The Economic Value of Museums:

A Case Study of the National Museum of Natural Science, Taiwan

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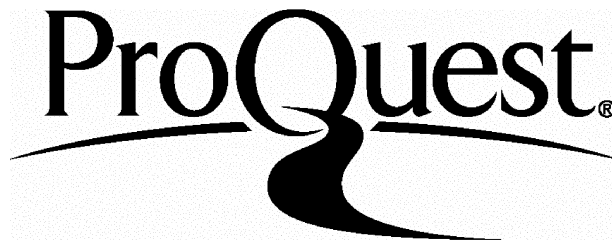
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ABSTRACT

The purpose of this research was to explore what contribution an economic valuation approach can make to achieve a more sustainable management of museums, using the National Museum of Natural Science (NMNS) in Taiwan as a case study. This research employs management interviews and museum documentary surveys to explore the current financing mechanism of the NMNS and the Contingent Valuation Method to demonstrate the total economic value of the NMNS.

The museum interviews and museum documentary surveys show that the development of the museums sector in Taiwan is a relatively new phenomenon. Although the NMNS and the museums sector are not directly under as strong political, economic and social pressures as their Western counterparts are, a more challenging future is foreseeable in the wider economic climate. The NMNS as well as the museums sector as a whole are not well prepared for this.

The Contingent Valuation study discovers that people in Taiwan care about museums in general. The NMNS, amongst all museums in Taiwan, is of national significance. People would support a substantially higher level of government subsidise for the NMNS, and perhaps higher personal admission charges.

This research has demonstrated that the Contingent Valuation Method can produce valid benefit measures of the NMNS, and identify factors associated with the benefit measures through econometric modelling. The revealed benefit measures and their associated factors provide useful information for museum policy formulation and evaluation from a public perspective. The results from the Contingent Valuation exercise are successfully used to demonstrate the NMNS's benefits to society, and to optimise its use of public resources without compromising the museum's fundamental duties.

Overall, this research presents:
- A first attempt to undertake a general public survey concerning the public demand for museums in Taiwan
- A first attempt to devise an economic valuation study of museums in a non-advanced country
- One of the very few economic valuation studies for cultural heritages to elicit non-use values, which enables a more comprehensive demonstration of the economic values of a cultural (quasi)-public good

- A critical analysis of the current and potential financing mechanisms for museums in Taiwan in general and for the NMNS in particular. This was achieved by making use of the results from the management interviews, museum documentary surveys, and the Contingent Valuation study.

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LIST OF ABBREBVIATIONS

ABS	Australian Bureau of Statistics
BMRB	British Market Research Bureau
CV	Contingent Valuation
DGBAS	Directorate-General of Budget, Accounting and Statistics
ICOM	International Council of Museums
NHM	National History Museum
NMNS	National Museum of Natural Science
NMMB	National Museum of Marine Biology
NMP	National Museum of Prehistory
NMST	National Museum of Science and Technology
NPM	National Palace Museum
TGI	Target Group Index Survey
WTA	Willingness-to-accept
WTP	Willingness-to-pay

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Chapter 1   Introduction

1.1 Background to the study

The issue of museum management has attracted much attention over recent decades,

due to the rapid and severe change in the context for management in museums: from a

laissez-faire climate in which professional, curatorial objectives dominated, to one in

which there are overt challenges. Museums, almost everywhere in the world, are under

pressure from increasing requirements of accountability, increasing competition with

each other and other societal interests for limited public resources, and a more

sophisticated and demanding market.

Management thinking from the commercial sector has been introduced to the museums

sector to help museums respond to the challenges. Despite the improvements in recent

years in terms of the quality of management practice in museums as well as the breadth

and depth of researches on museums from a management perspective, there remain

unresolved problems in responding to the pressures and challenges. The conventional

formulation of museum policies and missions tends to be a supply-driven approach

representing the perspectives from the professional communities on how museums

should be managed, which may be challenged in the current participatory democracies.

Other tools, such as performance measurements, and museum market surveys, do not

provide enough information for comparisons between the demands for museums

against each other or with other societal needs – key pieces of information needed for

public resource allocation.

Tools developed by environmental economists to value ' public good' aspects of the

' natural' world have great potential to provide a valuable step further, since they are

demand-driven and involve public participation. So far there have only been a few

empirical applications to cultural heritage issues (see Table 2.1). Furthermore, they

normally produce a single, simple and understandable measurement – a monetary

value – which makes a relatively objective comparison between projects possible, so as

to enable an informed decision about the allocation of scarce public resources.

There are four main economic valuation studies on museum issues (Martin 1994;

Santagata and Signorello 2000; Maddison and Foster 2001; Mazzanti 2001). All their

valuation exercises are based in the context of the developed world, and the policy

recommendations from the survey results are mainly drawn from economic rationales

with little reference to museum managerial and curatorial attitudes and perspectives.

To extend the context of empirical studies on economic valuation for museums to the

non-advanced world, a museum in Taiwan – the National Museum of Natural Science

(NMNS) – has been selected as the case study for this research.

Amongst all the museums in Taiwan, the NMNS was chosen as the case study because

of its enormous publicity, which lessened the difficulties involved in the Contingent

Valuation exercise. Also, the NMNS plays a critical role in linking the development of

museums in Taiwan with the international museum community. It has been following

closely the development of its counterparts in the West, and, at the same time, leading

the museum community in Taiwan since its beginning. Therefore, lessons learned from

the NMNS will not be completely foreign to the international museum community and

will influence the museum development domestically.

In order to achieve a critical analysis of the current and potential financing mechanisms

for museums in Taiwan in general and for the NMNS in particular, the results from the

Contingent Valuation exercise, together with the qualitative information concerning the

managerial and curatorial attitudes towards the management of the museum are

required.

Currently, the NMNS is relatively secure financially, and is entirely dependent on

government funding. At the government level, there is neither clear policy nor

legislation on how much money the government should spend on the museums sector

or any single museum. Although the NMNS is, for the time being, one of the highest

profile and best resourced museums in Taiwan, there is no guarantee that its finance

will continue to be as secure in the future. Also, in the wider economic climate, with the

widening of budget deficits, the accumulation of outstanding public debt and growing

demands on public policies and programmes, the government' s ability to keep funding

the NMNS as generously as it has been is open to question.

As is the case with all other public services sectors, all the expenses of the NMNS

depends entirely on the allocation of government expenditure, while all the

self-generated income including admission charges is paid into the government

finances without benefiting the museum. The current financing mechanism of the

NMNS leaves the museum with no incentive to increase its earned revenues, and,

sometimes, even results in it deliberately decreasing its earned revenues. From the

perspective of the allocation of public resources, the resourcing of the NMNS is often

less than efficient. The problems which may result from its resource management have

not yet surfaced, since the NMNS and the museum community in Taiwan have not yet

faced pressures in their management and financing as fierce as their Western

counterparts have. However, the management tool provided by economic valuation can be helpful if the NMNS and other museums in Taiwan are to be prepared for a more challenging future.

1.2 Research inquiries and contributions

In the context described above, the ultimate aims of this research are:

- to explore the application of economic valuation techniques to the area of museum financing policy issues

- to reach a critical analysis of the current and potential financing mechanisms for museums in Taiwan in general and for the NMNS in particular, by making use of the results from the management interviews, museum documentary surveys, and the Contingent Valuation study

- to examine whether the economic valuation approach can be a useful and stimulating addition to the existing museum management portfolio

- to offer an empirical contribution to the economic valuation literature in the area of museums in non-developed countries

To address the above issues, detailed research in relation to the case study institution was required in four key areas

1. the managerial and curatorial perspectives on financing of the museums sector and of the NMNS

2. public attitudes towards the museums sector and the NMNS

3. the economic values associated with the maintenance of the NMNS at its current level and the access to it

4. policy implications of the revealed economic values

The first task involved surveying official documents and conducting in-depth interviews with key personnel of the NMNS. The exploration of public attitudes and the measurement of the economic values were achieved by means of a Contingent Valuation (CV) survey. The last was investigated by drawing together literature reviews, expert reviews, and the CV survey results.

CV is a demand-driven approach which involves public consultation. It employs survey techniques to ask respondents about the values that they would place on the non-market good in question, revealed by their willingness-to-pay (WTP) for the provision of the good, in a hypothetical market (Mitchell and Carson 1989; Bateman *et al* 2002). Because the elicited WTP values are contingent upon the hypothetical market described to the respondents, this approach came to be called the contingent valuation method (Mitchell and Carson 1989: 3). The important advantages of the CV method are that it is flexible and powerful in its potential to measure the values that may be unrelated to the actual use, and that it is informative since it allows the collection of attitudinal data. As a result, it is particularly suited for the evaluation of cultural heritage, including museums.

The CV survey employed in this research focuses on three tasks to attempt to account holistically for the economic value accruing to museum visitors and the general public in Taiwan from maintaining the provision of the NMNS and visiting the museum. The tasks were to:

1.   elicit from the visitors and the public, their willingness-to-pay (WTP) for the
      maintenance of, and visit to, the NMNS

2.   identify factors determining WTP

3. obtain data on the uses of, and attitudes towards, the museums sector in Taiwan as a piece of complementary information on the demand for the NMNS

Overall, this research presents:

*   a first attempt to undertake a general public survey concerning the public demand for museums in Taiwan. Although the issues concerning the public demand for museums have been widely explored in the museum management literature, they are, mainly, addressed in the context of the developed world and have generally not involved WTP estimates (see, for example, Falk and Dierking 1992; Hooper-Greenhill 1994; Davies 1994; Middleton 1998)

*   a first attempt to devise an economic valuation study of museums in a non-advanced country. The previous four major economic valuation studies of museums (Martin 1994; Santagata and Signorello 2000; Maddison and Foster 2001; Mazzanti 2001) all relate to developed economies. As far as the policy issues of the museums sector are concerned, to estimate the economic values for museums will provide information that is in addition to that obtained through conventional museum management approaches

*   one of the very few economic valuation studies for cultural heritages (see Table 2.1) to elicit non-use values, which enables a more comprehensive demonstration of the economic values of a cultural (quasi-)public good

*   a critical analysis of the current and potential financing mechanisms for museums in Taiwan in general and for the NMNS in particular. This was achieved by making use of the results from the management interviews, museum documentary surveys, and the CV study

1.3   Outlines of thesis chapters

The remainder of the thesis is organised as follows: Chapter 2 considers the role of

economic valuation in museum management. Issues and developments of museum

management literature are reviewed so as to identify any gaps in the research which the

economic valuation approach can provide additional insights. Chapter 3 then

introduces the case study and its contextual information revealed by analysing museum

documents and in-depth interviews with key personnel within the museum. Chapter 4

focuses on the methodological issues and the design of the contingent valuation (CV)

survey. Following the conventional CV survey design, the current CV survey consists

of three parts: attitudinal questions, the valuation exercises, and the demographic

questions. Chapter 5 analyses the results of the CV survey from the demographic

section, and the attitudinal questions, which provide background information on the

composition of the survey respondents, and complementary attitudinal information on

the public demands for the NMNS. In Chapter 6, the survey results from the valuation

exercises are econometrically analysed. Chapter 7 discusses the management

implications of the survey results. The last chapter concludes and evaluates the

economic valuation approach.

Chapter 2   The Role of Economic Valuation in Museum Management

This chapter begins by reviewing the challenges and pressures on the management of

museums. This leads to the development of the application of management thinking

for improving museum efficiency in meeting public demand. The concept of economic

valuation is then introduced to see why it has the potential to take this challenging task

of museum management one step further. The available economic valuation studies for

cultural heritages, especially those concerning museums, are reviewed in the final part

of this chapter.

2.1   Museum management – the issue

2.1.1. Challenges and pressures

Over the last decade or so, there has been a proliferation of articles and books that refer

to museum management. A review of the museum management literature shows that

the context for management in museums has been changing rapidly, from a *laissez-faire*

climate in which professional, curatorial objectives dominated, to one in which there

are overt pressures and challenges (see, for example, Boylan 1992; Moore 1994; Fopp

1997; Huang 1997; Kolter and Kolter 1998; Babbidge 2000). According to Moore

(1994: 1), these pressures and challenges can be schematically divided into the political,

the economic and the social, although these sometimes overlap and are inter-linked

(Figure 2.1).

Figure 2.1   Museum management – challenges and pressures
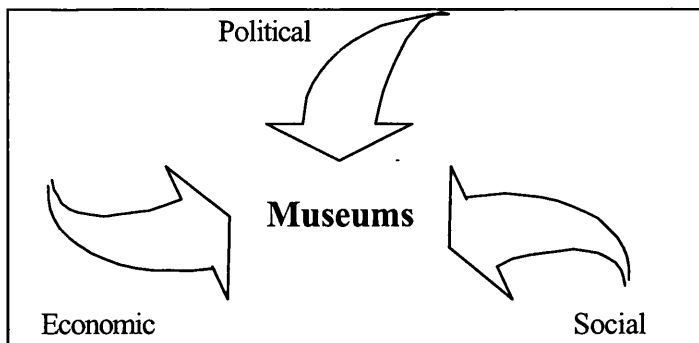
Political

Most museums depend either directly or indirectly on public funding. It is therefore

inevitable that museums are affected by government policies to a substantial extent. It

is commonly recognised in museum and heritage conservation literature, that in many

countries since the late 1970s, public spending has been cut, and there has been a

greater emphasis placed upon the market place as an alterative source of income.

Museums have not escaped these general changes in public expenditure policy (see, for

example, Moore 1994: 1; Doughty 1997: 35; Hebditch 1997: 91; Pickering 1997: 105).

This has resulted in a growing emphasis on efficiency in museum management.

The current norms of public sector management have brought to prominence such

concepts as the accountability and audit of museums (Fahy 1995: 2; Mann 1997: 69;

Blackmore *et al* 1997: 17). Tax payers have been encouraged to exert their right to

bring public servants to account and to insist that they are told how their money is spent,

and that it is being spent wisely and that it represents at least the essential minimum of

spending. Public institutions are increasingly encouraged, or even required, to justify

their expenditure decisions or requests for funding in terms of generated ' consumer

benefits' and those that are unable to do so might find their budgets cut (Pearce *et al*

2001: 10; Cassar 1998: 5).

This world-wide process of decreasing support from the public sector has also led to an

increased cooperation between the public and private sectors and pushed museums

gradually towards the market place, with a consequent need to emphasise income

generation and marketing as never before (Moore 1994: 1; Snickars 1996: 352).

Economic

Museums, like many other organisations, are also affected by the prevailing economic

climate. The economic climate within which museums, especially the public sector

ones, have to operate has become more hostile and uncertain, and has created a sharper

competitive environment in recent years. For many museums today, the traditional

mission has been joined by a more immediate goal: economic survival (see, for

example, Perrot 1992: 148; Moore 1994: 1; Baer and Snethlage 1996: 2; Frey and

Busenhart 1996: 279). This is partly due to the political challenges discussed above,

and partly the increasingly challenging 'market'.

It goes without saying that resources, including money, people, and knowledge, are

needed for maintaining and managing of museums. Museums are only one domain of

cultural heritage. Preservation of cultural heritage competes with other societal

interests, such as education, social welfare, or national defence. Even within the

cultural budget, single projects also compete with each other for limited resources. In

an economic environment where future governmental funding for museums is likely to

remain constant or be reduced, museums now need to pay close attention to the

performance of their budgets to ensure that the existing museum activities and services

provide value for money and that current resources are allocated efficiently and

effectively (Johnson and Thomas 1991a: 37; Leigh *et al* 1992: 282; Mohr and Schmidt

1996: 335; Knell 1997: 15; Huang 1997: 17; Avrami and Mason 2000: 4; Cernea 2001:

41).

In addition to the foreseeable static or decreasing governmental resources, museums

have also been facing an increasingly challenging and rapidly changing market.

Museums have always competed for visitors with each other. The rapidly growing

number of museums in almost all countries in the world has led to the possibility that

the museum market is now oversupplied. Competition from without has also been more

intense, both from a broader range of attractive leisure pursuits, and from the 'heritage

industry' style of attractions, which arguably offer more sophisticated and entertaining

displays to an ever more astute public (Moore 1994: 1; Middleton 1998: 15).

Social

Museums have also been increasingly required to respond to a further set of what can

be loosely defined as 'social pressures', to respond more effectively to the needs of a

plural society (see, for example, Ames 1986: 11; Vergo 1989: 2; Horne 1992; Moore

1994: 2; Brimblecombe 1996: 396; McLean 1997: 23; Huang 1997: 166; Avrami and

Mason 2000: 68). Historically, the very existence and function of museums has been

taken for granted, especially amongst museum professionals. That societies should

save old things was a matter of tradition, to be accepted and respected, and the reasons

were not examined too closely. However, it is not until recently that the traditional

notions regarding museums and their collections have been challenged. In the current

climate of globalisation, technological advances, population mobility, and the spread of

participatory democracies and market economics, it has become quite clear to the

museum community that these and other societal trends are profoundly and rapidly

changing cultures and communities. There has been a growing pressure from society

for museums to provide access in its broadest sense to meet the needs of the public, to

represent more fully their histories in a multicultural society, and to make contributions

to the society that is asked to support them.

2.1.2. Management thinking in the museum context – development and deficiency

The above challenges and pressures were the context in which management thinking

from the commercial sector was introduced to the museums sector to help museums

respond. Fopp has thoroughly reviewed the chronology of management thinking and

how that thinking has affected museums and galleries (Fopp 1997: 7-33). In this section,

the review of management thinking in the museum context focuses on the application

of various management techniques in museums since the 1970s based on the

Anglo-American experiences.

The application of management theories in museums has not been without its problems.

However, with the learning process of adopting and adapting various management

theories to the specific needs and context of museums in the past few decades, some

management approaches have been proved useful. These include the formulation of an

overall policy, mission statements, and forward plans, performance measurement and

evaluation, museum marketing, and financial management.

The overall policy, the mission statements, and the forward plans, are about formulating

what a museum wishes to achieve, and how it intends to achieve it. They have proved

invaluable in helping museums to define their unique contribution and to focus on the

activities of museums to fulfil their missions (Hatton 1994; Cossons

1994; Lord and Lord 1991). However, despite the welcome development of overall

policy, mission statements and forward planning, a key issue, especially under the

current ' social pressures' , remains unresolved: by whom, and through what process,

should these be formulated? Whose vision should guide a museum' s decision-making,

and how can this best be established (Beer 1994: 31)?

Knowing what to do and how to do it, a museum then needs some means of measuring

or evaluating how successfully this is being done. This is where ' performance

measurement' comes into play. Counting visitor numbers or finding out expenditure

per visitor can be considered a very simple form of performance measurement. What is

useful is its recent emphasis on establishing whether or not museums provide ' value for

money' (Ames 1994; Jackson 1994; Gosling 1994). While performance measurement

undoubtedly has many benefits to offer, it is not without its problems. First, many, if not

most of the critical qualities of good museums cannot be measured quantitatively; so,

how can the overall importance or the quality of a museum be measured? Second, how

many indicators are needed and how can the ideal range for a given performance

standard, if any, be calculated? Third, how to compare one museum' s performance over

time, with other museums' or even, with those of other institutions in other sectors

(Ames 1994; Jackson 1994)? These are crucial issues when the information is used for

allocation of resources.

Acknowledging that museums are in sharper competition for a share of the public' s

money, time, interest, energy and support, museums marketing departments have

developed dramatically since the mid-1980s and museum marketing has become one of

the most high-profile aspect of research on museum management in recent years

(Moore 1994: 12; Lewis 1994; McLean 1997; Huang 1997: 19; Kawashima 1998).

There has been a growing knowledge about the museum 'market' (see, for example,

Davies 1994; Middleton 1991; MORI 2001) and the use of museum 'product' – mainly,

the visiting experiences (see, for example, Falk and Dierking 1992; Hooper-Greenhill

1994). Museums now have a better understanding of, and the techniques to obtain, the

visitor and non-visitor profile, why people visit and do not visit museums, and the

patterns of behaviour during a museum visit. It is even possible to predict the market

size and trends. However, there is still no complete understanding of how important

museums are for society, when they are compared with each other, or especially, with

other societal needs – one of the key pieces of information needed for resource

allocation.

Until a few decades ago, most museums were only concerned about expenditure,

because their source of funding was through regular grants. Spending these funds

required only the general oversight of a budget which was frequently sufficient to cover

perceived needs. However, due to relatively recent changes in the economic climate,

financial management in museums today involves not only watching museum budgets

but also seeking new sources of funding. Therefore, financial management skills have

had to be developed and the wider economic role of museums has had to be explored.

Although some researchers have started responding to financial management and

economic thinking (see, for example, Atkinson 1994; Harney 1994; Johnson and

Thomas 1991; Fopp 1997), a greater understanding of the economic approach to

management and its application to museums is still needed.

The above review shows that important strides have been made in recent years in terms

of the quality of management practice in museums as well as the breadth and depth of

research on museums from a management perspective, but there remain unsolved

problems in responding to the current political, economic, and social challenges. A

more public consultation economic valuation approach may provide a valuable further

step.

2.2   Economic valuation and museum management

2.2.1. The debate

The debate about whether museums should subject themselves and their collections to

economic analysis is long standing. The argument against using economic analysis

tends to focus on the unique nature of museum collections as a barrier to any economic

valuation. Those who are opposed to adopting an economic approach have argued that

museum collections are beyond economic reasoning and calculation: the museum's

raison d'être is exactly seen in the fact that it is divorced from material considerations.

Following this perspective, museum collections need no economic justification.

Preservation of museum collections is a moral duty imposed upon the museum

community. Museums are thus considered to be appropriate institutions for collective

finance with public money (Carman *et al* 1999: 146; Carnegie and Wolnizer 1996, 1997;

Mann 1997: 69; Fitzgerald *et al* 1997: 110).

However, the claim for the absoluteness of 'priceless' museum collections is faced with

serious challenges in the current political, economic, and social environment, and can

hardly be maintained in practice. This becomes particularly obvious when public

subsidies are required for the support of museums. As was mentioned earlier, in the real

world, museums cannot avoid being affected by the scarcity of resources, which is a

central concern of economic analysis. Museums and collections are restricted by the

economic resources available; they cannot assume that resources are free goods which

are available in abundance. Any collection, any activity in a museum requires scarce

resources in the form of labour, capital, time, etc.; therefore, there is a cost to each

collection. In turn, each unit of cost reflects a sacrifice by society – the money could

always have been spent on something else.

'Cost' is what is missing in the 'moral imperative' argument against an economic

approach. With careful application, an economic perspective can help by opening up a

number of insights into the costs and benefits of museums and their collections. In

economic terms, 'cost' includes two related concepts – the direct financial cost and the

opportunity cost. The financial cost is very straightforward. In the case of museums, the

financial cost is the money spent on the operation of the museum. The opportunity cost

comes from the idea that if one is using one's resources in one application, one forgoes

the opportunity of employing those resources elsewhere (Bateman *et al* 2002: 0.1).

Taking museums as an example, the cost of collections includes the money, time,

human resources spent on operating the museum (Lord *et al* 1989), as well as the

foregone alternative use of the resources used by the care of collections. The alternative

use of the resources could be social welfare, education, or national defence. Therefore,

as long as cost is positive, the care of collections means we go without something else.

There may be moral concerns about the things which are given up, such as education

and social welfare. The foregone 'moral' alternative is what is missed in the moral

argument against the economic approach, i.e. there may be a moral trade-off between

museums and the social good sacrificed by using resources for museums.

Also, the idea of museums being beyond economic reasoning and calculation implies

that the value of museums is to be determined and assessed by the professional

community. This is challenged by the notion that resource allocation is an issue for the

current participatory democracies (Bateman *et al* 2002: 1.17; Mohr and Schmidt 1996: 336). The intrinsically anti-elitist economic valuation approach responds to this recent social pressure better by letting the professionals' valuation enter the theoretical valuation function with the same weight as that of anyone on the street. The sheer difference in numbers between the professionals and the public implies that the former's valuation would be negligible in assessing the value attributed by the representative individual. However, in spite of being greatly outnumbered, the professional community can still play an important part. As long as the professional community succeeds in convincing the public of the merits of a museum, economic value will come close to the value held by the professional community. In an economic valuation process, the relationship between the professional community and the public is about communication and convincing.

Furthermore, in a world where potential visitors have more available leisure choices than free time and are becoming more sophisticated in their demands, museums have to be innovative and market themselves in order to compete and survive. The traditional supply-driven approaches should be replaced with a consumer-oriented approach to understand the demand, and to generate awareness and support. The demand-oriented economic valuation approach provides such a function.

The tool provided by the economic valuation approach is a demand-oriented tool, involving public consultation, for a sensible choice of the allocation of scarce resources. Therefore, despite the difficulties of putting economic values on museums and the collections in their care, there are reasons to believe that it is not adequate to assert that this kind of valuation is impossible or even undesirable without first having attempted the exercise.

2.2.2. A step further

To sum up, facing new challenges and pressures, museums almost everywhere in the

world have been forced to reaffirm their reasons for being, to demonstrate their benefits

to society, and to optimise their use of resources. The development of museum

management within the museum community, in response to these challenges and

pressures, has equipped museums with the tools to define their unique contributions, to

set standards to achieve them, even to market them to the public, in the interests of

sustaining the collections, the activities of museums, and public life.

Economic valuation approaches are able to take this work one valuable step further for

the following reasons:

1. The valuation units used in an economic valuation approach – monetary values –

    are the most widely understood units of comparison in communicating relative

    importance. Therefore, they provide some general quantitative basis for

    discussing values that have previously been stated in qualitative terms;

2. Due to its general quantitative basis, economic valuation offers museums an

    analytical framework and diagnostic tool to demonstrate their benefits to society

    in a quantifiable, comparable, and understandable manner. This further enables

    inter-sector, or intra-sector, projects to be assessed, prioritised, and co-ordinated,

    and thereby convinces all sections of society that museums are worth their

    interest;

3. Economic valuation approaches provide the possibility for museums to move

    away from decisions previously based mainly on cost, towards a more balanced

    benefit and cost assessment of different decisions. This assists not only in

    budgeting service provision and more efficient resource allocation but also in

    making a seemingly subjective decision-making process more objective;

4. Economic valuation approaches involve public consultation in the decision-

    making process, which responds well to the current participatory democracies.

    Also, empirical evidence from available cultural heritage valuation studies shows,

    in general, that people attribute a significantly positive value to the conservation of

    cultural heritage (Pearce *et al* 2001: 11). Public pressure can be an extremely

    powerful force in persuading governments to put more resources into museums.

In short, economic valuation is more powerful than, and complementary to, the existing

museum management approaches in coping with the current challenges and pressures

faced by the museum community. Therefore, museum professionals should take the

initiative and not just respond passively to events but to actively seek to shape them as

far as possible, by attempting to provide well argued valuation estimates. Like all

appraisal techniques, economic valuation has its problems. A detailed discussion of the

disadvantages is set out in Chapter 4.

2.3 Economic valuation – applications

Although the application of the economic valuation approach to cultural heritage is

relatively recent and scarce, there are many hundreds, if not thousands, of studies on the

economic measurement of environmental assets. Over the last few decades,

environmental valuation has become an established branch of environmental

economics, and has made a valuable contribution to environmental conservation. Due

to the similarities between cultural and environmental goods, what is essentially the

approach of environmental economics to cultural assets, if applied carefully, it is argued,

can fulfil a similar function.

In the past fifteen years, there have been an increasing number of economic valuation

studies carried out in Taiwan (see, Table 2.1). Most of them are valuing environmental

goods, while a few of them are concerning public transportation and public health.

There has been no available economic valuation studies on cultural heritages in Taiwan.

Table 2.1   Economic valuation studies in Taiwan

Source	Focus of valuation	Valuation method
Xiao, D-J (1987)	The external cost imposed upon Fu-Long Beach by the fourth nuclear power plant	Travel cost Contingent valuation
Liu, J-T (1990)	The economic benefits of improved water quality in Dan-Shui River	Contingent valuation
Huang, Z-H (1990)	The leisure benefits of National Parks	Contingent valuation
Huang, Z-H	The conservation benefits of National Parks	Contingent valuation
Huang, Z-H (1991)	The costs of pollution prevention	Contingent valuation
Liu, J-T (1992)	Reduced environmental risks	Contingent valuation
Huang, Z-H and Wu, M-Y (1991)	The benefits of improved water quality	Contingent valuation
Wu, P-Y and Cai H-W (1993)	The benefits of improved water quality	Contingent valuation
Wu, P-Y and Chen M-J (1993)	The external costs from pig farming	Contingent valuation
Liu, J-T (1993)	The willingness-to-pay for stopping the construction of the fourth nuclear plant	Contingent valuation
Liu, Y-Z (1995)	The cost of the impact on the scenery of Hua-Lian area by the cement industry	Contingent valuation
Fu, Z-T and Zhou, J (1995)	Willingness to pay for the deduced travelling time by taking the high-speed rail	Contingent valuation
Zeng, M-X (1996)	Valuing the conservation of the wetlands	Contingent valuation
Liu J-T and Chen, Y-T (1996)	WTP for reduced health risks	Contingent valuation
Luo, K-A and Luo, S-L (1997)	The benefits of wildlife conservation	Contingent valuation

The estimation of the economic value of cultural heritage has increasingly been

recognised as a fundamental part of cultural policy in developed countries (ICCROM

1999; Pearce and Mourato 1998). Table 2.2 lists the available studies in various

contexts[1]. They span a wide range of focus of valuation and end use.

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[1] For a comprehensive review, see Pearce and Mourato 1998 and Pearce *et al* 2001.

Table 2.2   Application of economic valuation techniques

Study	Focus of valuation	End Use	Source
Determining the size of museum subsidies (Canada)	The social value of the Musee de la civilisation of Quebec City	**Policy on financing:** To justify public subsidy.	Martin, F. (1994)
Paying for heritage: what price for Durham Cathedral? (UK)	The access to Durham Cathedral	**Policy on financing:** Voluntary donation or compulsory payment mechanism?	Willis, K. (1994)
The Danish population's valuation of the Royal Theatre in Copenhagen (Denmark)	The values of the Royal Theatre for the Danes	**Policy on financing:** To assess the current financing of the Royal Theatre.	Hansen, T. (1995)
Benefits received by visitors to heritage sites: a case study of Warkworth Castle (UK)	The access to Warkworth Castle	To set **priorities** between different functions.	Powe, N. Willis, K. (1996)
Valuing acid deposition injuries to cultural resources (US)	The benefits of reduced injury to the marble monuments in Washington, D.C.	**Cost-benefit analysis** for the National Acid Precipitation Assessment Program.	Morey, E., Rossmann, K. Chestnut, L. Ragland, S. (1997)
Valuing undiscovered attributes: a combined revealed-stated preference analysis of Northern American aboriginal artefacts (Canada)	The demand by recreationists for aboriginal artefacts in wilderness areas	**Demonstration** of the importance of the aboriginal artefacts in the management of wilderness areas.	Boxall, P. Englin, J. Adamowicz, W. (1998)
Valuing the invaluable: approaches and applications (Morocco, Croatia, and Jordan)	The benefits of preserving and improving conditions in the Fes Medina, Morocco for the tourists	**Demonstration** of the importance of the Fes Medina.	Dixon, J. Pagiola, S. Agostini, P (1998)
	The benefits of the conservation of the historic centre of Split in Croatia for visitors and residents	**Demonstration** of the importance of the historic centre.	
	The rents from tourism in Petra and Wadi Rum in Jordan	**Policy on financing:** To explore the financing mechanisms.	

Table 2.2 Application of economic valuation techniques – continued

Study	Focus of valuation	End Use	Source
Valuing different road options for Stonehenge (UK)	Valuing the impacts of road improvements upon Stonehenge, UK.	**Cost-benefit analysis** for the different road options for Stonehenge.	Maddison, D. Mourato, S. (1998)
Contingent valuation of quasi-public goods: validity, reliability, and application to valuing a historic site (US)	The benefits of the preservation of the Ste. Genevieve Academy for the local households	**Cost-benefit analysis** of the preservation of the Ste. Genevieve Academy.	Chambers, C. Chambers, P. Whitehead, J. (1998)
Estimating the public good value of preserving a local historic landmark (US)	The benefits of the preservation project of the Northern Hotel for the local households	**Cost-benefit analysis** of the preservation project of the Northern Hotel.	Kling, R. Revier. C. Whitehead, J. (2000)
Valuing our recorded heritage (UK)	The benefits of preservation at the Surrey History Centre for current users and non-users The benefits of preservation at the Hulton Getty Picture Collection for current non-users	**Cost-benefit analysis** of the preservation of recorded heritage.	Pearce, D. Ozdemiroglu, E. Mourato, S. Hett, T. Howarth, A. (2000)
Contingent valuation and cultural policy design: the case of ' Napoli Musei Aperti' (Italy)	The benefits of maintaining the provision of Napoli Musei Aperti for the local residents	**Policy on financing:** To explore the alternative financing mechanisms of providing a cultural public good.	Santagata, W. Signorello, G. (2000)
Is it worth subsidising regional repertory theatre? (UK)	The consumer surplus of the Royal Theatre, Manchester	**Policy on financing:** To justify public subsidy.	Forrest, D. Grime, K. Woods, R. (2000)
Valuing the benefits of cleaning Lincoln Cathedral (UK)	The benefits of preserving the good appearance of Lincoln Cathedral for Lincolnshire residents	**Demonstration** of the damage inflicted by air pollution on the appearance of Lincoln Cathedral.	Pollicino, M. Maddison, D. (2001)
Valuing congestion costs in the British Museum (UK)	The congestion cost in the British Museum	**Demonstration** of the costs of congestion.	Maddison, D. Foster, T. (2001)

Table 2.2   Application of economic valuation techniques – continued

Study	Focus of valuation	End Use	Source
Discrete choice models and valuation experiments: an application to cultural heritage (Italy)	The marginal values of different service improvements for the current users of the museum of Galleria Borghese	**Policy on financing:** To justify a multi-financing mechanism; To set **priorities** between different service improvements.	Mazzanti, M. (2001)

The focus of valuation ranges over the overall benefits of maintenance of a single

good at its present level (Martin 1994; Hansen 1995; Chambers *et al* 1998; Kling *et al*

2000; Santagata and Signorello 2000), the benefits/costs of (the preservation of)

certain attribute(s) of a single good, such as the access to a site (Willis 1994; Powe and

Willis 1996), the appearance of a site (Pollicino and Maddison 2001), the congestion

at a site (Maddison and Foster 2001), or different service improvements at a site

(Maddison and Mourato 1998; Mazzanti 2001), and the benefits of the preservation of

a group of multiple goods, such as a group of monuments, or archaeological sites

(Morey *et al* 1997; Boxall *et al* 1998; Dixon *et al* 1998). The types of goods and asset

being valued vary from the provision of arts, to archaeological sites, to cathedrals, to

monuments and museums. The end use of the economic valuation exercise includes

assessing financing policy, ranking priorities, cost-benefit analysis, and

demonstrating the importance of an issue. As is evident from the existing studies,

economic valuation has a very wide potential application to the management of

cultural heritages, including museums.

There are currently a few available economic valuation studies on museum issues (see,

for example, Martin 1994; Santagata and Signorello 2000; Maddison and Foster 2001;

Mazzanti 2001). Martin (1994) measures the total social benefits of a museum, using

the Musée de la civilisation of Quebec City in Canada as a case study, to determine the

size of museum subsidies. The main focus of the valuation study is to reach an

absolute figure to justify subsidies on economic grounds. The valuation techniques

employed are far from advanced, and no social-economic information on the

distribution of demands for the museum is presented. The aims of the Santagata and

Signorello study (2000) are to offer a reliable empirical contribution to the contingent

valuation literature in the areas of cultural goods, and to explore some alternative

schemes of cultural policy, using the case of Napoli Musei Aperti in Italy. The final proposed policies regulating the provision of a cultural public good are assessed from an economic efficiency stand point. Maddison and Foster (2001) narrow their valuation focus down to the congestion costs imposed by visitors to the British Museum on their fellows to examine, from an economic perspective, the relevance of a hitherto neglected argument in favour of charging for museums: the presence of significant congestion costs. Mazzanti (2000) uses the case of the museum of Galleria Borghese in Rome to explore some methodological and econometric issues of economic valuation techniques. Recognising that the decision on museum financing is only in part driven by economic rationales, its empirical implications are that cultural institutions may investigate by economic valuation exercise which incremental services are valued by users and what the possible sources of economic surplus are.

The four studies reviewed above offer empirical results all based in the context of the developed world, in which museum visitors belong to specific and elitist classes of the population, wherein variability and heterogeneity is lower[2] (Santagata and Signorello 2000; Maddison and Foster 2001; Mazzanti 2001). Martin' s study attempts to cover a wider range of benefits, but the valuation techniques are less than satisfactory. Others studies, although employing state-of-the-art valuation techniques, either have a very specific narrow valuation focus (Maddison and Foster 2001) , or propose policy recommendations mainly from economic rationales with little reference to museum managerial and curatorial attitudes and perspectives (Santagata and Signorello 2000;

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[2] This finding corresponds closely to museum visiting patterns addressed in museum literatures, most
of which are also based in the context of the developed world (see, for example, Merriman 1991: 50;
Falk and Dierking 1992: 20-24; Davies 1994: 56; Bailey *et al* 1998: 105).

Mazzanti 2001). In short, there has been, so far, no economic valuation study which

explores the overall conservation and maintenance benefits of a museums based on a

sensible valuation exercise, and most important of all, in the context of curatorship.

To sum up, the issue of museum management has attracted much attention over the

last decade or so, due to the rapid and severe change in the context for management in

museums. However, relatively little is known about how the public values museums.

Apart from what can be inferred from visitation data or maintenance and renovation

expenditures, there are only a few attempts of quantitative estimates of the overall

conservation and maintenance value of museums. Even less is known about how

public valuation of museums, if available, can be used in the context of the managerial

and curatorial objectives of museum management. Also, there are no examples of

economic valuation techniques being applied to museums in the non-advanced

countries.

Therefore, the current research is carried out with the ultimate aim being:

● to analyse critically the current and potential management of museums in

Taiwan in general and of the NMNS in particular, by making use of the results

from the management interviews, museum documentary surveys, and the

Contingent Valuation study;

● to examine whether economic valuation approach can be a useful and

stimulating addition to the existing museum management literature;

● to offer an empirical contribution to the economic valuation literature in the area

of museums from a non-advanced country.

National Museum of Natural Science in Taiwan – a museum in a non-advanced

country – is selected as an illustrative case study to address the above issues.

The details of the case study are presented in the next chapter.

Chapter 3   The National Museum of Natural Science (NMNS) – The Case Study

This chapter begins by explaining the reasons for selecting the NMNS as the case study.

Two pieces of information are to be explored from the case study: the managerial and

curatorial perspectives on the management of the NMNS, and the economic values

associated with the maintenance of the NMNS at it current level and the access to it.

The latter is dealt with by employing an economic valuation approach, which will be

addressed in Chapters 4, 5, and 6, while the former is revealed by the documents survey

and management interviews. Sections 3.2 and 3.3 present and analyse the results from

the documents survey and management interviews. The overall museums sector in

Taiwan is explored in section 3.2 as a wider context of the management of the NMNS.

Section 3.3 focuses on the financing of the NMNS.

3.1   Choice of case study

The case study aims to offer an empirical examination of applying economic valuation

techniques to the area of museum financing policy issues. As was mentioned in Chapter

2, due to the lack of examples of such valuation studies in the non-developed countries,

the case study is selected from museums in Taiwan. Amongst all the museums in

Taiwan, the National Museum of Natural Science (NMNS) is chosen as the case study

for the following two reasons:

1.   The NMNS plays a critical role in linking the development of museums in Taiwan

     with the international museum community. The NMNS was established in a

     period when experiences of museums in the West were brought into Taiwan with

     the aim of becoming a model museum and of promoting the development of

     museums in Taiwan to an international level. The NMNS has then been closely

     following the development trend of its counterparts in the West, and, at the same

time, leading the museum community in Taiwan since its earliest stage. The

NMNS is an interesting study case in that it shares a number of common problems

with the international museum community and through its great potential in

shaping the museum development domestically. Therefore, lessons learned from

the NMNS will not be completely foreign to the international museum community

and will influence the museum development domestically.

2.   The enormous publicity of the NMNS in Taiwan lessens the difficulties involved

in the economic valuation exercises, which will be explained in greater detail in

the next chapter.

In order to fulfil the ultimate aims of the current research described earlier in the

previous chapter, detailed research in relation to the case study institution was required

in four key areas:

1.   the managerial and curatorial perspectives on financing of the museums sector and

of the NMNS

2.   public attitudes towards the museums sector and the NMNS;

3.   the economic values associated with the maintenance of the NMNS at its current

level and the access to it;

4.   policy implications of the revealed economic values

Measuring the economic values is one of the most challenging parts of the current

research, and will be addressed fully later in Chapter 4, 5 and 6. While exploring the

managerial and curatorial perspectives on museum financing is relatively

straightforward. This can be achieved by surveying official documents and in-depth

interviews with key personnel of the NMNS. The following sections of this chapter

present the results and analysis from the documents survey and management interviews.

The design of the documents survey and management interview can be found in

Appendix I.

3.2   The museums sector in Taiwan

3.2.1. The historical context

The island of Taiwan is located off the south east coast of mainland China in the

Western Pacific between Japan and the Philippines, and is separated from the Chinese

mainland by the Taiwan Strait (Figure 3.1). The total area of Taiwan is about 36,000 sq.

km, and has a population of about 22 million. Its incorporation into the regime in

Mainland China can be traced back at least to 1683 when the Qing Dynasty (1626 AD –

1911 AD) took over Taiwan. Taiwan then belonged to the Qing empire until the end of

the nineteenth century when the Qing empire lost the war against Japan in 1895. Taiwan

was then ceded to Japan for fifty years. During the colonial period (1895 – 1945), the

Japanese government established six museums in Taiwan with an aim to demonstrate,

both to the colony as well as the world, the research achievements of Japanese scholars

by collecting, researching and displaying objects concerning ethnography and natural

history in Taiwan (The Council for Cultural Affairs 1996, Qin 1988: 17). These

museums were Western-style museums, because the concept of 'museum' in Japan was

transmitted from the West, especially the UK and the US, in the late 1860s. Setting up

museums at that time was symbolic of westernisation, which also meant modernisation

(Chen 1995: 16). These Japanese-founded museums, with their collections, were taken

over by the Chinese government (Republic of China) later with the return of Taiwan to

China in 1945 and have been open to the public, though not attracting much public

attention nor scholarly inputs.

Figure 3.1 **Taiwan in East Asia**

A civil war broke out in mainland China soon after its winning the war against Japan in

1945. Due to the civil war, China was, in 1949, split into the Republic of China

(ROC, the Nationalist Party regime in Taiwan) and the People's Republic of China

(PRC, the communist regime in mainland China). The *status quo* has been maintained

ever since. When ousted from mainland China to Taiwan, the Nationalist Party brought

some of the most important Chinese antiquities collections from museums in China. In

the 1950s, the Nationalist government in Taiwan launched a 'Cultural renaissance

campaign' in response to the Cultural Revolution in the communist China. Serving the

aim of the 'cultural rena issance campaign', five museums, including the National

Palace Museum and the National History Museum, were established in the 1950s by the

government to demonstrate, mainly to foreign visitors and international scholars, its

legitimacy of inheritance to orthodox Chinese culture. The National Palace Museum

and the National History Museum were founded on the basis of the Chinese antiquities

brought from China, while the other three institutions were mainly exhibition galleries

of science and Chinese cultures (The Council for Cultural Affairs 1996). With a strong

hidden political agenda, these museums had little reference to the local culture and

community, and nor were they interested in education and communication with people

in Taiwan.

In the 1960s and 1970s, although there were a growing number of museums, there was

no museum project at the national level. The majority of museums established during

this period were small scale local private as well as public funded museums meeting the

gradually increasing demand for the preservation of the local cultural and historical

heritage. These museums have not attracted many visits nor resources from outside

their local communities.

With political stability and rapid economic development, there was a growing

awareness of the importance of culture and education at the national/central

governmental level in the late 1970s. In 1977, the central government (the Executive

Yuan) launched twelve national development projects, the twelfth of which was to

establish nationwide cultural institutions, including museums. 23 out of 65 museums

built between 1981 and 1995 were the result of this cultural development project (The

Council for Cultural Affairs 1996). Unlike the previous public funded museums which

were established for the preservation of the existing collections, these museums (to be

more precise, the buildings for the museums) were founded prior to the accumulation of

collections under government policy. The scale of the overall project was the most

comprehensive ever museum development project in Taiwan, in terms of the number

and variety of museums, the size of the museum buildings and the construction budgets,

because having 'institutions' called 'museums' was considered an indicator of a

wealthy and developed society (NMNS 1993; Huang 1997: 163). Experiences of

managing museums in the West were brought in. The intention of the project was to
build museums to demonstrate the achievements in cultural developments in Taiwan
and to enhance the quality of museums to an 'international' level. This was widely
recognised as the 'new era' of museum development in Taiwan by the museum
communities (Chen 1995: 84; Qin 1988: 28). On the surface level, it seemed to be a
prosperous development in the museums sector. However, there have been some
inevitable pitfalls as a result of this deliberate rapid expansion, such as the shortage of
museum professionals, an inadequate sense of orientation for long-term development,
and an intensifying competition for limited public resources. Many of these museums
stopped developing once the museum building was built and the first exhibition was
installed. Amongst the museums established under this trend, the National Museum of
Natural Science (NMNS) was one of the few relatively successful cases, in terms of its
development and management in general, and has become a model museum in Taiwan.
Its development has had great influence on other museums, which will be discussed
further later.

Figure 3.2 sums up the development of museums in Taiwan using the data from the
currently most comprehensive museums survey commissioned by the Council for
Cultural Affairs in 1995 (The Council for Cultural Affairs 1996) plus information on
three national museums founded in the late 1990s. The recognition of the museums
sector in the survey is rather imprecisely defined at the margin, i.e. there are some
institutions over which there is some doubt as to whether they should be labelled as
museums. However, they still have much in common. On the supply side, the
technologies and procedures that they use are broadly similar and they frequently
compete in the same specialist labour market. On the 'demand' side, the products
offered by different museums, however loosely defined, are often seen as closely

related. Similar relatedness also exists in research and scholarship, with museums
complementing and/or competing with other museums in these functions.

Figure 3.2 shows that the number of museums established in Taiwan has increased
rapidly since the 1950s, particularly the private and local authority museums in the
1980s. Since the main data source was a survey carried out in 1995 (The Council for
Cultural Affairs 1996), it is not known exactly how many museums have been set up
after 1995 other than the three national museums. Therefore, it is not known whether
the rapid growth has slowed down. Figure 3.2 also shows the high correlation between
the increasing number of museums founded and per capita GNP before 1991. This is
not surprising since it was the intention of many public funded museums built in the
1980s to demonstrate economic development in Taiwan.

Figure 3.2   The growth of museums in Taiwan
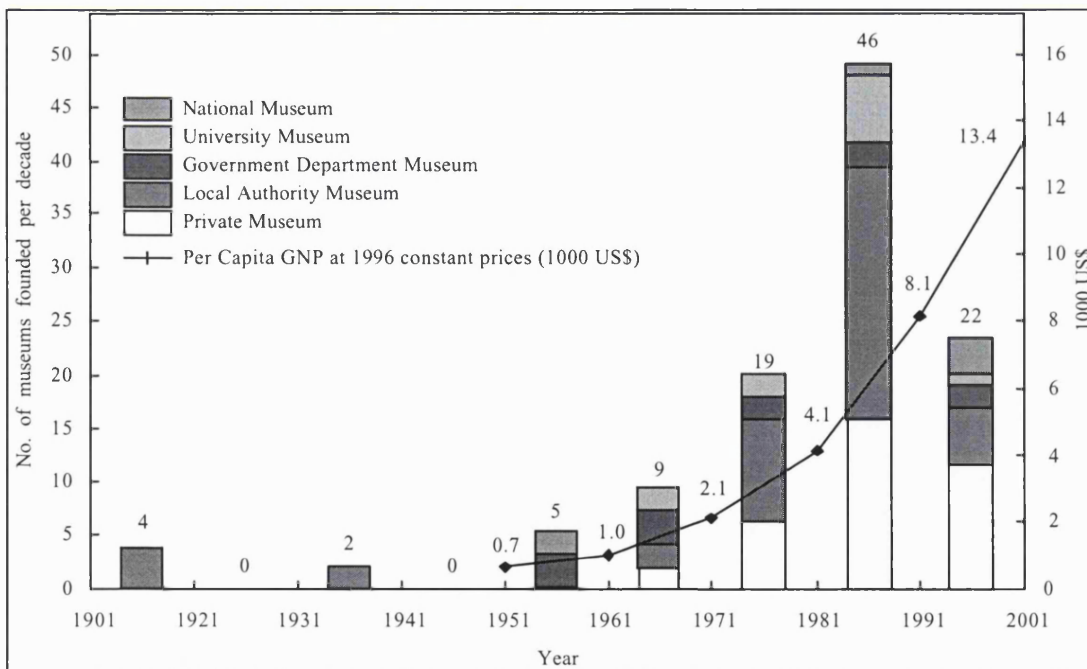
Data source: The Council for Cultural Affairs 1996; Major Indicators, DGBAS

3.2.2. The scale and characteristics of museum activities

In the following section, the main focus will be public funded, especially central

government funded, museums in Taiwan.

Size of the museums sector

There are currently at least 107 institutions considering themselves as 'museums',

nearly 70 per cent of which are public funded museums (The Council for Cultural

Affairs 1996). The five categories of museums given in Table 3.1 relate to individual

institutions, some of which are part of bigger organisations. For example, amongst the

Government Department and Local Authority museums included in Table 3.1, 12 are

branch museums (The Council for Cultural Affairs 1996).

Table 3.1   Types of museums in Taiwan

Type	No. of museums	%
National	6	5.6
Government Department	12	11.2
Local Authority	44	41.1
University	11	10.3
Private	34	31.8
Total	107	100

Data source: The Council for Cultural Affairs 1996

There are at least 1,535 people employed full-time in the 10 national and government

department museums whose staffing data are available in 2000 (Table 3.2). They are

highly concentrated in National Palace Museum and National Museum of Natural

Science.

Table 3.2   **No. of full-time staff in selected museums**

	No.
National Museums	
National Palace Museum	455
National History Museum	94
National Museum of Natural Science	396
National Museum of Science and Technology	164
National Museum of Marine Biology	91
Preparatory Office of National Museum of Prehistory	40
Subtotal:	1,240
Government Department Museums	
Taiwan Museum	60
Taiwan Fine Arts Museum	135
Science Education Centre	61
Arts Education Centre	39
Subtotal:	295
Total:	**1,535**

Data source: Budget for Government Agencies, 2000, DGBAS

Visits to public funded museums

Table 3.3 shows that in 2000 11.7 million visits, compared with the total population of

22 million people in Taiwan, were recorded at 14 public funded museums whose

numbers of visits received are available (Tourism Bureau 2001). National museums

account for less than 30 per cent (5.5 per cent in The Council For Cultural Affairs 1995

survey) of the number of museums (whose visit figures are available) but more than 60

per cent of visits (Table 3.3). They are also highly concentrated: the two largest national

museums (National Palace Museum and National Museum of Natural Science)

attracted nearly half of the visits to public funded museums (Tourism Bureau 2001).

Table 3.3   Visits to public funded museums, 2000

	Visits	% of total museum visits
National museums		
National Palace Museum	1,864,061	15.9
National History Museum	669,520	5.7
National Museum of Natural Science	3,829,824	32.7
National Museum of Science and Technology	1,219,991	10.4
Subtotal:	7,583,396	64.7
Government Department museums		
Arts Education Centre	582,519	5.0
Science Education Centre	230,852	2.0
Museum of Aviation	221,400	1.9
Subtotal:	1,034,771	8.9
Local Authority Museums		
Space Science Education Centre	1,112,910	9.5
Transport Museum	169,503	1.5
Taipei Fine Arts Museum	723,240	6.2
Kaohsiung Fine Arts Museum	539,460	4.6
Taiwanese Aborigines Cultural Park	407,256	3.5
Lu-Kang Folk Museum	87,372	0.8
Kaohsiung History Museum	69,100	0.6
Subtotal:	3,108,841	26.7
Total:	11,727,008	100

Data source: Tourism Trends, 2001, Tourism Bureau

Management of the public museums sector

Public museums in Taiwan are considered cultural, arts, or social educational

institutions which are funded by the central/local governments and under the advisory

of either the Ministry of Education or the Council for Cultural Affairs (Figure 3.3).

Figure 3.3   Funding and advisory bodies of the public museums sector
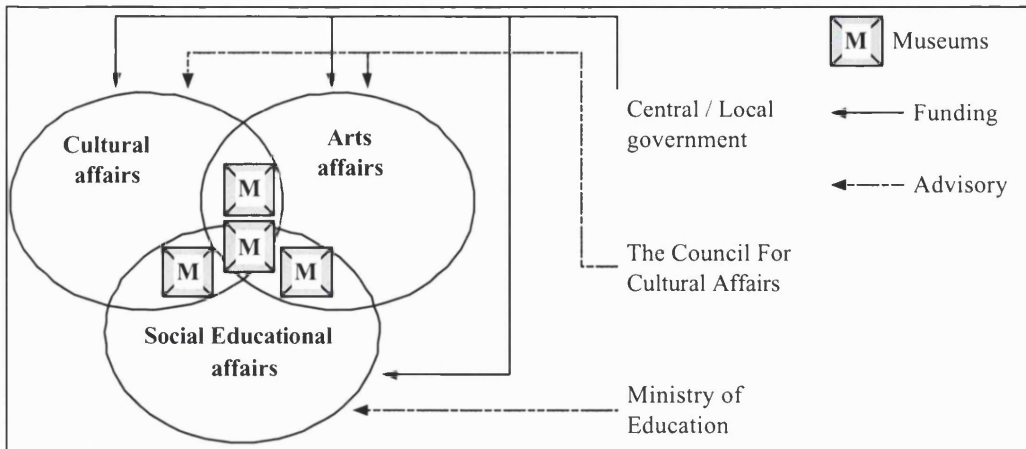
Social education is a relatively marginal responsibility of the Ministry of Education.
In addition, most people who work for the Ministry of Education are professionals in
education with little expertise in museums. Therefore, the Ministry of Education has
not paid much attention towards policy formulation for the museums sector. The only
statement from the Ministry of Education which is relevant to the management of
museums is that social educational institutions, including museums, should 'logically
apportion the government's funds, and curb waste' (Social Education Department,
Ministry of Education 2001). However, there have been neither policies nor strategies
to implement this statement.

The Council for Cultural Affairs under the Executive Yuan[3] was founded in 1981 to
coordinate and guide the various ministries and councils of the Executive Yuan in
cooperating to promote national culture in Taiwan. It is currently working towards
establishing a Ministry of Culture, which will be the supreme governmental agency
overseeing cultural affairs. It is the first and the only governmental agency which
considers culture, including museums, as an economic asset and acknowledges the

economic values of cultural institutions (The Council for Cultural Affairs 1999).

However, there have been no further attempts towards formulating policies on

demonstrating or capturing the economic values of cultural institutions.

Having explored governmental attitudes towards the management of the museums

sector, it is useful to inspect how its finance is managed currently.

As is the case with all other public services sectors, all the expenses of museums

depend entirely on the allocation of government expenditure, while all the earned

income from museums shops, admission tickets, etc. goes back to the government as

government revenue (Figure 3.4). Each year each individual museum has to prepare its

annual expenditure estimates and to submit its budget proposal via its superior

government agencies to the Executive Yuan. The Executive Yuan then combines

individual agencies' budget p roposals into the central government budget proposal.

Following the passage of the cabinet meeting, the Executive Yuan submits the central

government budget proposal to the Legislative Yuan[4] for approval. Whether a museum

can receive the amount of money it needs, therefore, depends on the approval of its

superior organisations and the Legislative Yuan. The budget proposed by a museum is

often granted if: (1) the government has enough money that year, or (2) the museum

requests a similar amount of budget as it did the previous year, or (3) the museum is

more popular or at least remains as popular as it used to be, i.e. the museum receives

similar or more visitor or visit figures[5].

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[3]The Executive Yuan is one of the five Yuan (governing branches) of the central government.

[4] The Legislative Yuan is the legislative governing branch of the central government.

[5] Sources of information: my interviews with selected people, including curators/staff working in
museums and members of the Legislative Yuan, who have participated in budgeting processes.

Figure 3.4   Financial flows of public museums
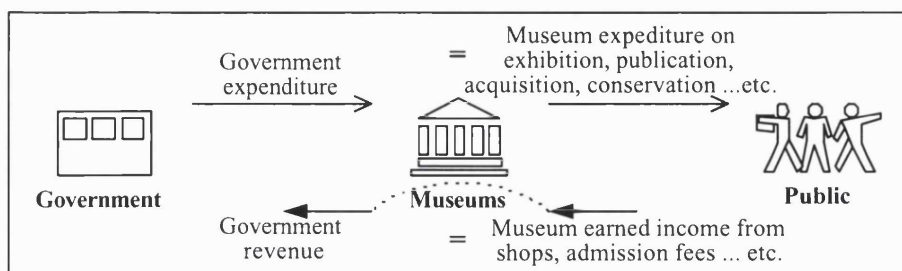
Most publicly funded museums charge for admission. Table 3.4 presents the admission

fees charged by national museums. There is no government policy on admission

charges and the price is determined by individual museum, very often, for no particular

reason.

Table 3.4   Admission fees (US$) of selected public funded museums

	National Palace Museum	**National History Museum**	**National Museum of Natural Science**	**National Museum of Science and Technology**	**National Museum of Marine Biology**
Full price (per person)	3	0.6	3.2	3	9
Concession (per person)	1.5	0.3	2.4	2	6
Special tickets	Group 2.4/person	-	Family card (Table 3.6)	Golden pass 18/20 visits	Group 7.2/person

The advantages and disadvantages of this financing system will be discussed in greater

detail using the National Museum of Natural Science as an illustrative example later.

Government expenditure on the museums sector

In this section, data from the central government budget allocation is used to depict the

economic status of the museums sector in Taiwan. In government budget documents,

expenditure on museums is categorised in the spending on Education, Science and

Culture. Figure 3.5 shows a steady increase of central government expenditure on

Education, Science and Culture, which has become the largest spending next to social

welfare since 1998. A further investigation shows that in 2001, at least 0.3% of central

government expenditure (144 million US$) is allocated to national and government

department museums (Figure 3.6).

Figure 3.5   **Time series data on allocation of Central Government**
                      Expenditure, Fiscal Year 1950 – 2001
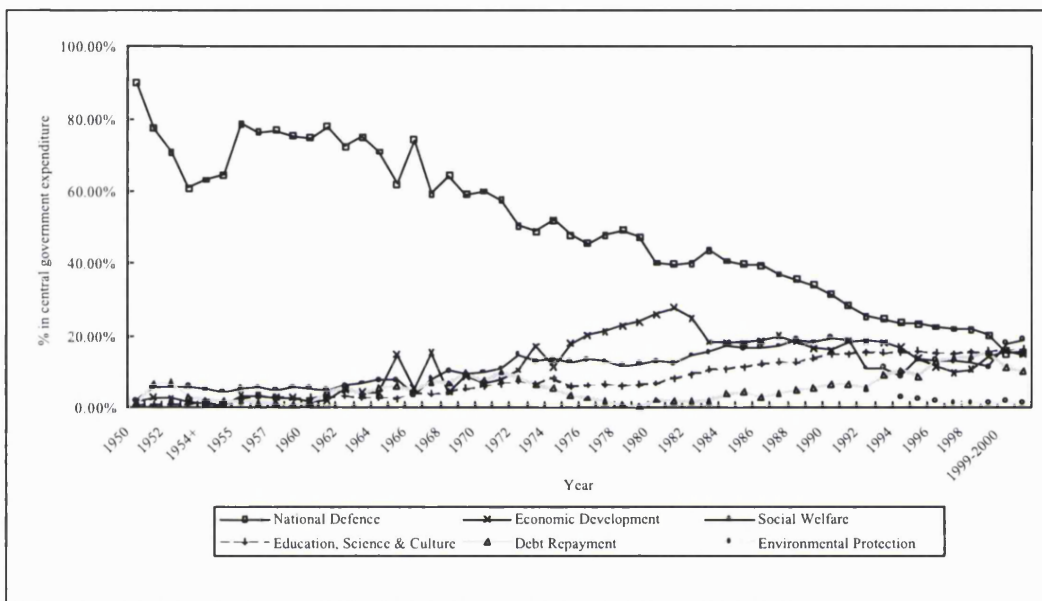
Data source: Central Government Revenues and Expenses 1950 – 2001, DGBAS

Figure 3.6 **Allocation of central government budget, 2001**

Retirement & Condolence
9.0%

Environmental Protection
1.4%

Social Welfare
18.9%

Debt Repayment
10.1%

Grants & Others
2.7%

Science
4.2%

*Education,
Science
& Culture
16.4 %*

*Culture
1.2 %*

*Museum
0.3 %*

144 million (US$)

Economic
Development
14.8%

Education
11.0%

Others
0.9%

Administrative Affairs
11.2%

National Defence
15.5%

Total anual central government expenditure, 2001: 46 billion (US$)
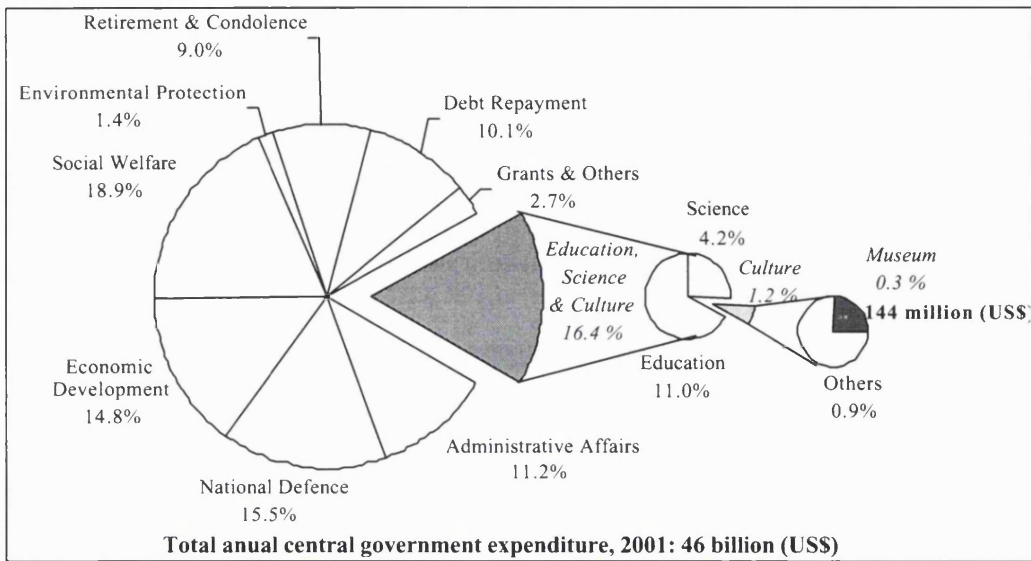
Data source: Central Government Budget 2001, DGBAS

Table 3.5 shows that expenditure on museums seems to have occupied a fairly static proportion of total central government expenditure since fiscal year 1993/1994. A further investigation reveals that an average of at least 32% of the museum expenditure since fiscal year 1993/1994 was spent on museum building constructions, especially in fiscal year 1996/1997, 1999/2000, and 2001. There were no major museum building construction projects in fiscal year 1994/1995 and 1995/1996, which explains why expenditures on museums in these years were less in proportion to total government expenditures.

Table 3.5   **Central governmental expenditure on museums at current prices**

Fiscal year	Total expenditure on museums (million US$)	Total expenditure on culture (million US$)	Total expenditure (million US$)	Expenditure on museums/ expenditure on culture (%)	Expenditure on museums/ total expenditure (%)
1993/1994	81	355	31,317	22.8	0.3
1994/1995	56	277	30,271	20.4	0.2
1995/1996	68	308	33,377	22.0	0.2
1996/1997	133	388	35,125	34.3	0.4
1997/1998	80	338	36,037	23.7	0.2
1998/1999	105	525	38,741	20.0	0.3
1999/2000	218	895	65,729	24.3	0.3
2001	144	566	46,338	25.5	0.3

Data source: Central Government Budget 1993 – 2001, DGBAS

Note: Before July 1999, a fiscal year started on 1 July and ended on 30 Jun the next year.
From 1 July 1999, the government has adjusted the period of a fiscal year in
accordance with a calendar year. Therefore fiscal year 1999 started on 1 July
1999 and ended on 31 Dec 2000, which was 6 months longer than a normal fiscal
year, which is why the expenditure in this year was very much larger than all the
other years.

Figure 3.7 and Figure 3.8 show the allocation of central government expenditure on

different national and government department museums and their contribution to

government revenue in 2001. The Science Education Centre is under refurbishment

and the National Museum of Prehistory is under construction. That is why they are

using so much financial resources. The National Museum of Natural Science

obviously is one of the best resourced museums and contributes more than most other

museums to government revenue.

Figure 3.7 **Allocation of central government expenditure on museums, 2001 (US\$ at current prices)**

National Museum of Natural Science
16.6 million (US\$)
(12%)

National Museum of Science & Technology
9.4 million (US\$)
(7%)

National Museum of Fine Arts
8.7 million (US\$)
(6%)

Taiwan History Museum
2.0 million (US\$)
(1%)

Taiwan Museum
3.5 million (US\$)
(2%)

Arts Education Centre
3.4 million (US\$)
(2%)

Science Education Centre
41.2 million (US\$)
(29%)

National Museum of Marine Biology
7.2 million (US\$)
(5%)

National Museum of Prehistory
27.5 million (US\$)
(19%)

National Palace Museum
18.8 million (US\$)
(13%)

National History Museum
5.9 million (US\$)
(4%)

Total museum budget, 2001: 144 million (US\$)

Data source: Central Government Budget 2001, DGBAS

Note: The National Museum of Prehistory is under construction, and the Science
Education Centre is under refurbishment.

Figure 3.8 **Contributions of national/government department museums to central government revenue, 2001 (US\$ at current prices)**

National Museum of Natural Science
3.75 million (US\$)

National Museum of
Science & Technology
3.13 million (US\$)

Other sources of revenue
99.968 %

Revenue from museums
0.027%

National Museum of
Marine Biology
1.48 million (US\$)

Arts Education Centre
0.25 million (US\$)

Science Education Centre
0.06 million (US%)

National History Museum
0.21 million (US\$)

National Palace Museum
3.62 million (US\$)

National Museum of Prehistor
0.35 million (US\$)

Total annual revenue from museums, 2001: 12.85 million (US\$)

Data source: Central Government budget 2001, DGBAS

To sum up, the government in Taiwan is interested in increasing the number of

museums, and is currently spending a significant proportion of central government

budget on the museums sector. However, the government has barely any explicit

policy nor strategy regarding the museums sector, and the economic benefits of the

sector are hardly recognised. Although most public museums in Taiwan charge for

admission, they are never expected to maximise their earned income. Moreover,

public museums are under little scrutiny in their efficiency in terms of using public

financial resources, even though they are entirely government-financed.

Having explored the wider context in which National Museum of Natural Science is

placed, its management and the financial accounts will be analysed in the following

sections.

3.3   The National Museum of Natural Science (NMNS)

3.3.1. The development of the NMNS

In September 1977, the Executive Yuan announced the plan for the National Museum

of Natural Science (NMNS). In April 1981, the development office of the NMNS was

established under the commission of the Ministry of Education. As was mentioned

before, it was the first national museum born out of the national culture development

scheme of the late 1970s. Its project mission statement was:

> *Every civilised country in the world has several well-established large scale
> science museums. They are a reliable record of the county's scientific
> development and a mark of scientific progress, but also a place where people can
> learn at their leisure. However, we cannot deny that our country has fallen behind
> in this field. Therefore, it is the responsibility of the National Museum of Natural
> Science to promote the development of science and culture of our country to an
> international level (NMNS 1984).*

Therefore, the scale of the museum has to be large, national and, even, international.

For the planning of the museum, a study trip was organised to visit science and natural

history museums in Italy, Germany, Denmark, Sweden, the UK, and the US. The

experiences from these Western museums became the foundation of the museum.

The museum has two primary missions:

1. To be a national centre for the study of Taiwan's natural history by collecting

   natural history objects and by making available to the science community the

   associated information;

2. To entertain and educate the public about the indivisible relationship between

   people and nature through displays and educational programmes (NMNS 1993).

To accomplish the above missions, the museum devised four phases (Figure 3.9 and

Figure 3.10). Phase I consists of a space theatre and a science centre, covering 9,870 sq.

m. The maximum capacity of the space theatre is 304 people. The science centre

contains two exhibition halls, a science classroom, a discovery room, a computer room,

a lecture hall and a video-tape corner. Phase II is the life science hall, covering an area

of about 16,952 sq. m., which consists of the research departments, the collection space,

and the eight natural history galleries: origin of life, age of dinosaurs, the human story,

the human body, food and population, sound in nature, colour in nature, numbers and

forms. Phases III and IV, occupying about 56,393 sq. m., includes the six galleries in

the Chinese Science Hall (Phase III) and wide ranging exhibitions, in terms of both the

themes and the technologies used, in the Global Environment Hall (Phase IV). The

museum now is 'said' [6] to receive around 3 million visits per annum. Figure 3.10 shows

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[6] The visit figures are expected to be exaggerated, since they derive from manual counting at the museum

the change of visit figures with the development of the museum.

Figure 3.9   **Layout of the museum grounds**
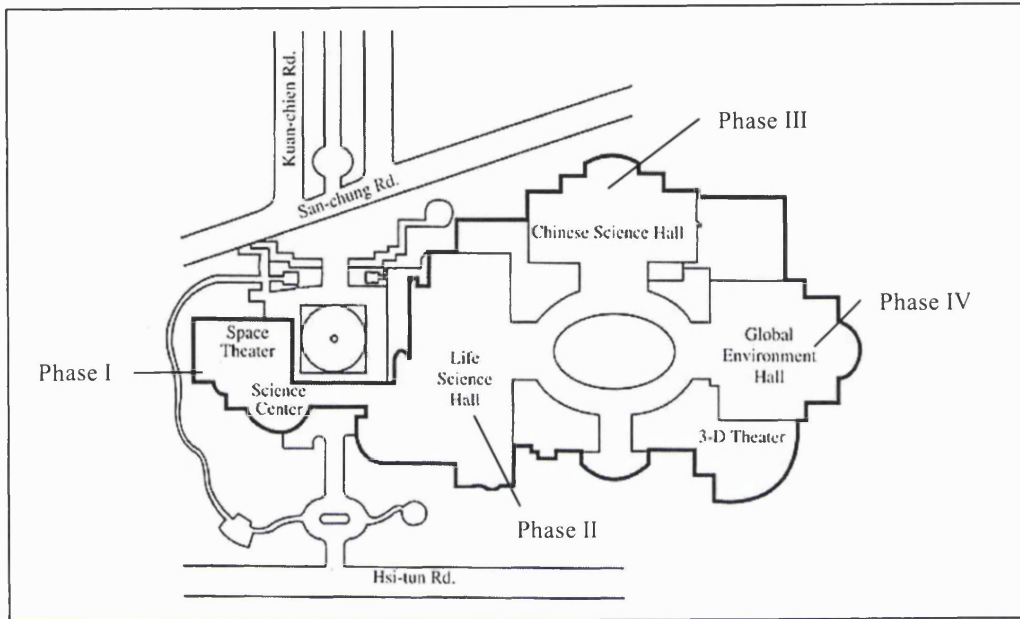
Figure 3.10   **Development and visit figures of the NMNS**

Development of NMNS	Project initiation	Development office	Phase I	Phase I + II	Phase I + II + III +IV

Y-axis: Visits (million / year) — 0, 0.5, 1, 1.5, 2, 2.5, 3, 3.5

X-axis: 1977, 1978, 1979, 1980, 1981, 1982, 1983, 1984, 1985, 1986, 1987, 1988, 1989, 1990, 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999
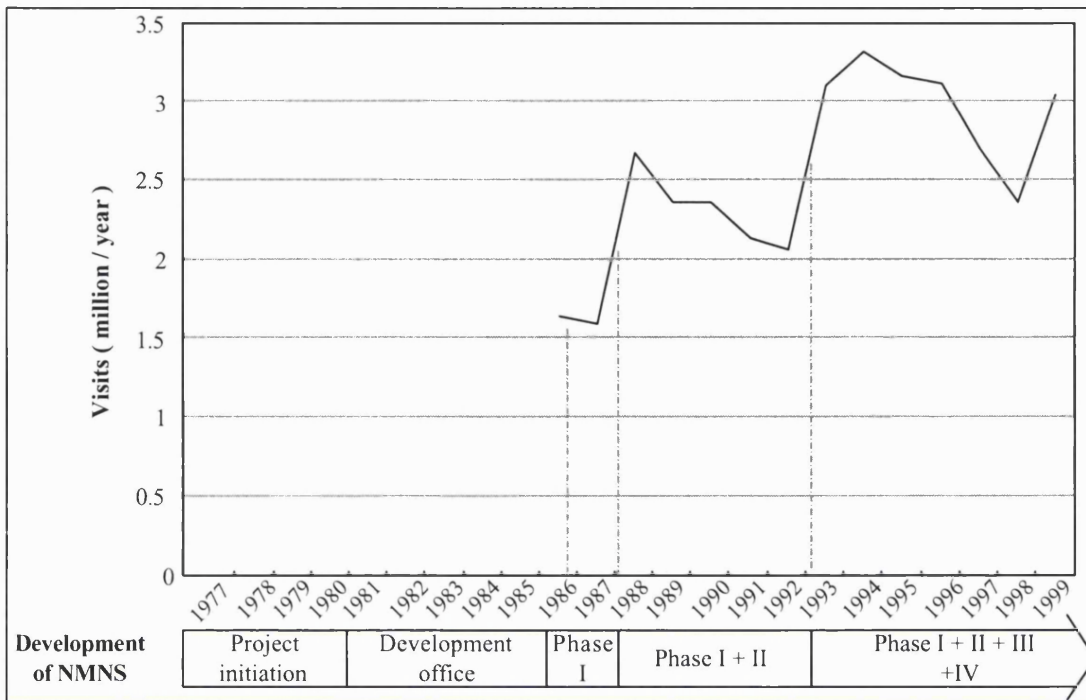
3.3.2. The staff structure of the NMNS

It is through the staff structure that the relationship between the individuals in the organisation is set out, and their responsibilities are defined. Furthermore, the staff structure reflects the balance it expresses between one function and another (Diamond 1992: 160). The staff structure of the NMNS is presented in Figure 3.11. The academic departments, which consist of researchers and specialists in each discipline[7], have always been the core of the museum since its establishment. Their concerns with how the museum should be managed are broadly in line with their western counterparts. The administrative departments, which can only recruit people with civil service qualifications[8], are the supporting departments of the museum. They are responsible for

---

[7] In Taiwan, there are not many professionally trained specialists in museum exhibition and museum education. Curators in the exhibition department are mostly specialists in other disciplines originally. They were transferred from other academic departments because they were interested in museum exhibitions. As for curators in the education department, they were mostly from Sociology or Education training background.

[8] According to the legislation on public institutions.

administrative works within the museum and between the museum and the government.

In general, their thinking is strictly confined to current legislation.

Figure 3.11   Staff structure of the NMNS
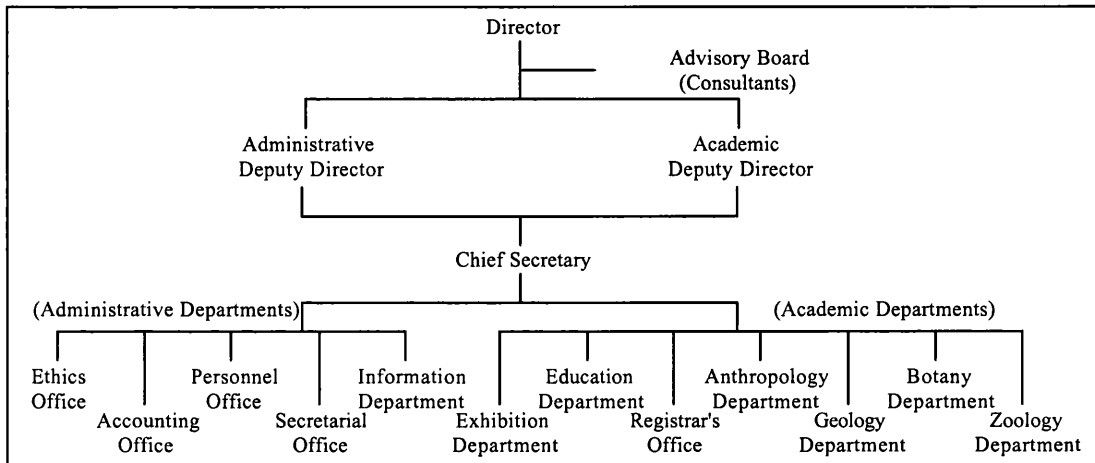
3.3.3. The financing of the NMNS

As has been explained previously, the museum budget entirely comes from the

government, while the earned income goes to the government (Figure 3.12). Figure

3.12 presents the expenditure and earned income of the NMNS since both Phase I and

II were open to the public in 1986[9]. A significant proportion of expenditure was spent

on building construction before all four phases of the museum were complete and fully

open in 1994. Since then, its annual expenditure has been around three to four times

larger than its annual earned income.

As is the case with all the national museums, the NMNS obtains its funds from the

central government depending on the approval of its budget proposal by its superior

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[9] Due to the adjustment of the period of a fiscal year from July 1999, the fiscal year 1999/2000 is an
18-month fiscal year starting from 1/July/1999 till 31/December/2000. This is why the figures in fiscal
year 1999/2000 are higher than an ordinary fiscal year.

organisation[10] and the Legislative Yuan. The amount granted is determined by the

macro economic environment in Taiwan, the visit figures of the NMNS, and/or if the

amount requested remains reasonably static as that of the previous year. Being one of

the most popular museums in Taiwan, the NMNS has hardly experienced any difficulty

in obtaining the amount it needs[11].

Figure 3.12   Financial flows of the NMNS
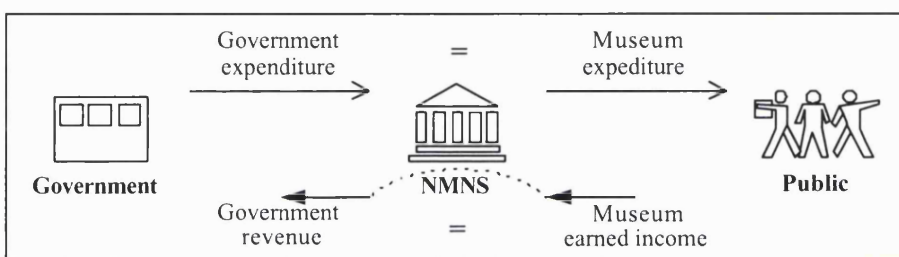
Figure 3.13   Total expenditure and earned income of the NMNS (US$ at current prices)
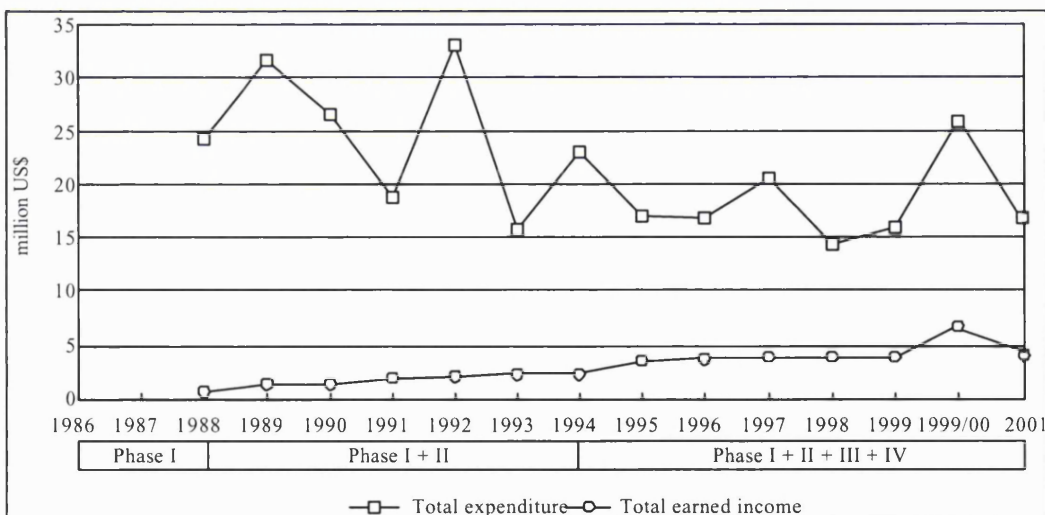
Figure 3.13 shows a fairly smooth and steady increase in the annual earned income. Its

earned income consists of the admission charge (95.2%), the sale of its publications

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[10] In this case, the superior organisation of the NMNS is the Ministry of Education.
[11] Source of information: management interviews.

(0.8%), the rents from the shops and restaurants (3.6%), and others (0.4%) (National

Museum of Natural Science Budget, 1999/2000). Although the NMNS contributes to

the central government revenue most amongst all the other national museums (Figure

3.8), a further inspection reveals that the museum has not maximised its earned income.

First, according to the legislation, being a non-profit-making organisation financially

fully supported by the government leaves the NMNS no incentives to maximise its

earned income. Therefore, the museum rents out its space to shops and restaurants to

private corporations for a fixed amount of rent[12] however successful the business has

been. At the museum level, the current approach seems reasonable. Under the condition

that the museum does not have to worry about profits, the current approach saves the

costs, including human resources and finance, of running the business itself. However,

from the perspective of the central government, this seems an inefficient use of public

resources. The government is very likely to receive more revenue from such successful

shops and restaurants in this popular government-funded museum, if: (1) the NMNS

managed the business itself, or (2) it paid a contractor a management fee and took a

reduced share of the profits, or (3) it rented the space as it is now but asked for a certain

percentage of the turnover instead of a fixed amount of rent.

The admission charge is the largest earned income source of the NMNS. However,

further investigation shows that the earned income from admission charges could have

been more – something which will be discussed in greater detail in the following

sections.

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[12] Source of information: management interviews.

There is neither government policy nor regulation on whether museums should charge

or not, which, therefore, is entirely up to individual museums. Since the initiation

stage of the NMNS, there has been a consensus amongst people involved in the project

that the museum should charge for admission on the basis of 'users-pay' principle [13].

The question was how much the museum should charge, under the condition that the

museum cannot use the money it makes and is not required to maximise its earned

income. The museum decided to launch different types of tickets. Table 3.6 shows the

current charging categories. The ticket prices to Exhibition Hall (Phase I + II + III + IV)

and Botanical Garden were determined based on their estimated maintenance costs,

while the ticket prices to Space Theatre and the 3-D Theatre were based on the hire

charges for the films being shown in the theatre[14]. The prices have not been changed

since 1994 when the museum was fully open.

Table 3.6   Charging categories

Single entry ticket	Full price (US$)	Concession (US$)
Exhibition Hall (Phase I + II + III + IV)[15]	3.2	2.4
Space Theatre	2.9	2.1
3-D Theatre	2.1	1.5
Botanical Garden	0.6	0.6

Note: These are separate fees.

In addition to the single entry ticket, the NMNS also sells 'Family Card' . The
price of a 'Family Card' is calculated according to the following formula:
Price = 3*[(2.9 US$ * No. of adults in the family) +

(2.1 US$ * No. of people eligible for concessions) +

(0.6 US$ * No. of family members)]

only one non-transferable card is allowed per family and is valid for two years
from the date of purchase. Family card holders can enjoy free admissions to the
exhibition halls, discounts on tickets to Space Theatre and 3-D Theatre, and some
other benefits.

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[13] Source of information: management interviews.
[14] Source of information: management interviews.
[15] Before 1994 when only Phase I and II were open, the admission to the exhibition hall was 1.2US$ for

Whether the admission charge does cover the costs as intended is revealed in Table 3.7.

The operating costs of exhibitions and theatres can be identified under the categories of

'public service [16]' and 'exhibition planning and maintenance [17]' in the museum's a nnual

budget reports.

adults and 0.9US$ for concessions.

[16] The costs of public service include the maintenance of public facilities (such as public phones, drinking water, and toilets), security guards, air-conditioning, and so on, in the exhibition areas.

[17] The costs of 'exhibition planning and maintenance' include film rental or sometimes film production in theatres; the maintenance and refurbishment of the exhibition areas and the theatres.

Table 3.7   Total earned income from admission charge and operating costs of exhibitions and theatres (US$ at current prices)

		Total earned income from admission charge (1,000 US$)			Maintenance costs of exhibitions and theatres (1,000 US$)		
		Exhibition hall	Space theatre	3-D theatre	Exhibition hall	Space theatre	3-D theatre
I + II	1988	690			-		
		161	529	-	-	-	-
	1989	1,323			-		
		794	529	-	-	-	-
	1990	1,323			-		
		794	529	-	-	-	-
	1991	1,912			-		
		-	-	-	-	-	-
	1992	2,071			2,544		
		1,295	776	-	-	-	-
	1993	2,288			2,482		
		1,322	887	79	1,802	604	76
I + II + III + IV	1994	2,271			5,488		
		1,760	412	99	4,587	719	182
	1995	3,382			6,385		
		2,118	1,029	235	5,238	813	334
	1996	3,529			6,559		
		2,000	1,235	294	5,216	1,009	334
	1997	3,676			6,003		
		2,162	1,029	485	5,030	710	263
	1998	3,676			5,865		
		-	-	-	-	-	-
	1999	3,676			6,164		
		-	-	-	-	-	-
	1999/00	6,470			8,563		
		-	-	-	-	-	-
	2001	3,740			5,989		
		-	-	-	-	-	-

Note: Between 1993 and 1997, the costs of exhibitions and the two theatres were reported separately; while during other years, they were reported together so that a breakdown of individual cost is not available.

The admission charge to Space Theatre and 3-D Theatre seems to have covered their maintenance costs fairly well, especially Space Theatre (1993 – 1997 in Table 3.7).

Table 3.7 also shows that in 1992 and 1993, the amount of total earned income from admission charges was almost as much as the operating costs of exhibitions and

theatres. However, since the opening of Phase III and IV in 1994, the operating costs

of the exhibition hall have increased almost three times larger than before, while the

total earned income has not increased as much. It is this wider gap between the costs

and the earned income that requires a more detailed examination.

In 1994, the admission price to the exhibition hall was increased by 2.6 times. There

has also been an increase in the number of visits. Therefore, the total earned income

from admission charges to the exhibition hall should have been at least 2.6 times bigger

than that before 1994. The key to the reason why this is not happening could be the

museum's policy towards museum income. According to the Budget Law, if the

(revenue) budget settlement[18] of an organisation is less than 80 percent of its initial

(revenue) budget proposed, the organisation is required to give reasons for it. On the

other hand, if the budget (revenue) settlement is much higher than the initial (revenue)

budget proposed, the organisation is very likely to be required to raise its (revenue)

budget for the following year. Therefore, in this case, to avoid the pressure of being

required to increase the museum's earned income, the administration department of

the NMNS does its best to keep the income as stable as possible every year. What has

been happening in the museum is that if, at certain point of a year, it is realised that

the earned income is going to be higher than the proposed (revenue) budget, the

museum would start offering some free entry days for the public[19]. In short, the

underlying policy towards museum income is income-stabilising rather than

income-maximising.

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[18] The budget settlement is the result of budget execution.
[19] Source of information: management interviews.

3.3.4. Towards a more independent finance?

Having explained that the finance of the NMNS has been entirely dependent on

government funding and fairly secure so far, it is useful to explore whether the

museum will still be financially secure and whether it still wants to be financially

dependent in future.

At the government level, there is neither clear policy nor legislation on how much

money the government should spend on the museums sector or any single museum.

Although the NMNS is currently one of the highest profile and best resourced museums

in Taiwan (Figure 3.7), there is no guarantee that its finance will be as secure as it has

been. Also, in the wider economic climate, with the broadening of budget deficit, the

building up of the outstanding public debt and a growing demand on public policies and

programmes, whether the government will keep supporting the NMNS as generously as

it has been is open to question.

A further examination on government policy on the finance of other public sectors

discovers that the government has begun to review the non-profit funds under the

control of the central government budget agencies since the early 1990s. The review

was the result of the finding that too many funds had been created, some of which had

not lived up to the goals of their establishment, and that no flexibility has been

permitted for the execution of these funds. One of the major changes from the review

was to set up the 'National University/College Operation Fund' scheme in Fiscal Year

1996 (DGBAS 2001). In the past, budgets for state-owned universities and colleges

were organised in the form of agency budgets (Figure 3.14), which is the same as the

current system for the museums sector. However, it was discovered by the government

that those universities and colleges were operated without comprehensive management

and cost-benefit analysis, leading to inefficient use of resources. Therefore, the 'National University/College Operation Fund' scheme (Figure 3.15) was introduced, in which the universities/colleges are responsible for balancing their incomes and expenditures. The new system has produced satisfactory results since its first five trial cases in Fiscal Year 1996, and has expanded to include another 21 national universities and junior colleges. The government is planning to implement the 'National University/College Operation Fund' scheme for all national universities and colleges (DGBAS 2001).

Figure 3.14   Financial flows of 'agency budgets'
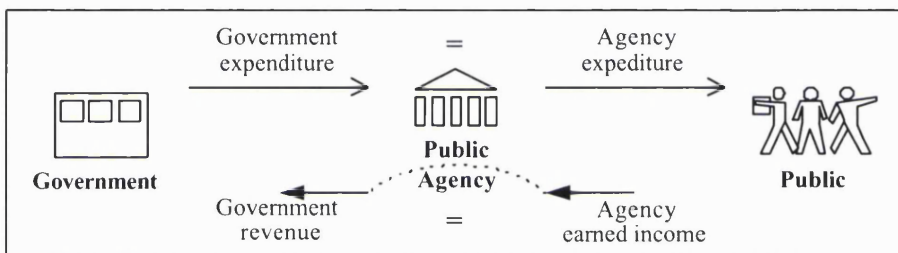
Figure 3.15   Financial flows of 'National University/College Operation Fund' scheme
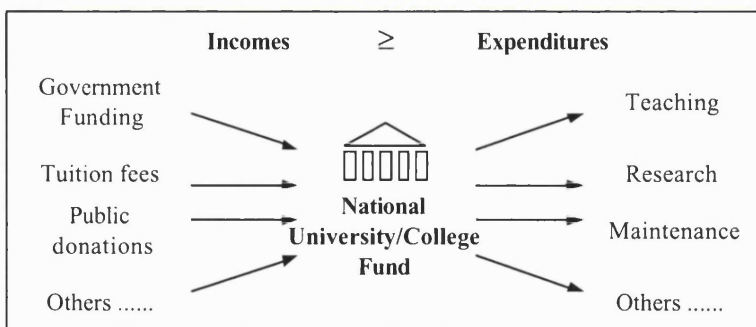
How is this trend going to affect the museums sector? There are many similarities in the museums sector and the universities sector, especially in national museums and national universities. Most national museums are under the governance of the Ministry of Education as all universities are. The staff structure and recruitment of

curators in the academic departments of most national museums are modified from that

of national universities. Most important of all, they share the same problems of

inefficient use of public resources and lack of flexibility in their budget execution.

However, the size and homogeneity of the university sector is much larger than that of

the museums sector. Due to the relatively small size of the national museums sector, it

is under less governmental or public scrutiny. Also, the earned incomes between

different museums vary considerably. Few museums, the NMNS being one of them,

can earn a significant amount of income compared to their expenditures. Therefore,

for the time being, it is less likely for the government to initiate the change in the

financing mechanism of the overall museums sector though this may improve their

operation efficiency. However, with the increasing governmental budget deficit and

outstanding public debt, and a growing demands on public programmes in the macro

economic climate, it is expected that the museums sector will have to face directly the

political and economic pressures which the university sector is facing in the foreseeable

future.

Although there is currently no sign of the intention of changes in the financing of the

museums sector at the governmental level, due to the success and expansion of the

'National University/College Operation Fund' scheme, museums are allowed to

initiate the change in their financing mechanism following the 'National

University/College Operation Fund' scheme if they wish to have more flexibility and

independence in their execution of budgets.

Should the NMNS take the initiation to join the 'National University/College

Operation Fund' scheme for more flexibility and independence in its financing? There

was no consensus towards this issue in the museum amongst the staff during my

interviews. Six out of the thirteen curators/managers interviewed were in favour of the current dependent financing. They believed that the dependent financing prevents the museum from the need of pursuing economic profits, which may compromise its fundamental duties. Their arguments were in line with certain perspective from other museum professionals (see, for example, Carman *et al* 1999: 146; Carnegie and Wolnizer 1996, 1997; Mann 1997: 69; Fitzgerald *et al* 1997:110) that museums and their duties are beyond economic reasoning and calculation and, therefore, should be free from economic justification.

As for the other seven curators/managers who thought the NMNS needs more flexibility and independence in its financing, they believed that a more flexible and independent financing system would help museums to fulfil their responsibilities more comprehensively. For them, the idea of profit-maximising does not necessarily mean commercialising the museum. In their opinion, the NMNS is a museum with a great potential for making profits but one which tries to make the least profit possible, which is not reasonable for the government, the tax payers, and the museum itself. They considered the current funds the museum receives from the government are only enough for the general maintenance of the museum, including acquisition, conservation, collections management, research and exhibition area maintenance, etc. However, the museum could have done more, such as touring exhibitions, better outreach services for students in the rural areas, and the refurbishment of the 17-year-old Life Science Hall (the Phase II exhibition hall), if the museum had more money or had saved the money from its earned income for more flexible use.

3.3.5. The potential, unexplored, or under-developed income sources?

Given the future possibilities of needing to maximise its earned income, does the

NMNS have other potential, explored, or under-developed income sources?

As mentioned before, currently the shops and restaurants in the museum are run by private companies paying a fixed amount of rent to the museum each year. It is generally agreed amongst ten of the thirteen curators/managers interviewed that the shops and restaurants can be very promising income sources if the museum managed the business itself, or paid a contractor a management fee and took a reduced share of the profits, or rented out the space as it is now but asked for a certain percentage of the turnover.

Digital technology is proposed by two curators/managers as an income source. Digitising museum collections or even museum exhibitions is currently a trend both in Taiwan and internationally. A digital museum put on the Internet is believed to be able to attract more and wider public access to the real exhibition. Museums can also sell digitised information on CD-ROMs, or charge for internet access. The Metropolitan Museum of Art in New York City provides an example of charging for internet access (The Metropolitan Museum of Art 2000 – 2002). It launched a new membership category called 'Met Net' in 1996, which has been geared to cyberspace visitors. Its special membership benefits are available only via the Internet, upon entry of a member's access code, which costs an annual fee of $50 (Kotler and Kotler 1998: 210).

One of the curators/managers proposed running courses at graduate and undergraduate levels as another possible income source. There is an increasing flexibility in the provision of higher education in Taiwan. Given the fact that the NMNS is also a research centre both in relevant disciplines as well as museum studies

in Taiwan and many curators are lecturing and supervising research students in universities, the museum is capable of running some courses itself. By charging for attending these courses and taking research students, the museum could increase its income and at the same time enhance its research.

Lastly, extending more flexible opening hours is also thought by three curators/managers to be a measure to generate more income by receiving more visitors, which, meanwhile, serves the aim of the museum better.

3.4 Conclusion

To sum up the analysis of the management of the NMNS, the development of the museums sector in Taiwan is a relatively new phenomenon compared to that in developed countries. Partly due to the relatively short history of the development of the museums sector and the relatively smaller size, in terms of public resources allocation, the NMNS and the museums sector are not directly under as strong a political and economic pressures as their Western counterparts are. However, a more challenging future is foreseeable in the wider economic climate, and the museum as well as the sector are certainly not prepared.

There is currently no consensus amongst the museum managers and curators towards how the NMNS should be financed. The argument cannot be settled unless more information about the public demand for the NMNS is revealed. The economic valuation approaches provide useful tools to obtain and analyse such information. The next chapter introduces the theory of economic valuation and how it can be implemented.

Chapter 4 Economic Valuation – What Is It and How to Do It?

This chapter begins by introducing the theory of economic valuation in section 4.1.

The methodology chosen for the current study – Contingent Valuation Method – is then

explained in section 4.2. Finally, in section 4.3, the contingent valuation survey design

is described in detail.

4.1 Economic valuation – the theory

'Economic valuation' refers to the assignment of economic values to non -market goods

and services based on welfare economics. Economic theory assumes that human

well-being is determined by the fulfilment of people's preferences. Therefore,

economic value measures the change in human well-being arising from the provision of

a good or service. The notion of 'well -being', in turn, refle cts what individual prefer.

Consequently, economic valuation is preference-determined. In the following sections,

the theoretical basis and different techniques of economic valuation are introduced.

4.1.1. Benefits, costs, and economic efficiency

Economic actions involve two sides: they create benefits and they encounter costs. A

person receives a benefit whenever s/he receives something in return for which s/he is

willing to give up something else that s/he values. On the contrary, a person incurs a

cost whenever s/he gives up something that s/he would be willing to give up only if s/he

was given something else that s/he valued as compensation. Therefore, benefits and

costs are defined in terms of one another. That is, any benefit is measured by that cost

which, in the preferences of the person who benefits, would offset it. Conversely, any

cost is measured by that benefit which, in the relevant person's preferences, would

exactly offset it. This reflects a crucial feature of economic valuation: there is no

absolute measure of value; there are only equivalences of value between one thing and

another (Bateman *et al* 2002: 1.3). Therefore, economic valuation is not measuring 'the

(absolute) value' of the good or the service (e.g. some cultural heritage), but people's

preferences for changes in the state or the provision of the good or service in question.

Consequently, there should be no dispute that people have preferences for and against

changes in cultural provision, and nor is there dispute that people are willing to pay to

prevent or secure a change. The problem will only arise when this willingness to pay is

taken as 'the value' of the change.

Economic valuation is an approach which allows all costs and benefits to be measured

in a single dimension, if one particular type of benefit is chosen as a standard. All other

benefits and costs can then be expressed in terms of that standard, using individuals'

own preferences to determine equivalences of value. In economics, the usual

convention is to use money as the standard of measurement since money is finely

divisible. Money also represents general purchasing power; therefore, it is arguable that

most people prefer more money rather than less and money can be treated as an

effective substitute for the array of benefits and costs to be measured (Bateman *et al*

2002: 1.3).

If money is used as the standard, the measure of benefit is willingness to pay (WTP) or

willingness to accept (WTA). Therefore, for example, one's preference for the access to

a particular museum can be obtained by finding out one's maximum WTP for accessing

the museum (or the minimum WTA compensation for not having access to the

museum). The WTP (or WTA) amount corresponds to the access to the museum. This

measurement forces people to take into account their sacrifices in order to gain access

to the museum, and must weigh-up the value of the access against alternative uses of

that money. WTP (or WTA), in this sense, is a more effective measure of value than the

conventional attitudinal statement (Pearce and Mourato 1998: 11).

The above measures of benefit and cost underlie the concept of economic efficiency.

Economic efficiency is a criterion for evaluating the performance of an economic

system or a part of that system (Bateman *et al* 2002: 1.3). To identify whether the rate of

the output of a certain good or service is socially efficient, the aggregate marginal

benefits[20] and the marginal costs[21] of the output should be compared. Figure 4.1 depicts

the aggregate marginal benefits curve and the marginal costs curve for a hypothetical

good. The efficient level of production for this item is the quantity identified by the

intersection of the two curves, labelled 'Q' in the figure. At this output level the costs of

producing one more unit of this good are exactly equal to the marginal benefit of it, as

expressed by the marginal benefits curve. This value is 'P'. There is another way of

looking at this notion of efficiency. When a rate of output is at the socially efficient

level, the net benefit, defined as total benefits minus total costs, is as large as possible.

In Figure 4.1, at 'Q', the total benefit is equal to an amount corresponding to the area

under the marginal benefits curve from the origin up to 'Q'; this area consists of the

sum of the three subareas: $a + b + c$. Total cost, on the other hand, consists of the area

under the marginal cost curve, or area c. Thus, the surplus is $(a + b + c) - c = a + b$,

which is the triangular area enclosed by the marginal benefits curve and the marginal

cost curve. At any other quantity the corresponding value of total benefits minus total

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[20] Marginal benefit is the *additional* benefit from an extra output.
[21] Marginal cost is the added cost (or the cost saving) when output is increased by one unit (or decreased by one unit).

costs will be less than this area $a + b$. To sum up, from the standpoint of society at large,

production is at an efficient level when marginal benefits equal marginal costs, i.e.,

when net benefits are maximised.

Figure 4.1   **The socially efficient level of output**
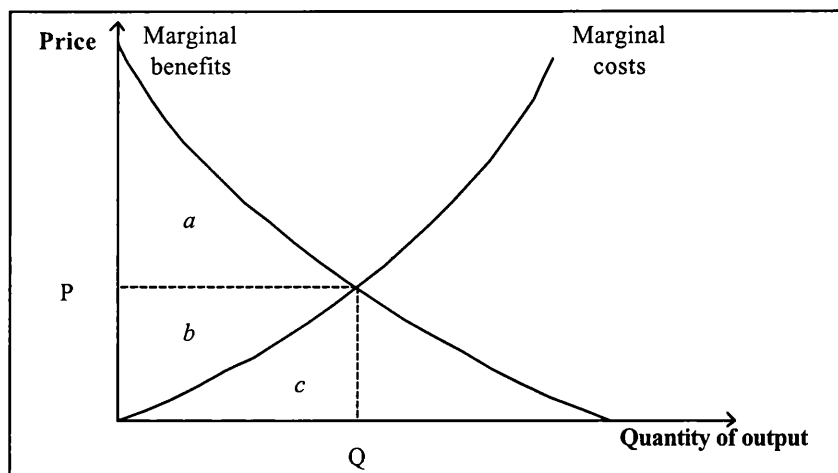
According to welfare economics, in any equilibrium state of a competitive economy

without externalities, resources are allocated in such a way that no further gains of

economic efficiency are possible. Also, in a perfectly competitive economy, individuals

increase economic efficiency whenever they act in accordance with their own

references. Since the allocation of resources among private consumption goods is

generally determined through markets, it is preferable that the methods of valuation that

are used to guide public decision-making could underwrite the resource allocations that

are generated by markets (Bateman *et al* 2002, 1.4).

4.1.2. Property rights to quasi-private and pure public goods

Cost-benefit analysis is redundant when markets work well. Its main use is in situations

in which markets do not exist, or in which they fail to generate economic efficiency. In

particular, it is useful when policy is concerned with projects with the nature of public

goods, such as public museums.

Kopp and Portney (1985) divide the goods entering an individual's utility function into

three classes: pure private goods, pure public goods, and quasi-private goods (quoted in

Mitchell and Carson 1989: 55; Aabo 1998).

Pure private goods are bought and sold in organised markets where those participating

have an identifiable individual property right to the goods. The process of buying and

selling leads consumers to reveal their true preferences for these goods, and their values

are determined on the basis of competitive prices (Mitchell and Carson 1989: 57;

Turner *et al* 1994: 78).

Pure public goods cannot be divided among individuals owing to the non-rivalry and

non-excludability of benefits. They have no explicitly identifiable property rights and

cannot be traded efficiently in any markets. For these goods, neither a competitive

market price nor which quantity of them consumers desire can be observed (Mitchell

and Carson 1989: 57; Turner *et al* 1994: 78).

Quasi-private goods are intermediate to pure public and private goods. They are similar

to private goods except that they are not freely traded in an organised market. They tend

to suffer from one or two aspects of impurity: the presence of congestion or rivalry in

the use of the good, or the practicality and possible desirability of exclusion from the

good. The goods do have individual property rights, but they are subject to market

imperfections and cannot efficiently be traded in markets without government

intervention. The values for these goods are not determined by market prices, but it is often possible to observe which quantities of the goods individuals do consume (Mitchell and Carson 1989: 57; Turner *et al* 1994: 78).

Where do museums fit in this type of classification? Are the property rights to their benefits collectively or individually held? Mitchell and Carson (1989: 38) state that collectively and individually held property rights are the two basic dimensions, but that it is possible to identify a wider variety of property rights for public goods when seen from the individual consumer's perspective. This seems to be relevant for museums. Museums provide a wide spectrum of goods and benefits, some of them are private goods with individually held property rights, such as an individual's museum visit ing experience, purchase of museum publications and museum gifts; others are goods where the property rights are collectively held, such as collections, conservation, exhibition, etc.; and several services have property rights which are both individually and collectively held, such as the exhibition space, guided tours, etc. Where such museum services as exhibitions are marketed, the market value provides a first approximation to economic value. Where other services, such as collections and conservation, are not marketed, it is necessary to use non-market valuation techniques to discover what individuals are willing to pay for the benefits from museums.

4.1.3. Total economic value

A comprehensive assessment of the benefits of a public good should include all of the benefits which will legitimately accrue from the provision of a given good. This concept is known as the 'total economic value' approach (see, for example, Turner *et al* 1994: 111-114; Mitchell and Carson 1989: 59). Some kinds of benefits are easier to

measure than others, and the failure of economists to measure non-use values has long

been criticised by non-economists. Much of the history of benefits measurement can be

written in terms of how researchers have devised ways to measure a larger and larger

fraction of the total benefits of providing a public good (Mitchell and Carson 1989: 59).

The total economic value of museums can be classified into use and non-use value

(Figure 4.2).

Figure 4.2   Total economic values
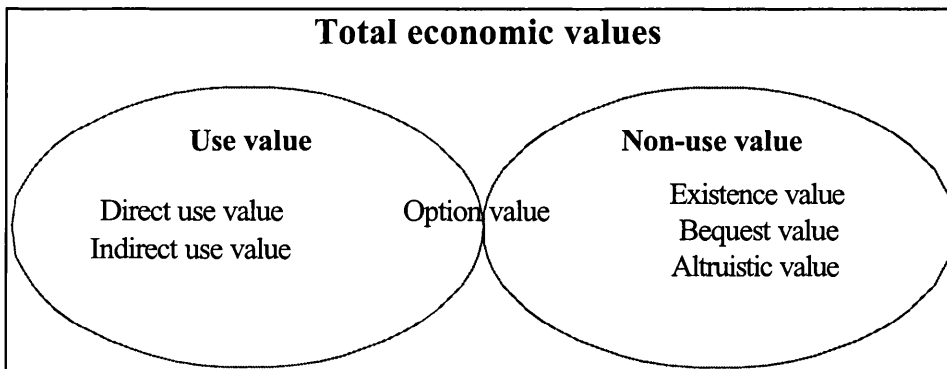
By definition, use values derive from the actual use of the collections and museums.

Direct use values are those directly related to the use of collections or museums. For

example, people visiting museums derive recreation and education benefits from the

experience. Collections or museums may also provide pleasure and knowledge through

books, magazines, photographs or films.

Indirect use values refer to benefits that people derive indirectly from collections and

museums. For example, a museum may yield benefits for the local community in the

form of increased employment and business opportunities. Slightly more complicated

are values expressed through options to use the collections and museums in the future.

They are essentially expressions of preference for the conservation of museum collections or the maintenance of the museum against some probability that the individual will make use of them at a later date. Provided the uncertainty concerning future use is an uncertainty relating to the 'supply' of the museum, economic theory indicates that this option value is likely to be positive (Turner *et al* 1994: 113). Option values refer to the value of securing a possible future use of a cultural resource. In effect, by conserving museum collections or maintaining a museum in operation, one is retaining the possibility of using them in some point in the future. A related form of value is bequest value – a willingness to pay to preserve the museum and its collections for the benefits of one's descendants. It is not a use value for the current individual valuer, but a potential future use value or non-use value for their descendants (Turner *et al* 1994: 113). Option value is the potential benefit which consumers might derive from resources. It is an expression of a willingness to pay for their preservation in order to retain the option of using them in the future. In this sense option demand is a quasi-use value. It may be extended to include an option for others to enjoy the consumption of certain resources, a kind of vicarious demand. Some economists distinguish between demand by the current and by future generations. The term bequest value has been coined to suggest the value which the present generation places on resources, when it expresses a willingness to pay for their preservation for the benefit of future generations. This, however, can be constructed as a form of option demand (Allison *et al* 1996: 6).

Non-use values are those benefits that are totally unrelated to any personal use of the commodity. People may value museums and their collections for a number of reasons without ever using or visiting them. Non-use values may be motivated by altruistic values associated with the knowledge that other people may enjoy visiting museums;

by bequest values accruing from the desire to conserve museum collections for future

generations and from existence values, that is, benefits that come from the knowledge

that museums are there and collections are taken care of. Non-use values are thought to

be a significant proportion of total value in the case of cultural heritage, including

museums, that may well extend beyond country borders and current generations

(Pearce and Mourato 1998: 11). The existence value is a more complex and unclear

form of value, in that it can be considered to be unrelated to demand. People may have

preferences for, and therefore place value on, the continued existence of resources

which they have no intention of ever using. Therefore the preservation of natural and

human-made resources may be advocated because it is recognised that they have

existence values (Allison *et al* 1996: 6).

The above clarification of the concept of 'Total Economic Value' has demonstrated that

economic value and commercial value are not synonymous and it would be a mistake to

think that economic valuation takes account only of self-interested preferences. In short,

economic value refers to those values that cannot be captured in markets as well as

those that can. More fundamentally, economics does not place any restriction on the

motivation underlying an individual's willingness to pay.

4.1.4. Economic valuation techniques

Valuing the economic benefits of several types of amenities not traded in markets has

become theoretically defensible and practically feasible due to recent developments in

environmental economics and social survey methodology. The solutions to the absence

of markets are either 'revealed preference' or 'stated preference' techniques (Turner *et*

al 1994: 116). 'Revealed preference' techniques analyse preferences for a c ertain good

as implied by people's WTP behaviour in an associated market; while 'stated

preference' techniques create a hypothetical market in which individuals can express

their WTP for the good in question (Pearce and Mourato 1998: 80). Detailed surveys of

the various techniques can be found in Freeman (1994), Pearce *et al* (1994), Willis *et al*

(1999), or Garrod and Willis (1999).

4.2   Contingent valuation (CV) – the methodology

This section first explains why CV is chosen as the valuation technique, then introduces

the technique, and finally discusses its methodological challenge.

4.2.1. Choice of valuation technique

Amongst the wide array of economic valuation techniques, Contingent valuation (CV)

is chosen as the valuation techniques for the current study for the following reasons:

1.   Use and non-use values

The main issue of the thesis is to demonstrate the total economic value of the National

Museum of Natural Science (NMNS) – a museum of national significance with few

substitutes in Taiwan. This type of good, as is evident in previous valuation studies

(Bateman *et al* 2002: 2.9), is presumed to have significant non-use value, which can

only be detected by stated preference techniques. In order to find out the total economic

value, including both the use and non-use values, the valuation technique has to be

chosen from the group of stated preference techniques, to which CV belongs.

2.   Total values vs. attributes

Since the focus of the valuation exercise is the total value, rather than the characteristics

or attributes of a good, CV is preferred over choice modelling approaches[22].

3.   Public consultancy

As was mentioned earlier in Chapter 2, what is needed in the wider museum context is a

public consultancy approach. Therefore, CV is more suitable than the Delphi

technique[23].

4.2.2. Contingent valuation (CV)

Contingent valuation (CV) is the most prevalent of the stated preference techniques. It

employs survey techniques to ask individuals (or households) about the values that they

would place on the non-market good in question in a hypothetical market (Mitchell and

Carson 1989; Bateman et al 2002). There are three basic parts to most CV survey

instruments: attitudinal and behavioural questions, the contingent scenario (i.e., the

object to be valued, along with its context), and questions about respondents'

socio-economic and demographic characteristics. Respondents are assumed to behave

as though they were in a real market. The average willingness to pay (WTP) can be

calculated and this is then multiplied by the total number of people who enjoy the

benefits to obtain an estimate of the total value which people have for that asset.

Because the elicited values are contingent upon the hypothetical market described to

the respondents, this approach came to be called the contingent valuation method

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[22] The design and implementation of a choice modelling questionnaire is very much similar to a CV questionnaire with the only difference in the design of the valuation scenario section. The CM approach does not directly elicit a willingness to pay amount but instead seeks a ranking, discrete choice, or rating across several policy options. Each option contains a bundle of attributes (characteristics) and one of these is a price or cost. The CM approach does not ask for willingness to pay but instead infers it from the choice across options (see Louviere 2000 and Bennett and Blamey 2001).

[23] Delphi technique involves administering one or more questionnaire to a group of experts. It is mainly used for consensus building or characterisation of the distribution of experts' valuations. Although its advantages lie in its low cost, simplicity and convenience, it is widely criticised to be unscientific and undemocratic (Pearce and Mourato 1998: 22).

(Mitchell and Carson 1989: 3). Mitchell and Carson (1989) have set out a detailed

review of its development and application, and Bateman *et al* (2002) provide the most

up-to-date manual.

Although still controversial, this direct survey approach to estimating household

demand for public goods has been gaining increasing acceptance amongst both

academics and policy makers as a versatile and complete methodology for benefit

estimation in the case of environmental improvements and other public goods. In recent

years, the CV has been extensively applied in both developed and developing countries

to the valuation of a wide range of non-market goods and services. However, there are

only a few, but wide ranging, applications to cultural goods. These are reviewed by

Pearce and Mourato (1998). The most important advantage of the CV is that it has the

potential of capturing the non-use values of the non-market good in question. Therefore,

it is particularly suited to evaluate cultural heritage, including museums, where a large

proportion of value may be unrelated to the actual use. In theory, it can be applied to all

sorts of cultural goods and services. Therefore, it is considered the most flexible and

powerful of all the valuation techniques (Pearce and Mourato 1998: 19).

4.2.3. Validity and reliability

Although the method is now widely used, there is still scepticism about the validity and

reliability of the CV. The main area of controversy of the CV lies in the problematic

nature of its survey approach as to whether surveys can obtain reliable and valid

willingness to pay amounts from random samples of people. The following section

discusses about the general validity and reliability issues.

<u>Validity</u>

Validity refers to the correspondence between that one wishes to measure and that which one actually measured. The factors that may systematically bias respondents' answers include the interviewer bias, strategic behaviour, the embedding effect, anchoring bias, familiarity, instrument bias, sequencing, and hypothetical bias.

1. **Interviewer bias** is the attempt the respondents make to please the interviewer by agreeing to pay some amount when they would not do so otherwise. This is proved avoidable by well-trained, neutral interviewers (Carson *et al* 1992; Moser and Kalton 1997: 276).

2. **Strategic behaviour** includes free-riding and over-pledging. In CV survey, the free-riding respondents are those who believe they will actually have to pay the amount they reveal but underbid in the expectation that others will pay enough to provide the good in question. While over-pledging respondents are those who believe they will not actually have to pay the amount they state but overbid in the expectation that the stated amount can influence provision of the amenity. The proposed solution to this perceived problem is to use an 'incentive compatible' elicitation procedure: that is, one where the questions are formulated in such a way that it is in each respondent's interest to give a truthful answer (Mitchell and Carson 1989: 156; Bateman *et al* 2002: 12.2).

3. **Embedding effect** means that respondents are willing to pay the same sum regardless of the scale of the benefit. This is considered the most serious empirical problem with the use of CV by CV critics (Carson *et al* 2001). Figure 4.3 explains why insensitivity to scope matters. If people's responses are insensitive (insensitive demand curve) to scope, a downward-slop demand curve (ordinary

demand curve) cannot be constructed. This offends economic theory in which,

ordinarily, the demand for a good increases when its price decreases (Varian 1996:

104). Carson (1998) has conducted a comprehensive review of the literature on

split-sample tests of sensitivity to scope. The empirical evidence seems to support

the view that the insensitivity to scope results can probably be attributed to poor

survey design and administration problems or to lack of statistical power in the test

used to detect differences in value. A clear, detailed and meaningful definition of

the scope of the proposed policy change is therefore suggested to minimise the

scope embedding effects (Bateman *et al* 2002: 8.17).

Figure 4.3   Sensitivity to quantity
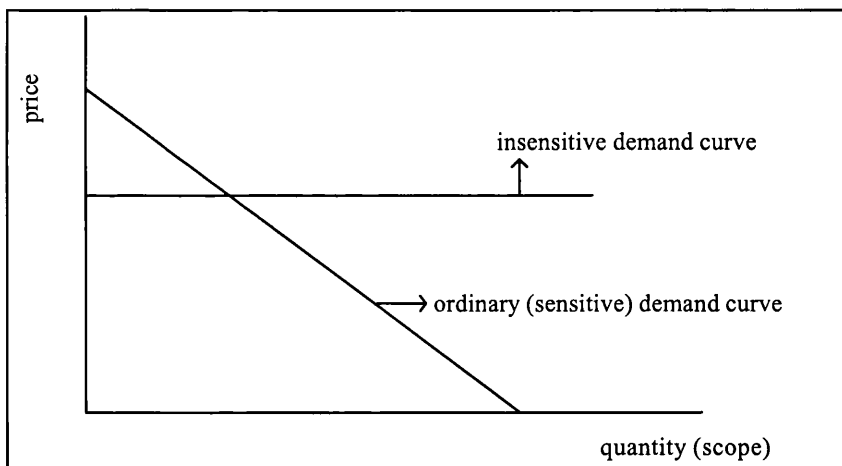
4.   **Anchoring bias**, also called starting-point bias, is associated with iterative

bidding, a technique often used in contingent valuation studies to obtain a measure

of maximum WTP from a respondent. The bias arises as a result of this initial bid

if respondents interpret it as being indicative of market information or as reflecting

some sort of representative measure of the sum they should be willing to pay

(Garrod and Willis 1990: 6). If this happens, the individual's eventual bid will

have been influenced by the starting point and will not be indicative of true WTP.

Garrod and Willis (1990:6) reviewed several studies which have investigated the presence of anchoring bias in their results. Results have not been consistent throughout these studies, and while some indicate that anchoring bias is present and most do not.

5. **Familiarity** with a commodity has been frequently claimed to be a necessary prerequisite to providing meaningful responses to valuation questions on CV questionnaires (Carson *et al* 2001). CV critics argue that surveys about commodities with which the respondents have little or no direct prior experience cannot result in meaningful values. This perspective relies upon a set of questionable assumptions about how people make purchase decisions (Carson *et al* 2001). First, consumers often make purchase decisions involving new products for which they have no prior experience, and no standard micro-economics text states that prior experience is a precondition to rational decision-making. Second, in most CV surveys, respondents usually spend no less time learning about the commodities being values than the time they spend in familiarising themselves with equivalently priced private goods before purchasing. Therefore, it is argued that the results of a CV study can be credible as long as the wording of the questionnaire successfully conveys the nature of the good and the context in which it can be purchased in a plausible, understandable, and meaningful way to the respondents (Carson *et al* 2001).

6. **Instrument bias** refers to that the respondents do not give true WTP due to their aversion to the proposed WTP payment instrument, such as income tax, admission charges, voluntary donation, etc., in the questionnaire. Instrument bias can be detected in a CV study if mean bids or protest votes vary significantly with the choice of instrument. A general guideline to avoid instrument bias as much as

possible is to have an appropriate payment instrument which is credible, relevant, acceptable and coercive (Bateman *et al* 2002: 8.21).

7. **Sequence and context effects** refer to the controversial area concerning the relationship between CV estimates for multiple, possibly unrelated goods. The first issue being that if one added up the amount of money people say they are willing to pay for certain goods (especially in different studies), then the sum of these values would easily exceed the income of most people. The second issue being that the value of a good falls, often precipitously; the later it is valued in a sequence of goods in the same study (Carson *et al* 2001: 186). The economic explanation for such findings relies upon the income and substitution effects which may occur when a list of purchase possibilities is extended: (1) each new public good the individual obtains reduces his/her available income to spend, and this has to be taken into account when aggregating CV estimates from different studies; (2) if the public goods from different studies are substitutes for each other, then each one added to the package looks less desirable than when valued as if it were the only new addition to the stock of public goods; (3) in the case of a sequence of, in some way substitutable, goods in the same study, the presentation of a given good lower down in the order must result in its value being assessed once respondent disposable income has been reduced and substitutes have been purchased in the course of prior valuation[24]. Therefore, this problem of taking into account of multiple changes should be seen as residing in the inappropriate aggregation and interpretation rather than the original CV estimates. Also, simple rules regarding the magnitude of such effects are likely to prove elusive for the time being (Bateman *et al* 2002: 8.18).

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[24] For more technical discussions of the issue, see Carson *et al* 2001.

8. **Hypothetical bias** is the umbrella designation for problems arising from the

hypothetical nature of the CV market. In addressing this problem, Mitchell and

Carson (1989: 187) review two types of evidence in the non-contingent valuation

literature which support the argument that CV surveys have the potential to obtain

valid WTP for well-defined public goods even if the contingent market is

hypothetical. The first evidence comes from the laboratory and field experiments

that reveal similar patterns of behaviour when comparing the results obtained by

treatments using a hypothetical payment structure with those involving a

nontrivial payment in real money. The second body of evidence comes from the

extensive researches on consumer behaviour prediction that demonstrate the

correlation between attitudes and behaviour.

Reliability

Reliability, as opposed to validity, is an index of the reproducibility and stability of a

measure. For CV studies, the index that is relevant for policy purpose is the stability

and replicability of CV estimates over time (Bateman *et al* 2002: 8.24). Reliability has

been assessed both within (see, for example, McConnell *et al* 1997) and across samples

(see, for example, Carson *et al* 2001: 195), and both comparisons have indicated that

estimates are reasonably reliable.

To sum up, the empirical findings largely support the validity and reliability of CV

estimates. The above concise overview shows that many of the criticisms of the CV

technique seems to be more to do with the problems at the survey design and

implementation than with some intrinsic methodological flaw. This indicates

promising prospects on the use of CV to estimate the value of non-market public goods

as long as the above issues are carefully addressed (Pearce and Mourato 1998: 28).

4.3 Contingent valuation (CV) – the survey design

4.3.1. Requirements and constraints of the survey

The aim of the survey was to obtain both the value of maintenance of the NMNS at its

current level and the value of accessing the museums. Therefore, the priorities were to

achieve a sample which includes both the users (i.e., visitors) as well as non-users of the

NMNS, and the survey mode had to be one which could facilitate the valuation

exercise.

The three major constraints on the study were cost, organisational resources and time.

Therefore, the study had utilised a minimal budget, and had to be manageable by one

person within a fairly short period of time. The survey mode, survey population, sample

size and sample chosen for the study and their reasons are described in greater detail

below.

4.3.2. Formulation and testing of questionnaires

The questionnaire was formulated on the basis of the research priorities of the study, on

discussion with colleagues, and on review of relevant surveys carried out in the UK and

in Taiwan. The importance of testing questionnaires with qualitative pre-testing and a

quantitative pilot survey is always stressed in survey research literatures (see, for

example, Moser and Kalton 1997: 47-52, Oppenheim 1996: 47-64, and Fink 1995: 86).

It is essential that all of the techniques used in a full-scale survey, especially in a

once-and-for-all operation such as an interview questionnaire, are tested at a small scale

level before full implementation. In this way, any important error can be detected which

might have had otherwise disastrous consequences. Initially, therefore, the survey was

tested on six colleagues, nine non-academics, and five NMNS curators and revisions

were made in question wording and layout. These revisions then formed the basis of a

larger scale pilot survey.

4.3.3. The pilot survey

The objectives of the pilot survey were to assess the feasibility of using Contingent

Valuation techniques under realistic conditions in Taiwan and to identify any remaining

problems in the wording of the questionnaire, the formats used for answering each of

the questions and the interview procedures. It used most of the techniques which the

full scale survey would involve, except that it was conducted by myself on the streets in

Kaohsiung city rather than by other interviewers at the other planed survey locations

(Taipei, Kaohsiung, Taichung, and the exits of the NMNS). This was to minimise the

cost and time spent on the pilot survey. The survey was carried out in 2000 on Sunday

13th February and Monday 14th February (a week-end and a weekday) from 9:00 to

17:00 with an hour lunch break between 12:00 to 13:00. A total number of 50

questionnaires, out of 67 people approached, were successfully completed, and it took

on average twelve minutes to complete an interview. The reasons for the 17 refusals

were lack of time (9), lack of interest (5), and unknown (3).

In light of the pilot survey, one question was modified, the description of the NMNS

was reduced in length, and one confirmation question was added. The question

modified was the first attitudinal question concerning priorities amongst different

public issues. In the pilot survey, the respondents were asked to rank the priorities

amongst national defence, crime prevention, social welfare, reducing environmental

pollution, education and museums (Box 4.1). This question was to measure the

attitudinal value the respondents put on museums in general as a reference to the

monetary value they put on the NMNS. All of the six issues chosen had attracted great

public attention for the past decade or even longer. National defence had long been one

of the top priorities of governmental spending in Taiwan due to the continual political

tension between Taiwan and mainland China since 1949. However, having kept the

peace and started a growing economic relationship between Taiwan and China for all

these years, and also with an increasing awareness of the importance of other public

issues, the government has gradually reduced the percentage of public spending on

national defence in the past ten years. The growing problem of crime, such as theft,

drugs, and robbery, had posed a greater danger to the public, and therefore had caused

increasing public concerns about crime prevention. Other issues, i.e., social welfare,

environment, education and museums, had also become issues of increasing

importance to the public due to the rapid economic development and industrialisation.

In the pilot survey, most respondents got stuck on this question at the very beginning of

the interview, and were then asked their reasons for not being able to answer this

question. It was discovered that the respondents found it too difficult to rank the

priorities amongst these issues because they were so varied in scale and in nature and

all very important for them. This showed that these public issues were considered more

complementary than substitutable for each other. Those who failed to answer this

question were then further asked to suggest a list of activities or facilities which they

thought to be comparable to museums and galleries in terms of competing for

governmental funding. The most mentioned four other cultural/leisure facilities,

including concert halls, parks, libraries and sports centres were then chosen for the final

questionnaire (Box 4.1).

Box 4.1   **Question 1 – comparison of two versions**

Question 1 – pilot survey version Taiwan is a rapidly developing country. However, the public resources are limited and they have to be allocated to priority issues. Could you please rank the priorities of the following public issues for the next five years? (1 as the most important, 2 as the next most important and so on) ☐1. National defence   ☐2. Crime prevention   ☐3. Social welfare ☐4. Environmental pollution ☐5. Education   ☐6. Museums / galleries.
Question 1 – final version Taiwan is a rapidly developing country. However, the public resources are limited and they have to be allocated to priority issues. Could you please rank the priorities of the following cultural/leisure facilities for the next five years? (1 as the most important, 2 as the next most important and so on) ☐1. Theatres/Concert halls ☐2. Parks   ☐3. Libraries ☐4. Museums/galleries   ☐5. Sports centres

It was also discovered from the pilot survey that people were all very familiar with the

NMNS. Therefore, the description of the NMNS was reduced to four sentences

covering only its uniqueness and core functions (Box 4.2).

Box 4.2   Museum description – comparison of two versions

Museum description – pilot survey (Chinese) version **(10 point Chinese font/389 words)** 國立台中自然科學博物館（以下簡稱科博館）是我國第一座國家級規模的科學博物館，目前有具有科學、歷史、文化及教育價值的標本及文物蒐藏四十萬號以上（蒐藏仍在積極地進行中，數量持續在增加），可說是現階段臺灣在動物、植物、地質、人類學標本整體性蒐藏數量最豐富，管理、維護保存制度最完善的博物館。 科博館的主要工作便是對蒐藏的標本和文物進行科學的研究，同時，也基於研究上的需求，進行積極的蒐藏，透過博物館的展覽、教育活動、出版品，將研究的成果，呈現給社會大眾，至於展出的及蒐藏的標本文物，則必須置於恆溫恆濕的環境中，妥善保存，以便將來的研究人員再進一步研究，也讓後代的子孫觀眾得以欣賞、學習。相對於如此龐大的蒐藏量及多重的功能，博物館也需要龐大的預算來維持其品質。 本研究所想要了解的是：「您**全家**對科博館所帶給您的種種好處所**願意支付的金額**」，請注意，您的願付金額是以您全家而不只是您個人為單位。
Museum description – final (Chinese) version **(10 point Chinese font/187 words)** 國立台中自然科學博物館是臺灣第一座國家級規模的科學博物館，目前有四十萬件以上的蒐藏，算得上是現階段臺灣專業整體性蒐藏數量最豐富，管理、維護保存制度最完善的博物館之一。 本研究所想要了解的是：「以科博館目前的整體水準，包括展覽、研究、收藏品、出版、教育推廣活動等等，對您『全家』而言，值多少錢？」換句話說，也就是您『全家』，透過『繳稅』及『門票』的方式，願意付出多少錢給科博館。

Note: The difference between the two versions is more obvious in the Chinese versions. Therefore, for more clear comparison, both versions are presented in Chinese with the information on the font size used and word count.

One of the most important objectives of the pilot survey was to find out how the respondents reacted towards the valuation exercise. This was particularly essential for the reasons outlined below. Firstly, it is rather unusual for people in Taiwan to be asked to put a monetary value on a museum. It is possible that people were unable to give the answer, or might even be against the idea of 'monetising' a museum. Secondly, the elicitation method employed, the 'payment ladder', was not straightforward and could sometimes be confusing. Thirdly, the current survey used two sequential valuation questions to elicit people's willingness to pay for the NMNS, which made the valuation exercise slightly more complicated. According to the experiences gained from the pilot survey, the questionnaire worked well. The respondents had little difficulty understanding the valuation exercise, nor did any of them protest at the idea o f putting a

monetary value on a museum. The only problem discovered was that a small number of

the respondents (6 out of 50) mistook the two sequential valuation exercises for two

independent ones. Once it was explained how these two sets of questions worked, they

changed their answers without any problem. To prevent this misunderstanding, a more

detailed explanation of the sequence of the valuation exercises was emphasised before

the first valuation scenario and a confirmation question was added to make sure the

respondents understood the valuation exercise correctly (Box 4.3).

Box 4.3   Valuation misunderstanding prevention

Additional emphasis – final version   Later, I am going to ask you to say how much your household (or yourself only, if your are single) is willing to pay, if anything, to the NMNS through income tax each year AND entrance ticket per visit.
Additional confirmation question – final version   23. We sometimes find that people do not realise that they are asked about two sequential ways of payments to the museum until both sections are finished. Now, at this point of the interview, I would like you to review what you have just said and give you the chance to make adjustments. In question 13 and 18, you said you were willing to pay no more than NT$_____ per year in tax PLUS no more than NT$_____ each time you visit the NMNS. If you and your family go to the NMNS once a year, this gives NT$_____ as the MAXIMUM amount annually your household would be willing to pay for the museum. If you would like to make any change, please do not hesitate to do so. We want to get your best judgement about how much the museum is worth to your household. There are no right or wrong answers. Would you like to shift any amounts around or raise or lower the total amount?   ☐1. Yes, make changes → go back to 13 or 18   ☐2. No → continue

4.3.4. The questionnaire design[25]

The aim of the questionnaire was to elicit attitudes towards, and individual preferences

for, the existence and the use of the NMNS. The questionnaire, therefore, had to be

designed to get respondents to think seriously about the importance of the NMNS, to

provide the necessary information for them to be able to make informed decisions and

to encourage them to identify and reveal their monetary evaluations.

Based on typical design of CV questionnaires, the current questionnaire consists of

three sections in the following order: the attitudinal questions, the valuation questions,

and the classification questions. The sequencing of the questions plays a crucial role in

the questionnaire design, because it may affect the refusal rate and it may also influence

the answers obtained (Bateman *et al* 2002: 4.23, Moser and Kalton 1997: 346).

Conventionally, the preliminary section of a CV questionnaire contains a considerable

number of attitudinal, behavioural and lifestyle questions about the good/service to be

valued and of the subset of goods/services of which it is a part. This set of initial

questions does not provide an answer to the main aim of the CV questionnaire.

However, they are related to that aim as they reveal some of the underlying factors

behind respondents' values. In addition, these questions serve as a preparation for

responding to the more demanding valuation questions (Pearce and Mourato 1998: 18,

Bateman *et al* 2002: 4.23). In the current survey, the attitudinal section asked people's

attitudes towards museums in Taiwan in general, including the importance of museums,

their uses of museums, their reasons for visiting museums, and their opinions on the

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[25] The CV survey was carried out in Taiwan using Chinese questionnaires. The survey questions referred
to in the thesis are English translations, except Box 4.2. The final questionnaires (the Chinese original
version and the English translation version) are attached in Appendix II.

functions of museums (see Appendix II). Apart from warming up the interview and exploring the underlying motives, this set of questions was also used to remind the respondents that public resources were limited and they had to take into account other public issues when answering their valuation questions at a later stage.

The second section of questions provides the main core of basic information, the monetary valuation. In general, the valuation section in a contingent valuation survey follows an outline explained below. To begin, the respondent is presented with a scenario. The scenario must provide as clear and plausible as possible a description of the 'good' the respondent will be asked to value. Following the scenario the respondent is presented with a policy or project that will be undertaken to ensure that the respondent hypothetically, but realistically, receives this good. The policy or project description must include a payment vehicle, the mechanism through which the respondent will be expected to pay for the policy or project. The scenario, policy and payment vehicle together compose a hypothetical description of a means by which individuals can express their willingness to pay for a good that they could not normally purchase in a market – a so-called contingent market. Having created a description of a contingent market, an elicitation procedure is then used to reveal the respondents' willingness to pay. Conventionally, follow-up attitudinal questions are also asked after monetary valuation questions to uncover the reasons behind the values stated (Mitchell and Carson 1989: 3). This set of questions is cognitively more demanding than the former. However, at this point, it is expected that the initial questions have a positive effect on the quality of answers to the subsequent section, so the respondents should be sufficiently engaged in the exercise to be willing to make the effort to continue (Pearce and Mourato 1998: 18, Bateman *et al* 2002: 4.24). In the current survey, this section

started with a household composition question to inform the respondents of using

'household' as the valuation unit. The current state of the NMNS was then described,

followed by two subsequent sets of valuation questions. The respondents were asked to

value the existence and maintenance of the museum as well as the visit to the museum.

Since the museum is funded by central public funding and charging for admission,

income tax was chosen as the payment vehicle to capture the values of the existence

and maintenance of the museum and admission charge was used to capture the use

value. The payment ladder was used as the elicitation method. A confirmation question

was asked after the valuation questions to make sure the respondents understood the

exercise correctly. The respondents' opinions on paying for the museum were then

enquired at the end of the valuation section.

Normally, the closing section consists of the most sensitive questions, which are

classification questions about the socio-economic and demographic characteristics of

the respondents. This is because questions on sensitive topics may lead to the

respondent refusing to continue with the interview. If they are left until last, when a

refusal is met, relatively little information is lost (Moser and Kalton 1997: 346). In

Contingent Valuation surveys, these questions are to ascertain the representativeness of

the survey sample relative to the survey population and to study how willingness-

to-pay varies according to respondents' characteristics (Pearce and Mourato 1998: 18,

Bateman *et al* 2002: 4.24). Information on age, education, occupation, residence, and

household income of the respondents is collected for the current survey.

4.3.5. Survey mode – intercept interview

Face-to-face interview is the most recommended survey instrument for Contingent

valuation studies due to the special characteristics of the valuation exercise (Mitchell

and Carson 1989: 110, Arrow *et al* 1993). First, the contingent market involves

complex scenarios that require careful explanation, and benefit from close control over

the pace and sequence of the interview. Second, the need to obtain monetary values

requires a method which can motivate respondents to make a greater-than-usual effort.

The physical presence of the interviewer allows the interviewer to probe and clarify

unclear responses and to help convey complex ideas or bodies of information. It also

offers the opportunity to motivate the respondents to co-operate fully with a complex or

extended interview. Finally, since the survey unit is the household rather than individual,

the interview can ensure that the correct member of the household responds to the

survey, something over which there is no control in a mail survey (Mitchell and Carson

1989: 110, Bateman *et al* 2002: 3.9).

There are mainly two types of face-to-face interviews: in-home surveys and intercept

surveys. In-home survey takes place in the respondents' homes, while intercept survey

takes place in a location outside the home, such as on the street, in a park, etc. The

former is more expensive and time-consuming. Since cost, time and organisational

resources were the main constraints on the current study, intercept in-person survey was

chosen as the most appropriate method.

Some disadvantages of intercept in-person survey do exist and should be noted.

Intercept surveys share the same problems with all face-to-face interviews. The

presence of the interviewer can affect the quality of data collection adversely if special

care is not taken, even though it can also affect it positively if it is done with great

caution. Face-to-face with an interviewer sometimes deters the respondents from

giving information that they may consider sensitive. Moreover, interviewers can bias

survey responses, and respondents may give the answers that they think the interviewer

want to hear (the so-called yea-saying bias). However, interviewer bias can be

minimised through careful and rigorous training of the interviewers prior to the start of

the survey. Also, careful wording of the questionnaire can lessen the likelihood of

yea-saying bias (Mitchell and Carson 1989: 110, Bateman *et al* 2002: 3.11, Moser and

Kalton 1997: 276). Intercept surveys also suffer from two particular disadvantages:

samples are normally not representative, and questionnaires have to be short (Bateman

et al 2002: 3.11). The problem of samples being non-representative can be dealt with,

though not ideally, by statistical weighting, and the constraints on length of

questionnaires would involve extra efforts in questionnaire design and wording.

4.3.6. Survey population and sampling

The survey population of the current study was aimed to consist of the group of

individuals who receive the benefits and bear of the costs of the NMNS. The NMNS is

of national significance in Taiwan and paid for through central governmental funding.

It is not an internationally renowned museum, so it has hardly any foreign visitors.

Therefore, the whole population in Taiwan, as taxpayers, were to be the target survey

population.

In order to find out the 'total economic value' of the museum, two sub -groups,

current-users and non-current-users, were selected as the survey sample. The current-

users were sampled onsite at the exits of the museum. The non-current-users were

sampled offsite from the three biggest cities in Taiwan.

Simple random sampling, the most basic method amongst various probability sampling
methods, was chosen as the sampling technique since it can theoretically achieve an
unbiased sample without much technical difficulty, given the constraints on the current
study. During the survey period, every 7th adult aged over 18 passing the sampling point
was requested to participate in the interview. A total number of 799 people were
sampled across 12 sampling points, at the exits of the NMNS and in the three biggest
cities in Taiwan: Taipei, Taichung, and Kaohsiung.

4.3.7. Interviewer recruitment

Having chosen the survey mode, the survey population, and sampling strategy, the
interviewers had to then be recruited and trained to do the survey. The core of the
interviewer's task was to select the sample members, to obtain interviews with them
and to ask the questions and record the answers as instructed. Therefore, an interviewer
had to be honest, interested in the work, and accurate in recording answers. 20
interviewers with the above desirable personal characteristics were selected from the
undergraduate students who attended the Museum Studies class in Tunghai University
and National Taiwan University. The reasons for using such a large number of
interviewers with each doing no more than 40 interviews were to minimise the risks of
interviewer bias and 'interviewer fatigue', as well as to increase the number of
sampling points.

After recruiting the interviewers, I gave them instruction on survey methods and
interviewing techniques, a brief explanation of Contingent Valuation Method, the aims

of the survey, and how the results were to be used. The importance of their roles in my

study was emphasised to make them feel, as was indeed the case, that the value of the

survey depended on the accuracy and completeness of the information they collected.

After instruction, they were then asked to interview each other under my supervision.

4.3.8. Survey implementation

The final survey was undertaken during March/April 2000. Following earlier

refinement, no major problems were encountered at this stage with the survey working

well in the field. A total of 799 people were sampled across 12 sampling points, on site

at the exits of the National Museum of Natural Science (NMNS) in Taichung and offsite

in the three biggest cities in Taiwan: Taipei, Taichung, and Kaohsiung (Table 4.1,

Figure 4.4). 620 respondents out of the 799 people sampled (77.6%) completed the

questionnaire successfully.

The data from the questionnaires was first entered into an SPSS for Windows 9.0[26]

dataset file and then transferred indirectly to a STATA 5.0s[27] dataset file. All statistical

analyses, except the econometric modelling of WTP responses, were processed using

SPSS. The econometric modelling of WTP responses was processed using STATA.

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[26] SPSS stands for *Statistical Package for the Social Sciences*. It is one of the most widely used statistical programs in the social sciences.
[27] An econometric package for Statistics and Data Analysis, published by the Stata Corporation.

Table 4.1   Survey response rate

Survey location	Sample size (N)	Useable response (N)	Response rate (%)
on-site			
Museum exit	400	319	79.8
off-site			
Taipei	133	95	71.4
Kaohsiung	133	106	79.7
Taichung	133	100	75.2
Total	799	620	77.6

Figure 4.4   Survey locations
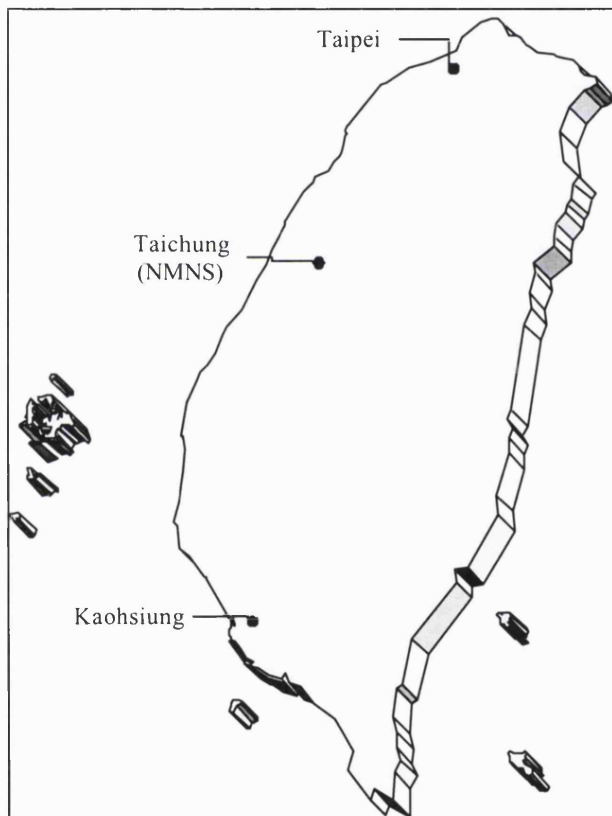
Non-response

It is rarely possible to obtain a response from all those selected for the sample. Non-response can be a source of bias, since non-respondents may well differ in their characteristics from respondents. Therefore, it should be dealt with carefully. It is

important to know why the non-respondents are not interviewed and what their

characteristics are. This can be achieved either by directly asking the non-respondents

or by inference based on a comparison of the achieved sample with information already

available about the population (Hoinville and Jowell 1978: 72).

In the current survey, the non-respondents included those who took part in the interview

in the beginning but did not complete the interview and those who refused to answer the

questionnaire. The gender of the non-respondents and their reasons for refusing are

presented in Table 4.2. It shows that refusals occurred because of general, rather than

survey-specific, reasons. In other words, the refusals had nothing to do with the

respondents' personal r eaction to the survey topic nor the valuation exercise.

Table 4.2   Survey non-respondents

	N	**% of non-respondents**
Gender		
• Female	85	47.5
• Male	94	52.5
Reasons for not completing the questionnaire:		
• Being interrupted by his/her child(ren)	15	8.4
• Running out of time	18	10.1
Reasons for refusing participating:		
• Lack of time	67	37.4
• Not interested in filling any questionnaire	59	33.0
• Not known	20	11.2
Total no. of non-respondents	179	100.0

One way of assessing non-respondent characteristics is to compare known population

characteristics with those of the achieved sample. Some researchers would engage in

statistical weighting to bring the survey sample into line with the known population

distribution, assuming that the non-respondents have the same attributes or experiences as the respondents (Hoinville and Jowell 1978:73, Fowler 1993: 48, Moser and Kalton 1997: 181). However, this can only adjust the bias in the survey sample along a few demographic lines, the bias in the opinion or behaviour of the survey sample is still not ascertained. Therefore, some researchers may do no more than to indicate the direction of the bias due to non-response (Oppenheim 1996: 106).

For the current survey, the demographic characteristics of the offsite population can be obtained from governmental statistics, while the onsite population is not known due to the lack of a comprehensive study on visitor profiles in the museum. The onsite sample was assumed to be representative of the onsite population, because the survey sample was selected randomly, the non-response were unconnected to the survey topic, and there is no population characteristics to be compared with. From the comparison of the demographic characteristics between the offsite sample and the full population, it is clear that the offsite sample is not representative of the entire population in Taiwan (Table 4.3). Weights could have been calculated by comparing the proportion of a certain characteristic of the full population with its proportion in the sample using the formula (Bateman *et al* 2002: 5.38):

$$\text{Weight} = \frac{\text{percentage of characteristic in full population}}{\text{percentage of characteristic in sample}}$$

In order to weight according to all three criteria, a complete coverage of all the population and sample characteristics in Table 4.4 is required. Due to the lack of a complete coverage of sample characteristics, it is not possible to weight the survey results properly. Therefore, tables concerning the offsite sample in the thesis are

presented un-weighted .

Table 4.3   Comparison of demographic profiles of the offsite sample and the general population `

		Full population (%)	Offsite sample (%)
Monthly income (US$/household)	<1,176	13.6	28.7
	1,176-2,353	37.1	32.9
	2,353-3,842	28.3	19.2
	3,842-5,882	17.3	9.1
	5,882-11,765	3.4	4.2
	>11,765	0.3	5.9
		100	100
Education level	Graduate	18.9	50.7
	High school	29.1	46.0
	Junior high school	22.4	2.0
	Elementary school*	29.6	1.3
		100	100
Age	18-24	16.9	36.8
	25-34	22.8	29.8
	35-44	23.3	19.6
	45-54	15.7	12.1
	>55	21.3	1.7
		100	100

Note: * elementary school and below.

Table 4.4   **Weighting criteria**

		Grad.					H.S.					J.H.S.					E.S/bw				
		18-24	25-34	35-44	45-54	>55	18-24	25-34	35-44	45-54	>55	18-24	25-34	35-44	45-54	>55	18-24	25-34	35-44	45-54	>55
Monthly Income	<1,176																				
	1,176 – 2,353																				
	2,353 – 3,842																				
	3,842 – 5,882																				
	5,882 – 11,765																				
	> 11,765																				

Chapter 5   Contingent Valuation I – Public Attitudes Analysis

This chapter begins by presenting the socio-economic and demographic profile of the respondents as a background information on the composition of the survey respondents. The public attitudes towards the museums sector in Taiwan is then analysed in section 5.2. Section 5.3 summarises the findings.

5.1   Socio-economic and demographic profile of the respondents

The socio-economic and demographic profile of respondents is presented first in the public attitude analysis as a general background of the survey results. This classification information serves two objectives in the current study. Firstly, as in most CV surveys, the socio-economic and demographic questions are used to ascertain the representativeness of the survey sample relative to the target survey population, to examine the similarity and difference of different groups receiving the same questionnaires and to study how willingness-to-pay varies according to the respondents' characteristics. Secondly, they provide valuable information on patterns of museum visiting in Taiwan, which has never been done before.

Table 5.1 presents a summary of selected socio-economic variables. It shows that both onsite and offsite samples, compared with the full population, are biased towards female, younger, smaller household, better educated and higher income respondents. It is clear that the offsite sample was not representative of the full population, which could derive from where and when the interview survey took place.

Table 5.1   **Summary statistics of selected socio-economic variables**

Variables	Onsite sample	Offsite sample	Pooled sample	Full population*
Total no. of respondents	319	301	620	
● Gender (%):				
Female	59.9	64.1	61.9	48.9
Male	40.1	35.9	38.1	51.1
● Average age	28.8	31.0	29.8	37.8
● Average family size (person/household)	2.1	2.3	2.2	3.8
● Education (%):				
University and above	45.3	50.7	47.9	18.9
Senior high school	58.2	46.0	49.5	29.1
Junior high school	1.9	2.0	1.9	22.4
Elementary school and below	0.0	1.3	0.6	29.6
● Average monthly household income (US$)	2,198	2,930	2,561	2,140

* Data source: Report on the Survey of Family Income and Expenditure in Taiwan Area of Republic of China, 1999 (DGBAS 2000).

5.1.1. Gender

Table 5.1 shows that 62% of the survey sample were females, which were significantly

over-represented compared with the governmental statistics[28] of 49% of population

being female. There are two possible reasons for this. Firstly, the survey was carried out

in daytime onsite at the exits of the museum and offsite on streets when and where

males could be less available during weekdays. Secondly, when a family or a couple

were approached, it tended to be the female rather than the male to answer the

questionnaire on behalf of the family or the couple. The effects of the

over-representativeness of female respondents on the survey results is minimised

because the willingness-to-pay unit is the 'household' rather than the 'person'. It is

also the case that there is no significant difference in answers to survey questions

between males and females.

5.1.2. Age distribution

Figure 5.1 shows the age distribution of the survey respondents and the full population.

From the comparison between the offsite respondents and full population, it can be

deduced that the age group 18-24 were over-represented while those who were over 55

years old were far under-represented. This is probably because the offsite survey was

carried out on the streets where the elderly tended to be less available or the younger

people were more willing to participate in an interview.

As for the onsite survey, it is difficult to detect whether there is any bias, due to the lack

of the data of visitor profiles from the museum. Assuming the onsite sample

represented an acceptable distribution of the visitor composition of the NMNS, it shows

that the visitor composition is towards the younger people compared with the full

population profile. This is slightly in contrast to the age distribution of the visitors to

museums and art galleries in the UK, which shows the relative unpopularity of

museums and art galleries with teenagers and the elderly (Davies 1994: 55, Middleton

1998:19). A further analysis on those who claimed to have visited any museum or

gallery at least once in the last year from the offsite sample discovers that the NMNS is

relatively more popular amongst younger people in Taiwan compared with museums

visitors in general in Taiwan (Figure 5.2).

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[28] Data source: Monthly Bulletin of Statistics, May 2000.

Figure 5.1   **Age distribution of full population and survey sample**
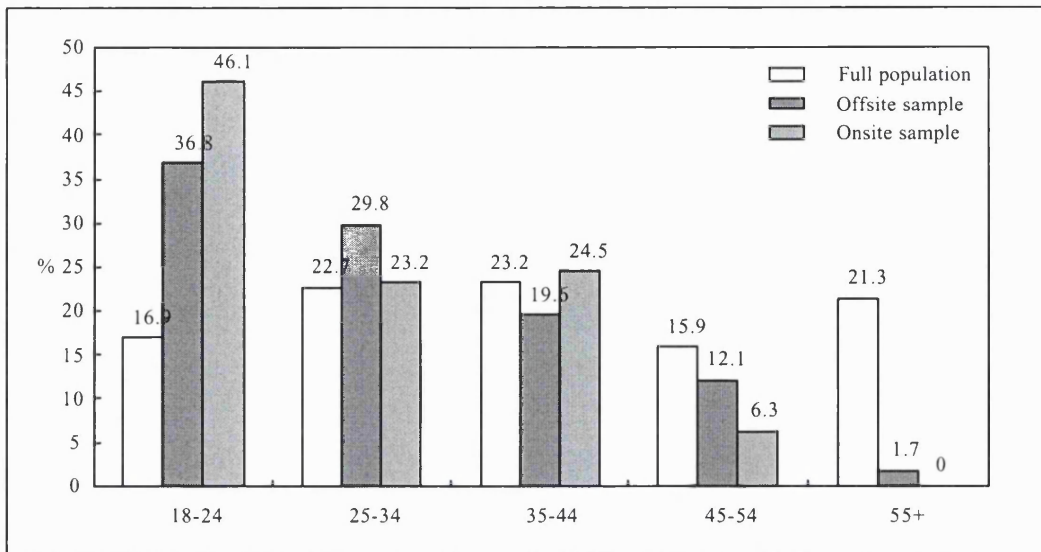
Data source: Current survey and 'Report on the survey of Family Income and
Expenditure in Taiwan, 1999'.

Figure 5.2   **Age distribution of full population, NMNS visitors and general
museums visitors.**
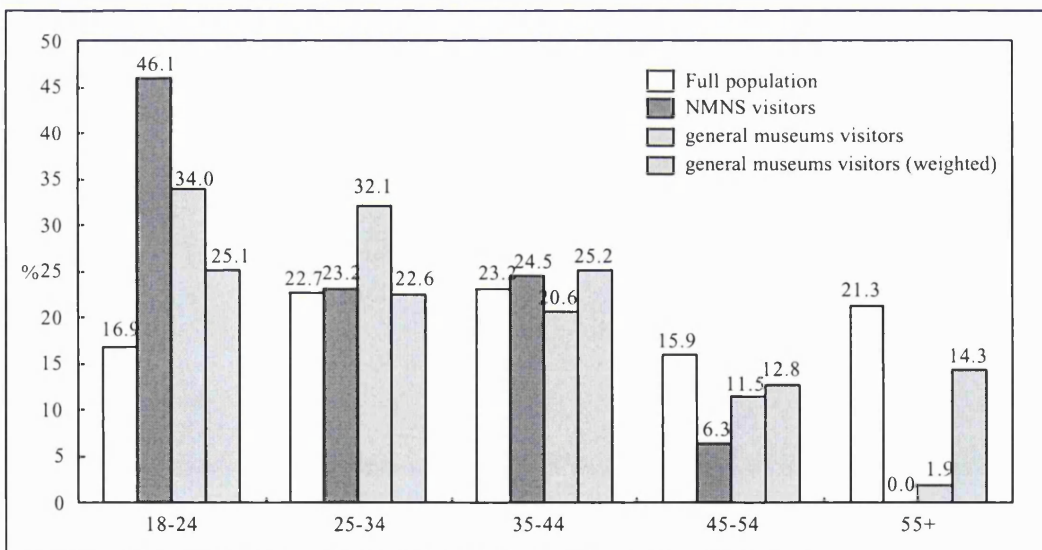
Note: 'Museums visitors' are those who visited any museum or gallery at
least once in the last one year from the offsite sample. The weighted
results are the above weighted by education.

5.1.3. Family size

The average family size of survey sample was smaller than that of the full population

(Table 5.1). This is reasonable because in the current survey those respondents who

were single, i.e. neither married nor single parent with children, were defined as one-

person households[29], while in governmental household surveys they may be grouped as

members of bigger households if they live with other members of the family. Therefore,

it is understandable to have more one-person households in the survey sample than in

the full population, resulting in the smaller family size in the survey sample.

A further investigation shows no significant difference in family size between

museum-visitors and non-museum-visitors in the offsite sample (Table 5.2). However,

the weighted results, which are closer to the demographic profile of the full population,

are significantly larger than that of the onsite sample, i.e., NMNS visitors. This could be

explained by the relative popularity of the NMNS amongst younger people discussed in

the previous section.

Table 5.2   Family size of different sub-groups

			Family size (persons)
Full population			3.8
Onsite sample (NMNS visitors)			2.1
Offsite sample	Survey results	Museum-visitors	2.3
		Non-museum-visitors	2.2
		Total	2.3
	Weighted results	Museum-visitors	3.2
		Non-museum-visitors	3.5
		Total	3.3

5.1.4. Educational attainment

Table 5.1 also shows that the respondents above senior high school level were far

over-represented while those with lower educational level were extremely

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[29] This was because those respondents who were single, even though they might be living with other
members of their families, were generally economically independent from other members in the same

under-represented. In order to find out whether this was related to half of the interviews

being carried out onsite at the exits of the museum or the bias in age distribution, the

educational attainment is checked against the age group in both onsite and offsite

samples (Table 5.3). From Table 5.3 it is clear that the proportion of respondents with

higher educational levels was indeed in excess of that of the full population across all

age groups regardless of where the interviews were carried out.

The high educational attainment of the onsite sample confirms the existing museum

visitor studies from the UK suggesting the more highly educated someone is, the more

likely a museum visit becomes likely (Hooper-Greenhill 1994: 65; Middleton 1991:

147). The relationship between educational attainment and museum visiting pattern

will be discussed in greater detail later.

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household, and the 'willingness -to-pay' unit should be more an economic unit than a generally
recognised household, defined by people living together in the same house.

Table 5.3   Education against age distribution

	Graduate and above	High school	Junior high school	Elementary school*	Total (%)
Onsite (%)					
18-24	15.0	83.6	1.4	-	100
25-34	76.4	23.6	-	-	100
35-44	67.9	29.5	2.6	-	100
45-54	68.4	21.1	10.5	-	100
55+	-	-	-	-	0
Total	45.3	52.8	1.9	-	100
Offsite (%)					
18-24	14.7	85.3	-	-	100
25-34	80.7	17.0	2.3	-	100
35-44	60.3	36.2	3.5	-	100
45-54	63.8	25.0	5.6	5.6	100
55+	60.0	-	-	40.0	100
Total	50.0	46.6	2.0	1.4	100
Full population (%)					
18-24	24.1	39.9	30.1	5.9	100
25-34	28.2	39.1	28.5	4.2	100
35-44	20.1	35.1	29.1	15.7	100
45-54	15.8	20.3	12.7	51.2	100
55+	6.3	9.4	9.3	75.0	100
Total	18.9	29.1	22.4	29.6	100

Note: * elementary school and below.

The bias in educational attainment of the offsite sample needs further investigation.

Other CV studies in Taiwan using the same survey instrument, i.e. intercept interview, were reviewed. One CV study on Taiwan's wildlife conservation area reported a similarly high percentage of respondents with a high level of educational attainment (Table 5.4) (Lin 1998). The other CV study by Qiu (1998) on the damage costs of air pollution also had a relatively higher educational level respondents (Table 5.4). It seems that, in Taiwan, people with lower educational level are less likely to participate in an intercept interview. The survey sample being unrepresentative of the survey population is also a common problem with intercept surveys (Bateman *et al* 2002: 3.11).

Table 5.4   **Comparison of educational attainment in different surveys**

Education	Offsite sample (%) N=296	Lin's 1998 survey (%) N=811	Qiu's 1998 survey (%) N=753	Full population* (%)
Graduate and above	50.0	56.9	34.0	18.9
Senior high school	46.6	37.6	39.7	29.1
Junior high school	2.0	3.8	11.7	22.4
Elementary school and below	1.4	1.7	14.6	29.6

* Data source: Report on the survey of Family Income and Expenditure in Taiwan,
        1999.

5.1.5. Household income

It is fundamental to obtain accurate estimates of household income, as this variable has

always been important in explaining willingness-to-pay as expected in economic theory.

Generally,

$$\text{Demand} = f(P, Y, E, S, x),$$

where 'P' represents 'price of the good', 'Y' represents '   respondent income', 'E'

represents 'scope and embedding', 'S' represents 'sequencing' and 'x' represents 'all

other variables' (Bateman *et al* 2002: 8.16). However, it is not always easy to measure

'Y' given the well -known reluctance of survey respondents to reveal their degree of

material wealth. The proportion of the overall respondents who did not reveal their

income was only 6.9% which is generally lower than percentages obtained in other

CV studies in Europe or the USA. This is probably because the survey was conducted

by undergraduate students of whom the general public in Taiwan have a typically good

impression. Also, this question was asked at the end of the interview. After answering

all the survey questions and realising the aims of the survey, the respondents may

become less suspicious of and more open with answering their income for research

purposes.

A comparison of income distribution of the survey respondents and full population is given in Figure 5.3. The distribution of the offsite sample was relatively closer to the full population, while the onsite sample contained a significant proportion of lower income group, most of which were students. The average monthly household income of the onsite sample (US$ 2,198) and the offsite sample (US$ 2,930) was higher than that of the full population (US$ 2,140). The highest-income respondents, both from onsite and offsite surveys, were over-represented, compared with governmental statistics. This is probably because the offsite survey was carried out in the three biggest cities and also nearly two third of the visitor survey respondent were from these cities where the average household income is higher than the one in Taiwan as a whole (Table 5.5).

Figure 5.3   Gross household income distribution (per month)
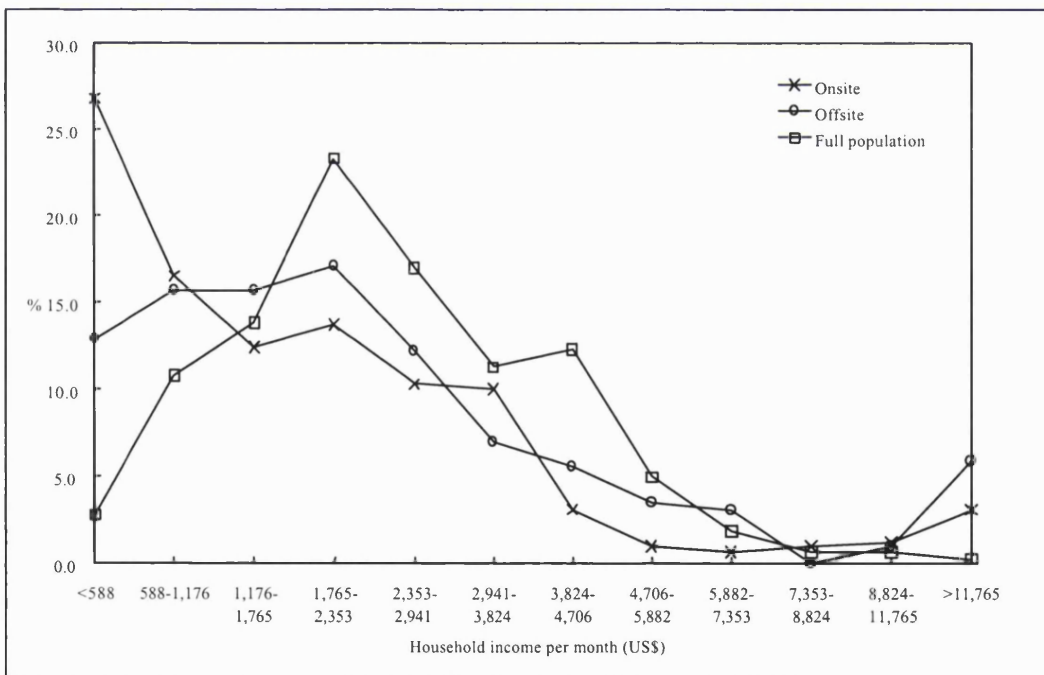
Data source: current survey and 'Report on the survey of Family Income and
        Expenditure in Taiwan, 1999'.

Table 5.5   **Average household income per month by area**

	US$
Taiwan	2,140
Taipei	2,932
Kaohsiung	2,210
Taichung	2,469
Average in Taipei, Kaohsiung, and Taichung	2,727

Data source: Report on the survey of family income and expenditure in Taiwan, 1999.

The survey results also suggest that the onsite sample were slightly wealthier than the

full population but less wealthier than the offsite sample. To find out whether this is

because there were more students in the onsite sample, the average income is

re-calculated excluding those who were students from both onsite and offsite samples.

Table 5.6 shows that the offsite sample was still richer than the onsite sample even if

students were excluded. A further comparison of respondents from Taipei, Taichung

and Kaohsiung in both samples also provides the same information that NMNS visitors

were less affluent. This implies that income is probably not a significant determinant of

visiting the NMNS.

Table 5.6   Average monthly household income excluding students

	US$
Survey sample (including student respondents)	
Onsite	2,198
Offsite	2,930
Survey sample (excluding student respondents)	
Onsite	2,695
Offsite	3,285
Respondents from Taipei	
Onsite (N=47)	2,775
Offsite (N=98)	3,304
Respondents from Taichung	
Onsite (N=124)	2,129
Offsite (N=68)	2,465
Respondents from Kaohsiung	
Onsite (N=21)	1,597
Offsite (N=109)	2,735

5.1.6. Geographical distribution

Finally, the place of residence of the onsite respondents is analysed[30]. Table 5.7 compares the geographical distribution of onsite sample and that of the full population. Visitors from Taichung, where the museum is located, were very much over-represented (42.7%). This is reasonable because the museum is geographically most accessible for them. The second and third most visitors were from Taipei and Kaohsiung (16.5% and 7.6%), which is understandable since they are the most populated areas in Taiwan. The strong and statistically significant positive correlation between the size of the population in the areas and the numbers of visitors from the areas supports this explanation (Table 5.8). Respondents from Xinzhu and Zhanghua were over-represented, which could partly be explained by their proximity to the museum. However, Miaoli, Nantou and Yunlin, also within similar distance to the

museum and with similar size of population, do not have as many museum visitors.

Table 5.8 also shows no statistically significant correlation between distances from the

areas to the museum and the visitor numbers. It seems that distance is not a strong

determinant of visiting the NMNS. So, what are the other factors affecting the visitor

distribution? One possible reason could be that the survey was carried out six months

after the big earthquake in 1999 and Miaoli, Nantou and Yunlin happened to be the

most damaged areas. However, due to the lack of data on the visitor profile over time,

there is no knowing whether there was any drop in visitor numbers from those areas

after the earthquake. Economics could be another possible explanation for the

geographical distribution of the visitors, since the average household income of people

in Xinzhu and Zhanghua is higher than those in Miaoli, Nantou and Yunlin. Also, there

is a strong statistically significant positive correlation between the average area

household income and the number of visitors in the area, which means, those who lived

in the wealthier area, even though they were not richer themselves, were more likely to

visit the NMNS. However, the sample size of the current survey, with often only one or

two visitors from certain areas, was not big enough for further quantitative analysis.

Also, the current survey was carried out during March/April, and, therefore, the visitor

profile during the survey period may or may not be representative of the visitor profile

throughout the year. What determines the geographical distribution of the visitors

requires further and longer-term studies, which is beyond the scope of the current study.

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[30] The place of residence of the offsite sample is not analysed, since most of them lived where they were interviewed.

Table 5.7   Geographical distribution of population from visitor survey
             respondents and governmental statistics.

	% in onsite sample	% in full population*	Distance to NMNS (km)	Household income in full population (NT$/month)*
1. Taipei	16.5	32.4	166	99,678
2. Ilan	0.6	2.0	252	65,292
3. Taoyuan	4.7	7.3	139	79,186
4. Xinzhu	7.0	3.3	98	80,009
5. Miaoli	0.6	2.2	49	63,448
6. Taichung	42.7	10.5	0	83,960
7. Zhanghua	8.2	4.8	20	67,011
8. Nantou	1.3	2.3	31	60,467
9. Yunlin	1.6	3.1	68	55,142
10. Jiayi	2.8	3.6	86	48,415
11. Tainan	4.1	8.4	134	68,373
12. Kaohsiung	7.6	13.1	181	78,151
13. Pingdong	1.3	3.8	210	61,870
14. Penghu	0.3	0.4	180	42,052
15. Taidong	0.3	1.1	349	46,851
16. Hualian	0.3	1.6	398	59,909

*data source: Report on the Survey of Family Income and Expenditure in Taiwan
                Area of R.O.C, 1999 (DGBAS 2000)

Table 5.8   Correlation of no. of respondents from each area against other
             variables

	No. of respondents from each area (Pearson correlation)
Area average household income	0.717**
Distance from the NMNS	-0.255
Population in the area	0.736**

Note: 1: perfect positive correlation; 0: no correlation; (-1): perfect negative correlation;
     **: significant correlation at 1% level (2-tailed).

Figure 5.4   Taiwan

1. Taipei
2. Ilan
3. Taoyuan
4. Xinzhu
5. Miaoli
6. Taichung
7. Zhanghua
8. Nantou
9. Yunlin
10. Jiayi
11. Tainan
12. Kaohsiung
13. Pingdong
14. Penghu
15. Taidong
16. Hualian
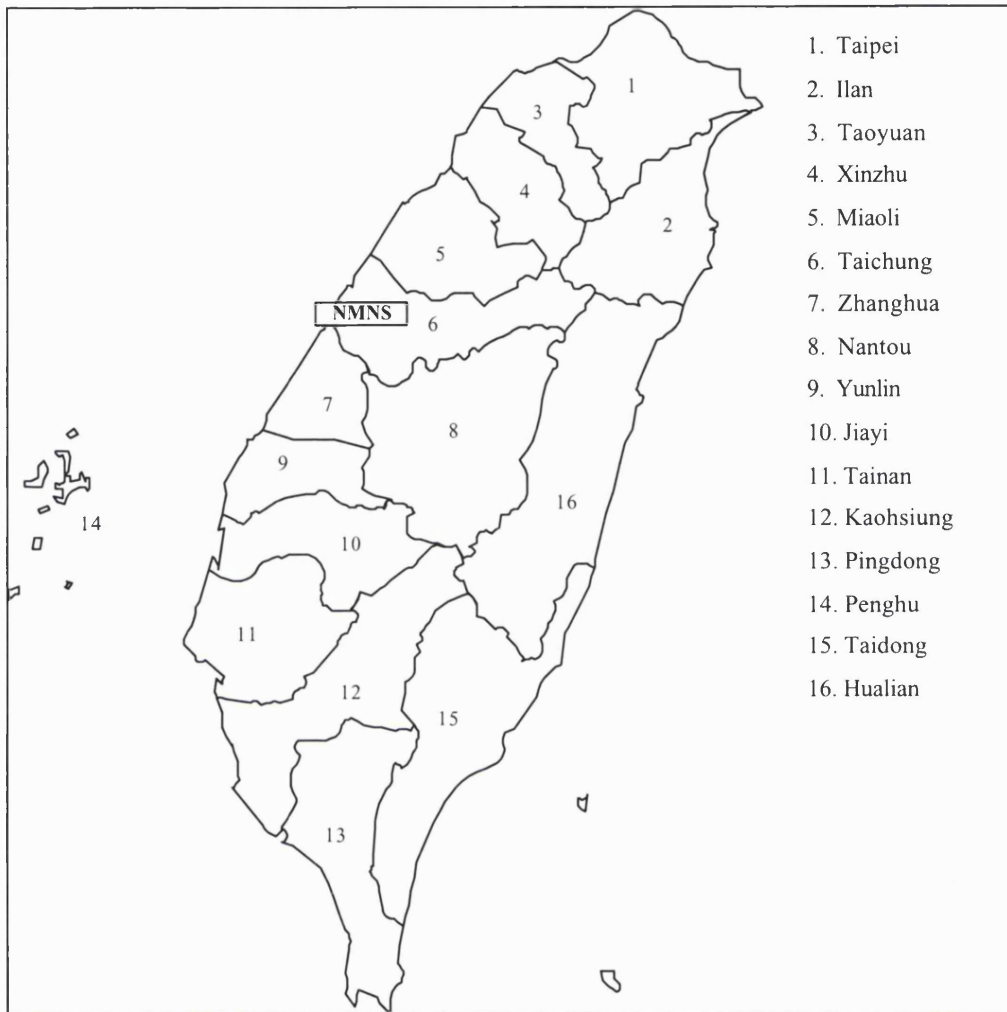
5.2 Public attitudes towards museums in Taiwan

Having analysed the demographic composition of the survey respondents, their

attitudes towards museums in Taiwan are analysed. The preliminary section of the

questionnaire contained a considerable number of attitudinal questions about museums

in Taiwan, including people's visits to museums, their expectations of museums, and

the importance of museums for them. These questions generate some useful

information on patterns of museum visiting in Taiwan as many museum visitor surveys

do (see, for example, Merriman 1991; Davies 1994; Hooper-Greenhill 1994). However,

the further interpretation of why these visiting patterns occur is not the aim of the

survey.

The intention of these attitudinal questions were to make respondents explore their

personal thoughts on museum related issues as a preparation for responding to the more

demanding valuation questions. In addition, these questions were designed to reveal as

much as possible about the underlying motives for supporting museums, so as to aid in

the interpretation of the valuation responses. Often, these attitudinal variables also turn

out to be good predictors of willingness-to-pay (Pearce and Mourato 1998: 18;

Bateman *et al* 2002: 4.23). This section summarises the findings from these attitudinal

questions.

5.2.1. Popularity of museums in Taiwan

There are at least 107 institutions claiming to be 'museums' in Taiwan (The Council for

Cultural Affairs 1996), and six of them were national museums when the current survey

was carried out. In the survey, the respondents were asked whether they had heard about

and visited the six national museums. In addition to finding out if people knew about

the national museums, these questions were used to remind the respondents that there

were at least five more national museums in Taiwan which should also be taken into

account when they were asked their willingness-to-pay for the NMNS in particular at a

later stage of the questionnaire.

The locations of the six national museums are marked on Figure 5.5. Table 5.9 presents

the survey results.

Figure 5.5   Locations of national museums in Taiwan
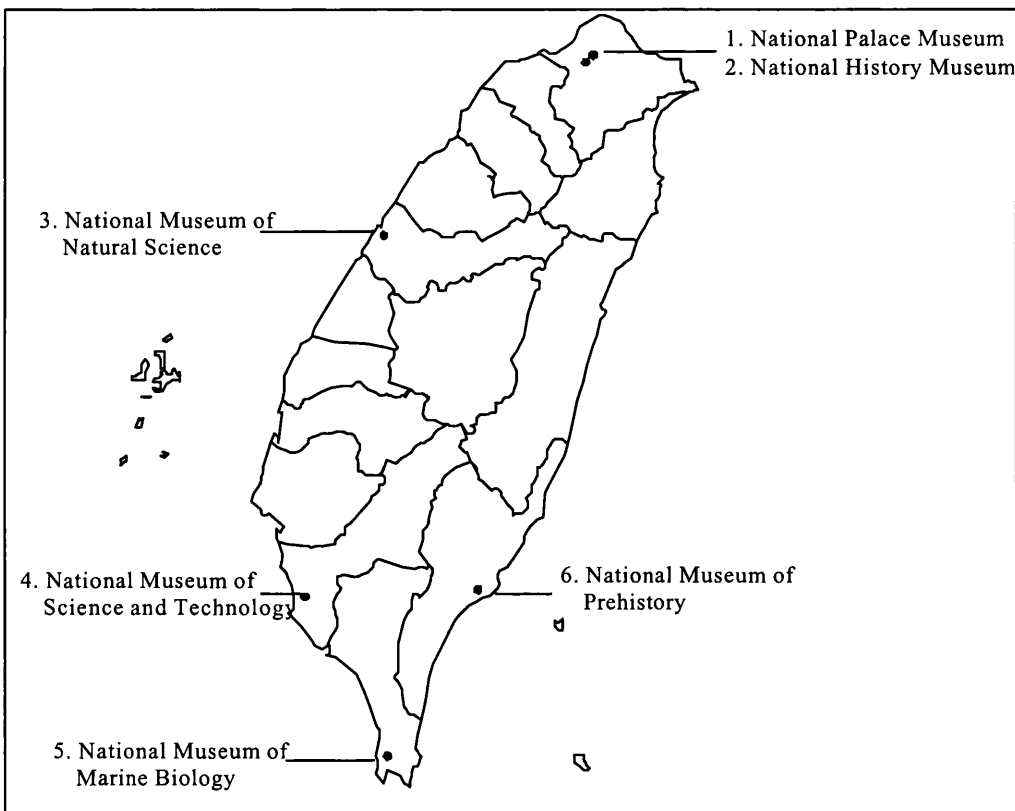
Table 5.9   **% of total respondents who have heard about and visited the six national museums in Taiwan**

	6. Have you heard about the following museums in Taiwan? (%)		7. Have you been to the following museums in Taiwan? (%)	
	Offsite sample	Onsite sample	Offsite sample	Onsite sample
1. National Palace Museum (NPM)	99.7①	100.0①	92.4①	86.5②
2. National History Museum (NHM)	80.1③	70.5③	46.5③	37.9③
3. National Museum of Natural Science (NMNS)	95.0②	100.0①	80.4②	100.0①
4. National Museum of Science and Technology (NMST)	57.1⑤	42.3④	33.6④	18.2⑤
5. National Museum of Marine Biology (NMMB)	79.7④	88.1②	17.3⑤	23.8④
6. National Museum of Prehistory (NMP)	7.3⑥	5.3⑤	4.7⑥	4.4⑥

Note: The circled numbers next to the percentage stand for the ranking.

The internationally well-known National Palace Museum (NPM) is obviously the

highest-profile museum with nearly all respondents having heard about it and only

around ten percent of respondents not having visited it (Table 5.9). This is not

surprising since it is located in the biggest city, which is also the cultural, political and

educational centre, in Taiwan, and has the most important Chinese antiquities in the

world on exhibition and in its care. It has long been used by the government as a

demonstration of its legitimacy and inheritance to traditional Chinese culture, and has

been an unskippable destination of all school trips. In addition to its world famous

collections, the museum, in the past decade, has organised several big exhibitions

loaned in from Europe and mainland China, which attracted huge attention and visits

from the public all over Taiwan.

The National History Museum (NHM), being in the same city as the National Palace

Museum (NPM), was visited by nearly half of the offsite sample and nearly 40% of the

onsite sample (Table 5.9). As is the case with the NPM, the collections of the NHM

were Chinese antiquities brought from mainland China to Taiwan after the civil war in

China in the late 1940s. However, unlike the NPM whose collections were royal

collections in ancient Chinese empire, the collections of the NHM were from a

provincial archaeological museum with local significance. Therefore, the museum has

not attracted very much public attention since its establishment in 1955 until recent

three years when the new director came to the museum. Since his arrival at the museum,

the new director has been actively involved in co-operating with public media in

organising 'blockbuster' exhibitions loaned in from abroad. That is the reason why

there were as many as three quarters of the respondents having heard about the

museum.

The survey result confirms National Museum of Natural Science (NMNS) as one of the

most visited museums in Taiwan (Table 5.9). Since the onsite survey was carried out at

the exits of the NMNS to its visitors, there were one hundred percent respondents

having heard about and visited the museum. The result from the offsite survey, however,

still shows that it is the second most visited museum (80.4%). Being the first 'modern'

museum in Taiwan, the NMNS has soon become one of the most popular museums

since its establishment in 1981. In addition to the novel experience of studying science

and natural history in a museum it provided for the public in Taiwan, the popularity of

the NMNS can also be attributed to its location and its special exhibitions. Situated in

the third biggest city in Taiwan, the museum is within a day-return-trip distance to most

areas in the most populated western part of Taiwan (see Table 5.7). There are many

tourist attractions, including theme parks and national parks, in its neighbouring areas,

which also attracts visitors from throughout Taiwan to the museum when visiting the

areas. Apart from its well-liked permanent exhibitions, the museum has long been

actively organising special exhibitions periodically, either by the museum itself or

loaned in from other museums abroad, to increase their visitor numbers.

The five-year-old National Museum of Science and Technology (NMST) in

Kaohsiung has never obtained very much attention from people outside Kaohsiung area

since its establishment. Neither its exhibition nor its marketing has been successful, and

its location has not been helpful either. Although being the second biggest city in

Taiwan, Kaohsiung is known as an industrial city with very limited cultural activities as

well as facilities, which hardly attracts any visitors from outside the area. Without

'precious' collections such as the National Palace Museum has, or fascinating

exhibitions like the National Museum of Natural Science, it is not surprising that the

museum, although being a national museum, is mostly known to the local public only

(Table 5.10). If part of the offsite survey had not been carried out in Kaohsiung, the

public familiarity with the museum could have been lower.

The National Museum of Marine Biology (NMMB) in Pingdong, which was opened to

the public during the survey period, has obviously soon gained huge public attention

(Table 5.9). Its topic of exhibition, and its location are the main reasons for its

popularity. Taiwan is a sub-tropical island surrounded by the Taiwan Strait and the

Pacific Ocean, and therefore oceanic resources have played an important role in

people's life. With a growing general public awareness of environmental issues within

the last decade, there has also been an increasing public interest in marine biology.

Evolved in this social context, the NMMB soon became well-known to the public. In

addition, the museum is very close to one of the most popular beach resorts, Kending

National Park, in Taiwan. The reason for the museum to be where it is was to

incorporate a marine biology museum visit into a seaside holiday.

The National Museum of Prehistory (NMP) in Taidong is an on-site archaeological

museum. It has not been fully open to the public yet, and is geographically less

accessible for the majority people who live in the western part of Taiwan. Therefore, it

was the least familiar museum to the survey respondents (Table 5.9).

Table 5.10 shows that four out of the six national museums, National Palace Museum

(NPM), National History Museum (NHM), National Museum of Natural Science

(NMNS), and National Museum of Marine Biology (NMMB), were quite well-known

at national level. The NPM and MMNS were the best known and most visited museums,

and people who have visited them were widely and relatively evenly dispersed

throughout Taiwan (Table 5.11).

Table 5.10   % of respondents in each area who have heard about the museum

	1.NPM	2.NHM	3.NMNS	4.NMST	5.NMMB	6.NMP
North Taiwan (N=198)	99.5	88.4	97.0	26.8	82.8	3.5
Mid Taiwan (N=255)	100.0	67.8	100.0	40.8	88.2	7.1
South Taiwan (N=159)	100.0	70.4	100.0	90.6	78.6	7.5
East Taiwan (N=3)	100.0	66.7	66.7	66.7	66.7	66.7

Note: North Taiwan: Taipei, Jilong, Ilan, Taoyuan Xinzhou and Miaoli.

    Mid Taiwan: Taichung, Zhanghua, Nantou, Yunlin and Jiayi.

    South Taiwan: Tainan, Kaohsiung, Pingdon and Penghu.

    East Taiwan: Taidong and Hualian.

Table 5.11   % of respondents in each area who have visited the museum

	NPM	NHM	NMNS	NMST	NMMB	NMP
North Taiwan (N=198)	96.5	66.7	84.8	8.1	20.7	3.0
Mid Taiwan (N=255)	83.1	27.8	100.0	14.5	21.2	3.1
South Taiwan (N=159)	91.2	34.0	83.3	64.2	18.2	7.5
East Taiwan (N=3)	100.0	66.7	66.7	66.7	66.7	66.7

Note: North Taiwan: Taipei, Jilong, Ilan, Taoyuan Xinzhou and Miaoli.

Mid Taiwan: Taichung, Zhanghua, Nantou, Yunlin and Jiayi.

South Taiwan: Tainan, Kaohsiung, Pingdon and Penghu.

East Taiwan: Taidong and Hualian.

Figure 5.6 to Figure 5.8 indicate the percentage of respondent who claimed to have visited the six museums from each age group, educational level and income range. To sum up, visitors to the NPM, the NMNS, the NMMB and the NMP were relatively evenly distributed across different age groups, while visitors to the NHM and the NMST were slightly over-represented among respondents over age 45 (Figure 5.6). In terms of educational level distribution, visitors to the NMNS, which were concentrated around higher educational levels, were in contrast with visitors to the NPM, the NMST and the NMMB, which had a peak at the lowest educational level (Figure 5.7). The income distributions of visitors were generally evenly dispersed across different income ranges, except the NHM with the lower income groups least well-represented (Figure 5.8). Generally speaking, the visitors to the NMNS are relatively evenly distributed throughout people from different social economic backgrounds.

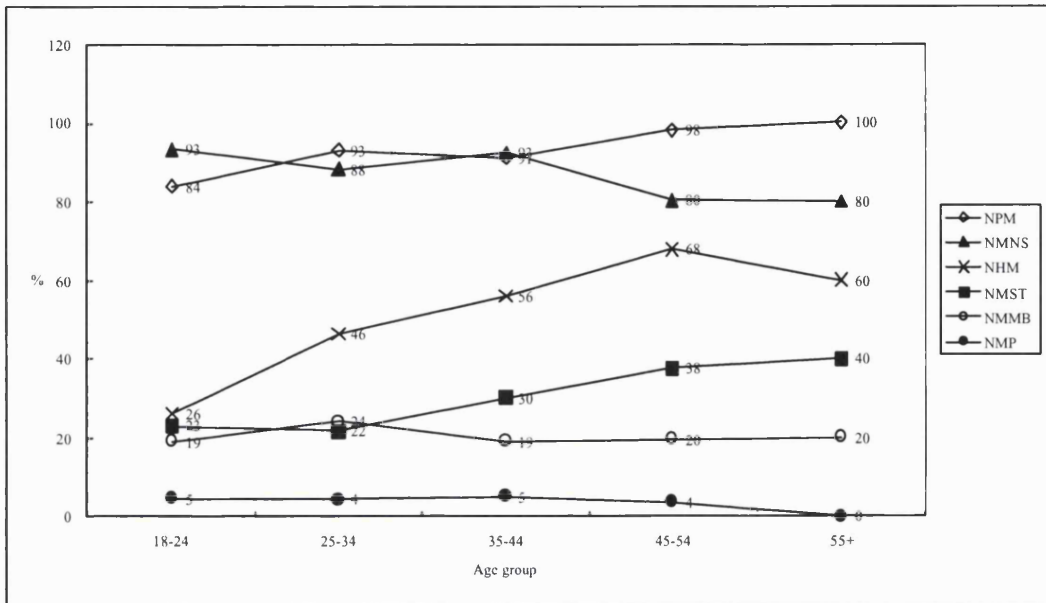**Figure 5.6   % of visitors to each museum by age group**

Figure 5.7   % of visitors to each museum by educational level
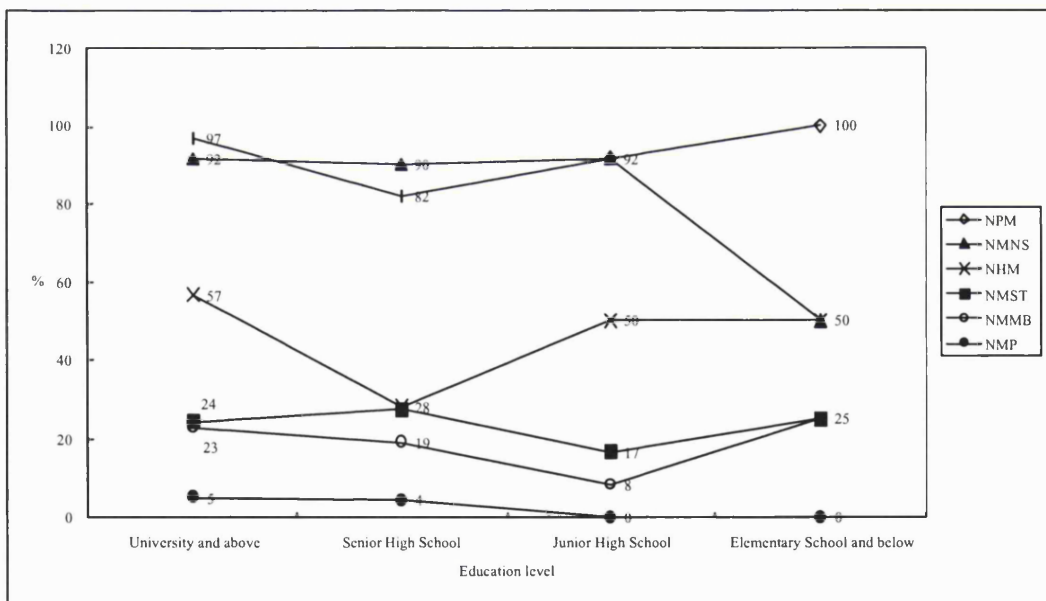
Figure 5.8   % of visitors to each museum by income group
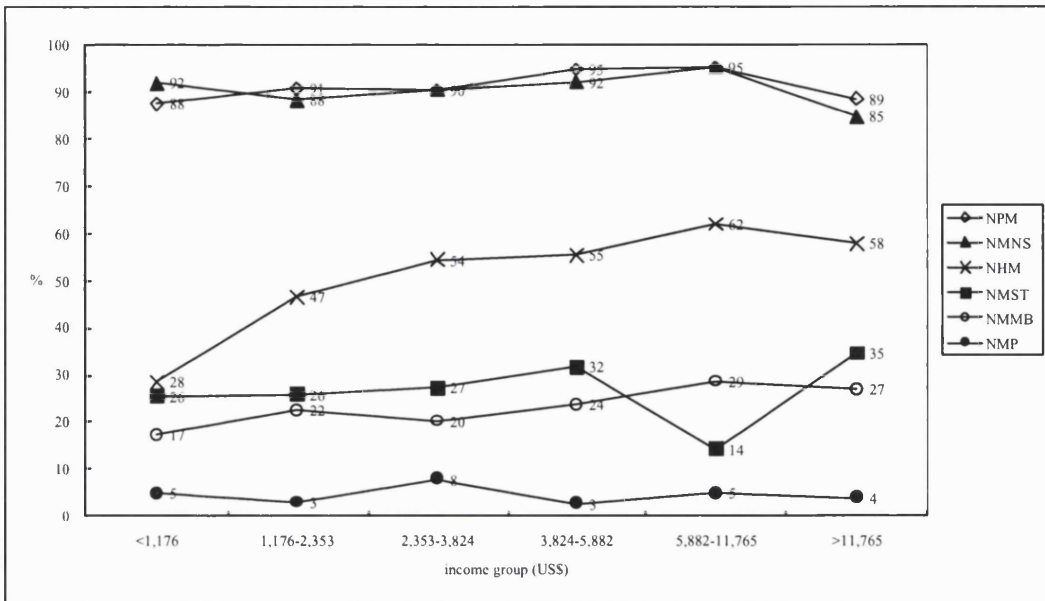
Having gathered the public familiarity with the national museums in Taiwan, it is useful

to know how museums become known to the public. The respondents were asked what

their sources of information on museums were. 0 shows that most respondents get their

information from newspapers. In the past ten years, most blockbuster exhibitions in

Taiwan were co-organised by museums and public media, especially newspapers.

Museums were in charge of setting up the exhibition, while the newspapers funded the

exhibition and organised a variety of supporting activities, including calling for articles

from the public who have seen the exhibition, providing special columns discussing the

exhibition everyday by relevant scholars during the exhibition period, etc. The way the

newspapers, instead of the museums, marketed the exhibition made the public feel they

were not 'up -to-date' if they did not go to the exhibition. The survey finding confirms

that the media have played an important role in current museum marketing in Taiwan.

Table 5.12   Sources of information on museums

8. What are your sources of information on museum?			
Source of information	% in offsite survey	% in onsite survey	% in total
Television	61.5	57.1	59.2
Newspaper	67.1	61.1	64.0
Magazine	24.9	18.8	21.8
Friends	52.5	53.6	53.1
Museums advertisement	20.3	24.8	22.6
Others	7.3	7.8	7.6

5.2.2. The functions of museums – the public perspective

Table 5.13 presents the people's perception of the importance of the differe nt functions

of publicly funded museums in Taiwan. To calculate the average ranking of the

importance of each function, each function is given a score of '5' when it is thought of

as 'very important', '4' as 'important', '3' as 'worth considering', and so   on. Therefore,

the higher the score is, the more important the function is.

Amongst the seven functions proposed in the questionnaire, acquisition/conservation,

research, and cultivating cultural identity loosely correspond to the non-use values

while education, leisure and exhibitions loosely correspond to the use values. It can be

seen from Table 5.13 that the most important two functions are the two non-use benefits:

acquisition/conservation and cultivating cultural identity, followed by education (use

benefits), exhibitions (use benefits) and research (non-use benefits), and finally, leisure

(use benefits) as the least important of all. It shows that the non-use benefits of the

NMNS are widely and highly appreciated.

The acknowledgements of these museum functions also suggest the respondents'

familiarity with museums in general, which increases the credibility of the valuation

exercises.

Table 5.13   Importance of functions of public funded museums

8. There are many museums in Taiwan. I would like you to consider the importance of the following functions of public funded museums: (1: very important; 2: important; 3: worth considering; 4: not important; 5: not important at all)						
Functions	1 (%)	2 (%)	3 (%)	4 (%)	5 (%)	Average score
Pooled sample	1. Acquisition/ conservation	72.1	26.5	1.3	0.0	0.1	4.72 ①
	2. Education	52.6	44.7	2.7	0.0	0.0	4.51 ③
	3. Leisure	18.0	43.0	29.5	8.4	1.1	3.69 ⑦
	4. Own exhibitions	38.2	49.8	11.0	0.8	0.2	4.26 ⑤
	5. Exhibitions from abroad	52.1	36.9	10.7	0.2	0.1	4.42 ④
	6. Research	42.6	39.4	16.2	1.8	0.0	4.24 ⑥
	7. Cultural identity	65.4	29.1	5.0	0.5	0.0	4.60 ②
Onsite sample	1. Acquisition/ conservation	69.0	29.5	1.6	0.0	0.0	4.67 ①
	2. Education	55.2	41.7	3.1	0.0	0.0	4.52 ③
	3. Leisure	18.2	42.9	28.8	8.5	1.6	3.68 ⑦
	4. Own exhibitions	42.0	43.8	13.2	0.6	0.3	4.27 ⑤
	5. Exhibitions from abroad	56.4	36.1	7.5	0.0	0.0	4.49 ④
	6. Research	41.8	39.3	16.7	2.2	0.0	4.24 ⑥
	7. Cultural identity	63.3	30.7	5.6	0.3	0.0	4.57 ②
Offsite sample	1. Acquisition/ conservation	75.4	23.3	1.0	0.0	0.3	4.73 ①
	2. Education	49.8	47.8	2.3	0.0	0.0	4.48 ③
	3. Leisure	17.8	43.0	30.2	8.4	0.7	3.69 ⑦
	4. Own exhibitions	34.1	56.2	8.7	1.0	0.0	4.23 ⑥
	5. Exhibitions from abroad	47.5	37.8	14.0	0.3	0.3	4.32 ④
	6. Research	43.5	39.5	15.7	1.3	0.0	4.25 ⑤
	7. Cultural identity	67.6	27.4	4.3	0.7	0.0	4.62 ②

5.2.3. Annual frequency of museum visiting

Table 5.14 shows the astonishing results that more than seventy five per cent of the total

survey respondents have visited a museum or gallery at least once in the last year. This

high museum visiting rate can partly be attributable to half of the interviews being

carried out at the exits of a museum. In the onsite sample, 81.2 % of the respondents

have visited a museum or gallery at least once in the last year and 9.0% have visited

more than five times. However, in the offsite sample, there were still 69.8% having

visited at least once and 5.7% visiting more than five times. It seems that even in the

offsite sample, the rate of museum visiting is very high. The figure 69.8% is chosen as a

more conservative estimate of the proportion of adults in Taiwan using museums and/or

galleries.

Table 5.14   Frequency of museum visiting in the last year

9. Approximately how many times have you visited any museum in Taiwan in the last year?			
Visits	% in total sample	% in onsite sample	% in offsite sample
0	24.6	18.8	30.2
1	21.9	21.6	22.3
2	21.9	23.5	20.3
3	13.2	14.1	12.3
4	4.8	6.0	3.7
5	6.3	6.9	5.6
6-10	5.4	6.5	4.4
>10	1.9	2.5	1.3
Mean	2.51	2.92	2.08

The percentage of museum and/or art gallery visiting in Taiwan from current survey

(the offsite sample) (69.8%) is higher than the figures reported in Great Britain and

Australia in the 1990s (see Table 5.15). The surveys selected in Table 5.15 were carried

out by different means and asked slightly different questions, which requires special

attention when making comparisons.

Table 5.15   Visitor surveys

Date (Country)	Criteria	Sample size	% of adults visiting p.a.	source
1988/89 (Great Britain)	Have you visited a museum during last twelve months?	25,000	29	BMRB (1)
1992/93 (Great Britain)	Have you visited a museum during last twelve months?	25,000	28	BMRB (1)
1996/97 (Great Britain)	Have you visited a museum during last twelve months?	25,000	26	BMRB (1)
1997 (Great Britain)	Museum or art gallery visiting in the last twelve months.	2,101	36	BMRB (2)
Feb 1999 (Great Britain)	Museum and/or gallery visiting in the twelve months prior to the survey.	2,454	28	Mori (3)
Nov 1999 (Great Britain)	Museum and/or gallery visiting in the twelve months prior to the survey.	4,461	35	Mori (3)
1995 (Australia)	Had visited a museum at least once in the previous twelve months.	-	27.8	ABS (4)
1995 (Australia)	Had visited an art museum at least once in the previous twelve months.	-	22.3	ABS (4)
1995 (Australia)	Had visited a museum or art museum at least once in the previous twelve months.	-	37	ABS (4)
1999 (Australia)	Had visited a museum at least once in the previous twelve months.	2,975,000	19.9	ABS (5)
1999 (Australia)	Had visited an art museum at least once in the previous twelve months.	2,975,000	21.2	ABS (5)

Note: 'adults' in these surveys were defined as those who aged 15 and ove r.

Sources: (1) BMRB/TGI; in: Middleton 1998: 18; (2) BMRB; in: Bailey *et al* 1998: 105; (3) Mori 2001: 4; (4) ABS 1997; (5) ABS 2001

The British Market Research Bureau (BMRB) 1988/1989, 1992/1993 and 1996/1997

surveys (Middleton 1998:17-18) were from its annual Target Group Index Survey

(TGI), which is the largest survey of its kind in Britain and provides valuable estimates

of the proportion of adults using museums over a year and their main demographic

characteristics (Middleton 1998: 17). These figures, reported in Middleton's work

(1998), reveal only the visits to museums excluding art galleries, which could account

in part for the low figures. However, the survey results still indicate that between

1988/9 and 1996/7 there has been a fairly consistent decline in the proportion of the

British population visiting museums at least once in a year.

The BMRB 1997 survey was commissioned by the Museums and Galleries

Commission (MGC) via COI Research Division using its weekly omnibus survey,

ACCESS. A nationally representative sample of 2101 face-to-face interviews was

conducted at home with adults aged 15 and over living in the UK. The data was

weighted to ensure that demographic profiles matched those for all adults aged over

15 in the UK (Bailey *et al* 1998: 105). The survey asking museum 'or' art gallery

visiting reveals a higher visiting percentage figure.

The Mori 1999 surveys were conducted by Mori on behalf of Resource: The Council

for Museums, Archives and Libraries to investigate the profile on visitors to the UK's

museums and galleries. The surveys form part of an ongoing project to monitor public

attitudes towards museums in the UK (Mori 2001: 1). The results of the February

survey are presented in the Mori 2001 report. The data is unweighted (Mori 2001: 8),

and the methodology is not mentioned. The November survey was placed on Mori's

Omnibus survey, in which a nationally representative quota sample of 4,461 adults was

interviewed. The data were weighted to reflect the national population profile (Mori

2001: 1). The results from both surveys indicate a short term decline in the proportion

of the UK public who visits museums or galleries, which may be temporary due to

many museum and galleries having delayed major exhibitions until the new millennium

(Mori 2001: 23). The surveys also found out that museums and galleries were still very

competitive when compared with other types of attractions and events, such as opera,

ballet, classical concert, parks, gardens and cathedrals, etc. (Mori 2001: 4).

The 1995 Australian Bureau of Statistics (ABS) survey shows that 37 per cent of

Australians visited a museum or art gallery. The percentage of museum visiting

(27.8%) and art gallery visiting (22.3%) is also presented separately (ABS 1997). The

ABS 1999 survey indicates a decrease in museum visiting to 19.9%. Neither the reason

for this decline nor the methodology of both surveys is reported.

The average figure for museum and/or gallery visiting in the UK and Australia in the

1990s being around 37 per cent is significantly smaller than that (69.8 per cent) of the

current survey. It seems that museum and/or gallery visiting is a more popular activity

in Taiwan than that in the UK and Australia.

Having analysed the annual museum and galleries visiting frequency, it would be useful

to explore the relationship between visiting frequency and other factors. Before going

into any detail, it should be borne in mind that the figures from current survey are not

absolute figures for museum visiting in Taiwan because the sample does not cover the

total population of museum visitors. The first problem is that the visiting patterns of the

non-respondents to the survey are not known to any degree of accuracy, except that a

substantial proportion of them may not be active museum visitors. The second problem

is that one important group of museum visitors, those under the age of eighteen, have

not been surveyed. Therefore, the current survey only analyses a certain part of the total

museum-visiting population. In view of this problem, the aim of this survey is not to

produce absolute figures for museum visiting, but to produce a database which will

allow systematic comparison of the attributes and attitudes of different adult participant

groups. The following section examines the museum visiting patterns in Taiwan.

Five subsets: education, income, age and family type, main reason for visiting

museums/galleries, and priorities on museums/galleries amongst the cultural facilities

are considered in turn and a current visitor profile offered (Table 5.16).

Table 5.16   Visiting patterns

		No. of visit per annual (Pooled survey sample)			
		0 times (%)	0-2 times (%)	3+ times (%)	Mean (times)
Education	Elementary s.	75	-	25	0.8
	Junior high s.	25	42	33	2.0
	Senior high s.	28	44	28	2.2
	University	20	44	36	2.9
	Spearman's correlation coefficient = 0.11***				
Income (US$)	< 1,176	29	45	26	2.3
	1,176-2,353	22	38	40	2.9
	2,353-3,824	21	44	36	2.9
	3,824-5,882	18	55	26	2.2
	5,882-11,765	5	62	33	2.4
	> 11,765	31	39	31	2.1
	Spearman's correlation coefficient = 0.08**				
Age	18-24	29	46	25	2.0
	25-34	24	46	31	2.4
	35-44	15	39	46	3.8
	45-54	23	41	36	2.5
	55+	20	40	40	2.0
	Spearman's correlation coefficient = 0.15***				
Family type	With child(ren)	18	42	40	3.2
	Married	14	57	29	2.0
	Single	29	44	27	2.1
	Chi-sq. = 17.40***				
Reason	P. exhibition	4	33	63	5.0
	Research	23	46	32	2.6
	S. exhibition	25	44	31	2.2
	Children	20	41	39	3.0
	Friends	32	50	18	1.6
	Casual	67	-	33	1.0
	Chi-sq. = 51.96***				
Priority	1st priority	21	44	35	2.1
	2nd priority	21	44	35	2.8
	3rd priority	23	48	28	2.6
	4th priority	34	38	27	2.2
	Last priority	26	44	31	2.0
	Spearman's correlation coefficient = 0.08**				

Note:***   Significant at 1% level of confidence

**   Significant at 5% level of confidence

*   Significant at 10% level of confidence

Education

Elementary school and junior high school education has been compulsory since 1968

in Taiwan; therefore, there are few people under the age of 45 without a junior high

school degree. Table 5.16 shows that the respondents with junior high school (75

percent) and those with senior high school (72 percent) degrees were fairly equally

likely to become museum/gallery visitors. Those with university degree were slightly

more likely to become museum/gallery visitors than the others (80 percent). In other

words, the current survey reveals that educational level is not very much a constraint

on 'entering' a museum/gallery in Taiwan. Although there is a tendency that the m ore

highly educated the respondents were, the more often they used museums and

galleries (Table 5.16), the influence of educational attainment on museum visiting

does not seem to be as strong as that revealed in other studies (see, for example,

Hooper-Greenhill 1994: 65; Davies 1994: 58; Merriman 1991:51).

Income

Table 5.16 shows a tendency that the richer people were more likely to become

museum/gallery visitors except the highest income group. However, the correlation

between household income and visiting frequency is very small although statistically

significant. As most visitor studies collect data on social class instead of income, no

straightforward comparison can be made between the income distribution of the current

survey and other studies. Nevertheless, the high correlation between high social status

and museum visiting (see, for example, Merriman 1991: 50; Falk and Dierking 1992:

20-24; Hooper-Greenhill 1994: 62-66; Davies 1994: 56; Bailey *et al* 1998: 105)

suggests museum visitors are relatively affluent. The finding from the current survey,

somehow, does not very much support this common perception, and implies that

economic status may not necessarily be a major barrier to recruiting visitors to useums.

Age and family type

The age distribution of museum visitors of the current study is very similar to that of

many other studies (see, for example, Davies 1994: 51-55; Hooper-Greenhill 1994:

62-64). The respondents in the 35-44 age-group were the most likely to become

museum visitors (85 percent) and the average visiting frequency (3.8 times per

annum) was the highest in this age-group (Table 5.16). In the current survey, this age-group mainly consisted of people with children. The relative popularity of museums and galleries amongst this age-group is also reflected in the visiting patterns amongst different family types. Although families with children under the age of 18 were not the most likely to become museums/galleries visitors (82 percent), this group of people, in average, do visit museums/galleries more (3.2 times per annum) (Table 5.16).

Main reason for visiting museums/galleries

The answer to the question 'What is your main reason for visiting museums?' is summarised in Table 5.17, which shows that a substantial proportion of people visited museums for special exhibitions/events, spending some time with friends, or to take children.

Special exhibitions/events, regardless of their topics, have obviously played an important role in attracting visitors. This confirms the recently wide-spread phenomenon in museums in Taiwan that museums try to organise blockbuster exhibitions, even without any reference to the nature of the museum itself and its collection, to increase their visitor numbers. Table 5.17 also shows that museum visiting is essentially a social occasion which the visitor carries out with family or friends. The finding that museum visiting is for most people a social occasion was also confirmed in Merriman's survey (1991: 53).

There were only a few respondents who went to museums mainly because of the permanent exhibitions or for doing research. It seems that the traditional function of museums to permanently exhibit material culture and its relevant information was not

so much an attraction for visitors. The reason why people seemed to be less interested

in the permanent exhibition or using museums as a source of research begs a wider

question which is not the focus of the current study.

Table 5.17   Main reason for visiting museum

10. What is your main reason for visiting museums? (Please tick the most important ONE)			
	Pooled sample (%)	Onsite sample (%)	Offsite sample (%)
1. For permanent exhibitions	7.7	7.9	7.7
2. To do research	3.6	5.0	2.0
3. For special exhibitions/events	36.3	37.1	35.8
4. Taking children to museums	23.9	23.9	24.1
5. To spend some time with friends	24.4	23.9	25.1
6. Just walk by	0.5	-	1.0
7. Never visiting any museum	0.3	-	0.7
8. Others	2.9	2.2	3.7

Table 5.16 shows that the main reason for visiting museums/galleries is a significant

factor correlating to the visiting frequency. Although permanent exhibitions do not

seem to be an effective way to attract museums visitor, those who visited museums

for the permanent exhibitions were significantly more likely to have visited a museum

or gallery last year (96 percent) and have visited museums and galleries (5 times per

annum) more than people visited museums for other reasons. While those who visit

museums for casual reason, as expected, are least likely to become museum visitors

and visit museums less even if they become visitors. It is interesting that those who

went to museums for their children were more likely to become museum visitors and

visit museums more than those who went to museums for special exhibitions or for

spending some time with friends (Table 5.16).

Priority given to museums/galleries amongst cultural facilities

At the beginning of the questionnaire, the respondents were asked to rank the

importance of five public cultural/leisure facilities. A more detailed analysis of this

question will be discussed later. The discussion here is focusing on the relationship

between visiting frequency and the ranking of importance of museums/galleries.

Box 5.1   Question 5 – importance of public facilities

5. Taiwan is a rapidly developing country. However, the public resources are limited
    and they have to be allocated to priority issues. Could you please rank the priorities
    of the following cultural/leisure facilities for the next five years? (1 as the most
    important, 2 as the next most important and so on)
    ☐1. Theatres/Concert Halls   ☐2. Parks   ☐3. Libraries
    ☐4. Museums/Galleries   ☐5. Sports Centre

It is clear in Table 5.16 that those who ranked museums/galleries as the top priority

did not necessarily visit museums/galleries more (2.1 times per annum) and nor were

they more likely to become museums/galleries visitors (79 percent). The unclear

pattern of the relationship between visiting frequency and priority ranking

(Spearman's correlation coefficient positive and significant but trivial) suggests that

the importance of museums/galleries may not be fully reflected by visitor figures or

visiting frequencies, i.e., people appreciate the importance of museums but do not

necessarily want to visit them. This confirms the fact that the benefits from museums

are more than just the museum visiting experiences.

5.2.4. The public attitudinal values of museums

Having analysed the popularity of museums, museum visiting frequency, reasons for

museum visiting, and public expectation from museums in Taiwan, it is important to

know whether people think museums in Taiwan are important. This is because the

analysis of museum visiting does not answer the question of the value of museums

fully. The success or usefulness of museums cannot be judged merely in terms of visitor

numbers or museum visiting patterns. It is not necessarily the case that those who do

not visit museums think that museums should not exist, because museums offer a wide

variety of benefits which do not involve the actual visiting to museums. As was

introduced in Chapter 4, it is possible that some people are pleased to know that

museums exist without visiting them, because they can retain the option of visiting

them in the future (option value), or because the future generation can enjoy the

benefits (bequest value), or because other people can visit them (existence value).

The attitudinal value people have to museums in Taiwan was measured by asking the

respondents to rank the importance of five cultural/leisure facilities, including

theatres/concert halls, parks, libraries, museums/galleries, and sports centres, in terms

of spending public money in Taiwan. This question is also used to remind the

respondents that resources are limited and they have to take into account other public

issues in answering their WTP amount at a later stage.

Before analysing the survey results, the bias that may affect the validity of this

attitudinal value the respondents put on museums is addressed. Interviewer bias, so-

called 'yea saying' bias, means that respondents in an interview survey may attempt to

please an interviewer by providing 'good' responses, i.e. those which are perceived to

be what the interviewer wants (Mitchell and Carson 1989: 235; Hoinville and Jowell

1978: 100). In the case of asking respondents to rank the importance of museums

amongst other public leisure facilities, care has to be taken to ensure that respondents

do not rank museums as a higher priority in order to please the interviewers. In this

survey, this bias was minimised since the respondents did not know the questionnaire

was about museums when answering this question[31]. Also, the five facilities being

valued: concert halls, parks, libraries, museums and sports centre, are all familiar and

important public facilities for the general public in Taiwan; therefore, the respondents

were not placed under any moral duress to provide higher value on museums, or any of

the five facilities.

Table 5.18 shows that, except the onsite sample, parks were ranked as the first

priority. However, there were also around twenty percent of the respondents[32] ranked

parks as the last priority. There seemed to be little consensus amongst the respondents

about the importance of parks, with many people ranked it as the top priority, but also

with nearly as many people put it to the bottom of the priority. Theatre/concert halls

had the second largest number of people rank it as the first priority (24.6%). However,

this, again, is similar to the results for parks in that nearly as many people gave it a

lower priority (38.0% as 4th and 5th priority) as gave it a higher priority (45% as 1st and

2nd priority). Libraries had a contrary result, with most respondents giving it medium

priority (22.6% as 2nd, 27.3% as 3rd, and 20.6% as 4th) and only a few people giving it

either highest or lowest priority. Museums/galleries, although had only

21.3% respondents giving it first priority, over sixty percent of the total respondents

gave it top three priorities. There seemed to be an agreement that museums and

galleries are an important issue, at least amongst cultural and leisure ones. Sports

centres, amongst five facilities, had the last priority (38.5%).

For calculating the average ranking of priorities, each of the five facilities is given a

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[31] This question was asked at the very beginning of the interview, although the results of this question is
   analysed at the last section.
[32] Nearly thirty percent in the onsite sample.

score of five whenever it is given a first priority, four when given a second priority,

and so on. Therefore, the higher the score it, the higher the priority it gets. Table 5.18

shows that, amongst the pooled and onsite sample, museums/galleries, averagely,

were ranked as the first priority.

Table 5.18   Ranking of cultural/leisure priorities

Taiwan is a rapidly developing country. However, the public resources are limited and they have to be allocated to priority issues. Could you please rank the priorities of the following cultural/leisure facilities for the next five years? (1 as the most important, 2 as the next most important and so on)

		Priority (%)					Average score
		1st	2nd	3rd	4th	5th	
Pooled	Theatres/concert halls	25	20	16	21	18	3.1 ②
	Parks	26	14	16	22	22	3.0 ④
	Libraries	17	23	27	20	12	3.1 ②
	Museums/galleries	22	28	24	17	9	3.4 ①
	Sports centres	12	15	16	19	38	2.4 ⑤
Onsite	Theatres/concert halls	27	23	16	19	16	3.3 ②
	Parks	19	14	15	26	27	2.7 ④
	Libraries	16	23	31	19	12	3.1 ③
	Museums/galleries	28	29	21	15	7	3.6 ①
	Sports centres	13	13	17	21	37	2.4 ⑤
Offsite	Theatres/concert halls	23	17	17	23	20	3.0 ④
	Parks	34	15	17	17	17	3.3 ①
	Libraries	19	23	24	22	12	3.2 ②
	Museums/galleries	15	28	26	20	11	3.2 ②
	Sports centres	10	18	16	16	40	2.4 ⑤

Table 5.19 presents the comparisons of priority given to museums/galleries at

different age groups, educational attainment, and income ranges. A score is given to the

importance of museums/galleries for each subgroup using the formula explained in the

previous paragraph. It shows that museums/galleries are fairly equally important for

people across all age groups, income ranges and family types, while they are

significantly more important to better educated respondents than less educated ones.

Table 5.19 Priorities given on museums across different social groups

		Priority given on museums (%)					Average score
		1st	2nd	3rd	4th	5th	
Education	Elementary s.	-	25	-	-	75	1.8 ④
	Junior high s.	18	9	36	18	18	2.9 ③
	Senior high s.	19	28	26	18	9	3.3 ②
	University	24	30	22	16	8	3.4 ①
	Spearman's correlation coefficient = 0.09**						
Income (US$)	< 1,176	21	31	24	15	9	3.4 ③
	1,176-2,353	22	25	23	22	8	3.3 ④
	2,353-3,824	24	24	23	20	12	3.3 ④
	3,824-5,882	29	24	24	16	8	3.5 ①
	5,882-11,765	14	38	38	5	5	3.5 ①
	> 11,765	21	25	25	17	13	3.3 ④
	Spearman's correlation coefficient = -0.02						
Age	18-24	20	30	24	18	9	3.3 ③
	25-34	20	29	26	14	11	3.3 ③
	35-44	26	22	26	21	6	3.4 ②
	45-54	29	27	18	18	9	3.5 ①
	55+	-	40	-	20	40	2.4 ⑤
	Spearman's correlation coefficient = 0.02						
Family	With child(ren)	28	23	24	18	8	3.4 ①
	Married	14	38	19	19	10	3.3 ②
	Single	18	31	24	17	10	3.3 ②
	Chi-sq.=12.06						

Note:*** Significant at 1% level of confidence

** Significant at 5% level of confidence

* Significant at 10% level of confidence

5.2.5 Image of the NMNS

It is the general image of the NMNS rather than the detailed information on how people

felt about the services provided by the museum that is needed for the current survey;

therefore, only two general questions were asked to elicit the public image of the

NMNS (Box 5.2).

Box 5.2   **Q14 and Q19 – general image of the NMNS**

14. What is your impression of the NMNS?
    ☐1. Very good   ☐2. Good   ☐3. Acceptable   ☐4. Bad
    ☐5. Very bad

19. how is your experience visiting the museum?
    ☐1. Very good   ☐2. Good   ☐3. Acceptable
    ☐4. Bad   ☐5. Very bad   ☐6. Never been there

Table 5.20 shows that, for the majority of the respondents, the image of the NMNS was

positive, with more than 80 per cent respondents' impression being very good or

good, and more than 70 per cent (61 per cent of offsite sample) respondents' visiting

experiences being very good or good. There were few people with bad impression or

bad visiting experiences.

Table 5.20   **Image of the NMNS**

`	Impression (%)			Visiting experience (%)		
	Pooled sample	Onsite sample	Offsite sample	Pooled sample	Onsite sample	Offsite sample
Very good	35.7	43.4	27.2	26.9	37.1	16.3
Good	48.5	43.4	54.1	44.8	44.8	44.7
Acceptable	15.7	17.4	18.4	18.4	17.4	19.3
Bad	0.2	0.0	0.4	0.3	0.6	0.0
Very bad	0.0	0.0	0.0	0.0	0.0	0.0
Never been there	-	-	-	9.7	0.0	19.7

5.3 Summary

To sum up, the analysis of the demographic profile of the offsite sample shows that it

is not representative of the survey population, i.e., the general public above age 18 in

Taiwan. The female, younger and better educated respondents were over-represented.

The average age and family size were smaller than those of the full population. This

could be attributed to the survey mode chosen, i.e. intercept interview, and is dealt

with by applying a weighting index by education when necessarily.

Secondly, this section reveals some observations concerning the public uses of and attitudes towards the museums sector in Taiwan:

1. Although museums and museum visiting are a fairly recent phenomenon in Taiwan (Figure 3.2), the importance of museums is ranked fairly highly amongst other cultural/leisure facilities by the public (Table 5.18) and the basic functions of museums are generally and highly appreciated by the public (Table 5.13). Also, museum visiting is a more popular activity in Taiwan than that in the UK and Australia (Table 5.14 and Table 5.15);

2. The correlations between visiting frequency and education as well as income are trivial although statistically significant (Table 5.16), which dose not support very much the common perceptions that museum visitors tend to be those who are better educated and more affluent. However, the current survey does not provide enough information needed for a comprehensive explanation on this observation;

3. Comparing age, family types and reasons for museum visiting against museum visiting frequency shows a slight more clear pattern of museum visiting. Table 5.16 suggests that the middle-aged people, consisting mainly of families with children aged under 18, are most likely to become 'loyal' museum goers. Again, the current survey does not provide enough information needed for a comprehensive explanation on and a further use of this observation;

4. The trivial though statistically significant correlation between priorities given to museums and visiting frequency (Table 5.16) implies that the visits/visitors figure, the widely used indicator, is not a satisfactory indicator for the importance of museums. This can be explained by the fact that museums have many other benefits that does not involve the actual use/visit to museums.

Lastly, this section also provides some background information about the visitors to the NMNS:

1. The NMNS is one of the most popular museums in Taiwan, which confirms the findings of the documents surveys in Chapter 3 (Table 3.3);

2. Visitors to the NMNS are relatively evenly dispersed throughout Taiwan (Table 5.11) and distributed across different social economic backgrounds (Figure 5.6 to Figure 5.8);

3. The younger and better educated people and those who live in wealthier counties are more likely to visit the NMNS while household income and distance of residence from the museum are not a significant determinant of visiting the NMNS (Table 5.1, Table 5.6, Table 5.8, and Figure 5.1) As for why this is so is beyond the scope of the current study.

Chapter 6 Contingent Valuation II – Willingness to Pay (WTP) Analysis

This chapter begins by describing the contingent market in detail in section 6.1.

Responses to the valuation exercise are then analysed in section 6.2. In section 6.3 the

econometric modelling process is explained and the results are presented. Finally, the

validity and reliability issues concerning the current survey is assessed in section 6.4.

6.1 The contingent market

6.1.1. Description of the good

In the current survey, the valuation section was preceded by a description of the

NMNS. This permitted a homogenisation of information across respondents. The

current state of the NMNS was verbally described by the interviewers. Box 6.1

exemplifies the textual description. The pilot study showed that most people were very

familiar with the museum, and therefore had no difficulty understanding the

description. The main survey also clearly showed that most respondents had visited the

museum and nearly all respondents had heard about it (Table 5.9). It was also found that

most respondents appreciated the importance and various functions of museums in

general in Taiwan (Table 5.13 and 18). As a result, the respondents were not asked to

value something with which they were unfamiliar.

Box 6.1   Current state of the National Museum of Natural Science

National Museum of Natural Science is the first national natural science museum in
Taiwan, and is comparable to the standard of other science museums abroad. It is one of
the most professional and best managed museums, and it has the most comprehensive
natural history collections in Taiwan. The museum currently has four hundred thousand
pieces of collections in its care. It is dedicated to collecting, conserving, exhibiting and
researching natural specimens, natural resources and anthropological relics.

6.1.2. Payment vehicle

Following the description of the good being valued is the explanation of the payment

vehicle and the valuation process. The payment vehicle describes the route through

which payments will be effected; therefore, an appropriate payment vehicle must be,

ideally, credible, relevant, acceptable and coercive (Bateman *et al* 2002: 8.21). The

museum is currently funded by central governmental funding and charges for

admission. Income tax was therefore chosen as the payment vehicle to capture the value

of the maintenance of the museum, and the admission charge was used to capture the

use value of visiting the museum.

The questionnaire proceeded with descriptions of two subsequent sets of scenarios for

the respondents to value. The first one was the WTP for maintaining the NMNS at its

current level, income tax being the vehicle ($WTP_{maintenance}$). This captures the total value

attributed to the maintenance of the museum, which encompasses non-use elements as

well as option values and possible use values relating to well maintained museum. The

second set of questions was the WTP for visiting the museum through admission

charges (WTP_{visit}). If people pay, they can visit the museum. If they do not pay, they

cannot visit the museum. This captures the additional value that respondents attribute to

a visit to the museum. Once more, textual descriptions read by the interviewers were

used. A version of the valuation questions is included in Box 6.2.

Box 6.2   WTP questions

With its huge number and variety of collections and functions, it needs a great deal of resources for its maintenance. Later, I am going to ask you to say how much your household (or yourself only, if you are single) is willing to pay, if anything, to the museum through income tax each year AND entrance ticket per visit.

WTP$_{maintenance}$
Before asking how much your household is willing to pay for the NMNS through entrance ticket, I would like you to tell me how much YOUR HOUSEHOLD would be willing to pay each year, through tax, to continue to keep the existence and maintenance of the NMNS at its present standard. Please look at the monetary value below. Starting from zero, tick the sums that YOUR HOUSEHOLD (or YOURSELF if you are single) would definitely be willing to pay EACH YEAR. Leave a blank space in front of the amounts you are not sure whether you would pay. Place a cross in front of the amounts you are sure you would not pay.

WTP$_{visit}$
Now I would like you to tell me how much YOUR HOUSEHOLD would be willing to pay EACH TIME you visit the museum, through admission charge, on top of the tax you pay for its existence and maintenance each year, for visiting the NMNS with its quality at present level. Please look at the monetary values below. Starting from zero, tick the sums that YOUR HOUSEHOLD would definitely be willing to pay EACH YEAR. Leave a blank space in front of the amounts you are not sure whether you would pay. Place a cross in front of the amounts you are sure you would not pay.

In order to avoid the so-called 'yea-saying' bias, care was taken to ensure that respondents were not placed under any mental or moral duress to provide positive valuation, and that respondents were not persuaded to provide valuation answers #where indifference or uncertainty prevails. The approach adopted in the current survey was to include the value 'zero' on the payment card [33], which gave an explicit opportunity for the respondents not to participate in the contingent market, or not to pay, if they were not willing to. Similarly, a 'Don't know' option was included within the valuation question for use by the interviewer only when sufficient time for respondent consideration has elapsed. This was not presented to individuals as an

explicit response option as this may encourage respondents to avoid the cognitive effort of the valuation task.

6.1.3. Eliciting monetary values

After the presentation of the hypothetical scenario, the provision and payment mechanism, the respondents were then asked to determine how much they would value the good if confronted with the opportunity to obtain it, under the specified terms and conditions. The elicitation question can be asked in a number of different ways (see, Mitchell and Carson 1989: 97 – 104; Bateman *et al* 2002: 4.15 – 4.19). 'Payment card' method was chosen for the current survey because it is well established, informative and relatively cheaper to implement.

The payment card presented to the respondents in the current survey is similar to that shown in Box 6.3. The prices represented possible $WTP_{maintenance}$ and WTP_{visit} amounts. Respondents were asked to begin with the lowest values and put a tick against only those amounts that they were sure that they would be willing to pay. Subsequently, respondents were asked to turn to the highest values and put a cross against those amounts that they were sure that they would not be willing to pay. Therefore the example given in Box 6.3 indicates that the respondent is certain that he/she would be willing to pay as much as US\$ 81 per year and equally certain that he/she would not be willing to pay as much as US\$ 133 per year. Between those two values, the respondent was unable to mark either a tick or a cross, thereby indicating that willingness to pay was uncertain over this range. The same rules apply to WTP entrance ticket price.

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[33] The payment card will be fully explained and discussed later.

Box 6.3   Example of willingness to payment card

WTP$_{maintenance}$/year (US$)	✓ or ✗	WTP$_{visit}$/visit (US$)	✓ or ✗
0	✓	0	✓
7	✓	3	✓
15	✓	6	✓
22	✓	9	✓
30	✓	12	✓
37	✓	15	✓
44	✓	18	✓
51	✓	21	
59	✓	24	
66	✓	26	
74	✓	29	
81	✓	37	✗
88		44	✗
103		51	✗
118		59	✗
132	✗	66	✗
147	✗	74	✗
162	✗	81	✗
176	✗	88	✗
over 176	✗	over 88	✗

6.2   Responses to the WTP questions

Before analysing the WTP data, the issue of respondents who refuse to answer the valuation questions needs to be discussed. In survey terminology this is known as the problem of non-response. Non-response makes the imputation of the respondent's true valuation impossible. One way of dealing with the non-response is to exclude these responses from the data (Bateman *et al* 2002: 5.4), the other is to assume those non-respondents as not willing to pay anything and therefore to impute 'zero' value for the non-respondents for a conservative estimate (Mitchell and Carson 1989: 282).

The first problem is then the identification of non-response. Conventionally, CV studies recognise two forms of non-response: refusal to participate in the valuation question and 'protest bids' (Bateman *et al* 2002: 5.4). The latter includes respondents that do not

provide their genuine WTP but respond with either a zero value or an unrealistic high

value instead. However important it is to distinguish the 'protest bids' from genuine

responses, it is neither easy nor straightforward. The usual procedure for identifying

'protest zeros' is through follow -up questions in which respondents are asked their

reasons for being unwilling to pay anything for the good being valued (Bateman *et al*

2002: 5.4). This is used to distinguish between respondents that place a value of zero on

the good because they genuinely do not value it from those that are responding zero for

some other reasons. It is important to note that 'genuine zeros' are perfectly legitimate

responses to CV questionnaires and those zeros must be included in the estimation of

mean WTP. A more difficult problem lies in identifying 'high protest bids'. 'High

protest bids' could possibly be de tected by comparing the reported WTP with the

respondents' reported income, and from follow-up and interviewer debriefing

questions (Bateman *et al* 2002: 5.4). The comparison between WTP and reported

income may be able to distinguish those who reported a WTP that is in excess of their

ability to pay (ATP) or WTP that are an extremely high percentage of incomes. The

former is a clear indication of a 'protest bid' (WTP cannot exceed ATP) and the latter is

a strong but not conclusive indicator of protest. Follow-up questions can be used to

examine a respondent's reasons for answering the valuation questions in the way they

did. Interviewer debriefing questions could allow interviewers to flag respondents who

they believe may have been expressing a protest response.

Having dealt with the problem of identifying non-response, a further concern then is

that excluding observations from the data may have some systematic bias on the results

of the analysis (Bateman *et al* 2002:5.4). Systematic bias is expected only if

non-response were correlated with the true WTP, i.e., all those who did not answer the

valuation questions had, for example, a very high WTP. Since there is no clear test for

this sort of bias existing due to the unknown true WTP of such respondents, CV

researchers usually make the assumption that the true WTP of non-responders will be

similar to that quoted by respondents with comparable socio-economic and attitudinal

characteristics. Under this assumption, as long as excluding non-respondents from the

data does not bias the representativeness of the sample it should not bias the analysis of

the WTP data. If the reduced sample is not representative of the population, weighting

procedures should be employed to analyse the data (Bateman *et al* 2002: 5.5).

6.2.1. Non-response and zero-response analysis

In the current survey, the respondents were asked two subsequent sets of WTP

questions: their WTP for the maintenance of the NMNS through income tax per year,

and their WTP for visiting the museum per time in addition to the $WTP_{maintenance}$.

According to the types of WTP answers, the sample can be divided into nine subgroups

as shown in Table 6.1. There were 578 out of 620 respondents reporting both positive

$WTP_{maintenance}$ and positive WTP_{visit}. That is, 93.2% of the sample ticked a figure greater

than zero on both payment cards. The remaining eight subgroups are analysed further to

identify the non-response.

Table 6.1   **Respondents with positive or null WTP**

WTP	N	%
Positive $WTP_{maintenance}$ and positive WTP_{visit}	578	93.2
Positive $WTP_{maintenance}$ and zero WTP_{visit}	6	1.0
Positive $WTP_{maintenance}$ and WTP_{visit} non response	1	0.2
Zero $WTP_{maintenance}$ and positive WTP_{visit}	26	4.2
Zero $WTP_{maintenance}$ and zero WTP_{visit}	1	0.2
Zero $WTP_{maintenance}$ and WTP_{visit} non response	0	0.0
$WTP_{maintenance}$ non response and positive WTP_{visit}	6	1.0
$WTP_{maintenance}$ non response and zero WTP_{visit}	2	0.3
$WTP_{maintenance}$ non response and WTP_{visit} non response	0	0.0

Six respondents who were willing to pay for the existence and maintenance through tax did not want to pay anything for visiting the museum through admission charge. They were asked to give their reasons for not willing to pay for visiting (Box 6.4), and all six of them gave the same reason ' My household has already paid in taxes and don' t want to spend more' . They were then asked a follow-up question to reconsider their answers (Box 6.5), and none of them changed their answers. The value of visiting the NMNS of these six respondents was therefore embedded in the value they gave for the existence and maintenance of the museum. Their both reported WTPs are, as a result, considered invalid due to their rejecting the payment vehicle.

Box 6.4   **Follow-up question for zero WTP_{visit}**

You have said that you are not willing to pay anything. Can you give the main reason for this answer?

☐   1. I don' t visit the museum; only those who visit the museum should pay for it;

☐   2. My household has already paid in taxes and don' t want to spend more; (go to end note 3)

☐   3. The museum wastes too much money; (go to end note 4)

☐   4. That is what visiting the museum is worth to me;

☐   5. Other, _____.

Box 6.5   **Follow-up question for reason two for zero WTP$_{visit}$ and WTP visit non response (end note 3)**

> Don' t you think you get more benefits by visiting the museum? It is very important for us to learn what value you place on visiting the museum when you are given the chance to make the choice yourself. Would you be willing to answer your WTP amount now?
> (Yes → go to 18; No → go to 23)

One respondent gave a positive WTP$_{maintenance}$ but did not answer the WTP$_{visit}$ question. She was asked why she did not answer the WTP$_{visit}$ question (Box 6.6). Her reason was the same as the previous six who gave a zero WTP$_{visit}$. She was also then explained and asked to reconsider her answer (Box 6.5). She did not change her answer; therefore, as is the case with the previous six respondents, her responses are considered illegitimate for both WTP analysis.

Box 6.6   **Follow-up question for WTP$_{visit}$ non response**

> 20. Can you tell me why you refuse to answer the question?
> ☐ 1. I don' t visit the museum; only those who visit the museum should pay for it;
> ☐ 2. My household has paid the museum through taxes and don' t want to spend more; (go to end note 3)
> ☐ 3. The museum wastes too much money; (go to end note 4)
> ☐ 4. Other, _____.

The fourth group (Table 6.1) is more complicated. There were twenty six people reporting zero WTP$_{maintenance}$ but positive WTP$_{visit}$. There are many reasons why people would not be willing to pay anything towards the existence and maintenance of the NMNS. Those who reported a zero WTP$_{maintenance}$ were asked why they did not want to pay (Table 6.2) to identify protest zeros from the genuine economic zeros.

Table 6.2   Reasons for zero WTP$_{maintenance}$

Q17. You have said that you are not willing to pay anything. Can you give me the main reason for this answer?	N
1. I don't visit the museum; only those who visit the museum should pay for it;	2
2. My household is paying too much in taxes already and don't want to spend more; (go to end note 1)	14
3. The government or the museum wastes too much money; (go to end note 2)	2
4. That is what the museum is worth to me;	2
5. We don't want to pay the museum through tax, we want to pay entrance charge/donation/sponsorship.	4
6. We cannot afford it.	1
7. We don't visit the museum very much; only those who visit often should pay.	1

There were three respondents placing zero value on the existence of the NMNS because they did not use the museum very much (Reason 1 and 7 in Table 6.2), which are considered as genuine economic reasons. They are, therefore, treated as valid responses in both WTP analysis.

For the fourteen respondents who answered 'My household is paying too much tax and we don't want to pay more', a following question was then explained and asked if they would change their answer (Box 6.7). None of them changed their answers. Their WTP$_{maintenance}$ are considered protest zeros to the payment vehicle. The further question is whether their WTP$_{visit}$ were valid responses. Their WTP$_{visit}$ would not be valid only if their WTP$_{maintenance}$ was included in the former. Their reasons for zero WTP$_{maintenance}$ suggested their WTP$_{visit}$ may be valid. Therefore, their WTP$_{maintenance}$ are considered illegitimate but their WTP$_{visit}$ valid.

Box 6.7   **Follow-up question for reason two for zero WTP$_{maintenance}$ and WTP$_{maintenance}$ non response (end note 1)**

I'd like to remind you that your household is already paying some amount for the NMNS in your taxes. It is very important for us to learn what value you place on maintaining the museum when you are given the chance to make the choice yourself. Would you be willing to answer your WTP amount now? (Yes → go to 13; No → go to 18)

For the two respondents whose reasons for not willing to pay were ' The government or the museum wastes too much money.', a following question was also explained and asked (Box 6.8). Neither of them changed their answers. As is the case with the fourteen respondents above, these two are considered to have illegitimate WTP$_{maintenance}$ but valid WTP$_{visit}$.

Box 6.8   **Follow-up question for reason three for zero WTP$_{maintenance}$ and WTP$_{maintenance}$ non response (end note 2)**

It is very important for us to learn what value you place on maintaining the museum when you are given the chance to make the choice yourself. Would you be willing to answer your WTP amount if I noted here that the amounts you give are based on the assumption that the museum would be efficient and well run? (Yes → go to 13; No → go to 18)

There were two respondents would not pay because that was what the existence and maintenance of the museum were worth for them, which was a valid economic reason for zero response. They are treated as valid responses in both WTP analysis.

A further four respondents showed their protest to the payment vehicle (5 in Table 6.2). They are obviously protest zero to the WTP$_{maintenance}$ question. The problem is their WTP$_{maintenance}$ may have been included in their WTP$_{visit}$. Therefore, their WTP$_{maintenance}$ and WTP$_{visit}$ have to be treated as illegitimate responses.

The last one of the twenty six would not pay because she could not afford it, which was a valid economic reason for not paying. Her responses are therefore considered 'genuine zero'.

There was only one respondent gave both zero $WTP_{maintenance}$ and WTP_{visit}. He was asked why (see, Box 6.4 and Table 6.2), and he answered 'other' to both questions, without specifying what 'other' was. His both WTP responses, therefore, are treated as illegitimate responses since there is no knowing whether those were valid zeros or protest zeros.

There were six respondents who refused to respond to $WTP_{maintenance}$ question but gave a positive WTP_{visit} (Table 6.1). The reasons why they refused to give $WTP_{maintenance}$ are analysed first (Table 6.3). The one who did not want to pay because he thought his household was paying too much in taxes was asked a follow-up question to see if he would change his answer (Box 6.7). He did not, and therefore is treated as a protest response to $WTP_{maintenance}$. The question then comes to whether his WTP_{visit} was valid. If his true $WTP_{maintenance}$ was zero, he should have given a zero response rather than a protest response to the payment vehicle. Therefore, his true $WTP_{maintenance}$ is assumed to be positive but through other payment vehicle. The key question of whether his WTP_{visit} was valid then becomes whether his true $WTP_{maintenance}$ was embedded in his WTP_{visit}. If his true $WTP_{maintenance}$ had been included in the WTP_{visit}, he should have given other reason than a protest response to payment vehicle for not participating in the $WTP_{maintenance}$ question. Therefore, his $WTP_{maintenance}$ is considered illegitimate, but his WTP_{visit} valid. As for the other five who did not give reasons for not answering the $WTP_{maintenance}$ question, there is no knowing what their true values of both were. Therefore, they are treated as illegitimate responses of both WTP analysis.

Table 6.3   **Reasons for not answering WTP$_{maintenance}$**

Q16. Can you tell me why you refuse to answer the question?	N
1. I don't visit the museum; only those who visit the museum should pay for it;	0
2. My household is paying too much in taxes already and don't want to spend more (go to end note 1);	1
3. The government or the museum wastes too much money (go to end note 2);	0
4. Other, (not specified _____).	3
• Non response	2

There were two people refusing to answer the WTP$_{maintenance}$ and stating zero value for

WTP$_{visit}$ (Table 6.1). One of them did not specify what her reasons were for not

participating the WTP$_{maintenance}$ question, and did not give a reason for her zero WTP$_{visit}$.

She, therefore, is treated as illegitimate responses for both analysis. The other one did

not specify his reason for not answering the WTP$_{maintenance}$ question either, but he stated

zero WTP$_{visit}$ because he did not visit the museum. He, therefore, is treated as

illegitimate for WTP$_{maintenance}$ analysis, but valid for WTP$_{visit}$ analysis.

As for 'high protest bids', it is possible to detect its existence by comparing the

reported WTP and income or from follow-up and interviewer debriefing questions. As

is mentioned earlier, if a respondent reported a WTP that is in excess of his/her ability

to pay, the WTP is clearly a protest bid. Or, if a respondent reported a WTP that is an

extremely high percentage of income, the WTP is likely, though not conclusively, to

be a protest bid. In the current survey, the lowest monthly income range was US$ 0 to

US$ 588, which equals to US$ 0 to US$ 7,059 per annum, while the highest

WTP$_{maintenance}$ and WTP$_{visit}$ were NT$ 176 per annum and NT$ 88 per visit. Therefore, it

is impossible to have a WTP in excess of the ability to pay. However, there were 79

respondents (12.7%) willing to pay more than one percent of their annual income for

the existence of the museum, which was suspiciously high. Their attitudes towards the

museum are analysed. It is discovered that 80 percent of them thought the museum

was very good or good and the other 20 percent thought the museum was acceptable[34].

This can not prove the existence of the 'high protest bid' convincingly either.

Therefore, it is assumed that there is no 'high protest bid' in the current survey.

Having identified the 'illegitimate' responses, as is mentioned earlier, there are two

approaches to deal with the illegitimate responses. One way is to remove them from

WTP analysis, because their true WTP is not known. In this sense, thirty six

respondents (5.8% of the total 620 respondents) have to be removed from $WTP_{maintenance}$

analysis and eighteen respondents (2.9% of total respondents) have to be excluded

from WTP_{visit} analysis. However, it is possible that the respondents felt embarrassed

to show that they did not value the museum so that they either did not respond to the

WTP questions or gave other reasons for their responding zero. Therefore, the other

way to treat the illegitimate responses, for a conservative estimate of WTP, is to

assume their WTP to be 'zero'. The second approach, i.e., assuming the suspected

'illegitimate responses' as 'genuine zero', is adopted for the current study. It is worth

noting that the percentages of the 'illegitimate' responses in the full sample are small;

therefore, these responses have little impact on the results of data analysis.

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[34] 14. What is your impression of the NMNS?
   ☐1. Very good ☐2. Good ☐3. Acceptable ☐4. Bad ☐5. Very bad

6.2.2. WTP responses

Details of the WTP responses are presented separately in Table 6.4 and Table 6.5, and

the survivor functions are plotted in Figure 6.1 and Figure 6.2. The WTP responses

contain two pieces of information: ticks and crosses. The ticks are the amounts that the

respondents were sure that they would be willing to pay, and the highest one stands for

the highest amount the respondents were certain they would pay. On the contrary, the

crosses are the amounts that the respondents were sure that they would not be willing to

pay, and the lowest one marks the lowest amount the respondents were certain they

would not pay. The range between the highest tick and the lowest cross is the range of

uncertainty. For the convenience of discussion, from now on, the highest tick is referred

to as 'tick', while the lowest cross as 'cross'. In   Table 6.4 and Table 6.5, the columns

labelled 'frequency' provide the frequencies individuals ticked (or crossed) this amount

as the highest they were certain they would pay (or the lowest they were certain they

would not pay). For the ticks, the columns labelled 'cumulative' report the number of

respondents who were certain they would pay at least this amount. For crosses, they

report show the number of respondents who at this value had not yet stated they would

not pay. When presented as a function, the cumulative figures describe what is known

as a 'survivor fu nction'. Therefore, the survivor function of ticks (or crosses) describes

the portion of the sample at each value on the payment card whose highest tick is at

least this value (or whose lowest cross is higher than this value).

Table 6.4   Details of WTP$_{maintenance}$ payment card responses (pooled data)

WTP (US$)	Ticks			Crosses		
	Frequency	Cumulative	Survivor	Frequency	Cumulative	Survivor
0	28	559	1.00	0	559	1.00
7	57	531	0.95	33	559	1.00
15	94	474	0.85	16	526	0.94
22	21	380	0.68	28	510	0.91
29	160	359	0.64	55	482	0.86
37	10	199	0.36	55	427	0.76
44	30	189	0.34	27	372	0.67
51	3	159	0.28	8	345	0.62
59	53	156	0.28	47	337	0.60
66	3	103	0.18	29	290	0.52
74	21	100	0.18	19	261	0.47
81	0	79	0.14	10	242	0.43
88	25	79	0.14	45	232	0.42
103	3	54	0.10	15	187	0.33
118	5	51	0.09	14	172	0.31
132	0	46	0.08	7	158	0.28
147	20	46	0.08	38	151	0.27
162	0	26	0.05	11	113	0.20
176	16	26	0.05	3	102	0.18
Missing	10	10	0.02	99	99	0.18

Note: 'Missing' refers to those who were not sure what either their highest WTP or their lowest unwillingness-to-pay was.

Table 6.5   Details of WTP$_{visit}$ payment card responses (pooled data)

WTP	Ticks			Crosses		
(US$)	Frequency	Cumulative	Survivor	Frequency	Cumulative	Survivor
0	9	559	1.00	0	559	1.00
3	135	550	0.98	9	559	1.00
6	148	415	0.74	56	550	0.98
9	76	267	0.48	87	494	0.88
12	40	191	0.34	55	407	0.73
15	46	151	0.27	70	352	0.63
18	22	105	0.19	44	282	0.50
21	5	83	0.15	14	238	0.43
24	13	78	0.14	15	224	0.40
26	4	65	0.12	8	209	0.37
29	33	61	0.11	50	201	0.36
37	5	28	0.05	15	151	0.27
44	3	23	0.04	19	136	0.24
51	0	20	0.04	4	117	0.21
59	7	20	0.04	17	113	0.20
66	0	13	0.02	2	96	0.17
74	1	13	0.02	4	94	0.17
81	0	12	0.02	1	90	0.16
88	3	12	0.02	5	89	0.16
Missing	9	9	0.02	84	84	0.15

Note: 'Missing' refers to those who were not sure what either their highe st WTP or their lowest unwillingness-to-pay was.

Figure 6.1   Survivor functions for ticks and crosses of WTP$_{maintenance}$ (pooled data)
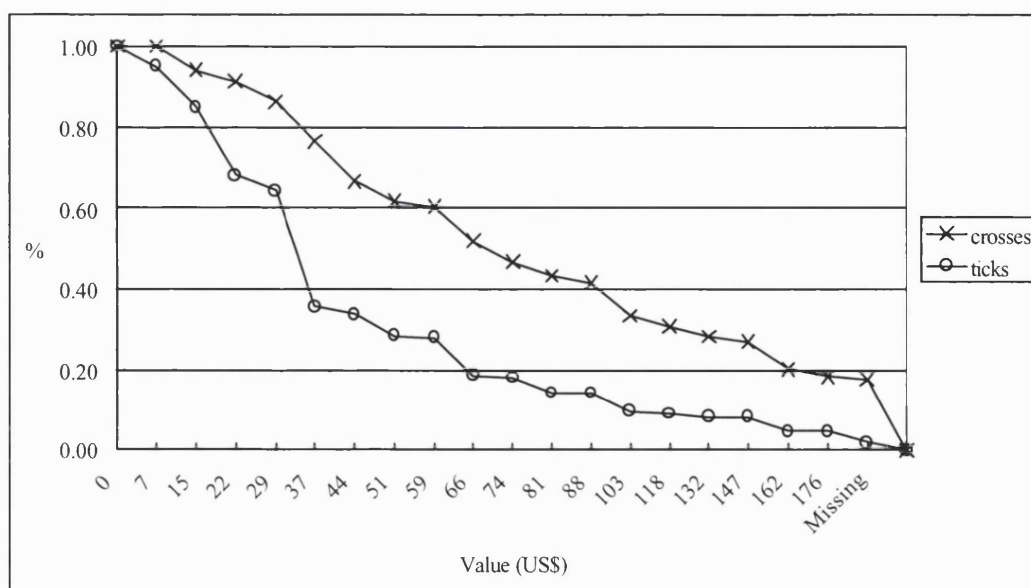
Figure 6.2 **Survivor functions for ticks and crosses of WTP$_{visit}$ (pooled/ unweighted data)**
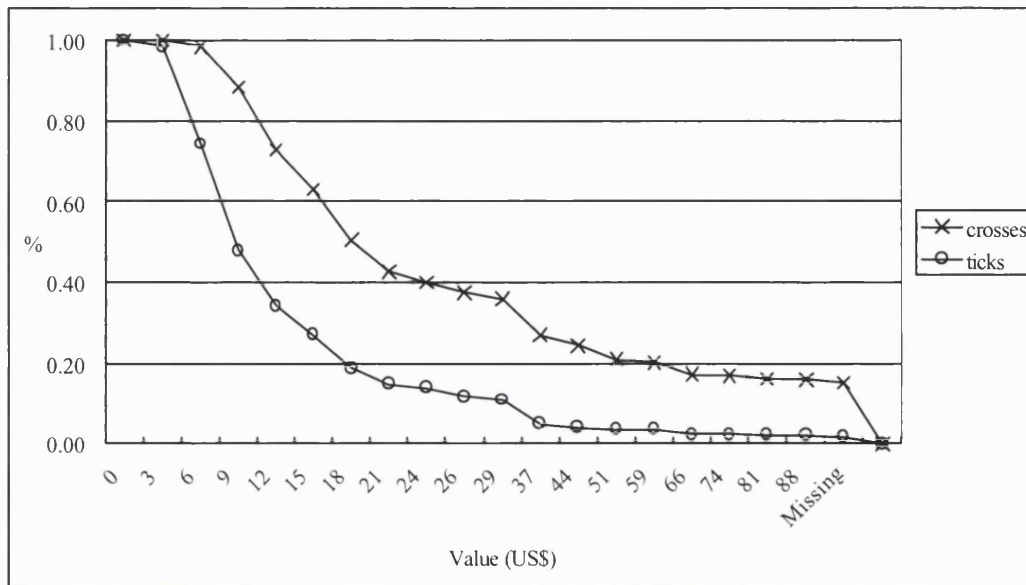
More familiar ways of summarising the data are provided in Table 6.6, which reports

the mean, standard deviation, minimum and maximum of the ticks and crosses provided

in the sample.

Table 6.6 **Summary statistics for WTP$_{maintenance}$ (US$/household/year) (pooled/unweighted data)**

	WTP$_{maintenance}$ (US$/household/year)		WTP$_{visit}$ (US$/household/visit)	
	Tick	Cross	Tick	Cross
Mean	41	64	11	20
Median	29	59	6	15
Std. Dev.	40	43	12	16
Min	0	7	0	3
Max	176	176	88	88

The above analysis provides some key information on the upper and lower bounds of

WTP of the sample. However, they do not supply answers to such questions as the

implicit average WTP of the survey sample as well as of the target population, and the

factors determining WTP. More complex analysis of the CV data is needed to be able to

answer these questions. Before moving to the more complex analysis, some attitudinal

WTP follow-up questions are analysed first.

6.2.3. Reasons for WTP_{maintenance}

As is mentioned in Chapter 3, a comprehensive assessment of the benefits of a public

good should include all of the benefits which will legitimately accrue from the

provision of a given good. This concept is known as the 'total economic value'

approach (Pearce and Mourato 1998: 10). The total economic value of museums in

general has been discussed previously in Chapter 4, and the same concept can be

applied to the total economic value of the NMNS specifically.

In the current survey, the respondents were asked why they would be willing to pay for

the maintenance of the NMNS after the WTP_{maintenance} question (Box 6.9). The survey

result is incorporated into the total economic value framework and presented in Figure

6.3[35]. Figure 6.3 shows nearly two thirds (63.5%) of respondents were willing to pay

for the existence and maintenance because the future generation can enjoy its benefits,

which, in economic terms, is the bequest motivation. More than half of the respondents

would be willing to pay because they thought the existence of the museum was

important whether they visited it or not (55.4%), which falls into the categories of, in

economic terms, the existence motivation. Nearly two thirds of the respondents

(64.5%) would be willing to pay so that they may visit the museum sometime in the

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[35] The 'indirect use values' refer to benefits that people derive indirectly from the museums, such as the benefits for the local community in the form of increased employment and business opportunities (Pearce and Mourato 1998: 10). The examples of the 'indirect use values' can be exhaustive, and to translate the idea of 'indirect use values' into questionnaire questions can be extensive too. Since the reasons for the WTP is not the main focus of the current survey, the 'indirect use values' is not phrased into the question design to avoid complicating the question. However, the option of 'other' reason was open to the respondents. None of the respondent addressed any reason which can be considered as the 'indirect use values'.

future, which falls into the category of the option motivation. The option of 'other

reason' was open to the respondents, but none of them claimed to have any other

reasons. It seems that the three suggested motivations have covered the respondents'

reasons for WTP well.

Box 6.9   **Q15 – reasons for WTP$_{maintenance}$**

15. Why would you be willing to pay? (you can chose more than one answers)
- □   1. I would like to keep the museum running so that I can go there sometime in the future, whether I visit it or not currently;
- □   2. It is important to have a museum like this in Taiwan no matter I visit it or not;
- □   3. The future generation can enjoy the benefits;
- □   4. Other,...

The survey findings support the argument that economic valuation takes account not

only of self-interested preferences but also of other people's benefits (Bateman *et al*

2002: 1.6).

Figure 6.3   **Reasons for WTP$_{maintenance}$ and total economic value (pooled data)**

Total economic value

Use value | Non-use value

Direct use values | Indirect use values | Option values (I'd like to keep the museum running so that I can go there sometime in the future, whether I visit it or not currently) **(64.5%)** | Bequest values (The future generation can enjoy the benefits.) **(63.5%)** | Existence values (It is important to have a museum like this in Taiwan no matter I visit it or not.) **(55.4%)**

6.2.4. Preferred method of payment

At the end of the valuation section, the respondents were asked their preferred method

of payment for the benefits of the NMNS (Box 6.10).

Box 6.10   Q23 – preferred payment method

23. If you were given the chance to make the choice of how you pay for the NMNS, what method of payment would you prefer?

☐ 1. I would like to pay through my income tax every year for the general maintenance of the museum, and through admission charges for visiting the museum;

☐ 2. I would like to pay for the museum only through my income tax every year, and I think visiting the museum should be free;

☐ 3. I would like to pay for the museum through admission charge only when I visit it;

☐ 4. Other, _____.

Table 6.7 shows that nearly 40 per cent of the respondents were happy with the current

payment vehicle, i.e., through income tax as well as admission charges and nearly 80

per cent would be happy to pay admission charges.

Table 6.7   Preferred method of payment (pooledsample)

	%
Tax + admission charge	39.0
Tax only	22.0
Admission charge only	38.5
Others (not specified)	0.5

6.3 Econometric modelling

The previous section provides some key information on the WTP of the sample

populations. However, to estimate the benefits from the museum accruing to the whole

population, it is necessary to employ the techniques of econometric analysis. The

econometric analysis begins by building a behavioural model that seeks to explain why respondents answer the WTP questions in the CV survey as they do. This behavioural model is translated into an econometric model that can be estimated from the survey data using statistical techniques. The econometric model provides indications of the importance of different factors, such as income, education, and attitudes, in determining a household's WTP for the NMNS. The e conometric model describes how decisions concerning WTP are made and can be used to estimate measures of the average WTP in the sample.

6.3.1. Model building

As described in 6.1, the ticks and crosses on the payment card provide information on the lower and upper bounds of household's WTP or 'bids'. The lower bounds will be labelled henceforth as B_L and the upper bounds as B_H . The amount households would actually pay for the good, the unobserved 'true WTP', will be denoted as y_i (where the i subscript denotes household i). Thus, a simple behavioural model describing WTP can be built:

$$B_L < y_i < B_H \qquad (1)$$

Alternatively, a household might say their WTP is certainly lower than an amount presented on the payment card but that they are not sure about their lower bounds of WTP. Denoting this by $B_H *$ the alternative simple behavioural model can be built:

$$y_i \leq B_H * \qquad (2)$$

Finally, the household may state that their WTP is greater than a certain amount on the payment card but that they are not sure about their upper bound. Denoting this $B_L *$ a third model is written as:

$$B_L * \leq y_i \qquad (3)$$

The aim of the model building is to determine the value of y_i. With the data that are

collected from the payment card, as analysed in session 6.2, the true value of y_i is not

revealed. Instead an econometric model is used to make a prediction of y_i based on the

variables which are thought to probably influence its value. This predicted value

function will be denoted as z_i. Therefore,

$$y_i = z_i (X_i, \beta) + \mathring{a}_i, \tag{4}$$

where z_i $()$ is a function that gives a prediction of the true WTP y_i,

          X_i represents a vector of variables, e.g., $X_i=(X_1, X_2, X_3 \ldots X)$,

          β represents a vector of parameters that measure the influence

               of the X_i variables on the value of z_i,

          $\mathring{a}_i$ represents the part of the true WTP that the researcher is

               unable to predict, i.e. the 'error' term.

There are a number of ways of explaining the existence of this unpredictable element of

WTP ($\mathring{a}_i$). Two commonly suggested explanations are that $\mathring{a}_i$ represents the

influence of the many other variables that influence WTP but which are not included

in the model, and the respondent's personal uncertainty concerning his/her WTP at the

time when he/she is asked (Mourato and Day 1998: 48).

Thus, the true value of y_i could lie above or below the prediction (z_i). Substituting

Equation (4) in Equation (1), (2) and (3) and rearranging, gives

$$B_L - z_i < \mathring{a}_i < B_U - z_i \tag{5}$$

$$\mathring{a}_i \leq B_H * -z_i \tag{6}$$

$$B_L * -z_i \leq \mathring{a}_i \tag{7}$$

In words, given the prediction of WTP for household i (z_i), the amount ticked

($B_L, B_L *$) and the amount crossed ($B_H, B_H *$), the bounds of the value taken by $\mathring{a}_i$ can

be defined.

If it is assumed that $\mathring{a}_i$ follows some probability distribution, it becomes possible to regard the model in probabilistic terms:

$$\Pr(B_L - z_i < \mathring{a}_i < B_H - z_i) \tag{8}$$

$$\Pr(\mathring{a}_i \leq B_H{}^* - z_i) \tag{9}$$

$$\Pr(B_L{}^* - z_i \leq \mathring{a}_i) \tag{10}$$

Equations (8), (9) and (10), where 'Pr' means 'Probability that ...', define the general probabilistic models. To complete the transformation of the behaviour models into an econometric model that can be estimated, the cumulative density function (CDF) of $\mathring{a}$ will be specified as $F(\mathring{a})$. That is, $F(x)$ defines the probability that $\mathring{a}$ will take a value less than x.

For the model, the probability that $\mathring{a}_i$ is

- less than $B_H - z_i$ while not being less than $B_L - z_i$,
- no more than $B_H{}^* - z_i$, or
- no less than $B_L{}^* - z_i$

has to be defined.

In words, the probabilities of a household with characteristics X_i responding to the WTP question by

- ticking a value of B_L and crossing a value of B_H ,
- ticking a value of $B_L{}^*$ only, or
- crossing a value of $B_H{}^*$ only

are given by the statements:

$$P_i = F(B_H - z_i(X_i, \beta)) - F(B_L - z_i(X_i, \beta)) \tag{11}$$

$$P_i = F(B_H * - z_i (X_i, \beta))$$ (12)

$$P_i = 1 - F(B_L* - z_i (X_i, \beta))$$ (13)

where P_i () is the probability of the household deciding to tick and cross the values that were chosen.

Given the model described in equations (11), (12) and (13) and some initial estimates of β, the total probability that the households in the sample would have answered the WTP questions as they did can be computed according to

$$L = \prod_i P_i$$ (14)

Where L is known as the 'likelihood function' and measures the total probability (predicted by the model at the given parameters, β) that respondents will have answered the WTP question in the way they did.

For convenience it is more usual to work with the log of this expression

$$\log L = \sum_i \log P_i$$ (15)

Using computer maximisation routines, the model is estimated by selecting the set of parameters, β, that maximise this log likelihood expression. These values for β give the best estimates of how the X variables influence household WTP.

A plethora of specific models can be built from the general model expressed above, depending on different assumptions about probability distributions. Choosing which probability distribution to model CV data is one of the major decisions facing the researcher.

Data from households $i \in L$ which only gave the higher bound of their WTP, denoted

as $B_{Hi}*$, are treated as left-censored data, i.e., it is only known that the unobserved

y_i is less than or equal to $B_{Hi}*$. Similarly, households $i \in R$ which gave only the lower

bound of their WTP, denoted as $B_{Li}*$, is treated as right-censored data, i.e., the

unobserved y_i is more than or equal to $B_{Li}*$. For the rest ($i \in I$) who gave both the

lower and upper bound of their WTP (B_{Li}, B_{Hi}), it is known that their unobserved y_i is

in the interval $[B_{Li}, B_{Hi}]$.

The final log likelihood function can be written as

$$
\begin{aligned}
\log L = & \sum_{i \in L} w_i \log \Phi(\frac{B_{Hi}* - X_i\beta}{\sigma}) \\
& + \sum_{i \in R} w_i \log\left[1 - \Phi(\frac{B_{Li}* - X_i\beta}{\sigma})\right] \\
& + \sum_{i \in I} w_i \log\left[\Phi(\frac{B_{Hi} - X_i\beta}{\sigma}) - \Phi(\frac{B_{Li} - X_i\beta}{\sigma})\right]
\end{aligned}
\tag{16}
$$

where $\Phi( )$ is the cumulative standardised normal distribution function,

w_i is the weight for household i. In the current study, no weights are

specified[36], so $w_i = 1$.

The log likelihood function given in equation (16) was maximised using STATA 5.0[37].

The model estimated values for the σ and β parameters and the results are presented in

the next section.

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[36] DuMouchel and Duncan (1983) argue that weights that make the realised sample representative of the population are not needed for estimating the valuation function as long as the regression model assumes constant coefficients for all observations and there is no sample selection bias (Mitchell and Carson 1989: 273).

[37] An econometric package for Statistics and Data Analysis, published by the Stata Corporation.

6.3.2. Explaining willingness to pay – the variables

In order to obtain a conservative estimate of WTP, the suspected 'illegitimate responses' in the current survey are treated as 'genuine ze ro' for the econometric analysis.

Table 6.8 presents the potential variables tried in econometric model building. The user/non-user variable was included to compare the differences between the users and non-users of the NMNS. If this variable turns out to be significant, it would suggest that the users benefit more from the existence of the NMNS than the non-users. On the other hand, if this variable turns out to be insignificant, it would probably reflect the benefits from the NMNS are equally distributed to both users and non-users.

Table 6.8   Potential variables used in econometric modelling

Variable	Description
• User/non-use	Dummy variable: 1 if the respondent has been to the NMNS. 0 if the respondent has never been to the NMNS.
Social-economic variables:	
• Gender	Dummy variable: 1 if the respondent is male. 0 if the respondent is female.
• Education	Dummy variable: 1 if the respondent holds a university or equivalent or above degree. 0 if the respondent does not have a university or equivalent degree.
• Income	Household monthly income.
• Children	No. of children age under 18 in the household.
• Age	Age of the respondent.
• Distance	Distance from the respondent's hometown to Taichung city (where the NMNS is).
Attitudinal variables:	
• Priority	Dummy variable: 1 if the respondent gives museums and galleries the top two priorities in question 5^{38}. 0 if the respondent gives museums and galleries the last three priorities amongst
• Frequency	Frequency of visiting any museum or gallery last year.

Six social-economic variables were included (Table 6.8). The *a priori* expectations

about these variables are as follows:

1. Gender: It is expected that there is no significant difference in different gender

    groups.

2. Education: Positive association is expected.

3. Household income: Positive association is expected.

4. No. of children age under 18 in the household: From the survey results analysed in

    Chapter 5 and earlier in this chapter, it is possible that the number of children aged

    under 18 in the household is positively related to both $WTP_{maintenance}$ and WTP_{visit}.

    The more children there are in the households, the more frequently the

    respondents take their children to museums and galleries and also the more likely

    they would be willing to pay for the existence of the NMNS for the benefits of

    future generations. This implies that the museum might have higher use and

    non-use values for those who have (more) children under age 18 in their

    households.

5. Age: As was suggested earlier, as people grow older, they start paying more

    attention to the future generations, which may lead to higher WTP, too.

6. Distance from the NMNS: The variable 'Distance' was included in the model

    building to find out the catchment areas of the benefits of the museum. If this

    variable turns out to be insignificant, it would probably reflect the national rather

    than regional importance of the museum. On the other hand, distance is a proxy

    for cost of traveling to the museum. Therefore, it may turn out that distance is

    negatively related to WTP_{visit} since the more people spend on traveling to the site,

    the less people may be willing to pay to enter the site.

Two attitudinal variables: priority and frequency, were tried in the model building.

They were about the respondents' attitudes towards museums in Taiwan in general. The

NMNS is one of the most popular and reputable museums in Taiwan. Therefore, those

who valued museums in general in Taiwan more, by placing a higher priority on

museums and visiting museums more frequently, may be expected to have higher WTP

for the NMNS.

6.3.3. Explaining willingness to pay – model results

The above variables were included in initial modelling efforts. The results of the

econometric modelling of WTP are presented in Table 6.9. Model 1 and Model 3

contain the user/non-user variable, the two attitudinal variables as well as a large

number of socio-economic variables. This demonstrates an important aspect of typical

CV surveys, namely that the WTP amount revealed can be shown to have a basis in the

attitudinal beliefs expressed by the respondents as well as by their socio-economic

characteristics. Model 2 and Model 4 remove the user/non-user and the attitudinal

variables to predict the WTP of the population[39].

---

[39] Due to the constraints of the current survey and the characteristics of the survey data, the attitudinal
variables have to excluded if the equation is to be used to predict the WTP of the population. The reason
for this and the method employed for prediction will be addressed in detail in the next section.

Table 6.9   Results of econometric modelling

Variables	WTP$_{maintenance}$		WTP$_{visit}$	
	Model 1	**Model 2**	**Model 3**	**Model 4**
Log of WTP:				
Constant	6.908358*** (0. 2711125)	7.039079*** (0.1481387)	5.11735*** (0.158256)	5.085779*** (0.120663)
User/non-user	0.06726 (0.2268153)	-	0.0315369 (0.1034698)	-
Gender	-0.0112406 (0.0950917)	-0.009431 (0.0922014)	0.022667 (0.1042166)	0.0174568 (0.1018374)
Education	0.1204142 (0.0892872)	0.1388419 (0.0880801)	-0.0766206 (0.0628372)	-0.0863718 (0.0642349)
Income	1.14e-06** (5.51e-07)	1.10e-06* (5.69e-07)	1.23e-06*** (4.50e-07)	1.26e-06*** (4.39e-07)
Children	0.0452169 (0.043609)	0.0565945 (0.0446914)	0.1230663*** (0.0405752)	0.1179916*** (0.041092)
Age	0.0037293 (0.0051718)	0.0037072 (0.0055363)	0.022462*** (0.0054357)	0.0221649*** (0.0053727)
Distance	-0.0006075 (0.0005978)	-0.0008087 (0.0005847)	0.0007272 (0.0004633)	0.0008194* (0.0004728)
Priority	0.0434502 (0.0811806)	-	-0.0918262* (0.0441921)	-
Frequency	0.0152312** (0.006456)	-	-0.0087566 (0.0061827)	-
ó	0.9230292	0.9264655	0.6643722	0.6668989
Log Likelihood	-949.47564	-950.70937	-772.1872	-773.82806

Note: ***   Significant at 1% level of confidence

        **   Significant at 5% level of confidence

        *   Significant at 10% level of confidence

        Figures in parentheses are Robust Standard Error adjusted for clustering on interviewer.

Table 6.10 presents the comparison of the expected results and the econometric modelling results. Starting from those variables that work well in the models, income turns out positive and significant, as expected from the economic theory, in both WTP$_{maintenance}$ and WTP$_{visit}$ models. The user/non-user variable has a positive, although not significant, association as expected too. The two no-a-$prior$-expectation variables – distance from the NMNS, and gender – turn out insignificant, which suggests that the benefits of the NMNS might be equally distributed across both genders regardless of the geographically locations, as expected.

Other variables are discussed in turn:

1. Education: Positive association is commonly expected in cultural asset studies.

    In WTP$_{maintenance}$ modelling, it was not significant (P=0.177) in Model 1, but it

    became significant, as expected, if all the other variables were removed from the

    model. The negative sign in WTP$_{visit}$ Model 3 is unexpected. However, when the

    variable education was fitted to the WTP model on its own without including other

    variables, it was significantly positive. Therefore, this unexpected result should be

    attributable to some unknown effect from other variables entering the equation

    statistically rather than its effects on WTP.

2. No. of children: No. of children was not significant in the original WTP$_{maintenance}$

    model building (Model 1). The positive association between WTP$_{maintenance}$ and no.

    of children supports the earlier presumption that the more children there are in the

    households, the more likely people would be willing to pay more to support the

    museum due to their possibly greater attention to and care for the future

    generations. The possible explanation for the positive association with WTP$_{visit}$

    could be that the more people in the household visit a museum together, the more

    money they are prepared to pay[40]. This is because that people in Taiwan are used to

    paying for visiting museums, and museums in Taiwan charge admission fees

    normally on a per-person-per-visit base.

3. Age: Age did not turn out significant in WTP$_{maintenance}$ model suggests that it might

    not be an important factor influencing WTP. The reason for its positive association

    with WTP$_{visit}$ is not clear.

4. Priority and frequency: They were expected to have positive association with

---

[40] This was commonly observed during the interview, when the respondents were asked their WTP$_{visit}$ for their households, that they spoke a figure to themselves and then multiplied that figure by the no. of the people in their households to work out the household WTP$_{visit}$.

WTP, but both turn out not significant. One possible explanation could be that the people's preferences towards the NMNS do not necessarily correspond to their attitudes towards museums in general in Taiwan. A possible implication of their insignificant associations could be that attitudinal values and visiting frequencies are not satisfactory indicators of the benefits of a cultural asset.

Overall, the econometric modelling results did not turn out too well, with the WTP_{visit} models slightly better than the $WTP_{maintenance}$ models. Although most important variables had the expected signs, and some of which were significant, on the whole very few explanatory factors are identified by the parametric regressions. This is common in cross-sectional studies of this type.

Table 6.10   **Comparison of expected and modelling results**

Variable	Expected result	$WTP_{maintenance}$ Modelling result Model 1	WTP_{visit} Modelling result Model 3
User/non-user	Positively related	Positive NS	Negative NS
Gender	No *a priori* expectation	Negative NS	Positive NS
Education	Positively related	Positive NS	Negative NS
Income	Positively related	Positive S	Positive S
Children	Positively related	Positive NS	Positive S
Age	Positively related	Positive NS	Positive S
Distance	No *a priori* expectation	Negative NS	Positive NS
Priority	Positively related	Positive NS	Negative NS
Frequency	Positively related	Positive S	Negative NS

Note: 'S' stands for 'significant'; 'NS' stands for 'not significant'

6.3.4. Willingness to pay

Having constructed both WTP$_{maintenance}$ and WTP$_{visit}$ models in the previous section,

Table 6.11 provides a number of estimates of both the mean and the median WTP[41]

derived from the current survey. The results labelled as non-parametric are those that do

not rely on a model for their calculation – they are taken straight from the survey data.

The results labelled as parametric-sample are those that derived from the econometric

models presented in the last section using sample data for the values of the variables.

Finally, the parametric-population results are those derived from the econometric

models using population data to estimate the population WTP.

Table 6.11   WTP for the NMNS

WTP Measure	WTP$_{maintenance}$ (US\$/household/annum)	WTP$_{visit}$ (US\$/household/visit)
Non parametric:		
Ticks:		
Mean	41	11
Median	29	6
Crosses:		
Mean	64	20
Median	59	15
Average*:		
Mean	49	15
Median	44	10
Parametric sample:		
Mean	66	14
Median	43	11
Parametric population:		
Mean	63	19
Median	41	15

Note: * given by (tick + cross)/2

The mean of the values ticked, US\$ 41 for existence and US\$ 11 for visit, can be

---

[41] The mean measures what is commonly called the average value, whilst the median measures the middle value (such that 50% of respondents have a WTP higher than the median value and 50% have a WTP lower than the median value).

thought of as a lower bound to WTP$_{maintenance}$ and WTP$_{visit}$. They represent values that,

on average, respondents were certain they would pay for the existence of the NMNS per

household per annum and their visit to the NMNS per household per visit. Similarly the

mean values of crosses, US$ 63 and US$ 20, can be considered an upper bound to

WTP$_{maintenance}$ and WTP$_{visit}$.

The figures presented as the mean of the average WTP are derived by calculating an

average WTP for each household based on the amount they ticked and the amount they

crossed. The values calculated by this method are US$ 49 and US$ 15 and take into

account some degree of uncertainty in responses.

The parametric results are derived from the econometric models (Model 2 and Model 4)

presented in the previous section, and can be considered the best estimate of

WTP$_{maintenance}$ and WTP$_{visit}$ for the sample as well as the population. The econometric

models used assume that WTP is distributed log-normally; therefore, the formulae for

calculating the mean WTP and median WTP are:

$$\text{Mean WTP} = \exp(ì) * \exp(\acute{o}^2/2)$$

$$\text{Median WTP} = \exp(ì)$$

Where ì is the mean of log *WTP* and ó is the standard deviation of log *WTP*.

According to Model 2 in Table 6.9, the function to estimate mean 'log *WTP$_{maintenance}$*' is:

$$\log WTP_{maintenance} = 7.039079 + (-0.009431)*G + 0.1388419*E + (1.10e\text{-}06)*I + 0.0565945*C$$
$$+ 0.0037072*A + (-0.0008087)*D$$

The sample mean 'log *WTP$_{maintenance}$*' can be obtained by imputing sample mean values

for the right-hand side variables in the valuation function, while the population mean

'log $WTP_{maintenance}$' can be obtained by imputing population mean values, assuming the population variance is the same as the sample variance.

Similarly, the function to estimate mean 'log WTP_{visit}' from Model 4 in Table 6.9 is:

$$\log WTP_{visit} = 5.085779 + 0.0174568*G + (-0.0863718)*E + (1.26e\text{-}06)*I + 0.1179916*C + 0.0221649*A + 0.0008194*D$$

The sample and population mean 'log WTP_{visit}' can be obtained by the same way used to obtain 'log $WTP_{maintenance}$'.

The best estimates of the median $WTP_{maintenance}$ and WTP_{visit} of the sample are US\$ 43 and US\$ 11, and US\$ 41 and US\$ 15 for the population. These estimates provide a measure of the values that half of the sample (or population) would be willing to pay for the existence of and the visit to the NMNS and that half would refuse to pay. It is worth noting that the median values tend to be somewhat lower than the mean values suggesting that WTP is skewed to the right, i.e., most households have a WTP clustered around the median whilst a minority of households have a relative high WTP that increases the value of the mean.

6.4   Validity tests

Finally in this chapter, the validity issues related to the current study are assessed. The central problem in assessing the validity of value measures obtained from the current CV survey is the absence of an unambiguously clear and definitive criterion against which to compare those measures. There are currently two basic strands of validity tests (Box 6.11).

Box 6.11   Types of validity tests (reproduced from Bateman *et al* 2002: 8.5)

Content/face validity	Are the questions in a CV study and the description of the contingent market asked in a clear, understandable, sensible and appropriate manner with which to obtain a valid estimate of the construct under investigation?
Construct validity ✧ Convergent validity	Are the relationships between measures produced by a CV study and other measures in accordance with expectations? Results obtained from a CV study are compared with some combination of: ✧ Measures obtained from other valuation approaches; ✧ The findings of cross-study analyses; and ✧ Simulated markets.
✧ Expectation-based validity	CV measures are related to other constructs in a manner which is consistent with prior expectations: ✧ Theoretical expectations derived from economic theory; ✧ Intuition and empirically driven expectations derived from prior intuition and regularities across prior studies.

6.4.1. Content validity

Content validity (sometimes called face validity) involves the issue of whether the measure adequately covers the construct's domain. It differs from the other validity types in that it can only be assessed by a subjective judgement based on an examination of the instrument, which, usually, is the wording of the questions.

The content validity of the current CV study is assessed against the check list proposed by Bateman *et al* (2002: 8.26):

1.   Is the good offered clearly specified to and understood by respondents?

Yes, this was communicated and tested in the peer-review and pilot survey.

2.   Are substitutes and the consequences of non-payment adequately described?

The substitutes and consequences were not explicitly described in the valuation scenarios because respondents got bored if the descriptions of the scenarios had been longer than its current version. However, the messages of the available substitutes were conveyed in the attitudinal questions section by asking

respondents to rank the priorities between different cultural/leisure facilities and to recall whether they had heard about and been to the six national museums. Slightly more problematic is the absence of a counterfactual scenario in the WTP$_{maintenance}$ section. Respondents were not told what would happen to the museum if they would not pay to maintain its services. The possibilities may be the complete closure of the museum, partial closure of the museum, the deterioration of its services, reduced opening hours, or reduced exhibition, etc. This leads to the probable ambiguity of the quantity of the good to be measured. A conservative approach to remedy this problem is to assume that the respondents were measuring the biggest loss, i.e. the current level of services against a complete closure of the museum. Therefore, the WTP$_{maintenance}$ results can be interpreted as the maximum amount the respondents were willing to pay for any level of deterioration.

3. Is the information provided adequate and reasonable to describe the provision change and payment scenario?

Some CV studies attempt to link their proposed scenario to public issues to make the provision change more realistic (see, for example, Mourato *et al* 2000: 99). In the current study, there might be issues of credibility of the proposed scenario due to the lack of explanation of why the payment was needed when respondents were asked to pay to maintain a service that they already had at its current level. However, the respondents did not seem bothered by this question. This is supported by the fact that there had never been anybody questioning the reason for the payment in both the pilot and the main surveys. One possible explanation to this could be that people in Taiwan are relatively less interested in public issues than those in the West, and, culturally, they are less curious about (or less suspicious of) the motivation of a survey. The other possible reason could be the defect in the CV scenario design that the counterfactual scenario was not explicitly

specified, and, therefore, less explanation of the provision change was needed.

4. Is the chosen welfare measure appropriate?

    Since it was the maximum WTP for the NMNS to continue its activity at the

    present level that was interested in the valuation exercise, the correct measure for

    valuation of the NMNS was therefore WTA (willingness-to-accept), i.e., the

    minimum payment the respondents are willing to accept in compensation for

    doing without the good. However, because of the many negative results with the

    WTA measure, and on the basis of Mitchell and Carson's interpretation of the

    property rights to public goods that require regular payments to maintain the

    existing quality level, the WTP measure was chosen for this study.

5. Is the chosen elicitation format appropriate?

    Yes, 'payment card' method was chosen for the current survey because it is well

    established, informative and relatively cheaper to implement.

6. Is the method of provision (and allied institutional arrangements) plausible?

    Yes, the methods of provision proposed in the valuation exercise were the same as

    how the NMNS is provided.

7. Are respondents likely to have an expectation of having to pay for the good if it is

    provided?

    Yes, actually, the respondents were paying for the good and they were aware of

    that.

8. Are respondents likely to feel that they are providing an input to the

    decision-making process?

    No, because people in Taiwan are not used to participating in the decision-

    making process of the provision of any public good. Therefore, this is a weak point

    of the current study concerning the content validity. However, failing to meet the

    requirement of this particular one criteria should not become a major problem for

the current survey since other factors concerning the content validity were taken care of.

9. Has the correct population been identified and adequately sampled?

Yes, the correct population has been identified and adequately sampled concerning the constraints (limited time, money, and human resources) and use of the current survey (a doctorial research). Although the current survey suffered from an un-representative sample, statistical weighting was employed when necessary.

10. Is the choice of survey mode appropriate?

Yes, the survey mode, face-to-face interview, is the most recommended survey instrument.

11. Has the survey administration and data preparation been conducted to a sufficiently high standard?

Yes, selected trained interviewers were employed to conduct the survey and were reasonably closely supervised during the survey. Data was prepared using appropriate computer software.

12. Does the questionnaire design collect adequate data concerning predictor variables to permit construct validity testing (including the elicitation of attitude and response reason data)?

Yes.

6.4.2. Convergent validity

Convergent validity assessments typically compare measure obtained from CV studies with those obtained from other valuation methods, across multiple CV studies, and/or with those obtained via experimental simulated markets. In convergent validity testing no measure can automatically claim superiority in terms of being a naturally closer approximation of the value of the underlying construct. This could be considered as

'validity by association' (Bateman *et al* 2002: 8.11).

Convergent validity assessments were not incorporated in the current study, due to the constraints in terms of time, money, and resources. The closest assessment to convergent validity assessment is the compare the estimated WTP_{visit} with the current charging at the NMNS (the detail comparison is presented in Chapter 7). The problem here is that the latter actual charging is a fixed amount and the 'real' WTP is still un-observed.

6.4.3. Expectation-based validity

The objective of expectation-based validity tests is to see whether survey findings conform to prior expectations. The economic theoretical expectations tests include price of the good, respondent income, the scope and embedding of the good, and sequencing (Bateman *et al* 2002: 8.16):

1. Price of the good: The current survey has certainly passed the first most fundamental theoretical test that as the price of a good increases then consumption of that good should fall. It was observed in the survey that as bid levels rose, the proportion of respondents agreeing to pay that bid amount fell.

2. Respondent income: The current survey has also passed this second economic theoretical test that there was significantly positive association between WTP and the respondent's income.

3. Scope and embedding: The issue of scope and embedding is explained in greater detail in Chapter 4. The focus in this section is on the testing. Whether scope tests should be considered a compulsory part of all CV studies is still controversial (Bateman *et al* 2002: 8.17). Bateman *et al* (2002) argue that the nature of the good under consideration, the relevant policy context and objective, and the scale of the

issue and study should be borne in mind when reaching a judgement of whether a

scope test may be useful. The aim of the current study was to value the NMNS as

an integrity rather than to value the separate functions the museum serves. The

scope tests seem therefore to be less relevant. In addition, for this study, being a

small scale doctoral research with limited resources and implemented in a short

time-scale, scope tests seem to be less feasible. Therefore, the concerns of scope

and embedding effects tests were not integrated in the questionnaire design.

4. Sequencing: The issue of sequencing is discussed in Chapter 4. The reason for not

incorporating the sequencing effects tests into the current survey is the same as

that for not integrating scope and embedding effects tests described above.

Chapter 7   Management Implications from Economic Valuation

Chapter 7 brings together the findings from the museum management investigation

and the CV survey, and discusses the overall management implications from the case

study using an economic perspective. This chapter begins by comparing both the

intended outputs of the NMNS from the professional perspective and the expected

outputs from the public perspectives in section 7.1 to find out whether there is any gap

between the professional intentions and public expectations. In section 7.2, the

concept of the Total Economic Value is then applied to cast light on some museum

management issues in the context of the NMNS. Finally in section 7.3, policy

recommendations of an optimal financing for the NMNS are proposed.

7.1   Museum outputs

The attitudinal section of the current CV survey provides some useful information on

the public perception of the museum outputs. In this section, the museum outputs are

looked at and compared from both the supply side, i.e. the professional perspective,

and the demand side, i.e. the public perspective.

7.1.1. The professional perspective

As was mentioned in Chapter 3, the NMNS was established in a period when

experiences of museums in the West were brought into Taiwan. With an aim to

become a model museum and to promote the development of museums in Taiwan to

an international level, the NMNS has been closely following the development trend of

its counterparts in the West since its early stage. Therefore, it was designed to be in

line with the ICOM definition:

A museum is a non-profit making permanent institution in the service of society and of its development, and open to the public, which acquires, conserves, researches, communicates, and exhibits, for purposes of study, education and enjoyment, material evidence of people and their environment (ICOM 1990).

According to the definition, the outputs produced by the NMNS may be classified as 'intermediate' or 'final' [42] (Figure 7.1). The final outputs are very straightforward, which include exhibition, educational events and publications. These outputs are the 'experience' enjoyed by the public when they read a museum publication, make a visit or attend the event.

The acquisition, care and research of collections which serve as a resource base for publications, exhibitions and educational events can be regarded as intermediate outputs. The intermediate outputs are not an end in themselves but a means to the final outputs. These outputs are normally the 'behind the scene' activities which may not be appreciated by the public.

In addition, the final outputs described above may generate positive externalities[43], that is, benefits which do not accrue to purchaser of publications or the visitors. For instance, one individual's consumption of a publication may have an educational effect on others. Similarly, someone who has visited the NMNS may generate greater knowledge and appreciation of the subject in others. Being a popular museum, the NMNS also generates even wider economic benefits by attracting some visitors who

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[42] A number of typologies of museum output exist in the literature (see, for example, Keene 1996; Martin 1994; Johnson and Thomas 1991a). The one adopted here is after Johnson and Thomas (1991a:17).

[43] Externalities are defined by economists as 'uncompensated side-effects of production and consumption that affect a third party either positively or negatively'.

in turn cause external benefits in the economy. For example, incoming visitors may generate demand for leisure facilities that the local community can also enjoy and which would not otherwise exist.

Figure 7.1   The NMNS system – the professional perspective
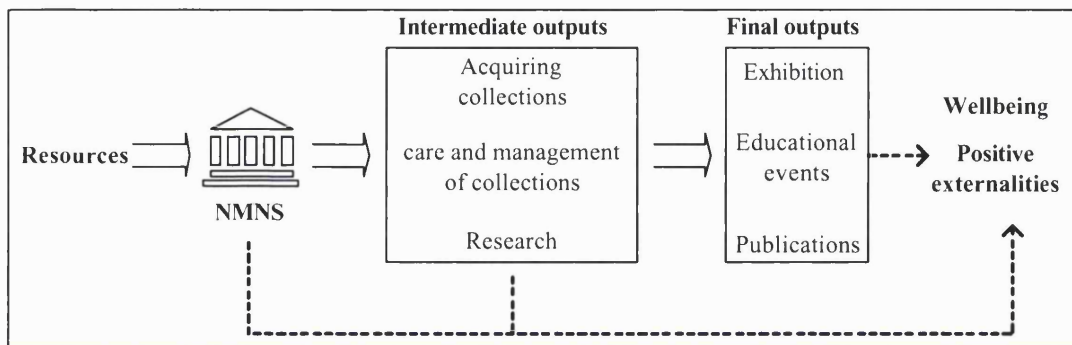
7.1.2. *The public perspective*

Chapter 5 demonstrated that people in Taiwan acknowledged various outputs of museums (Table 5.13). In the CV survey, the respondents were presented with a list of functions of public funded museums and were asked to consider the importance of them. The list proposed included:

- Acquire and take good care of objects with historic significance;

- Provide art education, science education, …etc.;

- Provide leisure experience;

- Have exhibitions with their own collections;

- Have exhibitions with collections loaned in from other countries;

- Research;

- Enable people to understand and to appreciate Taiwan / Enhance cultural identity.

The education, leisure and exhibition functions are directly connected to people's

'direct use' of museums through their visiting the museums, reading museum

publications, and attending educational events. While the other three functions,

acquisition and conservation, research, and enhancing cultural identity, may not

always be experienced by the public through their 'direct use' of museums.

The survey shows some interesting results that the two most highly appreciated

outputs were 'acquisition and conservation' and 'enhancing cultural identity', which

do not necessarily involve people's direct use of museums (Table 5.13).

The above comparison is encouraging for the NMNS that the outputs that the NMNS

intends to generate are acknowledged and valued by the public regardless of whether

they directly benefit from them or not.

7.2   Total economic value in the NMNS context

7.2.1. The total economic value

The analysis in Chapter 6 revealed that, in general, households are willing to pay for

the existence of the museum and their visits to it, such as that described in the

contingent valuation scenarios. The best estimate, from the econometric models

explained in Chapter 6, of the population mean of $WTP_{maintenance}$ is US$63 per

household per annum and that of WTP_{visit} is US$18 per household visit. However, the

medium of the values ticked on the payment card from the survey data, US$29 for

maintenance and US$6 for visit, are used as the more conservative figures. The

information provided here can be used to give some insights into the total economic

value of maintaining and accessing the NMNS at its current level.

The US$29 figure provides a conservative estimate on what at least half of the households in Taiwan would be willing to pay for the maintenance of the NMNS at its current level even though they may not use it themselves. This figure comprises the option value, the bequest value, the existence value, and, possibly, some use value. Therefore, multiplying US$ 29 by 6.27 million, the total number of households in Taiwan, becomes US$182 million – the estimated annual total economic value of the maintenance of the NMN at its current level. .

Similarly, the US$6 figure stands for an estimate on what at least half of the households in Taiwan would be willing to pay to visit the NMNS. Since there are approximately, on average from 1995 to 2000, 343,861 household visits to the NMNS per annum, the estimated total access value of the NMNS is US$2.1 million[44] per annum.

Box 7.1 presents some summary statistics of the WTP analysis. The current survey reveals a substantially high value of the maintenance of the NMNS at its current level (US$ 182 million per annum). This amount captures the total value attributed to the maintenance of the museum, which encompasses non-use elements (as is demonstrated in Figure 6.3) as well as option values and possible use values relating to well maintained collections. This is in line with the findings in the attitudinal section that the most important two functions of museums, perceived by the respondents, are the two non-use benefits: acquisition/conservation and cultivating cultural identity (Table 5.13). This further supports the argument that economic valuation takes account not only of self-interested preferences but also of other

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[44] US$ 6 multiplied by 343,861 household visit per annum.

people's benefits (Bateman *et al* 2002: 1.6).

The WTP$_{visit}$ captures the value that respondents attribute to a visit to the NMNS in addition to the value attributed to its maintenance. This 'additional' positive result confirms the finding that nearly 80 per cent of the respondents would be happy to pay admission charges (Table 6.7). It also reflects the findings in Chapter 5.2.3. that people value museums mainly for the temporary exhibitions, and as a social activity with friends and families (Table 5.17).

Box 7.1   Summary statistics of WTP analysis

• WTP$_{maintenance}$/household/annum:	US$ 41	(Sample mean of ticks)
	US$ 29	(Sample median of ticks)
• zero WTP$_{maintenance}$:	5.6 %	(Assuming all zero-responses and non-responses as 'true' zero WTP)
• WTP$_{maintenance}$ as a % of income:	0.11 %	(Median WTP$_{maintenance}$/annual disposable income)
• Estimated maintenance value of NMNS/annum:	US$ 182 million	(Median WTP$_{maintenance}$ * 6.27 million households)
• WTP$_{visit}$/household visit	US$ 11	(Sample mean of ticks)
	US$ 6	(Sample median of the ticks)
• zero WTP$_{visit}$	1.6 %	(Assuming all zero-responses and non-responses as 'true' zero WTP)
• WTP$_{visit}$ in income:	0.02 %	(Median WTP$_{visit}$/average annual disposable income)
• WTP$_{visit}$ in recreation, education and cultural expenditures:	0.27 %	(Median WTP$_{visit}$/average annual recreation, etc. expenditures)
• Estimated total household visit/annum:	343, 861 visits	(1995 – 2000 average)
• Estimated use value of NMNS/annum:	US$ 2.1 million	(Median WTP$_{visit}$ * 343,861 household visits)

7.2.2. A cost-benefit analysis

Having estimated the total economic value of the NMNS, the benefits of maintaining the NMNS can then be compared to its operation costs (Box 7.2). The notion of 'cost-benefit analysis' can be used to illustrate the first use of economics applied to the management of the NMNS.

The NMNS costs resources to maintain and manage. If the gross benefits of

maintaining its current quality exceeds the costs of supplying the outputs, then

maintaining the NMNS has passed a 'cost-benefit test' (Turner *et al* 1994: 93). The

gross benefits should include both the use and maintenance values of the NMNS

regardless of whether they are captured as cash flows or not. In the case of the NMNS,

the museum is charging for admission, which constitutes around 95% of the

museum's earned income. Box 7.2 shows that the current earned income of the

NMNS amounts to 4 million US$ per year. Comparing the earned income with the

operation costs[45] of 16.9 million US$, on the face of it, maintaining the NMNS to its

current quality is not justified on economic grounds (–$16.9million + $4million

= –$12.9million). However, the CV survey reveals a substantial value of maintaining

the NMNS at its current level which amounts to at least 182 million US$ per year.

Then the net economic benefits of maintaining the museum become ' –$16.9 million +

$4 million + $182 million = +$169.1 million'. In cost-benefit terms the existence of

the NMNS is justified[46].

However, the cost-benefit result shows the maintenance of the NMNS is justified but

the financial flows are not sufficient to keep the museum going. What the analysis has

done is to justify a subsidy. The subsidy in this case could be as high as 182 million

US$ per year, but Box 7.2 shows US$12.9 million would make the museum viable (-$

16.9 million + $ 4 million = - $ 12.9 million). Since subsidies come from scarce

government revenues the minimum subsidy (12.9 million US$) should be the one that

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[45] Operation costs include expenses on curatorial functions, library, security, maintenance,
administration, and public programmes.

[46] Even if the maintenance value – $WTP_{maintenance}$– were overestimated, the maintenance value would
only have to be $12.9 million (-$16.9 million + $4 million = -$12.9 million), which is only7 percent of
the estimated maintenance value, to justify the current revenue.

is justified.

Box 7.2   A cost-benefit analysis of the NMNS

Operation costs of NMNS per annum:	- US$16.9 million[47]
Benefits of NMNS per annum:	
Current earned income	+US$4.0 million[48]
Estimated total maintenance benefits	+ US$182.0 million
Net benefits of NMNS per annum:	+ US$169.1 million

The cost-benefit analysis suggests the answer to two questions. The first is whether

the NMNS should be maintained to its current level. In this case, the answer is 'yes',

since the sum of total economic values exceeds its operation costs, even though some

of its economic values do not accrue as cash flows. This approach can be further

applied to answer other types of questions, such as, how much conservation should be

done, how many exhibitions should be there, how many specimens should be

acquired, etc. The answer would be that resources should be spent on any level of

conservation, exhibition, or collections up to the point where the difference between

benefits and costs is greatest. Moreover, this rule can be extended to overall budgets

possessed by a museum, a government, or a local authority. Those budgets should be

allocated in such a way that the net benefits of the resources used are maximised.

Lastly, the current cost-benefit exercise also demonstrates its application to justify the

receipt of a subsidy. A subsidy is justified if the total economic benefits exceed the

operation costs but the financial benefits are less than the costs.

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[47] 1995 – 2000 average.
[48] 1995 – 2000 average.

7.2.3. Public subsidy in the NMNS context

Box 7.1 shows only a small proportion of respondents (5.6%) are unwilling to pay

anything at all to maintain the existence of the NMNS. This suggests not only that the

mean willingness to pay aggregated across the entire population is substantial, but

also that the NMNS is politically supportable, i.e. the number of people benefiting

from the existence of the NMNS exceeds far more than 50%. It also suggests that the

NMNS may not be an elitist good, one that benefits only a minority of the population,

typically, the users of the cultural good and the wealthier and better educated

segments of the population (Pearce *et al* 2001: 12). The policy implication of this

finding needs further examination.

Figure 7.2 presents the predicted population $WTP_{maintenance}$ by significant social

economic variables. It shows that although education and income are significant

factors, their impacts on the difference in the willingness to pay amount are not

substantial. The small number of zero $WTP_{maintenance}$ together with the low income

elasticity of $WTP_{non-use}$ (Box 7.3) suggest that using general taxation to subsidise the

NMNS could be equitable, since the benefits of the existence of the NMNS is fairly

equally enjoyed by people across different social economic groups. However, so far,

the justification of a subsidy from public money has not answered the questions about

the best way to finance the NMNS and the long-debated issue of museum charging

fully.

Figure 7.2   WTP$_{maintenance}$ **by types of social economic variables**
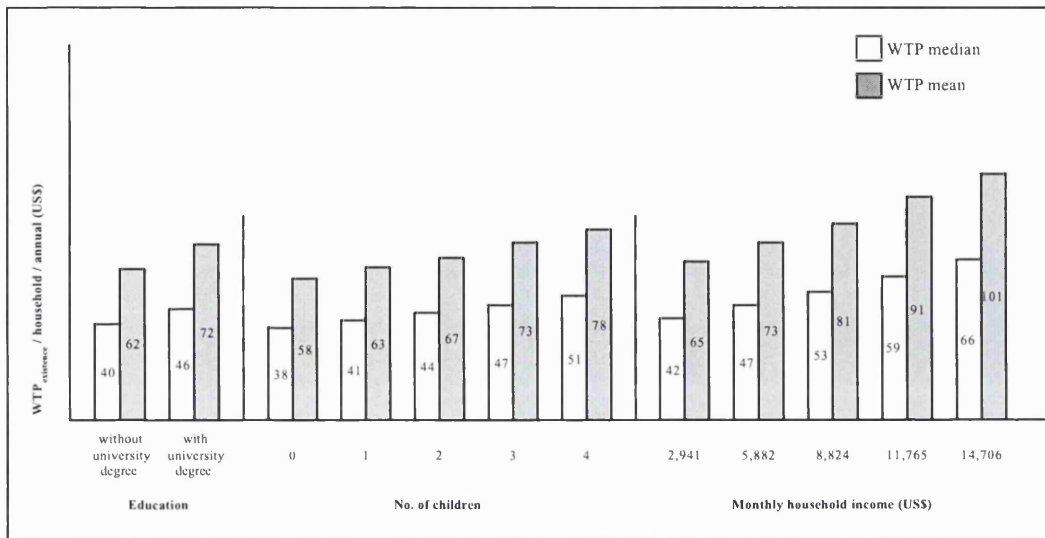
Box 7.3   Income elasticity of WTP$_{maintenance}$

The WTP equations in the current study are semi-log equations:

$$\ln WTP = \beta_1 + \beta_2 Y \dots\dots\dots\dots\dots\dots\dots\dots \quad (1)$$

Differentiating (1):

$$\frac{\partial WTP}{\partial Y} = \beta_2 W \dots\dots\dots\dots\dots\dots\dots\dots \quad (2)$$

To obtain an elasticity multiply $\dfrac{\partial WTP}{\partial Y}$ by Y/WTP:

$$e_Y = \frac{\partial WTP}{\partial Y} \cdot \frac{Y}{WTP} = \beta_2.WTP.\frac{Y}{WTP} = \beta_2.Y \dots\dots \quad (3)$$

where e_Y is the income elasticity of WTP. (Note this is not the same as the income

elasticity of demand. The income elasticity of demand measures the percentage

change in quantity with respect to a percentage change in income. The e_Y here is the

percentage change in WTP with respect to a percentage change in income).

To obtain the income elasticity of WTP$_{maintenance}$, take the coefficients of income from

Model 2 in Table 6.11 and multiply by the population mean level of income Y:

$$WTP_{maintenance} = 1.09e\text{-}06 * 72,760 = 0.079 \dots\dots\dots \quad (4)$$

Equation (4) suggests a very low income elasticity of WTP, i.e. if people had 10% rise

in incomes the increase in WTP would be about 0.8%.

Public subsidy and admission charges are two interrelated issues relevant for resource

allocation. The main grounds on which a general case for the public subsidy of

museums may be argued are market failures in the form of public goods (Johnson and

Thomas 1991a; Martin 1994) and the substantial maintenance values of museums,

such as that demonstrated by the current survey. However, it is argued by Johnson and

Thomas (1991a: 30) that 'even though such "market failure" may occur this fact in

itself is not enough to justify public funding, since the latter may induce "government

failure" which more than offset the gains from eliminating market failure'. Although

'market failure' provides good reasons for government subsidies, governments are

not necessarily better at managing museum resources than the free market. The

following are the reasons for this.

First, 'government failure' may be taken to include failure not only in sponsoring

ministries and agencies but also in museum management. A possible source of

government failure may be the development of managerial slack arising from the

availability of public funds. This requirement to follow the bureaucratic procedures

often associated with public funding may sometimes stifle innovative behaviour

(Johnson and Thomas 1991a: 30). This can be observed in the case of the NMNS in

that its underlying policy towards museum income generation is income-stabilising,

sometimes even income-minimising, rather than income-maximising (see, Chapter

3).

Second, it is often taken for granted that the duty and purpose of government is to act

in the public interest as a community rather than as individuals. This is the reason for

laws, police forces, public health regulations and so on; but the image of 'benign'

governments could be false, or biased. At one extreme, governments may be despotic

and interested only in favouring the interests of some part of the community rather

than the community as a whole. Even in democratic countries, governments may act

to please a particular pressure group rather than the society as a whole. This means

that governments may possibly not act to protect the cultural heritage if the claims of other interest groups take political precedence (Turner *et al* 1994: 80).

Third, governments may not be very good at getting the right information which enables them to come to an appropriate decision on public subsidies. Even if a government is well intentioned, what actually happens may not be what it intended to due to sometimes over-simplified information (Turner *et al* 1994: 80). This is important in the museum context in Taiwan, especially when the politicians tend to see the more obvious and easily obtainable indicators, such as visitor number, rather than other more critical issues, such as the quality of exhibitions, or quality of visitor experience. This can be observed in the case of the NMNS in that its funds from the government are partly determined by its visit figures.

In addition to the 'government failure' argument, the 'mixed' nature of museums also challenges the justification for using public subsidy as the only source of financing. Museums in general are often considered as a public good because their provision can be jointly enjoyed by everyone and no individual can be excluded from its benefits (Mitchell and Carson 1989: 55). However, to be more precise, museums are in fact a 'mixed' good. They have public good characteristics in that benefits of their existence (maintenance value) can be enjoyed by everyone without any one person reducing the benefits of any other. But the direct use of museums, such as attending exhibitions, is closer to the concept of a 'club good', one that is intermediate between pure public and private goods. They are similar to private goods except that they are not freely traded in an organised market. They tend to suffer from one or two aspects of impurity: the presence of congestion or rivalry in the use of the good, or the practicality and

possible desirability of exclusion from the good. The goods have individual property

rights, but they are subject to market imperfections and cannot efficiently be traded in

markets without government intervention (Mitchell and Carson 1989:55). It is this

'mixed' nature of museums that makes governmental subsidy through general tax

only one of several possibilities, and the same argument applies to the case of the

NMNS.

To sum up, in the case of the NMNS, public subsidy through general taxation is

justified based on the results of the current CV survey. However, relying on public

subsidy as the only financing source, the current financing mechanism of the NMNS,

does not seem to be an optimal way of financing on the grounds of the 'government

failure' phenomena observed in the management investigation.

7.2.4. Admission charges in the NMNS context

Shifting the emphasis onto the direct users' willingness to pay at the door is only part

of the answer to 'government failure', since focusing only on admission charge

ignores other large contributions to value – the 'non-use' value of museums. In terms

of economic theory, admission charges and public subsidies can be complementary

rather than mutually exclusive. The latter can be paid in respect of any social benefits

which extend beyond the chargeable benefits gained by the individual service user

(Bailey et al 1998:7). The currently extensive debate on charging admission to

museums is reviewed in the following section to set a wider context for discussing the

effects of public subsidy and admission charges on resource allocation.

The debate about whether or not to levy charges for admission to public museums is

long standing in the UK (see, for example, Peacock and Godfrey 1997; House of

Commons 1989; Bailey *et al* 1997, 1998; Bailey and Falconer 1998), Ireland

(O'Hagan 195), and North America (Dickenson 1994). The arguments can be

classified as about the principles and economics of admission charges.

The arguments against charging as a matter of principle are based on arguments

relating to freedom of access and social equity (see, for example, House of Commons

1989: 7; Bailey *et al* 1997: 360, 1998), and the traditional ideology of the museum

itself (see, for example, Dickenson 1994: 104).

It is conventionally argued that an admission charge is a serious impediment in

fulfilling the aims of museums to reach as many and socially wider people as possible

and to touch as many people in as profound a way as possible. This argument rests

largely on the key assertion that admission charges result in a significant fall in visitor

numbers and repeat visits and deter less well-off people from visiting museums;

therefore, charging is contrary to principles of freedom of access and social equity, the

core values of museums. However, some empirical studies, including the current

study, suggest charging is not necessarily a barrier to museum visiting. According to a

recent MGC (Museums and Galleries Commission) survey covering all types of

museums and galleries throughout the UK (Bailey *et al* 1998), there is little evidence

relating to whether, and to what extent, the introduction of charges affects the total

number of visitors, their social composition or their propensity to return. Museums

that have recently introduced general admission charges reported both reductions and

increases in visitor numbers and only marginal alterations in the social profile of

visitors (Bailey *et al* 1998:26). The current study also shows that nearly everyone

(98.4% of the respondents) was willing to pay something to visit the NMNS. It is,

therefore, not convincing to suggest that free access is necessarily synonymous with

either equality of opportunity or with equality of outcome in terms of use of museum

services by all social, demographic and ethnic groups. In addition, any foreseen

adverse impacts on user class representation caused by the introduction of charges can

always be minimised by concessions.

The traditional ideological arguments against charging have their origins as an

invention of the Enlightenment even though collections of objects and works of art

have existed since ancient times (Lewis 1994: 9; Woodhead and Stansfield 1994: 6).

From its initial establishment, the notion of the public museum grew and flourished,

finding its greatest development in the Victorian period. Museums became an

essential component of mechanics institutes and athenaeums, of normal schools and

universities. It was seen as an instrument of enlightenment, of education, and of social

salvation. Almost every small town in Britain and in North America sought to have a

public park, a public library, which a number of social reformers insisted were as

valuable to the community as sewers and drains (Dickenson 1994). Museums were

thus from their origin seen as a public good, one whose use was the prerogative of all

citizens. The appearance of admission charges at the national museums and galleries

of Britain and Canada is therefore argued to have gone against a long tradition of

public policy and public expectations. However, even though the tradition of free

public access was long-standing, it did not necessarily preclude the levying of charges

on the visitors. Museums worldwide, in general, like other public organisations during

the 1980s and 1990s, have felt a wind of change in the roles that they are expected to

play, and in what is expected of the people working in them. There is also an

enormous increase in the size of the collections as well as visitors. The organisational

arrangements and economic considerations that were adequate in the past are not

appropriate to the current circumstances. Although it is generally agreed amongst

museums in the West that, as a matter of principle, admission charges should not be

levied, economic necessity may require them (Bailey *et al* 1998). This is best

illustrated by Sir Neil Cossons, Director of the Science Museum:

> ' *we are faced with a dilemma. If the museum is to remain free it must be substantially paid for by the taxpayers. In recent years, the taxpayers have never paid properly to fund the Science Museum. As a result, it has gradually deteriorated. We have, therefore, to contemplate a new approach to the funding of our activities if we are to stay in business and present to the public something from which they can benefit... The public can have a decaying museum for nothing or with additional income they can have a museum which can serve them properly... My responsibility, it seems to me, is twofold – to the collections and their conservation and preservation, and to the public and their access to them... It is irresponsible to have a museum which is providing its service at no cost to the customer at the point of consumption but which is deteriorating rapidly in quality* (House of Commons 1989: 27-29).

Also, free public access means that the costs of providing and managing public

museums must be subsidised from taxpayers' taxes. Those taxes have many other

public uses, e.g. to provide social welfares, medical care etc. In other words, any

public subsidy has an opportunity cost, a forgone benefit equals to the social value of

the subsidy funds in some alternative use. Free access entails subsidies means

diverting government revenues to the supply of museums. The justification of this

diversion, therefore, must take the form of demonstrating that the money given in

subsidizing museums could not have been used to better purpose. Whether a subsidy

is justified thus has an empirical case to answer, and cannot be justified as 'of right'

(Pearce *et al* 2001: 7).

Some people argue against admission charges from an economic perspective. One

such argument is based on the assertion that admission charges result in a decrease in

visitor numbers and repeat visits so that the economic benefits from admission

charges is not much more, or even less, than the economic costs from administration

and the reduced shop sales as well as catering revenues (House of Commons 1989:

43-49; Dickenson 1994; Bailey *et al* 1997, 1998). The issue of marginal costs has also

been addressed by some authors to support free admission to museums. It suggests

that a museum may as well be free since the fixed costs are so high and the variable

costs so low that the costs for each additional visitor are minimal (Dickenson 1994:

108). The revenue derived from visitor admissions is highly variable amongst

different museums, depending on number of visitors, price of admission,

attractiveness of the 'product', and co mpetition in the market. Although the above

argument takes into account the costs of admission charge, more empirical researches

are needed before reaching any sensible conclusion.

There is one more economic argument which is based on the public good nature of

museums. Public museums are considered a 'merit good', like education, which is not

always appreciated and often underprovided by market, but which society as a whole

feels it is important to support (Dickenson 1994: 108). This suggests that they should

be paid for out of general taxation and not by admission charges. However, the

benefits of visiting museums are not necessarily evenly distributed and in principle

people should pay different amounts according to their uses of museums. It could

therefo re be argued that those who attend public museums are those who derive most

benefits from museums and that on grounds of equity, given that a benefit-related tax

cannot be implemented, their contribution through general taxation should be 'topped

up' throu gh the imposition of admission charges. The above argument is reinforced by

the fact that the benefits of attending museums are extra to the benefits that might

arise from it being existent and thereby the argument that people should pay more for

theses extra benefits. This is especially true when providing access to the public

involves significant extra costs and when the level of museum attendance to be either

very low or very uneven across different socio-economic group. The 'use fee' actually

involves the recovery of a fair share of the cost of providing goods and services from

those who receive a direct benefit from them. They are not necessarily seen as another

form of taxation; they may increase the equity of the revenue system by shifting some

of the burden away from general taxation borne by the taxpayers to those individuals

who derived a clear benefit from specific government activities (O'Hagan 1995).

The above review about the charging debate suggests that the key to understanding

charging policy lies in an analysis of charging 'practices' rather than 'principle', since

an analysis of charging policy must be based on the appreciation of the particular

museum for which the charge is imposed and of the specific financial constraints

operating in that policy domain.

In the UK, since the Labour government in the late 1990s, there has been a heated

debate on museum charging 'practices' (see, for example, Museums Journal 1997: 24;

Museums Journal 1998: 20; Nightingale 1999: 11; Morris 2000: 9; Butler 2000: 4;

Hull 2001: 11), since 'free access' lies in the heart of Labour's cultural policy (Davies

1997: 36). Charges to all UK national museums have finally been abolished in 2001

(Kennedy 2001). The breakthrough on free admission was the announcement that free

museums will be able to reclaim VAT. The fact that previously only charging

museums could do this has cost the free institutions a fortune (Kennedy 2001; Hull

2001).

At first glance, free admission to national museums seems to fulfill the government

policies on wider access and social inclusion, especially when the figures showed

visits doubled during the first month of free admission (Gibbons 2002). However,

some sections of the museum world expressed caution. It was discovered in Wales

that at the same time when the national museums received successful turnouts, smaller,

independent museums nearby were experiencing numbers lower than normal. Some

museums officials believed the foot-and-mouth epidemic accounts for this, but others

were blaming the free-admission policy (Hull 2001: 7). There were also reservations

from some museum directors. Lindsay Sharp, director of the Science Museum said:

'at the moment, the visitors who pay to get into the museum are largely middle -class

or foreign tourists. There should be funds to target those who are at the lower end of

the social scale.' (Heywood 2001: 6). The most unfortunate possible outcome of the

free-admission policy is probably the British Museum's first ever strike in its

250-year history due to its financial plight. Whether this came from the museum's

poor management, or the free-admission policy which led to extra government

funding going to compensate only the museums which scrapped admission charges,

or both, begs further investigation. What is certain is that free-admission requires

more funding from the government, which is not very promising, especially when

many museums are currently under- funded. No wonder Roy Clare, the director of the

National Maritime Museum, was concerned that 'free entry could mean our (the

museums') long -term security is in jeopardy' (Heywood 2001: 6).

The UK experience has demonstrated that free admission is certainly not only an

ideological/ethical issue, but also a very delicate practical financial issue. It has to be

treated with great caution and taking into account everything within a museum's

internal management to its wider 'market'.

In the following section, the information provided by the WTP_{visit} modelling results and management investigation of the current study can be used to give some insight into the charging debate.

The current CV survey discovers that nearly 99% of the respondents were willing to pay non-zero sums to visit the NMNS in addition to their willingness to pay for the existence of the NMNS. The econometric model of WTP_{visit} also shows that museum visiting frequency was not a significant factor influencing WTP amounts. In addition, there were 77.5% respondents who would choose to pay for the NMNS through admission charge in some way[49] if they were given the chance to decide the method of payment (Table 6.9). The finding suggests that modest levels of charge are not a deterrent for both visitors and non-visitors. This is also supported by other research evidence in respect of UK museums (Davies 1994), elsewhere in Europe, and in North America (Bailey et al 1998). The high percentage of positive $WTP_{maintenance}$ (94.4%) and WTP_{visit} (98.4%) demonstrates that people acknowledged that benefits of attending museums are extra to the benefit that may arise from having them existent and thereby were willing to pay more for these extra benefits.

Due to the constraints of the questionnaire survey, the WTP_{visit} scenario was not constructed in a manner that can reveal the price elasticity of WTP_{visit}[50]. Therefore,

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[49] 39% would like to pay through income tax every year for the general maintenance of the museum, and through admission charges for visiting the museum. And 38.5% would like to pay for the museum through admission charges only when they make a visit.

[50] A scenario which can reveal the price elasticity would require more questions on the relationship between WTP amount and visiting frequency (to NMNS). This would have made the questionnaire

there is no hard evidence from the current study about the impacts of charging on visiting frequency to the NMNS. However, it is likely that the demand of visiting the NMNS is price inelastic because of the national significance of the NMNS and its lack of close substitutes. Also, the mean WTP_{visit} (US$18 per household visit) implies that the WTP_{visit} amount is a relatively small proportion of the total cost of the visiting, including transportation costs, time costs, and expenses in the shops and restaurants, etc., especially for people who live outside Taichung City (where the NMNS is located). This suggests that increased charges can be expected to have little impact on the frequency of use.

Contrary to the prevailing view in many quarters that museums should not charge for admission as a matter of principle (see, for example, House of Commons 1989: 27-29; Bailey and Falconer 1998: 169), there is a general agreement amongst curators of the NMNS, the 'model museum' in Taiwan, that museums may charge f or admission based on the 'user -pay' principle. Some curators even argued for using admission charges as a means to reduce congestion in the museum. The reasons for these views probably lie in the differences in museum development in Taiwan and in the West. Providing free access to museums has been a long tradition of public policy and public expectations in the West. While the 'modern' museums, represented by the NMNS, in Taiwan were created by the government within a relatively short period more to demonstrate the achievements in economic and cultural development than to provide an instrument, free to the society, of enlightenment, of education, and of social salvation. There was, therefore, little 'traditional ideology' to follow.

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even more complicated and lengthy.

The current study has demonstrated that charging, in the case of the NMNS:

- is not a deterrent to visit this museum;

- is expected to have little impacts on visiting frequencies and visitor profiles;

- is appreciated by the public as an additional payment for the extra benefits received from attending the museum;

- is not against any traditional ideology amongst the museum community in Taiwan.

Therefore, charging for visiting the NMNS is justified.

Due to the same reason explained earlier for not being able to reveal the price elasticity of WTP_{visit}, the data collected from the current CV survey are not sufficient for calculating the optimal pricing of admission charge for revenue maximisation. However, it can still provide some insights into the current charging practice in the NMNS.

The NMNS is now charging US$ 3.2 for a full-rate visit and US$ 2.4 for concession. There are averagely 2.59 adults and 1.18 children in a household[51]. Therefore, the museum is charging averagely US$ 11.1 per household visit. The current survey discovers that nearly 99% of people would be willing to pay something through admission charges to visit the NMNS. The mean WTP_{visit} estimated from the econometric model is US$ 18 per household visit, i.e., the 'average' household would be willing to pay US$ 18 to visit the NMNS. While the median WTP_{visit} is US$ 14, meaning half the population would be willing to pay US$ 14 to visit the NMNS. The

[51] Data source: Report on the Survey of Family Income and Expenditure in Taiwan Area of Republic of China, 1999.

current charging is significantly smaller than both the mean and median WTP$_{visit}$

estimated from the econometric model. Figure 7.3 presents the predicted population

WTP$_{visit}$ from econometric modelling by significant social economic variables and the

income elasticity of WTP$_{visit}$ is 0.092[52]. It seems that the current admission charges to

the NMNS may be under-priced and are affordable across almost all social economic

groups.

Figure 7.3   **Econometric model result of WTP$_{visit}$ by types of social economic variables**
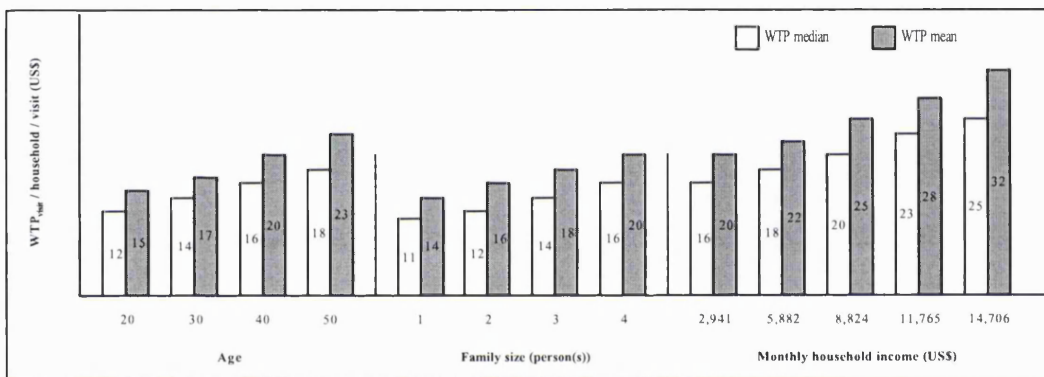
7.3   Optimal financing for the NMNS

Having demonstrated that economic value of maintaining the NMNS is measurable

and substantial; the final question is how they can best be captured so that the NMNS

can be optimally financed. A full answer to this question is not possible on the basis of

the available information. However, some suggestions are made about how to

formulate the context for such an analysis. Capture involves turning willingness to

pay into actual cash flows and, of great importance, ensuring that at least a significant

proportion of those cash flows reach the NMNS so as to keep it running at an optimal

level. Innovative finance, according to Pearce and Mourato (1998: 5), means

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[52] WTP$_{visit}$ = 1.27e-06 * 72,760 (for detail explanation of the equation, see Box 7.3)

minimising the financial dependence of the museum on government. This is

important for several reasons:

- such approaches can reduce the reliance on public expenditure which can then be

  redirected to other basic social needs;

- self-financing could reduce the risks of cyclical financing as public expenditure is

  controlled for macroeconomic reasons;

- self-financing helps to make the decision-making and policy of the museum free

  from the whims of politicians;

- self-financing should focus management on issues of efficiency, together with

  innovative ways of expanding resources. Reliance on subsidies can encourage

  inefficiency and diverts valuable resources towards lobbying governments for

  more resources.

It is worth emphasising that although innovative financing makes more use of the

market mechanism than conventional public finance approaches to cultural heritage,

it does not imply complete surrender to the free market mechanism (Pearce and

Mourato 1998: 5). The aim is to find out the optimal mixture of financing for the

benefit of the entire society, i.e. there may continue to be a public subsidy.

As was explained in Chapter 3, due to the current legislation on public service sectors

in Taiwan, the NMNS cannot keep any of its earned income as additional revenue

including its admission charge and its rents from its shops and restaurants. Also, the

amount of its earned income has no relation to the amount of subsidy from the

government each year. In other words, the current financing mechanism leaves the

museum with no incentive to increase its earned revenues. Therefore, the starting

point should be one which gives the museum more autonomy in the management of

its earned revenues.

The Taiwanese policy on museum financing, with the government providing all

expenses and taking all earned income, is similar to the old museum system in Europe.

However, due to the worldwide reduction in government support, museums have a

new agenda to rethink their policies and funding sources. This leads to the ICOM's

continuing campaign on 'museum autonomy' (Scharer 2002: 3). Nowadays, if

museums are to remain true to their mission of preservation of cultural heritage and

dissemination of its meanings, they have to be autonomous without abrogating

governments' responsibility for long-term preservation. Efforts have been made in

many parts of the world, such as Italy (Pinna 2002: 4), Japan (Igarashi 2002: 4),

Russia (Tolstoy 2002: 5), and the Netherlands (Christine van der Sman 2002: 8), to

reconcile the need of a certain amount of government protection with the need to

allow museums more room for manoeuvre.

7.3.1. Capturing the use values

Given that capturing the use values is potentially easier and relatively more

straightforward (e.g. through charging for service), the design of an appropriate fee

mechanisms should be the beginning of any financing scheme. Before going into any

detail of the capture mechanism, it is worth recalling that access is arguably the

cornerstone of most museums. The NMNS, as do most museums, aims to reach as

large and socially broad an audience as possible and to touch as many people in as

profound a way as possible. Therefore, a successful pricing policy has to increase the

gross revenue of the museum and, at the same time, alleviate its possible adverse

effects on access. To some extent this can be achieved by price discrimination whereby lower prices are charged for such groups as children, the elderly, students, the unemployed, and the disabled.

What has been learned from the current study concerning admission charge includes:

- nearly everyone is willing to pay something to visit the NMNS;

- the current admission charge is not a deterrent to visit the NMNS, and is very likely to have limited impacts on the visiting frequencies and visitor profiles;

- the NMNS is now charging significantly less than the amount that people are willing to pay;

- the demand for visiting the NMNS is very likely to be price inelastic;

- the NMNS currently has certainly neither the intention nor the incentive to maximise its earned income through admission charges. Its current policy towards admission charge is income stabilising rather than income maximising;

- the NMNS is offering reduced admission charges for children, the elderly, family card holders, students, the unemployed, and the disabled.

What is needed for a full price policy formulation but is not covered by the current study includes:

- the proportion of repeat visits within total visits;

- the consequent changes in other sources of income if the price of admission charge was increased to maximise the museum's gross revenue;

- the consequent changes in other sources of income with the different possible charging scenarios, such as more/less free entry hours/days, free entry categories, to maximise the museum's gross revenue.

We have argued that the NMNS has not explored its considerable potential for generating revenue through admission charges fully. If equity and social efficiency are to be improved, as well as revenue raised, much more attention has to be paid to:

- the capture of the use value of the NMNS through admission charge to a more sensible extent;

- the use of time-variable admission charges taking into account of peak and off-peak periods by time of day, week and year;

- the removal of disincentives to charging, i.e. 'zero additionality ' of revenues from charges;

- the use of the additional revenues raised by charges to improve the visitor related service, from the exhibitions to toilet facilities.

With special care to alleviate the possible adverse effects on access from charging (or increased charging), it is arguable that (increased) admission charges can help the NMNS fulfil its mission better. First, increased revenues from charges may finance increased access, such as 'outreach' programs, which the curators in the NMNS have planned to do in the past but without sufficient budget to do so. Second, use of revenues from charges to make the exhibitions more up-to-date[53] and the visitor experience more attractive may stimulate demand, i.e. visits, so much that it should more than offset any fall in demand as a result of the (increased) charge. This seems likely, from experiences reported elsewhere (Bailey *et al* 1998), because demand appears to be unresponsive to modest increases in admission charges once levied (for detailed explanation, see Box 7.4). Third, charges can be used as an effective way of

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[53] The 17-year-old 'Life Science Galley' of the museum is the one needs the money most, and the museum has no money and plan 'up -date' it.

keeping demand within the carrying capacity of the museum, which, in turn, can help

improving visiting experiences in the museum. Lastly, charging has also a managerial

benefit in the area of attuning the museum collections and activities more towards the

public's requirements while maintaining standards of scholarship and researc h, which

makes curators more accountable and responsive to the wishes of the public.

Box 7.4   The effect of increased admission charge
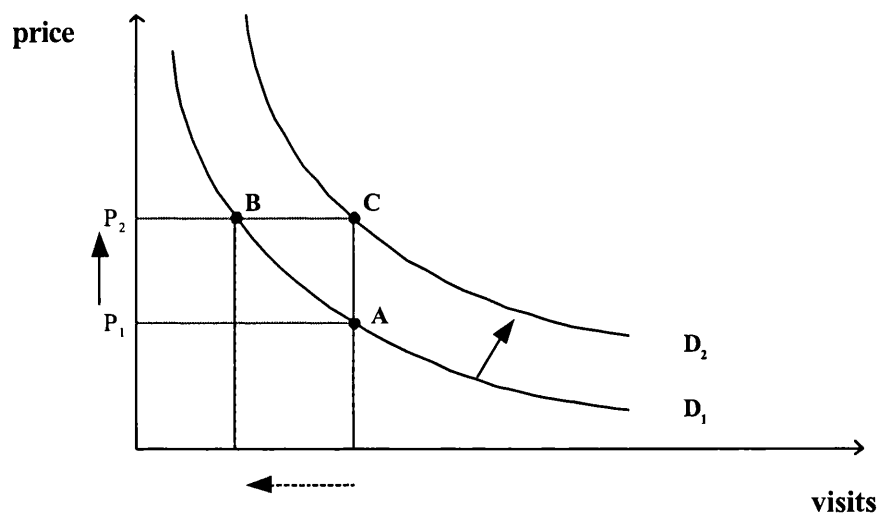
Expressed in economic terms, an increase admission charge (P1 to P2) may not
only cause a movement from right (A) to left (B) along the demand curve (D1)
but also lead to a shift to the right of the demand curve (D2) if revenues are used
to finance better quality of exhibitions or facilities, etc. to increase demand. The
effect of the shift may outweigh the effect of the movement along the demand
curve such that the net impact is increased demand. If this is the case, then even
if the admission price is increased from P1 to P2, the demand (visits) may not
decrease (A to C).

The current CV survey focuses the issue of the use values of the NMNS on admission

charge, because it is currently the largest income source of the NMNS (95.2% of total

earned income in 1999/2000 fiscal year). There are other services offered by the

NMNS which involve the direct use of the museum but are not investigated in the current CV survey.

The rents from the shops and restaurants are the second biggest income sources (3.6% of total earned income in 1999/2000 fiscal year). The museum currently receives only fixed rents from the caterers and retailers each year. There are two feasible options for managing the catering and shopping facilities and to bring the facilities more in line with the financing of the museum: pay a contractor a management fee, while taking a reduced share of the profits; or franchise the facilities, as it is now, but receiving a certain 'percentage' of t he turnover, rather than just the fixed rents.

The NMNS and its collections can also, potentially, be used, by the visitors and the public through various other means. The wide array of other mechanisms available to the NMNS to capture its use value which are not yet captured, such as internet access to the museums and collections, educational events and outreach programs, etc., is worth exploring too.

7.3.2. Capturing the non-use value

It has already been demonstrated in the $WTP_{maintenance}$ analysis that the NMNS has a substantially high non-use value. Although capturing the non-use value is less straightforward, there are many payment mechanisms available.

The most widely employed capture mechanism, also the one being used in the NMNS, is government subsidy through general tax. The economic rationale for its use and the

justification of the its size[54] from the current CV survey results have been discussed earlier in this chapter and are not reiterated here. The essential point is that the non-use values do justify a public subsidy.

Volunteering of time is another widely used resource. This is seen as a source of financing as without it paid employees would be required, thus adding to costs. It is part of the general phenomenon of 'belonging' and involveme nt with others that makes up social capital (Pearce and Mourato 1998: 65). Also, the volunteer involvement broadens the base of public interest and support for the museums. The NMNS established a program, in 1986, for volunteer support in six major areas of museum work: visitor services, instruction and education, answering of inquiries, administrative support, specimen collection, and research support. In 2000, the number of volunteers totals 706 and the total volunteering time amounts to 72,473 hours, which roughly equals to US$ 0.2 million[55]. The relationship between the museum and its volunteers has been a successful one in which the museum benefits from the presence of the volunteer who, in turn, gains satisfaction, recognition, knowledge and expertise. It has been a situation of mutual advantage, in which both parties gain from the museum.

Other potential sources of finance which are not captured by the museum include providing graduate courses, tax provision, bequest, donation and sponsorship.

Tax provision, bequest, donation and sponsorship are often interrelated mechanisms.

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[54] Any amount between US$ 12.9 million to US$ 401.2 million can be justified depending on the policy objectives, see Box 7.2.
[55] The wages for a part-time research assistant are US$ 3 per hour at current price. Therefore,

Charitable donations are subject to tax allowances in many countries and have proved

to be an effective means for cultural heritage conservation in, for example, the US.

The effect is to reduce tax on companies or individuals if donations are made to

charities (Pearce and Mourato 1998: 69). Tax provisions can also be used to increase

the 'supply of collections' by allowing donations of collections to the museum instead

of taxes. This is mechanism is used in the UK for the conservation of cultural heritage.

Effectively, privately owned heritage is converted to publicly owned heritage. While

the overall 'supply' of assets is not increased, its public accessibility is (Pearce and

Mourato 1998: 70). The same mechanism can be applied to museums, too. In Taiwan,

there is currently no legal base for this mechanism yet, though it is proposed in

Museum Bill of 1995 (drafted by Executive Yuan) which is still in the legislative

process.

7.3.3. Conclusion

Finally, the 'innovative financing mechanism' based mainly on economic grounds is

compared and contrasted with the managerial/curatorial perspectives in the current

management context of the NMNS.

As mentioned in Chapter 3, the NMNS is currently financed following the 'agency

budgets' mechanism (Figure 7.4[56]), while it could be financed alternatively following

the 'National University/College Operation Fund' scheme (Figure 7.5) if it chose to.

The most crucial difference between the two is that the museum would have to be

responsible for balancing its incomes and expenditures should it be financed

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72,473 (hours) * 3 (US$) = 217,419 (US$).

[56] Figure 7.4 and Figure 7.5 first appear in Chapter 3. They are reproduced here for illustration.

following the latter, while the museum has little control, and little worry, over its

budget under the current financing mechanism.

Figure 7.4   **Financial flows of 'agency budgets'**
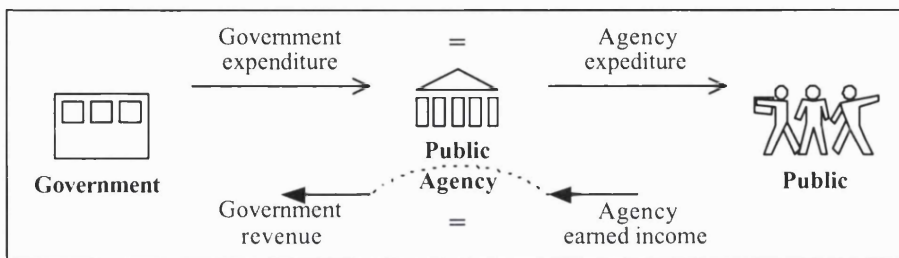
Figure 7.5   **Financial flows of 'National University/College Operation Fund' scheme**
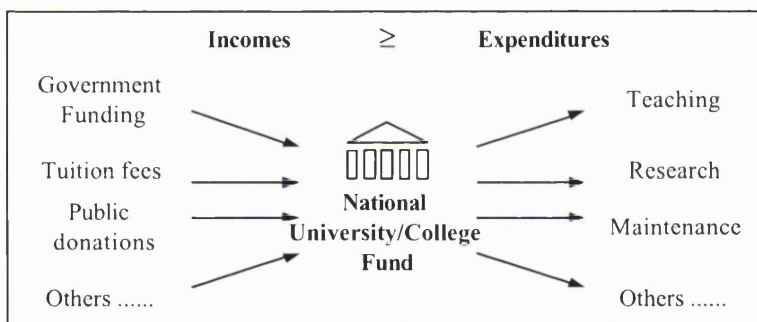
In practice, the current financing mechanism – the 'agency budgets' mechanism –

suffers from several problems. First, it is not reliable for the long run due to the total

and single reliance on governmental funding which arrives without an overall policy

at the government level concerning the public spending on the museums sector or any

single museum. Second, it induces inefficient use of public resources since the current

justification of the size of the subsidy involves too many bureaucratic procedures and

bears little economic grounds. Third, it does not reflect the 'mixed' nature of

museums.

However, the current financing mechanism has kept the museum viable since the museum was established. During the management interviews, nearly half (6 out of 13) of the curators/managers interviewed still preferred the current financing, even they knew about the problems, on the grounds that it prevents the museum from the need of pursuing economic profits. They suspected that by pursuing economic profits, the museum might compromise its mission and integrity.

The idea of the 'innovative financing mechanism' is similar to that of the 'National University/College Operation Fund' scheme, which was preferred by the other half of the curators/managers interviewed. They believed a more flexible and independent financing system would help the museum to fulfil its function more comprehensively. The discussions in section 7.3.1 and 7.3.2 have demonstrated that this is possible and that pursuing economic profits dose not necessarily have to compromise its mission and integrity. The latter is also supported by the CV survey results that museum outputs are generally in line with the public expectations from public museums in Taiwan.

Therefore, the alternative financing – the 'National University/College Operation Fund' scheme – seems to be superior for the following reasons:

1. it reduces the reliance on public expenditure which can then be redirected to other basic social needs;

2. it avoids the risks of cyclical financing as public expenditure is controlled from macroeconomic reasons;

3. it helps to make the decision-making and policy of the museum free from the whims of politicians;

4.   it offers the museum more flexibility and possibility to fulfil its mission and

     integrity.

On the other hand, the current financing mechanism has always kept the museum

viable without needing to worry about balancing its incomes and expenditures. There

is always a risk that the museum might have to start struggling with its survival

financially should it move from the currently dependent and, so far, secure financing

towards an independent, but could be challenging financing. However, given the

encouraging results from the current CV survey which reveals significantly high

economic value of the NMNS, it should be a risk worth taking.

Chapter 8 Conclusion

This final chapter first summarises the research findings in section 8.1. Section 8.2 then

addresses the implication of this research on the wider museum community, focusing

on the contributions of the economic valuation approaches and the pitfalls to be aware

of when carry out an economic valuation. Finally, section 8.3 suggests further research

that might follow from this research.

8.1 Summary of research results

This research provides four types of previously unavailable information: (1)

management of the museums sector and the NMNS; (2) visitors' attitudes towards the

museums sector and the NMNS; (3) evidence that significant economic values are

associated with the maintenance of the NMNS; (4) policy implications of the revealed

economic values.

8.1.1. Summary of findings regarding management

The government in Taiwan is currently spending a significant proportion of central

government budget on the museums sector, but it is more interested in increasing the

number of museums than improving the quality of existing museums. The government

does not have an explicit policy nor strategy regarding the museums sector, and the

economic benefits of the sector are hardly recognised. Public museums in Taiwan are

never expected to maximise their earned income, and are under little scrutiny in their

efficiency in terms of using public financial resources.

The NMNS, as is the case with all other national museums, is entirely financed through

central government funding. Being one of the most important museums in Taiwan, the

NMNS has always been one of the better resourced museums since its establishment.
The government funding has been stable so far. However, due to the lack of clear
government policies on the financing of the museums sector and a growing competition
for the limited government resources both within the museums sector as well as with
other public sectors, there is no guarantee whether and for how long the NMNS will
still be financed sufficiently. In short, the future financing of the NMNS is uncertain
and is facing growing challenges.

Due to the current financing mechanism and the constraints from legislation of public
agents, neither the museum entry fees nor the profits from museum shops and
restaurants are retained by the museum. The lack of incentives for income generation
has resulted in an inefficient use of governmental resources and the lack of preparation
to respond to financial challenges should anything happened.

The museum has been relatively sufficiently financed for its maintenance at its present
level. However, more resources are needed, which is not likely to happen within its
current financing mechanism, to generate more outputs for society and to fulfil its
responsibilities more comprehensively.

Nearly half of the key museum managers and curators interviewed are in favour of the
current financing mechanism, which is thought to be secure and able to prevent the
museum from compromising its fundamental duties due to pursuing economic profits.
While the others are in favour of a more flexible and independent financing system.

Being one of the most popular museums in Taiwan, the NMNS is a museum with great
potential for making profits if it wished to. Its unexplored, or under-developed income

sources include changing the management of the shops and restaurants, providing

on-line digital access and graduate courses, extending more flexible opening hours, and

raising the admission charges and keeping the proceeds.

8.1.2. Summary of findings regarding public attitudes

Although museums and museum visiting are a fairly recent phenomenon in Taiwan,

people in Taiwan care about museums. This is demonstrated from the results of the

current CV survey that: (1) museums are considered fairly important amongst other

cultural/leisure facilities; (2) the basic functions of museums are generally and highly

appreciated by the public; (3) museum visiting is a considerably popular activity in

Taiwan.

Some museum visiting patterns in Taiwan are obtained from the CV survey but a

satisfactory interpretation of the observed patterns needs more research beyond the

scope of the current study: (1) museum visitors tend to be those who are better educated,

wealthier, and give museums higher priority amongst other cultural/leisure facilities,

although their correlations are small but statistically significant; (2) age, family types,

and reasons for museum visiting seem to be better indicators of museum visiting

frequencies; (3) the middle-age people, consisting mainly of families with children age

under 18, are most likely to become 'loyal' museum goers; (4) The small although

statistically significant correlation between priorities given to museums and museum

visiting frequencies implies that the visits/visitors figure, the widely used indicator,

may not be a satisfactory indicator for the importance of museums.

Some information on the visitors to the NMNS, which confirm its national significance,

are also obtained: (1) the NMNS is one of the most popular museums in Taiwan; (2)

compared with visitors to other national museums, visitors to the NMNS are dispersed throughout Taiwan and relatively evenly distributed across different social economic backgrounds.

8.1.3. Summary of findings regarding valuation

The total economic value of maintaining the NMNS at its present standard ($WTP_{maintenance}$), elicited through the respondents' WTP each year, through income tax, are substantial and nearly everyone in the survey is willing to pay for it. The best estimate of the average household $WTP_{maintenance}$ is US$ 63 per annum – 0.24% of average annual disposable income or 2.52% of average annual recreation, education, and cultural expenditures. A conservative aggregation, using the median of the least amount the respondents were sure they would pay from the survey sample, amounts US$182 per annum.

The reasons why people are willing to pay for its maintenance include, at least, that people want to secure their future options to use the museum, that people want to maintain the museum for the benefits of future generations, and/or that people think the existence of the NMNS is very important regardless of whether they use it or not. The econometric model shows that the better educated, the wealthier, and families with more children are willing to pay more for the maintenance of the NMNS. The former two variables are common results in cultural studies, while the latter variable could reasonably be attributed to people's greater attention towards the future generation(s).

The use value is elicited through the respondents' WTP each time they visit the museum, through admission charges, on top of the tax they pay for the museum's existence and maintenance each year (WTP_{visit}). Nearly everyone in the survey is

willing to pay for the visit. The best estimate of the average household WTP $_{visit}$ is

US$ 18 per household visit – 0.078% of average annul disposable income or 0.82% of

average annual recreation, education, and cultural expenditures. A conservative

aggregation, using the median of the least amount the respondents were sure they

would pay from the survey sample, amounts US$2.1 per annum. The econometric

model shows that wealthier households, the elderly and families with more children are

willing to pay more for a visit to the NMNS. The first variable is a common result of

cultural studies. The positive association with number of children could be that people

are prepared to pay more to visit the museum when there are more people visiting

together. However, the reason for the positive association with age is not clear.

8.1.4. Summary of findings regarding policy

Based on a simple benefit-cost analysis, the results from the CV survey suggest that the

maintenance of the NMNS to its current level is justified. It is economically acceptable

because the sum of the total economic values exceeds its operational costs, even though

some of its economic values do not accrue as cash flows. It is also politically

supportable, because the number of people benefiting from the NMNS exceeds far

more than 50%.

The survey results also shed light on the issues of public subsidy and admission charges.

The current research takes the stand that the key to understanding charging policy lies

in an analysis of charging 'practices' rather than 'principle', since an analysis of

charging policy must be based on the appreciation of the particular museum for which

the charge is imposed and of the specific financial constraints operating in that policy

domain. Therefore, public subsidy and admission charges are considered two

interrelated, rather than contradictory, issues relevant for resource allocation.

Both public subsidy and admission charges are justified in the case of the NMNS based

on the current CV survey. The justification of the latter lies in that: (1) charging is not a

deterrent to visit this museum; (2) charging is expected to have little impacts on visiting

frequencies and visitor profiles; (3) charging is appreciated by the public as an

additional payment for the extra benefits accruing to attending the museum; and (4)

charging is not against any traditional ideology amongst the museum community in

Taiwan. Public subsidy of the NMNS through general taxation is considered equitable,

based on the survey results that the benefits of the existence of the museum is fairly

equally enjoyed by people across different social economic groups.

Finally, the CV survey provides some promising results encouraging a possible change

in the financing of the NMNS. The museum is currently facing an opportunity to

initiate a change in its financing mechanism: from the dependent 'agency budgets'

financing to the self-responsible 'National University/College Operation Fund' scheme.

The latter seems to be superior because: (1) it reduces the reliance on public

expenditure which can then be redirected to other basic social needs; (2) it avoids the

risks of cyclical financing as public expenditure is controlled from macroeconomic

reasons; (3) it helps to make the decision-making and policy of the museum free from

the whims of politicians; (4) it offers the museum more flexibility and possibility to

fulfil its mission. The managerial/curatorial opinions are split into two camps, both

knowing the problems with the current dependent financing and the advantages of the

alternative. The hesitation and scepticism towards the change lie in the risk involved

with the change that the museum may be forced to struggle with its survival financially

so as to compromise its mission and integrity. The argument cannot be settled without

an understanding of the public demand for the NMNS. The CV survey provides such

information, and the encouragingly significant economic value of the NMNS revealed

from the survey suggests a promising prospect of the change.

8.2 Implications on museum management

The current study has demonstrated that the contingent valuation method can produce

valid benefit measure of the NMNS and identify factors associated with its benefit

measure through econometric modelling. The revealed benefit measure and its

associated factors provide useful information for museum policy formulation and

evaluation from a public perspective. The results from the economic valuation exercise

are successfully used to demonstrate the NMNS's benefits to society, and to optimise its

use of resources without compromising the museum's fundamental duties.

In the case of measuring the economic benefits the NMNS, there is a consistency

between both the curatorial/managerial and the public perspectives on the importance

of the NMNS. The absence of conflicts between both sides makes the policy

formulation less complicated. However, it is possible that the results from the

contingent valuation could have failed to support the maintenance of the NMNS, either

by revealing a small economic value, or by failing a cost-benefit analysis. If this had

been the result, it could have been interpreted as a warning sign of a need of improving

the service provided by the museum or improving the communication between the

museum professionals and the public.

Overall, the case study proves the economic valuation approach flexible and powerful.

The current research confirms the promise of the economic valuation approach

addressed earlier in Chapter 2:

1. It produces benefit measure revealed by monetary value – the most widely

    understood unit of comparison in communicating relative importance – to provide

some general quantitative basis for discussing values that have previously been stated in qualitative terms.

2. Due to its general quantitative basis, economic valuation offers museums an analytical framework and diagnostic tool to demonstrate their benefits to society in a quantifiable, comparable, and understandable manner. This will further enables different sectoral, or inter-sectoral, projects to be assessed, prioritised, and co-ordinated, and convinces all sections of society that museums are worth their interests.

3. Economic valuation approaches allow museums to move away from decisions previously based mainly on costs, towards a more balanced assessment of benefits and costs of different decisions. This will assist not only in budgeting service provision and more efficient resource allocation but also in making a seemingly subjective decision-making process more objective.

4. Economic valuation approaches involve public consultation in the decision-making process which responds well to the current participatory democracies.

While economic valuation undoubtedly has many benefits to offer, there are a number of potential pitfalls that those who carry out economic valuation exercise need to be aware of. The main area of controversy over economic valuation exercise lies in the problematic nature of its survey approach as to whether surveys can obtain reliable and valid WTP measures, i.e. the respondents may not be telling the truth. The general validity and reliability issues have been reviewed in Chapter 4, and are not revisited into great detail here.

In short, validity refers to the correspondence between that one wishes to measure and that one actually measured. The factors that may affect the validity include: the

interviewer bias, strategic behaviour, the embedding effect, anchoring bias, familiarity,

instrument bias, sequencing, and hypothetical bias. As opposed to validity, reliability is

an index of the reproducibility and stability of a measure. For economic valuation

studies, the index that is relevant for policy purposes is the stability of WTP measures

over time.

The concise review of the above issues in Chapter 4 provides evidence that many of the

criticisms of the technique seems to be related to problems at the survey design and

implementation stage rather than to some intrinsic methodological flaw. The empirical

findings from the current CV survey largely support the validity of CV estimates. It also

shows that the validity problems experienced in the current survey are more to do with

the survey design than the cultural differences occurred when the methodology applied

in a non-Western context[67].

8.3. Future research avenues

There have been only a few contingent valuation studies in Taiwan, and the current

study provides the first empirical application of contingent valuation study on museum

related issues. Although the public in Taiwan are not used to being asked to put a

monetary value on public issues, let alone public cultural issues, the current study has

demonstrated that a carefully designed and implemented contingent valuation study

can generate valid economic measures in Taiwan.

There are three key areas in which this research effort may be usefully extended:

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[67] The biggest difference between the respondents in the West and that in Taiwan is probably the lack of
curiosity of respondents in Taiwan about the motivation of the contingent scenario.

1. Refining the CV survey instrument developed in the current CV survey and collecting responses from a nationally representative sample.

2. Extending the valuation research along similar lines to other national museums in Taiwan.

3. Incorporating the psychological and sociological approaches towards understanding public images of museums and museum visiting in Taiwan into this valuation approach.

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Appendix I – Design of Document Survey and Management Interview

The aims of the document survey and management interview are:

1. to explore the wider context in which the NMNS is managed;

2. to explore the managerial and curatorial perspectives on the financing of the NMNS.

The document survey was carried out from August to December in 1999. The documents surveyed include:

1. Governmental publications;

2. Governmental websites[68];

3. NMNS publications;

4. NMNS internal documents.

The document survey focuses on the following subjects:

1. Governmental budgets and policies on the museums sector in Taiwan;

2. NMNS's policies on its management;

3. NMNS's financial accounts.

Thirteen key museum personnel, including the museum director and the head of each department/office (see, Figure A1.1), were interviewed. In the interviews, the curators/managers were encouraged to talk freely about the following issues:

1. What are the past, present, and possible future sources of financing of the NMNS?

2. What are the museum's past, present, and possible future policies towards its financing?

3. What do they, as curators/managers, think about the past, present, and possible future financing of the NMNS? Why?

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[68] Data collected from the governmental websites survey are updated during the course of writing.

4. How were the entrance ticket prices determined?

5. What do they, as curators/managers, think about the issue of museum charging?

Figure A1.1   Staff structure of the NMNS
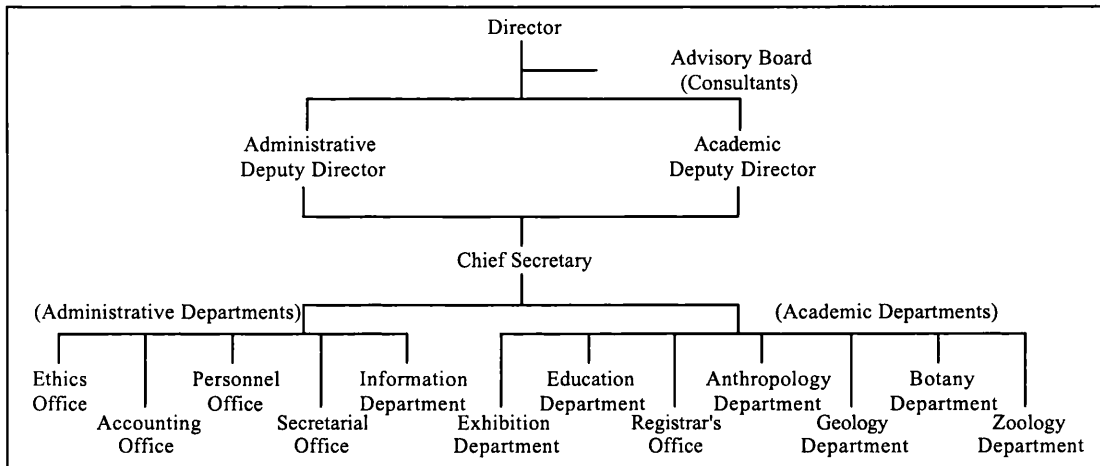
Appendix II – The Questionnaire

(The Chinese version)

(The English translation)

年滿十八歲的了嗎？這份問卷是一名就讀於英國倫敦大學博士班研究生的論文的一部分，希望您能抽出10分鐘左右回答以下幾個問題。您的回答僅供本研究之用，絕不向外透露，謝謝您的合作。

---

1. 訪員：
2. 日期：
3. 時間：
4. 地點：☐1. 台北市　　☐2. 高雄市　　☐3. 台中市　　☐4. 科博館出口處

文化、休閒設施

5. 如果今天政府要投資增設獲改善文化、休閒設施，在您心目中，下列設施的優先順序爲何？
   （填1、2、3、4、5：第一優先填1，第二優先填2，以此類推。）
   ☐1. 音樂廳、表演廳　　　　☐2. 公園　　　　　　　☐3. 圖書館
   ☐4. 博物館、美術館　　　　☐5. 綜合體育館、球場

博物館

6. 請問您是否曾聽過以下博物館，若是聽過請打✓：
   ☐1. 國立故宮博物院　　　　☐2. 國立歷史博物館　　　☐3. 國立台中自然科學博物館
   ☐4. 國立高雄科學工藝博物館　☐5. 國立海洋科學博物館　☐6. 國立台東史前博物館

   ☐7. 在您居住的縣市中的任何一所博物館：_____

7. 請問您是否曾參觀過以下博物館，若是參觀過請打✓：
   ☐1. 國立故宮博物院　　　　☐2. 國立歷史博物館　　　☐3. 國立台中自然科學博物館
   ☐4. 國立高雄科學工藝博物館　☐5. 國立海洋科學博物館　☐6. 國立台東史前博物館

   ☐7. 在您居住的縣市中的任何一所博物館：_____

8. 請問您對於這些博物館的訊息多來自何處（可複選）？
   ☐1. 電視　　　　　　　　　☐2. 報紙　　　　　　　☐3. 雜誌
   ☐4. 朋友　　　　　　　　　☐5. 博物館文宣　　　　☐6. 其他：_____

9. 去年一整年中，您大約一共參觀過多少次博物館？

   總次數 _____ 次，分別是哪些博物館：_____

10. 請問您去參觀博物館的最主要原因是什麼（單選）？
    ☐1. 定期去博物館看看展覽　☐2. 去做研究　　　　　☐3. 有特展、特殊活動
    ☐4. 假日帶小孩一起出門走走　☐5. 和朋友一起出門走走　☐6. 路過、躲雨、吹冷氣、……
    ☐7. 從來不去博物館　　　　☐8. 其他：_____

11. 博物館有許多的功能，下列幾個博物館的功能中，您覺得他們的重要性如何？

	1.非常重要	2.重要	3.可以考慮	4.不重要	5..非常不重要
博物館應該要收藏並妥善保存具有歷史價值的文物	☐	☐	☐	☐	☐
博物館是提供民眾美術、歷史、科學教育的場所	☐	☐	☐	☐	☐
博物館應該是提供休閒娛樂的場所	☐	☐	☐	☐	☐
博物館應該利用本身的收藏辦展覽	☐	☐	☐	☐	☐
博物館應該多辦國外來的展覽	☐	☐	☐	☐	☐
博物館應該積極進行研究	☐	☐	☐	☐	☐
博物館應該幫助人民更了解、更珍惜臺灣	☐	☐	☐	☐	☐

家戶資料

12. 以下問題都是以「家戶」爲作答的單位，因此，請您先說明您家庭成員的組成：
    ☐1. 已婚，有小孩：全家有 ____ 人：其中未滿18歲人口 ____ 人，其餘 ____ 人：以下問題請以您全家『____ 人』爲單位作答。
    ☐2. 已婚，沒有小孩：全家有 ____ 人：其中未滿18歲人口 ____ 人，其餘 ____ 人：以下問題請以您全家『____ 人』爲單位作答。
    ☐3. 未婚：以下問題請以您個人『1 人』爲單位作答。

國立自然科學博物館

國立台中自然科學博物館是臺灣第一座國家級規模的科學博物館，目前有四十萬件以上的蒐藏，算得上是現階段臺灣專業整體性蒐藏數量最豐富，管理、維護保存制度最完善的博物館之一。

本研究所想要了解的是：「以科博館目前的整體水準，包括展覽、研究、收藏品、出版、教育推廣活動等等，對您『全家』而言，值多少錢？」換句話說，也就是您『全家』，透過『繳稅』及『門票』的方式，願意付出多少錢給科博館。

13. 請問，您『全家』『每年』以『繳稅』的方式，願意付出多少錢給科博館，使它能維持目前的水準？下列金額中，從 0 開始，在您『一定願意』付出的金額的空格上打✓，在您『不確定』是不是願意付出的金額的空格留空白，到您『一定不願意』付出的金額的空格上開始打✗。（若拒絕作答，請到問題 16）（若答案是○元，請到問題 17）

☐ 0 元	☐ 2500 元
☐ 250 元	☐ 2750 元
☐ 500 元	☐ 3000 元
☐ 750 元	☐ 3500 元
☐ 1000 元	☐ 4000 元
☐ 1250 元	☐ 4500 元
☐ 1500 元	☐ 5000 元
☐ 1750 元	☐ 5500 元
☐ 2000 元	☐ 6000 元
☐ 2250 元	☐ 6000 元以上

14. 在您印象中，科博館是個怎麼樣的博物館？
☐1. 非常好　　☐2. 好　　☐3. 還可以　　☐4. 差　　☐5. 很差

15. 下列敘述中，何者能夠說明您願意付出這筆錢的理由（可複選）？
☐1. 雖然我沒參觀過科博館，但我願意每年繳稅，維持它的運作及品質，以便將來我去參觀
☐2. 我覺得臺灣有一個科博館很好、很重要，不管我參不參觀，我都願意繳稅支持它
☐3. 我願意繳稅支持科博館，以使後代子孫也能享有科博館
☐4. 其他：＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿
（到 18）

16. 請問您為什麼不願意作答？
☐1. 我從來不參觀科博館，只有參觀的人需要付錢
☐2. 我們家已經繳很多稅了，我們不想再花更多錢了（到註 1）
☐3. 政府或科博館都太浪費了，我們不想花錢在科博館上（到註 2）
☐4. 其他：＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿
（到 18）

17. 請問您不願意付出任何錢的理由是什麼？
☐1. 我從來不參觀科博館，只有參觀的人需要付錢
☐2. 我們家已經繳很多稅了，我們不想再花更多錢了（到註 1）
☐3. 政府或科博館都太浪費了，我們不想花錢在科博館上（到註 2）
☐4. 科博館對我就值這麼多錢
☐5. 其他：＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿

18. 請問『參觀科博館』，對您來說值多少錢，換句話說，您『全家』『每次』願意付多少門票費用參觀科博館，以使科博館能夠維持您目前參觀科博館時您所感受到的品質？下列金額中，從 0 開始，在您『一定願意』付出的金額的空格上打✓，在您『不確定』是否願意付出的金額的空格留空白，到您『一定不願意』付出的金額的空格上開始打✗。（若拒絕作答，請到問題21）（若答案是〇元，請到問題 22）

☐ 0 元	☐ 1000 元
☐ 100 元	☐ 1250 元
☐ 200 元	☐ 1500 元
☐ 300 元	☐ 1750 元
☐ 400 元	☐ 2000 元
☐ 500 元	☐ 2250 元
☐ 600 元	☐ 2500 元
☐ 700 元	☐ 2750 元
☐ 800 元	☐ 3000 元
☐ 900 元	☐ 3000 元以上

19. 請問您參觀科博館的經驗如何？

☐1. 非常好　　☐2. 好　　☐3. 還可以　　☐4. 差　　☐5. 很差　☐6. 沒去過

20. 請問科博館門票票價的高低是否會影響您參觀科博館的次數？

☐1. 會，門票愈貴，愈不常來參觀

☐2. 會，門票愈貴，愈常來參觀

☐3. 不會，票價不是影響我們家參觀科博館的主要因素，影響參觀次數的主要因素是

_____。

（到 23）

21. 請問您為什麼不願意作答？

☐1. 我從來不參觀科博館，只有參觀的人需要付錢

☐2. 我們家已經繳過稅給科博館了，我們拒絕付門票錢（到註 3）

☐3. 博物館太浪費了，我們不想花錢在科博館上（到註 4）

☐4. 其他，_____

（到 23）

22. 請問您不願意付出任何錢的理由是什麼？

☐1. 我從來不參觀科博館，只有參觀的人需要付錢

☐2. 我們家已經繳過稅給科博館了，我們拒絕付門票錢（到註 3）

☐3. 博物館太浪費了，我們不想花錢在科博館上（到註 4）

☐4. 參觀博物館對我就值這麼多錢

☐5. 其他，_____

23. 問卷到此，有些人會改變主意，覺得他們剛剛回答的金額太多或太少，在這裡，我們回憶一下，在問題 13 中，您說您全家願意以繳稅的方式，每年支付 _____ 元給科博館，問題 18 中，您說您全家願意每次參觀科博館時支付 _____ 元門票費給科博館，換句話說，如果您全家每年參觀一次科博館，您全家每年大約要付出 _____ 元給科博館。

我們真正想知道的，是您心目中，願意支付多少錢給科博館，答案沒有對或錯之分，如果您想改變剛才回答的數據，歡迎重新回到問題 13 及問題 18，重新作答。

☐1. 要，我要改變。→ 回問題 13 或 18

☐2. 不要。→ 繼續

24. 如果您能夠選擇付錢給科博館的方式，您會選擇以下哪一種方式？

☐1. 每年繳稅給科博館維持一般營運；參觀時，再付門票享受親身參觀博物館的樂趣

☐2. 每年繳稅給科博館，參觀時免費

☐3. 參觀時付門票，使用者付費，不必繳稅

☐4. 其他：_____

基本資料

25. 您是民國 _____ 年出生

26. 您的性別是：☐1. 男　☐2. 女

27. 您居住的地區在 _____ 縣（市）

30. 您家中負擔家計的主要成員的職業是：

☐1. 軍公教　　☐2. 營造業　　☐3..服務業　　☐4. 商業　　☐5. 農林漁牧業

☐6. 製造業　　☐7. 學生　　　☐8. 醫師　　　☐9. 律師　　☐10.研究機構研究員

☐11.待業、退休　☐12.其他，請註明_____

30. 您的教育程度：

☐研究所以上　　　　　　☐大學/專（畢、肄業）　　　　☐高中/職（畢、肄業）

☐國中（畢、肄業）　　　☐小學（畢、肄業）　　　　　　☐補習自修

31. 您的家庭完稅前每月的總收入是（指經常性收入，如：薪資、利息收入、房租……等。請注意，是
您全家收入的總和，而不是您個人的收入）：

☐20,000 元以下　　　　　☐20,001 元~40,000 元　　　　☐40,001 元~60,000 元

☐60,001 元~80,000 元　　☐80,001 元~100,000 元　　　☐100,001 元~130,000 元

☐130,001 元~160,000 元　☐160,001 元~200,000 元　　　☐200,001 元~250,000 元

☐250,001 元~300,000 元　☐300,001 元~350,000 元　　　☐350,001 元~400,000 元

☐400,001 元~450,000 元　☐450,001 元~500,000 元　　　☐500,001 元以上

問卷到此結束，感謝您的合作！

請問您願不願意留下您的大名及電話，以便日後若是需要做追蹤調查時聯絡？

附註

1. 其實，您每年所繳的稅中，已經有一部分是用在科博館上，我們想知道的是，如果您有機會能自己決
定，科博館對您值多少錢時，您會付出多少錢。您現在願意重新回答您的願付金額了嗎？（願意 → 回
問題 13；不願意 → 到問題 18）

2. 我們想知道的是，科博館對您值多少錢，如果我們假設政府及科博館都能妥善、有效率的運用這筆錢，
您願意重新考慮回答您願意付出多少錢嗎？（願意 → 回問題 13；不願意 → 到問題 18）

3. 您參觀科博館時，沒有得到更多收穫嗎？我們想知道的是，『參觀科博館』對您值多少錢，您願意重
新考慮回答您的願付金額嗎？（願意 → 回問題 18；不願意 → 到問題 23）

4. 我們想知道的是，科博館對您值多少錢，如果我們假設政府及科博館都能妥善、有效率的運用這筆錢，
您願意重新考慮回答您願意付出多少錢嗎？（願意 → 回問題 18；不願意 → 到問題 23）

Hello, are you over 18 years old? (Yes → continue; No → thank you very much)

I am conducting this interview on behalf of a postgraduate student at University College London as part of her PhD study. I would appreciate it if you could answer a few questions. They will take only 10 minutes and your answers will be treated completely confidentially. I hope you can help me. Thank you very much.

1.	Interviewer:
2.	Date:
3.	Time:
4.	Location: ☐1. Taipei ☐2. Kaohsiung ☐3. Taichung ☐4. Exits of NMNS

Priorities of cultural / leisure facilities

5. Taiwan is a rapidly developing country. However, the public resources are limited and they have to be allocated to priority issues. Could you please rank the priorities of the following cultural / leisure facilities for the next five years? (1 as the most important, 2 as the next most important and so on)
   ☐1. Theatres / Concert Halls   ☐2. Parks   ☐3. Libraries
   ☐4. Museums / Galleries   ☐5. Sports Centre

Museums

6. Have you ever heard about the following museums in Taiwan?
   ☐ 1. National Palace Museum
   ☐ 2. National History Museum
   ☐ 3. National Museum of Natural Science in Taichung
   ☐ 4. National Museum of Science and Technology in Kaohsiung
   ☐ 5. National Museum of Marine Biology in Pingdong
   ☐ 6. National Museum of Prehistory in Taidong
7. Have you ever been to the following museums?
   ☐1. National Palace Museum
   ☐2. National History Museum
   ☐ 3. National Museum of Natural Science in Taichung
   ☐ 4. National Museum of Science and Technology in Kaohsiung
   ☐ 5. National Museum of Marine Biology in Pingdong
   ☐ 6. National Museum of Prehistory in Taidong
8. What are your sources of information on museums?
   ☐1. Television;   ☐2. Newspaper;   ☐3. Magazine;
   ☐ 4. Friends;   ☐5. Museum poster / leaflet;   ☐6.Others,_____
9. Approximately how many times have you visited any museum in Taiwan in the last year?
10. What is your main reason for visiting museums? (Please tick the most important ONE)
    ☐1. Visiting the permanent exhibition;
    ☐ 2. For research purposes;
    ☐ 3. For special exhibition / events;
    ☐ 4. To spend some time with my children;
    ☐ 5. To spend some time with my friends;
    ☐ 6. Just walk by, it is rainy, or it is too hot outside;
    ☐ 7. Never visited any museum;
    ☐ 8. Others,_____
11. There are many museums in Taiwan. I would like you to consider the importance of the following functions of public funded museums: (1: very important; 2: important; 3: worth considering; 4: not important; 5: not important at all)

	1	2	3	4	5
Acquire and take good care of objects with historic significance	☐	☐	☐	☐	☐
Provide art education, science education....etc.	☐	☐	☐	☐	☐
Provide leisure experience	☐	☐	☐	☐	☐
Have exhibitions with their own collections	☐	☐	☐	☐	☐
Have exhibitions with collections loaned in from other countries	☐	☐	☐	☐	☐
Research	☐	☐	☐	☐	☐
Enable people to understand and to appreciate Taiwan	☐	☐	☐	☐	☐

Household

12. In the following sections, 'household' is used as statistical unit to answer the WTP questions. Therefore, I would like to ask you how many people there are in your household before starting the WTP questions.

   ☐ 1. Married with children: there are _____ people in my household, including ___ people over and above 18 years old, and _____ people under 18 years old, PLEASE ANSWER THE FOLLOWING QUESTIONS ACCORDING TO THE NUMBER OF PEOPLE IN YOUR HOUSEHOLD.

   ☐ 2. Married without any child: there are _____ people in my household, including ___ people over and above 18 years old, and _____ people under 18 years old, PLEASE ANSWER THE FOLLOWING QUESTIONS ACCORDING TO THE NUMBER OF PEOPLE IN YOUR HOUSEHOLD.

   ☐ 3. Single: PLEASE ANSWER THE FOLLOWING QUESITON ACCORDING TO YOURSELF ONLY.

National Museum of Natural Science

National Museum of Natural Science is the first national natural science museum in Taiwan, and is comparable to the standard of other science museums abroad. It is one of the most professional and best managed museums, and it has the most comprehensive natural history collections in Taiwan. The museum currently has four hundred thousand pieces of collections in its care. It is dedicated to collecting, conserving, exhibiting and researching natural specimens, natural resources and anthropological relics.

With its huge number and variety of collections and functions, it needs a great deal of resources for its maintenance. Later, I am going to ask you to say how much your household (or yourself only, if your are single) is willing to pay, if anything, to NMNS through income tax each year AND entrance ticket per visit.

13. Before asking how much your household is willing to pay for NMNS through the admission charge, I would like you to tell me how much YOUR HOUSEHOLD would be willing to pay each year, through tax, to continue to keep the existence and maintenance of NMNS at its present standard. Please look at the monetary values below. Starting from zero, tick the sums that YOUR HOUSEHOLD (or YOURSELF if you are single) would definitely be willing to pay EACH YEAR. Leave a blank space in front of the amounts you are not sure whether you would pay. Place a cross in front of the amounts you are sure you would not pay.

   ☐ 0   ☐ 2500
   ☐ 250   ☐ 2750
   ☐ 500   ☐ 3000
   ☐ 750   ☐ 3500
   ☐ 1000   ☐ 4000
   ☐ 1250   ☐ 4500
   ☐ 1500   ☐ 5000
   ☐ 1750   ☐ 5500
   ☐ 2000   ☐ 6000
   ☐ 2250   ☐ over 6000

   (if refuse to fill the box, go to 16)(if zero, go to 17)

14. How do you think about NMNS?

   ☐ 1. Very good   ☐2. Good   ☐3. Acceptable   ☐4. Bad   ☐5. Very bad

15. Why would you be willing to pay?

   ☐ 1. I would like to keep the museum running so that I can go there sometime in the future, whether I visit it or not currently;

   ☐ 2. It is important to maintain a museum like this in Taiwan no matter I visit it or not;

   ☐ 3. The future generation can enjoy the benefits of it;

   ☐ 4. Other, _____.(go to 18)

16. Can you tell me why you refuse to answer the question?

   ☐ 1. I don't visit the museum; only those who visit the museum should pay for it;

   ☐ 2. My household is paying too much in taxes already and don't want to spend more; (go to end note 1)

   ☐ 3. The government or the museum wastes too much money; (go to end note 2)

   ☐ 4. Other, _____.(go to 18)

17. You have said that you are not willing to pay anything. Can you give the main reason for this answer?
    ☐ 1. I don't visit the museum; only those who visit the museum should pay for it;
    ☐ 2. My household is paying too much in taxes already and don't want to spend more; (go to end note 1)
    ☐ 3. The government or the museum wastes too much money; (go to end note 2)
    ☐ 4. That is what the museum is worth to me;
    ☐ 5. Other, _____.
18. Now I would like you to tell me how much YOUR HOUSEHOLD would be willing to pay EACH TIME you visit the museum, through admission charge, on top of the tax you pay for its existence and maintenance each year, for visiting the NMNS with its quality at present level. Please look at the monetary values below. Starting from zero, tick the sums that YOUR HOUSEHOLD would definitely be willing to pay EACH YEAR. Leave a blank space in front of the amounts you are not sure whether you would pay. Place a cross in front of the amounts you are sure you would not pay.
    ☐ 0   ☐ 1000
    ☐ 100   ☐ 1250
    ☐ 200   ☐ 1500
    ☐ 300   ☐ 1750
    ☐ 400   ☐ 2000
    ☐ 500   ☐ 2250
    ☐ 600   ☐ 2500
    ☐ 700   ☐ 2750
    ☐ 800   ☐ 3000
    ☐ 900   ☐ over 3000
    (if refuse to fill the box, go to 21)(if zero, go to 22)
19. How is your experience visiting the museum?
    ☐1. Very good   ☐2. Good ☐3. Acceptable ☐4. bad   ☐5. Very bad   ☐6. Never been there
20. Will the price difference influence your frequency of visits to the museum?
    ☐ 1. Yes, the more I pay, the less I go there;
    ☐ 2. Yes, the more I pay, the more I go there;
    ☐ 3. No influence at all. Whether to visit the museum or not depends on _____.
    (go to 23)
21. Can you tell me why you refuse to answer the question?
    ☐ 1. I don't visit the museum; only those who visit the museum should pay for it;
    ☐ 2. My household has paid the museum through taxes and don't want to spend more; (go to end note 3)
    ☐ 3. The museum wastes too much money; (go to end note 4)
    ☐ 4. Other, _____. (go to 23)
22. You have said that you are not willing to pay anything. Can you give the main reason for this answer?
    ☐ 1. I don't visit the museum; only those who visit the museum should pay for it;
    ☐ 2. My household has already paid in taxes and don't want to spend more; (go to end note 3)
    ☐ 3. The museum wastes too much money; (go to end note 4)
    ☐ 4. That is what visiting the museum is worth to me;
    ☐ 5.Other, _____.
23. We sometimes find that people do not realise that they are asked about two sequential ways of payments to the museum until both sections are finished. Now, at this point of the interview, I would like you to review what you have just said and give you the chance to make adjustments and changes. In question 13 and 18, you said you were willing to pay no more than NT$_____ per year in tax and no more than NT$_____ each time you visit NMNS. If you and your family go to NMNS once a year, this gives NT$_____ as the MAXIMUM amount annually your household would be willing to pay for the museum. If you would like to make any change, please do not hesitate to do so. We want to get your best judgement about how much the museum is worth to your household. There are no right or wrong answers. Would you like to shift any amounts around or raise or lower the total amount?
    ☐ 1.Yes, make changes → go back to 13 or 18
    ☐ 2. No → continue
24. If you were given the chance to make the choice of how you pay for NMNS, what method of payment would you prefer?
    ☐ 1. I would like to pay through my income tax every year for the general maintenance of the museum, and through admission charge for visiting the museum;
    ☐ 2. I would like to pay for the museum only through my income tax every year, and I think visiting the museum should be free;
    ☐ 3. I would like to pay for the museum through admission charge only when I visit it;
    ☐ 4. Other, _____.

Social-economic information

25. What is the year of birth of your household head?
26. Sex: ☐1. Male   ☐2. Female
27. Where do you live?
28. What is the occupation of your household head?
    ☐1. Civil service/school teaching   ☐2. Architecture/construction   ☐3. Freelance
    ☐4. Commerce   ☐5. Agriculture/forestry/ fishing   ☐6. Manufacturing
    ☐7. Full-time study   ☐8. Medicine   ☐9. Law
    ☐10.Academics   ☐11.Retired/unemployed   ☐12.Other, _____
29. What is the highest level of finished education of your household head?
    ☐1. Postgraduate   ☐2. Undergraduate   ☐3. High school
    ☐4. Junior high school ☐5. Elementary school ☐6. Study at home
30. Would you place a tick by the relevant monthly income range for your household as a whole?
    ☐1. below 20,000   ☐2. 20,001~40,000   ☐3. 40,001~60,000   ☐4. 60,001~80,000
    ☐5. 80,001~100,000   ☐6. 100,001~130,000   ☐7. 130,001~160,000   ☐8. 160,001~200,000
    ☐9. 200,001~250,000   ☐10. 250,001~300,000   ☐11. 300,001~350,000   ☐12. 350,001~400,000
    ☐13. 400,001~450,000   ☐14. 450,001~500,000   ☐15. over 500,001

Thank you very much for answering my questions.

End note

1. Interviewer. I'd like to remind you that your household is already paying some amount for NMNS in your taxes. It is very important for us to learn what value you place on maintaining the museum when you are given the chance to make the choice yourself. Would you be willing to answer your WTP amount now? (Yes → go to 13; No → go to 18)

2. Interviewer. It is very important for us to learn what value you place on maintaining the museum when you are given the chance to make the choice yourself. Would you be willing to answer your WTP amount if I noted here that the amounts you give are based on the assumption that the museum would be efficient and well run? (Yes → go to 13; No → go to 18)

3. Interviewer: Don't you think you get more benefits by visiting the museum? It is very important for us to learn what value you place on visiting the museum when you are given the chance to make the choice yourself. Would you be willing to answer your WTP amount now? (Yes → go to 18; No → go to 23)

4. Interviewer. It is very important for us to learn what value you place on visiting the museum when you are given the chance to make the choice yourself. Would you be willing to answer your WTP amount if I noted here that the amounts you give are based on the assumption that the museum would be efficient and well run? (Yes → go to 18; No → go to 23)