758442 |
| N =      385  N0=      93   N1=      292 |
| LogL =  -205.44321  LogL0 = -212.8548  |
| Estrella = 1-(L/L0)^(-2L0/n) = .03843  |
+-----+
```

```
|      Efron |      McFadden |      Ben./Lerman |
|      .04046 |      .03482  |      .64876      |
|      Cramer |      Veall/Zim. |      Rsqrd_ML    |
|      .04140 |      .07060  |      .03777      |
+-----+
```

```
| Information Akaike I.C. Schwarz I.C. |
| Criteria      1.07763      422.79290 |
+-----+
```

Frequencies of actual & predicted outcomes
 Predicted outcome has maximum probability.
 Threshold value for predicting Y=1 = .5000

	Predicted		
Actual	0	1	Total
0	9	84	93
1	7	285	292
Total	16	369	385

=====
 Analysis of Binary Choice Model Predictions Based on Threshold = .5000
 =====

Prediction Success

```
-----
Sensitivity = actual 1s correctly predicted          97.603%
Specificity = actual 0s correctly predicted          9.677%
Positive predictive value = predicted 1s that were actual 1s  77.236%
Negative predictive value = predicted 0s that were actual 0s  56.250%
Correct prediction = actual 1s and 0s correctly predicted  76.364%
-----
```

Prediction Failure

```
-----
False pos. for true neg. = actual 0s predicted as 1s          90.323%
False neg. for true pos. = actual 1s predicted as 0s           2.397%
False pos. for predicted pos. = predicted 1s actual 0s        22.764%
False neg. for predicted neg. = predicted 0s actual 1s        43.750%
False predictions = actual 1s and 0s incorrectly predicted     23.636%
-----
```

LOGIT;Lhs=TY ; Rhs=ONE,TBID\$

--> RESET

READ;FILE="D:\dissertation_progress\Run.CVM\e4.other.xls";format=xls;names\$

--> LOGIT;Lhs=TY ; Rhs=ONE,TBID\$

Normal exit from iterations. Exit status=0.

.20379	.15831	.60603
Cramer	Veall/Zim.	Rsqr ML
.20447	.30894	.19584

Information	Akaike I.C.	Schwarz I.C.
Criteria	1.17739	259.87954

Frequencies of actual & predicted outcomes
 Predicted outcome has maximum probability.
 Threshold value for predicting Y=1 = .5000

	Predicted		
Actual	0	1	Total
0	86	32	118
1	37	60	97
Total	123	92	215

=====
 Analysis of Binary Choice Model Predictions Based on Threshold = .5000
 =====

Prediction Success

Sensitivity = actual 1s correctly predicted	61.856%
Specificity = actual 0s correctly predicted	72.881%
Positive predictive value = predicted 1s that were actual 1s	65.217%
Negative predictive value = predicted 0s that were actual 0s	69.919%
Correct prediction = actual 1s and 0s correctly predicted	67.907%

Prediction Failure

False pos. for true neg. = actual 0s predicted as 1s	27.119%
False neg. for true pos. = actual 1s predicted as 0s	38.144%
False pos. for predicted pos. = predicted 1s actual 0s	34.783%
False neg. for predicted neg. = predicted 0s actual 1s	30.081%
False predictions = actual 1s and 0s incorrectly predicted	32.093%

LOGIT;Lhs=FY ; Rhs=ONE,FBID\$

.....
 --> LOGIT;Lhs=FY ; Rhs=ONE,FBID\$
 Normal exit from iterations. Exit status=0.

Multinomial Logit Model	
Maximum Likelihood Estimates	
Model estimated: Jul 05, 2013 at 01:39:45PM.	
Dependent variable	FY
Weighting variable	None
Number of observations	215
Iterations completed	4
Log likelihood function	-138.5007
Restricted log likelihood	-141.3797
Chi squared	5.758077
Degrees of freedom	1
Prob[ChiSqd > value] =	.1641303E-01
Hosmer-Lemeshow chi-squared =	3.48565
P-value= .90030 with deg.fr. =	8

```

+-----+-----+-----+-----+-----+
|Variable | Coefficient | Standard Error |b/St.Er.|P[|Z|>z] | Mean of X|
+-----+-----+-----+-----+-----+
                Characteristics in numerator of Prob[Y = 1]
Constant      2.162586855      .70889938      3.051      .0023
FBID          -.6378556709E-02  .27204244E-02  -2.345      .0190      252.00000
(Note: E+nn or E-nn means multiply by 10 to + or -nn power.)

```

Matrix: LastO
[2,4]

```

+-----+-----+-----+-----+-----+
| Information Statistics for Discrete Choice Model.
|                                     M=Model MC=Constants Only  M0=No Model
| Criterion F (log L)                 -138.50069                -141.37973                -149.02664
| LR Statistic vs. MC                  5.75808                   .00000                   .00000
| Degrees of Freedom                   1.00000                   .00000                   .00000
| Prob. Value for LR                   .01641                    .00000                   .00000
| Entropy for probs.                   138.50069                 141.37973                 149.02664
| Normalized Entropy                   .92937                    .94869                    1.00000
| Entropy Ratio Stat.                  21.05190                  15.29383                  .00000
| Bayes Info Criterion                 282.37202                 288.13010                 303.42393
| BIC - BIC(no model)                  21.05190                  15.29383                  .00000
| Pseudo R-squared                     .02036                    .00000                    .00000
| Pct. Correct Prec.                   63.25581                  .00000                    50.00000
| Means:                               y=0      y=1      y=2      y=3      yu=4      y=5,      y=6      y>=7
| Outcome                               .3674    .6326    .0000    .0000    .0000    .0000    .0000    .0000
| Pred.Pr                               .3674    .6326    .0000    .0000    .0000    .0000    .0000    .0000
| Notes: Entropy computed as Sum(i)Sum(j)Pfit(i,j)*logPfit(i,j).
|         Normalized entropy is computed against M0.
|         Entropy ratio statistic is computed against M0.
|         BIC = 2*criterion - log(N)*degrees of freedom.
|         If the model has only constants or if it has no constants,
|         the statistics reported here are not useable.
+-----+-----+-----+-----+-----+

```

```

+-----+-----+-----+-----+-----+
| Fit Measures for Binomial Choice Model
| Logit model for variable FY
+-----+-----+-----+-----+-----+
| Proportions P0= .367442  P1= .632558
| N = 215  N0= 79  N1= 136
| LogL = -138.50069  LogL0 = -141.3797
| Estrella = 1-(L/L0)^(-2L0/n) = .02670
+-----+-----+-----+-----+-----+
| Efron | McFadden | Ben./Lerman
| .02644 | .02036   | .54756
| Cramer | Veall/Zim. | Rsqrd_ML
| .02672 | .04592   | .02643
+-----+-----+-----+-----+-----+
| Information Akaike I.C. Schwarz I.C.
| Criteria      1.30698      287.74266
+-----+-----+-----+-----+-----+

```

Frequencies of actual & predicted outcomes
 Predicted outcome has maximum probability.
 Threshold value for predicting Y=1 = .5000

```

                Predicted
-----  -----  +  -----
Actual   0      1  |  Total
-----  -----  +  -----
    0      6    73  |    79
    1      6   130  |   136
-----  -----  +  -----
Total    12   203  |   215

```

=====
 Analysis of Binary Choice Model Predictions Based on Threshold = .5000

Prediction Success

 Sensitivity = actual 1s correctly predicted 95.588%
 Specificity = actual 0s correctly predicted 7.595%
 Positive predictive value = predicted 1s that were actual 1s 64.039%
 Negative predictive value = predicted 0s that were actual 0s 50.000%
 Correct prediction = actual 1s and 0s correctly predicted 63.256%

Prediction Failure

 False pos. for true neg. = actual 0s predicted as 1s 92.405%
 False neg. for true pos. = actual 1s predicted as 0s 4.412%
 False pos. for predicted pos. = predicted 1s actual 0s 35.961%
 False neg. for predicted neg. = predicted 0s actual 1s 50.000%
 False predictions = actual 1s and 0s incorrectly predicted 36.744%

LOGIT;Lhs=TY ;
 Rhs=ONE, TBID, SEX, AGE, BUDD, SING, LOCA, BANG, EDU, FAM, INC, BASE, SERV, NGEN, ANCH\$

.....
 --> RESET
 -->
 READ;FILE="D:\dissertation_progress\Run.CVM\e4.total.complete.xls";format...
 --> LOGIT;Lhs=TY ;
 Rhs=ONE, TBID, SEX, AGE, BUDD, SING, LOCA, BANG, EDU, FAM, INC, BASE, ...
 Normal exit from iterations. Exit status=0.

```

+-----+
| Multinomial Logit Model          |
| Maximum Likelihood Estimates     |
| Model estimated: Jul 05, 2013 at 01:43:17PM. |
| Dependent variable               | TY |
| Weighting variable               | None |
| Number of observations            | 717 |
| Iterations completed              | 6 |
| Log likelihood function           | -405.0975 |
| Restricted log likelihood         | -496.7850 |
| Chi squared                       | 183.3750 |
| Degrees of freedom                | 14 |
| Prob[ChiSq > value] =             | .0000000 |
| Hosmer-Lemeshow chi-squared =    | 8.95489 |
| P-value= .34612 with deg.fr. =   | 8 |
+-----+
  
```

Variable	Coefficient	Standard Error	b/St.Er.	P[Z >z]	Mean of X
Characteristics in numerator of Prob[Y = 1]					
Constant	-3.176466020	2.8373659	-1.120	.2629	
TBID	-.2047142937E-01	.22861134E-02	-8.955	.0000	140.27894
SEX	-.1051103754E-01	.17592408	-.060	.9524	.50488145
AGE	.4404935625E-02	.11260757E-01	.391	.6957	37.234310
BUDD	.9789424766	.49714326	1.969	.0489	.96234310
SING	-.1958094653	.21122089	-.927	.3539	.54951185
LOCA	-.2586861597	.27493819	-.941	.3468	.16317992
BANG	.2497330272	.19808358	1.261	.2074	.53695955
EDU	.7898536996E-01	.36864378E-01	2.143	.0321	14.168759
FAM	-.4013219946E-01	.42315326E-01	-.948	.3429	4.0599721
INC	.1706142020E-04	.38273127E-05	4.458	.0000	32622.509
BASE	.2305971144	.98160798E-01	2.349	.0188	4.0278940
SERV	-.1214925872	.68384843E-01	-1.777	.0756	3.6471409
NGEN	.4901826498	.44428657	1.103	.2699	5.9637378

ANCH .3271828091E-01 .17203052 .190 .8492 .51603905
 (Note: E+nn or E-nn means multiply by 10 to + or -nn power.)

Matrix: LastO
 [15,4]

```

+-----+
| Information Statistics for Discrete Choice Model.
|                                     M=Model MC=Constants Only M0=No Model
| Criterion F (log L)                 -405.09746          -496.78498          -496.98653
| LR Statistic vs. MC                 183.37502              .00000              .00000
| Degrees of Freedom                  14.00000              .00000              .00000
| Prob. Value for LR                  .00000                .00000              .00000
| Entropy for probs.                  405.09746              496.78498           496.98653
| Normalized Entropy                  .81511                .99959              1.00000
| Entropy Ratio Stat.                 183.77813              .40311              .00000
| Bayes Info Criterion                902.24599              1085.62101          1086.02412
| BIC - BIC(no model)                 183.77813              .40311              .00000
| Pseudo R-squared                    .18456                .00000              .00000
| Pct. Correct Prec.                  70.99024              .00000              50.00000
| Means:          y=0   y=1   y=2   y=3   yu=4   y=5,   y=6   y>=7
| Outcome         .5119 .4881 .0000 .0000 .0000 .0000 .0000 .0000
| Pred.Pr         .5119 .4881 .0000 .0000 .0000 .0000 .0000 .0000
| Notes: Entropy computed as Sum(i)Sum(j)Pfit(i,j)*logPfit(i,j).
|         Normalized entropy is computed against M0.
|         Entropy ratio statistic is computed against M0.
|         BIC = 2*criterion - log(N)*degrees of freedom.
|         If the model has only constants or if it has no constants,
|         the statistics reported here are not useable.
+-----+
    
```

```

+-----+
| Fit Measures for Binomial Choice Model
| Logit model for variable TY
+-----+
| Proportions P0= .511855 P1= .488145
| N = 717 N0= 367 N1= 350
| LogL = -405.09746 LogL0 = -496.7850
| Estrella = 1-(L/L0)^(-2L0/n) = .24628
+-----+
| Efron | McFadden | Ben./Lerman
| .23101 | .18456 | .61598
| Cramer | Veall/Zim. | Rsqrd_ML
| .23152 | .35064 | .22567
+-----+
| Information Akaike I.C. Schwarz I.C.
| Criteria 1.17182 908.82106
+-----+
    
```

Frequencies of actual & predicted outcomes
 Predicted outcome has maximum probability.
 Threshold value for predicting Y=1 = .5000

		Predicted		
		0	1	Total
Actual	0	271	96	367
	1	112	238	350
Total		383	334	717

=====
 Analysis of Binary Choice Model Predictions Based on Threshold = .5000

Prediction Success

 Sensitivity = actual 1s correctly predicted 68.000%
 Specificity = actual 0s correctly predicted 73.842%
 Positive predictive value = predicted 1s that were actual 1s 71.257%
 Negative predictive value = predicted 0s that were actual 0s 70.757%
 Correct prediction = actual 1s and 0s correctly predicted 70.990%

Prediction Failure

 False pos. for true neg. = actual 0s predicted as 1s 26.158%
 False neg. for true pos. = actual 1s predicted as 0s 32.000%
 False pos. for predicted pos. = predicted 1s actual 0s 28.743%
 False neg. for predicted neg. = predicted 0s actual 1s 29.243%
 False predictions = actual 1s and 0s incorrectly predicted 29.010%
 =====

LOGIT;Lhs=FY ;
 Rhs=ONE,FBID,SEX,AGE,BUDD,SING,LOCA,BANG,EDU,FAM,INC,BASE,SERV,NGEN,ANCH\$

--> LOGIT;Lhs=FY ;
 Rhs=ONE,FBID,SEX,AGE,BUDD,SING,LOCA,BANG,EDU,FAM,INC,BASE,...
 Normal exit from iterations. Exit status=0.

```

+-----+
| Multinomial Logit Model
| Maximum Likelihood Estimates
| Model estimated: Jul 05, 2013 at 01:44:55PM.
| Dependent variable          FY
| Weighting variable          None
| Number of observations      717
| Iterations completed        6
| Log likelihood function     -383.1386
| Restricted log likelihood    -430.9071
| Chi squared                 95.53709
| Degrees of freedom          14
| Prob[ChiSq > value] =      .0000000
| Hosmer-Lemeshow chi-squared = 10.40903
| P-value= .23748 with deg.fr. = 8
+-----+
  
```

Variable	Coefficient	Standard Error	b/St.Er.	P[Z >z]	Mean of X
Characteristics in numerator of Prob[Y = 1]					
Constant	-2.143083313	2.8846926	-.743	.4575	
FBID	-.5919953841E-02	.14470572E-02	-4.091	.0000	252.83124
SEX	-.1128152119	.18237836	-.619	.5362	.50488145
AGE	.1000100433E-01	.12006781E-01	.833	.4049	37.234310
BUDD	1.502120950	.46360271	3.240	.0012	.96234310
SING	.1454014429	.22174130	.656	.5120	.54951185
LOCA	.5529335045	.26803379	2.063	.0391	.16317992
BANG	.4898357285	.20282945	2.415	.0157	.53695955
EDU	.9228749599E-01	.37394499E-01	2.468	.0136	14.168759
FAM	.2944070983E-01	.45400359E-01	.648	.5167	4.0599721
INC	.1972047245E-04	.52340146E-05	3.768	.0002	32622.509
BASE	.1489842457	.10054639	1.482	.1384	4.0278940
SERV	-.9250582877E-01	.70612074E-01	-1.310	.1902	3.6471409
NGEN	.9052789563E-02	.44737636	.020	.9839	5.9637378
ANCH	.2691744457	.18295641	1.471	.1412	.51603905

(Note: E+nn or E-nn means multiply by 10 to + or -nn power.)

Matrix: LastO
[15,4]

```

+-----+
| Information Statistics for Discrete Choice Model.
|
| M=Model MC=Constants Only M0=No Model
| Criterion F (log L) -383.13857 -430.90712 -496.98653
| LR Statistic vs. MC 95.53709 .00000 .00000
| Degrees of Freedom 14.00000 .00000 .00000
| Prob. Value for LR .00000 .00000 .00000
| Entropy for probs. 383.13857 430.90712 496.98653
| Normalized Entropy .77092 .86704 1.00000
| Entropy Ratio Stat. 227.69591 132.15882 .00000
| Bayes Info Criterion 858.32821 953.86530 1086.02412
| BIC - BIC(no model) 227.69591 132.15882 .00000
| Pseudo R-squared .11086 .00000 .00000
| Pct. Correct Prec. 72.10600 .00000 50.00000
| Means: y=0 y=1 y=2 y=3 yu=4 y=5, y=6 y>=7
| Outcome .2887 .7113 .0000 .0000 .0000 .0000 .0000 .0000
| Pred.Pr .2887 .7113 .0000 .0000 .0000 .0000 .0000 .0000
| Notes: Entropy computed as Sum(i)Sum(j)Pfit(i,j)*logPfit(i,j).
| Normalized entropy is computed against M0.
| Entropy ratio statistic is computed against M0.
| BIC = 2*criterion - log(N)*degrees of freedom.
| If the model has only constants or if it has no constants,
| the statistics reported here are not useable.
+-----+

```

```

+-----+
| Fit Measures for Binomial Choice Model
| Logit model for variable FY
+-----+
| Proportions P0= .288703 P1= .711297
| N = 717 N0= 207 N1= 510
| LogL = -383.13857 LogL0 = -430.9071
| Estrella = 1-(L/L0)^(-2L0/n) = .13171
+-----+
| Efron | McFadden | Ben./Lerman
| .12161 | .11086 | .64036
| Cramer | Veall/Zim. | Rsqrd_ML
| .12434 | .21540 | .12475
+-----+
| Information Akaike I.C. Schwarz I.C.
| Criteria 1.11057 864.90328
+-----+

```

Frequencies of actual & predicted outcomes
 Predicted outcome has maximum probability.
 Threshold value for predicting Y=1 = .5000

	Predicted		
Actual	0	1	Total
0	42	165	207
1	35	475	510
Total	77	640	717

=====
 Analysis of Binary Choice Model Predictions Based on Threshold = .5000
 =====

Prediction Success

```

-----
Sensitivity = actual 1s correctly predicted          93.137%
Specificity = actual 0s correctly predicted          20.290%
Positive predictive value = predicted 1s that were actual 1s 74.219%

```

Negative predictive value = predicted 0s that were actual 0s 54.545%
 Correct prediction = actual 1s and 0s correctly predicted 72.106%

Prediction Failure

False pos. for true neg. = actual 0s predicted as 1s 79.710%
 False neg. for true pos. = actual 1s predicted as 0s 6.863%
 False pos. for predicted pos. = predicted 1s actual 0s 25.781%
 False neg. for predicted neg. = predicted 0s actual 1s 45.455%
 False predictions = actual 1s and 0s incorrectly predicted 27.894%

LOGIT;Lhs=BY ;
 Rhs=ONE,BID,SEX,AGE,BUDD,SING,PROV,EDU,FAM,INC,BASE,SERV,NGEN,SCOP\$

--> LOGIT;Lhs=BY ;
 Rhs=ONE,BID,SEX,AGE,BUDD,SING,PROV,EDU,FAM,INC,BASE,SERV,NGEN,SCOP\$
 Normal exit from iterations. Exit status=0.

```

+-----+
| Multinomial Logit Model
| Maximum Likelihood Estimates
| Model estimated: Jun 02, 2013 at 00:56:15PM.
| Dependent variable          BY
| Weighting variable         None
| Number of observations      1434
| Iterations completed       6
| Log likelihood function     -814.3865
| Restricted log likelihood   -965.2607
| Chi squared                 301.7483
| Degrees of freedom         13
| Prob[ChiSq > value] =      .0000000
| Hosmer-Lemeshow chi-squared = 4.72093
| P-value= .78694 with deg.fr. = 8
+-----+
    
```

Variable	Coefficient	Standard Error	b/St.Er.	P[Z >z]	Mean of X
Characteristics in numerator of Prob[Y = 1]					
Constant	-3.248023260	1.8901557	-1.718	.0857	
BID	-.1009455595E-01	.12327404E-02	-8.189	.0000	196.55509
SEX	-.3185222316E-01	.12281978	-.259	.7954	.50488145
AGE	.7396577845E-02	.79990712E-02	.925	.3551	37.234310
BUDD	1.188062204	.34453832	3.448	.0006	.96234310
SING	-.1493182165E-01	.14984338	-.100	.9206	.54951185
PROV	-.1457135305E-03	.40064573E-03	-.364	.7161	124.49930
EDU	.8708502876E-01	.25717589E-01	3.386	.0007	14.168759
FAM	-.1289396680E-01	.29893063E-01	-.431	.6662	4.0599721
INC	.1864004357E-04	.30352184E-05	6.141	.0000	32622.509
BASE	.1846604622	.68396530E-01	2.700	.0069	4.0278940
SERV	-.1145267625	.47911842E-01	-2.390	.0168	3.6471409
NGEN	.1939031172	.29630359	.654	.5128	5.9637378
SCOP	2.237014569	.19168254	11.670	.0000	.50000000

(Note: E+nn or E-nn means multiply by 10 to + or -nn power.)

Matrix: LastO
 [14,4]

```

+-----+
| Information Statistics for Discrete Choice Model.
| M=Model MC=Constants Only M0=No Model
| Criterion F (log L) -814.38652 -965.26068 -993.97306
+-----+
    
```

```

| LR Statistic vs. MC      301.74832          .00000          .00000
| Degrees of Freedom      13.00000          .00000          .00000
| Prob. Value for LR      .00000           .00000          .00000
| Entropy for probs.      814.38652          965.26068          993.97306
| Normalized Entropy      .81932            .97111            1.00000
| Entropy Ratio Stat.     359.17307          57.42475          .00000
| Bayes Info Criterion    1723.25995          2025.00827          2082.43301
| BIC - BIC(no model)     359.17307          57.42475          .00000
| Pseudo R-squared        .15630            .00000            .00000
| Pct. Correct Prec.      70.99024          .00000            50.00000
| Means:      y=0    y=1    y=2    y=3    yu=4    y=5,    y=6    y>=7
| Outcome     .4003  .5997  .0000  .0000  .0000  .0000  .0000  .0000
| Pred.Pr     .4003  .5997  .0000  .0000  .0000  .0000  .0000  .0000
| Notes: Entropy computed as Sum(i)Sum(j)Pfit(i,j)*logPfit(i,j).
|         Normalized entropy is computed against M0.
|         Entropy ratio statistic is computed against M0.
|         BIC = 2*criterion - log(N)*degrees of freedom.
|         If the model has only constants or if it has no constants,
|         the statistics reported here are not useable.

```

```

+-----+
| Fit Measures for Binomial Choice Model |
| Logit      model for variable BY      |
+-----+
| Proportions P0= .400279  P1= .599721  |
| N =      1434  N0=      574  N1=      860  |
| LogL =   -814.38652  LogL0 =  -965.2607  |
| Estrella = 1-(L/L0)^(-2L0/n) = .20452  |
+-----+
|      Efron |      McFadden |      Ben./Lerman |
|      .19467 |      .15630   |      .61290      |
|      Cramer |      Veall/Zim. |      Rsqrd_ML    |
|      .19373 |      .30297   |      .18976      |
+-----+
| Information Akaike I.C. Schwarz I.C. |
| Criteria      1.15535      1730.52817  |
+-----+

```

Frequencies of actual & predicted outcomes
 Predicted outcome has maximum probability.
 Threshold value for predicting Y=1 = .5000
 Predicted

Actual	0	1	Total
0	320	254	574
1	162	698	860
Total	482	952	1434

=====
 Analysis of Binary Choice Model Predictions Based on Threshold = .5000
 =====

Prediction Success

```

-----
Sensitivity = actual 1s correctly predicted      81.163%
Specificity = actual 0s correctly predicted      55.749%
Positive predictive value = predicted 1s that were actual 1s  73.319%
Negative predictive value = predicted 0s that were actual 0s  66.390%
Correct prediction = actual 1s and 0s correctly predicted      70.990%
-----

```

Prediction Failure

```

-----
False pos. for true neg. = actual 0s predicted as 1s      44.251%
False neg. for true pos. = actual 1s predicted as 0s      18.837%
-----

```

```
False pos. for predicted pos. = predicted 1s actual 0s      26.681%
False neg. for predicted neg. = predicted 0s actual 1s      33.610%
False predictions = actual 1s and 0s incorrectly predicted  29.010%
=====
```

```
Maximize; labels = alpha,bta,bbudd,bedu,binc
;start=0.0001,0.0001,0.0001,0.0001,0.0001
;fcn = tyy*log(1-lgp(-alpha+bta*th+bbudd*budd+bedu*edu+binc*inc))+
tyn*log(lgp(-alpha+bta*th+bbudd*budd+bedu*edu+binc*inc))-(lgp(-
alpha+bta*tbid+bbudd*budd+bedu*edu+binc*inc))+
tny*log(lgp(-alpha+bta*tbid+bbudd*budd+bedu*edu+binc*inc))-(lgp(-
alpha+bta*tl+bbudd*budd+bedu*edu+binc*inc))+
tnn*log(lgp(-alpha+bta*tl+bbudd*budd+bedu*edu+binc*inc))$
.....
```

```
--> Maximize; labels = alpha,bta,bbudd,bedu,binc
;start=0.0001,0.0001,0.0001,0.0001,0.0001
;fcn = tyy*log(1-lgp(-alpha+bta*th+bbudd*budd+bedu*edu+binc*inc))+
tyn*log(lgp(-alpha+bta*th+bbudd*budd+bedu*edu+binc*inc))-(lgp(-
alpha+bta*...
tny*log(lgp(-alpha+bta*tbid+bbudd*budd+bedu*edu+binc*inc))-(lgp(-
alpha+bt...
tnn*log(lgp(-alpha+bta*tl+bbudd*budd+bedu*edu+binc*inc))$
Normal exit from iterations. Exit status=0.
```

```
+-----+
| User Defined Optimization |
| Maximum Likelihood Estimates |
| Model estimated: May 09, 2013 at 02:56:33AM. |
| Dependent variable          | Function |
| Weighting variable          | None     |
| Number of observations      | 717     |
| Iterations completed        | 10      |
| Log likelihood function     | 1052.326 |
| Restricted log likelihood    | .0000000 |
| Chi squared                 | 2104.651 |
| Degrees of freedom          | 5       |
| Prob[ChiSq > value] =      | .0000000 |
+-----+
```

```
+-----+-----+-----+-----+-----+
|Variable | Coefficient | Standard Error |b/St. Er. |P[|Z|>z] |
+-----+-----+-----+-----+-----+
ALPHA    -.2851197247   .72242115     -.395     .6931
BTA      .1040997498E-01 .80891051E-03  12.869    .0000
BBUDD    -.8431219957   .58316926     -1.446    .1482
BEDU     -.8304471672E-01 .27828737E-01 -2.984    .0028
BINC     -.1483213930E-04 .23502578E-05 -6.311    .0000
(Note: E+nn or E-nn means multiply by 10 to + or -nn power.)
```

[Matrix: LastO](#)
[5,4]

```
Maximize; labels = alpha,bta,banch
;start=0.01,0.01,0.01
;fcn = tyy*log(1-lgp(-alpha+bta*th+banch*anch))+
tyn*log(lgp(-alpha+bta*th+banch*anch))-(lgp(-alpha+bta*tbid+banch*anch))+
tny*log(lgp(-alpha+bta*tbid+banch*anch))-(lgp(-alpha+bta*tl+banch*anch))+
tnn*log(lgp(-alpha+bta*tl+banch*anch))$
.....
```

```
--> Maximize; labels = alpha,bta,banch
;start=0.01,0.01,0.01
```

```

;fcn = tyy*log(1-lgp(-alpha+bta*th+banch*anch))+
tyx*log(lgp(-alpha+bta*th+banch*anch))-(lgp(-
alpha+bta*tbid+banch*anch))+
tny*log(lgp(-alpha+bta*tbid+banch*anch))-(lgp(-
alpha+bta*tl+banch*anch))+
tnn*log(lgp(-alpha+bta*tl+banch*anch))$
Normal exit from iterations. Exit status=0.

```

```

+-----+
| User Defined Optimization
| Maximum Likelihood Estimates
| Model estimated: May 09, 2013 at 03:03:26AM.
| Dependent variable           Function
| Weighting variable           None
| Number of observations       717
| Iterations completed         8
| Log likelihood function      1087.994
| Restricted log likelihood     .0000000
| Chi squared                  2175.988
| Degrees of freedom           3
| Prob[ChiSq > value] =       .0000000
+-----+

```

```

+-----+-----+-----+-----+-----+
|Variable | Coefficient | Standard Error |b/St.Er.|P[|Z|>z] |
+-----+-----+-----+-----+-----+
ALPHA     1.972699781   .17609446   11.203   .0000
BTA       .9005209222E-02 .75276806E-03  11.963   .0000
BANCH    -.2935714822E-01 .15449005   -.190    .8493
(Note: E+nn or E-nn means multiply by 10 to + or -nn power.)

```

[Matrix: LastO](#)
[3,4]

```

Maximize; labels = alpha,bta,bbudd,bedu,binc
;start=0.0001,0.0001,0.0001,0.0001,0.0001
;fcn = fyy*log(1-lgp(-alpha+bta*fh+bbudd*budd+bedu*edu+binc*inc))+
fyn*log(lgp(-alpha+bta*fh+bbudd*budd+bedu*edu+binc*inc))-(lgp(-
alpha+bta*fbid+bbudd*budd+bedu*edu+binc*inc))+
fny*log(lgp(-alpha+bta*fbid+bbudd*budd+bedu*edu+binc*inc))-(lgp(-
alpha+bta*fl+bbudd*budd+bedu*edu+binc*inc))+
fnn*log(lgp(-alpha+bta*fl+bbudd*budd+bedu*edu+binc*inc))$
.....

```

```

--> Maximize; labels = alpha,bta,bbudd,bedu,binc
;start=0.0001,0.0001,0.0001,0.0001,0.0001
;fcn = fyy*log(1-lgp(-alpha+bta*fh+bbudd*budd+bedu*edu+binc*inc))+
fyn*log(lgp(-alpha+bta*fh+bbudd*budd+bedu*edu+binc*inc))-(lgp(-
alpha+bta*...
fny*log(lgp(-alpha+bta*fbid+bbudd*budd+bedu*edu+binc*inc))-(lgp(-
alpha+bt...
fnn*log(lgp(-alpha+bta*fl+bbudd*budd+bedu*edu+binc*inc))$
Normal exit from iterations. Exit status=0.

```

```

+-----+
| User Defined Optimization
| Maximum Likelihood Estimates
| Model estimated: May 09, 2013 at 03:09:16AM.
| Dependent variable           Function
| Weighting variable           None
| Number of observations       717
| Iterations completed         10
| Log likelihood function      910.3094
| Restricted log likelihood     .0000000
+-----+

```

```
| Chi squared                1820.619 |
| Degrees of freedom         5       |
| Prob[ChiSq > value] =     .0000000 |
+-----+

```

```
+-----+-----+-----+-----+
|Variable | Coefficient | Standard Error |b/St.Er.|P[|Z|>z] |
+-----+-----+-----+-----+
ALPHA    .6577929004E-01   .61599516      .107     .9150
BTA      .6397138821E-02   .38473740E-03  16.627   .0000
BBUDD    -.6405302078      .46558225      -1.376   .1689
BEDU     -.1105766512      .27991476E-01  -3.950   .0001
BINC     -.2365172102E-04  .26866911E-05  -8.803   .0000
(Note: E+nn or E-nn means multiply by 10 to + or -nn power.)

```

[Matrix: LastO](#)
[5.4]

```
Maximize; labels = alpha,bta,banch
;start=0.01,0.01,0.01
;fcn = fyy*log(1-lgp(-alpha+bta*fh+banch*anch))+
fyn*log(lgp(-alpha+bta*fh+banch*anch))-(lgp(-alpha+bta*fbid+banch*anch))+
fny*log(lgp(-alpha+bta*fbid+banch*anch))-(lgp(-alpha+bta*fl+banch*anch))+
fnn*log(lgp(-alpha+bta*fl+banch*anch))$
.....

```

```
--> Maximize; labels = alpha,bta,banch
;start=0.01,0.01,0.01
;fcn = fyy*log(1-lgp(-alpha+bta*fh+banch*anch))+
fyn*log(lgp(-alpha+bta*fh+banch*anch))-(lgp(-
alpha+bta*fbid+banch*anch))+
fny*log(lgp(-alpha+bta*fbid+banch*anch))-(lgp(-
alpha+bta*fl+banch*anch))+
fnn*log(lgp(-alpha+bta*fl+banch*anch))$
Normal exit from iterations. Exit status=0.

```

```
+-----+
| User Defined Optimization
| Maximum Likelihood Estimates
| Model estimated: May 09, 2013 at 03:13:20AM.
| Dependent variable          Function
| Weighting variable          None
| Number of observations      717
| Iterations completed        10
| Log likelihood function     970.2251
| Restricted log likelihood    .0000000
| Chi squared                 1940.450
| Degrees of freedom          3
| Prob[ChiSq > value] =      .0000000
+-----+

```

```
+-----+-----+-----+-----+
|Variable | Coefficient | Standard Error |b/St.Er.|P[|Z|>z] |
+-----+-----+-----+-----+
ALPHA    2.620324792      .15440078      16.971   .0000
BTA      .5591331308E-02  .35824128E-03  15.608   .0000
BANCH    -.1627729979     .13812629      -1.178   .2386
(Note: E+nn or E-nn means multiply by 10 to + or -nn power.)

```

[Matrix: LastO](#)
[3.4]

TOBIT; Lhs = TWTP; Rhs =
 ONE,SEX,AGE,BUDD,SING,PROV,EDU,FAM,INC,BASE,SERV,NGEN,ANCH\$

--> TOBIT; Lhs = TWTP; Rhs =
 ONE,SEX,AGE,BUDD,SING,PROV,EDU,FAM,INC,BASE,SERV...
 Normal exit from iterations. Exit status=0.

```

+-----+
| Limited Dependent Variable Model - CENSORED |
| Maximum Likelihood Estimates                |
| Model estimated: Apr 28, 2013 at 02:27:27PM. |
| Dependent variable                          TWTP |
| Weighting variable                          None |
| Number of observations                       717 |
| Iterations completed                        3     |
| Log likelihood function                     -4192.205 |
| Threshold values for the model:              |
| Lower= .0000                               Upper=+infinity |
| LM test [df] for tobit= 105.807[ 13]         |
| ANOVA based fit measure = .102851           |
| DECOMP based fit measure = .108264         |
+-----+
    
```

Variable	Coefficient	Standard Error	b/St.Er.	P[Z >z]	Mean of X
Primary Index Equation for Model					
Constant	-92.54431022	102.96870	-.899	.3688	
SEX	-2.537490170	6.3836944	-.397	.6910	.50488145
AGE	-.7597156841	.40040635	-1.897	.0578	37.234310
BUDD	35.57025750	16.653549	2.136	.0327	.96234310
SING	-19.56895682	7.7454100	-2.527	.0115	.54951185
PROV	-.1836529453E-02	.20190073E-01	-.091	.9275	124.49930
EDU	4.371085699	1.3520313	3.233	.0012	14.168759
FAM	-2.225730795	1.5461221	-1.440	.1500	4.0599721
INC	.7068987966E-03	.11031484E-03	6.408	.0000	32622.509
BASE	9.180504640	3.5506716	2.586	.0097	4.0278940
SERV	-2.424556151	2.4742097	-.980	.3271	3.6471409
NGEN	19.21490435	16.360940	1.174	.2402	5.9637378
ANCH	7.954671963	6.3070548	1.261	.2072	.51603905
Disturbance standard deviation					
Sigma	83.75789235	2.2118270	37.868	.0000	
(Note: E+nn or E-nn means multiply by 10 to + or -nn power.)					

Matrix: LastO
 [14,4]

```

--> calc; list; X=Phi(1.47957498142796)$
      X      = .93050664634543590D+00
--> calc; list; Y=N01(1.47957498142796)$
      Y      = .13351925263508970D+00
    
```

TOBIT; Lhs = FWTP; Rhs =
 ONE,SEX,AGE,BUDD,SING,PROV,EDU,FAM,INC,BASE,SERV,NGEN,ANCH\$

--> TOBIT; Lhs = FWTP; Rhs =
 ONE,SEX,AGE,BUDD,SING,PROV,EDU,FAM,INC,BASE,SERV...
 Normal exit from iterations. Exit status=0.

```

+-----+
| Limited Dependent Variable Model - CENSORED |
| Maximum Likelihood Estimates                |
| Model estimated: Apr 28, 2013 at 04:18:48PM. |
| Dependent variable                          FWTP |
| Weighting variable                          None |
| Number of observations                       717 |
| Iterations completed                        3     |
| Log likelihood function                     -4702.923 |
| Threshold values for the model:             |
| Lower= .0000                               Upper=+infinity |
| LM test [df] for tobit= 56.187[ 13]         |
| ANOVA based fit measure = .206921           |
| DECOMP based fit measure = .213183         |
+-----+
    
```

Variable	Coefficient	Standard Error	b/St.Er.	P[Z >z]	Mean of X
Primary Index Equation for Model					
Constant	-178.9521934	209.91938	-.852	.3939	
SEX	-9.050205196	13.014257	-.695	.4868	.50488145
AGE	-1.860432303	.81629709	-2.279	.0227	37.234310
BUDD	108.9101629	33.951119	3.208	.0013	.96234310
SING	-28.68075743	15.790348	-1.816	.0693	.54951185
PROV	-.1648328214E-01	.41160931E-01	-.400	.6888	124.49930
EDU	11.01878645	2.7563480	3.998	.0001	14.168759
FAM	-2.717908213	3.1520353	-.862	.3885	4.0599721
INC	.2187777506E-02	.22489574E-03	9.728	.0000	32622.509
BASE	24.47837995	7.2386537	3.382	.0007	4.0278940
SERV	-12.96080030	5.0441013	-2.569	.0102	3.6471409
NGEN	34.55984340	33.354586	1.036	.3001	5.9637378
ANCH	13.28546945	12.858014	1.033	.3015	.51603905
Disturbance standard deviation					
Sigma	170.7548443	4.5091892	37.868	.0000	
(Note: E+nn or E-nn means multiply by 10 to + or -nn power.)					

Matrix: LastO
 [14,4]

```

--> calc; list; X=Phi(1.84445597766558)$
      X      = .96744164209701720D+00
--> calc; list; Y=N01(1.84445597766558)$
      Y      = .72806687918688470D-01
    
```



```

+-----+
| Fit Measures for Binomial Choice Model |
| Logit      model for variable TY      |
+-----+
| Proportions P0= .511855  P1= .488145  |
| N =      717  N0=      367  N1=      350 |
| LogL =   -450.96035  LogL0 =  -496.7850 |
| Estrella = 1-(L/L0)^(-2L0/n) = .12550  |
+-----+
|      Efron |      McFadden |      Ben./Lerman |
|      .12302 |      .09224   |      .56179      |
|      Cramer |      Veall/Zim. |      Rsqrd_ML    |
|      .12308 |      .19512   |      .11999      |
+-----+
| Information Akaike I.C. Schwarz I.C. |
| Criteria      1.26349      915.07085 |
+-----+

```

Frequencies of actual & predicted outcomes
 Predicted outcome has maximum probability.
 Threshold value for predicting Y=1 = .5000
 Predicted

```

-----+-----
Actual   0    1 | Total
-----+-----
    0    267 100 |   367
    1    145 205 |   350
-----+-----
Total    412 305 |   717

```

=====
 Analysis of Binary Choice Model Predictions Based on Threshold = .5000
 =====

Prediction Success

```

-----+-----
Sensitivity = actual 1s correctly predicted          58.571%
Specificity = actual 0s correctly predicted          72.752%
Positive predictive value = predicted 1s that were actual 1s 67.213%
Negative predictive value = predicted 0s that were actual 0s 64.806%
Correct prediction = actual 1s and 0s correctly predicted 65.830%
-----+-----

```

Prediction Failure

```

-----+-----
False pos. for true neg. = actual 0s predicted as 1s 27.248%
False neg. for true pos. = actual 1s predicted as 0s 41.429%
False pos. for predicted pos. = predicted 1s actual 0s 32.787%
False neg. for predicted neg. = predicted 0s actual 1s 35.194%
False predictions = actual 1s and 0s incorrectly predicted 34.170%
-----+-----

```

=====
 =====

```

Maximize; labels = alpha,bta
;start=0.0001,0.0001
;fcn = ty*log(1-lgp(-alpha+bta*tbid))+(1-ty)*log(lgp(-alpha+bta*tbid))$
.....

--> Maximize; labels = alpha,bta
;start=0.0001,0.0001
;fcn = ty*log(1-lgp(-alpha+bta*tbid))+(1-ty)*log(lgp(-alpha+bta*tbid))$
Normal exit from iterations. Exit status=0.

```

```

+-----+
| User Defined Optimization
| Maximum Likelihood Estimates
| Model estimated: May 09, 2013 at 02:03:14AM.
| Dependent variable           Function
| Weighting variable           None
| Number of observations        717
| Iterations completed          6
| Log likelihood function       450.9604
| Restricted log likelihood      .0000000
| Chi squared                   901.9207
| Degrees of freedom            2
| Prob[ChiSq > value] =        .0000000
+-----+

```

```

+-----+-----+-----+-----+-----+
| Variable | Coefficient | Standard Error | b/St.Er. | P[|Z|>z] |
+-----+-----+-----+-----+-----+
ALPHA      2.613123592   .30618678      8.534     .0000
BTA        .1901211970E-01 .21117212E-02  9.003     .0000
(Note: E+nn or E-nn means multiply by 10 to + or -nn power.)

```

[Matrix: LastO](#)
[2.4]

```

create; z=log(1-tbid/inc)$
Maximize; labels = alpha,bta
;start=0.0001,0.0001
;fcf = ty*log(1-lgp(-alpha-bta*z))+(1-ty)*log(lgp(-alpha-bta*z))$
.....

--> create; z=log(1-tbid/inc)$
--> Maximize; labels = alpha,bta
;start=0.0001,0.0001
;fcf = ty*log(1-lgp(-alpha-bta*z))+(1-ty)*log(lgp(-alpha-bta*z))$
Normal exit from iterations. Exit status=0.

```

```

+-----+
| User Defined Optimization
| Maximum Likelihood Estimates
| Model estimated: May 09, 2013 at 01:18:29AM.
| Dependent variable           Function
| Weighting variable           None
| Number of observations        717
| Iterations completed          7
| Log likelihood function       455.2545
| Restricted log likelihood      .0000000
| Chi squared                   910.5091
| Degrees of freedom            2
| Prob[ChiSq > value] =        .0000000
+-----+

```

```

+-----+-----+-----+-----+-----+
| Variable | Coefficient | Standard Error | b/St.Er. | P[|Z|>z] |
+-----+-----+-----+-----+-----+
ALPHA      1.016381565   .13764662      7.384     .0000
BTA        144.1280397   14.237900     10.123    .0000

```

[Matrix: LastO](#)
[2.4]


```

+-----+
| Fit Measures for Binomial Choice Model |
| Logit      model for variable FY      |
+-----+
| Proportions P0= .288703   P1= .711297 |
| N =      717  N0=      207   N1=      510 |
| LogL =   -421.96102 LogL0 = -430.9071 |
| Estrella = 1-(L/L0)^(-2L0/n) = .02490 |
+-----+
|      Efron |      McFadden |      Ben./Lerman |
|      .02489 |      .02076   |      .59982      |
|      Cramer |      Veall/Zim. |      Rsqrd_ML    |
|      .02562 |      .04460   |      .02465      |
+-----+
| Information Akaike I.C. Schwarz I.C. |
| Criteria          1.18260      857.07218 |
+-----+

```

Frequencies of actual & predicted outcomes
 Predicted outcome has maximum probability.
 Threshold value for predicting Y=1 = .5000
 Predicted

```

-----+-----
Actual   0     1 | Total
-----+-----
    0     10  197 |    207
    1     10  500 |    510
-----+-----
Total    20  697 |    717

```

=====
 Analysis of Binary Choice Model Predictions Based on Threshold = .5000
 =====

Prediction Success

```

-----+-----
Sensitivity = actual 1s correctly predicted          98.039%
Specificity = actual 0s correctly predicted          4.831%
Positive predictive value = predicted 1s that were actual 1s  71.736%
Negative predictive value = predicted 0s that were actual 0s  50.000%
Correct prediction = actual 1s and 0s correctly predicted  71.130%
-----+-----

```

Prediction Failure

```

-----+-----
False pos. for true neg. = actual 0s predicted as 1s      95.169%
False neg. for true pos. = actual 1s predicted as 0s       1.961%
False pos. for predicted pos. = predicted 1s actual 0s     28.264%
False neg. for predicted neg. = predicted 0s actual 1s     50.000%
False predictions = actual 1s and 0s incorrectly predicted  28.870%
-----+-----

```

=====

```

Maximize; labels = alpha,bta
;start=0.0001,0.0001
;fcn = fy*log(1-lgp(-alpha+bta*fbid))+(1-fy)*log(lgp(-alpha+bta*fbid))$
.....

--> Maximize; labels = alpha,bta
;start=0.0001,0.0001
;fcn = fy*log(1-lgp(-alpha+bta*fbid))+(1-fy)*log(lgp(-alpha+bta*fbid))$
Normal exit from iterations. Exit status=0.

```

```

+-----+
| User Defined Optimization
| Maximum Likelihood Estimates
| Model estimated: May 09, 2013 at 02:01:27AM.
| Dependent variable           Function
| Weighting variable           None
| Number of observations       717
| Iterations completed         6
| Log likelihood function      421.9610
| Restricted log likelihood    .0000000
| Chi squared                  843.9220
| Degrees of freedom          2
| Prob[ChiSq > value] =      .0000000
+-----+

```

```

+-----+-----+-----+-----+-----+
| Variable | Coefficient | Standard Error | b/St.Er. | P[|Z|>z] |
+-----+-----+-----+-----+-----+
ALPHA      2.296086625      .34918019      6.576      .0000
BTA        .5435346413E-02  .12974409E-02  4.189      .0000
(Note: E+nn or E-nn means multiply by 10 to + or -nn power.)

```

Matrix: LastO
[2,4]

```

create; z=log(1-fbid/inc)$
Maximize; labels = alpha,bta
;start=0.0001,0.0001
;fcf = fy*log(1-lgp(-alpha-bta*z))+(1-fy)*log(lgp(-alpha-bta*z))$
.....

```

```

--> create; z=log(1-fbid/inc)$
--> Maximize; labels = alpha,bta
      ;start=0.0001,0.0001
      ;fcf = fy*log(1-lgp(-alpha-bta*z))+(1-fy)*log(lgp(-alpha-bta*z))$
Normal exit from iterations. Exit status=0.

```

```

+-----+
| User Defined Optimization
| Maximum Likelihood Estimates
| Model estimated: May 09, 2013 at 01:24:03AM.
| Dependent variable           Function
| Weighting variable           None
| Number of observations       717
| Iterations completed         7
| Log likelihood function      423.0360
| Restricted log likelihood    .0000000
| Chi squared                  846.0719
| Degrees of freedom          2
| Prob[ChiSq > value] =      .0000000
+-----+

```

```

+-----+-----+-----+-----+-----+
| Variable | Coefficient | Standard Error | b/St.Er. | P[|Z|>z] |
+-----+-----+-----+-----+-----+
ALPHA      1.341648715      .13034667     10.293     .0000
BTA        30.48230779      5.9736469     5.103     .0000

```

Matrix: LastO
[2,4]

```

Maximize; labels = alpha,bta
;start=0.01,0.01
;fcfn = tyy*log(1-lgp(-alpha+bta*th))+
tyn*log(lgp(-alpha+bta*th))-(lgp(-alpha+bta*tbid))+
tny*log(lgp(-alpha+bta*tbid))-(lgp(-alpha+bta*tl))+
tnn*log(lgp(-alpha+bta*tl))$
.....

```

```

--> Maximize; labels = alpha,bta
;start=0.01,0.01
;fcfn = tyy*log(1-lgp(-alpha+bta*th))+
tyn*log(lgp(-alpha+bta*th))-(lgp(-alpha+bta*tbid))+
tny*log(lgp(-alpha+bta*tbid))-(lgp(-alpha+bta*tl))+
tnn*log(lgp(-alpha+bta*tl))$
Normal exit from iterations. Exit status=0.

```

```

+-----+
| User Defined Optimization |
| Maximum Likelihood Estimates |
| Model estimated: May 09, 2013 at 02:20:00AM. |
| Dependent variable          Function |
| Weighting variable          None |
| Number of observations      717 |
| Iterations completed        7 |
| Log likelihood function     1088.023 |
| Restricted log likelihood    .0000000 |
| Chi squared                 2176.046 |
| Degrees of freedom          2 |
| Prob[ChiSq > value] =      .0000000 |
+-----+

```

```

+-----+-----+-----+-----+-----+
|Variable | Coefficient | Standard Error | b/St.Er. | P[ |Z|>z] |
+-----+-----+-----+-----+-----+
ALPHA    1.987601605    .15971716    12.445    .0000
BTA      .9002931260E-02  .75208423E-03  11.971    .0000
(Note: E+nn or E-nn means multiply by 10 to + or -nn power.)

```

[Matrix: LastO](#)
[2,4]

```

create; zbid=log(1-tbid/inc)$
create; zh=log(1-th/inc)$
create; zl=log(1-tl/inc)$
Maximize; labels = alpha,bta
;start=0.0001,0.0001
;fcfn = tyy*log(1-lgp(-alpha-bta*zh))+
tyn*log(lgp(-alpha-bta*zh))-(lgp(-alpha-bta*zbid))+
tny*log(lgp(-alpha-bta*zbid))-(lgp(-alpha-bta*zl))+
tnn*log(lgp(-alpha-bta*zl))$
.....

```

```

--> create; zbid=log(1-tbid/inc)$
--> create; zh=log(1-th/inc)$
--> create; zl=log(1-tl/inc)$
--> Maximize; labels = alpha,bta
;start=0.0001,0.001
;fcfn = tyy*log(1-lgp(-alpha-bta*zh))+
tyn*log(lgp(-alpha-bta*zh))-(lgp(-alpha-bta*zbid))+
tny*log(lgp(-alpha-bta*zbid))-(lgp(-alpha-bta*zl))+
tnn*log(lgp(-alpha-bta*zl))$
Normal exit from iterations. Exit status=0.

```

```

+-----+
| User Defined Optimization
| Maximum Likelihood Estimates
| Model estimated: May 09, 2013 at 02:34:15AM.
| Dependent variable           Function
| Weighting variable           None
| Number of observations        717
| Iterations completed          7
| Log likelihood function       1102.995
| Restricted log likelihood     .0000000
| Chi squared                   2205.989
| Degrees of freedom            2
| Prob[ChiSq > value] =       .0000000
+-----+

```

Variable	Coefficient	Standard Error	b/St.Er.	P[Z >z]
ALPHA	1.492843485	.12432809	12.007	.0000
BTA	117.6647159	9.5644893	12.302	.0000

Matrix: LastO
[2,4]

```

Maximize; labels = alpha,bta
;start=0.01,0.01
;fcf = fyy*log(1-lgp(-alpha+bta*fh))+
fyn*log(lgp(-alpha+bta*fh))-(lgp(-alpha+bta*fbid))+
fny*log(lgp(-alpha+bta*fbid))-(lgp(-alpha+bta*fl))+
fnn*log(lgp(-alpha+bta*fl))$
.....

```

```

--> Maximize; labels = alpha,bta
;start=0.01,0.01
;fcf = fyy*log(1-lgp(-alpha+bta*fh))+
fyn*log(lgp(-alpha+bta*fh))-(lgp(-alpha+bta*fbid))+
fny*log(lgp(-alpha+bta*fbid))-(lgp(-alpha+bta*fl))+
fnn*log(lgp(-alpha+bta*fl))$
Normal exit from iterations. Exit status=0.

```

```

+-----+
| User Defined Optimization
| Maximum Likelihood Estimates
| Model estimated: May 09, 2013 at 02:37:19AM.
| Dependent variable           Function
| Weighting variable           None
| Number of observations        717
| Iterations completed          7
| Log likelihood function       971.1131
| Restricted log likelihood     .0000000
| Chi squared                   1942.226
| Degrees of freedom            2
| Prob[ChiSq > value] =       .0000000
+-----+

```

Variable	Coefficient	Standard Error	b/St.Er.	P[Z >z]
ALPHA	2.693841729	.14524749	18.547	.0000
BTA	.5563158158E-02	.35279617E-03	15.769	.0000

(Note: E+nn or E-nn means multiply by 10 to + or -nn power.)

Matrix: LastO
[2,4]

```

create; zbid=log(1-fbid/inc)$
create; zh=log(1-fh/inc)$
create; zl=log(1-fl/inc)$
Maximize; labels = alpha,bta
;start=0.0001,0.0001
;fcn = fyy*log(1-lgp(-alpha-bta*zh))+
fyn*log(lgp(-alpha-bta*zh))-(lgp(-alpha-bta*zbid))+
fny*log(lgp(-alpha-bta*zbid))-(lgp(-alpha-bta*zl))+
fnn*log(lgp(-alpha-bta*zl))$

```

```

--> create; zbid=log(1-fbid/inc)$
--> create; zh=log(1-fh/inc)$
--> create; zl=log(1-fl/inc)$
--> Maximize; labels = alpha,bta
;start=0.0001,0.0001
;fcn = fyy*log(1-lgp(-alpha-bta*zh))+
fyn*log(lgp(-alpha-bta*zh))-(lgp(-alpha-bta*zbid))+
fny*log(lgp(-alpha-bta*zbid))-(lgp(-alpha-bta*zl))+
fnn*log(lgp(-alpha-bta*zl))$
Normal exit from iterations. Exit status=0.

```

```

+-----+
| User Defined Optimization
| Maximum Likelihood Estimates
| Model estimated: May 09, 2013 at 02:39:39AM.
| Dependent variable           Function
| Weighting variable           None
| Number of observations       717
| Iterations completed         6
| Log likelihood function      975.2798
| Restricted log likelihood     .0000000
| Chi squared                  1950.560
| Degrees of freedom           2
| Prob[ChiSq > value] =       .0000000
+-----+

```

```

+-----+-----+-----+-----+-----+
|Variable | Coefficient | Standard Error | b/St.Er. | P[|Z|>z] |
+-----+-----+-----+-----+-----+
ALPHA    2.119149612   .10576392    20.037   .0000
BTA      73.02627660   3.4399211   21.229   .0000

```

Matrix: LastO
[2,4]

BIOGRAPHY

NAME

Wiroj Lakkhanaadisorn

ACADEMIC BACKGROUND

Bachelor of Engineering degree with a major in Automotive Engineering from Chulalongkorn University, Bangkok, Thailand in 1999 and a Master in Business Administration from Chulalongkorn University in 2005

PRESENT POSITION

Director of SE-ED Learning Center and Director of Human Resources and Organization Development, SE-EDUCATION Public Company Limited, Bangkok, Thailand

EXPERIENCES

Received a merit scholarship from School of Development Economics, National Institute of Development Administration, Bangkok, Thailand during study Ph.D. program in Economics

The member of CSR Club committee, Thai Listed Companies Association